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ANNEX 1 – PART 1/2

ANNEX

to the

COMMISSION IMPLEMENTING DECISION

adopting the fourth revision of the work programme implementing the programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens (the ISA² programme) and the breakdown of the corresponding budgetary expenditure for 2020

ISA² WORK PROGRAMME

2020

**DETAILED DESCRIPTION OF ACTIONS
PART 1/2**

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FOREWORD

The structure of the ISA² work programme used in this document is designed to help identify links between similar initiatives by grouping them together in “packages”.

This document gives a detailed description of each action in the work programme along with detailed budgetary information.

The actions are based on proposals from the Commission and/or the Member States.

Actions under the ISA² programme are continuously coordinated and aligned with ongoing work under other EU initiatives. Similarly, the ISA^s programme supports these and similar initiatives whenever they contribute to interoperability between EU public administrations.

1 KEY AND GENERIC INTEROPERABILITY ENABLERS

1.1 ACCESS TO BASE REGISTRIES (2016.28)

1.1.1 IDENTIFICATION OF THE ACTION

Type of Activity	Common frameworks
Service in charge	DG DIGIT.D.2
Associated Services	

1.1.2 EXECUTIVE SUMMARY

The Communication on the Digital Single Market Strategy states that public services in Europe have embraced new technologies to varying degrees. However, more can be done in order to modernise public administrations, achieve cross-border interoperability and facilitate easy interactions with citizens.

Applying the once-only principle is one way to achieve efficiency and increase user-friendliness, meaning that instead of asking the citizen for information that they have already provided, public administrations will reuse the information they already have. [The eGovernment Action Plan 2016-2020](#) states that only in 48% of cases do public administrations reuse information about citizens and businesses that they already possess.

This Action will contribute towards achieving the goals stated in the [Digital Single Market Strategy](#) and eGovernment Action Plan. Base registries are authentic sources of data for public administrations. As such, they are one of the basic building blocks of public services and the key to making the once-only principle a reality. As the data from base registries is also important for the procedures to be digitalised by 2023 by the Single Digital Gateway, the results of this Action will serve as inputs for the further development of the SDG.

The situation on access to and interconnection of base registries is varied. Most Member States have realized the importance of interconnecting their base registries and are implementing interconnection infrastructures in order to achieve this. For the future, an interconnection of base registries will be key for the realization of the once-only principle across Europe, which will be one of the principal goals of the future Digital Europe Programme. As such, any work done under this Action will be a key input towards the work done under the DEP Programme.

On the European level, some important initiatives have already taken place, or are in the process of being developed to interconnect base registers. The Directive on the Interconnection of Business Registries ([Directive 2012/17/EU](#)) mandates the interconnection of the business registries of all the Member States and has a provision on the construction of an interconnecting infrastructure. This has been achieved with the BRIS infrastructure that

went live on 8 June 2017. The e-Justice Portal¹ provides a European Access Point search function to BRIS, and also serves as an important point for the interconnection of other types of registries. A first interconnection of the national Insolvency Registries has been in operation on the e-Justice Portal since 2014 and currently the Commission and Member States are carrying out activities towards an obligatory interconnection further to [Regulation \(EU\) 848/2015](#). The e-Justice Portal also provides an interconnection and access to the registries and databases of the national bar associations, law societies and notarial chambers of the EU Member States. Work is also ongoing on the voluntary interconnection of Member States' Land Registers.

The Action has identified that some specific tools are needed in order to help in the interconnection of base registries. The last phase of the Action concentrated on two main outputs: an initial **Framework on Base Registry Access and Interconnection**, and preliminary work on a **European Registry of Registries**.

The **Base Registry Access and Interconnection Framework** defines a common approach based on best practices on how to interconnect and give access to the data contained in base registries. The European Interoperability Framework (EIF) defines a base registry as a source of authentic master data for the different entities and processes of the public administration. As such, the Framework focuses on master data management methodologies.

Another need that has been identified on both the Member State level and the European level is the creation of a registry of registries. The Member States are working on putting their own registries of registries in place. Once these developments are advanced enough, these Member States' registries could be federated in order to create a **European Registry of Registries**.

This could also support the implementation of the once-only principle in the context of the Single Digital Gateway.

The Action focused on the creation of a specification on how to describe registries and the datasets contained in them. This specification reused the DCAT-AP data specification and created an application profile for base registries based on it. This should help Member States create their own registries of registries and in the future should facilitate the set-up of a Registry of Registries on the European level.

1.1.3 OBJECTIVES

- Finalize a Base Registry Access and Interconnection Framework

¹ <https://e-justice.europa.eu/home.do>

- Finalize the specification to describe the data in base registries and facilitate the creation of registries of registries
- Exchange best practices between the Member States on the interconnection of base registries
- Create reusable tools to help the Member States to set up their own registries of registries
- Integrate the registry of registries in the once-only ecosystem

1.1.4 SCOPE

The current phases of Action will continue the improvement and promotion of the different important elements which have been delivered in the last phases and which will be further expanded in future phases.

These include:

- 1) Cartography of Reusable Solutions for Base Registry Interconnection.
- 2) Guidelines for Successful Base Registry Interconnection.
- 3) State of Play of Base Registry Interconnection in the EU and MS.

These three deliverables will be displayed in a user-friendly way to allow interested parties to get the information they need without having to search for a long time.

Further elements that will be finalized are:

- 1) The Framework for Base Registry Access and Interconnection: which will be further discussed with the Member States and rolled out.
- 2) The data specification for a registry of registries (BRegDCAT-AP, based on the DCAT-AP), which has been delivered at the end of 2019 and will need to be endorsed by the Member States.

The next phases of the Action will be more practical in nature. The Framework and the data specification for the registry of registries will be rolled out, and can help the Member States in their work for interconnecting their base registries and in the implementation of the once-only principle. A validation tool to help validate conformance to the data specification will be created, as well as several other reusable tools that can help in the setting up of registries of registries.

1.1.5 ACTION PRIORITY

Base Registries form one of the most important building blocks of public services, as they contain the data which many of these services then use. The Once-Only Principle, as part of the implementation of the Single Digital Gateway, is listed as one of the key priorities for the European Commission under the Digital Single Market Strategy, and base registries play a key role in making this goal a reality.

1.1.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>According to the EIF, base registries are one of the key building blocks of public services.</p> <p>Improving the access to the data contained in base registries and their interconnection has been identified as a priority for most the EU Member States. . It will also facilitate the implementation of the once-only principle.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>Base registries fulfil an interoperability role that cannot be carried out by any alternative solution. They contain the authentic and authoritative data needed to carry out public services.</p>

1.1.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	The data contained in base registries can be reused for any type of public service and it is very important for the once-only principle. In terms of the Action results, the Cartography of Reusable Solutions will map out different reusable solutions for base registries, which will allow the developers of base registries to reuse already existing solutions, instead of building new ones.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	Solutions developed under the Action on Base Registries are used in the Business Register Interconnection System.

1.1.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	The results of the Action on Base Registries can be reused by any Member State or public administration and also in cross-border application of once-only principle.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	Some reusable elements delivered in past phases of the action, such as the BRIS search engine or the e-payment model, have already been put into use by BRIS and are being considered for reuse by other interconnection initiatives.

1.1.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	Base Registries are seen as a priority in the EIS, EIF, as well as form a key pillar of the Once-Only Principle.
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	As one of the priorities in the EIS and the EIF, ISA2 is the best fit for the implementation of this proposal.

1.1.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

Can the results of the action (following this proposal) be re-used by a critical part of their target user base, as identified by the proposal maker? For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

Name of reusable solution	Cartography of Reusable Solutions
Description	This is a catalogue of existing reusable solutions for different phases of base registry projects.
Reference	
Target release date / Status	The initial Cartography was released and will be continuously updated.
Critical part of target user base	
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution	Guidelines for Base Registry Access and Interconnection
Description	The guidelines tackle different challenges and problems that projects on base registry access and interconnection come across and provide instructions on how to tackle them.
Reference	
Target release date / Status	The initial Guidelines have been released and will be continuously updated.
Critical part of target user base	
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution	State of Affairs in the Member States
Description	This is a state of affairs analysis for base registry access and interconnection in the Member States. It will allow policymakers to have up to date information on what is happening in the MS and use that as input for the crafting of different policies on the MS and EU levels.
Reference	
Target release date / Status	An initial state of affairs analysis has been completed by the end of 2017. Further maintenance will happen through the NIFO Action in 2020.
Critical part of target user base	
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Framework for Base Registry Access and Interconnection
Description	This Framework should serve as the guiding principle for different projects dealing with base registries.
Reference	
Target release date / Status	The Framework should be released in 2019 after thorough consultations with the Member States. Further maintenance of the Framework will happen in 2020.
Critical part of target user base	
For solutions already in operational phase - actual	

reuse level (as compared to the defined critical part)	
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Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Registry of Registries
Description	This will result in the creation of a specification to describe registries and the datasets contained in them. This specification will be based on the DCAT-AP. Different tools to help in the creation of registries of registries will also be developed (one example is a validator tool to help test the conformance to the specification).
Reference	
Target release date / Status	A Working Group to discuss the specification has been set up and the target date for the release of the first version of the specification at the end 2019. There will be further maintenance of the specification after that.
Critical part of target user base	
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

1.1.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability</i>	The proposal makes use of several ISA interoperability solutions, including the

Question	Answer
<i>solution(s)? Which ones?</i>	Core Vocabularies and EIRA.
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	

1.1.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union’s initiatives such as the DSM.

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union’s high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	The Action contributes to the Once-Only Principle, which is one of the priorities of the DSM.

1.1.6 PROBLEM STATEMENT

Currently most public administrations store their authentic data on citizens, businesses, properties, vehicles and other items in large databases called base registries. The problem is that this data is often duplicated in other databases as well and the different parts of the public administrations are not interconnected between each other.

This results in a subpar delivery of public services and higher costs. Citizens are often asked to provide their data multiple times to different entities within the public administration, which causes significant burden for them.

The solution to this problem is to interconnect the different base registries with all relevant public services that require any such data, which will allow the citizen to provide their data only once. The different public administration entities requiring this data will then be able to access this data without having to ask the citizen for it again (provided there is user consent). Such a solution will be applicable both at national level and for cross border exchange of data.

The problem of	Base registry access and interconnection
affects	Most public services
the impact of which is	inefficient and costly public services, and hassle to citizens if the challenges are not tackled
a successful solution would be	An ecosystem of interoperable or interconnected base registries with clear rules to accessing the data and making the once-only principle a reality

1.1.7 IMPACT OF THE ACTION

1.1.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Savings in money can occur in a variety of ways. One way is through the reuse of already existing solutions. The Catalogue of Reusable Solutions will allow developers of base registries to potentially reuse solutions instead of developing new ones from scratch, saving money. The Guidelines address many of the potential challenges that occur in different base registry projects. By solving these challenges, significant problems can be avoided, which results in money savings.		Member State public administrations, Citizens

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in time	The Guidelines are designed to describe ways of tackling common problems in base registry projects, which can result in significant cost savings for these projects.		Developers of base registries
(+) Better interoperability and quality of digital public service	As the cornerstones of public services, a better access to the data in base registries will promote greater interoperability as well as result in higher quality public services.		

1.1.7.2 User-centricity

The user-centricity principle is kept in mind when designing the different outputs of the Action. For greater ease in accessing the information in the different deliverables, a Dashboard on JoinUp is being created, which will organize all the information in a user-friendly way

1.1.8 EXPECTED MAJOR OUTPUTS

Major outputs are presented in section 1.1.5.5.

1.1.9 ORGANISATIONAL APPROACH

1.1.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Member States		Giving inputs on the Framework
European Commission		Inputs for policy on once-only principle
Developers of public services, base registries		Inputs for Framework

1.1.9.2 Identified user groups

The results of this Action should be useful for any public administration that is looking to create base registries, interconnect their base registries, or creating their data management strategy. The Catalogue of Services can be used by developers who are considering the reuse of solutions when building their base registries, while the other deliverables (such as the Framework) are meant to help not only them, but also policy makers and public service administrators.

The BRegDCAT-AP specification, as well as the reusable tools around it, can be reused by developers working on setting up their own registries of registries.

1.1.9.3 Communication and dissemination plan

The main outlet for the dissemination of the results of the Action will be a Dashboard on JoinUp, which will consist of the Catalogue of Reusable Solutions, Guidelines, as well as MS Profiles. All of these will be organized in a user-friendly way.

1.1.9.4 Key Performance indicators

Provide a list of KPIs allowing the measurement of the progress and completions of milestones and the action. In case of an on-going action with already identified metrics² indicate the current values.

Description of the KPI	Target to achieve	Expected time for target
Reuse of the Registry of Registries specification based on the DCAT (either reuse natively or through the mapping of an existing data model to the specification)	All MS should either reuse the specification or map their own data model to it.	2020

1.1.9.5 Governance approach

The entire action is coordinated under the ISA² Programme. A Steering Committee has been set up.

The Steering Committee:

- Champions the project, raising awareness at senior level
- Guides and promotes the successful execution of the project at a strategic level
- Provides high level monitoring and control of the project
- Adopts the project charter
- Follows timely delivery and quality of new developments delivered by the system supplier
- Sets priorities, authorise plan deviations, scope changes with high project impact and decide on recommendations
- Arbitrates on conflicts and negotiate solutions to important problems
- Drives and manages change in the organisation
- Ensures adherence to organisation policies and directions
- Approves and signs-off all key management milestone artefacts (vision document, project plan, business case, etc.)

² For examples see the ISA2 dashboard <https://ec.europa.eu/isa2/dashboard/isadashboard>, **effectiveness** tab.

A Working Group has been set up to help define the BRegDCAT-AP specification for the registry of registries.

1.1.10 TECHNICAL APPROACH AND CURRENT STATUS

The technical approach will build upon the previous studies done under the Action on Base Registries and take advantage of synergies with other ISA² Actions such as the European Interoperability Cartography and the European Interoperability Reference Architecture.

The Action is in the process of implementing a practical tool (dashboard) in JoinUp. This tool will allow different stakeholders to access the three main outputs of the current phases of the Action (Cartography of Reusable Solutions, Guidelines for Base Registry Interconnection, State of Play on Base Registry Interconnection in the MS) in an interactive way.

A Working Group has been created which is in charge of developing the BRegDCAT-AP specification for the registry of registries. This Working Group will also oversee the development of reusable tools to help the Member States which are creating their own registries of registries. One of these tools will be a validator to help check the conformance to the specification, while other tools are still to be defined after a needs analysis in the Member States.

The aim of this Action is to be of practical help to the different initiatives trying to interconnect base registries. It should provide guidance to the different initiatives and some potentially reusable solutions. The results of the Action should be maintained, and further enhanced under the Digital Europe Programme. The BRegDCAT-AP specification will be the basis of application profiles defined in the Member States, and a maintenance of this model will be fundamental for interoperability and exchange of data from base registries across Europe. As such, a similar process of maintenance and sustainability as under related ISA2 Actions (SEMIC, and Catalogue of Services) will be followed.

1.1.11 COSTS AND MILESTONES

1.1.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Update of actions' deliverables and dashboard creation and maintenance		250		Q4/2016	Q3/2017
Creation of a Framework for Base Registry Access and Interconnection		200		Q4/2017	Q3/2018
Further work on the Framework and the creation of a specification for a European Registry of Registries		150		Q4/2018	Q3/2019
Finalization of the BRegDCAT-AP specification for the registry of registries, creation of reusable tools for the creation of registries of registries (based on an analysis of MS needs)		150		Q4/2019	Q3/2020

1.1.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Study, inception, execution	250	250
2017	Study, inception, execution	200	200
2018	Study, inception, execution	150	150
2019	Study, inception, execution	150	
2020	Study, inception, execution	150	

1.2 CATALOGUE OF SERVICES (2016.29)

1.2.1 IDENTIFICATION OF THE ACTION

Service in charge	DG DIGIT.D2
Associated Services	DG GROW

1.2.2 EXECUTIVE SUMMARY

A large number of public administration portals have been/ are being implemented throughout Europe with no harmonisation among them in terms of the description of public services and associated information. This lack of harmonisation makes it difficult to link or federate them. Furthermore, public services are often not organised in a user-centric perspective making more difficult the search of the information and the integration of several services around business or life events.

The action aims to deliver a set of specifications and solutions that will: help achieve a certain level of interoperability of national and European public services descriptions, facilitate the federation of public services and the creation of national and European catalogues, contribute to the “Single Digital Gateway” action established in the Digital Single Market Strategy and in particular support the discovery of public services, the collection of comparative data and the implementation of the once only principle at national or cross-border level.

Under the ISA programme, in collaboration with the representatives of the Point of Single Contacts of the Services Directive in several Member States, a Core Public Service Vocabulary Application Profile was defined as an extension of the ISA Core Public Service Vocabulary in order to model in more detailed public services information and to link them to business events.

The Core Public Service Vocabulary Application Profile (CPSV-AP) has been extended to cover all types of public services in order to support life events, as well as other controlled vocabularies. Translated versions of the labels in the 24 official languages of the EU were incorporated.

A set of software tools for the creation, validation, mapping and harvesting/ federation of public service descriptions have been implemented for potential re-use and as supporting instruments for the use of the CPSV-AP.

In addition to this, a number of interested Member States and European portals have been engaged in order to launch a series of real life pilots in order to test and prove the benefits of adopting the CPSV-AP and the software tools as means to: harmonise the descriptions of public services at national PSCs (Points of Single Contact); federate public services at the national portals and also at the European level; and create ultimately harmonised catalogues of public services.

In 2019 the action has explored how new technologies could be useful, together with well-structured vocabularies like CPSV-AP in order to create national and cross-border catalogues of services like an architecture to create chatbots, APIs and taxonomies. It has also worked on different studies on how the data model could help MS and the Single Digital Gateway to fulfil the requirements of the Single Digital Gateway Regulation (particularly articles 13,15 and 18). A preliminary taxonomy for public services has been created and discussed with the MS.

With regards to 2020 plans, the data model specification for describing public services (CPSV-AP) will be further maintained and extended. The same will be done for the software tools. Technical support like testing use cases will continue to be provided to EU MSs and EUIs (for instance DG GROW in the context of the Single Digital Gateway and Your Europe portal) in order to assist them in creating a catalogue of public services at the portal that could be used: for the search engine for the discovery of information, procedures and services, and by the feedback and assistance finder tools..

In detail, the data model specification for describing public services (CPSV-AP) will be tailored and enriched to account for the information on the 21 procedures of the Single Digital Gateway (SDG) Annex II and areas of information of Annex I.

The action will work on the definition of a taxonomy to classify public services based on best practices at Member States, EU and international level. Based on this taxonomy the action will define a particular taxonomy for the information areas, services and procedures listed in Annex I and II of the Single Digital Gateway Regulation.

The action will work in the definition of a taxonomy to classify the public services related to the 21 procedures of the SDG Annex II based on a gap analysis and previous work executed by this ISA2 action. Based on this taxonomy the action will define a particular taxonomy for the services and procedures listed in Annex II of the Single Digital Gateway Regulation.

Technical support like testing use cases will continue to be provided to EU MSs and EUIs (for instance DG GROW in the context of the Single Digital Gateway and Your Europe portal) in

order to assist them in creating a catalogue of public services around life and business events, and use the CPSV-AP and/or the tools.

New pilots with some portal owners will be launched to promote the creation of public services catalogues at national level as well as across-borders, and improve the user's experience. The action will define a fully-fledge Reference architecture for chatbots based on well-structured vocabularies like the CPSV-AP.

The CPSV-AP and associated taxonomies could be supported in the long run thanks to the Digital Europe Programme.

Moreover, being the CPSV-AP and associated taxonomies important specifications for some policy areas like the SDG (for the collection of links); and in order to bridge the gap between ISA2 programme and the Digital Europe Programme, extra funding will be requested for 2020 to ensure that some activities can be supported.

Finally, based on the recommendations of the ISA2 interim evaluation:

- to awareness-raising beyond national administrations on the EIF,
- act upon the synergies with other EU programmes to promote the EIF,

This project will keep promoting the CPSV-AP and assisting MS (also regional and local governments), as well as policy areas like the Single Digital Gateway in the efforts towards automating and improvement of the collection and federation of public service information, producing and creating Catalogue of Public Services and improve the user's experience at the public service portals. A workshop like the one organised in 2019 will take place to raise awareness and discuss important topics around Public Service Catalogues.

1.2.3 OBJECTIVES

The main objective of the action is to achieve interoperability around national and European service descriptions that would help European public administrations build national as well as cross-border harmonised catalogues of public services.

The action will work towards the fulfilment of these objectives:

- implement interoperability specifications that will help European public administrations to describe public services a group them under life and business events

- implement solutions to enable the link and federation of national and European public service into a Single Digital Gateway in order to foster them as one-stop-shops; particularly in relation to the 21 procedures of Annex II of the SDG Regulation and areas of information of Annex I
- test in real life how those solutions can provide the expected benefits and based on the practical results improve them
- promote the creation of public services catalogues and improve the user's experience at public services portals
- Creation of taxonomies to categorize public services at EU level;
- Promote the federation and in some cases aggregation of the public services offered by the various levels of public administrations into national Single Digital Gateways or one-stop-shops. This would lead at a later stage to the creation of a European catalogue of public services in various domains and would improve user experience of public services portals;
- Definition of a reference architecture for the use of chatbot with the CPSV-AP
- Technical assistance to the Member States and some European portals for adoption and use of the CPSV-AP vis-à-vis the SDG implementation. Launch of pilots
- Extend the data model to cover the whole lifecycle of public service creation, also the modelling at internal processes level.

1.2.4 SCOPE

The objective of the present action will be fulfilled through the implementation of interoperability solutions and by running pilots to link the Catalogues of public services existing throughout the EU. Initially the scope was limited to the Services Directive but under ISA² it was extended to other policy domains as well.

The main target audience are public administrations, in particular the entities in public administrations that are responsible for the implementation and provisioning of public services and the owners of the public service portals acting as one-stop-shops.

The action will deliver a set of specifications and solutions to achieve a certain level of interoperability around national and European public services descriptions as well as to facilitate the federation of public services and the creation of catalogues. This will help European public administrations to improve the discovery and the provisioning of national

and cross-border services, along with the implementation of the Single Digital Gateway Regulation and the deployment of the once only principle.

1.2.5 ACTION PRIORITY

This section is used to assess the priority of the proposal to become a programme action according to Art. 7 of the ISA² decision³.

1.2.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

According to the revised European Interoperability Framework and the Interoperability Strategy, Member States need to put in place catalogues of public services, interoperability solutions and use common models for describing them. To support the ability to find reusable resources (like public services) relevant catalogues are needed. This component allows publishers to document and make available resources with the potential to be reused by others. Commonly agreed descriptions of services and interoperable solutions published by catalogues are fundamental, to enable interoperability amongst different catalogues. This action aims at defining a technical specification (data model) and at implementing tools to facilitate the creation of catalogue of public services, one of the interoperability enablers for integrated public services according to the conceptual model defined by the EIF. Creating and using a common data model across public administrations is of a particular interest for the implementation of the Single Digital Gateway. It will help the user to easily find the right information and access the procedures both at national level or in a cross-border context.

Question	Answer
<i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors</i>	This action will help accomplishing action 13 of the action plan for interoperability “Implement and promote common models for

³ DECISION (EU) 2015/2240 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

Question	Answer
<p><i>in Europe?</i> <i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>describing and cataloguing public services across the EU”.</p> <p>It also addresses recommendation 44 of the revised version of the EIF on catalogue of public services. Catalogue of Public services is one of the interoperability enablers for integrated public services according to the conceptual model defined by the revised EIF.</p> <p>To that end, the action is defining a technical specification (data model) , taxonomies to classify European services and life events/ business events, and implementing a set of tools to facilitate the creation of national and cross-border catalogue of public services.</p> <p>This action also contributes to the principle of user-centricity of the Tallinn declaration.</p> <p>This action also contributes to the implementation of the once-only principle, mainly in a cross-border context.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>There is not a data model at EU level to harmonise the description of public services and the creation of catalogues of public services</p>

1.2.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	This action aims at defining a technical specification (data model) and at implementing tools to facilitate the creation of catalogues of public services in cross-cutting policies areas like the Services Directive, the Digital Single Gateway Regulation proposal or electronic service portals.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	The CPSV-AP is already being used by some Member States to create federated catalogue of public services in the domains of the Service Directive, national public service and eGovernment portals.

1.2.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	This action aims at defining a technical specification (data model) and at implementing tools to facilitate+ the creation of catalogues of public services in cross-cutting policies areas like the Services Directive, the Digital Single Gateway Regulation proposal or electronic service portals.

Question	Answer
	This action also contributes to the implementation of the once-only principle, mainly in a cross-border context.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	The CPSV-AP is already being used by some Member States to create cross-border federated catalogue of public services.

1.2.5.4 Urgency

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	<p>The action facilitates the creation of a one-stop-shop catalogue of public services thus contributing to the implementation of the Single Digital Gateway.</p> <p>The Services Directive establishes a single market for services within the EU and obliges MS to create Point of Single Contacts with all the information and the electronic access to the formalities to set-up a business. These portals can make use of the tools and solutions of this action for the harmonisation of the descriptions and the federation of public services, in order to foster the PSCs as one-stop-shops.</p>
<i>How does the ISA² scope and financial</i>	Yes, since interoperability is

Question	Answer
<i>capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	<p>fundamental in the implementation of solutions in this action.</p> <p>In addition to that, the scope of this action falls under the development, establishment, bringing to maturity, operation and re-use of new cross-border or cross-sector interoperability solutions and common frameworks; all of them are principles of the ISA2 programme.</p>

1.2.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

Can the results of the action (following this proposal) be re-used by a critical part of their target user base, as identified by the proposal maker? For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

Output name	Core Public Service Vocabulary Application Profile (CPSV-AP)
Description	Data model to facilitate the creation of catalogue of public services and the interoperability of machine readable descriptions of any type of public service; the model will also allow for the modelling of public service descriptions around life and business events.
Reference	https://joinup.ec.europa.eu/asset/cpsv-ap/home
Target release date / Status	Updated v2.2.1 released in May 2019. This version will be maintained in 2020
Critical part of target user base	Some portals acting as one-stop-shops for public services (PSCs; eGovernment portals; Digital Single Gateways)
For solutions already in operational phase – actual reuse level (as compared to the defined critical part)	Reused by Belgium, Greece, Italy, Finland, and Estonia to create national or cross-border catalogues of public services

Output name	Tools for the creation of Catalogues of Public Services
Description	Tools for the automated federation of public service descriptions and for the creation of catalogue of public services at national and cross-border level. The tools will provide the following functionalities: CPSV-AP mappings, public service description editor, public service description harvester, CPSV-AP validator.
Reference	
Target release date / Status	The pilot implementations of the tools have been released in summer 2016 and a quality check and correction was performed in 2018
Critical part of target user base	Some portals acting as one-stop-shops for public services (PSCs; eGovernment portals)
For solutions already in operational phase – actual reuse level (as compared to the defined critical part)	In piloting phase, some Member States are reusing the pilot implementation of the tools.

1.2.5.6 Level of reuse of existing solutions

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	<p>The CPSV-AP is based on the Core Public Service Vocabulary and the Core evidence vocabulary.</p> <p>DCAT-AP specification has been reused to create at the CPSV-AP a container of public service descriptions like a catalogue.</p> <p>A Solution Architecture Template of the European Interoperability Reference Architecture on Catalogue</p>

Question	Answer
	<p>of Public Services was developed in 2017 and a draft one on chatbots in 2019.</p> <p>The CPSV-AP validator is offered as a service through the ISA test bed action. Also a demo on how the tools can be orchestrated in a one-stop-shop public service portal is displayed in the test bed.</p> <p>A new page was created on JoinUp to host the open source tools.</p>
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	

1.2.5.7 Interlinked

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<p>The Services Directive establishes a single market for services within the EU and obliges Member States to create Point of Single Contacts with all the information and the electronic access to the formalities to set-up a business or formalities for citizens. These portals can make use of the tools and solutions of this action for the harmonisation of the descriptions and the federation of public services, in order to foster the PSCs as</p>

Question	Answer
	<p>one-stop-shops.</p> <p>The action facilitates the creation of a one-stop-shop catalogue of public services thus contributing to the implementation of the Digital Single Gateway regulation.</p>

1.2.6 PROBLEM STATEMENT

The problem of	Not having a standard way of describing and documenting public services following a user centric approach
affects	citizens and businesses when they search for information on administrative formalities based on life and business events
the impact of which is	lots of trouble in finding the right information in an easy way
a successful solution would be	A common semantic model and interoperability tools to describe and federate public services information at national and cross-border one-stop-shop portals. Finally, public administrations can create national and European catalogues. Such a solution would facilitate the implementation of the once only principle, mainly in a cross-border environment.

1.2.7 IMPACT OF THE ACTION

1.2.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Using the CPSV-AP and the other tools will support the PSCs and other one-stop-shops to integrate info on public services following a user centric approach (and the creation of catalogues of public services). That will save money to citizens and businesses when they want to complete formalities with competent authorities thanks to the creation of catalogue of public services	Solutions already available. Some portals already using it	Public authorities, citizens and businesses
(+) Savings in time	The same way, it will save time to citizens and businesses	Solutions already available. Some portals already using it	Public authorities, citizens and businesses
(+) Better interoperability and quality of digital public service	Using the CPSV-AP and the other tools will support the PSCs and other one-stop-shops to integrate info on public services following a user centric approach and the creation of Public Service Catalogues	Solutions already available. Some portals already using it	Public authorities, citizens and businesses

Impact	Why will this impact occur?	By when?	Beneficiaries
(-) Integration or usage cost	Reduced cost of integration of public service information at the one-stop-shop portals	Solutions already available. Some portals already using it	Public authorities

1.2.7.2 User-centricity

In the definition of the CPSV-AP user centricity was taken into account from the very beginning. The model was defined taking into consideration the way citizens and businesses perceive and search for public services (through life and business events). A specific controlled vocabulary defining a suggested list of first and second level of business events and a first level of life events was defined with the portal owners of several Member States.

The definition of an open reference architecture for the creation of chatbot functionalities for accessing Catalogue of Public Services by citizens/ businesses based on the CPSV-AP will help competent authorities being more user-oriented in accessing the information, through modern means.

The project is also working on the definition of a European taxonomy for public services, and particularly for the 21 procedures and related services of Annex II of the SDG Regulation, as well as the areas of information of Annex I. The definition is taking into account the user's perspective so that the way to search for information, services and procedures can be improved at the digital service portals.

As for the other tools, some pilots have been carried out with the technical teams working in the point of single contacts and other one-stop-shop portals to improve the user experience when using the technical tools developed in this action.

Continuous feedback from the users will be captured through webinars and the piloting experience in order to keep in mind further user's needs when maintaining the solutions.

1.2.8 EXPECTED MAJOR OUTPUTS

Output name	Consolidated technical specification of the Core Public Service Vocabulary Application Profile
Description	<p>Data model to facilitate the creation of catalogue of public service; interoperable machine readable descriptions of any type of public service and grouping of them around life and business events.</p> <p>The new version will be able to also model the 21 procedures and other services related to the Single Digital Gateway Regulation and areas of information of Annex I.</p> <p>A taxonomy for public services will also be created, and particular one of the 21 procedures of Annex II of the SDG and for areas of information of Annex I..</p>
Reference	https://joinup.ec.europa.eu/asset/cpsv-ap/home
Target release date / Status	<p>The consolidated version is available since the end of 2016. Updated v2.2.1 was in May 2019. This version will be extended in 2020 to model the services of the Single Digital Gateway, and particularly the digital ones foreseen in Annex II and areas of information of Annex I. services</p> <p>The taxonomy for public services, for areas of information of Annex I and for the 21 procedures of the SDG will be in place in Q1 2020</p>

Output name	Tools for the automated creation of Catalogues of Public Services
Description	For the automated federation of public service descriptions and for the creation of catalogue of public services at national and cross-border level.

	The tools provide the following functionalities: CPSV-AP mappings, public service description editor, public service description harvester, CPSV-AP validator.
Reference	
Target release date / Status	<p>The CPSV-AP validator is offered as a service in the ISA2 Test bed by the end of 2017.</p> <p>Quality checks and bug correction in Q1 2020.</p> <p>Fully production releases in JoinUP are in place since Q3 of 2018 and maintenance will run in 2019/2020</p>

Output name	Reference Architecture for chatbots based on the CPSV-AP
Description	Full open reference architecture for the creation of chatbot functionalities for accessing Catalogue of Public Services by citizens/ businesses based on the CPSV-AP.
Reference	
Target release date / Status	Q2 of 2020

1.2.9 ORGANISATIONAL APPROACH

1.2.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Member States	ISA ² representatives from the various working groups and Committees.	Policy makers and business owners defining business requirements and raising awareness

Stakeholders	Representatives	Involvement in the action
		of the solutions implemented in this action
Member States	Portals owners falling under the Single Digital Gateway Regulation ; other public service portals and national catalogues at Member State Level Portals at local level (for instance municipalities working on smart cities projects)	Potential users of solutions; participants in pilots
DG GROW Publication Office	Representatives of the SDG expert groups; DG GROW services responsible for the Digital Single Gateway Regulation proposal and for Your Europe portal. For the taxonomies and controlled vocabularies, we will do the work with the support of Publication Office	Potential users of the solutions

1.2.9.2 Identified user groups

The action is managed by DIGIT with the support of an external contractor. Whenever major deliverables are to be published, the validation of the Member States representatives will be sought.

The current technical working group composed of several Member States from the EUGO Network has been extended to those working on the implementation of the Single Digital Gateway, also people working in national/ regional or legal catalogue of public services in order to hold the technical discussions and build consensus related to the implementation and the piloting of interoperability solutions. This group is counting on relevant European and Member States' stakeholders responsible for the provisioning of one-stop-shops of public services and for the creation of national catalogue of public services. We intend to involve more representatives from the SDG technical expert subgroup on ICT and digital procedures.

1.2.9.3 Communication and dissemination plan

The progress of this action will be communicated on a regular basis to ISA² representatives from the various working groups and committees.

The current technical working group composed of several PSCs owners has been extended to other portal owners. Several webinars have been held. A distribution list was created to communicate and exchange working documents and other information with the various participants in the working group. All the deliverables and related info to the action will be available in a workspace set-up on Joinup.

Some dissemination and communication material will be produced to raise awareness on the works carried out in this action and in order to engage all interested public administrations.

Several pilots with the Member States are currently underway where technical assistance is given on how to adopt and use the solutions implemented in this action.

1.2.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected time for target
Number of Member States participating in the creation of the model	16	2017
Number of Member States using the tools or adopting the model	7	2019
Number of policy domains using the model	3	2019

1.2.9.5 Governance approach

The action is managed by DIGIT with the support of an external contractor.

The current technical working group is composed of several Member States representatives nominated by the ISA2 Committee members, managers of the PSCs created under the Services Directive and other public service portal owner. In this group technical discussions

are held to build consensus related to the implementation, maintenance and piloting of interoperability solutions. This group is counting on relevant European and Member States' stakeholders responsible for the provisioning of one-stop-shops of public services and for the creation of national catalogue of public services, as well as policy DGs like DG GROW and the national SDG coordinators group, also dealing with ICT and digital procedures.

The ISA2 Committee and Coordination Group will be updated regularly on the progress of this project.

Strong coordination with DG GROW is in place for the implementation of the Regulation on the Single Digital Gateway.

1.2.10 TECHNICAL APPROACH AND CURRENT STATUS

The Core Public Service Vocabulary Application Profile (CPSV-AP) has been extended to cover all types of public services in order to support life events, as well as other controlled vocabularies. Translated versions of the labels in the 24 official languages of the EU have been incorporated to the model over the last months of 2017.

A set of software for the creation, validation, mapping and harvesting/ federation of public service descriptions have been implemented for potential re-use and as supporting tools for the use of the CPSV-AP.

In addition to this, a number of interested Member States and European portals has been engaged in order to launch a series of real life pilots in order to test and prove the benefits of adopting the CPSV-AP and the software tools as means to: harmonise the descriptions of public services at national PSCs (Points of Single Contact); federate public services at the national portals and also at the European level; and create ultimately harmonised catalogues of public services

The action aims to deliver a set of specifications and solutions that will: help achieve a certain level of interoperability of national and European public services descriptions, facilitate the federation of public services and the creation of national and European catalogues, contribute to the "Single Digital Gateway" action established in the Digital Single Market Strategy and facilitate the implementation of the once only principle at national or cross-border level.

Under the ISA programme, in collaboration with the representatives of the Point of Single Contacts of the Services Directive in several Member States, a Core Public Service

Vocabulary Application Profile was defined as an extension of the ISA Core Public Service Vocabulary in order to model in more detailed public services information and to link them to business events.

The Core Public Service Vocabulary Application Profile (CPSV-AP) has been extended to cover all types of public services in order to support life events, as well as other controlled vocabularies. Translated versions of the labels in the 24 official languages of the EU will be incorporated to the model over the last months of 2017.

A set of software tools for the creation, validation, mapping and harvesting/ federation of public service descriptions have been implemented for potential re-use and as supporting instruments for the use of the CPSV-AP.

In addition to this, a number of interested Member States and European portals have been engaged in order to launch a series of real life pilots in order to test and prove the benefits of adopting the CPSV-AP and the software tools as means to: harmonise the descriptions of public services at national PSCs (Points of Single Contact); federate public services at the national portals and also at the European level; and create ultimately harmonised catalogues of public services

With regards to 2020 plans, the data model specification for describing public services (CPSV-AP) will be further maintained and extended. The same will be done for the software tools. Technical support like testing use cases will continue to be provided to EU MSs and EUIs (for instance DG GROW in the context of the Digital Single Gateway and Your Europe portal) in order to assist them in creating a catalogue of public services at the portal that could be used: for the search engine for the discovery of services (and links of services), and by the feedback and assistance finder tools..

In detail, the data model specification for describing public services (CPSV-AP) will be tailored and enriched to account for the info on the 21 procedures of the Single Digital Gateway (SDG) Annex II and areas of information of Annex I.

The action will work on the definition of a taxonomy to classify public services based on best practices at Member States, EU and international level. Based on this taxonomy the action will define a particular taxonomy for the information areas, services and procedures listed in Annex I and II of the Single Digital Gateway Regulation and will improve user interaction with public services portals and will help the implementation of once-only principle.

The action will work in the definition of a taxonomy to classify the public services related to the 21 procedures of the SDG Annex II based on a gap analysis and previous work executed by this ISA2 action. Based on this taxonomy the action will define a particular taxonomy for the services and procedures listed in Annex II of the Single Digital Gateway Regulation.

Technical support like testing use cases will continue to be provided to EU MSs and EUIs (for instance DG GROW in the context of the Single Digital Gateway and Your Europe portal) in order to assist them in creating a catalogue of public services around life and business events, and use the CPSV-AP and/or the tools.

New pilots with some portal owners will be launched to promote the creation of public services catalogues at national level as well as across-borders, and improve the user's experience. The action will define a fully-fledge Reference architecture for chatbots based on well-structured vocabularies like the CPSV-AP.

The CPSV-AP and associated taxonomies could be supported in the long run thanks to the Digital Europe Programme.

Moreover, being the CPSV-AP and associated taxonomies important specifications for some policy areas like the SDG; and in order to bridge the gap between ISA2 programme and the Digital Europe Programme, extra funding will be requested for 2020 to ensure that some activities can be supported.

Finally, based on the recommendations of the ISA2 interim evaluation:

- to awareness-raising beyond national administrations on the EIF,
- act upon the synergies with other EU programmes to promote the EIF,

This project will keep promoting the CPSV-AP and assisting MS (also regional and local governments), as well as policy areas like the Single Digital Gateway in the efforts towards automating the collection and federation of public service information, producing and creating Catalogue of Public Services and improve the user's experience at the public service portals. A workshop like the one organised in 2019 will take place to raise awareness and discuss important topics around Public Service Catalogues.

1.2.11 COSTS AND MILESTONES

1.2.11.1 Breakdown of anticipated costs and related milestones

Phase: Inception Execution Operational	Description of milestones reached or to be reached	Anticipated Allocation (KEUR)	Budget line ISA, ISA ² / others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYYY)
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Phase: Inception Execution Operational	Description of milestones reached or to be reached	Anticipated Allocation (KEUR)	Budget line ISA, ISA ² / others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYYY)
Inception/ execution	<p>Extension of the public services data model: to cover the whole lifecycle of public service creation, also the modelling at internal processes level; creation of APIs, creation of new taxonomies for public services and the SDG Regulation.</p> <p>Implementation, test and pilot of solutions for the federation of public services descriptions.</p> <p>Maintenance of the solutions</p> <p>Guidelines and recommendations to build public service portals</p>	690	ISA ²	Q2/2016	Q3/2021

Phase: Inception Execution Operational	Description of milestones reached or to be reached	Anticipate d Allocation s (KEUR)	Budget line ISA, ISA ² / others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYYY)
Operation	Pilot operation with some national and European portals	410	ISA ²	Q3/2016	Q4/2019
	Total	1100			

1.2.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Inception, Execution, Operation	200	200
2017	Execution, Operation	200	200
2018	Execution, Operation	150	150
2019	Execution, Operation	200	200
2020	Execution, Operation	350	

1.3 DATA COMMUNICATION NETWORK SERVICE (TESTA / TESTA NG)(2016.02)

1.3.1 IDENTIFICATION OF THE ACTION

Service in charge	DIGIT D3
Associated Services	DG AGRI, DG BUDGET, DG DEVCO, DG DGT, DG ECHO, DG EMPL, DG HOME, DG HR, DG JUST, DG MOVE, DG SANTE, DG TRADE, DG Translation, EUROSTAT, Publications Office, Secretariat General, OLAF, CDT

1.3.2 EXECUTIVE SUMMARY

TESTA-ng is the natural successor to the initial TESTA, TESTA II and sTESTA networks developed respectively under the IDA, IDABC, ISA and now ISA² Community programmes. The TESTA project is funded by the ISA² Community Programme managed by the European Commission Directorate-General for Informatics (DIGIT).

A number of sectorial networks are currently using the TESTA services for their sectorial applications (OLAF, DG MOVE, DG EMPL, DG SANTE, CDT, DG JUST, DG ECHO , DG TRADE, etc).

The network is also used by the European Institutions, European Agencies and Joint Undertakings. In addition, the TESTA Framework is also extensively used by eu-LISA for the implementation/operations of the SIS II and VIS II networks and by EUROPOL for the implementation/operations of their own dedicated EUROPOL network. Also, the General Secretariat of the Council is using the TESTA Framework Contract for the implementation/operations of the Council Extranet and Courtesy networks.

The TESTA network is also used in the context of non-Community projects by Member State administrations or organisations acting on their behalf under certain conditions as described in the TESTA Memorandum of Understanding. One of the most successful non-community programmes is the trans-border police cooperation in the context of the Prüm treaty and the Financial Intelligence Unit network in the context of money laundering.

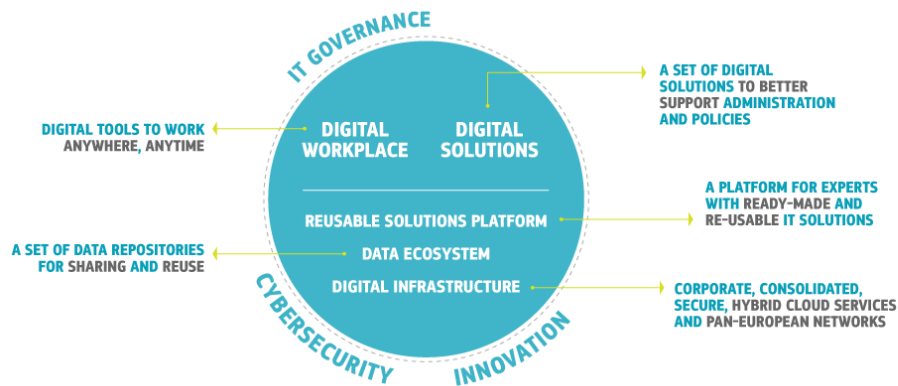
Hence, TESTA is fully in line with ISA² legal. As a core infrastructure platform, it offers a holistic cross-sector and cross-border approach which facilitates efficient and effective electronic cross-border and cross-sector interaction between European public administrations; supports the successful implementation of Union policies and activities and contributes to the implementation of the revised EIF and its Interoperability action plan.

Furthermore, during 2018 and first semester 2019, DIGIT, together with the main stakeholders of the network, have defined and approved the new orientation strategy for

the next evolution (beyond 2020) of the secure and reliable pan-European network services.

This new TESTA strategy has been co-created with all stakeholders to address their needs and identify synergies, leading to a corporate approach covering a wider scope, focusing on convergence for increased value and going deeper to address the constantly evolving needs in secure and reliable pan-European network infrastructures.

As integral underlying secured Digital Infrastructure layer, the future TESTA network will be a key infrastructure pillar of the European Commission Digital Strategy as depicted below:



By going wider, the future TESTA becomes a key component of the infrastructure layer supporting pan-European digital solutions for public administrations as described in the European Commission Digital Strategy. It will unify and provide a trusted, reliable and secure pan-European infrastructure to public administrations, DGs’ EU cross-border applications, EUIs and Agencies by building up and strengthening the consolidation of the current parallel networks into one approach.

By going deeper, it will be flexible and open to future requirements as well as proposes a modular service offering, from basic connectivity to advanced security services while supporting cross-border or cross-sector cooperation. It has been co-designed with all the stakeholders to address everyone’s needs and expectations, to meet all legal and other requirements and to provide cost containment through cost sharing.

1.3.3 OBJECTIVES

The main objectives of the future pan-European network are:

- To consolidate the network and ensure financial sustainability;
- To guarantee and further increase security and reliability in the exchanges between (mission) critical IT systems;
- To introduce secured trans-European collaborative services.

The future TESTA will be a key infrastructure building block for all the EUIs, agencies and bodies. Secure and reliable communications services are nowadays essentials for all, including Member States.

Further to the support of the senior management and IT boards, this strategy has been translated into technical specifications which has been published on 23 May 2019 to the market via a restricted call for tenders (reference DIGIT/A3/PR/2019/010). The awarding of the contract is expected by end of 2019.

Migration activities of the different existing networks from TESTA-ng (current network) to the future TESTA pan-European network is expected to take place in a phased approach starting in 2020 until end 2024 for the last network.

Part of the current TESTA-ng Eurodomain services will have to be operational until end of migrations. The operational continuity of the TESTA-ng Eurodomain in 2020 will rely on the ISA² funding.

1.3.4 SCOPE

Ensure continuity for the provision of the current TESTA-ng network.

1.3.5 ACTION PRIORITY

1.3.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> <i>the new European Interoperability</i> 	<p>The nature of the TESTA project “trans- border data communication” makes TESTA an underlying communication infrastructure directly contributing to cross border interoperability. Various policy areas (trans-border police cooperation, money laundering, asylum policy etc....) are directly served via the</p>

Question	Answer
<p><i>Framework (EIF),</i></p> <ul style="list-style-type: none"> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>TESTA initiative.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>TESTA provides network infrastructure that</p> <ul style="list-style-type: none"> - is private and only accessible to the EUI, Agencies and Public Administrations, ensuring confidentiality of transmissions and a greatly reduced surface of exposure to intrusion and hacking; - is independent of public Internet backbones, and therefore always available if when the Internet is down, ensuring that crucial information systems such as border control and police cooperation will continue to work even in the event of large-scale cyber attacks - has its own Security Operations Centre providing 24/7 monitoring and protection by security cleared personnel; - has built-in redundancy so as to guarantee 99,95% measured

Question	Answer
	availability even in case of technical problems within its own infrastructure.

1.3.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	YES, once the future TESTA is completed it will also provide collaborative secured cross border and cross sector services
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	TESTA is the undelaying secured transport platform for many policy areas. Justice and Home Affairs, Health, Transport, Trade, Employment are examples of policy areas that rely since years on TESTA.

1.3.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of</i>	Yes, TESTA is operational and used by the 28 Member States.

Question	Answer
<i>view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	Yes. TESTA is covering the whole territory of the European Union, EFTA Countries and Acceding Countries.

1.3.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	The continuation of the funding of this action for 2020 is urgent in order to guarantee the preparation of the next Pan-European network (FPEN) to replace TESTA-ng from 2020.
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	TESTA - is a common service (1) facilitating efficient and effective electronic cross-border/cross-sector interaction between European public administrations and between European public administrations. - operates (2) interoperability solutions supporting the implementation of Union policies and activities.

Question	Answer
	<p>(1) As per Article 2 of the ISA² <u>Decision 2015/2240</u>, 'common services' means the organisational and technical capacity to deliver a single outcome to European public administrations, including operational systems, applications and digital infrastructures of a generic nature which meet common user requirements across policy or geographical areas, along with their supporting operational governance.</p> <p>(2) As per Article 3 of this Decision, the ISA² programme shall support and promote: (a) the assessment, improvement, operation and re-use of existing cross-border or cross-sector interoperability solutions and common frameworks.</p> <p>Since ISA² is more focussing on new initiatives, the Commission has to define mechanisms to ensure the financial and operational sustainability of the infrastructure services.</p> <p>Interim financing is however mandatory to ensure continuity of service during the transition phase.</p>

1.3.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

Can the results of the action (following this proposal) be re-used by a critical part of their target user base, as identified by the proposal maker? For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	TESTA-ng
Description	
Reference	
Target release date / Status	
Critical part of target user base	
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	One of the main objectives of TESTA is “network consolidation”. In this perspective a common data communication infrastructure has been set up and is used and reused by many Union policy areas. The last decade TESTA as actively avoided the proliferation of communication infrastructures dedicated to one application.

1.3.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	TESTA is a generic key interoperability solution, supporting public administrations by providing a secured communication infrastructure and facilitating secured cross border data communications. TESTA serves

Question	Answer
	<p>information systems in various EU policy areas such as, Asylum (Eurodac/ Dublinet), trans border police cooperation (Prüm), judicial cooperation (ECRIS), financial intelligence (FIUNET), civil protection (CECIS), transport (TACHONET/EUCARIS), social security (EESSI), health (eHealth/Tobacco/ novel food), International Trade in Goods (MDE) and control of exports; transfer; brokering and transit of dual-use items (DualUse). Also the ISA action 2017.04 REGDEL relies on TESTA.</p>
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	<p>TESTA is reusing existing interoperability solutions such as CIRCABC, EU Survey. See also answer above.</p>

1.3.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union’s initiatives such as the DSM.

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union’s high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<p>As underlying secured communication infrastructure TESTA EuroDomain contributes directly via the information systems that are using TESTA to the implementation of:</p> <ol style="list-style-type: none"> 1. <u>Justice and fundamental rights</u> by

Question	Answer
	<p>providing secured and reliable communication infrastructure to information systems in the context of Fight against organised crime:</p> <ul style="list-style-type: none"> a) European Criminal records Information System (ECRIS), b) Cross border police cooperation combating terrorism and cross border crime (Prüm), c) System of Control of Explosives for the Prevention and Fights against the terrorism (SCEPYLT). <p>2. <u>Migration</u>: by providing secured and reliable communication infrastructure to information systems in the context of Asylum (Eurodac/ Dublinet for the comparison of finger Prints of asylum applicants.</p> <p>3. <u>The Internal Market</u>: by providing secured and reliable communication infrastructure to information systems in the context of</p> <ul style="list-style-type: none"> a) Financial Intelligence Network (FIUNET) in the context of money laundering; b) By letting people move more freely by supporting the electronic exchange of social security information (EESSI).

1.3.6 PROBLEM STATEMENT

The problem of	1. Having a defined strategy for a future pan-european network addressing the business requirements of all the stakeholders and being financially sustainable without extensive dependence on funding from community programme.
affects	All EU communities
the impact of which is	Less quality, higher price
a successful solution would be	<ol style="list-style-type: none"> 1. the execution of the new strategy for the future consolidated pan-European network, defined in 2018-2019, through the award to a new contractor of the restricted call for tender published mid 2019. 2. <u>Financial sustainability</u> - Currently the EuroDomain is financed by the ISA² programme and by DG CONNECT. The strategy for the future is focused on becoming financially sustainable by working towards a sound legal basis and by applying cost sharing by end 2021.

1.3.7 IMPACT OF THE ACTION

1.3.7.1 Main impact list

The funding of the continuation of the TESTA services will allow all communities that use the TESTA network to continue their services.

In parallel an action for the preparation of the future TESTA with a different governance model will be started. The activities in this context will initially be started up by budget that has been recovered from the TESTA-ng provider due to late delivery of the services.

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Consolidation of network infrastructure	From 2021 onwards	All Member States and user communities in all different EU policy areas.
(+) Cost sharing	Cost sharing after the migration to the new network	2022	All Member States and user communities in all different EU policy areas
(+) Cyber-Security and trust	TESTA provides enhanced security and resiliency in network communications. There are nowadays essential in support to eu-policies and (mission critical) cooperation. The future network will provide, on top of what TESTA provides today resiliency and security for a wide range of services including cloud connectivity to major providers and private clouds.	2021	All Member States and user communities in all different EU policy areas

1.3.7.2 User-centricity

In order to keep track of the needs of the users the TESTA team has or continues to assist different EU policy sectors for the integration of their information systems on TESTA (e.g. eHealth, EUCEG, nf-Net of DG SANTE, Service of Foreign Policy Instruments (FPI) and the respective European Union Advisory Missions, Agriculture expenditure audit of DG AGRI, police cooperation convention for Southeast Europe (PCCSEE) on the automated exchange of DNA data, dactyloscopic data and vehicle registration data).

On a yearly basis a TESTA workgroup with the TESTA representatives of the Member States is organised. The next meeting will take place during the last quarter of 2019.

Several Member States as well as the representatives of the EU Agencies have been contacted in bilateral in 2019 to address some of their specific requirements within the future TESTA network (Sweden, Germany ...).

Also the TESTA team is closely following up the ICTAC activities of EU Agencies.

1.3.8 EXPECTED MAJOR OUTPUTS

Output name	SCEPYLT
Description	(Explosives Control & Protection System to prevent and fight against terrorism). <i>DG for Migration and Home Affairs - Unit DI: Terrorism and Crisis Management is looking to expand the SCEPYLT system to additional Member States and 3rd countries.</i>
Reference	Legal basis: meeting in Sheffield July 2004
Target release date / Status	2018-2020

Output name	SIMSTAT / ESDEN
Description	ESDEN (modernisation of the data exchange services across the European Statistical System (ESS). Increase the number of National Statistical Institutes connected to TESTA for the exchange of statistical micro-data foreseen in the proposed

	regulation on Business Statistics (FRIBS).
Reference	
Target release date / Status	2018-2019

Output name	EU ETS
Description	Union Registry information system which handles the registration of carbon emission allowances exchanges (within the European Emission Trading System)
Reference	
Target release date / Status	2019

Output name	<i>NCPeH</i>
Description	eHealth System via National eHealth Infrastructure Agency
Reference	
Target release date / Status	2018-2019-2020

Output name	<i>EUROHPC</i>
Description	Connecting the Common European initiative on High Performance Computing- “EuroHPC” to TESTA
Reference	
Target release date / Status	2019

Output name	PCCSEE
Description	Connecting the Western Balkan countries having signed the Police cooperation convention for Southeast Europe (PCCSEE) on the automated exchange of DNA data, dactyloscopic data and

	vehicle registration data
Reference	
Target release date / Status	2019-2020

1.3.9 ORGANISATIONAL APPROACH

1.3.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Specific sectors	Ability for sectors and EU agencies to use a secured trans-European network service for the exchange of data with specific availability or security requirements over a shared quality solution. Prevents proliferation of uncontrolled networks.	user
Member States/ EFTA & candidate countries' Public administrations	Ability for MS administrations to use a secured trans-European network service for the exchange of data with specific availability or security requirements, with EU Institutions, EU agencies and other MS administrations. The provided solution is managed and the access points are under control of the MS/ EFTA & candidate countries' administrations.	user
EU Institutions and Agencies and JUs	Avoids the unnecessary implementation of costly shadow network infrastructures.	user
Non-community programs	TESTA can be used in the context of a non-Community project by Member States administrations or organisations acting on their behalf under certain conditions described in the TESTA Memorandum of	user

Stakeholders	Representatives	Involvement in the action
	Understanding. It stimulates the re-use of an existing infrastructure.	

1.3.9.2 Identified user groups

This table is an extract of the list of policy areas where TESTA is referenced.

This is not an exhaustive list:

Action / Policy	Description of relation
ECRIS	Council Decision 2009/316/JHA on the establishment of the European Criminal Records Information System (ECRIS).
Prüm	EU Council Decision (2008/616/JHA) on the implementation of Decision 2008/615/JHA on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border crime. Trans-border police cooperation in a non-community programme.
DUBLINET	Commission Regulation (EC) No 1560/2003 of 2 September 2003 laying down detailed rules for the application of Council Regulation (EC) No 343/2003 establishing the criteria and mechanisms for determining the Member State responsible for examining an asylum application lodged in one of the Member States by a third-country national. DubliNet is based on the use of the generic IDA services referred to in Article 4 of Decision No 1720/1999/EC.
Eurodac	Council Regulation No 2725/2000 of 11 December 2000 concerning the establishment of 'Eurodac' for the comparison of fingerprints for the effective application of the Dublin Convention. But in the COM/2016/0272 Proposal for a Regulation of the European Parliament and of the Council on the establishment of 'Eurodac' for the comparison of fingerprints for the effective application of [Regulation (EU) No 604/2013 establishing the criteria and mechanisms for determining the Member State

Action / Policy	Description of relation
	responsible for examining an application for international protection lodged in one of the Member States by a third-country national or a stateless person] , for identifying an illegally staying third-country national or stateless person and on requests for the comparison with Eurodac data by Member States' law enforcement authorities and Europol for law enforcement purposes (recast)
CECIS	Council Decision 2007/779/EC, Euratom of 8 November 2007 establishing a Community Civil Protection Mechanism and 2014/762/EU: Commission Implementing Decision of 16 October 2014 laying down rules for the implementation of Decision No 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism and repealing Commission Decisions 2004/277/EC, Euratom and 2007/606/EC, Euratom (notified under document C(2014) 7489) Text with EEA relevance.
EDRIS (ex 14 POINTS HOLIS)	Council Regulation (EC) No 1257/96 of 20 June 1996 concerning humanitarian aid
FIUNET	Council Decision 2000/642/JHA of 17 October 2000 concerning arrangements for cooperation between financial intelligence units of the Member States in respect of exchanging information
SIGL	Council Regulation (EEC) No 3030/93 of 12 October 1993 on common rules for imports of certain textile products from third countries.

1.3.9.3 Communication and dissemination plan

Event	Representatives	Frequency
TESTA workshop	TESTA national experts + representatives from EU Institutions, EU Agencies and application owners	From 1 to 2 times a year
TESTA	EU Institutions or national	On demand

Event	Representatives	Frequency
stakeholders	governments	
TESTA webportal	https://portal.testa.eu	At least on a monthly basis

1.3.9.4 Key Performance indicators

Key performance indicators for the continuation of services of TESTA-ng are contractually defined by the service level agreements and associated penalties.

From Jan-May 2019:

Average availability of EURODOMAIN for 2019 is 98.78%

Number of P1 security tickets with breached SLAs	1 out of 4
Number of P1 tickets with breached SLAs	16 out of 33
Number of P2 security tickets with breached SLAs	0 out of 0
Number of P2 tickets with breached SLAs	7 out of 42

1.3.9.5 Governance approach

Organisational: TESTA workgroup with the TESTA experts of the Member States / EFTA & candidate countries.

Technical: The network's governance approach for 2019 shall remain as is. It is fully outsourced to T- Systems whereby a SOC manages the day to day operations and a layer of specialists sits in between DIGIT and the SOC to facilitate reporting. An independent team of auditors perform the necessary controls and audit checks on the entire project scope.

Meanwhile, during 2018 and 2019, DIGIT has established a Task Force composed of senior officials of the General Secretariat of the Council, EEAS, representatives of the Information Communication Technology Agencies Committee (ICTAC), DG TAXUD, EU-LISA, and Europol. This Task Force reports to a Steering Board composed of senior management representatives from these respective entities. This Task Force has defined the strategy for the future pan-European network to replace current TESTA-ng. The strategy addresses the following aspects:

- Timeline for service continuity of TESTA-ng and development of the future network,
- Common functional and technical requirements,

- Definition of a High-level service catalogue to support the requirements of the key stakeholders,
- Transitioning strategy,
- Service provision strategy,
- Co-financing strategy.

DIGIT, in collaboration with the other stakeholders, have subsequently prepared the restricted call for tender and its subsequent publications. This work is still ongoing in 2019. Implementation of the new EURODOMAIN network shall take place in 2020.

Migration activities of the different existing networks from TESTA-ng (current network) to the future TESTA pan-European network will take place in a phased approach starting in 2021.

1.3.10 TECHNICAL APPROACH AND CURRENT STATUS

Currently the contract with T-Systems is active up until 06/2020. DIGIT has started negotiations to extend the contract for maximum 4 years. This will allow continuity of the current TESTA-ng services delivered to eu-LISA (SIS II and VIS II networks), EUROPOL and the General Secretariat of the Council (Extranet and Courtesy) while migrating progressively each of these networks to the new network.

In order to control the quality of the provided services and adherence to the security requirement of the project, assistance services are necessary in the domains of service provisioning, security, ITIL processes, customer relationship management.

Activities in relation to the preparation of the future TESTA are NOT covered by this budget.

1.3.11 COSTS AND MILESTONES

1.3.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
TESTA-ng	Continuation	2338	ISA	01/2020	12/2020

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
continuation	of the current TESTA-ng services contract T- Systems				
TOTAL		2338			

1.3.11.2 Breakdown of ISA2 funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016		2500	2500
2017		3546	3010
2018		3600	3039
2019		2238	2200
2020		1938	

1.3.12 Planning for the tendering procedures to be launched for the action

Call for tenders foreseen Global amount in KEUR	Call for Tenders Duration in years	Indicative planning of publication (QX/YYYY)
400 000	8	05/2019 (Phase 1 of the restricted procedure published).

Call for tenders foreseen Global amount in KEUR	Call for Tenders Duration in years	Indicative planning of publication (QX/YYYY)
		eTendering - DIGIT/A3/PR/2019/010 https://webgate.ec.europa.eu/publications/etendering/intranet/cft/cft-display.html?cftId=4803 https://ted.europa.eu/udl?uri=TED:NOTICE:238502-2019:TEXT:EN:HTML&src=0 08/2019 (Phase 2 of the restricted procedure to be published).

1.4 IPV6 FRAMEWORK FOR EUROPEAN GOVERNMENTS (2016.09) – FUNDING CONCLUDED

1.4.1 IDENTIFICATION OF THE ACTION

Service in charge	DG CONNECT
Associated Services	DIGIT

1.4.2 EXECUTIVE SUMMARY

The main objectives of the study running from 09/2017-11/2018 include:

- Update of the **status of IPv6 deployment in public administrations** in Europe;
- Discussion of **Best Practices and Lessons Learned** from Member States in advanced stages of deployment, namely Germany and Spain, in a number of workshops in the next months;
- **Guidelines** to set up IPv6 in public administrations, starting with an Addressing Plan and a dedicated Local Internet Registry;
- **Training material** for public administrations on the transition to IPv6, building upon identified Best Practices and above Guidelines;
- **Tailored recommendations for (the planning of) the transition towards IPv6**, taking into consideration specific national circumstances.

1.4.3 OBJECTIVES

Objective 1: ensuring interoperability between European Administrations

- develop, maintain and promote a holistic approach to interoperability in the Union in order to eliminate fragmentation in the interoperability landscape in the Union;

Objective 2: provide advanced eGovernment services to European citizens

- facilitate efficient and effective electronic cross-border or cross-sector interaction between European public administrations on the one hand, and between European public administrations and businesses and citizens on the other, and to contribute to the development of a more effective, simplified and user-friendly e-administration at the national, regional and local levels of public administration.

1.4.4 SCOPE

The ISA² Programme Committee approved a number of actions in its 2016 Work Programme, including Action 2016.09, **IPv6 Framework for European Governments**, aiming at

ensuring interoperability between European Administrations and provide advanced eGovernment services to European citizens by sharing best practices and lessons learned and providing a tested transition plan, based on the results of the Competitiveness and Innovation Framework Programme (CIP) project GEN6 (www.gen6-project.eu, 2012-15).

1.4.5 ACTION PRIORITY

This section is used to assess the priority of the proposal to become a programme’s action according to Art. 7 of the ISA² decision⁴.

NB: This is an ongoing Action.

1.4.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines,</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>By facilitating the deployment of IPv6 across all European governments/ administrations, it will ensure interoperability between European Administrations and facilitate advanced eGovernment services to European citizens, even across borders.</p> <p>It will also be a basis for the next generation sTESTA.</p>

⁴ DECISION (EU) 2015/2240 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

Question	Answer
<i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i>	YES.

1.4.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	interoperability between European Administrations eGovernment services
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	N/A

1.4.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the</i>	YES. Eventually for all Member States and Associated Countries. Starting with early adopters, like Spain, Germany, Portugal, Czech Republic and

Question	Answer
<i>concerned Member State.</i>	Slovenia.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	N/A

1.4.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	YES YES – the 2018 Cybersecurity Package
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	N/A

1.4.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

Can the results of the action be re-used by a critical part of their target user base, as identified by the proposal maker?

YES – it is a framework for interoperability.

For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

N/A

1.4.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	NO
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	N/A

1.4.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union's initiatives such as the DSM.

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	It contributes directly to the DSM, by ensuring interoperability across public administrations, and making available advanced services across borders.

1.4.6 PROBLEM STATEMENT

The problem of	slow deployment of / transition to IPv6
affects	Public Administrations
the impact of which is	lack of / slow deployment of advanced eGovernment services to citizens
a successful solution would be	Expedite deployment of/ transition to IPv6 building upon best practices and lessons learned

1.4.7 IMPACT OF THE ACTION

1.4.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	YES	Upon deployment	Public Administrations
(+) Savings in time	YES	Upon deployment	Public Administrations, Businesses and Citizens
(+) Better interoperability and quality of digital public service	YES	Upon deployment	Public Administrations, Businesses and Citizens
(-) Integration or usage cost	YES	Upon deployment	Public Administrations

1.4.7.2 User-centricity

Cross-border availability and interoperability building upon IPv6 will facilitate and make available, among other things, advanced eGovernment services to businesses and Citizens. This is being/will be discussed and assessed at the various open Workshops planned by the action.

1.4.8 EXPECTED MAJOR OUTPUTS

Output name	Status of IPv6 deployment in public administrations
Description	Update of the status of IPv6 deployment in the different MS and ACs, including in particular by their Public Administrations
Reference	
Target release date / Status	end-March 2018 - Available

Output name	Guidelines to set up IPv6 in public administrations
Description	starting with an Addressing Plan and a dedicated Local Internet Registry
Reference	
Target release date / Status	end-April 2018 - Available
Output name	Training material for public administrations on the transition to IPv6
Description	Based upon Best Practices and Lessons learned, starting with Guidelines and proposing concrete Addressing Plans and dedicated Local Internet Registries which can be tailored to concrete stage of the (non-)deployment of IPv6
Reference	
Target release date / Status	September 2018 – in preparation

Output name	Tailored recommendations for (the planning of) the transition towards IPv6
Description	taking into consideration specific national circumstances
Reference	
Target release date / Status	November 2018

1.4.9 ORGANISATIONAL APPROACH

1.4.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Member States	ISA ² Coordination Group	Direct targets of the outputs
Member States	Public Administrations at National, Regional and Local levels	Direct and Indirect targets
Member States	Council of European Municipalities and Regions	Indirect targets

Stakeholders	Representatives	Involvement in the action
European Commission	DIGIT	Direct target of the outputs

1.4.9.2 Identified user groups

List the main group of end-users of your solutions.

- Public Administrations at National, Regional and Local levels
- Council of European Municipalities and Regions
- European Commission

1.4.9.3 Communication and dissemination plan

The communication channels include on-line presence beyond the end of the Action targeting Public Administrations, including the training material produced by the Action with links to the GEN6 results as well; participation in relevant events, including RIPE meetings, to disseminate the results of the Action.

1.4.9.4 Key Performance indicators

Provide a list of KPIs allowing the measurement of the progress and completions of milestones and the action. In case of an on-going action with already identified metrics⁵ indicate the current values.

Description of the KPI	Target to achieve	Expected time for target
Involvement of Member States and Associated Countries	90% of countries or population, whatever highest	End of Action

1.4.9.5 Governance approach

Ongoing action – involvement of MS&AC via ISA² Management Committee

⁵ For examples see the ISA2 dashboard <https://ec.europa.eu/isa2/dashboard/isadashboard>, effectiveness tab.

1.4.10 TECHNICAL APPROACH AND CURRENT STATUS

All documents described above will be proven by results from a lab environment, so all statements are accompanied by relevant evidence.

Technical Approach:

- Organizational and Process LIR Definition
- Assessment of relevant IT devices
- Identification of relevant IPv6 standards
- Definition of requirements to IPv6 enabled devices within European public administrations
- Definition of minimal mandatory IPv6 capabilities

1.4.11 COSTS AND MILESTONES

1.4.11.1 Breakdown of anticipated costs and related milestones

Phase: Inception Execution Operational	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA ² / others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Inception	Project Charter	30	ISA ²	Q1/2016	Q1/2016
Execution	output 1	80	ISA ²	Q1/2016	Q1/2016
	output 2	120	ISA ²	Q1/2016	Q2/2016
	output 3	80	ISA ²	Q1/2016	Q4/2016
	output 4	40	ISA ²	Q1/2016	Q4/2016
	output 5	80	ISA ²	Q2/2016	Q4/2016
operational	pilot -output 3	35	ISA ²		
	pilot -output 5	35	ISA ²		
	Total	500			

1.4.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Inception	30	
2016	execution, operational	470	
2017			
2018			
2019			
2020			

1.4.12 Planning for the tendering procedures to be launched for the action

N/A – ongoing action

1.4.13 ANNEX AND REFERENCES

Description	Reference link	Attached document
GEN6	http://www.gen6-project.eu/	
Spain's' transition to IPv6 strategy	http://administracionelectronica.gob.es/pae_Home/pae_Estrategias/pae_Interoperabilidad_Inicio/pae_Transicion_a_IPv6.html?idioma=en	
The Government of the Republic of Slovenia, Ministry of Higher Education, Science and Technology Study: Transition to IPv6 (Guideline for Deliberation on the National IPv6 Strategy)	http://go6.si/docs/Study_MVZT_IPv6_en.pdf	
Federal Ministry of the Interior and "Deutschland Online Infrastruktur", presentation IPv6 Workshop - creating a constructive Dialogue, European Commission, April 2010. Presentation in the NL	https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/20114.pdf https://www.forumstandaardisatie.nl/fileadmin/os/presentaties/10mei12_constanze-buerger.pdf	
All Documents from Germany	http://www.bva.bund.de/DE/Organisation/Abteilungen/Abteilung_BIT/Leistungen/IT_Beratungsleistungen/IPv6/best_practice/bestpractice_node.html	

1.5 TRUSTED EXCHANGE PLATFORM (E-TRUSTEX) (2016.19)

1.5.1 IDENTIFICATION OF THE ACTION

Service in charge	DIGIT.D.3
Associated Services	SG B4, JUST B.4, COMP R.3, SANTE A.4, ESTAT.A.3, DIGIT.B.2, DIGIT.B.4, OP.A.2

1.5.2 EXECUTIVE SUMMARY

Advancements in technology are progressively replacing paper-based information flows with electronic transactions. As a result, public administrations are being pressed to adopt electronic means to exchange data and documents with other public administrations, businesses and citizens. This change is inevitable as legislation at all levels increasingly foresees the exchange of data electronically.









The eTrustEx action aims to support public administrations in this highly transformational process towards digital and electronic transactions by providing them with a service-oriented platform that helps automate the exchange of all type of documents and data.

eTrustEx is a service-oriented platform that acts as a broker, in the exchange of data and documents, between a defined boundary (e.g. this may be a Member State, a Region, a Ministry or an organisation) and its outside world. To enable interoperability across organisational boundaries and borders, eTrustEx uses the Internet and the secure message exchange protocol of the CEF eDelivery building block⁶ (i.e. the AS4 messaging protocol). Thanks to its standardised interfaces, eTrustEx is capable of interacting with many different heterogeneous information systems. For example, once a Member State deploys the platform, it can swiftly interlink its several national information systems, of any type and associated to any sector, with a single messaging platform. The eTrustEx platform is operational, offered to the EU Institutions as a service and to the Member States as an open source software tool via Joinup⁷. The table below summarizes key features of the eTrustEx platform. More information about the components can be found in the eTrustEx Node and Web Component Offering Descriptions.⁸

⁶ <https://ec.europa.eu/cefdigital/eDelivery>

⁷ <https://joinup.ec.europa.eu/solution/open-e-trustex>

⁸ <https://joinup.ec.europa.eu/solution/open-e-trustex/document/open-e-trustex-documentation>

-  **Open and extensible:** eTrustEx is open source, released under the EUPL license. The platform can be easily extended via its community of developers or via direct collaboration between the European Commission and the Member States.
-  **Secure:** eTrustEx enables mechanisms to ensure integrity, authenticity, confidentiality and non-repudiation of information.
-  **As a tool or as a service:** eTrustEx can be installed by public administrations (Member States) as a tool or used as a service by the EU institutions.
-  **Re-usable:** eTrustEx can be re-used by any public administration in the Member States. This may generate both cost and time savings.
-  **Customisable:** New modules can be added on top of the eTrustEx platform to fulfil specific needs of different sectors.
-  **Content agnostic documents:** Users can share structured and unstructured documents.
-  **Technical support for existing users and Member States willing to re-use the platform:** This includes activities such as support of the technical interface of the several components of the platform, debugging, testing, etc.
-  **Development of additional features and improvements:** within the eTrustEx platform by integrating it with the AS4 Access Point of eDelivery and other elements.

The continuation of the eTrustEx action will ensure that the platform continues to be live and that support is available to its users. The diagram below summarizes the main concepts of the eTrustEx action.

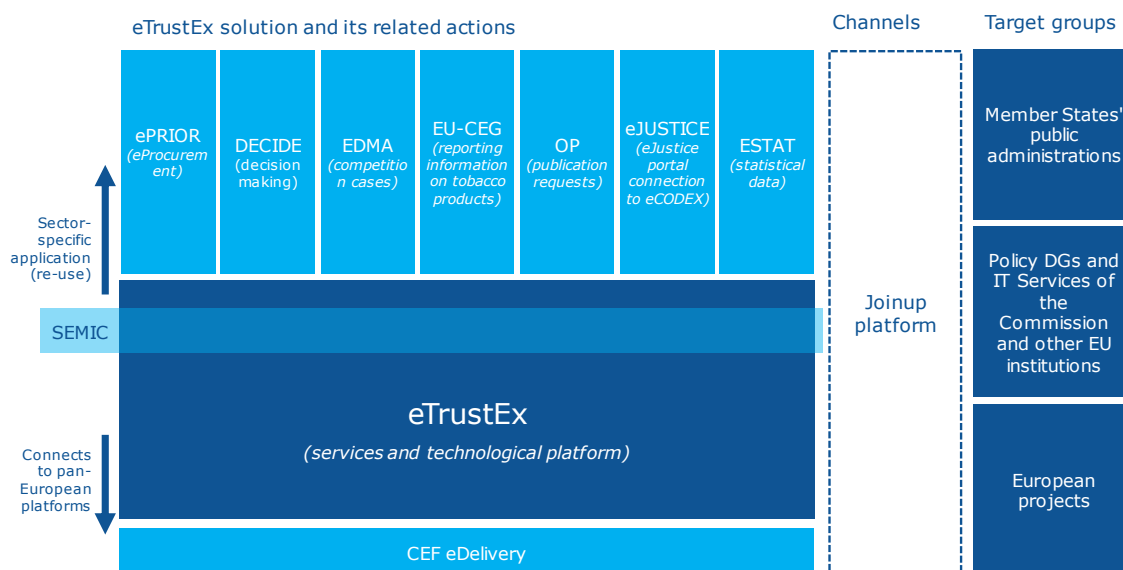


Figure 1 eTrustEx Action at a glance

1.5.3 OBJECTIVES

The main objective of the eTrustEx action is to support public administrations implementing EU policies that require the exchange of information across borders in an electronic format. This is why ISA² provides Member States with a service-oriented platform such as eTrustEx. As the eTrustEx platform can be used in virtually every sector (e-Justice, eProcurement, etc.), once deployed for the purposes of one sector, it may support and consequently accelerate the automation of data exchange in other sectors.

The eTrustEx platform offers services such as validation, transformation and routing of data and documents as well as the ability to send large messages. The platform uses a CEF eDelivery Access Point as its most important machine-to-machine interface. The platform also has a web application that makes a mailbox-type of service available to end-users. Thanks to the open source policy of ISA², the Member States are able to re-use and extend all elements of eTrustEx for their own specific needs.

Another objective of this action is to **lay the groundwork for the sustainability of the eTrustEx action** within the EU institutions and in the Member States. As the ISA² Programme is coming to an end in 2020, and several of the pan-European projects using eTrustEx reach (or have reached) operations, it comes the time to prepare their sustainability outside of the ISA² Programme. Having this objective in mind, the Commission has created a corporate service dedicated to the secure exchange of information. This managed service aims

to sustain the projects of the EU Institutions that currently rely on eTrustEx for secure exchange of information beyond the end of the ISA² Programme.⁹

1.5.4 SCOPE

In Scope

The eTrustEx action includes the following elements:

- Development of additional features and improvements within the eTrustEx platform and web application;
- Operations of the platform for the EU institutions that reuse it in service delivery mode. This includes maintenance of the platform, improvement of its governance, quality control and assurance processes and mechanisms in order to enhance the services provided to the project stakeholders. This will be gradually transferred to the new managed service by the end of this Work Programme; and
- Technical support to users and Member States willing to re-use the platform. This includes activities such as increasing the user request resolving time, support of deployment, integration, specifications of the technical interface and of the several components of the platform, debugging, testing, etc. A part of these tasks will also be gradually transferred to the new managed service by the end of this Work Programme.

Out of scope

The eTrustEx action does not cover the following elements:

- Hosting costs linked to the open source version of eTrustEx;
- Implementation of back-office integration (to be complemented by implementers' own budget);
- Specific support to their sectorial systems;
- Development of custom functionality and extensions; and
- The exchange of classified documents.

1.5.5 ACTION PRIORITY

This section is used to assess the priority of the proposal to become a programme's action according to Art. 7 of the ISA² decision¹⁰.

⁹ EU Send web portal: <https://europa.eu/!wp94dH>

¹⁰ DECISION (EU) 2015/2240 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

1.5.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>eTrustEx is a platform offered to public administrations at European, national and regional level to set up secure exchange of natively digital documents or scanned documents between human users or from system to system via standardised interfaces.</p> <p>eTrustEx is a cross-sector, open-source, free-to-use tool that will help Member States to exchange structured and unstructured documents and to connect to pan-European messaging infrastructures with reduced investment. A significant number of them already use or will soon be implementing the CEF eDelivery messaging protocol (i.e. AS4).</p> <p>Experience shows that the use of common technical specifications promotes interoperability, facilitates the cross-border and cross-sector information exchange, taking into account legal, organisational, semantic and technical aspects.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>Yes. This proposal refers to an already existing Action, to which its relevance in terms of interoperability has been demonstrated, and recognized by the</p>

Question	Answer
	ISA ² programme ¹¹ .

1.5.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	See below.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	<p>eTrustEx is used in the following policy areas:</p> <p><i>Business:</i></p> <ul style="list-style-type: none"> • e-Procurement¹² (DIGIT) <p><i>Justice, home affairs and citizens' rights:</i></p> <ul style="list-style-type: none"> • e-Justice Portal¹³ (DG JUST) <p><i>Environment, consumers and health:</i></p> <ul style="list-style-type: none"> • EU-CEG¹⁴ tobacco reporting (DG SANTE) <p><i>Economy, finance and tax:</i></p> <ul style="list-style-type: none"> • EDMA¹⁵ competition cases (DG COMP) <p><i>Cross-cutting policies:</i></p>

¹¹ https://ec.europa.eu/isa2/actions/permitting-secure-document-workflows-between-eu-and-national-institutions_en

¹² ePRIOR https://ec.europa.eu/isa2/solutions/open-e-prior_en

¹³ European e-Justice Portal <https://e-justice.europa.eu/home.do?action=home>

¹⁴ EU Common Entry Gate (EU-CEG) https://ec.europa.eu/health/euceg/introduction_en

¹⁵ Electronic Document Management Agent (EDMA) <http://ec.europa.eu/dpo-register/details.htm?id=26771>

Question	Answer
	<ul style="list-style-type: none"> • DECIDE¹⁶ decision making process (SG) • newCERES¹⁷ (Publications Office) • ESDEN¹⁸ collection of statistical data (ESTAT)

1.5.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	See below.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	<p>For example, the eTrustEx platform is currently used as a key element of pan-European messaging infrastructures by the following projects:</p> <ul style="list-style-type: none"> • e-PRIOR (DIGIT) • DECIDE (SG) • EDMA (DG COMP) • e-Justice Portal (DG JUST) • newCERES (Publications

¹⁶ Decide https://ec.europa.eu/info/sites/info/files/activity-report-2015-dg-sg_june2016_en.pdf

¹⁷ Common Electronic Reception System https://ec.europa.eu/info/sites/info/files/management-plan-op-2017_en.pdf

¹⁸ European statistical data exchange network (ESDEN) <http://ec.europa.eu/eurostat/web/ess/about-us/ess-vision-2020/implementation-portfolio#ESDEN>

Question	Answer
	<p>Office)</p> <ul style="list-style-type: none"> • EU-CEG (DG SANTE) • ESDEN (ESTAT) <p>Around 200 public administrations across the 28 Member States are in scope of these projects (such as national parliaments and permanent representations).</p> <p>Around 12 million messages have been exchanged between the European Commission, the EU Council, the Member States, and around 8000 private companies (e-PRIOR and EU-CEG projects) since its go live until July 2019.</p>

1.5.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	This proposal refers to an already ongoing action. Its urgency has already been assessed by ISA ² . ¹⁹
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified</i>	This proposal refers to an action already under the ISA ² scope. The action includes a mix of

¹⁹ https://ec.europa.eu/isa2/actions/permitting-secure-document-workflows-between-eu-and-national-institutions_en

Question	Answer
<i>and currently available sources?</i>	experimentation and production and therefore fitting ISA ² 's scope and objectives.

1.5.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

Can the results of the action (following this proposal) be re-used by a critical part of their target user base, as identified by the proposal maker? For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	eTrustEx open source software package
Description	The eTrustEx open-source software package is offered to public administrations at European, national and regional level to set up secure exchange of digital structured and unstructured documents from system to system via standardised interfaces.
Reference	https://joinup.ec.europa.eu/solution/open-e-trustex
Target release date / Status	Released
Critical part of target user base	Target level: continuous monitoring of reuse cases
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	EU-CEG (DG SANTE) has adopted the eTrustEx solution to interconnect CEF eDelivery with the EU-CEG back-office. DG SANTE hosts and manages it in a secure environment.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	eTrustEx instance hosted at the EC.
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Description	eTrustEx is reused in a service delivery mode within the EU Institutions (EU Send).
Reference	EC-ETRUSTEX-SUPPORT@ec.europa.eu
Target release date / Status	Released
Critical part of target user base	Target level: 5
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	<p>The following projects are reusing, or considering reusing the solution:</p> <ul style="list-style-type: none"> • e-PRIOR (DIGIT) – In production • DECIDE (SG) – In production • EDMA (DG COMP) – In production • newCERES (Publications Office) – In production • e-Justice Portal (DG JUST) – In production • ESDEN (ESTAT) – In production • JSIS²⁰ (PMO) – Considering reusing the solution <p>Around 200 public administrations across the 28 Member States are in scope of these projects (such as national parliaments and permanent representations). Around 12 million messages were exchanged between the European Commission, the EU Council, the Member States and around 8000 private companies (e-PRIOR and EU-CEG projects) since its go live until July 2019.</p>

1.5.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
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²⁰ Joint Sickness Insurance Scheme of the European Union (JSIS)

http://ec.europa.eu/pmo/info.sickinsurance_en.htm

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	See below.
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	<p>ISA² Action 1.7 - ePRIOR: the eTrustEx platform was originally built on the basis of the ePRIOR platform and is now used by ePRIOR.</p> <p>ISA² Action 4.2.4 - Joinup: the eTrustEx platform is made available via the ISA Collaborative Platform (Joinup).</p> <p>ISA² Action 1.1 - SEMIC: IMMC Metadata (Interinstitutional standard metadata defined in the context of the decision making process) files are transferred to EU stakeholders and Members States through eTrustEx.</p> <p>CEF eDelivery DSI: the eTrustEx uses the Access Point and other elements of the CEF eDelivery Building Block.</p>

1.5.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union's initiatives such as the DSM.

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political</i>	DSM strategy In 2015, the digital single market

Question	Answer
<p><i>priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<p>strategy was released. The eTrustEx action contributes to boosting competitiveness through interoperability and standardisation, which is explicitly mentioned in the communication.</p> <p>Juncker's political guidelines As eTrustEx creates technical interoperability cross borders, it supports Priority n°2: A Connected Digital Single Market of the Political Guidelines for the next European Commission – A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change (15 July 2014).</p> <p>eGovernment Action Plan 2016-2020 In Action 6 of the eGovernment action plan, the Commission commits to reusing operational building blocks (such as eTrustEx) in view of its own digital transformation.</p> <p>eIDAS Regulation The regulation on electronic identification and trust services for electronic transactions was adopted at end of 2014. It will further foster interoperability and reduce barriers in the internal market, supported by solutions such as eTrustEx.</p> <p>Connecting Europe Facility (CEF)</p>

Question	Answer
	The eTrustEx platform reuses the CEF eDelivery building block and is analysing the reuse of CEF eID in its web application.

1.5.6 PROBLEM STATEMENT

The problem of	According to the eIDAS Regulation ²¹ “ <i>electronic documents are important for further development of cross-border electronic transactions in the internal market</i> ” and therefore “ <i>an electronic document should not be denied legal effect on the grounds that it is in an electronic form in order to ensure that an electronic transaction will not be rejected only on the grounds that a document is in electronic form.</i> ”
affects	Public administrations that will be required to replace information flows based on paper with electronic transactions.
the impact of which is	Public administrations are being pressed to adopt electronic means to exchange data and documents. This change is inevitable as legislation at all levels increasingly foresees the exchange of data electronically with other public administrations, businesses and citizens.
a successful solution would be	<p>To support public administrations implementing EU policies requiring the exchange of information across borders in electronic format by providing them with a service-oriented platform that can be used in every sector.</p> <p>As the eTrustEx platform is multi-sector, once deployed for one of them, it accelerates the automation of data and documents exchange in the other sectors. The platform implements several services such as validation, transformation and routing of data and documents as well as the ability to send large messages. The platform uses a CEF eDelivery Access Point as its most important API. The platform also has a web application that makes available mailbox-type services to its end-users.</p>

²¹ http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2014.257.01.0073.01.ENG

1.5.7 IMPACT OF THE ACTION

1.5.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Switching from registered post to digital exchange of information reduces the cost of these exchanges (as an example, public administrations in France exchange millions of letters with delivery receipt – each one of them costing around €4 to €5 each).	Once sectors start switching to digital exchanges of information instead of paper-based means.	<ul style="list-style-type: none"> • European Projects • Member States • Public Administrations • EU Institutions and Agencies.
	Cost savings and improved efficiency by enabling interoperability within and across sectors.		
	Cost savings to connect to pan-European messaging infrastructures.		
(+) Savings in time	Time savings to connect to pan-European messaging infrastructures.	Once implemented.	
	Creation of a 'deploy once, use multiple times' platforming approach. This will create economies of scale avoiding that each sector develops their own specific solution.		
	Full automation of message exchanges among several parties in different sectors.		

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Better interoperability and quality of digital public service	Increase the security and reliability of information exchange and at the same time reduce the effort that usually needs to be dedicated to this type of process.	Once implemented.	
	Provide free-to-use open source tools for national parliaments and permanent representations to send and receive electronic legal documents and metadata.		
	Sharing of experiences, lessons learnt, specifications, tools and components published as open source reusable by any Member State or EU Institution on Joinup.		

1.5.7.2 User-centricity

In the context of eTrustEx, user-centricity has different meanings. On one hand, the governance model facilitates stakeholders' involvement in the process by enabling them to exchange views and voice specific needs. On the other hand, eTrustEx also has end-users, the people using the eTrustEx web application. They expect a clean, intuitive interface that helps them get work done. Both dimensions of user centricity in the context of eTrustEx are explained in the sections below.

Governance as a means to listen to the stakeholders' voice

As detailed in section 1.1.9.5 "Governance approach", the users form part of the governance of eTrustEx. There are regular operational management board meetings, enabling the users to steer the direction of the action within the scope and guidelines set by the ISA² Programme.

The governance process is based on open government principles and collaborative practices. Consultations and discussions, encouraging users' feedback, are therefore an integral part of the governance structure.

Improving the user experience of the eTrustEx Web: a journey, not a destination

A UX redesign study has been carried out in 2017 to better meet the users' needs and improving their experience using the web application. The findings and recommendations of the study are already in implementation in the eTrustEx Web application, v.4.0 currently under development, as one of the priorities of Execution Phase 3 and 4. The end-users are involved in the development of the application.

1.5.8 EXPECTED MAJOR OUTPUTS

Major outputs are presented in section 1.5.5.5.

1.5.9 ORGANISATIONAL APPROACH

1.5.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
ISA ² Coordination Committee	Appointed ISA ² Coordination committee members	Assists the European Commission in translating priorities into actions and to ensure continuity and consistency in their implementation.
Secretariat General (SG)	SG.B4 (Advice and Development)	This unit is the system owner and business project manager of DECIDE and represents the interests of DECIDE's users.
Directorate General for Informatics (DIGIT)	Unit DIGIT.D.3 (Trans-European Services)	This unit is the service in charge of this action and responsible for the development coordination and maintenance of eTrustEx.
	Unit DIGIT.B.2 (Solutions for Legislation, Policy & HR)	This unit is in charge of the ISA action 'Reusable tools for EU

Stakeholders	Representatives	Involvement in the action
		public participation' that includes the European Citizens' Initiative (ECI). This unit is also in charge of developing the DECIDE system for the SG.
	Unit DIGIT.B.4 (Software Engineering Capabilities)	This unit coordinates the development of the eProcurement modules within the European Commission.
Directorate General for Communication Networks, Content and Technology (DG CNECT)	Unit CNECT.H4 (Trust and Public Services)	The cooperation with DG CONNECT is key given its role in the provision of the building blocks via the CEF programme.
Directorate General Competition (DG COMP)	Unit COMP.R.3. (Information Technology)	This unit is in charge of the EDMA project.
The statistical office of the European Union (DG EUROSTAT)	ESTAT.A.3 (IT solutions for statistical production).	This unit is responsible for the ESDEN project that involves the exchange of statistical information between Member States and the EU institutions.
Directorate General for Health and Food Safety (DG SANTE)	Unit SANTE.A.4 (Information Systems)	This unit is the system owner of the EU-CEG project on Tobacco Reporting.
Directorate General for Justice and Consumers (DG	Unit JUST.B.4 (e-Justice, IT and document management)	The unit is utilising and relying on eTrustEx in the context of the European access point to the e-CODEX system, established on

Stakeholders	Representatives	Involvement in the action
JUST)		the European e-Justice Portal.
Organisations in the Member States	Members States representatives of administrations either working on similar initiatives or interested in reusing eTrustEx.	As required
Other DGs of the European Commission (as required)	Representatives of other DGs / EU Institutions either working on similar initiatives or interested in reusing eTrustEx.	As required

1.5.9.2 Identified user groups

The eTrustEx action targets Member States' public administrations, EU Institutions, including policy DGs and IT services of the European Commission and various European projects. The following projects are identified as user groups:

- e-PRIOR (DIGIT)
- DECIDE (SG)
- EDMA (DG COMP)
- newCERES (Publications Office)
- e-Justice Portal (DG JUST)
- EU-CEG Project (DG SANTE)
- ESDEN (ESTAT)
- JSIS (PMO) – Considering reusing the solution

1.5.9.3 Communication and dissemination plan

The eTrustEx action uses the available ISA² communication channels, including the ISA² website, ISA² Newsletter and Joinup to disseminate information and publish the releases of the platform. It is also invited to participate in Joinup's governance meetings. The pages of both the action and solution are kept up to date. Furthermore, the eTrustEx action uses an intranet wiki to collaborate and engage with its users. The table below presents an overview of the foreseen events.

Event	Representatives	Frequency of meetings / absolute dates of meetings?
ISA ² Coordination Committee	Appointed ISA ² Coordination committee members	Quarterly
Operational Management Board Meetings	Representatives of the system suppliers or owners connected to eTrustEx or in the process of being connected to eTrustEx	Monthly
Bilateral meetings with Member States	DIGIT representatives and Member States representatives	These meetings are arranged by DIGIT on an ad-hoc basis.
Bilateral meetings with EU-wide initiatives	DIGIT representatives and representatives of EU-wide initiatives	These meetings are arranged by DIGIT on an ad-hoc basis.
Bilateral meetings with policy DGs	DIGIT representatives and policy DGs representatives	These meetings are arranged by DIGIT on an ad-hoc basis.
Relevant conferences and events	DIGIT with any other project stakeholder	On invitation to participate in relevant meetings or events organised by Member States or other stakeholders.

1.5.9.4 Key Performance indicators

The table below presents key traffic figures extracted from the eTrustEx platform operated by the European Commission and of the software package that is made available to the Member States.

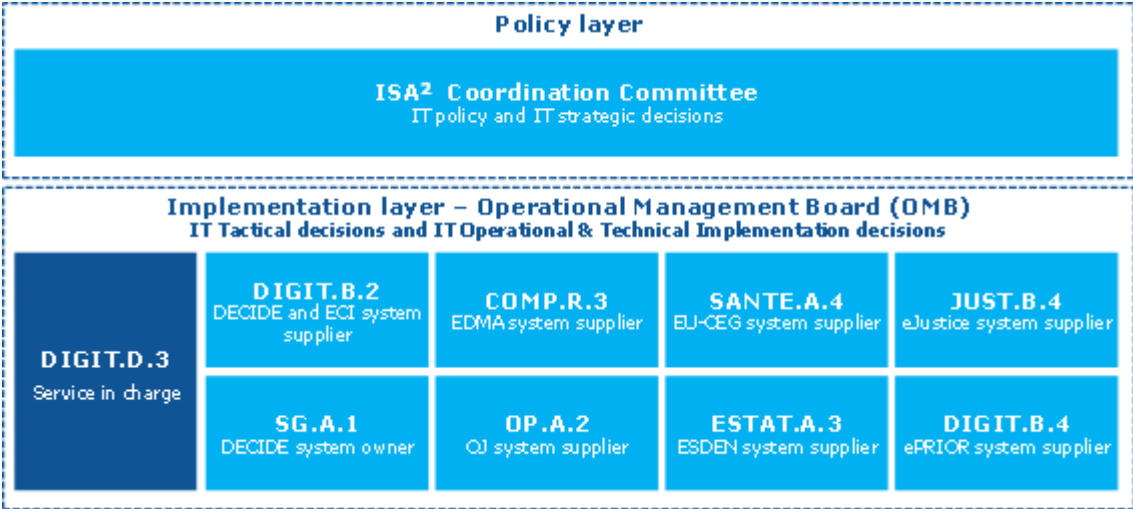
Description of the KPI	Target to achieve	Values
Number of documents exchanged via the GUI	150 000 (Yearly, cumulative)	Q2-2018: 142 760 Q3-2018: 112 729 Q4-2018: 23 923 Q1-2019: 146.415
Number of projects using the eTrustEx infrastructure for the exchange of documents	5 (Per quarter, not cumulative)	Q2-2018: 6 Q3-2018: 7 Q4-2018: 7 Q1-2019: 7
Number of documents exchanged in the generic eTrustEx environment (via the eTrustEx Node)	300 000 (Per quarter)	Q2-2018: 523.626 Q3-2018: 624.044 Q4-2018: 800.201 Q1-2019: 770.355

1.5.9.5 Governance approach

The eTrustEx project, an action of the ISA² programme, follows the ISA² governance structure. To achieve its objectives, this action will collaborate with several DGs of the European Commission and with various other stakeholders (listed in section 1.1.9.1.).

Regular Operational Management Board (OMB) meetings aim to ensure continuous coordination with the system owners of the various systems connected to eTrustEx. The OMB is composed of representatives of the system suppliers and system owners of systems already connected to eTrustEx or in the process of being connected to eTrustEx. The objective of the OMB is to provide a vehicle for the participants to take decisions and handle all IT tactical and IT operational and technical implementation matters.

The graphic below presents an overview of the governance structure.



1.5.10 TECHNICAL APPROACH AND CURRENT STATUS

This action is the continuation of work started in ISA and on-going work funded under the first Work Programmes of ISA². After several enhancements, the eTrustEx platform is today more scalable, reliable and supports additional functionalities.

During the last years, a number of pilots involving the secure exchange of information have been carried out in several sectors using the eTrustEx platform. As a result of these successful pilots, eTrustEx is now on-boarding an increasing number of stakeholders. Some of them are already using the platform in a production mode.

In the last phase (Phase 5) of the ISA² Work Programme, the project will be focusing on two key work packages:

1. Continuous improvement of the platform (including the eTrustEx web application). The activities involved in each improvement cycle will contribute towards the further development of its functionality. The main focus of the last work package will be on easing the configuration and maintainability of eTrustEx Node (including the Admin console) and putting in production the new eTrustEx Web 4.0.
2. Finishing the handover of the operational part of the action to the managed service set up in the European Commission (DIGIT), which will sustain the projects of the EU Institutions that currently rely on eTrustEx for secure exchange of information beyond the end of the ISA² Programme.

The outputs and results of the execution phase are divided into work packages as detailed in the next section.

Execution phase [PHASE 1] – completed, from April 2016 – March 2017

Main focus: Additional functionalities and improvements

Details: The activities of this phase are contained in the following WPs:

	Scope	Identified objectives
WP2	Continuous Improvement of software package	Improvement of the several elements of the eTrustEx platform, including its web application, based on change requests received from users and technological advancements. This included elements such as: <ul style="list-style-type: none"> • Implementation of interoperable queue protocol • UX redesign study for the eTrustEx GUI, taking mobile access into account • Centralised configuration mechanism • Notification mechanism • Interoperable queue protocol • Start work on replacement of the web applet using WebStart
WP3	Operation and support	Supporting projects that have already reached production such as DECIDE.

Execution phase [PHASE 2] – completed, from April 2017 – March 2018

Main focus: Adoption of development QA and QC best practices, continuous improvement

Details: The activities of this phase are contained in the following WPs:

	Scope	Identified objectives
WP1	Migration of eTrustEx Adapter	Preparation of migration of the eTrustEx Adapters to the AS4 Access Point of CEF eDelivery.
WP2	Continuous Improvement of software package	<p>Improvement of the several elements of the eTrustEx platform, including its web application, based on change requests received from users and technological advancements. This is expected to include elements such as:</p> <ul style="list-style-type: none"> • Improvements to the admin console • eTrustEx mobile access • Complete work on replacement of the web applet using WebStart • Improved security • Improve existing documentation • Implementation of code QA and QC methods and tool (code quality review, unit testing and integration testing tools, test automation)
WP3	Operation and support	Supporting projects that have already reached production such as DECIDE.

Execution phase [PHASE 3] – currently ongoing, from April 2018 with planned conclusion for March 2019

Main focus: Migration of the eTrustEx Adapter by the AS4 Access Point of CEF eDelivery

Details: The activities of this phase are contained in the following WPs:

	Scope	Identified objectives
WP1	Migration of eTrustEx Adapter	Full migration of the eTrustEx Adapters to the AS4 Access Point of CEF eDelivery.
WP2	Continuous Improvement of software package	Improvement of the several elements of the eTrustEx platform, including its web application, based on change requests received from users and technological advancements. This is expected to include elements such as: <ul style="list-style-type: none"> • Normalising the eTrustEx DB • Setup of a cloud instance of the eTrustEx node for demo purposes • Integrate new design on eTrustEx GUI • Improve the environment for eTrustEx testing
WP3	Operation and support	Supporting projects that have already reached production such as DECIDE.

Execution phase [PHASE 4] – From April 2019 with planned conclusion for March 2020

Main focus: Leveraging the AS4 Access Point of CEF eDelivery

Details: The activities of this phase are contained in the following WPs:

	Scope	Identified objectives
WP1	Migration of eTrustEx Adapter	<p>After replacing the eTrustEx Adapter with the AS4 Access Point of CEF eDelivery, several efforts will be done to:</p> <ul style="list-style-type: none"> • Simplify the native web-services of eTrustEx and • Of its message exchange patterns. <p>Changes will be implemented in order to leverage the functionalities of the AS4 Access Point.</p>
WP2	Continuous Improvement of software	<p>Improvement of the several elements of the eTrustEx platform, including its web application, based on change requests received from users and technological advancements. This is expected to include elements such as:</p> <ul style="list-style-type: none"> • eTrustEx Message/User Reporting • Simplify and document the eTrustEx node data model • Improved logging on eTrustEx • Fix browser compatibility issues on eTrustEx Web; • Putting in production the JavaScript version of eTrustEx Web (removal of Java plugin); • Improve the encryption process of the platform; • Fully automate regression testing on eTrustEx Node • Improve continuous integration processes
WP3	Operation and support	<p>Supporting projects that have already reached production such as DECIDE.</p> <p>Start the gradual handover of operations to the managed service set up in the European Commission (DIGIT).</p>

Execution phase [PHASE 5] – From April 2020 with planned conclusion for March 2021

Main focus: Continuous Improvement of the software and finishing the handover of operations to the managed service set up in the European Commission (DIGIT).

Details: The activities of this phase are contained in the following WPs:

	Scope	Identified objectives
WP1	Continuous Improvement of software	Improvement of several elements of the eTrustEx platform, including its web application, based on change requests received from users and technological advancements. This is expected to include elements such as: <ul style="list-style-type: none"> • Putting in production the new eTrustEx Web 4.0 and phasing out the Web 3.x.; • Ease the configuration and maintainability of eTrustEx Node, including the Admin console; • Improve continuous delivery; • Analysing the reuse of CEF eID in the new web application.
WP2	Operation and support	Finishing the handover of the operational part of the action to the managed service set up in the European Commission (DIGIT).

1.5.11 COSTS AND MILESTONES

1.5.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Phase 1 – Execution	Additional functionalities and improvements	950	ISA ²	Q2/2016	Q1/2017

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Phase 1 – Operational	Operation phase 1	250	ISA ²	Q2/2016	Q1/2017
Phase 2 – Execution	Adoption of development QA and QC best practices, Continuous improvement	1020	ISA ²	Q2/2017	Q1/2018
Phase 2 - Operational	Operation phase 2	250	ISA ²	Q2/2017	Q1/2018
Phase 3 – Execution	Migration of eTrustEx Adapter and Continuous Improvement of software	750	ISA ²	Q2/2018	Q1/2019
Phase 3 – Operational	Operation and support	250	ISA ²		
Phase 4 – Execution	Leveraging the AS4 Access Point of CEF eDelivery and Continuous Improvement of software	750	ISA ²	Q2/2019	Q1/2020
Phase 4 – Operational	Operation and support	250	ISA ²		
Phase 5 – Execution	Finalising Improvements	700	ISA ²	Q2/2020	Q1/2021
Phase 5 – Operational	Operation and support	200	ISA ²		
	Total	5.370			

1.5.11.2 Breakdown of ISA2 funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Phase 1 – Execution	950	
	Phase 1 – Operational	250	
2017	Phase 2 – Execution	1020	
	Phase 2 – Operational	250	
2018	Phase 3 – Execution	750	
	Phase 3 – Operational	250	
2019	Phase 4 – Execution	1100	
	Phase 4 – Operational	200	
2020	Phase 5 – Execution	350	
	Phase 5 – Operational	250	

1.5.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
Digital Single Market	http://ec.europa.eu/priorities/digital-single-market_en	
Digital Single Market Strategy	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52015DC0192	
CEF Digital	https://ec.europa.eu/digital-agenda/en/connecting-europe-facility	
eIDAS regulation	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.257.01.0073.01.ENG	

1.6 ELECTRONIC DOCUMENTS AND ELECTRONIC FILES: INTEROPERABILITY AGREEMENTS AND FORM GENERATORS (2016.26)

1.6.1 IDENTIFICATION OF THE ACTION

Type of Activity	Common Frameworks
Service in charge	DIGIT B2, DIGIT D2, GROW E3
Associated Services	GROW R3, R4, JUST B4

1.6.2 EXECUTIVE SUMMARY

In previous phases of the action, an extensive overview of how Member State administrations use electronic documents was produced, which served as the basis for the categorisation of requirements, possible solutions and interoperability issues related to these solutions, with the goal to identify areas where interoperability agreements would be useful, and consequently establish such agreements. On the semantic layer, interoperability agreements often take the form of XML schemas for transactional exchange of data.

The work to establish a set of best practices and tools and provide support to cross-border initiatives to create XML schemas, based on ISA Core Vocabularies, will continue. XML schemas - based on Core Vocabularies - that will be produced, meet the requirements of the forthcoming Digital Europe Program regarding the assessment, updating and promotion of existing common specifications and standards, the promotion of new common and open specifications, as well as re-usability at cross- border, cross- domain sectors.

Another interesting use case to implement the digitalisation of administrative documents is provided by the Regulation on the Single Digital Gateway²² that aims at making it easier for citizens and businesses to move, live, work or establish in another EU Member States. The regulation requires Member States to digitalise the front office of 21 procedures²³. It also aims

²² Published in the Official Journal on 21/11/2018:

<https://eur-lex.europa.eu/legal->

[content/EN/TXT/?uri=uriserv:OJ.L_.2018.295.01.0001.01.ENG&toc=OJ:L:2018:295:TOC](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.295.01.0001.01.ENG&toc=OJ:L:2018:295:TOC)

²³ *Requesting proof of registration of birth; Requesting proof of residence; Applying for a tertiary education study financing, such as study grants and loans from a public body or institution; Submitting an initial application for admission to public tertiary education institution; Requesting academic recognition of diplomas, certificates or other proof of studies or courses; Request for determination of applicable legislation in accordance with Title II of Regulation (EC) No 883/2004; Notifying changes in the personal or professional circumstances of the person receiving social security benefits, relevant for such benefits; Application for a*

at making procedures that are already online for domestic users also accessible for cross-border users.

Some Member States, like Denmark, Ireland, Belgium and Spain are using form generators for digitalising procedures, which they have estimated to be particularly cost-efficient. In 2018 the Commission launched a study to examine the feasibility of creating a '*generic EU form generator*' which could be used for digitalising at least these 21 procedures referred to above for enabling Member States to comply with the requirement that online procedures should be provided without discrimination also to users from other Member States. It could also provide an opportunity for Member States' public administrations to digitalise their procedures more widely beyond the ones mentioned (at all levels, incl. regional and local). Furthermore, the assistance services covered by the single digital gateway could also use the form generator to offer an online intake form for requests for assistance.

The next phase of the action will aim at developing this generic EU form generator, if determined to be needed²⁴.

The operation interoperability agreements, initiation, planning, execution and closing will be initially funded by ISA2 program. From 2021 onwards, the developments could be maintained through Internal Market Program.

European Health Insurance Card (EHIC); Submitting an income tax declaration; Registering a change of address; Registering a motor vehicle originating from or already registered in a Member State, in standard procedures; Obtaining stickers for the use of the national road infrastructure: time-based charges (vignette), distance-based charges (toll), emission stickers issued by a public body or institution; Obtaining emission stickers issued by a public body or institution; Claiming pension and pre-retirement benefits from compulsory schemes; Requesting information on the data related to pension from compulsory schemes; Notification of business activity, permission for exercising a business activity, changes of business activity and the termination of a business activity not involving insolvency or liquidation procedures, excluding the initial registration of a business activity with the business register and excluding procedures concerning the constitution of or any subsequent filing by companies or firms within the meaning of the second paragraph of Article 54 TFEU; Registration of an employer (a natural person) with compulsory pension and insurance schemes; Registration of employees with compulsory pension and insurance schemes; Submitting a corporate tax declaration; Notification to the social security schemes of the end of contract with an employee, excluding procedures for the collective termination of employee contracts; Payment of social contributions for employees (from Annex II of the Regulation).

²⁴ Will be determined through the study results led by DIGIT D2 and GROW E3 by end-2019.

1.6.3 OBJECTIVES

The original objective of the action is the definition of common specifications (interoperability agreements) in relation to electronic documents and the electronic files. As in the previous phase, the action will continue to support the creation of interoperability agreements for electronic documents, taking the form of XML schemas. The tools and best practices that have been created will be further developed, and the action will continue to offer support to interoperability initiatives (e.g. cross-border projects) for the development of XML schemas based on Core Vocabularies.

On the Form Generator tool, based on the outcome of the 2019 study that analysed the requirements, the objective of the action is to develop and deploy a *generic EU form generator*. Based on the conclusions of the study the most suitable existing open source form generator will be further developed to serve the purpose of generic EU form generator. It may either be developed as a building block which can be reused by Member States to support their Web development needs, reduce their implementation costs, and ensure interoperability by incorporating data exchange standards and data privacy principles or delivered as a service to the Member States. The most promising way to implement this project would be to engage existing open source development groups in the public administrations of the Member States to jointly develop the additional functionality that is needed. The action would seek to organise, to promote, to co-develop and to create incentives for such an open source approach. Based on an analysis of requirements, a future phase of the action could also aim at providing reusable back office elements such as a case management system. This would serve various assistance service providers, covered by the SDG Regulation, who operate currently still on paper or e-mails, but would need a structured IT tool to manage their cases and feed in with the collected statistics to an SDG's common dashboard.

1.6.4 SCOPE

Regarding interoperability agreements, the scope of the action has (compared to previous phases) been narrowed down to interoperability agreement that take the form XML schemas, mostly for electronic documents (though an extension to electronic files can be envisaged).

The action is linked to Regulation (EU) 2016/1191 (“the Public Documents Regulation”), the e-Evidence project of DG JUST and the Single digital gateway Regulation.

The generic EU forms generator tool will be made available to all EU Member States for every administrative level (incl. regional offices and municipalities) and to assistance services to enable the generation of customised forms. . The main functionalities of the tool will be:

- being available in all EU languages,
- fields enabling the input by users of all required information to launch a procedure,
- enabling the option to submit supporting documents,
- enabling the option for users to identify themselves and to sign electronically,
- enabling an option for payments,
- enabling the option of an interconnection with back office systems to populate the forms with personal information coming from authentic sources and enabling the data provided in the form to be integrated with existing back office systems where relevant,
- complying with the GDPR and other relevant data protection rules,
- enabling the option to gather and share statistics on the requests submitted,
- and supporting reuse of data ('once only' principle).

In a future phase, the aforementioned reusable back office elements might also be inside the scope of the activities.

1.6.5 ACTION PRIORITY

This section is used to assess the priority of the proposal to become a programme's action according to Art. 7 of the ISA² decision²⁵.

1.6.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union.

²⁵ DECISION (EU) 2015/2240 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

Question	Answer
<p>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</p> <p>In particular, how does it contribute to the implementation of:</p> <ul style="list-style-type: none"> • the new European Interoperability Framework (EIF), • the Interoperability Action Plan and/or • the Connecting European Facility (CEF) Telecom guidelines • any other EU policy/initiative having interoperability requirements? 	<p>The EIF calls for the establishment of interoperability agreements. The action aims at establishing such agreements for electronic documents and electronic files.</p> <p>By contributing to the development of the Single Digital Gateway, it will help with the implementation of the following principles of the EIF:</p> <ul style="list-style-type: none"> - principle 3: visibility. - principle 4: reusability of IT solutions. - principle 6: user-centricity.
<p>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</p>	<p>Interoperability agreements are often very specific to the business processes they apply to. The action aims at identifying and standardising recurring elements. In many cases ISA Core vocabularies are well suited to cover such common elements (natural persons, businesses, places).</p> <p>The generic EU forms generator will also avoid fragmentation in the development of solutions, both in the EC and the Member States.</p>

1.6.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<p>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</p>	<p>ISA core vocabularies as part of interoperability agreements are particularly well suited for cross-sector use. The XML schemas developed for DG JUST in the context of the Public Documents regulation cover procedures, some of which are also relevant with regard to the 21 procedures agreed for the SDG and could therefore also be reused for this purpose.</p> <p>These 21 procedures are used in a wide range of policy sectors (e.g. education, employment, civil status, transport, social security, business registration). The form generator, if created, will be easily extended for the digitalisation of procedures in additional policy sectors. In a future phase, the aforementioned reusable back office elements, including a possible case management system, could be used by various assistance service providers of the internal market.</p>
<p>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</p>	<p>The form generators in use in Germany, France, Austria, Poland, Slovenian Ireland, Denmark, Belgium and Spain already cover various policy sectors, like taxes, transport, customer</p>

	service, licenses or health care system.
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1.6.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<p>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</p>	<p>All policy initiatives supported with the creation of XML schemas are cross-border.</p> <p>Both, the Single Digital Gateway and the IMI system, are serving all EU Member States.</p> <p>Some Member States have explicitly stated their interest in a forms generator.</p>
<p>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</p>	<p>Form generator tools are already used in some countries such as Germany, Austria, Poland, Slovenia, Ireland, Denmark, Belgium and Spain. The typologies of form generators cover all sort of systems from open source (i.e. France) to stand alone systems (i.e. Germany, Austria, etc.). In addition, the systems are implemented either as products or as software as a service.</p>

1.6.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources.

Question	Answer
<p>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in</p>	<p>Interoperability agreements in the form of XML schemas support policy</p>

Question	Answer
EU legislation?	<p>implementation (Public Documents Regulation, European Investigation Order in the context of the e-Evidence project).</p> <p>The generic EU Forms Generator is meant to be an enabler to deliver the Single Digital Gateway²⁶ as per the agreed schedule and help the assistance services to digitise their case handling systems and local authorities with the digitalization of the procedures set in the Annex II.</p>
How does the ISA ² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?	<p>Elaboration of interoperability agreements / specifications is closely linked to other ISA² actions (SEMIC, EIRA).</p> <p>As a general purpose tool, the generic EU Form Generator will also improve the efficiency of the electronic interaction between European public administrations and businesses / citizens.</p> <p>In a future phase, the aforementioned reusable case management system would improve the efficiency of the electronic interaction between assistance service providers and the Commission by providing more complete information on the obstacles on the Single Market.</p>

²⁶ Following the adoption of the Regulation on Single Digital Gateway, it is urgent to offer such tools to Member States who have not digitised their procedures already so that they can comply with the requirements of the Regulation.

1.6.5.5 Reusability of action's outputs

Can the results of the action (following this proposal) be re-used by a critical part of their target user base, as identified by the proposal maker? For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

Output name	Reference Architecture for e-Documents (produced in previous phases of the action)
Description	The e-Documents action has produced a reference architecture for electronic documents, based on the European interoperability Reference Architecture (EIRA). It is meant to enable public administrations to make informed architecture decisions when building e-document solutions.
Reference	http://joinup.ec.europa.eu/site/isa_edocuments/edocuments/index.html
Target release date / Status	2016 / Status: first version published in 2015, updated in 2016 and 2017
Critical part of target user base	A measurable number would be the architecture initiatives in Member states that reuse this reference architecture. The number of solution architects that use it for the creation is difficult to know.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Information was exchanged / cooperation initiated with architecture initiatives in Belgium and Demark, which took some input from the reference architecture.

Output name	XML schemas for Public Documents
Description	Schemas that were produced for DG Justice and Consumers for the forms that will be published on the European e-Justice Portal in the context of the Public Documents Regulation.
Reference	Handed over to DG JUST for distribution to MS
Target release date / Status	The first complete draft version has been delivered to DG JUST end of Q2 2018.
Critical part of target user base	These forms will be implemented in the e-Justice Portal, and they will be implicitly used by all MS. An achievement towards interoperability would be if a large number (one third) of Member States would implement the schemas in their IT systems.

For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Some MS have expressed interest to implement the schemas in their national system (Finland, Czech Republic, Estonia, France, Hungary, Lithuania and Poland). Some others are considering the possibility (Austria, Croatia, Denmark, Latvia, Romania, Slovakia and Slovenia).
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Output name	XML schemas for e-Evidence
Description	In the context of digitalising the European Investigation Order (EIO), DG JUST develops a Digital Exchange System for electronic evidences. ISA supports this project through the creation of XML schemas based on Core Vocabularies.
Reference	To be handed over to DG JUST
Target release date / Status	Schemas for Proof-of-Concept in Q3 2018, maintenance ongoing

Output name	Tool for the creation of XML schemas
Description	Originally an eclipse-based tool that transforms (under the control of scripts) UML Diagrams into XML schema. Reuse of ISA Core Vocabularies and Naming and Design Rules are built into the tool as a configurable feature. Revised and simplified in 2018, now based on input from text files (csv).
Reference	To be published on Joinup
Target release date / Status	Finalization of first version Q4 2017, revised in 2018
Critical part of target user base	Since an important aspect of the tool is that it has support for the ISA Core Vocabularies built-in, the interesting number to measure is not the number of end users but the number of policy DGs, cross-border projects and/or Member States that use the tool for the creation of their schemas. Target for

	2020: 4 different projects in 2 policy areas.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Currently the maintenance of the DG JUST schemas (for which the tool was created) is done by ISA ² , if this is not continued in the future there would be a need to hand the tool over to the policy owner.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Generic EU forms generator
Description	An open source tool that can be used by all EU Member States' administrations at all levels to generate forms building the front office of administrative procedures.
Reference	Existing tools in DE, FR, AT, PL, SI, IE, DK, BE, ES
Target release date / Status	2019-2020
Critical part of target user base	All Member States authorities to which the Regulation will apply are potential users, at all layers (national, federal, regional, municipal). Several of them already expressed interest in the tool. Beyond the authorities in charge of the 21 procedures listed in the executive summary, it is expected that the tool could easily be used within a wider range of policy areas. In addition, the assistance service providers across EU can also be potential users.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	N/A

1.6.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
Does the proposal intend to make use of any ISA ² , ISA or other relevant interoperability solution(s)? Which ones?	The action uses various results (methodologies, Core Vocabularies) from ISA action 1.1 (SEMIC). The Form Generator will take into consideration existing open source form generators and the possibility to integrate with other CEF building blocks (eDelivery, eSignature...).
For proposals completely or largely already in operational phase : has the action reused existing interoperability solutions? If yes, which ones and how?	

1.6.5.7 Interlinked

Question	Answer
Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?	Mutual recognition of electronic documents and efficient exchange between administrations are certainly key elements for the free movement of citizens and goods and establishing the once-only principle. The reusable forms generator component is directly supporting the once-only principle. It will simplify and speed up the deployment of front office and collaborative interfaces supporting the EU procedures and regulations.

1.6.6 PROBLEM STATEMENT

The problem of	Exchange and processing of electronic documents being done at present almost exclusively at national level
affects	Citizens and business that move and economically act across borders
the impact of which is	that many processes that citizens can in their own country already execute digitally, remain closed to citizens of other Member States.
a successful solution would be	Interoperability agreements that permit the exchange and mutual recognition of electronic documents across borders.

The problem of	Lack of digitalisation of administrative procedures
affects	Cross-border citizens and businesses (including both nationals living abroad and stakeholders from other Member States)
the impact of which is	Costs, administrative burden, and the lack of use of the opportunities offered by the Single Market to their highest potential
a successful solution would be	A generic EU Forms generator

The problem of	Costs for digitalising administrative procedures
affects	Member States authorities
the impact of which is	Delayed or incomplete implementation of the single digital gateway, especially at decentralised levels of government
a successful solution would be	A generic EU forms generator, offering an easy to use and cost effective tool for authorities when digitalising procedures

The problem of	Lack of exchange of electronic data and documents within public administrations to other public administrations, businesses and citizens, in an interoperable, secure, reliable and trusted way
affects	EU and Member States' authorities
the impact of which is	Incomplete overview of the cases dealt by various assistance service providers, also an incomplete and fragmented knowledge on different obstacles encountered on the Single Market by businesses and/or citizens
a successful solution would be	A reusable open-source case management system for assistance service providers of the Single Market

1.6.7 IMPACT OF THE ACTION

1.6.7.1 Main impact list

Impact (interoperability agreements)	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Common specifications for electronic documents (data and metadata) will enable the processing of such documents generated by systems in one MS (or in central EU portals) by systems in another MS. This will generate savings in processing time and money in the public administration. At the same time, it will provide better service quality to the citizens and businesses.	A first manifestation of these benefits will be realised when Member States implement the schemas developed for the Public Documents Directive (as of 2018 / 2019)	Citizens, businesses, public administrations.
(+) Savings in time			
(+) Better interoperability and quality of digital public service			

Impact (forms generator)	Why will this impact occur?	By when?	Beneficiaries
<p>(+) Savings in money and in time</p>	<p>As identified in the SDG Regulation's Impact assessment: the cost of getting a single procedure online is estimated at EUR 600 000, which is at the higher end of the different estimates provided by the Member States.</p> <p>On average, 5 procedures are estimated around EUR 2.85 m per MS.</p> <p>Indirectly, this will enable citizens and businesses to launch administrative procedures online, thereby saving them money and time (estimated benefits: 855 000 hours and ~11-55 billion EUR saved annually).</p>	<p>2020 IV Q</p>	<p>Member States' public authorities, EU cross-border citizens and businesses</p>
<p>(+) Better interoperability and quality of digital public service</p>	<p>Indirectly, an EU wide form generator will improve quality of the procedures offered, and facilitate interoperability with final users.</p> <p>A reusable case management system for the assistance service providers, if provided, will improve the quality of information and statistics they</p>	<p>2020 IV Q</p>	<p>Mainly EU cross-border citizens and businesses, but also the public administrations when standardising their procedures and</p>

Impact (forms generator)	Why will this impact occur?	By when?	Beneficiaries
	provide the Commission with.		assistance services
(-) Integration or usage cost	Expected to be very limited, but will be specified in the study that is run in 2019.	2020 IV Q	Member States' public authorities
(+) Full use of the opportunities offered by the Single Market	Indirectly, through facilitating an access to procedures for EU cross-border users.	2020 IV Q	EU cross-border citizens and businesses

1.6.7.2 User-centricity

On Interoperability Agreements:

- On the one hand the usability for direct users (see section 1.6.9.2 below) is being assured by paying special attention to requirements analysis and documentation.
- On the other hand, to assure that benefits are being realised for citizens and businesses, the action's team is actively participating in the Member State groups of the relevant policy DGs that represent the end users in their countries.

On the Form Generator:

- Member States authorities will be involved in the process through exchanges on the project and its implementation in the frame of ad hoc meetings and when appropriate then also through the Single Digital Gateway coordination group (became active in 2019).
- In addition, the whole Single Digital Gateway includes tools for gathering user feedback, which can indirectly also feed into possible evolutions of the created generic EU form generator.

1.6.8 EXPECTED MAJOR OUTPUTS

Output name	Various Studies related to electronic documents
Description	<ul style="list-style-type: none"> • Updated study on state of the art of e-Document and eSafe solutions in Europe • Cross-border usability and use of eDelivery and eSafe solutions • Description of Architectural Alternatives • Metadata Specifications for Case Management / Document Management
Reference	https://joinup.ec.europa.eu/sites/default/files/ckedit_or_files/files/SC112-D02_01%20Report%20on%20Architectural%20and%20Solution%20Building%20Blocks%20for%20e-Documents%20used%20in%20Member%20States_v2_01.pdf others to be published on Joinup
Target release date / Status	2016 - 2018

Output name	State of the art on Form Generators
Description	State of the art analysing existing form generators, their characteristics and their reusability by other Member States, business requirements and development costs.
Reference	N/A
Target release date / Status	2018-2019

Output name	Development of a generic EU form generator
Description	Creating a generic EU form generator for all the EU public administrations to digitalise their public procedures
Reference	Existing tools in DE, AT, SI, PL, IE, DK, BE, ES, FR

Target release date / Status	2019-2020
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1.6.9 ORGANISATIONAL APPROACH

1.6.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Member States	ISA ² Committee, ISA ² Coordination group and working groups Points of Single Contact representatives Single Digital Gateway national coordinators	Decision-making about the further course of the action, providing input stock-taking
Commission Services - Policy DGs (DG JUST, DG GROW)	Project officers	Direct beneficiaries as schemas / specifications are being created for them
ICT	Representatives of ICT industry, SMEs	Gave input in previous phases
Cross-border businesses and citizens	Single Digital Gateway stakeholder group	Regular meetings to discuss development; user feedback mechanism
Assistance service providers	Single Digital Gateway coordinators	Beneficiaries by being able to digitalise their case management

1.6.9.2 Identified user groups

The reports and the reference architecture produced by previous phases of the action are meant to be used by:

- Policy makers in the Member States that want to know what kind of solutions are in place in other MS
- Policy makers at European level that want to know what kind of solutions are in place in the Member States, to what extent they can be used across borders and sectors and where there are potential gaps to be filled
- Enterprise and IT architects in the Member States that want to know the typical components of solutions for electronic documents and how to make them interoperable

Tools, XML schemas and similar technical interoperability agreements are meant to be used by

- IT architects and system implementers when creating systems for the exchange of electronic documents across organisational and political borders.

The Form Generator tool is meant to be used by:

- Member States authorities responsible for the 21 procedures listed in the executive summary or who will need to upgrade existing online procedures to make them accessible by cross border users, or who would want to digitalise any additional public procedures.
- EU institutions as the tool should be sufficiently generic to be adapted to other procedures and applications.

The reusable case management system, if provided, would be meant to be used by:

- EU and Member States' assistance service providers who operate on the Single Market.

1.6.9.3 Communication and dissemination plan

For the creation of XML schemas, the action's team actively approaches policy DGs. For the SDG-related aspects, the action will be advertised in the frame of the Single Digital Gateway coordination group (already started with the beginning of 2019). The group will enable to reach the authorities and assistance services providers that are the target group for the EU form generator. It is foreseen that the Single Digital Gateway coordination group meets twice a year in its configuration addressing IT matters. Specific events dedicated to this project may also be organised.

Besides, promotion of the Single Digital Gateway as a whole towards businesses and citizens is foreseen in the Regulation as an essential task that will take place in cooperation with Member States authorities.

Project results will also be made available using all ISA2 communication channels i.e., newsletter, blog posts, Joinup website, webinars, event etc.

1.6.9.4 Key Performance indicators

The ISA dashboard gives an overall efficiency indicator of 10; the effectiveness indicators provided to the “Monitoring and evaluation” action are indicated in the table below together with their value at the time of writing. Note however that these indicators have changed over time as the action’s focus has changed.

Description of the KPI	Target to achieve	Value Q2 2019	Expected time for target
Number of Member States visits for further exchange of information	3	3	Q4 2017
Number of Member States to provide additional input/specific fields for the creation of XML schemas ²⁷	27	27	Q4 2017
The number of eDelivery solutions examined	4	4	Q4 2017
The number of eSAFe solutions examined	4	4	Q4 2017
Number of alignments of the reference architecture with other ongoing efforts	3	3	Q4 2017
Number of existing form generators analysed	At least 5	N/A ²⁸	2019
Number of Member States consulted on their needs and requirements (<i>for the reusable</i>	28	N/A	2019

²⁷ New KPIs for the creation of XML schemas in the second half of 2018 and in 2019 will have to be defined.

²⁸ The generic EU forms generator's study was finalised in Q3 2019.

Description of the KPI	Target to achieve	Value Q2 2019	Expected time for target
<i>case management system for their assistance service providers)</i>			
Level of preparation of the final recommendations	100%	N/A	2019
A viable solution to be developed for the EU form generator	100%	N/A	2020 III-IV Q
A solution to be created for the reusable case management system for assistance services, when needed.	100%	N/A	2020 III-IV Q

1.6.9.5 Governance approach

The action will be managed by DIGIT for the XML schema creation and by the Single Digital Gateway team in DG GROW, in particular by its working group 6 “technical tools” for the Form Generator and a possible reusable case management system, with the support of external contractors. Whenever major deliverables are to be published, the validation of the MS representatives will be sought. In addition, the action will be run in close collaboration with the concerned Commission services.

Member States authorities and final users will be involved in its development and implementation in the way described in previous sections.

1.6.9.6 Sustainability

The operation interoperability agreements, initiation, planning, execution and closing will be initially funded via ISA2 program. From 2021 onwards, the developments could be maintained through Internal Market Program.

1.6.10 TECHNICAL APPROACH AND CURRENT STATUS

1.6.10.1 XML schemas

The cooperation with DG JUST is ongoing, for the development of XML schemas for electronic documents in the scope of the Public Documents Regulation²⁹. These are very fundamental documents and very good candidates for interoperability agreements. Further cooperations have started with other projects, including land registers and the electronic exchange of evidences.

The tools developed in this context in previous phases will be further developed and reused for new demands.

1.6.10.2 Forms Generator

During the preparatory phases, an inventory and analysis of what exists in the Member States, to which extent it can and is reasonable to be reused, and the usability of such tools by the authorities of the Member States. The study provided a clear assessment of the usability of such tools by Member States public authorities, assessed the pros and cons on the choice of development as well as provided also the business requirements for a potential development.

1.6.11 COSTS AND MILESTONES

1.6.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YY YY)
Initiation Interoperability agreements	Analysis of MS solutions Reference Architecture	200	ISA ²	Q2 2016	Q2 2017
Execution and	Approaches to document	487	ISA ²	Q3 2017	Q4 2019

²⁹ See http://ec.europa.eu/justice/civil/judicial-cooperation/document-circulation/index_en.htm

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YY YY)
Operation Interoperability agreements	exchange Business process analysis Public Documents XML schemas Analysis of standards for document managing / case management Maintenance of outputs from previous phases Support of policy DGs (schema creation)				
Operation Interoperability agreements	Support of policy DGs (schema creation and maintenance)	100	ISA ²	Q1 2020	Q2 2021
Initiation and Planning Forms Generator feasibility study	Inception report First list of existing form generators List of contacts to be made Timeplan	20	ISA ²	Q1 2018	Q3 2018
Execution Forms Generator feasibility study	Analysis of existing form generators Analysis of business needs by each Member State List of requirements for the tool (for the form generator and for the poss. case management system)	280	ISA ²	Q3 2018	Q4 2019

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YY YY)
	Options for development				
Closing Forms Generator feasibility study	Final evaluation	10	ISA ²	Q3 2019	Q4 2019
Initiation Forms Generator	Project Charter	17	ISA ²	Q1/2020	Q1/2020
Planning Forms Generator	Handbook Project Plan	34	ISA ²	Q2/2020	Q2/2020
Execution Forms Generator	e.g. Form Engine, Form Interface Generator, Forms Generator Admin GUI, Server Side Services, Export Capabilities, Documentation and Packaging	287	ISA ²	Q4/2020	Q4/2020
Closing Forms Generator	Final Evaluation	8	ISA ²	Q1/2021	Q2/2021
<i>Initiation – reusable case management system</i>	<i>Launching a contract for development Inception report</i>	<i>10</i>	<i>ISA²</i>	<i>Q1 2020</i>	<i>Q2 2020</i>
<i>Planning– reusable case</i>	<i>Project management and</i>	<i>10</i>	<i>ISA²</i>	<i>Q3 2020</i>	<i>Q4 2020</i>

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YY YY)
<i>management system</i>	<i>time plan</i>				
<i>Execution– reusable case management system</i>	<i>Development, testing the product, handover, launching the product</i>	280	ISA ²	Q1 2021	Q2 2021
	Total ³⁰	1743			

1.6.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Initiation and Execution Interoperability agreements	250	250
2017	Execution Interoperability agreements	197	197
2018	Execution and Operation Interoperability agreements	150	150
2018	Initiation, Planning, Execution and Closing Forms Generator feasibility study	300	
2019	Execution and Operation Interoperability agreements	100	100
2019	Initiation, Planning, Execution and Closing Forms Generator	346	346
2020	Operation Interoperability agreements	100	

³⁰ This total is without the Case Management System, which would be covered in the 2020 Work Programme

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2020	Initiation, Planning, Execution and Closing Case Management System	300	

1.6.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
Updated Reference Architecture for e-Documents	http://joinup.ec.europa.eu/site/isa_edocuments/edocuments/	
Proposal for a Regulation on a Single Digital Gateway	https://ec.europa.eu/info/law/better-regulation/initiatives/com-2017-256-0_en	

1.7 INNOVATIVE PUBLIC SERVICES (2018.01)

1.7.1 IDENTIFICATION OF THE ACTION

Service in charge	JRC.B6, DIGIT.D2, DIGIT.D3, CNECT.H4, COMP.R3	JRC B6, DIGIT D2,
Associated Services	JRC.I2, CNECT.A2, TAXUD, GROW, DGT, JUST.B4	JRC I2, CNECT H4, TAXUD, GROW, D COMP

1.7.2 EXECUTIVE SUMMARY

The EU is undergoing a radical economic and social transformation, mainly due to the digital transformation of all aspects of the economy, society, politics and government. In their nature as General Purpose Technologies, Information and Communication Technologies (ICTs) are horizontal and cross-cutting. Thus, they are and will be one of the pillars of our socio-economic and political systems and their transformation. Digital technologies and the amount of data they generate trigger further innovation in the shape of new products, services, business models, as well as new ways of interaction between humans and machines. The impact of such changes can help improve access to products and services and the quality of life of European citizens, while boosting the European economy. European industry can build on its strengths in advanced digital technologies and its strong presence in traditional sectors to seize the range of opportunities that technologies such as the Internet of Things, big data, advanced manufacturing, robotics, 3D printing, blockchain technologies and artificial intelligence offer. At the same time, the impact of digital transformation may be uneven, and the growth enabled by technology may benefit some social groups, while leaving others behind. This context is fully reflected in some of the most recent policy documents released by the European Commission (e.g. [Digital Transformation Scoreboard](#), [Digital Skills Gap](#), [Digitising European Industry](#)) both at the higher level of general digital policies and at the more specific level of eGovernment policy.

At a policy level, steps and commitments have been taken through the [Tallinn Declaration](#), signed on 6th October 2017, which confirms the commitment to the vision laid out in the [European eGovernment Action Plan 2016-2020](#) and in the European Interoperability Framework (EIF). One of the key elements is the “user-centricity principles for design and delivery of digital public services”. When interacting with public administrations and using digital public services, citizens and businesses should ensure: digital interaction, accessibility, security, availability and usability, reduction of the administrative burden, digital delivery of

public services, citizen engagement, incentives for digital service use, protection of personal data and privacy, redress and complaint mechanisms.

There is a need to support activities that will allow relevant stakeholders to put in practice political priorities, take better decisions, improve trust and security for the citizen, as the digitalisation of society has also profound impacts upon the extent our personal data are shared and protected and ultimately how our governance systems and democracies function.

All technological developments associated with digital government are based on data and information exchange. In particular, emerging disruptive technologies mentioned above, such as Blockchain, AI, and IoT related infrastructures, but also more common ones such as APIs, are data fuelled and have highly data-intensive processes³¹.

However, whereas the various terms are often used inconsistently, sometimes just as specific technological applications, it is evident that only in combination they acquire meaning and full potential for automation. The use of data can dramatically improve public sector productivity, in terms of efficiency and effectiveness, and quality of public service delivery.

To widen the diffusion and penetration of such emerging technologies in the public sector and achieve a positive impact, interoperability issues are a key challenge which need to be addressed at an early stage, especially in the context of innovation in the public administration, to avoid further fragmentation and allow an easy and effective sharing and reuse of solutions.

The action aims therefore at bringing together actors involved in innovation in Public Administration, to address multi-dimensional (i.e. technological, legal, organizational and semantic) interoperability issues of emerging technologies, and defining which conditions are required for their integration into more traditional technological systems and governance processes for improving public service delivery, and propose concrete solution reusable at EU level, including through cross-border collaboration and supporting the aim of ensuring a wide use of digital technologies across the economy.

On piloting activities, the action aims at examining existing use-cases where the blockchain technology as well as AI / machine learning algorithms could be used. Once these use cases are proven valid candidates they will be developed as a proof of concept.

³¹ See Chapter 8 of the [United Nations E-Government survey 2018](#)

As a starting point, a first pilot will aim at offering a private blockchain network and an API to easily notarize digital information, allowing verifying in the long-term the integrity of such information. It will rely on Open Source software and the Commission nodes will be initially connected to Luxembourg nodes, to later seek collaboration with other Member States to increase the number of partners and, as a consequence, the trust in the blockchain network.

At a second stage, using lessons learned and existing infrastructure from the first pilot, the focus will move to explore and implement a self-sovereign identity pilot using a blockchain-based solution. Self-sovereign identity is a concept where natural and legal persons can store their own identity data on their own devices, and provide it efficiently to those who need to validate it, without relying on a central repository of identity data. It is an interesting concept that could help in the application of eGovernment's once-only principle³², with a citizen-centric approach in contraposition to the traditional government-centric approach. This means that the citizen should request only once a credential to a public administration - or a trusted third-party -, store it, and share it with others under his own control; instead of providing information only once to a public administration and lose its control when it starts moving between different administrations.

The following stage of this action will continue to work on the combination of different building blocks. More specifically, the Commission and Member States will work to create guidelines, artefacts and recommendations supporting new patterns of data access by request (lookup by data consumers) and data sharing which could be employed in areas such as High value datasets, Access to Base Registries, Implementation of Single Digital Gateway e.g. Once-Only Principle, and European Common Dataspaces, As a first instance they will extend the eDelivery building block of CEF with a new REST-based API profile and with a log of transactions based on blockchain technology. The 'combination' of different reusable solutions aims at accelerating the creation of innovative public services that contribute to a vibrant and more secure Digital Single Market.

An AI Pilot will tackle the use of machine learning for document review/classification in administrations. The pilot will identify different use-cases in document classification, with a focus on investigative activities, where huge volumes of unstructured data (documents, emails) need to be reviewed by given deadlines to identify documents that are relevant for a particular matter. The AI Pilot will: (i) compare different machine learning algorithms and different model approaches; (ii) evaluate the added value of applying machine learning; (iii) assess the interoperability requirements for operating them, i.e. to integrate and exploit

³² The once-only principle aims reducing administrative burdens in the EU Member States, as exchanging information that has already been collected is cheaper and less burdensome than collecting and storing it repeatedly

machine learning on top of existing document repository and document review systems; (iv) assess legal and organisational aspects that could result from using machine learning by administrations for document classification.

A number of activities under this action will continue under the Digital Europe programme. The objective will be to allow cross-border experimentation and maturation of innovative solutions through a GovTech Incubator where different initiatives at national or regional level could experiment together and bring to maturity projects that could then be supported under a Digital Transformation platform.

1.7.3 OBJECTIVES

This action aims to provide support to identifying the innovation potential and framing conditions of emerging disruptive technologies such as Blockchain and Distributed Ledger Technologies, AI, and IoT related infrastructures, or technological solutions and platforms already mature in the private sector such as APIs, so to better assess their impact in terms of more efficient and improved service delivery, improved interaction between governments and social and economic benefits.

Specifically, the action has the following objectives:

- Implement an Innovative Public Services Observatory that will provide a state of play at EU level of the usage and implementation of emerging disruptive digital technologies in the public sector, to improve public service delivery productivity and quality, while facilitating broader public administration reforms, illustrating the benefits and transformative potential of the combination of diverse technological solutions in a specific local digital social innovation ecosystem at various governance levels. This state of play may look in particular at gathering information on all relevant EU Member States' national, regional and local initiatives of digital innovation in the public sector, including information on how public administrations are using and/or plan to use Blockchain/Distributed Ledger Technologies and AI in their work at all levels (national, regional, local).
- Identify key drivers and major bottlenecks that prevent the full use of emerging disruptive digital technologies in the public sector and their integration in public administration governance processes and policy-making mechanisms, hampering the EU's potential to deliver high quality digital public services with specific respect to interoperability issues at all levels (i.e. technological, legal, organizational and semantic),

- Outline recommendations for EU institutions and Public Administrations to set up assessment workflows that facilitate decision-making on technological evolution of public service provision. This includes advising on future pilot projects where both technological as well as policy measures could be tested and so transformative impacts can be both qualified and quantified. Among others, these pilots should help to i) identify public service domains where a technological solution may bring socio-economic value, ii) evaluate techno-policy impacts and feasibility and iii) identify adaptive measures required to integrate the combination of emerging disruptive technologies into traditional technological systems and governance processes. These recommendations would build upon synergies with the EU-wide network of Digital Innovation Hubs and will investigate means to integrate policy labs in the innovation cycle to facilitate timely policy awareness³³.
- Perform a specific study on API in order to identify common specifications limiting the design choice and supporting autonomous machine-to-machine exchange of information. This will directly support interoperability as well a number of European initiatives such as eIDAS / SDG / GDPR / Open Data / AI Action Plan.
- Use of blockchain in combination with other reusable solutions so that it can scale and be quickly replicated/ adopted in other contexts.
- Develop relevant legal, organizational and technical artefacts trialled through a extension and combination of the CEF eDelivery building block with blockchain-based transactions' log and a REST-based profile (a.k.a. APIs approach), that support new patterns of data access by request and data sharing.
- Develop an AI pilot on machine learning applied to document classification, seeking for answers to the questions of: pros/cons of different machine learning tools/approaches; interoperability requirements for operation i.e. integration with existing systems; legal and organisational implications. The results of the AI pilot will be compiled in a comprehensible Report with definitions, settings, findings, evaluation of the results of the pilot, lessons learnt, conclusions and recommendations, to share the experience and the insights gained with EU administrations that face the challenge of ever-increasing volume of unstructured data that needs to be reviewed / classified.

³³ The EU-wide network of Digital Innovation Hubs are one of the key elements of the Digitising European Industry strategy and shall '*ensure the digital transformation of public administration and public services and their EU-wide interoperability and facilitate access to technology and knowhow for all businesses, notably SMEs; acting as 'one-stop shops' for small and medium-sized enterprises and public administrations, providing access to technological expertise and experimentation facilities, as well as advice to better assess the business case of digital transformation projects*'.

- Lay out the foundations of a future GovTech Incubator by looking e.g. governance aspects and technical implementation.

1.7.4 SCOPE

The scope of the action will be the following:

- Create a map of initiatives in Member States (at local, regional and national level) fostering Digital Innovation in Public Services, with specific focus on the usage and implementation of emerging disruptive digital technologies to improve public service delivery productivity and quality, while facilitating broader public administration reforms;
- Define the factors that may affect the success and failure of digital government transformation, including the technology, environment and organisational/managerial aspects, and their interrelation, and the direct and indirect effects of each of them on the development of Digital Government, looking in particular at the interoperability issues concerning the free flow of data, restrictions on data localisation, access to and transfer of non-personal machine-generated data, liability and portability of non-personal data, etc.
- Assess the added-value of adoption of emerging disruptive digital technologies usage in Public Administration and their impact in terms of service delivery, productivity gains and quality, but also with respect to increased trust and security, due to effective modernisation of public authorities to meet citizens' expectation regarding service provision, transparency, accessibility, openness, accountability and user centricity, as well as the conditions for developing an ecosystem to nurture such digital transformation process, ensuring the interoperability of technological infrastructure and governance procedures to facilitate cross-border operational cooperation of public sector organisations and to further develop an integrated EU market.
- A decentralized trusted repository that contains the relevant information to identify organizations capable of:
 - issuing specific types of attestations/ credentials such as professional and/or academic qualifications and
 - the type of attestations/ credentials they are capable to issue such as attestations/ credentials.
- Investigate the legal requirements/restrictions needed for the use of Self Sovereign Identity associated to blockchain.

- A set of guidelines and specifications for establishing interoperable REST-based APIs for service invocation and publication of both open and protected data. Sample library implementation for API's as well as software supporting central/core services such as service catalogues and service discovery could be also in scope.
- Extension of eDelivery with other building blocks and innovative technical approaches such as blockchain and APIs. Should the pilots be successful, the CEF eDelivery building block will be enriched with a REST-based profile and a blockchain-based log of transactions. Every element will be modular so that it can be used in combination with the existing AS4-profile (of eDelivery) or on its own.

Not in scope:

- A production ready blockchain infrastructure for interoperability among EU institutions, Member States and European citizens as this will be the result of the European Blockchain Infrastructure initiative of the CEF Programme. This action will contribute to it.
- A production ready solution for machine learning applied to document classification for administrations.
- SOAP and Elastic search technologies are considered out of scope of this project.

1.7.5 ACTION PRIORITY

New technologies such as AI and blockchain will impact the ICT landscape and offer a strong potential to improve the interaction between the EU institutions, the Member States and the citizens. In particular, investigating the feasibility and possibilities by exploring the use cases from the voucher scheme project and rolling out the associated platform represent a concrete opportunity for the Union to offer a higher level of transparency to the European citizens and create a trusted ledger mechanism. As the market for possible adoption of this technology is evolving at a fast pace, the EU needs to be prepared to tackle emerging challenges and grasp the opportunities brought about by its use urgently.

1.7.5.1 Contribution to the interoperability landscape

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>The action will identify interoperability issues in a number of technologies to be used in the GovTech sector at an early stage to ensure scaling. A number of pilots and testbeds will allow to assess interoperability aspects of possible solutions and ultimately its feasibility.</p> <p>When identifying solutions, particular care will be taken to follow the recommendation of the following principles of the EIF: openness, technological neutrality and data portability and user-centricity.</p> <p>From the Interoperability Action Plan, this</p> <p>11. Identify or introduce means of user engagement in the development of digital public services.</p> <p>6. Clarify and propose ways to formalise public administrations' organisational relationships as part of the establishment of European public services.</p> <p>1. Identify and liaise with other relevant policies and their governance structures at EU and national levels (including the sectoral committees).</p>

Question	Answer
	<p>The Blockchain pilots of this action will contribute to the setup of CEF's European Blockchain Services Infrastructure (EBSI). The EBSI initiative, under the CEF Programme, will launch a blockchain infrastructure to be used by Use Cases coming from different sectors. Consequently, this action reinforces the objective set by the Commission and the European Blockchain Partnership (EBP) of creating a European blockchain infrastructure that caters for the requirements of the public sector such as eIDAS and GDPR.</p> <p>The initiative to support new patterns of data access by request and data sharing by extending and combining eDelivery with a REST-based profile and a Blockchain based log will facilitate design choices on the legal, organizational, semantic and technical level necessary for setting up APIs.</p> <p>The AI pilot will assess interoperability requirements as key factor of operating new technology beyond experimenting, i.e. how to integrate and exploit machine learning on top of existing document</p>

Question	Answer
	repository and document review systems used in administrations.
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>One of the core objectives of the action is to tackle possible interoperability barriers at the earliest possible stage.</p> <p>The blockchain pilot on SSI aims at improving the trust in digitally signed documents. More specifically, even if there are ways to sign documents using seals and qualified certificates, there is currently no way to automatically verify cross-borders who the issuing organisation is e.g. if the organisation is an educational institution capable of issuing a specific type of qualification such as an official diploma, professional certificate, etc. Thanks to this initiative, such information will become more transparent and interoperable among all parties.</p> <p>The GovTech Incubator by bringing together and allowing for cross-border experimentation will ensure interoperability by default in the deployment of emerging technologies.</p>

1.7.5.2 Cross-sector

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>The studies will propose a number of testbeds pilots that could be scaled across different sectors or combining data from sectors.</p> <p>The API activities will be useful in multiple sectors such as</p> <ul style="list-style-type: none"> • eGovernment giving access to public data, • Healthcare sector giving access to citizens • Private sector using public data and public services
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<p>API technologies are widely adopted in both private and public sector but without standardized profiles making implementations fragmented with limited interoperability and higher costs for users</p>

1.7.5.3 Cross-border

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<p>The studies will have as one of the main objectives to identify and propose pilots and testbeds that will be by essence cross-border, thus involving a number of EU countries.</p> <p>The IPS Observatory will help to identify similar initiatives ongoing at</p>

Question	Answer
	<p>different places.</p> <p>The GovTech Incubator will allow by definition to benefit multiple Member States.</p> <p>The pilots involving blockchain will directly contribute to CEF's European Blockchain Services Infrastructure (EBSI). For example, this will enhance the trust in documents of sensitive nature (i.e. as notarisaton Use Case) and the verification of digitally signed diplomas (i.e. diplomas Use Case). The EBSI is scheduled to go live in Q1 2020 and will include the aforementioned Use Cases.</p> <p>The Common API specifications will be useful for all Member States improving cross boarder access to data and services set out in initiatives like:</p> <ul style="list-style-type: none"> • Public Sector Information (PSI) High value datasets • Single Digital Gateway and Once Only Principle • Access to data for Artificial Intelligence <p>The AI pilot will share the experience and insights gained from the pilot on how to go operational with machine learning for document classification, among EU administrations that face</p>

Question	Answer
	the challenge of ever-increasing volume of unstructured data that have to be reviewed / classified.
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i></p>	<p>The APIs pilot to be carried out as an extension of eDelivery is linked to a request from DK and the NL. Other Member States are interested to participate in it as well. Similar requests were received to combine eDelivery with blockchain technology. Some Member States have made national specifications in the area of API access but with low cross boarder coordination.</p>

1.7.5.4 Urgency

Question	Answer
<p><i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i></p>	<p>The pace and evolution of technological innovation can surpass the speed at which government can absorb them. Uncoordinated development of pilots and implementation in MS can lead to interoperability issues that could be detrimental to EU public services. Blockchain is a new technology with a relevant potential for the interaction between the EU institutions, the Member States and the citizens. Exploring the implementation of self-sovereign identity concept in initiatives</p>

Question	Answer
	<p>as the pilot on digitally-signed qualifications is an opportunity to set-up legislation activities, such as in extending the trust service providers role in the eIDAS regulation, but also to contribute to the once-only principle which, at the time of writing, is being piloted by TOOP³⁴. The combination of blockchain and eDelivery will leverage the auditability capability of blockchain technology applied to the distributed exchange of information. This feature is particularly useful for large Trans European Systems (TES) given that fully distributed networks, without a central log of transactions, are likely to be interested in blockchain's auditability. Furthermore, the addition of a REST-profile to eDelivery will further strength its usefulness in securing the exchange of information over the internet.</p> <p>Common API specifications are urgent to PSI High value datasets, Single Digital Gateway and the accelerating digital transformation.</p>
<p><i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i></p>	<p>ISA² is currently the only programme able to tackle interoperability issues the recent technological innovations in their use in governmental context.</p>

³⁴ The European Commission launched the Once-Only Principle Project (TOOP) on 1st January 2017.

1.7.5.5 Reusability of action's outputs

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Recommendations on the impact of technological innovations with strong potential for the Digital Transformation of government.
Description	The proposal will provide a knowledge base and inventory of use cases on the usage of innovative disruptive technologies and recommendations for their use to support Digital Government transformation based on analysis of their impact on public administrations in their interactions with citizens and businesses.
Reference	
Target release date / Status	Q2 2019
Critical part of target user base	Any public administration at any level (national, regional, local)
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	n.a.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Innovative Public Services Observatory.
Description	The analysis will provide a Knowledge Map of actions implemented by Public Administrations using emerging disruptive technologies in all Member States developing and applying a methodological approach to identify innovative solutions based on technology assessment principles. This activity shall be conducted in collaboration with

	ongoing EU initiatives and projects such as the Digital Innovation Hubs ³⁵ , the H2020 Support Action Big Policy Canvas ³⁶ , (among others) and prospects emerging from digital social innovation research and initiatives as well as prospective analysis that can be conducted within the scope of the JRC EU Policy Lab.
Reference	https://ec.europa.eu/jrc/en/iesi
Target release date / Status	Q4 2019
Critical part of target user base	Any public administration, Member States CIOs,
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Technological pilot(s)/testbed(s)
Description	<p>The proposed pilot(s) will be designed to facilitate the evaluation of impacts and feasibility of technological solutions in public service provision, and to identify adaptive measures required to integrate the combination of emerging disruptive technologies with more mature building blocks into traditional technological systems and governance processes.</p> <p>An example could be a pilot on the use of Application Programming Interface (APIs) in government data/services provision and the linkages with AI introduction strategies. This pilot would</p>

³⁵ <http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs>

³⁶ <https://www.bigpolicycanvas.eu>

	have the am to test interoperability aspects of such solutions and assess the potential for scalability / transferability at the EU level.
Reference	JRC Report on Blockchain (to be published) ; COMP Report on Machine Learning applied to document classification (to be published)
Target release date / Status	Q4 2019 - JRC Report on Blockchain; Q4 2020 - COMP Report on Machine Learning
Critical part of target user base	Any public administration, Member States CIOs,
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	<ul style="list-style-type: none"> • Technical specifications / profiles on how to implement a REST pattern as an extension of the eDelivery building block. • Technical specifications / profiles on how to use eDelivery with Blockchain as a log of transactions. • Technical specifications on a SSI eIDAS profile. <p>Sample software will be created to pilot the aforementioned technical specifications that will then be contributed and integrated into the CEF building blocks for production purposes.</p>
Description	<p>Technical specifications and sample software will be created to either:</p> <ul style="list-style-type: none"> • Extend the eDelivery building block or to • Contribute to the EBSI building block.
Reference	
Target release date / Status	End of 2020
Critical part of target user base	All specifications of the pilots will be reused by all users of the target base.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	n.a.

1.7.5.6 Level of reuse of existing solutions

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	<p>The action will reuse the results of studies performed under the ELISE action and any other studies that contribute.</p> <p>The studies will also liaise with a number of initiatives such as the EU</p>

Question	Answer
	<p>Observatory on Blockchain and the 'EU Observatory on Artificial Intelligence' for example.</p> <p>Any testbed or piloting will make reuse of existing solutions (e.g. Core vocabularies), either from the Building Blocks from CEF or ISA² (e.g. CEF eDelivery). Any architectural design will have to follow the EIRA structure.</p> <p>In particular the API common specifications will build on:</p> <ul style="list-style-type: none"> • EIF • EIRA • APIs4DGov • European Dataset Catalogue • CPSV-AP • Access to base registries
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	<p>n.a.</p>

1.7.5.7 Interlinked

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<p>The action will contribute to the third pillar of the DSM on Economy and Society and more specifically on the</p> <ul style="list-style-type: none"> • definition of priorities for standards and interoperability

Question	Answer
	<p>in emerging technologies.</p> <ul style="list-style-type: none"> • support of an inclusive digital society <p>The action has also a special focus on the user-centricity principles annexed to the Tallinn declaration.</p>

1.7.6 PROBLEM STATEMENT

The problem of	low uptake of innovative technologies in Public Administration and Governments
affects	the delivery of public services
the impact of which is	inefficient Public Services towards the citizens and Businesses
a successful solution would be	the identification game changing technologies that could have a high impact.

The problem of	A fast development of new technologies developing at a rapid pace without interoperability considerations
affects	Public Administration (procurers), citizens
the impact of which is	fragmentation and unscaling of solutions using new technologies due to the lack of interoperability
a successful solution would be	identify at an early stage interoperability issues in new technologies to liaise with

The problem of	Trans European Systems often require the combination of several reusable solutions such as the CEF building blocks and ISA ² solutions.
affects	Information systems of Member States and those of the European Commission that participate in the implementation of EU regulations that promote the exchange and verification of information across borders.
the impact of which is	the combination of building blocks should be experimented and coordinated taking account the needs from as many Member States as possible.
a successful solution would be	A successful solution would be that all these initiatives are gathered in one proposal (i.e. this one) taking into account the needs from as many stakeholders as possible.

1.7.7 IMPACT OF THE ACTION

1.7.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Most off the ICT enabled innovations are known	Probably 2020	All administrations (EU, National, local) that work with contracts, grants, legal policies...
(+) Savings in time	Because of previous gain less time needs to be spend by Member States, municipalities, local administrations and	Probably 2020	All administrations (EU, National, local) and European

Impact	Why will this impact occur?	By when?	Beneficiaries
	European citizens in finding the relevant information. Auditing the transactions will be much easier and bring huge time savings		citizens that work with contracts, grants, legal policies...
(+) Better interoperability and quality of digital public service	As all European citizens will have access improved to better service delivery and by extension novel ways to interact with their administration.	Probably 2020	All European Citizens and local administration as well.
(-) Integration or usage cost	Proposal of EU cross-border and cross-sector pilots can lead to shared infrastructure and reusable services.	Probably 2020	Local administrations of EU
(+) Savings in money	The notary pilot will help in reducing the amount of money required in audits, as public services information systems can benefit from secure and immutable logs and audit trails. And the digitally-signed qualifications pilot will help in moving to a paper-less situation, with much trusted information, which will be machine-processable, requiring less resources	Probably 2020	All administrations (EU, National, local), educational institutions, private organizations, employers, citizens
(+) Savings in time	Because of previous gain,	Probably 2020	All

Impact	Why will this impact occur?	By when?	Beneficiaries
	<p>less time needs to be spent by Member States, European citizens in finding and verifying the relevant information. Auditing machine-processable information will be much easier and bring huge time savings.</p>		<p>administrations (EU, National, local), educational institutions, private organizations, employers, citizens</p>
<p>(+) Better interoperability and quality of digital public services</p>	<p>The digitally-signed qualifications pilot will help in increasing the new qualifications standard trust, adding integrity, but especially authenticity, and will help to verify cross-borders the identity of the educational institution and its capabilities. All this in a common Blockchain accessible to all European citizens, which will have all access to the same information.</p>	<p>Probably 2020</p>	<p>All administrations (EU, National, local), educational institutions, private organizations, employers, citizens</p>
<p>(-) Integration or usage cost</p>	<p>Local infrastructure needs to be set up by the organizations, most likely Member States and Trust Service Providers running Blockchain nodes, that will be responsible of recording blocks. In addition, the maintenance</p>	<p>Probably 2020</p>	<p>Member States, European Commission, Trust Service Providers</p>

Impact	Why will this impact occur?	By when?	Beneficiaries
	of the system needs to be foreseen but will be lower than the gains.		
(+) Fraud and trust	The solution will help in reducing fraud, and the trust on the information backed by the Blockchain network will increase.	Probably 2020	All administrations (EU, National, local), educational institutions, private organizations, employers, citizens

1.7.7.2 User-centricity

Most of the emerging technological innovations addressed in this action are pushing the interactions between humans and machines to more simple and intuitive solutions and approaches, and have therefore user-centricity aspects as a big component of their success.

For this reason being the focus of this action on public service delivery, it is expected to take into account and contribute to further improve the user-centricity principles as annexed to the Tallinn Declaration, when drafting recommendations or proposing pilots.

Another user-centric aspect that will be considered as part of this action is the possible redesign of approaches during policy formulation and evaluation phases, by enabling new ways of interaction between citizens and their governments.

To enhance the impact of the action it is envisaged to work in collaboration with an Expert Group focused on Innovation issues, and disseminate results to relevant formal groups of the EC and other relevant organisations as it may be appropriate.

1.7.8 EXPECTED MAJOR OUTPUTS

Output name	Study “API strategy essentials for the public sector”
Description	This action will build on the results of the APIs4DGov study to co-create Guidelines for

	organisational and legal aspects (e.g. handling the transfer of responsibility, versioning and change management and service level agreements) as well as blueprints, patterns necessary to enhance e.g. API discoverability, Security requirements and Traceability, that can be trialled in the combination of eDelivery with a REST-based profile (below) and re-used in other scenarios.
Reference	
Target release date / Status	2020-21

Output name	Extension of the eDelivery Building Block
Description	This action will contribute to enriching the eDelivery building with a REST-based profile (including proposals for technical specifications re-usable in other scenarios e.g. specifications for handling temporal properties, representation of data in services, concepts commonly used in APIs, REST request structure, conventions on HTTP verbs used and Error message structure and assessments of the proposals on the blueprints and patterns for e.g. API discoverability, Security requirements and Traceability as developed by the study on “API strategy essentials for the public sector”) as well as the possibility to use blockchain as a trusted log of transactions.
Reference	
Target release date / Status	2020

Output name	Contribution to the European Blockchain Services Infrastructure (EBSI)
Description	This action will contribute the component that will interconnect the SSI core solution to the eIDAS trust framework.

Reference	
Target release date / Status	2020/in preparation

1.7.9 ORGANISATIONAL APPROACH

1.7.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Member States, Industry, Citizens	MS representatives, CIO Network, experts, civil society through an Expert Group	Product owner
European Commission	JRC, DIGIT	Project owner
European Commission	CNECT (Digital Innovation and Blockchain unit, F3, and eGovernment & Trust unit, H4)	Associated
European Commission	COMP: AI pilot on machine learning for document classification	Associated
United Nations	United Nations Department of Economic and Social Affairs, Division for Public Institutions and Digital Government (UNDESA)	Associated
OECD	Directorate for Public Governance – Digital Government Team and Observatory of Public Sector Innovation (OPSI).	
European Commission	EMPL (Skills and Qualifications unit, E2)	Associated
Educational Institutions	Educational Institutions representatives	Business users / Beneficiaries
Trust Service Providers	Several accredited (Qualified) Trust Service Providers under eIDAS regulation	Business users
All citizens	A group of citizens representing the user community of Europass	Business Users / Beneficiaries

1.7.9.2 Identified user groups

The user groups will be largely composed of the stakeholders but should also include end-users being not only the recipients of the public services but as well as the public servants in particular for any piloting activity. This involvement may be facilitated by the development of an ad hoc online community linked to Joinup.

The observatory will engage also with National, regional or local initiatives such as GovLabs but also companies working in the GovTech area.

1.7.9.3 Communication and dissemination plan

The project will use the common ISA² website and social communication channel for communicating with the general public and promote their most salient results.

The studies will be published either as JRC Technical Reports or Science for Policy Reports which are published by the Publication Office of the EC.

An important part of user engagement activities will take place on the Joinup platform, which will address a more specialised audience using the features offered by the platform.

The dissemination of the results will be using all the above channels for greater impact but also through the participation to scientific conferences and policy events addressing Digital Government transformation and public sector innovation in general.

1.7.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected time for target
Number of pilots/testbed	1 per year	End of 2020
Number of specific studies (on technology use/assessment)	1 per year	End of 2020
Number of initiatives recorder in the IPS Observatory	100 inventory / 50 mapped	End of 2020
Number of participations to events	3 per year	End of 2020
Number of engaged stakeholders and organizations	200	End of 2020
Number of educational institutions registered in the digitally signed qualifications pilot	10	End of 2020
Number of issued qualifications in the digitally signed	100	End of 2020

qualifications pilot		
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1.7.9.5 Governance approach

The overall action will be jointly managed by DIGIT. D2, D3 and JRC.B6, JRC.B6 conducting most of the study work as well as the creation of the knowledge base and coordinating the piloting activities, which shall be implemented in collaboration with relevant stakeholders and partners and with the support of external specialised experts (depending on the subject) and to be sub-contracted according to JRC procurement rules.

DIGIT D3 and COMP will be in charge of the pilots.

Other relevant EC services shall be associated and results may be discussed in related technical committees, working groups or Inter-Service Consultation groups and reported to MS as appropriate.

1.7.10 TECHNICAL APPROACH AND CURRENT STATUS

The study should identify, reuse and compile existing studies having explored any particular innovative technology as well as a compilation of research and innovation projects (e.g. Horizon 2020).

1.7.11 COSTS AND MILESTONES

1.7.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Initiation	Knowledge base and inventory of use cases on the usage of innovative disruptive technologies and recommendations for	300	ISA ²	Q1/2018	Q4/2019

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	their use to support Digital Government transformation				
Execution	Knowledge Map of innovative technological solutions and applications for Public Administration.	250	ISA ²	Q2/2019	Q2/2021
Initiation	User engagements activities on the User of Innovative Technologies	200	ISA ²	Q2/2019	Q2/2021
Execution	Study on future technological solutions for innovating public services	100	ISA ²	Q3/2019	Q4/2020
Initiation	Foundations for a GovTech Incubator	300	ISA ²	Q4/2019	Q4/2021
Initiation	Creation of the project charter	500	ISA ²	Q1/2018	Q1/2018
Planning	Create the WBS and project plans			Q1/2018	Q1/2018
Execution	Exploration of Blockchain technology			Q2/2018	Q3/2020
	Design and development of digitally-signed qualifications in combination with a blockchain-based ledger	380	ISA ²	Q1/2019	Q4/2019
	Piloting of APIs and	500	ISA ²	Q1/2020	Q3/2020

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	blockchain with eDelivery				
	Study on “API strategy essentials for the public sector”	500	ISA ²	Q2/2020	Q4/2021
Execution	AI pilot on machine learning for document classification	150	ISA ²		

1.7.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2018	Initiation, planning and Execution	600	
2019	Initiation, planning and Execution	1200	1250
2020	Initiation, planning and Execution	1250	

1.7.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
The European Interoperability Framework	https://ec.europa.eu/isa2/eif_en	
Study Blockchain for eGovernment	https://joinup.ec.europa.eu/collectio n/elise-european-location-interoperability-solutions-e-government/document/blockchain-digital-government	
Report Machine learning for document classification in administrations	To be published as COMP Report	
UN eGovernment Survey 2018	https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2018	

2 SEMANTIC INTEROPERABILITY

2.1 SEMIC: PROMOTING SEMANTIC INTEROPERABILITY AMONGST THE EUROPEAN UNION MEMBER STATES (2016.07)

2.1.1 IDENTIFICATION OF THE ACTION

Type of Activity	Common Services
Service in charge	DIGIT.D2
Associated Services	European Commission (DIGIT, EAS, JRC, ESTAT, SANTE, SG, GROW, EMPL) Publications Office of the EU European Parliament

2.1.2 EXECUTIVE SUMMARY

The objective of this action is to promote semantic interoperability amongst the EU Member States (MSs) and the EU Institutions. This is achieved by:

- Supporting alignments and agreements on common definitions and specifications at the semantic layer for the Member States and the EU Institutions.
- Maintaining the e-Government Core Vocabularies, the ADMS and DCAT-AP specifications.
- Promoting the use of the e-Government Core Vocabularies, the ADMS and DCAT-AP specifications.
- Supporting relevant policy and projects executed by DGs and Member States, also in using the ISA² specifications in operational systems.
- Promoting best practices, and lessons-learnt in the area of semantic interoperability.
- Promotion and dissemination work including the SEMIC conference.

The Digital Europe Programme refers several times to the importance of *frameworks* like the specifications developed by the Action to ‘*facilitate cost-efficient implementation and interoperability*’. More specifically ‘*support the design, testing, implementation and deployment of interoperable digital solutions, [...] and establishing common frameworks in order to unleash the full potential of the public administrations’ services for European citizens and businesses;*’³⁷

³⁷ Digital Europe Programme – Article 8 1.(f)

During 2019 has taken place the interim evaluation of the ISA² programme. In that evaluation, SEMIC is considered a *nodal* action in the programme: *‘that there are multiple instances of internal reuse of ISA² solutions, with actions like “SEMIC” or “Joinup” playing a particularly nodal role in the system.’* Also, in the evaluation there are recommendations that the Action will address and, in some cases, is even already addressing. One of the recommendations is on the increase of awareness and collaboration beyond national administrations with regional and local administrations. SEMIC already works intensively with all level of national public administrations and we count with representatives of regions and municipalities in the working groups dealing with ISA² specifications.

To understand better the value of SEMIC and SEMIC solutions, a study was published on the benefits provided by ISA² specifications³⁸.

To improve our communication, on top of the yearly SEMIC conference, during 2019 the Action has organised a series of webinars around semantic interoperability topics or ISA². This webinars have always counted with partners outside the Action, or even Europe, to share different experiences.

Multilingualism is a very important value of the EU and the Action will do a bigger effort on adapting the ISA² specifications during 2020.

Furthermore, aiming at addressing the lack of a mature and interoperable tool for the management and publication of controlled vocabularies, the Action, in close collaboration with the Publications Office of the EU, will continue the development around the open-source RDF data management tool VocBench. VocBench offers a ready solution for the management, alignment and publication of controlled vocabularies (in the broader sense, including ontologies, thesauri and lexicons) as Linked Open Data, thus taking away the burdens for public administrations to maintain and publish their controlled vocabularies in an open and interoperable way. Furthermore, it includes new features enabling an increased collaborative work on vocabularies, and the Sheet2RDF platform which is targeted towards the acquisition and processing of information from datasheets, in order to generate RDF content modelled according to any target RDF vocabulary.

VocBench has already put together an advanced range of functionalities, beyond the core set developed in the context of the first 2016 funding, of the extensions developed in the 2017 and 2018 actions and of those features being developed in the 2019 action. Since version 1.0,

³⁸ Study on use cases and benefits of ISA² specifications (<https://joinup.ec.europa.eu/node/701691>)

VocBench is able to deal with OWL ontologies, SKOS (/XL) thesauri and general RDF data, since version 4.0, it is able to manage lexicons. As such, VocBench offers a powerful editing environment, with facilities for management of OWL ontologies, SKOS/SKOS-XL thesauri, OntoLex lexicons and any sort of RDF dataset. More recent evolutions carried on in the 2018 action (versions 5.0 and 6.0 of VocBench) include, among others, the possibility to connect to Dataset Portals, further improvements on Sheet2RDF for the automatation of the data load and transform process from datasheets and batch actions that can perform massive changes on a repository, yet being easily and intuitively configurable through the VocBench UI. Connection to other systems and interoperability (not just concerning the produced data, but on its own system functionalities) has always been a characteristic of the platform, with open extension points providing interfaces that can be implemented even by third party developers for creating their own extensions and plugging them to the system.

Additionally, its community of users is growing quite fast and EU institutions, agencies and Member States have already expressed a strong interest for it and for the services offered by the Publications Office (controlled vocabulary maintenance and dissemination). One of the next steps (i.e. beyond the developments planned for 2019 and foreseen for 2020) is to turn it into an interinstitutional web-based, multilingual and collaborative development platform for managing the types of assets mentioned above.

Part of the *domain specific work* done in SEMIC to explore the validity of semantic interoperability techniques when applied to specific domains, is the work done on ESCO, the multilingual classification of European Skills, Competences, Qualifications and Occupations developed by the Commission , will be used within the EURES network of employment services in order to exchange job vacancies and CVs between Member States and with the Commission.

Regulation 2016/589/EU (EURES Regulation) modernises the EURES. According to Art. 19 of the EURES Regulation, **Member States will map their national, regional and sectoral classifications to ESCO** within 3 years from the adoption of the relevant Implementing Acts. These Implementing Acts will be effective starting on 8 August 2018, therefore **Member States need to start mapping their classifications to ESCO** with a deadline of 8 August 2021. In this context, DG EMPL has been working on the technical infrastructure for managing and disseminating the ESCO classification and mapping it to national, regional and sectorial classifications. The work to be done in SEMIC concerns important improvements to this technical infrastructure.

SEMIC is also working on the innovative sphere: Interested users (public administrations, businesses and even citizens) can get information on innovation supporting instruments, and innovation actors using a multitude of platforms, such as the Digital Innovation Hubs, the Key Enabling Technology Centres, the European Network for Pilot Production Facilities and Innovation Hubs, or the Smart Specialisation Platform for Industrial Modernisation with the caveat that, currently these platforms provide only fragmented information which makes it challenging and costly for European and national authorities, policymakers to have an insight on the cross-impact of the various supporting instruments. Through the development of common semantic language to be used to exchange data among the various European and national platforms and through a federated central website, it is aimed at supporting European public administrations and enterprises in getting relevant information more efficiently and faster.

Completing both the work done at SEMIC and at DG SANTE, and recognising the prioritisation of certain types of data as vital economic assets in the DSM strategy, DG SANTE is working on building additional cross-sector reusable components to an existing SANTE data structured platform to implement a coherent, standard approach that adds efficiency to each stage of collecting, providing, collating, understanding, analysing, linking, publishing and disseminating health and food safety structured data to the benefit of the EC and national public authorities. These additional components seek to:

- Increasing access to large and diverse datasets to innovate agriculture, sustainability, energy and geo-spatial data (used particularly in the areas of plant protection and plant health);
- Making data available to business and citizens;
- Contributing to evidence that can be used to adapt policy and legal solutions to increase the potential of the data-driven economy (e.g. analysis of number of official controls carried out and number of animal disease or plant pest outbreaks);
- Adding to the free-flow of data by storing and sharing data between Member States in a secure way while implementing adequate data protection safeguards;
- Improving access to non-personal data and facilitating Member State public administrations to provide and share more data;
- Ensuring that data is portable and that data can be shared in a technologically-neutral (and cost-neutral for the Member State) way in specific policy areas from administration to administration (Member States to SANTE).

2.1.3 OBJECTIVES

The objective of the Action is to promote semantic interoperability amongst the EU Member States (Member States) and the EU Institutions. This is achieved by:

- Supporting alignments and agreements on common definitions and specifications at the semantic layer for the Member States and the EU Institutions.
- Maintaining the e-Government Core Vocabularies, the ADMS and DCAT-AP specifications.
- Promoting the use of the e-Government Core Vocabularies, the ADMS and DCAT-AP specifications.
- Supporting relevant policy and projects executed by DGs and Member States, also in using the ISA² specifications in operational systems.
- Promoting best practices, and lessons-learnt in the area of semantic interoperability.
- Promotion and dissemination work including the SEMIC conference.
- Supporting the development of VocBench as a toolbox for controlled vocabularies, metadata, glossaries, ontologies, lexicons and data other models.
- Turning VocBench into a corporate tool for EU institutions, agencies and bodies, and on request for national public services,
- Ensuring the sustainability of VocBench (maintenance, operation and management aspects),
- Benefiting from semantic interoperability, link diverse datasets about innovation in Europe facilitating both EU and national policy making
- Improving, further developing and operating a technical capacity for mapping national classifications of skills and occupations to ESCO, and for exploiting the mapping tables.

- Expand the operation of a user-friendly, smart, secure, interoperable platform for the receipt of structured data in multiple formats validated by business rules as defined in EU health and food safety legislation.
- Capitalise on data assets in health and food security by enforcing [re]use and sharing of standards and terminology libraries.
- Use business intelligence for evidence-based decision-making by tracking data trends over time and through cross-sectoral analytics.
- Contribute to the free flow of [non-personal] data across borders and systems ensuring data has only to be provided once to Commission services and Agencies.

2.1.4 SCOPE

Maintenance of existing specification and development of new ones, policy and technical support, pilots and promotion activities are within the scope of the Action. Emphasis will be

given on promoting cross-domain interoperability but single-domain, cross-border and/or cross-EU institutions initiatives remain with the scope of the Action.

Moreover, the Action will develop a new version of the collaborative thesaurus-management platform VocBench.

The ESCO Technical infrastructure project includes the following technical work and components:

- The improvement of the existing mapping platform.
- Implementation of a dataset management system for ESCO.
- An update of the ESCO portal.
- The implementation of a mechanism to use mapping results for the continuous improvement of ESCO.

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

- A sustainable common set of taxonomies and vocabularies to describe common attributes of innovation actors and supporting instruments
- A supporting community of collaborating platforms, national innovation supporting actors, EU services and main users
- A central database³⁹ used to collect, quality-check and merge datasets from various data providers and to publish common datasets under an open licence.
- A central demonstrator website and various reusable web-components to allow the search of collected datasets within a graphical user interface (a.k.a “openstreetmap”)

For the Structured Data Collection Platform Data Interoperability Components:

- Develop add-on components to an existing secure on-line solution with reusable components that allows data submission and retrieval in a structured and harmonised way, ensures data integrity and compliance, enforces data protection safeguards, allows intelligent analysis and tracking of data patterns, reports, links, disseminates and publishes information received, timers and status notification loops, handles simple workflows (approve/reject).
- The add-on deliverables are to: integrate machine translation; generate a data dictionary maker to be used during legislation drafting; render structured data and datasets as open data; implement terminology matching and ranking system. Non-deliverables: one-off simple data collections; single-purpose information system.

³⁹ It should be noted that the central database and website does not aim to replace IT systems used to collect and share information on the various aspects of industrial innovation. Rather, it aims at allowing these IT systems to share information with each other using a common language and commonly agreed processes, allowing a better user experience for their targeted stakeholders.

2.1.5 ACTION PRIORITY

2.1.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>The Action supports the implementation of the EIF and the EIS, the INSPIRE Directive, the Open Data Directive as the previous PSI Directive, the Service Directive and the Single Digital Gateway by promoting semantic interoperability, through the definition and use of common specifications. Also contributes to the implementation of the European Commission Digital Strategy regarding the <i>data</i> elements.</p> <p>VocBench is an open-source reference tool for the management of semantic interoperability assets. It promotes the opening of data and facilitates the exchange of data between national and EU administrations. It also opens up the possibility for potential reuse by businesses and citizens. The proposal covers the following underlying principles of the EIF: Reusability, Multilingualism, Openness, Semantic interoperability, Technical interoperability and Standardisation.</p>
<p><i>Does the proposal fulfil an interoperability</i></p>	<p>The Action develops, maintains and</p>

Question	Answer
<p><i>need for which no other alternative action/solution is available?</i></p>	<p>promotes common specifications when such specifications are not available. It is the only horizontal action for promoting semantic interoperability for the European public administrations. Moreover, VocBench is the most mature OSS platform for advanced thesaurus management and is nearly the only existing one (at least, not including minor research efforts) for managing Ontolex lexicons.</p>

For the ESCO Technical infrastructure:

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>The proposal contributes to improving the semantic layer of interoperability according to the EIF as it allows public and private employment services to systematically share information on new job openings. This will result in businesses being able to efficiently match people to their vacant jobs, and people to match their skills to relevant job opportunities. This contributes to the implementation of the Skills Agenda for Europe initiative (of which ESCO forms part), which is part of the Europe 2020 strategy for smart, sustainable and inclusive growth.</p>
<p><i>Does the proposal fulfil an interoperability</i></p>	<p>Yes, there is no other established</p>

Question	Answer
<i>need for which no other alternative action/solution is available?</i>	reference framework that could help to bridge between and link national occupational and skills classifications.

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>The purpose of the EIF is to inspire and guide European public administrations to design and deliver seamless public services (cross-border, digital, open by default).</p> <p>This project contributes to the implementation of the EIF, by developing and providing a public service, which</p> <ul style="list-style-type: none"> • merges several currently non-interoperable datasets on innovation actors and supporting instruments into one interoperable one • is based on an open and freely reusable specification to describe common datasets • provides information on innovation actors across-borders • will develop open and reusable IT tools (specifications and software) <p>The solution will be developed</p>

Question	Answer
	<p>while fully taking into account the EIF underlying principles and recommendations</p> <p>The solution would</p> <ul style="list-style-type: none"> - allow current platform operators to provide crucial information from various data sources with minimal added effort; - lower the effort needed by local and regional data providers to provide data, by avoiding duplications; - provide direct benefit to enterprises, cluster organisations and national authorities by sharing datasets gathered from various locations at one central place, via a central demonstrator site - European policymakers gather more insight on the current state and impact of various innovator supporting instruments by cross-analysing the data gathered from multiple platforms.
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>The need for an interoperable solution is recognised in the Communication on Smart Specialisation that states “the Commission will provide stakeholders with a comprehensive mapping of support actors and state-of-the-art facilities in regional eco-systems to</p>

Question	Answer
	<p>foster cross-regional partnering and access to competences”.</p> <p>Currently, stakeholders (SMEs, enterprises, technology centres, innovation hubs, investors, public authorities) have to consult multiple (dozens) of EU and regional information sources to get information on innovation actors and instruments. This results in multiple effort from the platform operators’ side, lower user experience, additional burden on the data providers, and fragmentation and lower visibility of the provide information in general.</p>

For the Structured Data Collection Platform Data Interoperability Components:

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European</i> 	<p>In line with EIF, the SDCP:</p> <ul style="list-style-type: none"> • allows stakeholders to provide secure, administration to administration, harmonised, common terminology-based, structured data by direct upload or using web-forms • makes the data available for reuse through business intelligence • publishes analysis of the data to allow transparency of evidence used for decision-making • ensures a user-centric, multi-channel, technologically neutral common interface and collects data in a portable format

Question	Answer
<p><i>Facility (CEF) Telecom guidelines</i></p> <ul style="list-style-type: none"> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<ul style="list-style-type: none"> • enables single-sign-on (from data provision through to accessing the analysis of data) • single-point of contact for support to collect and collate user feedback and ensure system availability • protects personal data and provides adequate safeguards for users • streamlines and simplifies the provision and use of legally required data and reduces the administrative burden of compliance with EU legislation, e.g. official controls • collects, collates, analyses applicant and indicator data to measure the effectiveness of CEF funded programmes, e.g. European Reference Networks • enables the curation and maintenance of data over time, ensuring long-term accessibility.
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>Yes, the SDCP provides a solution to harmonise and collect structured data in line with specific business rules cross-borders and cross-sectors and to analyse and disseminate that data over time and allows multi-party interaction between stakeholders.</p>

2.1.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the sectors concerned

Question	Answer
<p><i>Will the proposal, once completed be</i></p>	<p>The specifications developed by the</p>

Question	Answer
<p><i>useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>Action are generic and reusable in any policy domain. VocBench can be used for hosting any type of thesaurus, lexicon and vocabulary, allowing also mappings and alignment amongst assets coming from different policy areas.</p> <p>Vocbench will facilitate the online cooperation for the multiple projects management with various users, and the cross-sector interoperability by use of semantic technologies/formats and by facilitating alignments between controlled vocabularies from different sectors/policy domains. E.g.: Alignment of specialised thesauri from the 'Agriculture, fisheries and foods' policy domain with specialised thesauri from the 'Environment, consumers and health domain' and with generic thesauri that cover all EU policy domains such as EuroVoc.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<p>The DCAT-AP specification is used in the Open Data Directive and in environmental (INSPIRE) policy areas. The e-Government Core Vocabularies are used in the EU Business Registers Interconnection System (BRIS) or by the Belgian region of Flanders in their OSLO initiative.</p> <p>VocBench has been used to create semantic interoperability between datasets in the fields of agriculture, environment, gender equality and</p>

Question	Answer
	education.

For the ESCO Technical infrastructure:

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p><i>The proposal will be used primarily in the employment sector, for matching jobs to people in the context of the EURES portal.</i></p> <p><i>It can be used in the education and training sector, since ESCO has the ambition of identifying and categorising qualifications, and systematically showing their relationships with occupations and skills.</i></p> <p><i>The solution can also be applied in the EU institution's HR management (DG HR), in the field of regulated professions (DG GROW) and for big data analysis of the labour market (Cedefop).</i></p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>By its very nature, innovation is sector agnostic. The European innovation policy (or set of policies) have created various instruments to support European enterprises in developing new innovative technologies and/or business models, in a sector agnostic manner.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and</i></p>	

Question	Answer
<i>how they have been utilised in two (2) or more EU policy sectors.</i>	

For the Structured Data Collection Platform Data Interoperability Components:

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	<ul style="list-style-type: none"> • The business process from conception (legal drafting) through data provision, analysis and delivery could be reused. • Software components can and have been reused across several policy sectors. End-users require no software installation to use SDCP. • The terminologies and terminology code linker identified can be re-used as a stand-alone, independent open source tool by any sector or operator (see examples listed in Section 2.1.5.4).
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	<p>The SDCP is already in use in the following EU policy sectors: official controls (F7); food of non-animal origin (D2); food irradiation (G4); food contact materials (E2); plant protection; plant health (G1/5); animal welfare on farms and in transport (F2); depopulation on farms (F2); animal identification (G3); eradication of animal diseases (emergency and avoidance measures) (D4); the treatment of rare and low prevalence complex diseases (ERNs) (B3). It is intended that the new components produce results in terms of data assets and data interoperability mapping that is reusable by any interested party. The CodeLinker will be developed so that it can be re-used as a standalone data matching tool by any operator.</p>

2.1.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<p>The proposal will facilitate the cross-border interoperability thanks to its inherent support for multilingualism. Further cross-border interoperability improvements can be expected through the alignment of the generic EuroVoc thesaurus that covers the EU policy domains with specialised EU and national controlled vocabularies through VocBench. Potentially all stakeholders listed in this <i>fiche</i> can be linked using VocBench. VocBench is already used by public administrations in Denmark, France, Italy, the UK, the Netherlands and Scotland and interest has been expressed from public administrations in Belgium, Slovenia and in the Czech Republic.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i></p>	<p>VocBench is already used by public administrations in Denmark, France, Italy, the Netherlands, Scotland and the UK, and will be assessed in some other EU countries.</p>

For the ESCO infrastructure:

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of</i></p>	<p>The action will involve all Member States, as this is required by Regulation 2016/589/EU (EURES</p>

Question	Answer
<i>three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	Regulation) and the Implementing Decision according to its Article 19.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	<p>The project aims to collect data on innovation supporting actors and instruments across Europe. Its participating projects, such as for example the Digital Innovation Hubs, or the Key Enabling Technology Centres websites already collect data on hundreds of such actors from all Member States across Europe.</p> <p>1) Administration to Administration. Once completed, the platform will be used several agencies, and Commission services as well as authorities in Member states to get an overall insight on the various innovation supporting tools provided at European level. The project will establish close cooperation with the</p>

Question	Answer
	<p>various public stakeholders with the goal to involve the final users as soon as possible in the project.</p> <p>2) Administration to citizens & administration to business. Collected data will be publicly accessible both via a graphical user interface and as machine readable open data.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i></p>	

For the Structured Data Collection Platform Data Interoperability Components:

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<ul style="list-style-type: none"> • The SDCP is interoperable because it is technologically-neutral and can be used by all Member States (and external stakeholders) to provide and consult/download data. • Shared libraries of processes, features and terminologies are used in each case to customise specific business rules depending on the legal mandate. • The Code Linker tool will be reusable by any operator in (or outside) Member States, particularly useful for public administrations interacting with the European Commission.
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations</i></p>	<ul style="list-style-type: none"> • All Member State public administrations use the SDCP to provide and consult data in the various policy areas listed and have provided feedback and input to the solutions that continue to be developed.

Question	Answer
<p><i>of three (3) or more EU Members States.</i></p>	<ul style="list-style-type: none"> • Support is provided for Member States to make their systems (e.g. collecting similar data from regional services at national level) compatible or possible with the SDCP using roles and simple workflows. For example, some Member States use the SDCP to collect regional data and the analysis tools to check the data at national level before formalising submissions to SANTE, e.g. food contact materials.

2.1.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<p><i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i></p>	<p>Semantic interoperability has always been identified as an important barrier in digital EU policies (e.g. Digital Agenda for Europe, Digital Single Market). I.e., in the last Report on IMAPS results – 2018 Edition where it is claimed that <i>‘interoperability is jeopardized more by semantic and technical challenges than by regulatory or organisational settings’</i>. Implementation of this version of VocBench is quite urgent, as the major revision of VocBench concerns in particular the inclusion of new requirements that emerged and were strongly asked by the stakeholders/user community, in light of the extended capabilities that the system achieved in</p>

Question	Answer
	<p>the past actions. Also, mature adopters of the system (such as the Publications Office of the EU) face new scalability challenges while they progressively manage bigger projects and, most important, a larger amount of them in the size of hundreds of projects hosted on the same instance. Finally, maintenance of the core technologies, such as updating to latest versions of the client framework, bring in improved performances and is an insurance for functional aspects, such as browser compatibility, for more years to come. These requirements have been shadowed by the long list of requests present each year but represent a necessary step to be undertaken for guaranteeing a long and healthy life to the platformISA².</p>
<p><i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i></p>	<p>As semantic interoperability should be promoted at a horizontal and cross-domain level, the ISA² is a perfect match for hosting such activities.</p>

For the ESCO Technical infrastructure:

Question	Answer
<p><i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i></p>	<p>The action is urgent because Member States need already now the mapping functionalities of ESCO in order to map their national, regional and sectorial classifications to ESCO.</p>

Question	Answer
	According to Art. 19(3) and 19(5) of the EURES Regulation, Member States will map their national, regional and sectoral classifications to ESCO within 3 years from the adoption of the relevant Implementing Acts (i.e. by 19 July 2021), whereas the Commission will provide technical support to Members States for this mapping exercise.
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	The proposal concerns the interoperability between different national public employment systems for the use of citizens and businesses in the labour market. Such interoperability will be achieved through the development and further improvement of the mapping IT functionalities of the common classification framework of ESCO. This falls directly within: a) the <i>ISA²</i> scope, as described in the programme's objectives in Article 1 of the ISA Decision; and b) the actions falling under the financial capacity of the <i>ISA²</i> programme, as stipulated in Article 11(1) of the ISA Decision.

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in</i>	Yes, the implementation of such a future system is called for in the

Question	Answer
<i>EU legislation?</i>	Communication on Smart Specialisation that states “the Commission will provide stakeholders with a comprehensive mapping of support actors and state-of-the-art facilities in regional eco-systems to foster cross-regional partnering and access to competences”
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	Yes, on one hand, the ISA ² scope and vast experience in the field of interoperable public services fits perfectly to the nature of the proposal. On the other hand the financial support would also make it much easier to kick-start the implementation of a common solution, rather than having to administer the funding from 10-12 participating projects. Once the solution is implemented, its maintenance is planned to be overtaken by participating projects.

For the Structured Data Collection Platform Data Interoperability Components:

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	<p>The solution operates to meet the obligations of the European Commission to facilitate stakeholders in meeting their recurrent legal mandates by set deadlines (see References for full details):</p> <ul style="list-style-type: none"> • Regulation (EU) 2017/625 • Directive 2011/24/EU • Regulation (EU) No 652/2014 • Regulation (EC) No 882/2004

Question	Answer
	<ul style="list-style-type: none"> • Directive 1999/2/EC • Commission Regulation (EC) No 1505/2006 • Council Regulation (EC) No 1099/2009 • Commission Regulation (EU) No 284/2011 • Commission Decision 2006/778/EC • Council Regulation (EC) No 1/2005 • Commission Implementing Decision 2013/188/EU • Commission Regulation (EC) No 669/2009.
<p><i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i></p>	<p>The queued SDCP core features are within the scope of EIF, DSM and ISA² (SEMIC, EIRA) and make the ISA² financial capacity the best fit for the implementation of the proposal because we seek to:</p> <ul style="list-style-type: none"> • Enhance the capacity to make health and food safety information more interoperable by supporting efforts to remove EU policy silos. In the areas of health and food safety the use of multiple terminologies can present challenges but offers opportunities if the data is linked by identifying matches between widely used terminologies. In healthcare this can lead to better diagnosis and clinical decisions, on the farm it can lead to a more efficient use of national resources and it can improve efficiency and productivity in food processing, logistics and trade. • Improve the electronic exchange of structured data from stakeholders, regions and national authorities across all SANTE sectors, identify what information is public, make it accessible and reusable by stakeholders for analytics at no cost for users, guarantee consistency of the data and link it to other EU and external thesauri and standards (e.g. EFSA Matrix, AGROVOC (FAO), ADMS, EPPO, UPOV, Codex alimentarius, OECD, OrphaCodes, ICD-10, OMIM).

2.1.5.5 Reusability of action outputs

Can the results of the action (following this proposal) be re-used by a critical part of their target user base, as identified by the proposal maker? For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

Name of reusable solution	Data models
Description	A set of 6 e-Government Core Vocabularies, three DCAT-related specifications and ADMS have been developed by the Action.
Reference	https://joinup.ec.europa.eu/collection/semantic-interoperability-community-semic
Target release date / Status	2012 – today: All the specifications are released on Joinup.
Critical part of target user base	The specifications can be used by all system architects, designers and national authorities as horizontal data standards.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	34 known implementations in 8 countries are presented on https://joinup.ec.europa.eu/collection/semantic-interoperability-community-semic

Name of reusable solution	VocBench
Description	The main outcome of the work. A fully-fledged open source collaborative platform for management of SKOS vocabularies, OWL ontologies OntoLex lexicons (and their interfacing with ontologies) and RDF datasets in general, with emphasis on controlled collaboration, extensibility, scalability and interoperability.
Reference	https://joinup.ec.europa.eu/solution/vocbench3/about
Target release date / Status	VocBench3-2017 planned for Q3/2018. VocBench3-2018 planned for Q3/2019. VocBench3-2019 planned for Q3/2020. VocBench3-2020 planned for Q3/2021.

Critical part of target user base	<p>VocBench is an open source system for collaborative editing of RDF data, OWL ontologies, SKOS and SKOS-XL thesauri and Ontolex thesauri. VocBench's adoption is not meant to be in any way restricted to the registered stakeholders, and its full compliance with W3C standards makes it a perfect platform for the evolution of many organizations and authorities towards production and publication of Linked Open Data. Several public administrations in the EU Member States as well as EU institutions and international organisation are using VocBench. Major users and the vocabularies managed through VocBench are described here: http://vocbench.uniroma2.it/support/community.jsf. There is also a mailing list (vocbench-user@googlegroups.com) with more than 170 registered users.</p>
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	<p>VocBench3-2017 (final release) was downloaded 674 times between 27/07/2018 and 06/08/2018 while the mid-release of the 2018 action (released in February 2019) collected 529 downloads until 08/08/2019.</p>

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	ESCO API
Description	The improvement of management of the ESCO vocabularies and mapping data that are available through the ESCO API, for a more efficient alignment and update of semantic assets.
Reference	
Target release date / Status	Initial version (which would be improved as part of this action) is available since 2017.

Critical part of target user base	All services using the ESCO semantic assets and the results of their mapping to national classifications, indicatively Public Employment Services, Private Employment Services, EU services doing big data analysis of the labour market and Services offering training opportunities
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	This service is used by private employment services, profit-making organisations, non-profit organisations, trade unions and employers' organisations that use ESCO. Its improvement will increase the reusability of the ESCO dataset and the national classifications, e.g. in job matching, big data analysis and for improvement of the classification itself.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	ESCO online forum
Description	An update of the ESCO online forum in order to manage the feedback on ESCO's semantic assets coming from different sources (Member States, ESCO users, professional associations etc) for updating ESCO's semantic assets in view of publishing the next major version of ESCO (ESCO v1.1) at the end of 2021.
Reference	
Target release date / Status	Initial version (which would be improved as part of this action) is available in the ESCO portal since March 2019.
Critical part of target user base	All public and private services at EU or national level using the ESCO semantic assets, for improving ESCO or their own classifications. Also all other stakeholders coming from all areas of the economy (professional associations, companies from different sectors, education and training institutions, consultancies etc.) for informing their activities with

	input on skills and occupations.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	The updated ESCO online forum will allow for a better reusability of the ESCO dataset.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Tool for the automated linking of national qualifications to ESCO skills and knowledge concepts.
Description	The development of a tool for the automated linking of national qualifications with ESCO semantic assets (skills and knowledge), using Natural Language Processing (NLP), following an (ongoing) pilot with candidate Member States.
Reference	
Target release date / Status	Initial version (which would be improved as part of this action) will be available in October 2019, to be used in the ongoing pilot with candidate Member States.
Critical part of target user base	All public and private services at EU or national level using the ESCO semantic assets, active in the employment and the education and training fields. The results of the services of the tool or even the direct usage of the tool (to be examined primarily for public EU or national services) will benefit the linking of job opportunities with job candidates, the preparation of job vacancies by employers and the preparation of education and training curricula by relevant institutions.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution to be produced (for new	Common vocabulary and taxonomies
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proposals) or produced (for existing actions)	
Description	Common vocabulary and taxonomies to be used to exchange datasets among participating projects
Reference	
Target release date / Status	2019 Q2
Critical part of target user base	The common vocabularies shall be used by 80% of all participating projects by end of 2019, representing 400-500 data providers.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Central database of shared datasets
Description	Central database of shared datasets, available under an open licence. The datasets shall be accessible to all participating projects and any third parties. The datasets will be also referenced in the European Open Data Portal.
Reference	
Target release date / Status	Q3 2019
Critical part of target user base	80% of all participating projects by end of 2019, representing 400-500 data providers.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Central demonstrator website
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existing actions)	
Description	providing searchable user access to shared datasets via an “open-streetmap” like user interface. The website would
Reference	
Target release date / Status	2019 Q3
Critical part of target user base	
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Embeddable mapping component
Description	The mapping component can be embedded to third party websites to provide access to all participating projects’ datasets in an easy-to-use component, providing searching and filtering capabilities
Reference	
Target release date / Status	Q4 2019
Critical part of target user base	
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

For the Structured Data Collection Platform Data Interoperability Components:

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	SDCP Code Linker [Note: this will be developed as an open source tool for reuse by any operator.]
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Description	<p>A component that allows data from any two or more multiple code systems to be uploaded, programmatically matches them as one-to-one or one-to-many.</p> <p>One-to-many matches are ranked and an interface displays the results to the business user allowing them to select the suitable matches for their policy context.</p> <p>For example, the use of combined nomenclature (CN Codes)⁴⁰ when used for import controls should match the harmonised coding system recommended by the IPPC⁴¹ to facilitate the management of plant and pest names (EPPO⁴² codes).</p>
Reference	EIF: underlying principles 2, 4, 7, 9
Target release date / Status	2020 / prototype developed and tested
Critical part of target user base	Yes
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Re-usable for any structured code systems that share values, e.g. plant name, commodity name, disease classifications, etc.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	SDCP Data Dictionary Maker
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⁴⁰ For classifying goods for the Common Customs Tariff and the EU external trade statistics

⁴¹ International Plant Protection Convention

⁴² European Plant Protection Organisation

Description	A component that collates structured data values and presents them in an interface as recommended values. This would allow a business user to browse cross-sectoral and or standardised terminologies and features already used to harmonise and collect structured data in the policy areas of health and food safety and to select elements for re-use in drafting a new data dictionary, which in turn feeds proposals put to Member States and stakeholders for agreement on standards at the legislative drafting stage (e.g. use of standard terminologies across all sectors).
Reference	EIF: underlying principles 2, 4, 6, 7, 9, 12
Target release date / Status	2020 / early-stage prototyping
Critical part of target user base	Yes
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Re-usable in any context even without the further use of the SDCP but the values collected cross-sector will be collated from the SDCP.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	SDCP Open Data
Description	A component that assigns existing URIs (Uniform Resource Indicator) or requests new URIs for re-usable non-personal public data elements, values or datasets and makes them accessible by rendering them for export as RDF (Resource Description Framework) or as semantic data and publishes the datasets for download with other SANTE Open Data on a Sparql Endpoint and CIRCABC with links from the EU Open Data Portal. The second phase would be to create further meaningful links with EU, ISA ² and wider-world big data.
Reference	EIF: underlying principles 2, 4, 6, 7, 9, 12

Target release date / Status	2020 / early-stage prototyping
Critical part of target user base	Yes
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	To be reused for all data collections, process would reuse existing open source open data and semantic data tools in SANTE and Joinup.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	SDCP Open Data [It is intended to re-use existing ISA and JoinUp tools where possible.]
Description	A component that assigns existing URIs (Uniform Resource Indicator) or requests new URIs for re-usable non-personal public data elements, values or datasets and makes them accessible by rendering them for export as RDF (Resource Description Framework) or as semantic data and publishes the datasets for download with other SANTE Open Data on a Sparql. Endpoint and CIRCABC with links from the EU Open Data Portal. The second phase would be to create further meaningful links with EU, ISA ² and wider-world big data.
Reference	EIF: underlying principles 2, 4, 6, 7, 9, 12
Target release date / Status	2020 / early-stage prototyping
Critical part of target user base	Yes
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	To be reused for all data collections, process would reuse existing open source open data and semantic data tools in SANTE and Joinup.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	SDCP Translate [eTranslation and multilingualism are the objectives.]
Description	A component that allows a data provider or a data receiver to use machine translate on the fly on a per field basis, integration with DGT machine translation. A second phase would be to allow storage and further processing of the translated text and to explore a more complete integration with DGT translation requests (ePoetry).
Reference	EIF: underlying principles 2, 3, 4, 5, 6, 9
Target release date / Status	2020 / information received from DGT, no testing yet
Critical part of target user base	Yes
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Re-usable for all recurrent SANTE data collections that require the collection of harmonised structured data that needs to be analysed and disseminated cross-sector, cross-border over time.

2.1.5.6 Level of reuse by the proposal

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
Does the proposal intend to make use of any ISA ² , ISA or other relevant interoperability solution(s)? Which ones?	Joinup is used as a publishing and community building tool for all the specifications developed under the Action. The specifications produced by the Action have the potential to be used by several other Actions in all data modelling tasks. For VocBench, the current platform already generates metadata descriptions of the controlled vocabulary in VoID, LIME, DCAT and the ISA-funded DCAT-AP and ADMS. The module can be extended to cover other

Question	Answer
	<p>ISA interoperability solutions such as StatDCAT-AP and GeoDCAT-AP and the various DCAT-AP-xx developed by the single member states of the EU. Furthermore, VocBench is used for the sake of the Public Multilingual Knowledge Management Infrastructure for the Digital Single Market (PMKI) and of the e-procurement / e-Invoicing action.</p> <p>This version will reuse information from the EU Data Visualization Catalogue of the EU Open Data Portal developed thanks to ISA² funding (https://data.europa.eu/euodp/en/visualisation-home/). A catalogue pointing to different visualization technologies.</p> <p>Compatibility with the EU Login solution will also be achieved in this action.</p>
<p>For proposals or their parts already in operational phase: has the action reused existing interoperability solutions? If yes, which ones?</p>	<p>Joinup is the main publishing and community platform for the Action.</p>

For the ESCO Technical infrastructure:

Question	Answer
<p><i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i></p>	<p>Yes:</p> <p>DCAT-AP (for the Dataset Management Service)</p> <p>ADMS (for the Dataset Management Service)</p> <p>Joinup (for publishing semantic assets)</p>

Question	Answer
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Question	Answer
<p><i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i></p>	<p>Yes,</p> <p>During the design phase it intends to base its architecture model on the EIRA.</p> <p>The development of the common taxonomies and vocabulary are planned to be based on the Common Vocabularies (in particular, Common Organisation, Common Location, Common Person), developed under the SEMIC action. The methodology developed under the SEMIC action will be used to develop the necessary open specifications.</p> <p>The Common specifications and software developed within the scope of the project will be shared under the Joinup platform. This platform will also be used to animate the participating projects' stakeholders.</p> <p>The recommendations of the Sharing and Reuse of IT solutions framework will be fully taken into account when developing the open</p>

Question	Answer
	<p>specifications, software components and services within the scope of the project.</p> <p>The DCAT application profile will be used to describe the shared datasets and publish them on the European Open Data Portal.</p> <p>The EUPL licence will be used to publish reusable software components developed under the project.</p> <p>During the design and development of the tools, the Interoperability Quick Assessment Toolkit (IQAT) will be used to ensure a fully interoperable public service in full alignment with the EIF recommendations.</p>
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	

For the Structured Data Collection Platform Data Interoperability Components:

Question	Answer
<p><i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i></p>	<p>Use of core vocabularies (ADMS, etc.) and open data (e.g. EuroVoc, ELI), sharing and publishing non-personal public data on the EU Open Data Portal, assigning existing or creating new URIs for data elements or datasets. For further information on inter-operability see above.</p>

Question	Answer
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	EuroVoc is used to identify data collections in specific areas, ELI is used to link relevant legislation to each data collection. For further information on inter-operability see above (and below).

2.1.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union’s initiatives such as the DSM.

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union’s high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	<p>Interoperability is considered critical for the progress of the Digital Single Market, and special references are included in the relevant strategy. Admittedly, the semantic interoperability EIF layer together with the organisational one are the two layers where most Member States experience the most severe problems.</p> <ul style="list-style-type: none"> ○ The Action contributes to “better public services” in the Digital Single Market strategy. ○ Copying from the DSM strategy “<i>The lack of open and interoperable systems and services and of data portability between services represents another barrier for the cross-border flow of data and the development of new services.</i>” The Action contributes to better interoperability and data portability. ○ The DSM promotes the “Free flow of data” and identifies interoperability as an important issue for achieving this. ○ The DSM strategy asks for a revision of the European Interoperability Framework. One of the interoperability levels there refers to <i>semantic interoperability</i>. ○ The DSM discusses about the interconnection of base registries and the Once-Only principle. Semantic interoperability is a prerequisite for achieving these targets.

Question	Answer
	<p>In line with the EC objectives in the area of the Open Data Directive, the Action promotes policies towards both open data and open metadata by the Member States and the EU services as a support measure for the more general Open Data policy.</p> <p>One of the concrete measures developed to implement this policy entails the setting up of the EU Open data Portal which is operated by the Publications Office of the EU. Close collaboration and common activities with the Publications Office of the EU have already started in 2013 and continues to secure alignment of efforts and concrete results.</p> <p>The creation of the pan-European Open Data portal is also part European open data policy. The portal has started its operation in 2015, and the DCAT-AP specification is used as the metadata standard for the description of the datasets coming from over 79 Open Data portals from 35 countries. The Action closely collaborates with the relevant EC services.</p>

For the ESCO Technical infrastructure:

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<p>The proposal directly contributes to the implementation of the DSM (Creating a digital society), the new EURES Regulation, the Skills Agenda for Europe and the Europe 2020 strategy for smart, sustainable and inclusive growth.</p>

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which</i></p>	<p>The proposal directly contributes to the digital single market by allowing relevant stakeholders to get access to</p>

Question	Answer
<i>ones? What is the level of contribution?</i>	relevant innovation related information across-borders and sectors.

For the Structured Data Collection Platform Data Interoperability Components:

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	<p>The proposal corresponds to the DSM by:</p> <ul style="list-style-type: none"> • Recognizing food safety and health data as an economic asset • Increasing access to large and diverse datasets to innovate agriculture, climate change, energy and geo-spatial data (used particularly in the areas of plant protection and plant health) • Making data available to business and citizens • Contributing to evidence that can be used to adapt policy and legal solutions to increase the potential of the data-driven economy (e.g. analysis of number of official controls carried out and number of animal disease outbreaks) • Adding to the free-flow of data by storing and sharing data between Member States in a secure way while implementing adequate data protection safeguards • Improving access to non-personal data and facilitating Member State public administrations to provide and share more data • Ensuring that data is portable and that data can be shared in a technologically-neutral (and cost-neutral for the Member State) way in specific policy areas from administration to administration (Member States to SANTE).

2.1.6 PROBLEM STATEMENT

The environment in which data exchange and service execution takes place amongst Member States is very complex contributing many barriers and challenges to the exchange of data during the execution of European Public Services. These barriers include divergent interpretations of the data, lack of commonly agreed and widely used data models, absence of

universal reference data (e.g. code lists, taxonomies), from which only few are publicly available, lack of interoperable tools/formats for the management and publication of reference data or the multilingual challenge.

Due to these pressures, semantic interoperability becomes an important element in many eGovernment and interoperability national agendas and interesting experience and lessons-learnt can already be shared at a European level.

The problem of	divergent interpretations of the data, lack of commonly agreed and widely used data models, absence of universal reference data (e.g. code lists, taxonomies), from which only few are publicly available, lack of interoperable tools/formats for the management and publication of reference data and the multilingual challenge
affects	the exchange of data during the execution of European <i>public services</i> ;
the impact of which is	a fragmented European Union <i>public services space</i> where European citizens cannot easily interact with public administrations in a cross-border way.
A successful solution would be	having semantic interoperability as an essential elements in eGovernments and interoperability national agendas and sharing of lessons learnt and best practices.

The problem of	bringing existing vocabularies, thesauri, ontologies and datasets to Linked Open Data (LOD) standards
affects	EU institutions, national administrations and businesses
the impact of which is	that data interoperability is hampered.
a successful solution would be	to provide system and tools for porting local data to LOD standards, facilitating (possibly collaborative) maintenance and evolution.

The problem of	exploring and visualizing data in editing tools, which are usually focused on optimizing editing
affects	both domain experts and naive users, less specialized in data modelling/editing and more focused on domain exploration and analysis
the impact of which is	that the ‘understandability’ of the content is affected.
a successful solution would be	to provide additional, alternative, visualization and exploration solutions.

The problem of	lack of interoperability of national, regional and sectorial classifications
affects	the ability of European national public employment services and other relevant actors to enable labour mobility across Europe
the impact of which is	that national classification systems cannot communicate with each other across borders and languages
a successful solution would be	to improve, further develop and operate the technical capacities for making available the results of the mapping national classifications of skills and occupations to the common European framework of ESCO.

The problem of	Fragmented, non-interoperable platforms providing information on (part of) all relevant innovation actors and supporting instruments in Europe
Affects	SMEs, Enterprises, technology centres, innovation hubs, pilot platforms, regional authorities, EU authorities, investors
the impact of which is	Lower visibility, relevant information not reachable by stakeholders, innovation not reaching its full potential
a successful solution would be	an interoperable solution to describe innovation actors and supporting instruments, accessible to all EU platforms and third party websites, facilitating the seamless access to innovation related information to broader stakeholder groups.

For the Structured Data Collection Platform Data Interoperability Components:

The problem of	Diverse or no common terminologies or structures used in the provision and analysis of health and food safety data to SANTE in cross-sectoral silos by national competent authorities and stakeholders. This problem is common to all stakeholders subject to legislation at EU level in the areas of health and food safety.
affects	Data availability for competent authorities at EU and MS level.
the impact of which is	Lack of secure storage and processing of data that remains accessible for regulatory and supervisory control across borders in the EU.
a successful solution would be	A simplified, streamlined platform with single-sign-on that facilitates harmonised, structured data collections, which employs and shares standard methods, features and terminologies for the provision and analysis of health and food safety data for use by SANTE, national authorities and stakeholders.

The problem of	Duplicate data being provided by EC stakeholders.
affects	Once-only principle at EU and MS level.
the impact of which is	The same data is collected multiple times in SANTE, other Commission services or Agencies (e.g. AGRI, EFSA, EPPO, JRC, ERNs).
a successful solution would be	A simplified, streamlined platform with single-sign-on that facilitates harmonised, structured data collections, which employs and shares standard methods, features and terminologies for the provision and analysis of health and food safety data for use by SANTE, Commission services, national authorities and stakeholders.

The problem of	Administrative procedures not being digitalized.
affects	Transparency and openness at EU and MS level.
the impact of which is	Unstructured data being provided in harmonised formats that renders it difficult to [re]use, link and make accessible.
a successful solution would be	A simplified, streamlined platform with single-sign-on that facilitates harmonised, structured data collections, which employs and shares standard methods, features and terminologies for the provision and analysis of health and food safety data for use by SANTE, Commission services, national authorities and stakeholders.

2.1.7 IMPACT OF THE ACTION

2.1.7.1 Main impact list

For Vocbench

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Users adopt more tools for maintaining/browsing their	As soon as the new version is	All users, both

Impact	Why will this impact occur?	By when?	Beneficiaries
	data, as none of them satisfies all of user needs. The need to efficiently browse arbitrary data structures in a convenient way often asks for customized solutions that are developed ad-hoc. Adding more customization possibilities, especially for exploration navigation and search make an editing tool closer to suit different, specific needs of each user for exploring their own data.	adopted and the users abandon multiple solutions in favour of a centralized management in VocBench	producers and consumers of structured metadata.
(+) Savings in time	Better, customizable interaction possibilities (both for data exploration, search and navigation) improve productivity and thus reduce working time	As soon as the VocBench version is adopted	All users, both producers and consumers of structured metadata.
(+) Better interoperability and quality of digital public service	Better data quality thanks to visual exploration of data maintained in VocBench3 facilitating identification of non-standard patterns	As soon as the VocBench version is adopted	All users
(+) Integration or usage cost	The usage cost is reduced especially for those users more interested in exploring, analysing, navigating and searching	As soon as the VocBench version is adopted	Final users, non-editors

Impact	Why will this impact occur?	By when?	Beneficiaries
	the data		
(+) Guarantee of conformance to standards	VocBench follows strict analysis on standard compliancy and conformance. Data produced by VocBench is, for what concerns what is driven and checked by the system, guaranteed to adhere to W3C standards for Linked Open Data publication	As soon as the VocBench version is adopted	All users

For the ESCO Technical infrastructure:

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	This impact will occur as a direct consequence of the action, since there will be a single European mapping platform and framework instead of multiple national ones.	Q3 2020	Direct beneficiaries: Public and Private Employment Services, profit-making organisations, non-profit organisations, trade unions and employers
(+) Savings in time			
(+) Better interoperability and quality of digital public service	At this stage there is no interoperability between the different national and private classifications of skills and occupations. The proposed solution will provide for the digital interlinking of national classifications through semantic and technical	Q3 2020	

Impact	Why will this impact occur?	By when?	Beneficiaries
	interoperability.		'
(-) Integration or usage cost	This impact will occur as a direct consequence of the action, since there will be a single European mapping platform and framework instead of multiple national ones.	Q3 2020	<p>organisations that need to map their own classifications to ESCO.</p> <p>Indirect beneficiaries: businesses searching for employees, jobseekers.</p>

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	<p>Less effort for data providers to provide similar data to multiple EU platforms.</p> <p>Less effort for data collectors (mainly EU platforms) to collect data, due to the reuse of data already collected by other data collectors.</p>	2019 Q4	Data providers (400-600 organisations across EU), data collectors (EU platforms)
(+) Savings in time	See "savings in money".	2019 Q3	

Impact	Why will this impact occur?	By when?	Beneficiaries
	<p>In addition, less time spent by end-users to gather information on relevant innovation actors and supporting instruments by only having to visit the website of one participating project</p> <p>Less time spent by EU and regional authorities for data-driven policy making.</p>		
(+) Better interoperability and quality of digital public service	<p>Data providers will not have to provide the same information to multiple data-collectors. Aligning several datasets and applying a common quality assurance will result in better quality of public service.</p> <p>Having access to multiple datasets in each of the participating projects websites will result in less fragmentation and an overall better user experience.</p>	2019 Q3	Data providers, data collectors, end-users
(-) Integration or usage cost	<p>Initial integration costs will be moderate, while maintenance costs will be low, especially when calculated per participating project.</p>		Data collectors (EU platforms)

For the Structured Data Collection Platform Data Interoperability Components:

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money (+) Savings in time (+) Better interoperability and quality of digital public service	<ul style="list-style-type: none"> • Less business and development resources required by the data recipients, providers and analysts to prepare, draft, agree, collect, provide, analyse, link, disseminate and [re]use data. • Health and food safety data recognised and used as a vital economic asset at EU and national level. • Standard specifications for shared features, terminologies, data and metadata will speed up analysis and processing and increase quality of service. 	As released	<ul style="list-style-type: none"> • EU competent authorities (DGs, services and Agencies) • National competent authorities in all MS and EFTA, EEA • SANTE stakeholders in business, healthcare and citizens.
(-) Integration or usage cost	<ul style="list-style-type: none"> • The integration and usage costs are negligible for users, primarily related to direct uploads from national databases. 	As released	

Beneficiaries	Anticipated benefits
Member States' Public Administrations	<ul style="list-style-type: none"> ○ Forum to identify opportunities for harmonization at European level ○ A virtual place to share best practices and experiences ○ e-Government Core Vocabularies, reference data, XML schemata and thesauri ready to be used in public administration information systems development. ○ Reduced development costs <ul style="list-style-type: none"> • due to reuse during the initial development phase

Beneficiaries	Anticipated benefits
	<ul style="list-style-type: none"> • due to less interoperability conflicts while integrating systems or providing cross-agency/domain/country services
IT Services Industry	<ul style="list-style-type: none"> ○ Reduced development costs, as explained above. ○ Reuse and integrate controlled vocabularies and metadata produced by Member States and Public Administrations or EU institutions and bodies.
European Commission Services	<ul style="list-style-type: none"> ○ A set of specifications in the form of e-Government Core Vocabularies and other relevant tools, such as reference data (e.g. authority tables), XML schemata and thesauri that can be reused by the EC services to facilitate interoperability among different applications and systems. ○ Also helping to implement both the European Commission Digital Strategy as well as the Data Strategy. ○ Reduced development costs, as explained above.
For VocBench	
European Commission Library	<ul style="list-style-type: none"> ○ Reconciliation and mapping of the European Commission thesaurus (ECLAS) with EuroVoc. ○ In the purpose of re-indexing the European Commission Library collection (ECLAS) with EuroVoc.
Various European Commission, Directorates - Generals (DG COMM – Communication, DG FISMA – Financial Stability, Financial Services and Capital Markets Union, DG HR – Human Resources and Security, DIGIT – Informatics, DG REGIO – Regional	<ul style="list-style-type: none"> ○ Collaborative maintenance of vocabularies with different permissions. ○ Improved interoperability by using same tools and formats, ○ Efficiency gains by mapping validation directly in VocBench. ○ Make vocabularies available in semantic formats. ○ Facilitate reuse of controlled vocabularies.

Beneficiaries	Anticipated benefits
and Urban Policy)	
EU and national Open Data Portals	<ul style="list-style-type: none"> ○ Use VocBench for the maintenance and dissemination of the DCAT-AP themes used as a standard vocabulary to annotate the Open Data datasets in European, trans-European and national Open Data Portals. ○ Improved interoperability by using same tools and formats. ○ Efficiency gains by mapping validation directly in VocBench. ○ Make vocabularies available in semantic formats. ○ Facilitate reuse of controlled vocabularies.
European Parliament	<ul style="list-style-type: none"> ○ EP shows some interest in the development of OWL ontologies collaboratively through VocBench. Two features being developed for the 2019 actions are particularly relevant to EP <ul style="list-style-type: none"> ○ Improved support for OWL, in particular logical expressions through the Manchester Syntax, covering the most advanced aspects of the OWL2 vocabulary ○ UML-Like view over ontology models (see Danish Agency for Digitisation) ○ Model view over graphs (available since end of 2018 action)
Institut National de la Recherche Agronomique (INRA, France)	<ul style="list-style-type: none"> ○ In the context of AnaEE France project (ecosystems and biodiversity thesaurus) and Délégation à l'information scientifique et technique (DIST). ○ Improved interoperability by using same tools and formats, ○ Efficiency gains by mapping validation directly in VocBench. ○ Make vocabularies available in semantic formats. ○ Facilitate reuse of controlled vocabularies.
The Netherlands	<ul style="list-style-type: none"> ○ Management of concepts and definitions in Firebrary, the electronic data dictionary for the Dutch service. ○ Improved interoperability by using same tools and formats. ○ Efficiency gains by mapping validation directly in VocBench. ○ Make vocabularies available in semantic formats.

Beneficiaries	Anticipated benefits
	<ul style="list-style-type: none"> ○ Facilitate reuse of controlled vocabularies.
Italian Senate	<ul style="list-style-type: none"> ○ Maintenance of TESEO (<i>Senate ThEsaurus for the Organization of parliamentary records</i>). ○ Improved interoperability by using same tools and formats. ○ Efficiency gains by mapping validation directly in VocBench. ○ Make vocabularies available in semantic formats. ○ Facilitate reuse of controlled vocabularies.
Centre for Agriculture and Biosciences International, head office (CABI, United Kingdom)	<ul style="list-style-type: none"> ○ CAB thesaurus maintenance. ○ Improved interoperability by using same tools and formats. ○ Efficiency gains by mapping validation directly in VocBench. ○ Make vocabularies available in semantic formats. ○ Facilitate reuse of controlled vocabularies.
Scottish Government	<ul style="list-style-type: none"> ○ Gov metadata. ○ Improved interoperability by using same tools and formats. ○ Efficiency gains by mapping validation directly in VocBench. ○ Make vocabularies available in semantic formats. ○ Facilitate reuse of controlled vocabularies.
Danish Agency for Digitisation	<ul style="list-style-type: none"> ○ Following a proposal from the Danish Agency for Digitisation, VocBench has featured an extension point for connectors providing a homogeneous interface to different metadata portals on the web, in order to automatically download ontologies thesauri and datasets that are otherwise not available through standard Semantic Web discovery mechanism or even for discovering new resources through their metadata description. ○ The developed connectors are for the following metadata portals: <ul style="list-style-type: none"> ○ LOV (linked open vocabulary) registry. ○ DataHUB.io. ○ EU Open Data Portal. ○ The Danish Digitisation Agency further contributed with proposals (accepted and being developed for

Beneficiaries	Anticipated benefits
	action 2019) for developing UML class views for ontology models, with large components representing self-contained descriptions of classes and of the interactions they have with other relevant elements in the ontology.

2.1.7.2 User-centricity

The specific actions listed in this proposal follow (and mostly complete) requirements gathered from:

- A synthesis of requirements and a development plan that followed an intense communication with the community of users during the last quarter of 2018 and the first half of 2018.
- Desiderata expressed by stakeholders along the second year of the project, through bilateral contacts with European and national counterparts and during the Inventory of controlled vocabularies workshop organised by the Publications Office on 8 June 2018 and attended by representatives of most Directorate-Generals of the European Commission (whose objectives included the presentation of controlled vocabularies management tools (VocBench included) and the identification of technical and operational convergences and the definition of possible synergies between vocabularies and for the use of technologies).
- Desiderata expressed by members of the EuroVoc maintenance committee and of Directorate-Generals of the European Commission making use of VocBench or similar tools (e.g. for the online co-management of controlled vocabularies).
- Feedback provided by the Publications Office following the mid- and full release of the system at the end of the action 2017/2018 (the system is under evaluation by the Publications Office at the time of writing).

For the ESCO Technical infrastructure:

- Users' engagement before and during the solution's implementation were achieved through two pilots, one for mapping occupations and one for mapping skills, aiming to test the creation of mapping relations. The occupations mapping pilot took place in the period May 2014 - December 2015 with the Czech Republic, France, the Netherlands and Spain. The skills mapping pilot took place in the period January-May 2018 with Austria, Sweden, Belgium, Romania and Hungary. After the start of operations, users' feedback will be sought through an ESCO technical community forum, webinars, trainings, technical support and country visits.

For the Structured Data Collection Platform Data Interoperability Components:

- The personal data of the SDCP users is adequately safeguarded. The users of the SDCP are an integral part of project governance and include users from SANTE and Member State users. A centralised support team provides assistance to collate or escalate feedback from users across all sectors using the SDCP. Users are involved in

testing and roll-out of each use of the SDCP. Demonstrations are provided at stakeholder and Member State Working Group meetings. The SDCP user-interface invites feedback from end-users, which is added to the product backlog for assessment and prioritisation.

2.1.8 EXPECTED MAJOR OUTPUTS

Output name	SEMIC style guide and QA methodology
Description	During the first half of 2020 the SEMIC action will develop its own style guide and <i>Name and Desing Rules</i> for all SEMIC semantic specifications. It will also develop a methodology guarantee the quality of its own specifications and, consequently, will apply it to them.
Reference	ISA ²
Target release date / Status	Q3/2020

Output name	Functionally improved and denser yet simpler to use user and project management interface
Description	Mature installations of VocBench serving many users (such is the case of the OP installation) require VB administrators to deal with hundreds of projects, more than one thousand users and requests coming in any form of contact in and out of the system (emails, requests performed within the system, etc..). While security compliance requires strict procedures to be observed, this should not hinder an agile process for the administration of these large sized VocBench instances. This action foresees improved notification, visibility, filtering and a series of quick suggested actions that will make the life of every administrator easier.
Reference	ISA ²
Target release date / Status	Q3/2021

Output name	Sheet2RDF: further improvements of the system (more expressive power)
Description	Sheet2RDF has been further enhanced in the 2018 action with a complete wizard/UI and a full representation of the PEARL transformation code. Substantially the aim was not to improve the system capabilities but to help even non-savvy users to reach the full potential of Sheet2RDF without working too much at the code level, benefiting from an elaborated UI and from a series of heuristics for

	prefilling the transformation. In this action we aim instead to expand the capabilities of the system, in order to cover different cases that couldn't be covered by the previous system, adding more converters for transforming the single values found in the datasheets' cells etc.
Reference	
Target release date / Status	Q2/2021

Output name	Multilingual user interface (support for i18n)
Description	1) VocBench strongly supports multilinguism with a series of features for managing linguistically rich descriptions of the semantic assets in multiple languages. However, paradoxically, its UI does not support localization. Simply, the system UI was too elaborated and with a very high level of dynamism to simply adopt existing frameworks for internationalization. In this action a dedicated framework for the VocBench UI will be developed and a dedicated instance will be developed for testing the multilinguality of the system.
Reference	1)
Target release date / Status	Q3/2021

Output name	Automatic Production of Ontology/Thesaurus/Lexicon Web Documentation
Description	Documenting datasets is a fundamental aspects of data production and publication. Instead of letting the user resort to external tools, usually limited to OWL ontologies, we will develop a general documentation framework and create then three instances specifically though for documenting thesauri, ontologies and lexicons.
Reference	-
Target release date / Status	Q2/2021

Output name	Support for ECAS/EU Login
Description	ECAS/EU Login will be supported by binding the user account mechanism in VocBench to the ECAS/EU login mechanism.
Reference	-
Target release date / Status	Q2/2021

Output name	Common vocabulary and taxonomies
Description	Common vocabulary and taxonomies to be used to exchange datasets among participating projects and to present a common data model to the users of the information.
Reference	
Target release date / Status	Q4 2020

Output name	Improved management of ESCO vocabularies and mapping data
Description	The improvement of management of the ESCO vocabularies and mapping data that are available through the ESCO API, for a more efficient alignment and update of semantic assets.
Reference	-
Target release date / Status	Q3 2020 (initial version)

Output name	An update of the ESCO online forum
Description	An update of the ESCO online forum in order to manage the feedback on ESCO's semantic assets coming from different sources (Member States, ESCO users, professional associations etc) for updating ESCO's semantic assets in view of publishing the next major version of ESCO (ESCO v1.1) at the end of 2021.
Reference	-
Target release date / Status	Mid 2020

Output name	Improved version of the ESCO portal
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Description	An amendment to the ESCO portal to work with both ESCO's current version (ESCO v1.0) and next version (ESCO v1.1), in order to support the parallel publication of these two major versions of the ESCO classification.
Reference	http://ec.europa.eu/esco
Target release date / Status	Online since 2013

Output name	Software tool for the automated linking of national qualifications with ESCO semantic assets
Description	The development of a tool for the automated linking of national qualifications with ESCO semantic assets (skills and knowledge), using Natural Language Processing (NLP), following an (ongoing) pilot with candidate Member States.
Reference	-
Target release date / Status	Q3/2020

Output name	Improvement of ESCO's publishing service
Description	An alignment of the publishing service of the ESCO portal with ESCO's Dataset Management System in order to streamline the publication flow. Also, a publication service on the ESCO portal for making mapping data (as resulting from the mapping of Member States' national classifications to ESCO) available to third parties.
Reference	-
Target release date / Status	Q3/2020

For the Structured Data Collection Platform Data Interoperability Components:

Output name	Improvement of health and food safety structured data interoperability and vocabularies
Description	An alignment of structured data to enable reuse and harness it as an economic asset. To assist policy makers with evidence for decision-making

	and to enable the reuse of data concepts in different contexts. Code Linker available to third parties.
Reference	-
Target release date / Status	Q4/2020

2.1.9 ORGANISATIONAL APPROACH

2.1.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	
Member States	<ul style="list-style-type: none"> ○ ISA² Committee. ○ ISA² Coordination Group or ISA CG equivalent. ○ Persons/units in charge of National and/or regional Interoperability Frameworks and/or metadata standards catalogues/repositories, etc. 	
Member States	EURES Coordination Group; ESCO Member States Working Group	Mapping of national, regional and sectorial skills and occupations
Standardization bodies	<ul style="list-style-type: none"> ○ W3C ○ OASIS ○ GS1 ○ CEN ○ UN/CEFACT ○ Dublin Core Metadata Initiative ○ EU Interinstitutional Metadata Maintenance Committee (IMMC) 	
DIGIT	<ul style="list-style-type: none"> ○ Unit (s) responsible for promoting common specifications in new and existing systems. 	
EU Publications Office	<ul style="list-style-type: none"> ○ The unit responsible for Standardisation ○ The unit responsible for the EU Open Data portal 	

Stakeholders	Representatives
Other EC DGs and EU Institutions	<ul style="list-style-type: none"> ○ Representatives from the DGs who work as IT coordinators (IRMs) ○ Representatives from DGs and EU Institutions (e.g. JRC, EEA etc.) who work in the area of metadata management. ○ DG CNECT units for public services and open data ○ The EC Secretariat General ○ The EU Council, the European Parliament.
FAO	<ul style="list-style-type: none"> ○ The unit responsible for metadata management using VocBench (main product: Agrovoc thesaurus) ○ The statistical unit
Public Administration, SMEs, Enterprises	<ul style="list-style-type: none"> ○ Power users identified by participating EU platforms.
Data providers	<ul style="list-style-type: none"> ○ Digital Innovation Hubs, KETs centres, EPPNs, etc.
Data collectors	<ul style="list-style-type: none"> ○ Participating EU platforms.

Participating EU platforms in the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Platform name	Participation in current action	URL	Service in charge
Mappings of regional competences and assets under the Thematic Smart Specialisation Platform for Industrial Modernisation	participating	Industrial Modernisation - Smart Specialisation Platform	GROW
KETs for clean production	Expressed interest to participate	not operational yet	GROW.F3

Platform name	Participation in current action	URL	Service in charge
Mapping of KET Technology Centres	participating	https://ec.europa.eu/growth/tools-databases/kets-tools/kets-tc/map	GROW.F1
Digital Innovation Hubs Catalogue	participating	http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool	CNECT
European Pilot production Network (EPPN)	participating	https://www.eppnetwork.com/	RTD.D3
European Cluster Collaboration Platform	participating	https://www.clustercollaboration.eu/	GROW.F2
COSME Loan Guarantee Facility	Potential stakeholder		
Innovation Radar	Potential stakeholder	https://www.innoradar.eu/	CNECT/GROW
Open Innovation Test Beds	Expressed interest to participate	not operational yet	RTD.D3
Industrial Infrastructures for Research and Innovation	Expressed interest to participate	not operational yet	RTD.D3
ONLINE-S3	Potential stakeholder	onlineS3.eu	REGIO
European Structural and Investment Funds	participating	https://cohesiondata.ec.europa.eu/	REGIO

For the Structured Data Collection Platform Data Interoperability Components:

Stakeholders	Representatives	Involvement in the action
European Commission	Users from policy units specifying requirements in a particular legislative context. Information systems units Statistics units and EUROSTAT. Better Regulation units.	Business owners and Data Users System suppliers
Member State National Authorities and Public Administrations	Users from EU, EFTA, EEA Member States, healthcare providers (e.g. hospitals).	Data providers and Data Users
FAO, IPPC, EPPO, ERNs, OECD,	Metadata management units	Data users and data providers
EC, inter-institutional and external stakeholders	Policy officers, Commission services and agencies, European Parliament, Member States, healthcare providers	Data users

2.1.9.2 Identified user groups

In principle any public administration from any Member State as well as EU Institutions are potential user groups.

For VocBench, other than the foreseen stakeholders, the project is already adopted by different entities. UNITOV offers open support through two mailing lists for end-users (vocbench-user@googlegroups.com) and developers (vocbench-developer@googlegroups.com) interested in the developing aspects of the system.

The lists are open and do not foresee any pre-identification of users. However, in two years of service, the following important actors have been identified that are adopters of VocBench.

The list below is not exhaustive as it is limited to organizations, companies and various entities from the public and private sectors which have been in direct contact with Publications Office and/or the developers of the platform. VocBench has a wider community which participates to the support lists and obviously other users which are not tracked.

For each identified user, we report the known managed resources:

- Publications Office of the EU > EuroVoc, CDM ontology, authority tables
- Food and Agriculture Organization (FAO) > AGROVOC, Biotechnology, Land and Water, FAO Topics, experimental versions of CRS (Creditor Reporting System) and CPC (Central Product Classification)
- Institut National de la Recherche Agronomique (INRA) > in the context of AnaEE France project (ecosystems and biodiversity thesaurus) and Délégation à l'information scientifique et technique (DIST)
- CABI (Centre for Agriculture and Biosciences International), head office UK > CAB thesaurus
- European Commission Central Library > ECLAS (library catalogue)
- European Environment Agency (EEA) > GEMET
- European Holocaust Research Infrastructure (EHRI) project > EHRI holocaust thesaurus, supporting the work of the EHRI Editorial Board (deployed by Ontotext)
- CAS > Chinese Academy of Science: management of Agriculture thesauri
- Columbia University > IEDA Thesaurus
- Harvard University > Unified Astronomy Thesaurus (UAT)
- University of Bamberg, Germany: University Glossary
- Italian Senate > TESEO
- Ministry of Food, Agriculture and Livestock, Dep. of Training, Extension and Publications, national AGRIS Center of Turkey
- Scottish Government > Gov metadata
- United Nations Convention to Combat Desertification (UNCCD)
- UNESCO > UNESCO Thesaurus (deployed by Sparna)
- United Nations Environment Programme (UNEP) > InforMEA, in the context of MEA, the Information and Knowledge Management Initiative
- Dutch Firebrigade
- Gelbe Seiten (German yellow pages) > managing the homonymous thesaurus
- Radiance Technologies (in the process of adopting VocBench)
- Solidaridad Network > two taxonomies (one of agricultural practices, one for profiling agriculture producers)

Another important group is represented by users working in education. We have known reports of professors adopting VocBench in order to:

- 1) Show how to develop a SKOSXL thesaurus (VocBench is in fact one of the very few systems which are at the same time: completely free, open source, and totally compliant and based on languages of the RDF family of standards).
- 2) Have students experience a collaborative experience in the development.

For the ESCO Technical infrastructure, the end-users of the solution at hand are actors that need to map their own classifications to ESCO, i.e. the national public employment services, private employment services, profit-making organisations, non-profit organisations, trade unions and employers’ organisations. Also, the users of the proposed ESCO solution are all services using the ESCO semantic assets and the results of their mapping to national classifications, indicatively Public Employment Services, Private Employment Services, EU services doing big data analysis of the labour market and Services offering training opportunities.

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation: Data providers: MS RTOs, Digital innovation hubs, Key Enabling technology centres, Smart specialisation partnerships, cluster organisations; Public Administrations interested in Innovation; Regional authorities; Investors; SMEs, Enterprises; and European agencies and Commission services.

For the Structured Data Collection Platform Data Interoperability Components:

The following groups of users specify data requirements, collect, provide, analyse and use disseminated data:

- The specific policy initiative Member State, EEA, EFTA representatives (see full list of current policy areas above).
- The specific policy officers and system owners.
- Stakeholders from within the European institutions.
- External stakeholders.
- Hospitals applying to participate in European Reference Networks.
- European Reference Network Coordination teams.

2.1.9.3 Communication plan

The Action will create the necessary links with the ISA² Communication Action to coordinate the promotion and dissemination of results to several types of recipients. The Action includes within its plan communication activities which are of technical nature, while the ISA² Communication Action will promote the results to a broader audience, using appropriate non-technical language, and different channels.

Event	Representatives	Frequency of meetings / absolute dates of meetings?
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Event	Representatives	Frequency of meetings / absolute dates of meetings?
The Action tries to disseminate its work with presentations, posters and panels in the major eGovernment and semantic technologies conferences and events		
The Action will raise awareness for the importance of metadata management, data standards and alignment in Member States and internally in the EC		
The Action will try to disseminate and promote the use of the e-Government Core Vocabularies and linked data best practices in the EU Member States		2 Member States visits per year
The Action will continue organising its annual conference which has been very successful so far		1 conference per year

VocBench is already a mature open-source project. Communication about its further releases, support and discussion are given and held through different channels, covering different needs with the most appropriate solution, and exhibiting redundancy to some extent.

Information about VocBench can be found on Joinup <https://joinup.ec.europa.eu/solution/vocbench3/about> and on the VocBench site: <http://vocBench.uniroma2.it>. Secondly, two mailing lists/discussion groups: *users*⁴³ and

⁴³ <http://groups.google.com/group/VocBench-user>

*developers*⁴⁴, provide assistance to, respectively, the community of users and of those willing to contribute to the project or develop independent extensions for it. An Atlassian Suite instance provides project management, bug report and wiki services. Finally, the EU Vocabularies site managed by the Publications Office of the EU and the Agricultural Information Management Standards (AIMS) portal, managed by FAO, report on news about VocBench and associated systems and tools.

The Publications Office of the EU will reserve a space on its future corporate EU Vocabularies website for information on VocBench. The Publications Office offers access to an instance of VocBench to other EU institutions and bodies through the Testa network. It will organise information and training sessions for services interested in managing their controlled vocabularies in VocBench.

Promotion beyond the EU institutions of the new version of VocBench is foreseen by making use of social media (Twitter), webinars and participation in conferences (posters). The project stakeholders will promote VocBench in their respective communities.

For the ESCO Technical infrastructure, the Commission has set up an online ESCO technical community forum, which will serve as a dialogue platform to share and discuss implementation options with Member States, such as future requests, best practices and technical issues related to mappings between ESCO and the national classification systems. At the same time, ESCO is published on the Joinup Collections, in order to share experience and receive relevant professional feedback. Finally, the project's description and news updates will be published on the website of the ISA² programme.

In order to facilitate the creation of corresponding tables (in the context of the EURES regulation) between the national classification systems and ESCO, the Commission has set up webinars between the relevant parties, provide technical documentation and guidance, trainings and, if needed, technical support, and will organise country visits.

The Commission will use different communication channels to ensure communication alignment between the Member States and support the public employment services in the mapping in order to facilitate cross-border job matching in EURES, through the following communication channels:

- ESCO presentations at sectorial meetings organised by DGs.
- Social Dialogue meetings.
- Participation at national conferences (e.g.: Human Resources Directors summit, Rethink!HR etc.).

⁴⁴ <http://groups.google.com/group/VocBench-developer>

- EURES Coordination Group (ECG) meeting.
- Presentation to the Advisors for European PES affairs (AFEPA) meeting.
- Presentations on the results of the mappings and potential technical questions/answers during the Member States Working Group (MSWG) of ESCO.

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation dissemination activities for the first phase will focus on informing stakeholders of the existence and objectives of the project. This will be done via the participating platforms themselves. The group of experts that will accompany the project will be asked to recommend the means of dissemination for the operational central demonstrator site, set of reusable components and open data. An exhaustive communication and dissemination plan will then be designed. This plan will involve online presence and offline materials, but would probably focus on networking, presentation to dedicated workshops and conferences. Corporate dissemination via the ISA² network of Member States coordinator as well as the participating platforms' networks could also be an efficient means of dissemination. To continue using the GROWNET platform is planned: to communicate with internal stakeholders of the projects. A Joinup collection space will be set up to store all reusable assets, code, supporting material centrally and engage external users.

For the Structured Data Collection Platform Data Interoperability Components:

Project Status Reports are published quarterly on GOVIS2. Hands-on training and demonstrations are provided on request at Member State Working Group meetings. The following minutes are on Confluence/SharePoint and shared with business units in SANTE:

- Regular meetings held with project owners in specific policy areas.
- Weekly development team meetings.

Communication with end-users (data providers):

- Can opt in to receive emails from SDCP (if they opt out they can still use the SDCP)
- Receive release notes from business contact points
- News and release notes are published on the SDCP
- Communicate regularly with the Helpdesk
- Receive automated business intelligence reports on the data provided.

Communication with policy officers or data recipients:

- Can consult on-demand using a web-interface.
- Can receive automated emails if requested of data updates.

2.1.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected time for target
Number of unique visitors on semantic interoperability pages on Joinup (SEMIC community)	3 000 / quart.	Regular KPI to be maintained.
Number of unique visitors to core vocabularies/specs on Joinup	1 950 / quart.	Regular KPI to be maintained.
Done.Number of downloads of core vocabularies/specs on Joinup	360 / quart.	Regular KPI to be maintained.
Twitter activity	30 / quart.	Discontinued
Joinup activity – News Items on ISA2 work (number of unique visitors)	660 / quart.	Regular KPI to be maintained.
Joinup activity – Events (number of unique visitors)	240 / quart.	Regular KPI to be maintained.
Known & verified real/life implementations	5 / quart.	Regular KPI to be maintained.
Number of SEMIC Conference attendees	100 / year	Regular KPI to be maintained.

For Vocbench

Description of the KPI	Target to achieve	Expected time for target
Acceptance of the mid-release	Mid-release version accepted	1 month after the delivery deadline
Update of the ISA ² website (VocBench page)	Mid-release advertised on the ISA ² website	1 week later
Update of the Joinup website (VocBench page)	Mid-release advertised on the Joinup website	1 week later
Reception of the full release	100% of the planned developments	15/31/07/20192021
Acceptance of the full release	Full release version accepted	15/08/20192021
Implementation of the full	Full release version	31/12/2021

Description of the KPI	Target to achieve	Expected time for target
release in Production	implemented in Production	
Update of the ISA ² website (VocBench page)	Full release advertised on the ISA ² website	30/09/2021
Update of the Joinup website (VocBench page)	Full release advertised on the Joinup website	30/09/2021

Description of the measurements	Expected time of measurement
Number of downloads of the VocBench version available on the vocbench.uniroma2.it website	For each reporting
Number of visitors (page views) on the ISA ² website (VocBench page)	For each reporting
Number of searches (VocBench) made on the ISA ² website	For each reporting
Number of visitors (page views) on Joinup (VocBench3 page)	For each reporting
Number of searches (VocBench) made on the Joinup website	For each reporting

For the ESCO Technical infrastructure:

Description of the KPI	Target to achieve	Expected time for target
Number of Member States using the ESCO mapping platform	15	2020
Number of mapping projects successfully completed with the mapping platform	20	2021
Downloads of mapping tables through the ESCO portal	1,000	2021
Number of relationships between ESCO concepts and other concepts in other classifications displayed on the ESCO portal	100,000	2021
Number of KPI reports based on mapping tables	4	2021

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Description of the KPI	Target to achieve	Expected time for target
Number of participating EU platforms	6	2019 Q4
No of innovation actors / supporting instruments described and published under an open, interoperable common dataset	80% of all actors, instruments described by participating projects	2019 Q4
Number of external datasets accessible from participating projects' websites	2 external datasets accessible in addition to own dataset by participating websites	2019 Q4

For the Structured Data Collection Platform Data Interoperability Components:

Description of the KPI	Target to achieve	Expected time for target
Number of projects on SDCP increases	Convert legacy projects; add new projects	As required
Number of shared libraries	10 % increase	End-2020
Number of dossiers submitted	50 % increase	Year-on-year
Number of active users	10 % increase	Year-on-year
SDCP Code Linker	Make available to users	2020
SDCP Translate	Integrate with DGT machine-translate	2020
SDCP Open Data	Make datasets available	2020
SDCP Data Dictionary Maker	Make available to users	2020
Uptime of the SDCP	95 % (5 % downtime scheduled)	Per year

2.1.9.5 Governance approach

The Action is run by the European Commission, DG DIGIT, D2 (Interoperability Unit).

For the work expected in this Action, collaboration with Member States and other stakeholders (e.g. DG EMPL, the EU Publications Office, other DGs, EU institutions, agencies and bodies, standardisation bodies) is considered of critical importance. For this reason, communication with the Member States and third parties will be frequent and their active involvement will be encouraged via invitations for participation in ad hoc groups discussing specialised issues related to the content of the Action.

For VocBench an annual VocBench Stakeholder meeting is organised to provide overall guidance, and to ensure the consistency of the project regarding the community expectations and requirements. The Stakeholder meeting consists of representatives from the Publications Office, UNITOV, DIGIT and other European Commission services, EU agencies, the Food and Agricultural Organisation (FAO) and representatives from the Member States' national or regional authorities. This configuration is meant to evolve, as exposed in the executive summary.

The ESCO mapping platform project is managed by the Commission, in particular Units E2 (skills and qualifications policy and ESCO content) and F5 (IT Unit) of DG EMPL. The governance structure includes also the ESCO Member States Working Group, which is

composed of representatives from Member States on employment and education and training affairs and representatives from European social partners. It advises and supports the Commission on the implementation and development of ESCO and ensures its interoperability with the national classification systems on employment.

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation, the project will set up a steering committee made up of participating EU platform representatives. The Committee will meet regularly (minimum 4 times a year is planned) to monitor the implementation of the project and provide high level guidance. Specific task force(s) will be set up to support the implementation of specific outputs, where necessary.

DG GROW.F1 act as secretariat for the Committee and lead the project. Technical implementation is foreseen by DG DIGIT.

For the Structured Data Collection Platform Data Interoperability Components:

DG SANTE information systems unit together with the project board decide on priorities from the product backlog and establish a delivery timeline accommodating all projects.

The input from System Users is based on reports from Working Groups, via the specific policy area System Owner or from the Helpdesk. The diagram below illustrates the governance approach.

2.1.10 TECHNICAL APPROACH AND CURRENT STATUS

Overview for work so far

The Action tries to overcome semantic interoperability problems by:

1. documenting what is available in each MS with regards to metadata policies and the management of semantic interoperability assets;
2. identifying opportunities for alignment;
3. promoting share and reuse of semantic assets, experiences and tools and facilitating agreements in key areas;
4. raising awareness on the importance of metadata management;
5. identifying and promoting successful practices and tools for linking governmental data;
6. maintaining, developing and promoting common specifications.

Through this action, the ISA² programme sets to achieve a better collaboration between European public administrations towards creating new and promoting existing agreements on the meaning of the exchanged information and on the common use of metadata. Joinup provides the necessary infrastructure for this collaboration while a broad network of stakeholders including several EC departments and other EU entities.

The Action maintains communication links with relevant initiatives to promote semantic interoperability around the world (e.g. USA, Japan) to exchange views and share experiences.

Below an overview of the results of the Action during the last 5 years is provided.

In 2015/16, the Action delivered: a revision of the DCAT-AP and two extensions to describe geospatial and statistical data; supported the DCAT-AP implementation at EU and Member States level; drafted a specification for publishing State Aid Notifications as open data working closely with DG COMP; supported the work to develop the Common Vocabulary for describing legal documents in the context of the IFC; drafted a specification for publishing the EU budget as open data with the PO; run a pilot with ESCO and DG Employment; run a pilot with the Core Public Service Vocabulary in Estonia; supported the creation of the data model for the Business Registers Interconnection System (BRIS) for DG JUST; provided the semantic layer for EIRA; supported the Secretariat General of the EC and EFSA to establish an information management strategy; supported EU inter-institutional work to establish persistent URIs management; supported local pilots to use the Core Vocabularies in Italy and Belgium.

In 2017/2018, the Action continued the maintenance of existing Core Vocabularies and DCAT-AP and create new representations in JSON-LD. Also, it proactively analysed how DCAT-AP is used on the European Data Portal, which harvests data from portals across EU Member States. It developed a draft Core Public Event Vocabulary to be tested by stakeholders around the EU. Additionally, the Action run several pilots to showcase the value of semantic interoperability and linked open data: The Financial Transparency System (FTS) pilot about publishing FTS data as linked open data and the NIFO one creating machine-readable representations of the NIFO fact sheets (https://github.com/SEMICEu/NIFO_pilot). Finally, the Action published a number of interesting studies in the field of semantic interoperability: A Big Data Interoperability Analysis identifying the interoperability challenges to be tackled when integrating data for analytical purposes and the role of technical and data standards to improve interoperability; and a Research Data Analysis which assesses whether DCAT-AP can be used as the standard for exchanging metadata about research datasets.

In 2018/2019, the different ISA² specifications were maintained and a [new minor release of DCAT-AP \(1.2\)](#) was published. As part of our commitment to share knowledge in the SEMIC community, a number of studies were carried out to showcase [the use and benefits of semantic specifications and assets](#) and to explain how SEMIC solutions are relevant for public

administrations. Three pilots took place using ISA² specifications, involving various stakeholders in the Member States and the European Commission: the Linked Data Showcase pilot about creating a reference architecture for offering the contents of relational databases as linked data. Work has continued on the National Interoperability Framework (NIFO) pilot to create [machine-readable representations of the NIFO e-Government factsheets](#). Regarding engaging with our community and communicating on semantic interoperability matters, the Action organised the [2018 edition of the SEMIC conference on Linked Digital Public Administrations](#) as one key moment to connect and engage with our diverse community of interoperability experts. We also participated in key events to share information and insights, to present our solutions and to give a semantic point-of-view on interoperability topics, such as the [ISA² mid-term conference](#) (Brussels, 29 November) or the [CEF eTranslation Conference](#) (Brussels, 29 November). We have organised several webinars during the year, on [AI](#), on [GeoDCAT](#) and on [CCCEV](#).

Activities in the new WP

Activities promoting semantic interoperability at horizontal level

As from 2020, the Action will continue to maintain, update and promote the above-mentioned specifications. It will also try to identify and develop new e-Government Core Vocabularies, promote the real usage of the existing specifications, make available a robust toolset for metadata management, further elaborate on policies for metadata. More specifically the Action will deliver the following results:

- e-Government Core Vocabularies
 - Review the current expressions of the e-Government Core Vocabularies and of all ISA² specifications maintained by SEMIC.
 - Identification of areas for new e-Government Core Vocabularies and/or common data models.
 - Checking maturity and opportunities for developing specifications with communities.
 - New vocabularies development.
 - Sustainability of the existing specifications.
- Policy and project support to DGs and Member States for promoting semantic interoperability with pilots and policy advice including the areas of open and linked data.
- Support for using the ISA² data models in operational systems in DGs and Member States.

- Work for metadata management, including documenting existing policies and tools, drafting guidelines, architectures, providing direct support to Member States and DGs, aligning and coordinating relevant initiatives.
- Continuation of the promotion and dissemination work including the SEMIC conference, identification of good practices, case studies, recommendations.

VocBench

Development will follow the modalities established in the previous ISA² actions, based on planning through JIRA, bug reporting, unit testing and possibly adding continuous development and deployment through a dedicated server.

The main milestones (with some comments describing their objectives) are:

- 1) Platform Sparse Improvements
Many improvements on the general platform, mostly about user management and data visualization
- 2) Initial configuration page for VB after the admin creation
Advanced settings of the platform through a UI when instantiating it for the first time
- 3) Action Level History Management: History Based Time Machine (sect. 5.7.3 of D03.03)
recovered after being postponed to this action in order to fit more urgent features into past actions
- 4) Support for UNDO (sect. 5.10. of D03.03): + multi-layered UNDO (at least with HISTORY mode)
recovered after being postponed to this action in order to fit more urgent features into past actions
- 5) Sheet2RDF: further improvements of the system (more expressive power)
see description of major outputs in section 1.1.8
- 6) Support for ECAS/EU Login
- 7) Update to Latest Angular version
necessary maintenance update
- 8) Project Virtual Directories and Features and Facets
a mandatory evolution of the system for agile maintenance of large number of projects, with project descriptions, classification, visibility and many other (indexable and customizable) facets
- 9) Solutions for quick automatic start of a VB instance
VB currently foresees the administrator to manually open projects through the UI in order

to enable access to them for ordinary users. This evolution will foresee compilable opening lists, visibility lists etc..

10) Reject action for action-owners

The validation system follows a strict (and necessary) workflow for collaborative, validated, content evolution. However, when making mistakes, users are kept on hold for rejection of their actions by validator users. This evolution will allow users to cancel their own actions, providing certain constraints are met (due to the parallelized and collaborative setting of the system)

11) Denser but Quicker User Registration and Activation

see description of major outputs in section 1.1.8

12) Updating all extensions to the newest frameworks for both extensions and property storage

necessary maintenance update

13) Export to spreadsheet (various formats, specific model requested by Danish Agency for Digitization)

export to a predefined model provided by the Danish Digitisation Agency

14) Renewed ACL, optimized for large quantities of projects, more intuitive UI

improvement for more agile management of inter-project access grants, especially in the case of a large number of projects

15) Installation of VB on docker

Very much requested by the community. Even though VB is incredibly easy to be installed, some installation still fail due to an improper configuration of the environment. A docker file solves this issue with a preconfigured environment that can be seamlessly installed on any real machine equipped with Docker.

16) Multilingual UI (support for in18n);

Support for multilingual UI

17) Automatic Production of Ontology/Thesaurus/Lexicon Web Documentation

Support for dedicated export templates for ontologies, thesauri and lexicons

18) Multiple named graphs management / User management

Possibility to manage the data of a project across different named graphs in the same dataset

19) Connector to Freedcamp

a free-to-use alternative to JIRA for the collaboration environment

20) Large Suite of Improvements/Addenda to the User Interface, in particular to the Resource View

21) Triple-view on the resource view as a triple-grained editor for resources

Possibility to modify single resource by accessing their triples through the resource view

22) Alignment Maintenance

Possibility to verify the consistency of alignments with the evolution of systems, by accessing online resources or linked projects, verifying the existence of resources etc...

23) OWL Inconsistency detection and report

By exploiting an external reasoning system

24) ICV Usability Improvements

The ICV will be able to run full tests and report on the overall status

ESCO mapping platform

- 1) ESCO is published as Linked Open Data. It can be accessed through the ESCO portal, by downloading the ESCO dataset, through a central API and by downloading and installing a local API. The ESCO classification is managed and published through a backend suite with various interlinked components, such as the taxonomy management system, the translation management system, the mapping platform and the ESCO portal.
- 2) The technical systems to support ESCO are up and running but will need further improvements over the coming months. The main areas for improvement are i) better management of the ESCO vocabularies and mapping data, ii) better support of versioning, iii) better management of feedback on ESCO's semantic assets, iv) better support for publishing ESCO's semantic and mapping data. The proposal at hand covers all of the above.

For the Structured Data Collection Platform Data Interoperability Components:

The project is structured using the standard project management methodology phases (initiation, planning, execution and closing). During the planning phase, it is checked what is available corporately in terms of features, tools and terminologies. Each specific project on the SDCP follows the same implementation approach, which involves all stakeholders:

Clients

Web Form

Admin UI

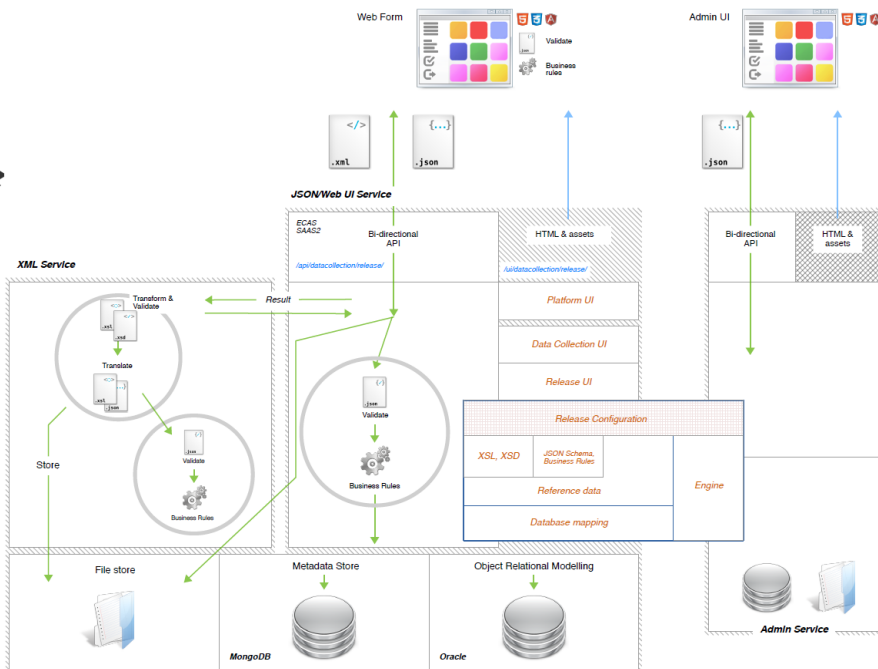


REST API

System

Router >
Dossier Interface >
Workflow >
Processor >
Response

Storage



2.1.11 COSTS AND MILESTONES

2.1.11.1 Breakdown of anticipated costs and related milestones

Main SEMIC action

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Operational	<p>Identification of areas for new Core Vocabularies and/or common data models.</p> <p>Checking maturity and opportunities for developing specifications with communities.</p> <p>New vocabularies development.</p> <p>Update and sustainability of the existing specs.</p>	820	ISA ²	Q2/2016	Q4/2020
	<p>Policy and project support to DGs and Member States for promoting semantic interoperability, linked and open data with pilots and policy advice.</p>	862	ISA ²	Q2/2016	Q4/2020
	<p>Use of core vocabularies in base registries.</p>	200	ISA ²	Q2/2016	Q4/2020

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	Support for using the ISA data models in operational systems in DGs and Member States	495	ISA ²	Q2/2016	Q4/2020
	Work for metadata management, including documenting existing policies and tools, drafting guidelines, architectures, providing direct support to Member States and DGs, aligning and coordinating relevant initiatives.	415	ISA ²	Q2/2016	Q4/2020
	Support to define information management strategies: good practices, guidelines, recommendations, tools.	254	ISA ²	Q2/2016	Q4/2020
	Support work for open data interoperability	150	ISA ²	Q2/2016	Q4/2020

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	with animation of a community of practice for DCAT-AP, maintenance and support for its real life-implementations.				
	Continuation of the promotion and dissemination work including country visits, the annual SEMIC conference, international workshops and webinars.	640	ISA ²	Q2/2016	Q4/2020
	Total	3836			

VocBench subactivity

Phase:	Description of milestones reached or to be reached	Anticipated Allocations (in KEUR)	Budget line ISA/ others (specify)	Start date (Q2/2019)	End date (Q2/2020)
Execution	Platform Sparse Improvements	14	ISA ²	Q4/2020	Q3/2021
Execution	Initial configuration page for VB after the admin creation	24	ISA ²	Q4/2020	Q1/2021
Execution	Action Level History Management: History Based Time Machine (sect. 5.7.3 of D03.03)	18	ISA ²	Q1/2021	Q3/2021
Execution	Support for UNDO (sect. 5.10. of D03.03): + multi-layered UNDO (at least with HISTORY mode)	12	ISA ²	Q4/2020	Q2/2021
Execution	Sheet2RDF: further improvements of the system (more expressive power)	24	ISA ²	Q4/2020	Q2/2021
Execution	Support for ECAS/EU Login	16.5	ISA ²	Q4/2020	Q2/2021
Execution	Update to Latest Angular version	18	ISA ²	Q4/2020	Q2/2021
Execution	Project Virtual Directories and Features and Facets	33	ISA ²	Q4/2020	Q2/2021
Execution	Solutions for quick automatic start of a VB instance	7	ISA ²	Q4/2020	Q2/2021
Execution	Reject action for action-owners	10	ISA ²	Q1/2021	Q3/2021
Execution	Denser but Quicker User Registration and Activation	8	ISA ²	Q1/2021	Q3/2021
Execution	Updating all extensions to the newest frameworks for both extensions and property storage	18	ISA ²	Q1/2021	Q4/2021
Execution	Export to spreadsheet (various formats, specific model requested by Danish Agency for Digitization)	10	ISA ²	Q4/2020	Q2/2021
Execution	Renewed ACL, optimized for large quantities of projects, more intuitive UI	4	ISA ²	Q1/2021	Q1/2021
Execution	Installation of VB on docker	5	ISA ²	Q2/2021	Q2/2021
Execution	Multilingual UI (support for in18n); Adoption of the intlIn framework developed for PMKI into the VB UI	10	ISA ²	Q4/2020	Q3/2021
Execution	Automatic Production of Ontology/Thesaurus/Lexicon Web Documentation	20	ISA ²	Q1/2021	Q3/2021
Execution	Multiple named graphs management / User management	24	ISA ²	Q1/2021	Q3/2021

Phase:	Description of milestones reached or to be reached	Anticipated Allocations (in KEUR)	Budget line ISA/ others (specify)	Start date (Q2/2019)	End date (Q2/2020)
Execution	Connector to Freedcamp	11.5	ISA ²	Q1/2021	Q3/2021
Execution	Large Suite of Improvements/Addenda to the User Interface, in particular to the Resource View	63	ISA ²	Q4/2020	Q3/2021
Execution	Triple-view on the resource view as a triple-grained editor for resources	11	ISA ²	Q4/2020	Q1/2021
Execution	Alignment Maintenance: possibility to verify the consistency of alignments with the evolution of systems, by accessing online resources or linked projects, verifying the existence of resources etc...	16	ISA ²	Q1/2021	Q3/2021
Execution	OWL Inconsistency detection and report	12	ISA ²	Q1/2021	Q3/2021
Execution	ICV Usability Improvements	9	ISA ²	Q4/2020	Q2/2021
	Total	398			

ESCO technical improvements and modules

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Initiation of phase 1	Scoping improvements of features for the mapping platform and the portal	10	ISA ²	Q4/2018	Q1/2019
Initiation of phase 1	Functional and non-functional requirements of the dataset management service and the KPI service	20	ISA ²	Q4/2018	Q1/2019
Planning of phase 1	Project management plan	20	ISA ²	Q4/2018	Q1/2019
Execution of phase 1	Development of the DCAT data model	30	ISA ²	Q4/2018	Q1/2019
Execution of phase 1	Development of the central data management system and the KPI service	75	ISA ²	Q1/2019	Q3/2019
Execution of phase 1	Development of improved versions of the ESCO portal and the mapping platform	85	ISA ²	Q1/2019	Q3/2019
Execution of phase 1	System integration	40	ISA ²	Q3/2019	Q3/2019

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Closing of phase 1	Deployment	10	ISA ²	Q3/2019	Q4/2019
Closing of phase 1	Execution report	10	ISA ²	Q4/2019	Q4/2019
Initiation of phase 2	Scoping improvements of features	10	ISA ²	Q2/2020	Q3/2020
Initiation of phase 2	Functional and non-functional requirements	20	ISA ²	Q2/2020	Q3/2020
Planning of phase 2	Project management plan	20	ISA ²	Q2/2020	Q3/2020
Execution of phase 2	Development of the proposed improvements and modules	190	ISA ²	Q3/2020	Q1/2021
Execution of phase 2	Systems integration	40	ISA ²	Q1/2021	Q1/2021
Closing of phase 2	Deployment	10	ISA ²	Q1/2021	Q2/2021
Closing of phase 2	Execution report	10	ISA ²	Q2/2021	Q2/2021
	Total	600			

Please note: Work on the ESCO data, on other elements of the ESCO IT infrastructure, on on-going support and maintenance and on hosting are covered through the EaSI programme.

For the Interoperable Mapping of Actors in the European Ecosystem of Innovation:

Phase: Initiation Planning	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/	Start date (QX/YYYY)	End date (QX/YYYY)
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Execution Closing/Final evaluation			others (specify)		
Initiation	Accepted project plan, governance model	20	ISA ²	Q2 2019	Q2 2019
Planning	Common vocabulary, taxonomies. Common quality assurance for specific attributes. Functional specifications for central database / demonstrator website	70	ISA ²	Q2 2019	Q3 2019
Execution	Implementation of central database, demonstrator website, common IT components, quality assurance	180	ISA ²	Q3 2019	Q4 2019
	Total	270			

For the Structured Data Collection Platform Data Interoperability Components:

Any solutions developed will be maintained, sustained post-2020 using SANTE budget.

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YY YY)	End date (QX/YY YY)
Initiation	Kick-off, establish road-map	10	SANTE	Q1/2020	



Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipat ed Allocati ons (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YY YY)	End date (QX/YY YY)
Planning	Define scope	10	SANTE	Q1/20 20	
Planning	Assess use of corporate tools	10	ISA ²	Q1/20 20	Q2/20 20
Execution	Project management	25	ISA ²	Q1/20 20	Q4/20 20
Execution	Establish metadata standards (in line with corporate strategy)	25	ISA ²	Q1/20 20	Q2/20 20
Execution	Map architecture and process flows	85	ISA ²	Q2/20 20	Q3/20 20
Execution	Define components/access/roles	40	ISA ²	Q1/20 20	Q3/20 20
Execution	Design and develop	85	ISA ²	Q1/20 20	Q4/20 20
Closing/Final Evaluation	Present results and deliver for use	30	ISA ²	Q4/20 20	Q4/20 20
	Total	320			

2.1.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Operational	950	950
2016	Execution (VocBench 3.0)	348	348
2017	Operational	746	746
2017	Execution (VocBench3-2017)	347	347
2018	Operational	800	800
2018	Execution (VocBench3-2018)	138	
2018	All (ESCO mapping platform)	110	
2019	Operational	690	
2019	Execution (VocBench3-2019)	518	
2019	All (ESCO mapping platform)	190	
2019	All (Interoperable Mapping of Actors in the European Ecosystem of Innovation)	270	
2020	Operational	650	
2020	Execution (VocBench3-2020)	298	
2020	All (ESCO improvements and modules)	300	
2020	Initiation/Planning (SANTE Structured Data Platform)	30	
2020	Execution (SANTE)	260	

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
	Structured Data Platform)		
2020	Closing/Final Evaluation (SANTE Structured Data Platform)	30	

2.1.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
Federation of Semantic Assets Repositories	https://joinup.ec.europa.eu/document/federation-semantic-assets-repositories	
e-Government Core Vocabularies	https://joinup.ec.europa.eu/solution/e-government-core-vocabularies	
The DCAT Application Profile	https://joinup.ec.europa.eu/solution/dcat-application-profile-data-portals-europe	
Asset Description Metadata Schema (ADMS)	https://joinup.ec.europa.eu/solution/asset-description-metadata-schema-adms	
Towards Open Government Metadata	https://joinup.ec.europa.eu/document/towards-open-government-metadata	
Similar project in another, related domain: Specifications for the development of an open metadata schema for qualifications	 20150717 Specifications.pdf  20150717 Annex to the Specifications.pdf	
EIF	https://ec.europa.eu/isa2/eif_en	
Joinup	https://joinup.ec.europa.eu/	
EU Open Data Portal	http://data.europa.eu/euodp/en/home	
Digital Single Market	https://ec.europa.eu/digital-single-market/en/policies/shaping-digital-single-market	
SANTE Data Collection Platform XMLGATE3 (SDCP)	https://webgate.ec.europa.eu/sante-xmlgate/#/	
EIRA	https://ec.europa.eu/isa2/solutions/eira_en	

Description	Reference link	Attached document
<p>Regulation (EU) 2017/625 of the European Parliament and of the Council of 15 March 2017 on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products</p>	<p>http://data.europa.eu/eli/reg/2017/625/oj</p>	
<p>Directive 2011/24/EU of the European Parliament and of the Council of 9 March 2011 on the application of patients' rights in cross-border healthcare</p>	<p>https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011L0024</p>	
<p>Regulation (EU) No 652/2014 of the European Parliament and of the Council of 15 May 2014 laying down provisions for the management of</p>	<p>https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32014R0652</p>	

Description	Reference link	Attached document
expenditure relating to the food chain, animal health and animal welfare, and relating to plant health and plant reproductive material		
Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32004R0882	
Directive 1999/2/EC of the European Parliament and of the Council of 22 February 1999 on the approximation of the laws of the Member States concerning foods and food ingredients treated with ionising radiation	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31999L0002	
Commission	http://data.europa.eu/eli/reg/2006/1505/oj	

Description	Reference link	Attached document
<p>Regulation (EC) No 1505/2006 of 11 October 2006 implementing Council Regulation (EC) No 21/2004 as regards the minimum level of checks to be carried out in relation to the identification and registration of ovine and caprine animals</p>		
<p>Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing</p>	<p>https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009R1099</p>	
<p>Commission Regulation (EU) No 284/2011 of 22 March 2011 laying down specific conditions and detailed procedures for the import of polyamide and melamine plastic kitchenware originating in or consigned from the People's Republic of</p>	<p>https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32011R0284</p>	

Description	Reference link	Attached document
China and Hong Kong Special Administrative Region, China		
Commission Decision 2006/778/EC of 14 November 2006 concerning minimum requirements for the collection of information during the inspections of production sites on which certain animals are kept for farming purposes	https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32006R1505	
Council Regulation (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32005R0001	
Commission Implementing Decision 2013/188/EU of 18 April 2013 on annual reports on non-discriminatory inspections carried out pursuant to	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D0188	

Description	Reference link	Attached document
Council Regulation (EC) No 1/2005 on the protection of animals during transport and related operations		
Commission Regulation (EC) No 669/2009 of 24 July 2009 implementing Regulation (EC) No 882/2004 of the European Parliament and of the Council as regards the increased level of official controls on imports of certain feed and food of non-animal origin.	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32009R0669	

2.2 SEMANTIC INTEROPERABILITY FOR REPRESENTATION POWERS AND MANDATES (2016.12) – FUNDING CONCLUDED

2.2.1 IDENTIFICATION OF THE ACTION

Type of Activity	Common frameworks and reusable generic tools
Service in charge	DIGIT D3
Associated Services	DIGIT D2, CNECT.H4

2.2.2 EXECUTIVE SUMMARY

STORK 2.0 project was initiated with the aim, among others, of developing an operational framework and infrastructure encompassing eID for secure electronic authentication of legal persons, including facilities for the management of representation powers and mandates.

In that sense, the project has achieved significant results, evolving STORK specifications to include attributes for legal persons and representation powers and mandates, and adapting the software building blocks to allow cross-border transfer of this kind of information. The feasibility of the developed solution has been verified by means of the STORK 2.0 pilots, in which use cases that require cross-border access to information about representation capabilities have been successfully tested.

However, the project has also found important barriers that currently hinder the adoption of an EU wide solution for cross-border transfer of representation information, one of the most relevant being the lack of a common semantic framework. Representation is complex and the national solutions are often too much focused on country specific details. Therefore, although there are some similarities among countries, there is not a shared European taxonomy about representation powers and mandates, what prevents powers/mandates information originated in one country from being directly machine processable in other.

Additionally, the need for service providers of having powers/mandates information together with the data regarding the represented and representing persons in order to properly assess the scope of the transactions that the representing person is allowed to perform on behalf of the represented one, has been steadily highlighted in the discussions of the eIDAS expert group.

Taking into account that the goal of the European Commission ISA² programme is the promotion of interoperable electronic public services, and that it includes specific actions about semantic interoperability like the ISA core vocabularies, there is an opportunity for continuing the work done in STORK 2.0 and other initiatives regarding representation powers/mandates under the scope of the ISA² programme and, by incorporating the results of

this action in the eIDAS interoperability framework, keep progressing towards the single digital market and the semantic harmonisation Europe-wide. In that sense, an evolution of the ISA Core Vocabularies to extend the Core Person and Core Business vocabularies with a common taxonomy for representation powers/mandates linked to legal entities may be one of the potential initiatives to be taken over by the ISA² programme.

2.2.3 OBJECTIVES

The main objective is **to create a shared European data model about representation powers and mandates**, which allows powers/mandates information originated in the information systems of one country to be directly processed automatically by the information systems in other country. The data model will be tested in real life through pilots with some MS and the technical specification will be put forward to the CEF eID Operational Management Board for endorsement and proposed to be incorporated in the CEF eID sample implementation and extension of the CEF eID technical specifications.

2.2.4 SCOPE

The action will provide a common data model for representation powers / mandates linked to legal entities, aligned with the Core Person and Core Business vocabularies, as well as some tools for integrating that data model into business applications.

2.2.5 ACTION PRIORITY

For the eIDAS Technical Specifications and the associated implementation under CEF eID, a solution for power and mandates is a top priority.

2.2.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
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<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>The proposal contributes to the implementation of REGULATION (EU) No 910/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, Commission Implementing Regulation (EU) 2015/1501 and REGULATION (EU) No 1316/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>Yes, currently there is no technical specification on how to support power in mandates in the context of the eIDAS infrastructure.</p>

2.2.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>The solution could be implemented in the CEF eID Building block, pending Operational Management Board approval. Once integrated, the solution would be used in the same EU policy areas as the CEF eID Building Block. For more information see the CEF</p>

Question	Answer
	Reuse matrix.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	Nothing in operational phase.

2.2.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	Yes. As part of eIDAS interoperability framework.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	Nothing in operational phase.

2.2.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	The main stakeholder group for which this action is addressed are the users of the CEF eID Building Block. As there are already commitments made to re-use this Building Block, and the likelihood that the requirement for power and mandates is high, the action is very urgent and has been referenced in CEF Work Program 2017.
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	As this action is about the design of a solution for powers and mandates, there are no other available sources under CEF.

2.2.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

Can the results of the action (following this proposal) be re-used by a critical part of their target user base, as identified by the proposal maker? For proposals or their parts already in operational phase: have they been re-used by a critical part of their target user base?

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Generic technical specification for the interoperability of powers and mandates
Description	Generic technical specification for the interoperability of powers and mandates, including a common data model or vocabulary, with semantic metadata models and controlled vocabularies that can accommodate cross-domain and cross-border requirements.

Reference	
Target release date / Status	Q2/2018
Critical part of target user base	The DSIs that are committed to use CEF eID, for more information see the CEF Reuse matrix.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	N/A

2.2.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	Core Person and Core Business vocabularies
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	Nothing in operational phase

2.2.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union's initiatives such as the DSM.

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	This proposal contributes to CEF eID Building Block. The CEF finances projects which fill the missing links in Europe's energy, transport and digital backbone. It will

Question	Answer
	also make Europe's economy greener by promoting cleaner transport modes, high speed broadband connections and facilitating the use of renewable energy in line with the Europe 2020 Strategy.

2.2.6 PROBLEM STATEMENT

Representation powers and mandates are an essential element for businesses establishing relationships with other businesses, governments and customers, because legal persons can only act legally by means of natural persons in most countries. Currently, there are important barriers that hinder the adoption of an EU wide solution for cross-border transfer of representation information, being one of the most relevant the lack of a common semantic framework. Representation is complex, and electronic mandates schemes and policies are basically national and usually do not contemplate the possibility to use those mandates in cross-border scenarios.

The problem of	Lack of interoperability for representation powers and mandates
Affects	businesses establishing relationships with other businesses, governments and customers because legal persons can only act legally by means of natural persons in most countries.
the impact of which is	hindering the adoption of an EU wide solution for cross-border transfer of representation information
a successful solution would be	allowing powers/mandates information originated in the information systems of one country to be directly processed automatically by the information systems in other country.

2.2.7 IMPACT OF THE ACTION

2.2.7.1 Main impact list

List the impacts of the action's outputs (following the proposal) on the beneficiaries to the extent possible. Some impacts are listed below – add others as needed.

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	The study will produce reusable specifications	Q4/2018	Citizens and business in Europe
(+) Savings in time	The study will also help the Member States which are currently working on definition of power and mandates solutions	Q4/2018	Citizens and business in Europe
(+) Better interoperability and quality of digital public service	The action would be allowing powers/mandates information originated in the information systems of one country to be directly processed automatically by the information systems in other country	Q4/2018	Citizens and business in Europe
(-) Integration or usage cost	The solution would be piloted by extending the eIDAS infrastructure, therefore re-using an existing solution.	Q4/2018	Citizens and business in Europe

2.2.7.2 User-centricity

The users of the generic technical specifications have been consulted in the initiation phase to provide their needs and priorities and they will be asked for feedback regarding the general technical specifications.

2.2.8 EXPECTED MAJOR OUTPUTS

Outputs are described in section 2.2.5.5

2.2.9 ORGANISATIONAL APPROACH

2.2.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Member States	<ul style="list-style-type: none"> • ISA2 Committee • ISA2 Coordination Group (or ISA CG equivalent) • CEF governance: eID DSI Operational Management Board; eID DSI expert group and Cooperation Network • Persons/units in charge of National Interoperability Frameworks and/or metadata standards catalogues/repositories, etc. • Persons/units in charge of business registers, public procurement and taxation applications, representation powers/mandates registries, etc. 	
Standardization bodies	W3C, OASIS, GS1, CEN , UN/CEFACT, etc.	
European Commission	DG JUST, DG GROW, TAXUD, DG DIGIT Unit (s) responsible for promoting common specifications in new and existing system, DG CONNECT as building block owner for eID	
End users	Citizens Representatives of companies	

2.2.9.2 Identified user groups

eIDAS interoperability framework and DSIs that are using or are committed to use CEF eID. For more information please see CEF Reuse matrix.

2.2.9.3 Communication and dissemination plan

Due to the strong link of the proposed action with action 1.1 Promoting Semantic Interoperability amongst the European Union Member States and action 1.2 Access to Base Registries, it is suggested that the communication plan for the proposed action leverages the dissemination activities already foreseen in the actions current under execution.

2.2.9.4 Key Performance indicators

Provide a list of KPIs allowing the measurement of the progress and completions of milestones and the action. In case of an on-going action with already identified metrics⁴⁵ indicate the current values.

Description of the KPI	Target to achieve	Expected time for target
Desk research target countries Number of Questionnaires filled in by MS	14	Q3/2017
Number of interviews performed	14	Q3/2017
Number of business/life events analysed	5	Q3/2017
Number of cross-border services identified	5	Q3/2017
Number of use cases analysed	20	Q3/2017
Number of requirements identified grouped by EIF interoperability layer	3	Q3/2017
Number of feasibility criteria defined	10	Q3/2017
Number of identified cross-border solutions / best practices	10	Q3/2017

⁴⁵ For examples see the ISA2 dashboard <https://ec.europa.eu/isa2/dashboard/isadashboard> , effectiveness tab.

Description of the KPI	Target to achieve	Expected time for target
Number of identified cross-border solutions / best practices	10	Q3/2017

NOTE: For 2018-2019 new KPIs will be defined.

2.2.9.5 Governance approach

Again, due to the link of the proposed action with the two mentioned actions, it is suggested to follow a similar approach to the one followed in those actions: Action run and coordinated by DIGIT D3, under the CEF governance for the eID DSI; i.e. Operational Management Board and the eID DSI expert group. Also with strong collaboration with other units of the Commission involved in managing information about representation (e.g. DG JUST as representation information is frequently managed by Business Registers; DG GROW for eProcurement applications; DG TAXUD in relation to the UUM&DS Project). DIGIT D2 will provide support for the development of the semantic data model.

2.2.10 TECHNICAL APPROACH AND CURRENT STATUS

STORK 2.0 project has developed an operational framework and infrastructure encompassing eID for secure electronic authentication of legal persons, including facilities for the management of representation powers and mandates. In that sense, it has evolved STORK specifications to include attributes for legal persons and representation powers and mandates, and has adapted the SW building blocks to allow cross-border transfer of this kind of information.

The feasibility of the developed solution has been verified by means of the STORK 2.0 pilots, in which use cases that require cross-border access to information about representation capabilities have been successfully tested.

To support this use cases, the project has developed a set of tools, which include a basic taxonomy for powers and mandates, that allows to obtain information about representation in one country, map this information to a common semantic model, and transfer it to another country so that it can be interpreted by an electronic service provider that needs it in order to perform a transaction with a natural person acting on behalf of a legal person.

The aim of the action is therefore to generalise this basic data model and related tools, now oriented to solve the specific needs of the STORK 2.0 project, so that it can cover any potential cross-border transfer of information about representation.

To do so, the action proposes four different phases:

An **initial phase** or feasibility study analysing the current situation on how electronic powers and mandates are managed in the individual Member States and also by other European-related projects like the UUM&DS Project from DG TAXUD, and their cross-border interoperability: The study will scope the work needed in order to develop a common data model that could be used across-sector and across-borders for the electronic identification of legal entities and the representation and mandates of those action on behalf of that legal entity.

Other similar initiatives will be taken into account, especially those in a European context offering services in production. Alignment with the eIDAS Regulation and the CEF specs on the eID DSI will be sought.

A **second phase** of production of requirements and good practices like frameworks and solutions that could facilitate the interoperable interconnection of representation information across sectors and across borders.

A **third phase** of designing and elaborating a generic technical specification for the interoperability of powers and mandates, including a common data model or vocabulary, with semantic metadata models and controlled vocabularies that can accommodate cross-domain and cross-border requirements. The action will consult with the CEF eID Expert Group in the context of phase 3.

A **fourth phase** where some solutions for integrating that framework into business applications will be implemented and also where real-life pilots with the MS will be launched to test the specification.

Finally, and as a result of the pilots the specification will be enhanced and presented to the CEF board for endorsement and proposed to be incorporated in the official specs of the CEF eID DSI.

2.2.11 COSTS AND MILESTONES

2.2.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Study	Study about cross-border interoperability of powers and mandates	150	ISA ²	Q4/2016	Q1/2017
Study	Production of requirements and good practices	100	ISA ²	Q4/2016	Q3/2017
Inception	Elaboration of the technical specification for interoperability	150	ISA ²	Q3/2017	Q1/2018
Execution	Design of reusable specifications	144	ISA ²	Q1/2018	Q4/2018
Execution	Launch of pilots	100	ISA ²	Q3/2018	Q2/2019
	Total	644			

2.2.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Study	250	
2017	Inception + Execution	294	
2018	Execution	100	

2.2.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
STORK 2.0 project website	https://www.eid-stork2.eu/	
STORK 2.0 Deliverable D3.3 Mandate/Attribute Management Report	https://www.eid-stork2.eu/index.php?option=com_phocadownload&view=file&id=7:d33-mandateattribute-management-report&Itemid=175	
STORK 2.0 Deliverable D3.5 Legal Entities Identification Report	https://www.eid-stork2.eu/index.php?option=com_phocadownload&view=file&id=8:d35-legal-entities-identification-report&Itemid=175	

2.3 PUBLIC MULTILINGUAL KNOWLEDGE MANAGEMENT INFRASTRUCTURE FOR THE DIGITAL SINGLE MARKET (2016.16)

2.3.1 IDENTIFICATION OF THE ACTION

Service in charge	Publications Office of the EU, unit Publications Office OP.A2
Associated Services	CNECT.G3 DIGIT.D2 DGT.R3 European Parliament, DG TRAD, Terminology Coordination unit OP.A1

2.3.2 EXECUTIVE SUMMARY

In its open letter to the European Commission the European Language (Technology) Community claims: Europe’s Digital Single Market (DSM) must be multilingual!⁴⁶ This statement had been confirmed by former Vice-President Ansip, who posted in his blog: “Overcoming language barriers is vital for building the DSM, which is by definition multilingual.”⁴⁷ In 2015, EU cross-border online services represented only 4% of the global Digital Market and only 7% of small and medium sized enterprises (SMEs) in the EU are actually selling cross-border.⁴⁸ Providing support for the EU economy and in particular to SMEs to overcome the language barriers will help to unlock the e-Commerce potential within the EU.

The objective of this action is to support enterprises and in particular the language technology industry with the implementation of the necessary multilingual tools and features in order to improve cross-border accessibility of e-Commerce solutions by the creation of a public knowledge management infrastructure. Public administrations and public entities within the EU will be invited to expose their reference data on the platform and added value will be created by creation of the alignments between the different datasets. The data will be by default open and reusable.

⁴⁶ See <https://ec.europa.eu/futurium/en/content/european-language-and-language-technology-community-europes-digital-single-market-must-be>

⁴⁷ Blog post by Commissioner Andrus Ansip at the 27 May 2016

⁴⁸ See http://europa.eu/rapid/attachment/IP-15-4653/en/Digital_Single_Market_Factsheet_20150325.pdf

In this context, multilingual tools and features refer to capabilities such as machine translation, localisation and multilingual search. The Public Multilingual Knowledge Management Infrastructure (PMKI) should reduce the investments of enterprises for the creation of their individual knowledge management systems by providing an agreed, open, reliable and persistent public core knowledge management system. This would also create space for innovation instead of wasting resources for redundant activities.

The public administrations and public entities will largely benefit from this initiative, in particular regarding the internationalisation of their e-Services. They will be able to share and to valorise existing taxonomies/terminologies and to extend their multilingual capabilities.

The action will also contribute to increase the interoperability between eGovernment services within EU in general.

In addition, the action will support the Connecting Europe Facility eTranslation⁴⁹ Platform, a common building block implemented through the CEF programme to be used by European cross-border online public services.

PMKI will be governed by a representative subgroup of stakeholders of the final system.

To realise PMKI the following aspects need to be addressed:

- Implementation of a technical infrastructure to expose existing multilingual taxonomies/terminologies in a standardised way based on semantic technology and Semantic Web standards;
- Implementation of existing alignments between terminologies and creation of further alignments and relations in order to enable interoperability;
- Creation and maintenance of meaningful supplements, i.e. of terms and relations that complete the coverage of the multilingual knowledge infrastructure and improve interoperability;
- Set-up of a community and a governance structure to extend systematically the coverage of the core infrastructure by the integration of supplementary public multilingual taxonomies/terminologies.

The cornerstone of PMKI will be EuroVoc, the multilingual, multidisciplinary thesaurus covering the activities of the EU, which is managed by the Publications Office. The project

⁴⁹ <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/eTranslation>

will also benefit from already existing alignments of EuroVoc with other thesauri (Agrovoc, Eclas, Gemet, Anubis and Inspire⁵⁰).

In addition, it should be investigated how the publication of the information as Linked Open Data (LOD) could be enhanced by introducing links between semantically equivalent or similar entities in a semi-automatized way. In this respect PMKI aims to provide an effective contribution to the creation and maintenance of a public Linguistic Linked Open Data (LLOD) cloud at European level.

The PMKI activities within the period 2016-2019 have already delivered relevant results in terms of:

1. Implementing knowledge representation standards for language resources.
2. Integrating such standards in a platform for managing vocabularies⁵¹.
3. Testing and developing language resources aligning procedures as contribution to the implementation of the LLOD.
4. Developing an operational prototype of the PMKI platform, allowing end-users to:
 - Submit and transform languages resources into the adopted standards;
 - Align resources with EuroVoc or other available resources;
 - Search, retrieve and integrating resources/concepts, reusable for implementing multilingual services.

At this stage, the overall PMKI platform is already a full-fledged operational prototype for managing and disseminating language resources in standard formats.

The feedback received through a series of presentations and demonstrations delivered in the last few months revealed a strong interest in the final service by potential stakeholders, who encouraged to finalize the development of the PMKI platform as a Dataset Catalogue, specifically dedicated to multilingual language resources.

On 4-5 June 2019, the Publications Office organised a workshop on ‘Semantic interoperability for the multilingual Web’. One of the main objectives of the workshop was to gather experts and professionals from academy, public administration and industry to promote and to discuss the status and the potential of the PMKI platform and its potential contribution to increase the semantic interoperability on the Web. The participants encouraged the Publications Office to further promote its multilingual interoperability services for the

⁵⁰ See <https://open-data.europa.eu/en/data/dataset/eurovoc>

[51 Vocbench implemented as ISA2- 2016.07 action has been adapted to support PMKI requirements](#)

Semantic Web, as well as partners from industry, public administration and academy to share their data through the PMKI service when it will become publically available.

In consequence, the Publications Office decided to request further funding for the PMKI platform to be able to transform the operational prototype into an operational system and to further increase its capabilities. The final system is intended to be installed in the public cloud. It will become part of the open and public service of the Publications Office. The Publications Office will manage i.e. availability, maintenance and evolutions. The platform will be open for contributions of external partners that will also be involved in the governance of the platform.

2.3.3 OBJECTIVES

The objectives of the proposed activity are:

- To provide an agreed, reliable, persistent and extensible public multilingual knowledge platform for multiple purposes and for multiple stakeholders composed of open public multilingual resources.
- To increase the interoperability of existing multilingual terminologies, in particular by aligning and linking them with other existing terminologies. Linking will enable at the same time specialisation (for example by linking a concept of a more general taxonomy/terminology with the corresponding concept of a domain specific taxonomy/terminology) and broadening (for example by linking similar concepts at the same level of granularity).
- To establish the initial governance structure to support and to supervise the execution of the project as well as the implementation, the management and the evolution of the final system.
- To contribute to the further standardisation of data models for thesauri and lexical knowledge database representations using latest semantic technologies.
- To support the contributing institutions with the transformation of their resources into adopted semantic format of the platform.
- To further develop the LOD capabilities of the system, in particular by enhancing the semi-automatized creation of semantic links between equivalent and similar concepts.

According to the collected stakeholders' needs the specific objectives of the current request are:

1. To stabilize and industrialize the current PMKI prototype;

2. To increment the capabilities of the platform.

2.3.4 SCOPE

The objective of the proposed activity in the scope of the ISA² programme is to verify the feasibility of the approach and to prepare the technical and the organisational aspects for the definitive and permanent implementation of an open PMKI managed by the EU Institutions. These objectives have already been largely achieved. Nevertheless, it will deliver already results, which could be used and applied by public administrations and bodies of Member States and EU Institutions independent from the PMKI project itself.

In scope and already achieved or going to be achieved until end of 2019:

1. Adoption of a standard representation for multilingual terminologies (candidates include SKOS⁵², Lemon⁵³ ...).
2. Definition of a core data model based on the standard representation in order to facilitate the interoperability between different terminologies, i.e. through a shared set of metadata, and to harmonise the representation of the data, which will be made available through the platform.
3. Specification of the technical architecture of PMKI and the necessary services to access and to manage the system.
4. Proof of concept, i.e. implementation of a first operational release of the system to demonstrate the core services of the system.
5. Set-up/adoption of an adequate initial governance structure.
6. Definition of an iterative implementation strategy, i.e. the specifications and the roadmap for the extension of the initial release of the system into a public service, which will be managed, further developed and maintained by the EU Institutions and governed by all contributors, i.e. in particular public administrations and entities within in EU. The result of the proof of concept should be reusable for the implementation of the final system.
7. Feasibility study in order to analyse and to test the creation of lexical semantic links between semantically equivalent and similar entities in a semi-automatized way.
8. Feasibility study for the use case of multilingual semantic indexing. PMKI's multilingual knowledge base with its alignments between taxonomies/terminologies should improve the quality of indexation and, in consequence, help to improve document search and retrieval services, including content disambiguation, geolocalisation, cross-collection and multilingual indexing.

⁵² See <http://www.w3.org/2004/02/skos/>

⁵³ See <http://lemon-model.net/index.php>

In scope and planned for the next period:

9. Implementation of an operational release of the PMKI platform in the public cloud.

Out of scope:

1. Implementation of the definitive public service that should be free of charge.
2. Management, further development and maintenance of the definitive system.

2.3.5 ACTION PRIORITY

The creation of PMKI contributes to the overcoming of language barriers, in particular in the context of the implementation of a Digital Single Market. It should also help to reduce the investments of the different stakeholders in cross-border e-commerce solutions and multilingual eGovernment solutions and to enhance the linguistic quality of the solutions.

2.3.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>The proposal meets the recommendations included in the EIF. In particular the adherence to specific standards for describing language resources and the creation of an interoperability platform to manage them comply with the main approaches and “clusters” of the EIF (reusability of the solutions, interoperability service architecture in the EU multilingual context, implication of ICT on new EU legislation, as well as promotion of the awareness on the maturity level and of the shareability of the public administration services). Similarly, the proposal meets the</p>

Question	Answer
	<p>recommendations and principles of the European Interoperability Framework (EIF)⁵⁴, in particular as regards multilingualism, accessibility, administrative simplification, transparency, reusability of the solutions. The creation of PMKI will support EU public administrations to create services that can be accessible and shareable independently from the language actually used, as well as the SMEs to sell goods and services cross-border in a digital single market.</p> <p>Moreover this action meets the Strategic Agenda 18-month Programme of the Council (1st July 2017 – 31 December 2018) as far as the focus on growth and competitiveness strategic objectives is concerned. According to such programme to achieve such strategic objectives one of the priorities is actually the effective development of the European Single Market representing one of the most significant sources of economic growth. In particular the creation of a Digital Single Market (DSM) is one of the main drivers for creating employment and fostering of competitiveness. The PMKI action is aiming to contribute to it by facilitating</p>

⁵⁴ COM(2010) 744 final Annex 2, http://ec.europa.eu/isa/documents/isa_annex_ii_eif_en.pdf

Question	Answer
	<p>connectivity and advancing the development of a competitive and fair DSM by encouraging cross-border e-commerce, and overcoming language barriers. The DSM has to be multilingual.</p> <p>The project contribution to the development of cross-border digital public services is also aligned with the EU e-Government Action Plan 2016-2020.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>This action represents a tremendous opportunity to harmonize the different language resources managed by EU institutions (for example EuroVoc, IATE, glossaries searchable on GlossaryLinks of the DG TRAD of the European Parliament, etc.), as well as the national resources managed by Member States, and, first of all, to make them interoperable.</p>

2.3.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>This action aims at establishing multilingual interoperability of language resources. Therefore, it will support the creation and the improvement of multilingual</p>

Question	Answer
	<p>interoperability services, as cross-collection and cross-language information retrieval, as well as automated translation services.</p> <p>It will contribute therefore to overcome the language barriers that are one of the obstacles for the further development of Digital Single Market in the EU, which represents one of the main priorities of the European Commission. In particular it addresses all the three policy areas of such priority:</p> <ul style="list-style-type: none"> - Better online access to digital goods and services; - An environment where digital networks and services can prosper; - Digital as a driver for growth.
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<p>This proposal is not in operational phase yet.</p>

2.3.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of</i></p>	<p>By guaranteeing interoperability of language resources in all the 24 official</p>

Question	Answer
<i>view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	languages of the EU, this proposal has the potential of improving the service interoperability of public administrations of all EU Member States, candidate countries or EFTA States.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	This proposal is not in operational phase yet.

2.3.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	The outcomes of this action can greatly improve the accessibility of EU and Member States' legislation and related information systems by promoting the interoperability of the language resources used for automatic translation, as well as multilingual classification and indexing. Moreover, it will promote e-commerce solutions and related services, which will rely on an agreed, authentic and persistent set of multilingual interoperable terminologies. This action is in particular foreseen in the framework of the creation of a European Digital

Question	Answer
	<p>Single Market, which is one of the priorities of the European Commission, aimed at supporting the EU economy (in particular the SMEs) to overcome the language barriers in order to unlock the e-Commerce potential within the EU.</p> <p>A prompt implementation of such proposal will have direct beneficial impacts on the addressed fields.</p>
<p><i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i></p>	<p>The proposal is specifically addressed to improve the interoperability of language resources and the services for public administration, SMEs and citizens. These are specific objectives of the ISA² which therefore fits to it better than other actions. In fact rather than other framework programmes, like for example Horizon 2020 mainly devoted to research and innovation or CEF mainly devoted to the implementation of the digital networks and infrastructures for the interoperability of digital services, ISA² represents the suitable programme for leveraging research results and implementing state-of-the-art semantic technologies for creating interoperability solutions to overcome language barriers in the EU digital market of goods and services.</p>

2.3.5.5 Reusability of action's outputs

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Core data model for multilingual taxonomies/terminologies
Description	<p>Formal definition of the core data model for multilingual taxonomies/terminologies and its necessary extensions that will be implemented by PMKI.</p> <p>The approach should be flexible in the way that data providers would be able to define private extensions, which would allow the upload of supplementary data that is available on their side and that could be useful for re-users.</p> <p>The aspects “provenance” and “license” have also to be taken into account.</p>
Reference	PUB_MUL_TERM_FORMAT
Target release date / Status	Q4/2017
Critical part of target user base	n/a
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	n/a (specifications)

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Semantic links
Description	<p>A core dataset with additional semantic links between different language resources (in particular having EuroVoc as pivot) will be available.</p> <p>This includes the development of a mapping approach based on language-independent algorithms respectively the combination of algorithms for semi-</p>

	<p>automatic mapping between multilingual language resources.</p> <p>The purpose is to demonstrate the potential of semantic technology in order to improve the semantic connectivity among multilingual knowledge resources (thesauri, vocabularies, classification schemes, etc.).</p>
Reference	PUB_MUL_TERM_SEMANTIC
Target release date / Status	Q4/2018
Critical part of target user base	n/a
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not in operational phase

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Multilingual semantic indexing
Description	Feasibility study on documents multilingual semantic indexing. Using PMKI results on multilingual alignment between taxonomies/terminologies, the aim is to test semantic indexing facilities for improving document search and retrieval services.
Reference	PUB_MUL_TERM_INDEXING
Target release date / Status	Q2/2019
Critical part of target user base	n/a
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not in operational phase

Name of reusable solution to	PMKI platform (operational prototype)
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be produced (for new proposals) or produced (for existing actions)	
Description	<p>An operational prototype of the PMKI web platform (access, knowledge base, knowledge model and a reasonable subset of services) will be available. It will be meant to demonstrate the potential of the interoperability approach in the field of multilingual language resources and can be reused for the eventual implementation of a real production system. Such a platform will be meant for publishing, advertising and accessing linguistic resources datasets.</p> <p>It will be also endowed with specialized services as the following:</p> <ul style="list-style-type: none"> • Language Resources Format Conversion (ex: TBX, zThes); • Dataset Metadata Management (ex: DCAT, VoID, LIME); • Linguistic resources alignments; • Batch-processing of alignments between two resources.
Reference	PUB_MUL_TERM_POC
Target release date / Status	Q4/2019
Critical part of target user base	n/a
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not in operational phase

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	PMKI platform (final system)
Description	The final version of the PMKI platform (access, knowledge base, knowledge model and the according services) will be available.
Reference	PMKI
Target release date / Status	Q4/2020
Critical part of target user base	n/a
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not in operational phase

2.3.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	N/A
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	The service layer of the PMKI platform (see architectural scheme in chapter “scope”) makes use of VocBench 3 for the management of the

Question	Answer
	<p>language resources that will be exposed on the PMKI web platform. VocBench 3 is multilingual platform for collaborative thesaurus management that is also developed in the context of the ISA2 programme. Specific extensions of VocBench have been made to support PMKI in creating and managing datasets to be published on the PMKI platform.</p>

2.3.5.7 Interlinked

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<p>This action contributes to the implementation of the Digital Single Market (DSM).</p> <p>In fact, by providing interlinked multilingual semantic web-oriented datasets, this action aims to provide support to SMEs, in particular the language technology industry, as well as public administrations, for developing multilingual digital services able to overcome language barriers and helps to unlock the e-Commerce and public e-services potential within the EU.</p> <p>The project will also provide the necessary set of tools (algorithms for semantic mapping and a web based dissemination platform), able to set the foundations for the implementation of</p>

Question	Answer
	<p>an open, persistent and sustainable service.</p> <p>Moreover, this action can contribute to the Connecting Europe Facility (CEF) programme, in particular to the Automated Translation (CEF.AT) service, where it can be used for better leveraging data to support customisation and adaptation. PMKI will provide a set of parallel data to build/reinforce machine translation systems, in particular domain specific systems focused on specific terminology and text types for their use case (public procurement terminology, medical terminology, etc.).</p> <p>In general, the availability of such interoperable multilingual datasets represents effective new parallel data that can contribute to improve and/or to further develop existing machine translation systems with gradable machine translation quality for specific domains.</p> <p>PMKI can offer also a good support to human translators providing resources such as dictionaries, thesauri, etc. that can be integrated in their work environments.</p> <p>Also, it can offer the possibility to browse available semantic networks (e.g., EuroVoc, etc.)</p> <p>Finally, the availability of interoperable multilingual datasets will</p>

Question	Answer
	be a good source of data production not only for Machine Translation but for Natural Language Processing applications in general mainly for under-resource languages, thanks to the cross-lingual and cross-collection concepts of datasets.

2.3.6 PROBLEM STATEMENT

The problem of	language barriers due to the 24 official EU languages
affects	the implementation of a European Digital Single market and causes fragmentation and short comings in the economic potential of the EU.
The impact of which is	that almost half of European citizens never shop online in languages other than their mother tongue. Moreover, the access to public e-services is usually restricted to national languages and the richness of EU educational and cultural content is confined within linguistic communities. European SME's are in particular disadvantaged, because the cost of providing services in multiple languages is prohibitive and has a negative impact on their competitiveness.
A successful solution would be	a PMKI, which will contribute to reduce and to secure the investments of the different stakeholders in cross-border e-commerce solutions and related services because part of their implementation could rely on an

agreed, authentic and persistent set of multilingual terminology.

Because the contributions for PMKI will come from different stakeholders (essentially public administrations and bodies of EU Member States, EU Institutions and international organizations) the challenge is to build a system, which empowers the stakeholders to manage the development and evolution of their taxonomies/terminologies on an individual base, but at the same time enables interoperability through alignment and linking.

The only constraint should be that stakeholders have either to adopt the core data model proposed by PMKI or, at least, have to be able to perform the necessary transformations to provide new releases in compliance with the core data model, i.e. in a way that they can easily be uploaded and integrated into the PMKI knowledge base.

The transformation will be supported by the PMKI system.

The problem of	searching heterogeneous legal data sources in a scenario where information is spread in a distributed and multilingual environment
affects	the cross-border expansion of enterprises business. The knowledge of business regulations of a target country, in relation to domestic and European law, as well as the certainty of rights are, in fact, pre-conditions for any enterprise international business expansion
the impact of which is	that enterprises international marketing and growth strategies can be hampered
a successful solution would be	having multilingual language resources endowed with reliable mutual links so that effective multilingual indexing, search and retrieval services can be implemented. This will increase interoperability among legal information systems, as well as provide users with a seamless navigation experience. The PMKI solution will be able to support law accessibility services in different languages and legal systems, thus promoting the knowledge and the uniform application of the law.

The problem of	translation in specialized domains
affects	the accessibility of digital cross-border services
the impact of which is	a barrier hampering the exploitation of digital services in the European Single Market as one of the main contributions for offering new opportunities to citizens and businesses unlocking innovation and potential growth, in particular as far as small, medium-sized enterprises and start-ups are concerned.
A successful solution would be	to use PMKI datasets to support localisation of digital services (for example the reuse of PMKI product taxonomies for the implementation of an e-commerce solution build by a SME).

The problem of	lack of multilingual digital language resources in standardized format
affects	the development of software for multilingual natural language processing (NLP).
The impact of which is	hampering the implementation of multilingual digital services.
A successful solution would be	to use the PMKI datasets, in their standard machine-readable formats, as knowledge base for the implementation of multilingual NLP solutions.

2.3.7 IMPACT OF THE ACTION

2.3.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	PMKI will contribute to the maintenance and extension of multilingual language resources as well as their interoperability. The result will be a public service which spares the language technology industry and public administrations from investing money to build up proprietary multilingual reference systems to support the implementation of their digital services.	After the service will enter in an operational phase	EU Institutions Member States EU language technology industry Terminology community
(+) Savings in time	Similar arguments as the above hold about the possibility to save time for PMKI stakeholders by profiting from PMKI interoperability solutions for managing multilingual language resources and by reusing PMKI datasets.	After the service will enter in an operational phase	EU Institutions Member States EU language technology industry Terminology community
(+) Better interoperability and quality of digital public service	The availability of semantic links between concepts from different multilingual language resources, described by	After the service will enter in an operational phase	EU Institutions Member States EU language technology industry

Impact	Why will this impact occur?	By when?	Beneficiaries
	proper semantic web standards, paves the way to the development of interoperable and high-quality digital services.		Terminology community
(+) Integration	PMKI services will facilitate the development of digital services for the European Digital Single Market.	After the service will enter in an operational phase	EU Institutions Member States EU language technology industry Terminology community
(+) Costs reduction for stakeholders	Stakeholders will greatly benefit from the PMKI services in terms of reduction of investments for maintaining and updating their multilingual digital services. Moreover, the use of semantic web technologies will contribute to costs reduction as for software development and long-term sustainability of the digital services.	After the service will enter in an operational phase	EU Institutions Member States EU language technology industry Terminology community

2.3.7.2 User-centricity

PMKI services are addressed to different kinds of users, which can be mainly distinguished into data contributors and data consumers.

Data contributors are basically public administrations managing specific vocabularies or taxonomies around which are used to support their web services (organisation, classification...).

The extension of the operational scenarios in the context of globalization causes a natural demand of cross-border extensions of such services and, in consequence, a need for multilingualism and interoperability.

PMKI will be able to support the implementation of such services, allowing data contributors to upload and share language resources, harmonize their technical formats, localize them in different languages, as well as linking and aligning them with other resources in order to establish interoperability between digital services.

Another typology of users is represented by data consumers, having the possibility to access PMKI data in order to build or expand digital services to become cross-border. Such users can benefit from PMKI because it allows them to improve or to obtain language resources that are necessary to develop multi-lingual, interoperable, open standard-based digital services. For this community, the project aims to play the role of a “market place” of controlled vocabularies, with language localization and aligning facilities.

In this respect PMKI can represent the foundation for providing services for different groups of stakeholders, in particular for public administrations, businesses and, as a consequence, for the citizens exploiting such services.

2.3.8 EXPECTED MAJOR OUTPUTS

Output name	Governance structure
Description	Proposal for an adequate governance structure for the supervision of PMKI.
Reference	PUB_MUL_TERM_GOVERNANCE
Target release date / Status	Q3/2017

Output name	Implementation strategy
Description	Proposal of an iterative implementation strategy in order to prepare the political decision about whether the EU institutions will support the implementation

	of PMKI and, if yes, how the system should be managed and financed.
Reference	PUB_MUL_TERM_STRATEGY
Target release date / Status	Q4/2019

Output name	Community building
Description	Proposal for implementation and organisation of a community (contributors, users...) to drive the further evolution of the system and of the language resources.
Reference	PUB_MUL_TERM_COMMUNITY
Target release date / Status	Q4/2019

Output name	PMKI platform
Description	Fully operational PMKI platform, implemented in the public cloud.
Reference	PMKI
Target release date / Status	Q4/2020

2.3.9 ORGANISATIONAL APPROACH

2.3.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
EU Institutions	European Parliament DG TRAD, Terminology Coordination Commission DIGIT DG DGT DG CONNECT Publications Office of the EU	Execution and governance. Collection of requirements and data.
International organisations	FAO	Collection of requirements and

Stakeholders	Representatives	Involvement in the action
		data.
Member States	Public administrations	Collection of requirements and data
Language technology industry	For example the companies represented by the LT innovate Association	Collection of requirements
Research community	Universities and research institutions that are active in this area	Collection of requirements and data

2.3.9.2 Identified user groups

- Member States (public administrations involved in “internationalisation” and “eGovernment” initiatives)
- Implementers of eGovernment solutions
- European Institutions and bodies
- Language Technology Industry and their customers
- Citizens
- Candidate countries, EFTA and other countries (public administrations involved in “internationalisation” and “eGovernment” initiatives)
- Research community.

2.3.9.3 Communication and dissemination plan

The following table presents the communication plan of the action based of the different beneficiaries/interest groups, which have been identified.

The existing platforms of the ISA² programme in the domain of language technology are taken into account for the set-up of an adequate communication platform.

Beneficiaries	Communication channel	Frequency
EU economy	Web (information about the activity on the ISA ² website and newsletter, Joinup, publicity on the Publications Office and other EU Institutions websites)	Regular updates during the lifetime of the project.
EU language	Web (information about the activity on	Regular updates during the

Beneficiaries	Communication channel	Frequency
technology industry	the ISA ² website and newsletter, Joinup, publicity on the Publications Office and other EU Institutions websites) Conferences (delivery of presentations, posters and papers)	lifetime of the project. 1 to 2 conferences per year
Member States	Web (information about the activity on the ISA ² website and newsletter, Joinup, publicity on the Publications Office and other EU Institutions websites) Workshops (organisation of dedicated workshops with interested Member States)	Regular updates during the lifetime of the project. 1 to 2 workshops per year
EU Institutions	Meetings Workshop (organisation of dedicated workshops with interested services)	Regular meetings of the EU institutional stakeholders 1 to 2 workshops per year
Terminology community	Conferences (delivery of presentations)	1 to 2 conferences per year
Semantic Web community	Conferences (delivery of presentations: SEMIC, dedicated conferences...)	1 to 2 conferences per year

2.3.9.4 Key Performance indicators

For 2020, the following key performance indicators are targeted:

Description of the KPI	Target to achieve in 2020	Expected time for target
Meetings held with stakeholders (institutions, research community, language technology industry)	12	Q4/2020

Description of the KPI	Target to achieve in 2020	Expected time for target
Participation in external events (conferences, workshops)	8	Q4/2020
Steering Committee meetings	2	Q4/2020
Deliverables	3	Q4/2020

2.3.9.5 Governance approach

The governance of the execution of the ISA² action itself is ensured by a Steering Committee composed of the associated EU Institutions and services.

The Steering Committee is involved in the supervision of the PMKI activities and in the assessment of its results, as well as in the definition of the further evolution of the system.

The proposal of a governance approach for the management of the PMKI platform in a real production context is one of the deliverables of the ISA² action.

The future PMKI governance structure has to be set up in a way that the interests of all the different stakeholders are represented.

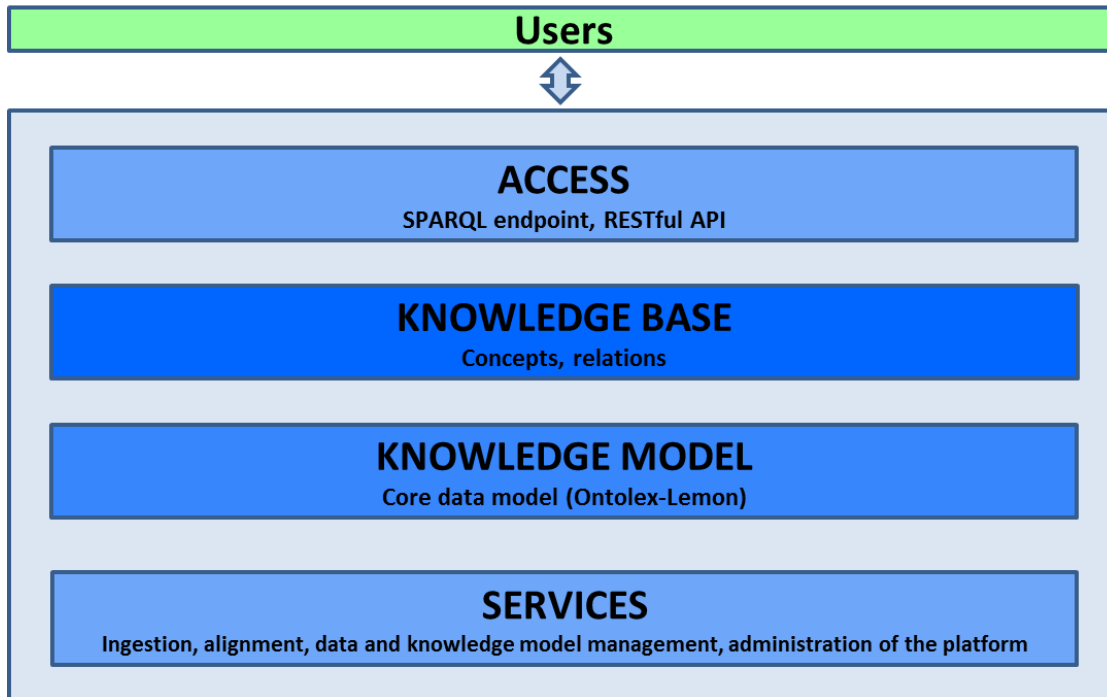
Taking into account the usefulness of PMKI services for EU institutions, public administrations and Language Technology industry, representatives of these groups of stakeholders should be represented in the PMKI governance structure.

This proposal will be discussed with a representative subset of potential of the final system stakeholders.

2.3.10 TECHNICAL APPROACH AND CURRENT STATUS

PMKI platform

The schema below shows a simplified conceptual view of the architecture of the PMKI platform.



The current status of the implementation of the different layers is as following:

- **Access**
The initial version of the main components of the access layer have been implemented: a Web interface, a SPARQL endpoint and a RESTful API.
The Web interface supports the display of the different datasets and their metadata as well as the visualisation of the individual concepts and their relationships. A graph view provides the final user with additional browsing possibilities. Users are also able to perform a search across all available datasets. In addition, alignments can be inspected through the Web interface.
- **Knowledge Base**
The Knowledge Base has been implemented as a triple store that is able to store all datasets that are accessible and reusable through the PMKI platform. The datasets are prepared in the “services” layer and propagated to the knowledge base if the quality is considered as sufficient.

The development of the tools supporting the automatic alignment between thesauri based on Natural Languages Processing is well advanced and the results are promising (~89% of accuracy for the alignment between EuroVoc and Eclas and ~92% of accuracy for the alignment between Eurovoc and the STW Thesaurus for Economics). The alignment tools will be made available as independent service on the platform.

▪ **Knowledge Model**

A Core Data Model based on existing standards (Ontolex-Lemon) has been elaborated and has been successfully reviewed by external experts. It is the underlying knowledge model of the “knowledge base”.

The PMKI platform itself is able to manage data represented in SKOS, SKOS-XL and Ontolex-Lemon.

▪ **Services**

The work on the “services” layer (Back office) is well advanced. VocBench, a knowledge management system for multilingual vocabularies, has been selected for the management of the datasets and the knowledge model. VocBench has been extended to be able to cope with the specific requirements of the PMKI platform, i.e. the support of Ontolex-Lemon on top of RDFS, OWL, SKOS and SKOS-XL. Integration between VocBench and the alignment service is foreseen.

Additionally, independent transformation and publication services will be integrated in the platform.

The “services” layer is completed by a set of administration services for the setup of the platform, integration of new datasets etc.

Communication and dissemination activities

The Publications Office participated in several workshops and conferences (Language Technology Industry Summit, JIAMCATT, etc.) to present the PMKI platform and to invite Language Technology stakeholders to become member of the PMKI governance structure. Eight scientific papers have been elaborated and submitted, where seven have already been accepted.

On the 4-5 June 2019, the Publications Office organised a successful 2-days workshop in Luxembourg entitled “Semantic interoperability for the multilingual web”. One of the main objectives of the workshop was to gather experts and professionals from academy, public administration and Language Technology industry to promote the PMKI platform and to assess its relevance and orientation.

The main outcomes of the workshop are the following:

- The approach and achievements of the PMKI project are “state-of-the-art”.

- The interest of the Machine Translation and terminology communities in PMKI (resources and results) has been confirmed.
- The initiative to create a PMKI community for sharing both problems and solutions has received a positive feedback.
- There are interesting collaboration perspectives with member states and institutions.

The collaboration with external stakeholders has been established (mainly with Language Technology industry and with public organisations in Member States).

Summary and outlook

In conclusion, the current achievements could be summarised as follows:

- A core data model based on Ontolex-Lemon and a first set of extensions have been defined and validated by external experts (including documentation).
- The technical architecture of the PMKI platform has been defined and validated by external experts.
- A proposal for an adequate government structure has been elaborated.
- The feasibility study for the enhancement of the semantic capabilities of the platform has been completed.
- The implementation of the operational prototype of the PMKI platform is well-advanced. An intermediate version has been presented to the Steering Committee in June 2019 and has been tested by the Publications Office.
- The communication and dissemination activities are proceeding as scheduled.
- The key performance indicators targeted for 2016, 2017 and 2018 as well as for Q1-Q2/2019 were achieved.

The current results of the action and their recognition by potential stakeholders confirm that there is a strong interest in a PMKI platform as a public service. In particular, the combination of multilingual assets from different origins (EU Institutions, international organisations, public administrations and well-recognised public resources on the Web) will create the conditions for a long-term sustainability of the PMKI platform. In consequence, the final system will be installed as a public service in the cloud. It will be managed by the Publications Office and it will be open for contributions of external partners that will also be involved in the governance of the platform.

2.3.11 COSTS AND MILESTONES

2.3.11.1 Breakdown of anticipated costs and related milestones

N.B.: All milestones marked in grey have been achieved.

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
Inception	Project organisation has been set-up	60		Q3/2016	Q4/2016
Execution	Standard representation has been adopted	50		Q4/2016	Q1/2017
Execution	Core data model and a first set of extensions have been defined (including documentation)	150		Q4/2016	Q4/2017
Execution	Technical architecture has been defined	50		Q2/2017	Q1/2018
Execution	Proposal for an adequate governance structure has been defined	50		Q1/2017	Q3/2017
Execution	First release of the system (operational proof of concept)	300		Q3/2018	Q4/2019
Execution	Proposal for the implementation	60		Q1/2019	Q4/2019

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
	strategy				
Execution	Creation of the community	60		Q4/2018	Q1/2021
Execution	Feasibility study for the enhancement of the semantic capabilities of the platform	70		Q3/2017	Q4/2018
Execution	Feasibility study on multilingual semantic indexing	50		Q2/2018	Q4/2019
Execution	Industrialization	140	ISA	Q4/2019	Q3/2020
Execution	Functional enhancements	140	ISA	Q2/2020	Q4/2020
	Total	1350			

N.B.: A first phase of the industrialisation will be financed by the budget of 2019. I.e. the budget requested for 2020 should cover the remaining part of the industrialization (50 KEUR), supplementary project management support for the period Q2/2020-Q1/2021 and the implementation of functional enhancements that have been identified in the discussions with stakeholders.

2.3.11.2 Breakdown of ISA2 funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Inception/execution	160	160
2017	Execution	244	244
2018	Execution	320	320
2019	Execution	376	266
2020	Execution	250	

2.3.12 Planning for the tendering procedures to be launched for the action

Call for tenders foreseen Global amount in KEUR	Call for Tenders Duration in years	Indicative planning of publication (QX/YYYY)

The development of the operational prototype will be covered by existing framework contracts.

2.4 INTEROPERABLE METADATA AND PROCESSING COMPONENTS FOR OPEN SOURCE INFORMATION MINING (2018.02)

2.4.1 IDENTIFICATION OF THE ACTION

Service in charge	Text and Data Mining Unit Directorate I: Competencies DG Joint Research Centre Ispra, Italy
Associated Services	

2.4.2 EXECUTIVE SUMMARY

The use of public information sources is crucial for the mission of many public authorities. A good example is how open source information can support investigations in law enforcement, immigration and customs authorities. However, the amount of data requires the use of automated tools. Several national public authorities have invested in a composite software tool chain for open source information processing. These tool chains are a mix of commercial, bespoke and open source components. Due to a lack of common metadata standards, however, software components (including the underlying resources used by them) of one Member State (MS) authority are often not interoperable with components and services of other MS authorities leading to a lack of reuse. Thus, many authorities expensively buy or develop software components that already exist in other MS.

The needed tool chains are always a mix of tools that are specific to the mission of the authority and tools or services which are generic. The generic components have an enormous potential for reuse. However, due to a lack of coordination and technical standards a common approach to reuse is missing with the following consequences:

- Duplication of same functionality
- Different input and output data standards
- Components from other MS authorities cannot be reused
- Knowledge bases and resources created by one authority cannot be reused by authorities in other MS without substantial effort
- Overly long time to adopt or introduce new software functionality

The dynamic evolution of Internet services providing open source information calls for a pragmatic, agile approach in software development and purchasing. Classical multi-year IT

projects are often not a good fit because they do not adapt fast enough to the changing requirements and work environments in this field.

In 2018 and 2019, the action has addressed these challenges and developed core components, a demonstrator application and a set of best practice standards. The action has shared the outputs with its MS stakeholders. For 2020, the action plans to advance the results with the following tasks:

- Improve user centricity by investing in training material and the usability of core components
- Validate and improve interoperability with existing MS and stakeholder processing environments
- Create a sustainable community around the action's outputs with MS and EU stakeholders

The JRC is willing to sustain the action's results and further development after the end of the ISA² program as part of its portfolio of software tools it is sharing with MS states authorities.

2.4.3 OBJECTIVES

The main objective of the action is to develop interoperable standards in the domain of processing open source information in order to facilitate and reduce the costs of public service organisations carrying out developments in this context. The action has met its specific objectives of the 2018 and 2019 work plan:

- Developing a demonstrator application in collaboration with stakeholders
- Defining a set of metadata standards to facilitate the interchange of software components in the field of open source information processing,
- Defining guidelines on how to adapt existing tools relevant for open source information processing and assemble them into composite applications (e.g. processing tool chains),
- Creating a set of freely available and interchangeable software components for open source information processing compliant with the aforementioned standards,

The action plans for 2020 the following objectives:

- Communicate action results using ISA²' communication channels
- Create training material and documentation to improve usability and user centricity
- Contribute training material to ISA²'s Interoperability Academy
- Validate interoperability of core components with stakeholder environments and improve where needed

- Create sustainable long-term community around the action’s outputs and make them available to EU and MS authorities

With regard to ISA² principles, the envisaged activity, using a holistic approach, will contribute to the development of interoperable cross-border and cross-sector solutions and guidelines for assembling open source information processing application that will indirectly support various Union policies.

2.4.4 SCOPE

The goal of the action is to build upon existing standards wherever possible. Existing standards may have to be adapted in a way that simplifies their use. Often this approach is already foreseen by existing standards in creating so-called profiles, which leave out certain parts.

Only where there is a clear gap in existing standards new development, built to fit into the landscape of existing standards, is needed. In other words, the action does not intend to develop “yet another set of standards”.

The activities required to choose existing standards, adapt them and fill potential gaps are part of the action’s plan.

2.4.5 ACTION PRIORITY

2.4.5.1 Contribution to the interoperability landscape

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan</i> 	<p>Recently, an ever-growing exploitation of open source information by many MS authorities across different sectors and borders can be observed. Member States are often forced to develop costly solutions for processing open source information from scratch. This action will boost development of interoperable metadata data standards to facilitate the interchange of software components in the field of open source information</p>

Question	Answer
<p><i>and/or</i></p> <ul style="list-style-type: none"> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>processing, including underlying resources, and will provide a pool of freely available (ideally open source) software components compliant with the aforementioned standards. In particular, the action will involve contribution from a wide range of MS organisations in the process of analysis and design of the data standards and evaluation of the resulting software components through testing a pilot application. The resulting data standards, software components and related reports and guidelines will be available through a publicly open web portal that will facilitate information exchange.</p> <p>Furthermore, the envisaged developments are highly related to other EU policy areas requiring interoperability. For instance, various communications of the European Commission emphasized the need to improve the cross-sectoral interoperability of EU information systems⁵⁵ (law enforcement,</p>

⁵⁵ (1) EU Agenda on Security : COM (2016) 205 “Stronger and Smarter Information Systems for Border and Security”, (2) Communication from the Commission to the European Parliament and the Council: Overview of information management in the area of freedom, security and justice.URL: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0385:FIN:EN:PDF>, (3) Regulation of the European Parliament and of the Council establishing a European Travel Information and Authorisation System (ETIAS) and amending Regulations (EU) No 515/2014, (4) DIRECTIVE (EU) 2016/681 of the European Parliament and of the Council of 27 April 2016

Question	Answer
	immigration, customs, etc.), where exploitation of open source information plays an ever-growing role as well since it needs to be jointly processed and analysed with other types of data. Therefore, alignment of the open source information processing chains with respect to interoperability with the aforementioned systems is of paramount importance and will be taken into account.
<i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i>	There are certain existing metadata standards. Often more than one for a specific purpose. However, it is needed to select a set interoperable metadata standards and pools of compliant software components for processing open source information that are agreed on the EU level

2.4.5.2 Cross-sector

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	Provided that the activity will turn out successfully it will pave the way towards a set of common metadata and component access standards for processing open source information. Cross-sectoral interoperability aspect is embraced through diversifying the

on the use of passenger name record (PNR) data for the prevention, detection, investigation and prosecution of terrorist offences and serious crime. URL: <http://eur-lex.europa.eu/eli/dir/2016/681/oj>

Question	Answer
	<p>range of end-user organisation participating in the activity. Finally, once developed, the common standards will also indirectly contribute to the improvement of the interoperability of EU information systems across various domains (law enforcement, customs, border control, migration, etc.), in whose context exploitation and sharing of open source information, whether processed or in raw format, is deemed to play an increasing role.</p>

2.4.5.3 Cross-border

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<ol style="list-style-type: none"> 1) Administration to Administration: The new set of standards will allow re-using existing processing components. For example processing of text for tax administration purposes can be shared across European MS authorities. 2) Administration to Business: A set of standards facilitates the procurement of bespoke or off-the-shelf components from commercial providers. Again with the ability to be shared between authorities.

2.4.5.4 Urgency

Question	Answer
<p><i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i></p>	<p>The action as such is not urgent. However, since many MS authorities are currently investing or plan to invest into solutions for open source processing the action proposal has higher impact if implemented now than at a later stage. While there is no specific EU policy related to the exploitation of open source information, it has been widely acknowledged across different domains and in various countries that open source information often constitutes relevant complementary information in the decision making processes of whatever kind, or it constitutes the only available information on certain topic/entity etc. Many organisations, which started or plan to exploit open sources as a crucial source of information, stumble across both budgetary and technical issues (including, i.e., interoperability problems) that prevent them from taking the full advantage of open source information. Thus, creation of common standards and a pool of freely available components for assembling open source information processing pipelines would alleviate the situation enormously. Furthermore, it would allow to</p>

Question	Answer
	immediately benefiting those organisations, which are at an early stage of considering exploitation of open source information.
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	This project matches the ISA ² goals. No other sources envisage funding of such an activity.

2.4.5.5 Reusability of action's outputs

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Training material such as a quick start guide and introduction to core components.
Description	Create training material on how to get started in assembling a composite application based on core processing components. Training material shall be created with re-use for the action 2019.01 Interoperability Academy in mind.
Reference	
Target release date / Status	Q2 / 2020
Critical part of target user base	Public services in Member States and EU organisations

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Validate interoperability aspects of core components with selected stakeholder processing environments. Improve interoperability where necessary.
Description	Stakeholders might have different processing environments where the interoperability with the actions core processing components needs to be validated and where necessary improved
Reference	
Target release date / Status	Q3 / 2020
Critical part of target user base	Public services in Member States and EU organisations

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Create a sustainability concept with stakeholders that defines governance and further development of the action's outputs beyond the end of the funding period.
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Description	The JRC plans to sustain the outputs as part of its solution portfolio. However, a governance concept is needed to define and secure involvement of external stakeholders and users.
Reference	
Target release date / Status	Q4 / 2020
Critical part of target user base	Public services in Member States and EU organisations

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Registry of available processing components
Description	A description of available processing components which are commercial, open source or available from MS authorities for sharing
Reference	2018.2 Action's Joinup Page ⁵⁶
Target release date / Status	Q4 / 2018
Critical part of target user base	Public services in Member States and EU organisations

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Existing Metadata Standards to be adopted for open source information processing applications
Description	Report of existing metadata standards and missing standards for definition
Reference	2018.2 Action's Joinup Page
Target release date / Status	Q4 / 2018

⁵⁶ <https://joinup.ec.europa.eu/collection/isa-action-201802-processing-open-source-data-exchangeable-components>

Critical part of target user base	Public services in Member States and EU organisations
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Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Metadata and Interoperable Components for Open Source Information Processing
Description	Report with project result: Adopted and newly designed standards, component access guide lines
Reference	2018.2 Action's Joinup Page
Target release date / Status	Q3 / 2019
Critical part of target user base	Public services in Member States and EU organisations

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Core Components for Open Source Information Processing
Description	Pool of Runnable software components, with documentation and source code repository
Reference	2018.2 Action's Joinup Page
Target release date / Status	Q4/2019
Critical part of target user base	Public services in Member States and EU organisations

2.4.5.6 Level of reuse of existing solutions

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	The proposal aims to make use of the work done in ISA's Core Data and PM ² solutions. Training material should be made

Question	Answer
	available to 2019.01 Interoperability Academy

2.4.5.7 Interlinked

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	By the end user community it addresses it contributes directly to the Security Union as part of the Justice and Fundamental Rights priority.

2.4.6 PROBLEM STATEMENT

The problem of	Fragmented, non-coordinated, and redundant efforts across sectors and borders in the context development of IT tools for processing open source information by public organisations
affects	Technical interoperability and reuse of existing solutions.
the impact of which is	Increased Time needed by an organisation to develop and introduce new software functionality for processing open source information
a successful solution would be	Definition of metadata standards to facilitate the interchange of software components in the field of open source information processing and establishing guidelines to adapt existing tools and resources and assemble them into composite applications. Creation of a pool of generic and freely

	available interchangeable software components compliant with the standards.
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The problem of	Incompatibility of metadata standards and interfaces in the context of IT tools for processing open source information
affects	Capacity to reuse of existing open source information and relevant resources created by other institutions
the impact of which is	Knowledge bases and resources created by one authority cannot be reused by authorities in other Member States without substantial effort
a successful solution would be	Definition of metadata standards to facilitate information access and exchange in the field of open source information processing

2.4.7 IMPACT OF THE ACTION

2.4.7.1 Main impact list

The beneficiaries of the project are MS authorities and EU/international organisations that use open source information for their daily tasks. Especially users in law enforcement, customs, finances, public health are primary beneficiaries.

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	The availability of freely available core components for assembling open source information processing pipeline will reduce the expenditures	Q1/2020 onwards	Member States and EU/international organisations
(+) Savings in time	The availability of freely available core components and guidelines for assembling open source	Q1/2020 onwards	Member States and EU/international organisations

Impact	Why will this impact occur?	By when?	Beneficiaries
	information processing pipeline will speed up the development process and potentially eliminate some procurements on the end-user side.		
(+) Improved cross-border and cross-sector exploitation and reuse of existing open source information	Through introduction of common metadata standards and corresponding APIs access and sharing of information will be easier	Q1/2020 onwards	Member States and EU/international organisations
(+) Improved interoperability at EU level	Due to consideration in the action metadata formats of the EU-level It systems conversion and integration of open source information in the related workflows will be easier	Q1/2020 onwards	Member States and EU/international organisations

2.4.7.2 User-centricity

The action will be strictly end-user driven, in particular, one will aim at involving possibly high diversity of end users with respect to different sectors and countries being involved. Information of the specific workflows related to processing open source information by end user will be collected at a very early stage of the project in order to best embrace end user needs in the scope of the planned activities and developments. A network of end-users will be established in order to safeguard end-user interests and sustainability of the to-be-developed deliverables and steer potential future developments.

2.4.8 EXPECTED MAJOR OUTPUTS

Please see major outputs already listed in 2.4.5.5.

Output Name	Pilot Application
Description	Pilot composite application using core components for open source information processing
Reference	
Target Release Date / Status	Q4/2019

2.4.9 ORGANISATIONAL APPROACH

2.4.9.1 Expected stakeholders and their representatives

The JRC has created a community of practice for Open Source Information exploitation with yearly meetings. The community is comprised of MS authorities, EU institutions and international organisations. The community as such will be brought in as a stakeholder. The following organisations have explicitly expressed support for the action:

Stakeholders	Representatives	Involvement in the action
Authority for Consumers & Markets, The Netherlands	Menno Israel	Provision of expertise in analysis, design and evaluation of the deliverables
Financial Investigation Service of the Tax Authority, The Netherlands	G.H. De Grutter	Provision of expertise in analysis, design and evaluation of the deliverables
Tax Authority, Denmark	Michael Krogh Jacobsen	Provision of expertise in analysis, design and evaluation of the deliverables
HS Leiden, Forensics Institute	Jos Griffioen	Provision of expertise in analysis, design and evaluation of the deliverables
Swedish Tax Agency	Joanna Kozakiewicz	Provision of expertise in analysis, design and evaluation of the deliverables
Dutch Customs	Liesbeth Kremer	Provision of expertise in analysis,

Stakeholders	Representatives	Involvement in the action
Administration		design and evaluation of the deliverables
Joint Research Centre	Bertrand de Longueville	Provision of expertise in open source information processing tools and standards development. Action management

2.4.9.2 Identified user groups

- Member State public service organisations (law enforcement, customs, tax, public health, etc.)
- EU Communities of Practice (e.g., ENLETS – European Network for Law Enforcement Technologies and Services)
- EU Institutions (COMM DGs, EU Agencies, etc.)
- International Institutions (e.g., International Criminal Court, IAEA)

2.4.9.3 Communication and dissemination plan

Both online and offline communication channels will be used. A web-based information sharing platform will be established to:

- a) report on the action progress,
- b) disseminate information on the deliverables,
- c) gather end-user feedback,
- d) facilitate information exchange between the different stakeholders involved.

For 2020 the action plans to improve communication using the ISA² communication channels such as the ISA²'s website and newsletter.

At the end of the project a workshop to present the outcomes will be organised. This workshop will be used to set up a post-action dissemination plan to inform other relevant communities will be elaborated with the participating end-users. Furthermore, on-site trainings and workshops to MS authorities will be organised. Finally, ISA² Member States-network will be exploited for action result dissemination.

2.4.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected delivery (months after kick-off)
Level of end-user interest with respect to the definition of the project	Participation of at least 15 experts from different authorities and countries to define the scope of the	M +1

Description of the KPI	Target to achieve	Expected delivery (months after kick-off)
	project	
Level of end-user satisfaction with the respect to the report on “Overview Existing Metadata Standards”	An average level of 4 in a scale from 1 (not satisfied) to 5 (very satisfied) in an end-user survey	M +6
Level of end-user satisfaction with the respect to the report on “New Metadata Standards and Component Access Defined “	An average level of 4 in a scale from 1 (not satisfied) to 5 (very satisfied) in an end-user survey	M +12
Level of readiness of the Core Components developed	At least 5 MS authorities have adopted the deliverables for operational work	M +18
Level of interest of end-user community in the events dedicated to the dissemination of the outcomes of the activity	At least 20 experts from 5 different sectors/countries participating in the result dissemination events	M +24

2.4.9.5 Governance approach

The project management board will be composed of the Head of the Text and Data Mining Unit of the Competencies Directorate of DG JRC, project manager Text and Data Mining Unit of the Competencies Directorate of DG JRC, and one representative from each participating Member States or other EU/international organisation. The board will meet 3 times during the execution of the project (at the beginning, at the end of 2018 and at the closing). Additional meetings could be organised if deemed necessary. An electronic web-based platform for monitoring the progress of the project and facilitation of the communication of the project management board will be put in place.

Since the continuous participation of the end-user community is crucial for accomplishing the goals of the project a pool of reserve end-user organisations will be maintained in case of unexpected resignation of the partners that agreed to participate in the project. This pool will

be centred on the expert OSINTcommunity, comprised of EU and MS officials, created within the last 10 years by DG JRC.

2.4.10 TECHNICAL APPROACH AND CURRENT STATUS

The project is structured into separate interlinked phases. After project initialisation with the main goal of setting up a stakeholder group, the main project phase is an iterative design and implementation phase to minimize risks and optimizes results with immediate stakeholder feedback. Finally, in the Closing/Evaluation phase the project results are presented and limited on-site trainings are provided to interested MS authorities. The various phases are detailed below.

1. **Initialisation Phase:** Take stock of state of play, form stakeholder group
 - a. Take stock of currently used open sources information processing workflows to define state of play (data standards and software used) and best practices
 - b. Create a stakeholder group of interested MS authorities, research and education institutions and EU partners willing to participate, give feedback and test the results in practice
2. **Definition Phase:** Define scope of project with stakeholders
 - a. Create a registry of used existing components which can potentially be shared or adapted for interoperability
 - a. Create a list of already used metadata standards
 - b. Create a list of missing standards and components with the greatest potential for reuse
3. **Execution Phase:** Design and Implementation
 - a. Develop best practice blue print pilot application which demonstrates how software components can be assembled
 - b. Based on the pilot application, define data formats and component access (see Annex 1 for detailed description)
 - i. Analyse existing metadata standards to be adopted or amended, find missing ones (gap analysis)⁵⁷.
 - ii. Define missing metadata formats for component interoperability
 - iii. Define guidelines on how to adopt existing or newly developed software components to be interchangeable⁵⁸.

⁵⁷ There are already several metadata standards, most notably the European Commission's ISA Core Vocabularies (see https://ec.europa.eu/isa2/solutions/core-vocabularies_en) which can be adopted as underlying basis.

⁵⁸ As far as possible reuse of existing approaches, such as REST-like interfaces for loosely coupled internet applications.

- c. Verify approach of blue print pilot by implementing set of core processing components
 - i. Develop set of software components (proof of concept) for open source information processing to be shared with MS authorities and EU institutions⁵⁹
 - ii. Develop best practice for easy distribution and sharing of pilot and components with and between stakeholders
- d. Continuously gather feedback from stakeholders to minimize risks and maximise applicability of results
- 4. Closing/Final Evaluation Phase:
 - a. Present project results to interested MS authorities and EU institutions at a workshop
 - b. Disseminate project results and carry an evaluation thereof through on-site trainings/workshops to/for MS authorities
- 5. Elaboration, Dissemination and long term Sustainability
 - a. Create further training material to foster dissemination beyond core stakeholder group
 - b. Validate interoperability and improve where necessary using stakeholder processing environments
 - c. Present action results at JRC and MS workshops to create sustainable community

It is important to emphasize that the Definition and Execution phase will also encompass studying the latest developments in the context of EU-level security-related IT systems⁶⁰ and existing EU customs-related information exchange platforms (e.g., CIS, FIDE)⁶¹ in order to safeguard interoperability therewith whenever applicable. In addition, recently introduced and future envisaged data exchange formats at EU level for sharing security-related

⁵⁹The JRC has already developed certain components which can be shared.

⁶⁰ Communication from the Commission to the European Parliament and Council. COM (2016) 205. "Stronger and Smarter Information Systems for Borders and Security"

<http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52016DC0205>

⁶¹ Communication from the Commission to the European Parliament and the Council: Overview of information management in the area of freedom, security and justice.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0385:FIN:EN:PDF>

information, e.g., Passenger Name Record (PNR)⁶² or European Travel Information and Authorisation System (ETIAS)⁶³ records, would also be considered if deemed relevant.

⁶² DIRECTIVE (EU) 2016/681 of the European Parliament and of the Council of 27 April 2016 on the use of passenger name record (PNR) data for the prevention, detection, investigation and prosecution of terrorist offences and serious crime. <http://eur-lex.europa.eu/eli/dir/2016/681/oj>

⁶³ Regulation of the European Parliament and of the Council establishing a European Travel Information and Authorisation System (ETIAS) and amending Regulations (EU) No 515/2014

2.4.11 COSTS AND MILESTONES

2.4.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipate d Allocation s (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YY YY)	End date (QX/YY YY)
Initiation and planning	Announcement, Forming Stakeholder Group, Kick-off	10	ISA	Q1 / 2018	Q2 / 2018
Planning	Project Scope Defined	10	ISA	Q1 / 2018	Q3 / 2018
Execution	Management and Supervision	20	JRC	Q1 / 2018	Q4 / 2019
Execution	Review Existing Metadata Standards	25	ISA	Q3 / 2018	Q2 / 2019
Execution	Blue print pilot application	95	ISA	Q4 / 2018	Q3 / 2019
Execution	Define Metadata Standards and Component Access	45	ISA	Q4 / 2018	Q3 / 2019
Execution	Core Components designed and developed	85	ISA	Q1 / 2019	Q2 / 2019
Final Evaluation	Result Presentation	15	ISA	Q4 / 2019	Q4 / 2019
Closing/Final Evaluation	On-Site Trainings and Result Dissemination	15	ISA	Q4 / 2019	Q4 / 2019
Elaboration,	Training material	50	ISA	Q1/2020	Q2/2020

Dissemination and Sustainability					
Elaboration, Dissemination and Sustainability	Validate with stakeholder environments	50	ISA	Q1/2020	Q4/2020
Elaboration, Dissemination and Sustainability	Create sustainable community and governance concept	30 10	JRC ISA	Q1/2020	Q4/2020
	Sums	ISA²: 410 JRC: 60 Total: 460			

2.4.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2018	Initiation and planning	20	
2018	Execution	125	
2019	Execution	125	
2019	Closing/Final Evaluation	30	
2020	Elaboration and Dissemination	110	

2.4.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
Letter of Support from Stakeholders	Are(2019)5354433	<ul style="list-style-type: none"> • Letter of Support, NL Tax • Letter of Support, DK Tax • Letter of Support, NL Consumer Market Authority • Letter of Support, NL HS Leiden

Description	Reference link	Attached document
		Forensics Institute <ul style="list-style-type: none">• Letter of Support Swedish Tax Agency• Letter of Support Dutch Customs

3 ACCESS TO DATA / DATA SHARING / OPEN DATA

3.1 SHARING STATISTICAL PRODUCTION AND DISSEMINATION SERVICES AND SOLUTIONS IN THE EUROPEAN STATISTICAL SYSTEM (2016.06) – FUNDING CONCLUDED

3.1.1 IDENTIFICATION OF THE ACTION

Type of Activity	Common services
Service in charge	ESTAT.A3
Associated Services	ESTAT.B1 ESTAT.B5

3.1.2 EXECUTIVE SUMMARY

European statistics are produced by the European Statistical System (ESS) that is a partnership between the Commission (Eurostat), and the public administration responsible for the production and dissemination of official statistics in each Member State⁶⁴ (mainly national statistical institutes (NSIs) as well as other national authorities). Member States collect data and compile statistics for national and EU purposes. The ESS functions as a network in which Eurostat has a key role to ensure harmonization of statistics working in close cooperation with the national statistical authorities. The ESS members share the same challenges and drivers: they have to embrace the digital transformation as well as to produce new, innovative and high quality standard statistical products under the pressure of limited and decreasing resources.

Based on a long tradition of sharing information, standards and tools, Eurostat and the members of the ESS jointly developed a common vision, the “ESS Vision 2020”⁶⁵, which

- Aims at further developing the cooperation between ESS members;
- Strives for setting up more collaborative production processes based on a shared architecture in the ESS, which should enable addressing new business requirements with a reduced time to market, strengthened quality and increased efficiency;
- Aims in particular at a future-proof dissemination and communication strategy that satisfies user needs at both national and European level, is flexible enough to adapt to emerging technologies and offers a variety of output channels and services.

⁶⁴ and EEA and EFTA countries

⁶⁵ The statistical dissemination has received as well special attention at EC level as external communication is listed as a key domain for cross sector and cross policy IT rationalisation in "[Communication from VP Šefčovič to the Commission: Follow up to the Communication "Getting the best from IT in the Commission" of 7 October 2010 - First decisions in the IT rationalisation process](#)".

Actions of this proposal elaborate on closely related to on-going ESS Vision 2020 implementation initiatives:

1. ESS Enterprise Architecture (ESS EA) – a joint effort to create a comprehensive target state ESS architecture considering both Member States and Eurostat. This allows harmonisation of business processes and bridging the gap between business and IT;
2. “Shared SERVICES” (SERV) – a project to create the conditions for sharing technical statistical services (including dissemination) and supporting their integration in the statistical production processes at national, ESS and Commission level;
3. Digital Communication (DIGICOM) – a programme to develop key capabilities to support user analytics, communication, dissemination, data visualisation, mobile solutions etc.

Part of those initiatives are already funded by Eurostat and some other parts require additional funding – potentially from ISA². ISA² funding is necessary to:

1. Finalise and extend the current **ESS statistical production reference architecture** to get it closer to implementation integrating the information sharing and the interoperability aspects;
2. Develop a sustainable release of **common infrastructure elements** such as the ESS catalogue of shared services;
3. Perform a thorough benchmark of as is architecture in MS to **identify components which can be readily transformed into shared services** as well as mapping the needs and gaps and tentatively define roadmaps for benefiting from shared development;
4. Provide new **reusable services and solutions** based on existing components or certified open source statistical library/components and to allow statistical producer to upgrade their architecture. For **dissemination of statistics, reusable solutions** will be derived from the “renovated Eurostat dissemination chain for statistical dissemination”;
5. Set up **reference implementations of processes using shared services** suitable to various environments and to propose technical architecture patterns and open source environments suitable for integration of service in statistical production.

The results of these actions have been made publicly available for the benefit of a broad range of public administrations that *produce and disseminate statistics*. In particular, the European Commission DG and Agencies of the European Union that collect and disseminate “other” statistics for their policy monitoring could reuse the dissemination packages, should they need so. In this case the cost of integration should be relatively low as the reusable components should operate as well on the generic EC infrastructure.

No budget was foreseen or committed in 2020 for this action. However, further procurements continue running and will come to an end in due course

In the sharing services strand, the task developing reusable services is running a procurement that will deliver two new services and make them available to countries via the Service

Catalogue by the end of September 2019. For the next iteration, two more will be selected to continue the task, The task implementing a new service catalogue will be reactivated through funds from a Eurostat project to implement some of the missing features. The task aiming at implementing shared services in production is about to sign the procurement and will provide first progress in October 2019.

Sustainability of the work done in this strand will be ensured via an Expert Group on Shared Tools which has been started by Eurostat and will involve member countries of the ESS. It will allow to continue engaging this community into collaborating on the maintenance of the Service Catalogue and the selection and implementation of reusable services which will be advertised in this catalogue.

The ESS EA strand will come to end by the end of 2019. The action has delivered according to expectations. In particular, scope adjustments have been done to realize business benefits and to support ESS Vision 2020 project deployment.

3.1.3 OBJECTIVES

Initiative area	Objectives
Enterprise Architecture	<ul style="list-style-type: none"> • Provide a reference architecture for statistical production provisioning for operational, semantic and technical operability of processes and information systems in the European Statistical System
Statistical Data production	<ul style="list-style-type: none"> • Develop the common infrastructure necessary to support sharing of components; • Improve the alignment to ESS reference architecture and adoption of Shared Services standards for at least 5 ESS members; • Support and guide statistical organisations to upgrade their architecture to align to the target state architecture and to benefit from services sharing; • Identify and build shared services based on existing components in use or certified open source statistical libraries.
Statistical Data Dissemination	<ul style="list-style-type: none"> • Deliver reusable services and a packaged solution for the statistical dissemination.

3.1.4 SCOPE

Initiative area	In the scope
Enterprise Architecture	<ul style="list-style-type: none"> • Extension and consolidation of the ESS Statistical Production Reference Architecture (for the 4 layers of EA).
Statistical	<ul style="list-style-type: none"> • Development of a multi-tenant version of the ESS Service

Initiative area	In the scope
Production	<p>Catalogue and related common infrastructure;</p> <ul style="list-style-type: none"> • Support to statistical production organisation to upgrade and align their infrastructure to benefit from shared statistical services; • Establishment of a list of certified and existing components or libraries suitable for the compilation of shared services; • Setting up of a whitelist of architecture patterns and open source components for realising the integration and usage of shared services; • Implementation of new statistical production processes using shared services providing reference implementations adapted to different contexts.
Statistical Dissemination	<ul style="list-style-type: none"> • Development and packaging of reusable solution and services for statistical dissemination

Out of scope
<p>Development of statistical methodologies;</p> <p>Production of statistical data;</p> <p>Standardisation of metadata repositories used by statistical data producers.</p>

3.1.5 ACTION PRIORITY

3.1.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p>	<p>The project contributes to the new EIF and the Interoperability Action Plan by</p> <ol style="list-style-type: none"> 1) developing, maintaining and promoting interoperable solutions for the production and dissemination of statistics by EU public administrations (including the EC) 5EIF (Focus Area 4) 2) developing, maintaining and promoting

Question	Answer
<ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>a) a specification of the EIRA to support better interoperability and cooperation for the production and dissemination of Official Statistics in the European Statistical System</p> <p>b) a common infrastructure and for the exposure and consumption of shared statistical services. (Focus Area 5)</p> <p>In addition, the proposal contributes significantly to the realisation of the ESS Vision 2020 objectives in the domain of sharing tools and improving statistical dissemination.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>The proposal follows an interoperability standard (CSPA) which has been proposed at the level of the Official Statistics Community for the sharing of statistical services.</p>

3.1.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>Yes, in general, the statistical products and services produced, developed and disseminated by the ESS constitute key data and information assets in order to help the Commission achieve its overall political objectives.</p> <p>The realisation of all Commission political priorities as a whole indeed relies heavily on the quality and accessibility of the European statistics</p> <p>In the case of dissemination, solution reuse is already planned in the domains of</p> <ol style="list-style-type: none"> 1. Economics and Financial affairs (DG ECFIN) 2. Taxation and Customs union (DG TAXUD), 3. Employment (DG EMPL), 4. Internal Market (DG GROW), 5. Competition (DG COMP) <p>and could be extended after 2018 to other interested DGs (e.g. potentially EAC, JUST, ENER+MOVE, REGIO ...)</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<p>NA</p>

3.1.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<p>Yes, in the current state, the development of statistical services includes a broad international community.</p> <p>In the ESS, no less than 14 MS are actively involved in a Task Force and a consortium of 6 MS (FR, PT, UK, LT, DE, SI) has been set up to provide input and take part in the development of the guidelines for sharing of statistical services and to implement the reuse of developed solutions and services with the European Commission.</p> <p>In the architecture domain, the ESS reference architecture in its current state has been adopted by the 28 NSI's CIO's and Heads of Methodology. Its improvement towards more interoperability through more standards and deeper architectural guidance is done in collaboration with an ESS EA Board involving 5 MS</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i></p>	<p>NA</p>

3.1.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<p><i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i></p>	<p>All actions of the proposal are key actions for the ESS Vision 2020 implementation which aims among others to upgrade ESS capacity to respond to policy needs by providing high quality and timely indicators for the monitoring of the objectives of EU 2020 strategy.</p> <p>More specifically, several business projects like the European Systems of Business Registers or the National Accounts are in demand of clear interoperability guidance and reusable services ensuring the smooth functioning of their service based target architecture.</p> <p>In addition, in the domain of statistical dissemination, the project has been listed as a critical project for Eurostat, with a strong commitment for the delivery of package solutions to DG ECFIN, TAXUD, COMP, EMPL, GROW.</p>
<p><i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i></p>	<p>A closer integration of production and dissemination of statistics with ISA2 framework will clearly generate economies of scale and sustainability of the results. The financial support of the ISA2 will certainly allow going a step further in the operationalization of the ESS Vision 2020 objectives.</p>

3.1.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

Name of reusable solution	Reusable solution for the dissemination of statistics
Description	<p>Dissemination means the activity of making statistics and statistical analysis accessible to users.</p> <p>The project aims at providing a reusable solution for the dissemination of statistics (cross policy & cross sector) to significantly improve technical interoperability in the fields of statistics, i.e. allowing multiple organisation to expose the same dissemination tools towards data consumers.</p> <p>The dissemination tools included in the solution are based on the established SMDX standards⁶⁶ (information model, guidelines for web services, implementations & tools);</p>
Reference	<p>SDMX Information model</p> <p>See https://webgate.ec.europa.eu/fpfis/mwikis/sdmx/index.php?title=Special:Pdfprint&page=SDMX https://webgate.ec.europa.eu/fpfis/mwikis/sdmx/index.php/Self_Learning_Tutorial:_Information_Model https://sdmx.org/wp-content/uploads/SDMX_2-1-1_SECTION_2_InformationModel_201108.pdf</p>
Target release date / Status	<p>1) For ECFIN, TAXUD, COMP, EMPL, GROW</p> <ul style="list-style-type: none"> • Alpha release delivered in early July 2016 • Beta releases delivered in January 2017 and June 2017 • Release Candidate release to be delivered by end Q3 2017 • Release for production to be delivered by end Q4 2017 <p>2) For ESS and other purposes</p> <p>Available on Joinup by end of 2018 (first publication), as a downloadable package</p>

⁶⁶ <https://sdmx.org/>

Critical part of target user base	Any administration, institution or organisation in need of disseminating statistics
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	<p>The solution is not yet operational</p> <p>Two beta releases of the solution were delivered in the 1st half of 2017 to five DGs for functional tests and validations by those DGs.</p> <p>The five listed DGs should go live after Q4 2017, for COMP, EMPL and GROW before the end of Q1 2018.</p>

Name of reusable solution	Statistical Production Reference Architecture V1.0 and subsequent
Description	<p>Based on the ESS EA RF developed by the ESS, this (ISA2) project will release a fully fledged and ready for implementation Statistical Production Reference Architecture i.e. set of artefacts to standardise EU statistic production processes including information and interoperability aspects. Subsequent releases will be enriched by reference to standard solution and reference implementations. Organisation should use it to benchmark their production architecture, develop services to be shared and integrate shared service in their production of statistics.</p> <p>This Statistical Production Reference Architecture can be re-used by the ESS Members and also by other Commission DG's dealing with official statistics.</p>
Reference	<p>ESS EA RF</p> <p>European Interoperability Reference Architecture (EIRA)</p>
Target release date / Status	SPRA v1.0 (first release) : 30/09/2017
Critical part of target user base	ESS 32 NSIs (EU + EFTA) and Eurostat

For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	The ESS EA RF has been adopted as a common reference for ESS Vision 2020 implementation by 28 NSI CIO's
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Name of reusable solution	Multi-tenant version of the ESS Service Catalogue
Description	Multi-tenancy is an architecture in which a single instance of a software application serves multiple customers. A central ESS Service Catalogue is required to publish the statistical services that are available for re-use in the European Statistical System. This service catalogue should use the same solution as the global (UN sponsored) service catalogue of statistical services (CSPA Service Catalogue). These catalogues shall be based on the same system, but shall clearly indicate the level of availability of the offered statistical services (e.g. ESS level or global level). It shall be also analysed how the ESS Service Catalogue – that contains statistical services according to international standards – can be integrated with the Service Catalogue of the Joinup platform.
Reference	SERV Business Case ESSC 29th meeting minutes
Target release date / Status	31/12/2017
Critical part of target user base	ESS 32 NSIs (EU + EFTA) and Eurostat Other statistical organisations
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution	Reference implementations of statistical production and dissemination processes using shared services adapted to different contexts
Description	The project will identify and prioritise development of shared services within the ESS. 5 new shared services based on existing components or statistical libraries will be implemented during the project and reference point in the ESS catalogue. The shared service will be implemented in the statistical processes of multiple ESS members and bring them process improvements. Furthermore the implementation and integration of those statistical services in several ESS members will lead to improvement of those services, which will allow easier adoption by further organisations.
Reference	TF Shared Services Mandate
Target release date / Status	31/12/2019
Critical part of target user base	ESS 32 NSIs (EU + EFTA) and Eurostat
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution	White list of open source packages for statistical production business functions and for integration and orchestration of statistical productions
Description	Re-using services can be based on services developed by other statistical organizations and also on open source. This work package will leverage the open source solutions for statistical production and for process orchestration.

Reference	SERV Business Case ESSC 29 th meeting minutes
Target release date / Status	31/12/2019
Critical part of target user base	ESS 32 NSIs (EU + EFTA) and Eurostat Other statistical organisations
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution	Technical architecture patterns for realising the ESS EA
Description	The analysis of open source software packages and the benchmark of MS architectures will produce a number of technical architecture patterns for realising the target state architecture. This will enable MS's to make practical decisions to start implementing the architecture in full scale. These architecture patterns will also be available and beneficial to other producers of statistics such as parts of the Commission.
Reference	CSPA
Target release date / Status	31/12/2018
Critical part of target user base	ESS 32 NSIs (EU + EFTA) and Eurostat
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	
Name of reusable solution	Fit / Gap Analysis and roadmaps for the transition to a target state architecture
Description	As part of the project, 4 specific architecture have been improved (data validation, business register

	<p>interoperability architecture, linked open data dissemination, data management). This was used to benchmark the maturity of large number of ESS members and to identify sensible next steps for improving maturity and interoperability ..</p> <p>The experience can be used by other organizations as examples for transitioning to a modernised architecture, which should lower barriers and increase the likelihood of successful realisation of the ESS EA.</p>
Reference	
Target release date / Status	31/12/2019
Critical part of target user base	ESS 32 NSIs (EU + EFTA) and Eurostat
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

Name of reusable solution	Inventory of reusable software components for statistical production
Description	The benchmark of the Member State architectures will identify and qualify a various solutions and services that can be made available to the ESS community and potentially outside the ESS
Reference	
Target release date / Status	31/12/2018
Critical part of target user base	ESS 32 NSIs (EU + EFTA) and Eurostat
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	

3.1.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<p><i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i></p>	<p>Joinup The reusable statistical services delivered by the project will be made available to anyone by means of Joinup; Joinup will serve as a repository for the ESS shared services catalogue where interfaces and service description will be make available in a standard way.</p> <p>EIRA - European Interoperability Reference Architecture EIRA will be used to upgrade the ESS Statistical Production Reference Architecture.</p> <p>DCAT Application Profile for data portals in Europe</p> <p>EIC - European Interoperability Cartography</p> <p>Open data Support(DG CONNECT)</p> <p>Catalogue of Services - Service attributes</p>
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	<p>EUPL - European Union Public Licence The expected applicable license scheme used for the delivery of this project is likely to EUPL</p> <p>EUSurvey EU Survey is used for the publication of surveys and public consultations.</p>

3.1.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union’s initiatives such as the DSM.

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union’s high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	DSM – Open government + Content & Media The reusable solution for the dissemination of statistics can be used by any administration (first EC DGs, in 2018 any organisation through Joinup) to <ul style="list-style-type: none"> • Ease the public delivery of statistical data to consumers, i.e. promoting open data and the reuse of public sector information / statistical data • Reduce the costs of dissemination • Re-use building block(s)

3.1.6 PROBLEM STATEMENT

The problem of	The lack of standards
affects	The exchange of software and statistical data
the impact of which is	Preventing reusability and sharing, increasing costs overall
a successful solution would be	Implement existing standards in the Statistical institutes and across DGs

The problem of	The lack of international collaboration and planning
affects	The efficiency of IT solutions development at EU and EFTA level
the impact of which is	High development costs due to multiplicity of IT tools developed
a successful solution would be	Use collaborative or community based approaches to reduce the number of IT solutions developed and increase efficiency

The problem of	Multiple, heterogeneous interfaces to disseminate statistical data
affects	Data consumers (e.g. citizens, journalists, researchers...) and data publishers
the impact of which is	Data consumer face complexity when integrating statistical data from institutions, e.g. European Commission Directorates General or National Statistical Institutes, resulting in costs Data publishers develop and maintain multiple dissemination interfaces, resulting in costs
a successful solution would be	To have a reusable solution for the dissemination of statistics, - managed by Eurostat within the EC for other DGs, and - made available through JoinUp to other stakeholders)

Historically, statistical organizations have developed their own business processes and IT-systems. This can be referred to as 'accidental architecture' as the process and solutions were not designed from a holistic view.

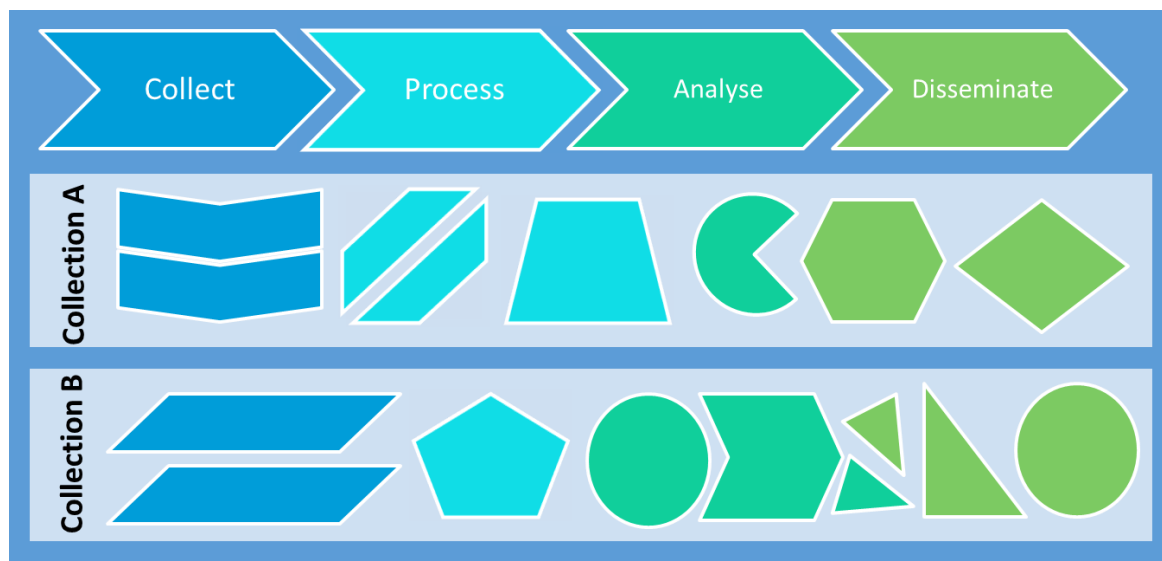


Figure 1: Accidental Architectures

Statistical organizations find it difficult to produce and share data and information aligned to modern standards⁶⁷. Process and methodology changes are time consuming and expensive resulting in an inflexible, unresponsive statistical organization.

Enterprise architecture is more and more used by statistical organisation to underpin their vision and change strategy. Enterprise architecture work enables to standardize organisation and processes. This is shown in Figure 2 where, as opposed to Figure 1, the countries have standardized their components and interfaces.



Figure 2: The result of standardization within an organization

⁶⁷ E.g. Data Documentation Initiative (DDI) and Statistical Data and Metadata eXchange (SDMX)

A common reference architecture is a set of standards will allow the statistical organisation in the ESS to share development costs and to provide new statistical products in a cost efficient manner.

3.1.7 IMPACT OF THE ACTION

3.1.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Deduplication of IT tools developed	Already started	National Statistical Institutes, Directorates General of the European Commission, other organisations of EU, Member States, EFTA countries. Also the worldwide statistical community
(+) Savings in time	Reuse of existing solutions taken from a catalogue Reuse of statistical production architecture model and template	2018	See above
(+) Better interoperability and quality of digital public service	Standardisation	Already started	See above
(-) Integration or usage cost	Reuse of IT tools developed by a third party	2018	See above

3.1.7.2 User-centricity

One of the conditions for maximizing the impact of the ISA² actions is by ensuring that they meet users' needs. For this to happen, users' engagement and involvement is needed before and during solutions' implementation, and users' feedback is sought after solutions are in operation. Explain how you intend to achieve the above.

User's engagement

- The reusable solution for the dissemination of statistics is currently in implementation with 5 DGs
- Eurostat will conduct in 1st half of 2018 a number of communication actions with various stakeholder groups (Digital Stakeholders Forum, European Political Strategy Centre EPSC, European Union Open Data Portal Steering Committee, Inter-institutional Editorial Committee on the Internet (CEIII), SDMX Global Conference)
- Users of statistical architecture models and services are brought together in many different fora e.g. the yearly Eurostat and UNECE Common Statistical Production Architecture workshops, the bi-yearly Eurostat meeting of the network on ESS Enterprise Architecture

Collection of comments and feedbacks

- The reusable solution for the dissemination of statistics includes in its web based user interface a "Contact" functionality, which each data publisher can configure.
- Eurostat will also use the Data Browser, part of the reusable solution for the dissemination of statistics for its own dissemination of European statistics and conducts regularly user surveys
- Consultation of stakeholders on needs and use of standard are carried out using EU surveys.

3.1.8 EXPECTED MAJOR OUTPUTS

Outputs are described in section 3.1.5.5.

3.1.9 ORGANISATIONAL APPROACH

3.1.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Eurostat	<ul style="list-style-type: none"> • Eurostat Architecture Team • ESS Vision 2020 portfolio managers • Eurostat units A3, B4, B5 	Project Management, Working Groups organisation, procurement
National Statistical Institutes	<ul style="list-style-type: none"> • Members for the Task Force and Steering Groups Shared SERVICES • Visions 2020 SERV Grant participants • Members of the ESS EA Board 	Provide collaborative input and define practical aspects for sharing and reuse. Provide list of priorities in the action
EC & inter-institutional stakeholders	<ul style="list-style-type: none"> • EC (other statistics): network of statistical correspondents • Inter-institutional: Editorial Committee on the Internet (CEIII) 	Reusable dissemination chain tools and techniques
Information Resource Managers (IRMs)	<ul style="list-style-type: none"> • List of Information Resource Managers • Digital Stakeholder Forum - chaired by DIGIT and assures inter-service communication and coordination for all matters relating to IT in the Commission 	Interface between DIGIT, DG ESTAT and other DGs
DIGIT	<ul style="list-style-type: none"> • DIGIT.B1 (Architecture centre of excellence) • DIGIT ISHS • DIGIT IPCIS team 	Expertise on EA, assistance on service hosting for Mses and other EC DGs

3.1.9.2 Identified user groups

The ESS IT Working Group bringing together IT correspondents in 32 NSIs and EVUG (EDAMIS and Validation Service User group)

The ESS EA Community of Practice (first meeting on 23 November 2016)

The EC DGs and agencies disseminating statistics

3.1.9.3 Communication and dissemination plan

Being part of the ESS Vision 2020 implementation the project will benefit from a broad communication plan designed for its purpose. Specific component targeting Commission services producing statistics will be added in January 2018.

The main list of stakeholders for ESS Vision 2020 and tentative related communication channels are:

European Commission	MyIntraComm Videos and webinars on the reusable solution for the dissemination of statistics Ad hoc seminar and workshops Digital Stakeholder Forum Leaflets
Eurostat staff	Eurostat-Cybernews Eurostat-Infos Lunchtime presentations Ad hoc seminar and workshops
NSI staff	European Statistical Training Program Quartely newsletter on Vision implementation Videos and webinars on the Vision implementation
NSI management	Regular presentation of project advances (Vision Implementation Group) ESS Website Dedicated European Statistical Training Program courses Circabc and CROS Portal Leaflets

General Public	Eurostat website (ESS vision dedicated section) Videos and webinars on the reusable solution for the dissemination of statistics Joinup
Official statistics Community	Conferences, Workshops Leaflets

3.1.9.4 Key Performance indicators

Provide a list of KPIs allowing the measurement of the progress and completions of milestones and the action. In case of an on-going action with already identified metrics⁶⁸ indicate the current values.

Description of the KPI	Target to achieve	Expected time for target
Number of National Architecture benchmark	27	2 (pilot phase in 2017) 27 by 2019
Number of detailed (domain) architecture produced	At least 3	4 by 2018
Reuse of the solution for the dissemination of statistics	Solution in use by 5 DGs (COMP, ECFIN, EMPL, GROW, TAXUD) in 2018	3 first DGs in 2018 Q1 2 other DGs at the latest by end of 2018
Reusable solution for the dissemination of statistics	Solution made available on Joinup as a software package	End of 2018

3.1.9.5 Governance approach

Project owner: L. Norlund, Director - Resources (ESTAT.A).

The project will report (mainly the reusable dissemination solution) for internal Eurostat governance to the

- Eurostat Dissemination Chain Steering Group;
- Eurostat IT Advisory Committee, and finally to

⁶⁸ For examples see the ISA2 dashboard <https://ec.europa.eu/isa2/dashboard/isadashboard>, effectiveness tab.

- Eurostat Director's Meeting

The project will report to the related ESS governance bodies

- The ESS Steering Group on Shared Services;
- The ESS Task Force on Shared Services for the project;
- ESS IT Director's Group (ITDG) will review project progress and its main deliverables;
- The Vision Implementation Group established by delegation of ESSC (The European Statistical System Committee) will provide strategic guidance for the project.

At EC level, involved governance bodies are the following

- IT Governance: the [Information Technology and Cybersecurity Board](#)
- ISA2 Governance bodies (through monitoring & evaluation reports, reporting about sub-delegated credits usage)

3.1.10 TECHNICAL APPROACH AND CURRENT STATUS

The project builds on a service-oriented paradigm to establish the cooperative architecture for ESS and for sharing statistical services among organisations. This approach leans on the SOA strategy of the Commission and on the Common Statistical Production Architecture developed at industry level facilitated by UNECE. The reusable solution for dissemination leans on the future renovated Eurostat dissemination chain (see task 8 description)

Task 1: Develop detailed ESS EA.

Activities: Detail the existing ESS EA to provide an operationalization of the sharing of services, the orchestration of these services in production processes and the management of data and metadata in the process. Communicate the ESS EA and facilitate the discussion and agreement in the ESS community on the ESS EA.

Deliverables: The ESS EA incorporating EIRA and operationalizing the sharing and orchestration of services and the management of metadata.

Current status: Benchmarking of ESS EA / SPRA concluded by Nov 2017 that there is a good alignment between EIF/EIRA and ESS EARF. SPRA has been released as a specific instance of EIRA (September 2017).

Task 2: Benchmark ESS architectures.

Activities: Analyse the ESS member architectures (as-is and target architectures) and benchmark the implementations and usage of technology to support the ESS EA. Identify potential components and services for sharing in the community.

Deliverables: Best practice architecture patterns, list of sharable services/solutions, sample roadmaps for realising the ESS EA based on specific as-is architectures and business requirements. List of possible candidates for shared services.

Current status: A generic version of the benchmarking model is available and has been piloted with 2 MS (Portugal and Malta). The benchmarking model has been further specialised for cover 4 domains : Data Validation,ESBRs (European System of Interoperable Business Registers), Linked Open Data Dissemination, Data management (based on the work accomplished by the centre of Excellence of Statistical Datawarehouse). Final domain benchmark reports have released in June 2019.

Task 3: Develop multi-tenant version of the ESS Service catalogue.

Activities: Develop an ESS Service catalogue for federated use in the ESS with requirements that support a flexible adoption and supporting easy discovery, test, and implementation of usage of a shared service which is preferably built on existing software.

Deliverables: An ESS service catalogue, which can be deployed in a federated manner including both service shared in the ESS as well as MS specific services.

Current status: The multi-tenant version of the catalogue has been delivered. Services have been added to it. This task is being reactivated relying on a Eurostat project's fund to implement additional features seen as a priority by the statistical IT community working on services.

Task 4: Develop statistical and dissemination services for sharing.

Activities: To select and develop existing functionality into shared services that can be used by the community.

Deliverables: New services to cover all the phases of the statistical processing. Services will be added to the multi-tenant catalogue and assistance will be provided to MS for implementation in production systems.

Current status: Procurement launched and running (until end of 2020). End of September will see the delivery of two fully new services to put in the catalogue. For the next iteration two new services are being selected.

Task 5: Produce white-list of open source software.

Activities: Analyse existing open source software packages and produce a white-list of components to be used in the technical architectures

Deliverables: The white-list of open source packages and guidance on its usage in the ESS EA.

Current status: running as part of the SERV project in particular the ESSnets on “Sharing common functionalities in ESS” and “Implementing shared statistical services”

Task 6: Support architecture alignment.

Activities: Support the architecture alignment in ESS member to be carried out by a central helpdesk e.g.: support for implementing shared solutions, and service.

Deliverables: Active support function to architecture alignment (e.g. number of reuse of reference architectures in the ESS).

Current status: Scope has been aligned to stick to ISA2 principles. The heldesk was opened in October 2018. Actions have focused on supporting the deployment in MSs of ESS Vision 2020 projects

Task 7: Implement shared services in production processes.

Activities: Support the implementation in production processes of the shared statistical services within ESS members.

Deliverables: Implementation of the VTL standard for validation in the Content Validation Service. Assistance to NSIs for use in their statistical production processes.

Current status: DIGIT-XM framework contract is active, the evaluation is being finalised. The procurement will run until march 2021 and the first progress is expected to be seen in October 2019

Task 8: Deliver a reusable solution for the dissemination of statistics.

Activities: retain and further develop the future renovated Eurostat dissemination tools specific components and package these as a software solution for systematic reuse.

Deliverables: Integrated software components and services for the dissemination of statistics, made available to other Directorates General of the European Commission and Agencies of the European Union by means of direct request to Eurostat, and to other stakeholders by means of JoinUp

Current status:

1) Reusable solution for the dissemination of statistics to be used in the European Commission

The reusable solution for the dissemination of statistics is delivered to the 5 DGs:

- COMP EMPL and GROW provided functional acceptance under conditions (training and slight improvements). There are no blocking issues and Eurostat is finalizing plans for their go live date in 2018 Q4 / early 2019 Q1

- ECFIN and TAXUD are conducting functional acceptance tests. ECFIN and TAXUD will decide by themselves their planned go live date

2) Reusable solution for the dissemination of statistics to be used by external stakeholders

The release of the reusable solution for the dissemination of statistics for publication on Joinup (2 changes: replacement of HighCharts by Vega library for visualisations, replacement of ECAS by other authentication mechanism) is under development and will be published on Joinup in 2019 Q1.

3.1.11 COSTS AND MILESTONES

3.1.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocation (KEUR)	Budget line ISA / others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
Inception	Project plan	0	ESTAT	15/09/2015	31/12/2015
Execution	Task 1: Develop detailed ESS EA.	200	ISA ²	01/09/2016	30/06/2017
Execution	Task 2: Benchmark ESS architectures.	215 ⁶⁹	ISA ²	01/01/2017	31/12/2018
Execution	Task 3: Develop multi-tenant version of the ESS Service catalogue.	200	ISA ²	01/10/2016	31/12/2017
Execution	Task 4: Develop statistical services for sharing.	350	ISA ²	01/07/2017	31/12/2020
Execution	Task 5: Produce white-	194	ISA ²	01/07/2017	31/12/2017

⁶⁹ 75 have been removed from 2019 planned

Phase: Initiation Planning Execution Closing/Fin al evaluation	Description of milestones reached or to be reached	Anticipate d Allocation s (KEUR)	Budget line ISA / others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
	list of open source software.			7	9
Operational	Task 6: Support architecture alignment.	350 ⁷⁰	ISA ²	01/01/201 8	31/12/201 9
Operational	Task 7: Implement shared services in production processes.	300	ISA ²	01/07/201 8	31/12/201 9
Execution & Operational	Task 8: Deliver a reusable solution for the dissemination of statistics.	1370 ⁷¹	ISA ²	01/01/201 6	31/03/201 9
	Total	3179			

3.1.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Initiation & Execution	1.050	1.035 commitment accepted
2017	Execution & Implementation	1.679	
2018	Execution, Implementation & Operation	450	200k cannot be committed this year
2019	Implementation & Operation	0	

⁷⁰ 150 will not be committed from 2018 budget

⁷¹ 50 will not be committed from 2018 budget

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2020	Implementation & Operation	0	

3.1.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
SERV Business Case	https://circabc.europa.eu/sd/a/0ffc64b1-5d5c-4a61-a030-4acd897779e0/SERV%20Business%20case%20v0.7.pdf	-
ESSC 29 th meeting (SERV document)	https://circabc.europa.eu/w/browse/2102612c-8f20-4a16-bb5e-5d5541b03492	-
SERV TF Mandate	-	Version 1.1
ESS EA RF	https://ec.europa.eu/eurostat/cros/content/ess-enterprise-architecture-reference-framework_en	Version 1.0
SPRA	https://ec.europa.eu/eurostat/cros/content/spra_en	Version 0.4
ESS Vision 2020	http://ec.europa.eu/eurostat/web/ess/about-us/ess-vision-2020	-
DISSCHAIN RENOV Business Case	https://circabc.europa.eu/w/browse/a21ebee-a7491-4806-8306-2ace57894218	
CSPA	http://www1.unece.org/stat/platform/display/CSPA/CSPA+v1.5	Version 1.5

3.2 FINANCIAL DATA STANDARDISATION (2016.15)

3.2.1 IDENTIFICATION OF THE ACTION

Service in charge	FISMA
Associated Services	DIGIT, OP, GROW, JUST, LS

3.2.2 EXECUTIVE SUMMARY

Many stakeholders from the financial sector, including private companies like banks or public administrations and National and European Regulatory/Supervisory Agencies, need to report or act on financial data as requested by EU law in force.

Further standardisation in financial data reporting is needed as can be seen from:

- The large amount of financial legislative acts and level 2 measures (implemented and expected),
- The call launched by financial industry for further data reporting standardisation and the Call for Evidence (CfE) undertaken in 2016 by DG FISMA to analyse and review the EU regulatory framework for financial services under the Better Regulation agenda
- The DG FISMA public consultation on supervisory reporting in 2018
- The DG FISMA Supervisory Reporting Conference held on the 4th of June 2018

The lack of a common financial language and the lack of inter-operability between public risk data infrastructures increase on one side the costs related to legal reporting requirements while making it difficult on the other side to aggregate risk data and to ensure a complete market monitoring.

The Financial Data Standardisation (FDS) project is addressing these issues by applying, amongst others, the ISA² Core Vocabularies Methodology and the European Interoperability Framework (EIF) recommendations with the long-term objective of having all reporting entities to report their data according to the “Once-Only” principle.

3.2.3 OBJECTIVES

The high-level objectives of the FDS project are to propose a framework of interoperable financial data reporting standards and enhance the interoperability of relevant data infrastructures, in order to enable a more (cost-)efficient reporting of financial data and monitoring of the financial system (banks, insurance companies, and financial markets) as

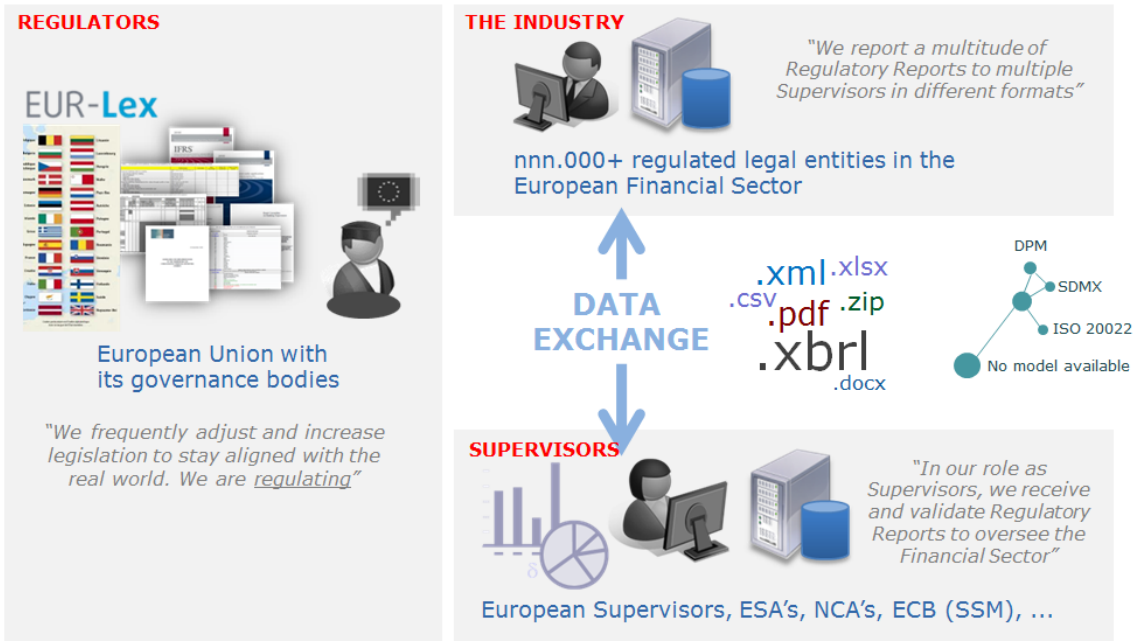
well as to enhance the risk assessment capabilities of the EU and the national supervision authorities, and thus contributing to the safeguarding of the stability of the EU's financial system.

3.2.4 SCOPE

The scope of the FDS project is the analysis of existing data reporting requirements enshrined in the EU financial acquis and to work towards a framework of standards capable of enhancing interoperability and reusability of reporting data.

The diagram below clarifies the different roles in the regulatory scene: the EU, European regulatory and supervisory bodies, and reporting entities. Currently, there is no common financial language and no digital link between the EU and the other actors.

Diagram 1: The Regulatory scene



Based on the analysis of the EU financial acquis, the FDS project delivered a shortlist of 22 reporting frameworks containing structured data that have been analysed in detail in terms of gaps, overlaps, redundancies and inconsistencies of reporting requirements. The stakeholders that are practically implementing the reporting frameworks and other involved stakeholders have been identified.

The FDS project covers all areas necessary to achieve the objectives: financial legislation, standardisation, stakeholder requirements, governance, security and data protection, and innovative technologies to comply with regulation (RegTech).

Table 1: Shortlist of structured reporting frameworks & stakeholders

Shortlist of 22 “Structured Data” Reporting Frameworks

Rank	Reporting Framework	Structured data?	Active?	EC	EBA	Member States	EIOPA	EGB	ESMA	ESCB	CEAOB	SFB
1	CRR/CRD IV	Yes	Yes	X	P		X	X	X			
2	Solvency II	Yes	Yes	X			P					
3	MIFID II/MIFIR	Yes	No	X	X				P			
4	IORP	Yes	Yes				P					
5	EMIR	Yes	Yes		X				P			
6	MIFID I	Partially	Yes						P			
7	AIFMD	Yes	Yes						P			
8	CSDR	Yes	Yes	X	X	X			P			
9	Transparency Directive	Partially	Partially						P			
10	Statutory Audit Regulation (SAR)	Partially	Yes	X	X	P	X				X	
11	SRM	Yes	Yes	X	X			X				P
12	SFTR	Yes	Partially						P	X		
13	NEW DGS Directive	Yes	Yes	X	X	P						
14	AoIU	Partially	Yes				P					
15	PRIPs Regulation	Partially	Partially		X		P		X			
16	Short Selling Regulation (SSR)	Yes	Yes	X					P			
17	BRRD	Yes	Yes	X	P	X			X			
18	UCITS (IV) Directive	Partially	Partially	X					P			
19	MCD	Partially	Partially	X	P	X						
20	Credit Rating Agencies Regulation/Directive CRAR/CRAD	Yes	Yes	X					P			
21	UCITS (V) Directive	Partially	Partially	X	X				P			
22	Market Abuse Directive/Regulation (MAD/MAR)	Yes	Partially			X			P			

X the EU body is involved as stakeholder in the Reporting Framework
P the EU body is practically implementing the Reporting Framework

3.2.5 ACTION PRIORITY

3.2.5.1 Contribution to the interoperability landscape

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> <i>the new European Interoperability Framework (EIF),</i> <i>the Interoperability Action Plan and/or</i> <i>the Connecting European Facility (CEF) Telecom guidelines</i> 	<p>The project will develop a framework for interoperable financial data reporting standards and targets the interoperability for exchange of information between administrations on business requests (scenario 2 from EIF) as well as the exchange of information between national administrations and EU institutions (scenario 3 from EIF).</p> <p>A roadmap for standardisation will be proposed implementing the 4 interoperability layers of the EIF conceptual model for cross-border/ cross-sectoral services and promote many of the EIF recommendations.</p>

Question	Answer
<ul style="list-style-type: none"> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>In addition, the FDS project will re-use the ISA² Core Vocabularies Methodology in order to create a common financial data language.</p> <p>The FDS project will also analyse financial data identifiers and reference data models (including business registers) used across the industries and propose ways to harmonise the models.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>The innovative aspect of the FDS approach is that it brings together analysis from several stakeholder viewpoints and from different financial sectors operating cross-border (banks, insurance companies, and financial markets). Per sector, information is already available but has never been put together. The main actors in the financial data reporting domain (ESMA, EIOPA, EBA, ECB, Eurofiling, and the Frankfurt Group) strongly believe that the involvement of the European Commission is required to define a common vision and strategy to address the current financial data reporting issues. The financial actors tried for many years to solve the inconsistencies but failed because no actor had sufficient authority to set cross-sector standards on its own. As a result, for example, a single taxonomy for the financial sector is still missing today.</p>

3.2.5.2 Cross-sector

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>The FDS project is cross sector and involving legislation from different financial policy areas (banks, insurance companies and financial markets) as demonstrated in Table 1 above.</p> <p>The stakeholders requested the Commission to address the reporting burden in a holistic (cross-sector) way to avoid a further increase of the burden resulting from piecemeal adjustments.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<p>N/A</p>

3.2.5.3 Cross-border

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<p>Financial transactions do not stop at national borders. The FDS proposal will therefore need to take the EU/global dimension of the financial sector into account (e.g. CEN, ISO TC68). The FDS project results will be instrumental for public and private stakeholders in all EU Member States and in non-EU countries covered by equivalence decisions for EU legislation.</p>

Question	Answer
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i></p>	<p>N/A</p>

3.2.5.4 Urgency

Question	Answer
<p><i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i></p>	<p>The FDS project has meanwhile been proposed by the Commission as a concrete follow-up action under the Better Regulation Commission Agenda. The FDS deliverables complement the ongoing Better Regulation actions by providing a “deeper” and more technical perspective on reporting. Completing the detailed analysis of the reporting frameworks is a prerequisite for the ongoing comprehensive assessment of the coherence and efficiency of the existing reporting frameworks and for the formulation of specific recommendations for future action.</p>
<p><i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i></p>	<p>The DG FISMA budget is limited and, on the short term, no other funding sources than those received from the ISA² Programme have been identified. Future standardisation actions may be funded by the Rolling Plan for ICT standardisation (DG GROW).</p>

3.2.5.5 Reusability of action's outputs

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Methodology for Data Reporting Requirements (DRR) analysis
Description	A validated methodology for the analysis of detailed reporting requirements embedded in the EU financial acquis. The methodology combines a top-down (EU viewpoint) and bottom-up (industry viewpoint) approach and combine both in order to find overlaps, redundancies, inconsistencies and gaps in the reporting requirements.
Reference	
Target release date / Status	Q3 2017
Critical part of target user base	Methodology can be reused for the analysis of structured reporting frameworks in other areas of the EU acquis.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	N/A

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Financial Core Vocabulary
Description	The FDS project aims to lay the foundation for a Common Financial Data Language which will address, <i>inter alia</i> , the issue of inconsistent definitions which is a main cause of the current reporting burden.
Reference	
Target release date / Status	Q4 2019
Critical part of target user base	The current scope of the Financial Core Vocabulary will be supervisory reporting but this vocabulary can be extended/reused to other domains such as

	financial reporting, financial disclosure for consumer and investor protection purposes, statistical reporting, anti-money laundering, measures to counter terrorist financing, etc.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	N/A

3.2.5.6 Level of reuse of existing solutions

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	<p>The FDS project will re-use the ISA² Core Vocabularies Methodology and the European Interoperability Framework (EIF). In addition, the FDS project will investigate possible reuse of other ISA solutions in the legislative domain, e.g. data automation tools for lawyers.</p> <p>In the domain of identifiers, the FDS project will look into ISA² solutions such as eIDAS and BRIS and propose an approach for common identifiers across regulations.</p>
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	N/A

3.2.5.7 Interlinked

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	Digital Single Market (DSM): The legacy data and systems in the financial sector are costly to maintain and create barriers to competition; in the absence of fully machine readable financial data (including contractual information) the sector will not realise the full potential contained in interoperability and data sharing solutions and is falling behind. The FDS project intends to address these interoperability issues with concrete actions in the domain of ICT standardisation and the once-only principle.
	The Commission's Better Regulation Agenda has identified financial services as a focus area where stakeholders have indicated their concerns regarding the administrative burden. The FDS project is a concrete follow-up action proposed by Commission (Communication of 23 November 2016) and will address many of the reported issues.

3.2.6 PROBLEM STATEMENT

The problem of	Supervisory reporting obligations are perceived as too burdensome because of duplicative, overlapping and inconsistent reporting requirements
Affects	EU and National Supervisory and Regulatory Authorities, and reporting entities such as financial institutions in the banking, insurance, asset management, pension funds sectors, operators of financial market infrastructure, etc., including SMEs
the impact of which is	that (i) implementing legal reporting requirements is excessively complex and costly; (ii) it is difficult to share efficiently reporting data, including between national authorities and EU and national authorities, or between EU authorities, because of lacking interoperability; (iii) it is excessively difficult to monitor financial risk in the EU's financial system
a successful solution would be	to reduce the administrative burden and compliance costs for industry and provide supervisory authorities with high quality data on market players and their activities; access to such data is essential to perform supervision of financial institutions, monitoring of systemic risk, market oversight and ensure orderly markets, financial stability, investor protection and fair competition

3.2.7 IMPACT OF THE ACTION

3.2.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money (+) Savings in time	A common financial language will address the issue of unclear definitions which is emerging as one of the main causes of the reporting burden and associated costs.	Planning will be based on the problem definition provided by the detailed analysis and machine learning proof-of-concept.	Supervisory Authorities, Industry
(+) Better interoperability and quality of digital public service	A framework for interoperable financial data reporting standards will be developed based on the project findings. An assessment will be done of innovative technologies to optimise supervisory reporting requirements	See above.	Supervisory Authorities, Industry
(+) Improve the quality and accessibility of data	The FDS project deliverables will be the culmination of the most extensive and comprehensive assessment of financial reporting requirements undertaken to date at the EU level, and will lay a very solid groundwork for the Commission to launch co-ordinated future action which could help revolutionise reporting and significantly improve the quality and accessibility of data, not just within the EU but internationally.	See above.	Supervisory Authorities, Industry

Impact	Why will this impact occur?	By when?	Beneficiaries
(-) Integration or usage cost	Cost/benefit assessment of proposed solution will be done at a later stage.	See above.	Supervisory Authorities, Industry

3.2.7.2 User-centricity

A Stakeholder Expert Group on reporting, called the Stakeholder RoundTable (SRT), has been established by DG FISMA. This group is primarily formed by experts from the European Supervisory Agencies (ESMA, EBA, EIOPA), the European Central Bank (ECB)/Single Supervision Mechanism (SSM), and the Single Resolution Board (SRB), but will also include National Authorities and Industry stakeholders that have relevant experience in this field. The experts provide valuable practical knowledge and experience, and are also an important source of information about ongoing initiatives and ensure that the project actions meet users' needs.

3.2.8 EXPECTED MAJOR OUTPUTS

Output name	Framework of interoperable financial data reporting standards and roadmap for standardisation
Description	<p>This output will provide regulators and reporting entities with an interoperable set of open standards facilitating efficient data exchange and processing and establish a common understanding of technological interoperability between electronic data standards operated by the banking, insurance and capital markets entities and supervisors in the European Union.</p> <p>A roadmap identifying priority areas for financial data standardisation will also be delivered. This roadmap will need to take into account the need for a general financial data reporting framework and specialised reporting in sectors.</p>
Reference	
Target release date / Status	2020

3.2.9 ORGANISATIONAL APPROACH

3.2.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
European Commission	FISMA units (internal stakeholders), DIGIT, OP, LS, JUST, GROW	
European Central Bank (ECB)	Statistical Reporting, Market Infrastructure, SSM	
European Supervisory Agencies	ESMA, EBA, EIOPA	
Single Resolution Board (SRB)		
The Frankfurt Group		
Eurofiling		
National Competent Authorities		
Industry	Banks, insurance companies, listed companies	
Standardisation Bodies	CEN, ISOTC68	
European Systemic Risk Board (ESRB)		

3.2.9.2 Identified user groups

The identified users of the FDS project results are the same as identified in 1.2.9.1

3.2.9.3 Communication and dissemination plan

A website has been set up as a central point to collect and share information on the FDS project. The information is updated on a regular basis. Access has been provided to relevant internal and external stakeholders and to the external contractor performing the studies. At the end of the FDS project, the ISA² Join-Up platform will be used to communicate the main project deliverables.

3.2.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected time for target
Overview of the relevant reporting	100% completed in time	Target reached

Description of the KPI	Target to achieve	Expected time for target
frameworks		
Methodology for detailed analysis validated	100% completed in time	Target reached
Detailed Analysis of 22 reporting frameworks	100% completed in time	Q4 2018
Other KPIs will be defined once the problem definition (based on the detailed analysis and machine learning PoC) has been completed		

3.2.9.5 Governance approach

The governance of the project is a key factor for the effective delivery of its objectives and is expected to improve the quality of the services provided, guarantee the alignment of its deliverables with the strategic objectives, ensure the proper allocation of roles and responsibilities and clearly identify the timeframes for a manageable and transparent execution of projects.

DG FISMA Unit E4 is the Business Owner, provides the Project Manager and is responsible for the coordination inside the DG. As part of the Better Regulation Call for Evidence follow up, the FDS project has become an essential and integral part of the supervisory reporting project in DG FISMA. Its deliverables have directly fed into the Better Regulation Fitness Check. The DG FISMA project team on supervisory reporting, staffed by all units handling one or several reporting frameworks, together with the Stakeholder Roundtable (SRT) mentioned above, will be the main vehicle ensuring that all work streams are well integrated and connected with the policy making in DG FISMA and the European Supervisory Authorities.

The conclusions of the DG FISMA Fitness Check of EU Supervisory Reporting Requirements will be published in Q4 2019. This report will focus on the cross-cutting issues and common areas for improvement that have been identified. The conclusions will be the basis for further discussion leading to proposals for action including how to take the FDS project forward.

3.2.10 TECHNICAL APPROACH AND CURRENT STATUS

To date, the FDS project has already delivered a series of outputs including (but not limited to):

- i) an overview of the reporting frameworks⁷² under DG FISMA's responsibility based on the analysis of all Level 1 and Level 2 legislation;
- ii) fact sheets with detailed information for all more than 50 reporting frameworks;
- iii) a shortlist of 22 “structured data”⁷³ reporting frameworks in scope for further detailed analysis;
- iv) a methodology for a detailed analysis of the reporting requirements per structured reporting framework;
- v) a detailed Data Reporting Requirements (DRR) analysis in terms of overlaps, gaps, duplications and inconsistencies in the regulatory frameworks; and
- vi) a proof of concept exercise (PoC) investigating the application of machine learning and natural language processing in particular, on a limited subset of legal documents, in order to increase the efficiency of the analysis.

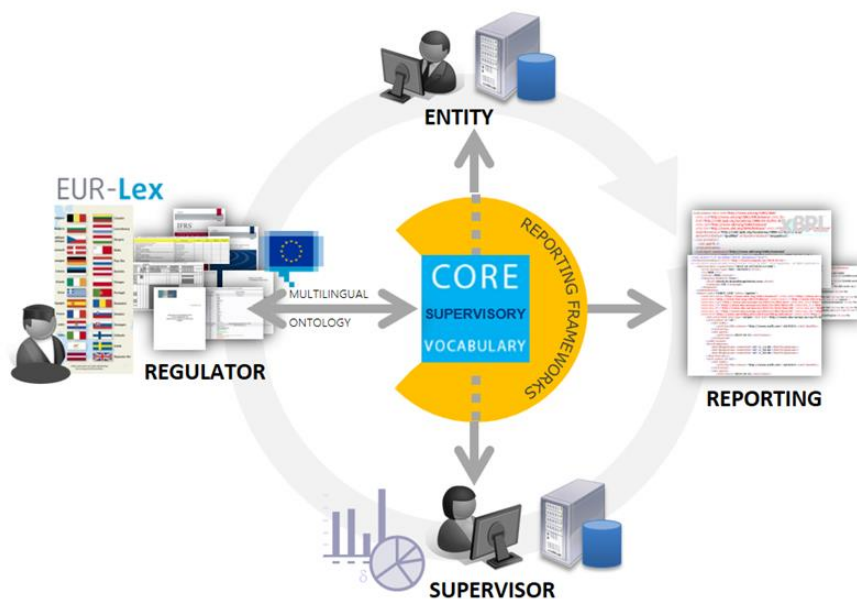
The findings of the FDS project detailed analysis show that the perception by the industry of overlapping reporting isn't confirmed by the facts. However, inconsistent definitions seem to be a main source of the burden and cost for Industry.

Currently, there is no common financial language, and the FDS project proposes to put a common data dictionary for supervisory reporting in the centre of the regulatory scene to connect the different roles as illustrated in the diagram below. In addition, it is anticipated that a tool may need to be developed that will allow regulators to re-use the definitions from the Common Financial Data Dictionary while drafting new legislation.

Diagram 2: Regulatory scene and Core Supervisory Vocabulary

⁷² A "reporting framework" is a set of information requirements managed and updated together at the EU level. Usually a reporting framework refers to a single level 1 legislation (e.g. EMIR) or set of connected level 1 legislations (e.g. MIFIDII/MIFIR) together with corresponding level 2 measures. The 300+ legal acts related to supervisory reporting under FISMA's responsibility have been categorised in these 'reporting frameworks'.

⁷³ Many reporting frameworks result in periodical data exchange between Regulated Entities and Supervisors. In many cases, the Regulator has imposed a data exchange format or has explicitly described metadata. Hence, we speak about “structured data”.



This vision would effectively implement the “define-once” principle during the initiation phase of new legislation and thus avoids the current issue of overlapping inconsistent definitions which is the largest source of costs and reporting burden. This approach is also compliant with the Tallinn Declaration on eGovernment signed by the Commission last year and represents a strong commitment towards the “Once-Only” principle.

In the Call for Evidence report⁷⁴, it was already mentioned that the FDS project would deal with the reporting issues in a holistic way and work towards a) the development of a Common Financial Data Language building on the detailed analysis of the FDS project and the ISA² Core Vocabularies methodology and b) the analysis of financial data identifiers and reference data models used across the industries and propose ways to harmonise the models and the application of common identifiers across regulations.

A common language and reference data will address the issue of unclear definitions, while common identifiers will allow the aggregation of data for supervisory authorities. They are essential building blocks required for any future RegTech solution

Since inconsistent definitions seem to be a main source of the burden and cost for Industry, the further funding from the ISA² Programme will be used to support these actions. In 2018 the funding has mainly been allocated to the following tasks (to be completed in 2019 and 2020):

- Update of existing Data Reporting Requirements repository. The relevant legal acts are regularly updated with new legislation and old legislation is repealed, modified or integrated. Given that changes in legislation occurred in the time period since the cut-

⁷⁴ See "Report on the follow-up to the Call for Evidence in the area of supervisory reporting" (COM(2017)736)

off date of the analysis conducted to date, the results obtained under the previous contract are partially outdated. The existing deliverables, the repository of reporting obligations and the data model repository, will therefore require updates.

- Investigate how the current work could be extended by also considering reporting obligations under relevant statistical reporting frameworks from the European Central Bank (ECB).
- Data modelling, Analysis and Development support for assignments based on a subset of interconnected reporting frameworks that are of interest to a high number of stakeholders in the financial sector.
- Machine Learning (ML) Proof-of-Concept: Because of the large volume and the layered structure of the existing legislation as mentioned above, the direct approach – manual analysis and annotation of legal documents – would require significant time and labour resources. Therefore, the FDS project carried out a proof of concept exercise (PoC) investigating the application of machine learning and natural language processing in particular, on a limited subset of legal documents. The aim was to increase the efficiency of the analysis of existing regulatory legislation and create a collection of defined concepts with links to their definitions within the legal text and extract a collection of reporting requirements laid down in the legislation. The performance (“accuracy”) of the PoC was evaluated on a gold-standard provided by DG FISMA. An initial assessment revealed that it achieved state-of-the art performance in extracting terms and semantic relations both for the definitions and reporting requirements.
- The encouraging results of the ML PoC motivated the extension of the approach in terms of coverage and functionality. The general objective of the exercise is to apply NLP and ML techniques combined with human expert input to analyse legal texts and identify relevant concepts and their definitions. An additional objective is to identify reporting requirements contained in the texts.

The future project deliverables will address areas where further standardisation could bring benefits and identify concrete proposals for streamlining and simplifying reporting requirements without compromising their objectives, with the long-term objective of having all reporting entities to report their data according to the “Once-Only” principle, including via the use of innovative technology (RegTech).

Concrete further actions will be decided based on the conclusions of the DG FISMA Fitness Check of EU Supervisory Reporting Requirements (to be published in Q4 2019).

Possible actions on which the FDS project will focus in 2019 and 2020 are:

- Proof-of-Concept Machine Readable and Executable Legislation
- Proof-of-Concept Legislative Drafting Tool to demonstrate how existing common definitions could be re-used during the drafting process of new legislation.

- Alignment with international standards (ISO, CEN)

The FDS project is a long-term action, eventually leading to a framework of interoperable financial data reporting standards together with a roadmap for standardisation, taking into account the need for a general financial data reporting framework and specialised reporting in sectors.

Sustainability

In order to engage with the key stakeholders, DG FISMA created a Stakeholder Expert Group on supervisory reporting, the Stakeholder RoundTable (SRT). The SRT already includes the European Supervisory Agencies (ESAs), European Central Bank (ECB) and Single Resolution Board (SRB), and could be enlarged by including National Authorities and Industry stakeholders. The FDS project and its deliverables will be taken forward by the SRT in cooperation with the European Commission.

Regarding the Machine Learning PoC, a project team has been created with other relevant Commission DGs (DIGIT, OP, LS, JUST) in which the project results are shared with the aim to reuse them across the Commission.

The conclusions of the DG FISMA Fitness Check of EU Supervisory Reporting Requirements will be published in Q4 2019. The conclusions will be the basis for further discussion leading to proposals for action including how to take the FDS project forward, e.g. the future maintenance of the FDS project results beyond the current lifetime of the proposed action.

3.2.11 COSTS AND MILESTONES

3.2.11.1 Breakdown of anticipated costs and related milestones

Funding 2016

Phase: Initiation Planning Execution Closing/Fin al evaluation	Description of milestones reached or to be reached	Anticipat ed Allocatio ns (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YY YY)	End date (QX/YY YY)
Initiation	Methodology validation for DRR analysis	80	ISA ²	Q3 2016	Q4 2016
Initiation	High-level DRR analysis of selected frameworks	50	ISA ²	Q3 2016	Q1 2017

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipat ed Allocatio ns (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YY YY)	End date (QX/YY YY)
Initiation	Detailed DRR analysis of 4 selected financial frameworks	150	ISA ²	Q4 2016	Q1 2017
Initiation	Feasibility study Distributed Ledger Technology	200	ISA ²	Q4 2016	Q2 2017
Execution	Definition of functional requirements	110	ISA ²	Q2 2016	Q4 2016
Execution	Tool development supporting efficient DRR analysis	110	ISA ²	Q2 2016	Q2 2018

Funding

2017

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipat ed Allocatio ns (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YY YY)	End date (QX/YY YY)
Execution	Tool development supporting efficient DRR analysis and reporting	110	ISA ²	Q2 2016	Q2 2018
Execution	Enterprise architecture of envisaged solution	168	ISA ²	Q1 2017	Q4 2017
Execution	Detailed DRR analysis, Final Methodology, and Financial standards Map	877	ISA ²	Q2 2017	Q4 2018

Funding 2018

Phase: Initiation Planning	Description of milestones reached or to be reached	Anticipat ed Allocatio	Budget line ISA/	Start date (QX/YY YY)	End date (QX/YY YY)
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Execution Closing/Final evaluation		ns (KEUR)	others (specify)		
Execution	Detailed DRR analysis to support the DG FISMA Fitness Check	175	ISA ²	Q3 2018	Q4 2018
Execution	Updates of the detailed DRR analysis taking into account new legislation and statistical reporting frameworks. Data Modelling, analysis and development to support assignments based on a subset of interconnected reporting frameworks	270	ISA ²	Q4 2019	Q4 2020
Execution	Common Financial Data Language technical preparation, including a machine learning proof-of-concept	120	ISA ²	Q4 2018	Q3 2019
Execution	Glossary of legal concepts defined and dictionary of reporting requirements contained therein using Machine learning (ML) and natural language processing (NLP) combined with human expertise	540	ISA ²	Q4 2019	Q4 2020
Execution	Enterprise architecture of envisaged solution	160	ISA ²	2019	2020

Funding 2019

Phase: Initiation Planning Execution Closing/Fin	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YY YY)	End date (QX/YY YY)
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al evaluation					
Execution	Machine Readable and Executable legislation Proof-of-Concept	420	ISA ²	2019	2020
Execution	Proof-of-Concept Legislative Drafting Tool to demonstrate how existing common definitions could be re-used during the drafting process of new legislation.	400	ISA ²	2019	2020

3.2.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Initiation & Execution	700	700
2017	Execution	1170	1155
2018	Execution	1265	1265
2019	Execution	820	820
2020	Execution	0	0
Total		3955	

3.2.12 Planning for the tendering procedures to be launched for the action

Call for tenders foreseen Global amount in KEUR	Call for Tenders Duration in years	Indicative planning of publication (QX/YYYY)
To be decided based on the conclusions of the DG FISMA Fitness Check of EU Supervisory Reporting Requirements (published in Q4 2019)		

3.3 DEVELOPMENT OF AN OPEN DATA SERVICE, SUPPORT AND TRAINING PACKAGE IN THE AREA OF LINKED OPEN DATA, DATA VISUALISATION AND PERSISTENT IDENTIFICATION (2016.18)

3.3.1 IDENTIFICATION OF THE ACTION

Service in charge	Publications Office of the EU (OP), Unit C4
Associated Services	European Commission: DG BUDG, DG CONNECT, DG DIGIT, JRC, DG COMM, DG ENV, ESTAT. Agencies: EMA, ERA, INEA

3.3.2 EXECUTIVE SUMMARY

The European Union Open Data Portal (EU ODP⁷⁵) and other stakeholders like the European Data Portal (EDP)⁷⁶ including affiliated Member State portals and administrations provide a service package in order to enable them to enhance their data visualisation capacity, to further open up their data as well as to increase data quality and interoperability in view of better data reusability.

Data visualisation is indispensable for a better and faster understanding of the data published. For policymakers it facilitates decision-making based on evidence and the communication of complex issues. Moreover, visualisation is indispensable for data analytics.

The current package is the continuation of ISA² Action 2016.18 of the WP 2016, 2017, 2018 and 2019⁷⁷, which has been triggered by the needs expressed by EU institutions and agencies during meetings with the EU ODP, and additionally brought to evidence by the interinstitutional survey on data visualisation needs back in 2015.

It is envisaged to continue the EU open data activities under the Digital Europe Programme.

The ISA² Action 2016.18 delivered the prototype of a catalogue of data visualisation tools, a training programme on data visualisation, data visualisation projects based on high-value

⁷⁵ <https://data.europa.eu/euodp>

⁷⁶ <https://data.europa.eu/europeandataportal>

⁷⁷ "Development of an open data service, support and training package in the area of linked open data, data visualisation and persistent identification".

open datasets, EU budget as Linked Open Data and it laid the basis for an interinstitutional community of data visualisation practitioners.

This proposal addresses the needs for:

- **Strengthening the open data and data visualisation community** and the knowledge base through awareness creation and best practices and knowledge sharing in events like domain-specific conferences and EU Datathons.
- **Enhanced interoperability of metadata and datasets**, improving the quality of the current service offered to reusers like citizens and businesses by the improvement of data quality and increasing data literacy and programmatic publishing of metadata on EU ODP (e.g. via development of data quality dashboards for data providers and linking together high-value datasets and harvesting solutions based on DCAT-AP⁽⁷⁸⁾). It is also important to increase awareness among data owners about importance of metadata quality and APIs for potential harvesting.

In order to increase the outreach of the action and to better understand the needs of reusers, it is further envisaged to organise the **EU Datathon 2020** as a continuation of previous versions in 2017, 2018 and 2019 (a competition which intended to highlight the potential of linking EU and national data as well as to promote the reuse of EU open data) and a **European conference on open data for the public sector** as a continuation of the **conference on data visualisation the EU DataViz 2019**⁽⁷⁹⁾, organised in 2019 with renowned experts and EU staff working in the domain.

The project will be implemented with associated Commission services such as DG COMM, DG CONNECT, DG DIGIT, ESTAT (GISCO⁽⁸⁰⁾ for corporate visualisations of maps for non-statistical data), JRC, and EU agencies.).

3.3.3 OBJECTIVES

The project aim is to provide a sustainable service package to data providers of the EU ODP (EU institutions, agencies and other bodies) and other stakeholders of the EU ODP, e.g. the

⁷⁸ DCAT Application Profile for data portals in Europe, https://ec.europa.eu/isa2ISA2/solutions/dcat-application-profile-data-portals-europe_en

⁷⁹ <https://publications.europa.eu/eudataviz>

⁸⁰ Within Eurostat, GISCO is responsible for meeting the European Commission's geographical information needs at three levels: the European Union, its member countries, and its regions.

European Data Portal and its affiliated Member State data portals. It will enable them to enhance their data visualisation capacity, enhance collaboration in the areas across organisational borders, and to further open up their data as well as to increase data quality and interoperability in view of better data reusability in the years to come.

The project fully supports the objectives of the ISA²ISA² programme and relates in particular to the ISA²ISA² activities 1, 2, 10 and 11 by:

- further developing and maintaining of the visualisation catalogue, i.e. bringing new interoperability services to maturity and maintaining existing interoperability solutions on an interim basis.
- re-using and bringing to maturity existing cross-border and cross-sector interoperability solutions such as DCAT-AP, and by promoting interinstitutionally-agreed reference metadata maintained within the Publications Office's EU Vocabularies website⁸¹. DCAT-AP is already a recognized standard for open data portals.
- identifying through work on data from different sectors areas in which such solutions are still missing and promoting the use of existing common specifications and standards and by evangelising stakeholders for developing in future common specifications and standards. These solutions will be of added value even after the end of the programme.
- building up, animating and supporting a sustainable community of practice in data visualisation, which is open to EU institutions and Member State administrations and supports cross-border and cross-section interaction, and the nurturing of a related knowledge base for capacity building, knowledge and best practices sharing.

3.3.4 SCOPE

Within the project scope are:

- Improvement of the visualisation catalogue with new tools and features and maintenance of **the content**
- Implement a **visualisation wizard** to increase the usability of the visualisation catalogue

⁸¹ <https://publications.europa.eu/en/web/eu-vocabularies>. The EU Vocabularies website provides access to reference data assets (metadata element sets, named authority lists, schemas, etc.) used by the different European Institutions and available for reuse for everybody.

- Working on pilot projects for **corporate solutions** for groups of datasets for example:
 - dashboards for internal indicators allowing for business intelligence and monitoring
 - visualisation of the EU Budget budget (with DG BUDG) and TED (Tenders Electronic Daily)
 - visualisation of environmental reporting (with DG ENV)
 - visualisation of geographical-related datasets on maps (with ESTAT)
 - Integration of controlled vocabularies and thesauri into selected data visualisation tools/solutions
 - visualisation of non-statistical datasets e.g. ontologies and texts.
- Developing data Support data providers in the implementation of quality guidelines and data quality monitoring on datasets published on the EU ODP and the EC data advisory service to be set-up.
- Continuation of **trainings** on data visualisation, adding a training on data literacy (training materials, delivery of the trainings) which will be available on EU ODP and could be reused by the Interoperability Academy and the EC Data Information & knowledge Management (DIKM) Strategy for 2020-2021.
- Organisation of a **conference** on data visualisation to share best practices and success stories on open data and data visualisation, with some renowned experts, EU staff working on data visualisations and representatives of public administrations in Europe;
- Monthly or bi-monthly **webinar** on specific visualisation topics (e.g. infographics, accessibility, cookies, data preparation, corporate glossaries)
- **Harvesting** solution for open data based on DCAT-AP to programmatically ingest and update datasets increasing the number of datasets available on the EU ODP
- The organisation of the **EU Datathon** 2018, 2019 and 2020 in coordination with the DIKM communication campaign ;
- Integration of one or more EU Datathons relevant apps showcasing high-impact success stories on the reuse of open datasets.

Outside the project scope are:

- The project is about achieving interoperability, corporate capability, sharing best practices and a network of actors driving a service ahead through **pilot projects**. Hence, at this stage of work, the delivery of data visualisation services upon request, such as normally addressed towards an established corporate service are excluded.

3.3.5 ACTION PRIORITY

This section is used to assess the priority of the proposal to become a programme’s action according to Art. 7 of the ISA² decision⁸².

3.3.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> 	<p>The proposal fully supports the EIF principles. The list below lists the relevant principles and the way the proposal addresses them:</p> <ul style="list-style-type: none"> • Openness: the project evolves around open data production, processing and data visualisation • Transparency: Datasets classified as high-value according to the new PSI directive (EU) 2019/1024 are given priority in the project like statistical and geospatial data. • Reusability: the project looks actively for reusable solutions and data visualisations. All the visualisation of high value datasets and integration of relevant EU Datathons applications will be available and reusable for users and do not require additional maintenance and funding after the end of the ISA² programme. • Data portability: the project promotes the use of controlled vocabularies and ontologies and DCAT-AP for the description of datasets • User centrality: The project aims to promote the reuse of the EU ODP datasets. The project will also focus its attention on making even easier the reuse for citizens and businesses by supporting them via possible forums, webinars and improving the dataset documentation (to access the data via APIs and

⁸² Decision (EU) 2015/2240 of the European Parliament and of the Council.

Question	Answer
<ul style="list-style-type: none"> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>SPARQL).</p> <ul style="list-style-type: none"> • Multilingualism: the Publications Office promotes the use of multilingual controlled vocabularies in the datasets dealing with data from different Member States • Reusability: All material produced will be published online in platforms like JoinUp, GitHub and the Interoperability Academy for the benefit of public administrations in Europe • Accessibility: visualisation, dashboards, technically open data formats • Simplification: simplification of reports via dashboards <p>Some of the high-value datasets are in RDF format, and are hence involving semantic interoperability by default.</p> <p>Through this, it contributes to the implementation of the Interoperability Action Plan via relevant enablers, the encouragement of public administrations to use existing interoperability solutions, and the further development of interoperability solutions.</p> <p>It also corresponds to the New European Interoperability Framework, namely the interoperability principles: Openness (2), Transparency (3), Reusability (4), User centricity (6) and Multilingualism (9). The action contributes to priorities in the focus area n2: organisational interoperability, n3 sharing of good practices, n1: governance structure and n4 key enablers: EU open data initiative.</p> <p>The is also very relevant to the EC Digital Strategy, and dat governance.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative</i></p>	<p>Yes, to our knowledge no other initiative among the EU institutions addresses the topic of interoperability for data visualisation purposes.</p>

Question	Answer
<i>action/solution is available?</i>	

3.3.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned

Question	Answer
<i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i>	<p>Data visualisation and open data are per se of cross-sector relevance. There is a need to publish more open data in better quality and more accessible for the public. Currently, there is a lack of existing data visualisation solutions available for the public sector.</p> <p>Data visualisation becomes particularly interesting when it combines data from different sources and domains.</p> <p>The participants in the data visualisation community of practice come from all EU institutions, agencies and bodies.</p> <p>The pilots envisage the visualisation of data from different sectors, e.g. EU research results (CORDIS), EU budget, call for tenders on TED (Tenders Electronic Daily), textual data, etc.</p>
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i>	Not applicable

3.3.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<p>The need for more sharing of open data and data visualisation solutions. Which was expressed by Member States and demonstrated for example in ESTAT meetings with National Statistical Institutes. Few of them already reuse data visualisation solutions provided by the EC. Member States can consult and reuse the project outputs (data visualisations, reuse success stories of applications using EU open datasets). It is too early to say which Member State will reuse particular outputs of this project.</p> <p>The use of tools depends on the respective underlying licences. Preference is given to open source and corporate tools allowing easy reuse within public administrations of EU Members States.</p> <p>By sharing best practices and experiences for publishing open data, Member States can benefit from this knowledge making it easier to implement the processes, workflows and documentations inside their organisation to publish more open data with better quality and having more potential for reuse.</p> <p>This supports the ambition of the new PSI directive.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three</i></p>	<p>Not applicable</p>

Question	Answer
<i>(3) or more EU Members States.</i>	

3.3.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	<p>The action is urgent and responds to needs expressed in different policies.</p> <p>For instance, the PSI directive 2019/1024 fixes a transposition deadline to Member States by 17 July 2021 to open their datasets to the public.</p> <p>The overall aim of the open data policy is to promote economic growth and societal benefits by opening up public sector data. The basic idea is that data that has been funded by the public purse should be available for all to use for commercial and non-commercial purposes. Opening public data includes aspects of interoperability, the possibilities to collect data and publish them on portals, data quality and curation, and ways of better communicating and exploiting them through visualisation and exposure for reuse. Beyond the reuse potential, the act of opening up government data contributes to a higher efficiency of public administration, more transparency and a better interaction between citizens and the administration, as well as better policy making.</p> <p>At Commission level, data visualisation and synergies in data management are key topics in the “Communication on Data, Information and Knowledge Management at the European Commission”⁸³.</p>

⁸³ [C\(2016\) 6626. The Communication underlines the need for a more strategic use of data for policy-making and how they can be gathered, managed, shared and preserved, and supported through new ways of collaborative working.](#)

Question	Answer
	<p>The project is partially linked to the proposal on big data for Public administrations namely in the activity for the evaluation of big data and data analytics needs which will be mostly based on the open data and can be used by European public administration to strengthen the capabilities of open data portals and foster the reuse of data.</p> <p>Furthermore, the project will embed and feedback all outputs of this ISA² project into the Commission internal initiative Data4Policy and action 2016.03 Big Data for Public Administrations.</p>
<p><i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i></p>	<p>The strong focus of ISA² on interoperability, standards, reuse and cross-service cooperation is especially propitious for the topics data visualisation, data management and linked open data. There are no alternative sources for carrying on this activity.</p>

3.3.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be reused.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Phase 2 of the catalogue of data visualisation tools and solutions
Description	It will consist of improvement of visualisation catalogue features such as adding a wizard guiding the users in the choice of a tool or solution as well as curation and enrichment of the content (e.g. describing existing reusable solutions that can be shared within EU institutions and public

	administrations in Europe).
Reference	https://data.europa.eu/euodp/en/visualisation-home
Target release date / Status	Q4 2019
Critical part of target user base	The visualisation catalogue itself as well as most of the content will be reusable.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	The first stage of the visualisation catalogue (technical solution) is completed, available online and can be reused. The whole content is published and can be freely used, too. The catalogue structure will also be published on JoinUp and available to allow reuse and adaptations for public administrations interested in data visualisation.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Development of corporate solutions in the domains data visualisation and reuse-oriented data
Description	The solutions for high value datasets lacking systematic data visualisation will be developed or adapted, e.g. maps for non-statistical data, dashboards for environmental reporting, EU budget or internal indicators. Pilot projects will be run on textual data as well.
Reference	-
Target release date / Status	Q4 2019
Critical part of target user base	The collaboration with other services like DG BUDG, DG COMM, DG ENV, ESTAT, DG BUDG will be essential
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not applicable

Name of reusable solution to	Development of documentation for open data
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be produced (for new proposals) or produced (for existing actions)	models and APIs
Description	<p>The proper description of open data models and APIs are key for their reuse. Citizens and businesses are looking for less cumbersome manners to identify and understand the datasets they are looking for. At this stage, proper metadata documentation can facilitate the integration of datasets into new third-party applications by removing any friction point preventing their reuse and therefore empowering the users.</p> <p>The documentation will be published on the ODP and EDP websites and maintained by own resources after ISA². There are no periodic updates required.</p> <p>The results will also be checked with CNECT.H.4 and JRC to prevent overlaps and to create new synergies.</p>
Reference	-
Target release date / Status	Q4 2021
Critical part of target user base	EU institutions and public administrations in Members States
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not applicable

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Integration of one or more apps as follow-up to the EU Datathons
Description	During the EU Datathons many applications are presented having, in many cases, a real relevant interest for EU institutions and the public sector in the Member States. Currently, those applications are

	<p>out of the radar of open data providers like EU institutions and the concerned public sector organisations in Member States. Making available those applications, enables EU institutions and the public sector in the Member States to integrate them and adapt them to their own needs.</p> <p>The apps will be integrated in EU ODP depending on the use case and target audience and published on reuse on sharing platforms like Joinup and GitHub (the maintenance is covered by OP once the ISA² programme finishes). Every citizen or business can download the apps or reuse the source code for their specific need.</p>
Reference	-
Target release date / Status	Q4 2021
Critical part of target user base	EU institutions like European Central Bank, European Investment Fund, DG ENV and public sector organisations in Member States.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	-

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Data visualisation and data literacy knowledge base to strengthen data visualisation community
Description	<p>The materials to achieve the goal will be collected internally, during workshops, webinars, trainings and the data visualisation conference.</p> <p>The training activities will all be published and is ready to use for trainers and the Interoperability Academy to offer those specialised training courses. The training courses also contain exercises for the participants.</p>

	<p>They will be reusable and published online in the future Digital Europe Programme. The intention is to add them to the knowledge centre of the catalogue of data visualisations.</p> <p>The topics that are already planned to be covered are:</p> <ul style="list-style-type: none"> • Data literacy and data quality guidelines (to complete the phase on data preparation essential in the data visualisation process), • Interactive infographics, • Accessibility, • Cookies, • Corporate glossaries, • Open data, • Linked open data.
Reference	https://data.europa.eu/euodp/en/knowledge-center
Target release date / Status	Q4 2019
Critical part of target user base	The output can be reused by a critical part of the target user base.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	The first stage of the training program is completed, available online and can be reused. The whole content is published and can be freely used, too. This might be useful for JoinUp and the Interoperability Academy.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Harvesting solution for open data based on DCAT-AP
Description	<p>Timely and systematic publishing of data is very important for reusers of open data. The data at the source are stored in a variety of databases describing data in different ways. A flexible harvester is needed to be able to deal with this situation.</p> <p>A harvesting solution will be developed to increase the level of automatization of the publishing process.</p>

	It will be based on DCAT-AP84 and will allow Member States to reuse it for their data portals compatible with DCAT-AP. The project will closely cooperate with the European Data Portal (EDP) in order to reuse, where possible, connectors already developed by them for harvesting existing and standard-driven data portals. The EU ODP in exchange will attempt to harvest repositories/databases of EU institutions with mostly proprietary and less documented data models.
Reference	-
Target release date / Status	Q4 2019
Critical part of target user base	The output can be reused by interested data portals.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not applicable

3.3.5.6 Level of reuse of existing solutions

The reuse by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	The harvesting solution will be based on DCAT-AP ⁸⁵ . Controlled vocabularies will be integrated in some data visualisation solutions.
<i>For proposals completely or largely already in operational phase: has the</i>	The solution(s) will be listed in Joinup and described using ADMS (Asset Description Metadata Schema). Reuse of corporate data visualisation tools for the

⁸⁶ Homepage: <https://publications.europa.eu/eudataviz>

⁸⁶ Homepage: <https://publications.europa.eu/eudataviz>

<i>action reused existing interoperability solutions? If yes, which ones and how?</i>	visualisation and publication of high-value datasets.
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3.3.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union’s initiatives such as the DSM.

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union’s high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	<p>(Open) government data is a core asset for the knowledge-based economy, since its reuse is a basis for innovative information products and services. It makes a significant contribution to the Digital Single Market and is a key enabler for transparency, evidence-based decision-making and a broader participation in the political discourse. As a by-product, it enhances administrative efficiency through streamlined data management.</p> <p>This package will enable administrations to enhance their data visualisation capacity, to further open up their data as well as to increase data quality and interoperability in view of better data re-usability.</p>

3.3.6 PROBLEM STATEMENT

The problem of	A fast growing number of data (various types and formats) which require appropriate tools to be identified in order to make them understandable.
affects	EU institutions, agencies and bodies and public administrations in Europe
the impact of which is	A difficulty to identify appropriate tools for visualising different types of data to create efficient data visualisation facilitating decision making, quick insight into the data and citizens engagement
a successful solution would be	Used for a variety of data published on the EU ODP for enhanced transparency and user experience through data visualisation

The problem of	Data visualisation is a complex topic requiring a set of different skills to identify and select the right tools.
affects	EU institutions, agencies, bodies, and public administrations in Europe.
the impact of which is	Difficulty to build upon existing resources to enhance the skills and capacities of public servants in the area of data visualisation and data preparation
a successful solution would be	An active community and a EU open data conference are the right places for proactively sharing their knowledge, experience and solutions

The problem of	Data quality that is required to create reliable and trustful data visualisation
affects	EU institutions, agencies and bodies and public administrations in Europe
the impact of which is	Impossibility to create data visualisation or very limited data visualisation
a successful solution would be	Guiding public administration in the data quality aspects.

The problem of	Need to publish metadata on EU ODP on a timely and regular basis thanks to automatization of the publishing process
affects	EU institutions, agencies and bodies, reusers of open data
the impact of which is	Some data are not yet available on the EU ODP on time
a successful solution would be	An automatic metadata publishing chain with possibility of harvesting the source based on the metadata schema of DCAT-AP.

The problem of	Provision of open data in a way that would allow to foster the economic growth and data reuse for the benefit of citizens and businesses.
affects	EU institutions, agencies and bodies and public administrations in Europe, reusers of open data
the impact of which is	Some data are not suitable for reuse due to technical or legal constraints, lack of context or quality issues
a successful solution would be	An active engagement with reusers and learn from them how to improve our data for reuse, highlight what could be done with the data e.g. through the EU Datathon on public open datasets, webinars on “what’s possible” with open datasets and create forums where reuses can exchanges about applications, best practices and success stories. The materials produced for the engagement with reusers will be compatible with ADMS format.

The problem of	Identifying relevant and innovative applications already available using open datasets for better serving citizens and businesses
affects	EU institutions and public administration in Members States
the impact of which is	EU institutions and public administrations should, most of the time, build from scratch or rebuild full open data applications, which are, most of the time, not suitable for reuse in other public administrations or EU institutions. This manner of working is against the principle of building effective public administration organisations in the EU.
a successful solution would be	Make the sourcing of relevant open data applications cumbersome for all EU institutions and public administrations by publishing them in a centralised and accessible repository.

The problem of	Lack of proper description open datasets and APIs for reuse
affects	EU institutions and public administrations in Member States
the impact of which is	Bad metadata on open datasets makes difficult their integration into third-party applications and consultation by citizens. It has the potential to discourage reusers to benefit from this valuable source of information.
a successful solution would be	Share best practices on proper documentation of public open datasets.

3.3.7 IMPACT OF THE ACTION

3.3.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	The reuse of data visualisation solutions and strengthening of skills will allow for creation of effective data visualisations without duplication of effort	Progressively from 2020 on	EU institutions, Member State administrations
(+) More datasets open to the public for reuse	This will happen through the actions related to open data.	Progressively from 2020 on	Member State administrations, citizens and businesses
(+) Savings in time	Data visualisation for some data can be created quicker and links between data updated instantly	Progressively from 2020 on	EU institutions, Member State administrations
(+) Better interoperability and quality of digital public service	Visualising data requires data of good quality, harmonized and interlinked.	Progressively from 2020 on	EU institutions, Member State administrations
(-) Integration or usage cost	Some cost will be required to maintain the solutions and curate content	Progressively from 2020 on	EU institutions
(+) Improved transparency	By visualising data, citizens will get insight into a wide range of data	Progressively from 2020 on	Citizens, businesses, NGOs, journalists
(+) Improved data quality	Data visualisation allows for quick discovery of data quality issues, missing values and inconsistencies	Progressively from 2020 on	EU institutions, data users

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Better regulation	Analysing and visualising data helps to determine what data is of sufficient quality allowing for successful comparative analysis	Progressively from 2020 on	EU institutions, Member State administrations

3.3.7.2 User-centricity

As stated under point 1.1.9.2 the end users of the solution are:

- The staff of the European institutions, agencies and bodies working on data and metadata management, data visualisation, data publishing and presentation.
- The staff of public administrations in Member States, especially in statistical institutes and national/regional data portals.
- The users of data portals: SMEs, other public organisations, researchers, journalists, NGOs, citizens.

The design of the solution takes place in collaboration and strong interaction with the user groups (surveys, forums, feedback). For instance, the engagement of reusers through webinars and forums makes possible to know their needs and expectations from public open datasets providers in terms of accessibility, documentation, quality, metadata and support.

3.3.8 EXPECTED MAJOR OUTPUTS

Output name	A European conference on data visualisation for public administrations in Europe: EU DataViz 2019
Description	<p>The highest standing conferences on data visualisation are organised outside EU. The distance and participation costs are prohibitive for many public servants thus limiting their access to up-to-date knowledge in this quickly evolving and innovative domain. On top of it, most of the conferences are not focusing on the public sector expectations, needs and constraints.</p> <p>A (free of charge) conference on open data and data visualisation will be organized where public servants will be able to listen to experts in the domain and attend workshops in their specific field of</p>

	<p>interest (e.g. geo-visualisation, infographics, data visualisation for decision making).</p> <p>All presentations and recordings will be published after the conference on the conference website and social networks. These results do not require any additional financing after ISA² and can be a permanent source of information for public administrations.</p>
Reference	https://publications.europa.eu/eudataviz
Target release date / Status	Q4 2019

Output name	A European conference on open data for public administrations in Europe
Description	<p>Most high standing conferences on open data and data visualisation are organised outside EU. The distance and participation costs are prohibitive for many public servants thus limiting their access to up-to-date knowledge in this quickly evolving and innovative domain. On top of it, most of the conferences are not focusing on the public sector expectations, needs and constraints.</p> <p>A (free of charge) conference on open data and data visualisation will be organized where public servants will be able to listen to experts in the domain and attend workshops in their specific field of interest (e.g. geo-visualisation, infographics, data visualisation for decision making).</p> <p>All presentations and recordings will be published after the conference on the conference website and social networks. These results do not require any additional financing after ISA² and can be a permanent source of information for public administrations.</p>
Reference	
Target release date / Status	Q4 2021

Output name	Delivery of training data visualisation and data literacy (training material will be available online)
Description	<p>The following training sessions are planned:</p> <ul style="list-style-type: none"> ○ Data visualisations – essentials ○ Visualising data with selected tools

	<ul style="list-style-type: none"> ○ Data literacy ○ Infographics ○ Data quality ○ Open data ○ Linked open data
Reference	
Target release date / Status	Q4 2019

Output name	Webinars on data visualisations, data literacy and data quality
Description	<p>The sharing of knowledge on a regular basis is important for community building. The domain of data visualisation is broad. Therefore, to cover the essential aspects several webinars will be envisaged. The topics will be dynamically selected by the needs and expectations from the with the existing data visualisation community.</p> <p>They will also be useful for increasing knowledge about the data published by EU institutions and promote existing visualisation and data cleaning solutions.</p> <p>Webinars will be on different topics. Most of them will be available for all public administrations.</p>
Reference	
Target release date / Status	Q4 2018- Q4 2019

Output name	EU Datathon results
Description	<p>Hackathons allow for direct interaction with open data reusers and help to understand their needs, requirements about data formats, descriptions, quality and other related aspects.</p> <p>They often result in innovative products and applications based on public data that can be further developed and possibly converted into an innovative business model.</p> <p>The teams in the EU Datathon will be source of inspiration and information for other projects and does not require any additional funding after ISA².</p>

Reference	
Target release date / Status	Q4 2020

Output name	Integration of one or more relevant apps for EU institutions and the public sector
Description	The most relevant apps from the EU Datathons for EU institutions and public organisations will be made available to them by: <ul style="list-style-type: none"> • Integrating them into the EU ODP. • Publishing them for reuse on sharing platforms like Joinup and GitHub.
Reference	
Target release date / Status	Q4 2021

Output name	Documentation of open datasets and APIs to facilitate reuse and foster reusers community
Description	Good metadata and documentation of APIs are key to facilitate reuse of open datasets. During this project, we will propose to EU Institutions and public administration a schema to document datasets, licenses, access points and APIs properly. The adoption of this structure will make easier the reuse of open datasets published by EU Institutions and public administrations.
Reference	
Target release date / Status	Q4 2021

3.3.9 ORGANISATIONAL APPROACH

3.3.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
OP.C.4	Xavier Desurmont, Agnieszka Zając	Supervising all activities
DIGIT	D.1 (Data Services) and D.2 (IOP academy and JoinUp)	<ul style="list-style-type: none"> • Data services providers • Interoperability Academy: reusability of data visualisation training material • JoinUp: publication of results of this action for reuse by other EU institutions and public sector in Member States
OP.C.3	Carmelo Greco	Collaboration on visualisation of the public call for tenders from TED (Tenders Electronic Daily)
DG ESTAT	Hannes Reuter	Collaboration on visualisation on maps
DG COMM	Laurent Corvelyn, Jose Arcos	Collaboration on visualisation for the web
DG ENV	Joachim D'Eugenio	Project on visualising environmental reporting
DG CONNECT	Daniele Rizzi	Collaboration with European Data Portal
DG BUDG	Andrea Scionti	Collaboration on visualisation of the EU budget

3.3.9.2 Identified user groups

The following main user groups have been identified:

- The staff of EU institutions, agencies and other bodies working on data and metadata management, data visualisation, data publishing and presentation.
- The staff of public administrations in Member States especially statistical institutes and national data portals.
- The users of data portals: SMEs, NGOs, researchers, journalists and citizens.

3.3.9.3 Communication and dissemination plan

This is a continuation of activities of ISA² Action 2016.18. The communication will embrace the outcomes of 2016.18 previous activities in the scope of the new proposal.

It will target different types of audiences: staff of EU institutions for the adoption of best-practices to better expose open datasets to the public, the multipliers for the new visualisations created, Member State administrations for the reusable apps and as well different profiles of the users of the EU ODP for open datasets reuse engagement: research community, NGOs, citizens and businesses.

The communication of the project will be ensured through the following channels:

- The EU ODP network and the Publications Office's publishing officers network towards institutional data providers as well as its social media and other channels towards reuser communities.
- European Data Portal towards affiliated Member State portals as well as networks of DGs in their domain of activity (e.g. ESTAT for Statistical Institutes).
- [ISA² newsletter](#) and ISA² main communication channels
- [JoinUp](#) platform
- Interoperability Academy
- Data visualisation community
- EC Local Data Correspondant network.

The main actions that will be envisaged are:

- Promotional materials, blog posts and tweets
- Presentations in interinstitutional meetings
- EU open data and data visualisation conference
- Regular webinars on data visualisations to be available later for the Interoperability Academy

- EU Datathon 2020

3.3.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected time for target
Number of corporate data visualisation solutions provided	2	2019
Number of data visualisations projects based on specific high value datasets	2	2019
EU Datathon: Number of project submissions	100	2020
Number of EU institutions partnering with the EU Datathon 2020	5	2020
Number of integrated apps from the EU Datathons	1	2021
Number of people who attended the trainings	100	2019
Number of people attending the webinars	200	2019
Number of people attending the EU open data conference	250	2021
Number of datasets harvested with DCAT-AP based harvester	100	2019
Number of raising knowledge raising activities	10	2019

3.3.9.5 Governance approach

The Publications Office will ensure the chairmanship and the project management.

The key stakeholders will be involved in the evolution of the data visualisation projects and data visualisation community building, the organization of an EU open data conference and the organisation of the EU Datathon 2020.

3.3.10 TECHNICAL APPROACH AND CURRENT STATUS

As described in the ISA² action 2016.18 the catalogue of data visualisations was created following a collaborative and iterative approach that engaged a number of key stakeholders from the EU institutions. The visualisation catalogue is already in production and accessible through the EU ODP. The visualisation catalogue is updated regularly with new training courses, reuse examples and content on data visualisation. It also trained EU institutions staff

on data visualisation, organised three EU Datathons involving 10 EU institutions as partners and a conference on data visualisation (EU DataViz 2019⁸⁶) for the public sector in Europe. The ongoing project further delivered eight sample visualisations of three high-value datasets, namely CORDIS⁸⁷, the Transparency Register and TED⁸⁸. The data visualisations were built to look at the selected datasets from different perspectives. Each visualisation is supported by a short description, which helps communicating its message to its target audience. Moreover, the OP published the EU budget as Linked Open Data (LOD)⁸⁹. In addition, a series of questions about the EU budget together with accompanying SPARQL queries have been developed. They allow to explore the EU budget published on the EU ODP from different angles, namely via visualisations and an interactive dashboard.

Building upon those achievements, the project proposes working over the next year on the concept of “EU data reuse: better data-based services and solutions for public” on the following topics:

- Sharing best practices on how to improve the communication with EU citizens through data visualisation;
- Show the value of EU open data;
- Solve EU institutions use cases by EU open data re-usability;
- Promote EU open data before the reusers community;
- Make accessible to the public high-value datasets through data visualisation.

This will be accompanied by actions to:

- **Build and strengthen the open data reuser community** through better metadata and dataset documentation, webinars, forums, videos and reuse success stories.
- **Exchange on best practices and success stories and actions** on better sharing data with the public and improving the communication with citizens through data visualisation.
- **Highlight the value of EU open data** and its impact on the citizen and businesses through superior applications serving their needs and expectations.

The ISA² project 2016.18 was managed using internal resources. However, data visualisation is closely related to data science, and is multidimensional, complex and requiring a

⁸⁶ Homepage: <https://publications.europa.eu/eudataviz>

⁸⁷ CORDIS data: <https://data.europa.eu/euodp/en/data/dataset/cordisref-data>

⁸⁸ Tenders Electronic Daily data: <https://data.europa.eu/euodp/en/data/dataset/ted-1>

⁸⁹ It was a follow up of the development of conceptual data model of the EU Budget Vocabulary based on RDF (Resource Description Format) which defined the structure of the EU budget data

combination of different skills⁹⁰. Therefore, in the new proposal, OP will engaged in 2020 a technical project manager with expertise and experience in the domain of data visualisation, data science and programming in order to establish the needed bridges between different aspects of data visualisation, technical solutions and their deployment. All outputs will be sustainable by building up skills internally and publishing all material for the reuse community. By doing so, the outputs can be updated if needed.

All actions are in line with the Digital Europe Programme and will support the Digital Single Market.

3.3.11 COSTS AND MILESTONES

3.3.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/others (specify)	Start date (Q2/2018)	End date (Q4/2019)
Not applicable for the whole column	Project Management	50	ISA ² ISA ²	Q2/2016	Q4/2017
	Development of catalogue of data visualisation tools and knowledge base	198	ISA ² ISA ²	Q2/2016	Q4/2017
	Support services for developing open data capabilities in the EU	110	ISA ² ISA ²	Q2/2016	Q4/2017

⁹⁰ See 8 hats of data visualisation by Andy Kirk <http://www.visualisingdata.com/2012/06/article-the-8-hats-of-data-visualisation-design/>

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (Q2/2018)	End date (Q4/2019)
	institutions				
	Publishing and visualising EU budget and related data	40	ISA ²	Q2/2016	Q4/2017
	Raising awareness and communication	20	ISA ²	Q2/2016	Q4/2017
	Improvement of the catalogue of the visualisation tools features and maintenance of the content	60	ISA ²	Q3/2018	Q4/2019
	Working on corporate solutions for groups of datasets (e.g. dashboards for internal indicators allowing for business intelligence and monitoring, visualisation of non-statistical datasets e.g. ontologies, texts)	140	ISA ²	Q3/2018	Q4/2019
	Data quality guidelines	25	ISA ²	Q3/2018	Q4/2019
	Continuation of trainings on data visualisation and data quality	35	ISA ²	Q3/2018	Q4/2019
	Organize a conference on data visualisation	40	ISA ²	Q4/2018	Q4/2019
	Monthly or bi-monthly webinar on a specific visualisation topics (e.g.	25	ISA ²	Q3/2018	Q4/2019

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (Q2/2018)	End date (Q4/2019)
	infographics, accessibility, cookies, data preparation, corporate glossaries, data quality)				
	Harvesting solution for open data based on DCAT-AP	50	ISA ²	Q3/2018	Q4/2019
Not applicable for the whole column	Organise a conference on open data	100	ISA ²	Q1 2020	Q4 2021
	EU Datathon 2020 (awards)	50	ISA ²	Q1 2020	Q4 2020
	Integration of one or more apps from the EU Datathons	150	ISA ²	Q4 2020	Q4 2021
	Engagement of the reusers community to promote the reuse of EU open data	100	ISA ²	Q1 2020	Q4 2021
	Project management (technical expertise of data visualisation and data science)	100	ISA ²	Q1 2020	Q4 2021

3.3.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in K EUR)	Executed budget (in K EUR)
2016		300	300
2017		118	118
2018	I	260	260
2019	II	330	202 (estimated)
2020	III	500	

3.3.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
Report on reusable data visualisation tools to support data-driven policymaking (ISA.1.1)	https://publications.europa.eu/en/publication-detail/-/publication/16d868c4-7ef4-11e6-b076-01aa75ed71a1	
Workshop on Data visualisation tools in the EU institutions	https://joinup.ec.europa.eu/sites/default/files/isa_field_path/presentation_workshop_data_visualisation.pdf	
Catalogue of data visualisation tools (including the inventory of tools)	https://data.europa.eu/euodp/tools	
Knowledge centre of the catalogue	https://data.europa.eu/euodp/en/knowledge-center	
Report: Data visualisation service definition	http://52.50.205.146:8890/data_visualisation_catalogue/node/111	
Pilot data visualisation	http://cpsv-ap.semic.eu/data-visualisation-	

Description	Reference link	Attached document
projects based on high value datasets published on the EU Open Data Portal	pilot/CORDIS/ http://cpsv-ap.semic.eu/data-visualisation-pilot/TransparencyRegister/ http://cpsv-ap.semic.eu/data-visualisation-pilot/TED/map/ted_layout.html	
Description of the project on Joinup	https://joinup.ec.europa.eu/asset/data_visualisation_and_open_data/description	
Training materials on Joinup (and soon on the Interoperability Academy)	https://joinup.ec.europa.eu/asset/data_visualisation_and_open_data/og_page/workshop	
Training material on EU Open Data Portal	https://data.europa.eu/euodp/en/knowledge-center	
EU Budget as Linked Open Data report	https://joinup.ec.europa.eu/asset/data_visualisation_and_open_data/description	
Summary of the project (leaflet)	https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/Open%20data%20publishing%20and%20visualisation.pdf	
EU Datathon 2019	https://publications.europa.eu/eudatathon	
EU DataViz 2019 conference	https://publications.europa.eu/eudataviz	

3.4 AUTOMATIC BUSINESS REPORTING (2016.11) – FUNDING CONCLUDED

3.4.1 IDENTIFICATION OF THE ACTION

Type of Activity	Common Frameworks
Service in charge	FISMA B2
Associated Services	TAXUD, ECFIN

3.4.2 EXECUTIVE SUMMARY

Automation and data exchange between companies and authorities is relevant for many European countries as well to increase productivity. Thus for the European countries to become particularly strong in the digital area, there is a need for a good infrastructure, sound public data and a willingness to develop digital solutions that can create jobs and economic growth.

The project will work to investigate the potential of establishing ways of automating data exchange between companies and authorities in the European Union. The idea is that this project will help to strengthen the region as a digital forerunner and greatly improve the digital inner market in Europe.

Automatic business reporting is an ambitious vision that potentially can revolutionize the way companies do accounting. Key to fulfilling the vision is to replace the burden of reporting on companies with a digital infrastructure that involves a greater use of automation and data reuse between authorities and companies. Automatic business reporting is a paradigm shift from the current state of reporting where businesses report data to the authorities again and again, to a new state where the authorities can “pull” or “harvest” relevant data from the companies through the use of a central data repository. The goal is to harvest data at the lowest level possible in the companies to enable full automation of the reporting.

Automatic business reporting is a new concept where production data from the companies are stored in a central solution. The central infrastructure can be accessed by public institutions and private organizations. Access and privacy issues are managed by a user authentication system to regulate the distribution of data. The software needed to deliver the data is developed by private companies according to specific standards specified by the government. Once the standardized format is settled the market can develop and modify existing systems to the new standards.

Ideally, once the user authentication, the standardized format and the central repository is developed the following outputs will happen:

- Business reporting to public institutions will cease to exist. Instead public institutions will harvest the necessary data using the central repository
- Documentation requirements in the form of financial statements and budgets are replaced by granting access to the data in the repository
- Automatic business reporting facilitates new and innovative ways of linking sales, inventory management, supplier management and bookkeeping in the individual company
- The Danish government cut spending on controlling the companies for tax fraud and etc. as the quality of the data improves both by the increased mass of data and the level of detail.
- The individual companies will have much better business intelligence (BI) options as the general level of digitization is increased and systems providers can develop new BI solutions and improve the growth potential.

While Automatic business reporting is very advantageous for the government in terms of better control mechanisms and more accurate reports, the real benefits of Automatic business reporting are actually reaped in the companies. Fully implementing Automatic business reporting will eventually increase the digitization level in the companies by a large margin. Having better technologies and a more detailed insight in the company will strengthen the company's business intelligence and improve B2B-relations due to more accurate information about the individual companies as well as entire business sectors.

This project is a study of the potential of establishing Automatic business reporting in the European countries. The primary actions will be analysis and the outputs will be extensive knowledge about the subject at hand and executable results on how to proceed with the Automatic business reporting vision.

3.4.3 OBJECTIVES

- Investigate the potential of data sharing and reuse in the European region.
- Investigate the possibility of increased automatic and standardized reporting in the European countries.
- Investigate the potential and possibilities of efficient business intelligence and business-to-business relations for SME's in European countries.

3.4.4 SCOPE

The scope of the project is to:

- Define the vision and scope for an Automatic Business Reporting.
- Identify and analyse the potential of automatic business reporting in terms of public savings and benefits for private businesses. Deloitte has made a rough estimate of the potential savings of automated reporting in Denmark. The estimate concludes that automatic business reporting has the potential of saving businesses 5-7 billion DKK every year. This estimate has to be further qualified in a more detailed analysis. Similar analysis can be initiated in the other European countries
- Initiate a range of technical, legal, cultural, organizational and political analyses to evaluate the potential of automatic business reporting in the European countries and identify solutions to overcome these barriers in close coordination with the other two European case studies.

3.4.5 PROBLEM STATEMENT

Big data and data-driven companies will be essential if the European Union wants to maintain a key role in the global economy. Automatic business reporting incentivises SME's to become more data-driven and reduces the burdens of administrative reporting by introducing automatic data collection.

3.4.6 EXPECTED BENEFICIARIES AND ANTICIPATED BENEFITS

This initiative will strengthen the competitiveness and create growth for small and medium enterprises, which will be the expected beneficiaries. The companies spend a lot of time and resources on administrative reporting – a cost that is estimated to 1 billion euros in Denmark alone. Deloitte has made a rough estimate of the potential savings of automated reporting in Denmark. The estimate concludes that automatic business reporting has the potential of saving businesses 1 billion euros every year in Denmark. The potential savings in the European Union are not calculated, but similar results can be expected.

Beneficiaries	Anticipated benefits
Small and medium enterprises	1) Fewer administrative burdens 2) Higher degree of digitization in the individual companies 3) Increased business intelligence and easier business-to-business relations

3.4.7 RELATED EU ACTIONS / POLICIES

Action / Policy	Description of relation, inputs / outputs
ISA2: Specific activities in the field of financial reporting and auditing	In a global economy, there is a need for a global accounting language. Automatic business reporting requires a standardized accounting language to pull the data from the ERP-systems, so the two policies synergizes well.

3.4.8 REUSE OF SOLUTIONS DEVELOPED BY ISA, ISA² OR OTHER EU / NATIONAL INITIATIVES

Data standardization in the European union
Digitization strategies in the European countries
Development and use of digital reporting in other countries (Netherlands, Australia, etc.)

3.4.9 EXPECTED RE-USABLE OUTPUTS (solutions and instruments)

Output name	State of the art report
Description	The report will assess already existing building blocks, solutions, identify users, needs to assess the feasibility of the proposal.

Reference	To be published on Joinup
Target release date / Status	2016

3.4.10 ORGANISATIONAL APPROACH

3.4.10.1 Expected stakeholders and their representatives

Stakeholders	Representatives
The Danish Business Authority	Rasmus Eskild Jensen, Nils-Bro Müller
Agency for Digitisation in Denmark	n/a
Business authorities in MSs	The action will identify further stakeholders in the course of the project

3.4.10.2 Communication plan

The Automatic business reporting project requires legal adaption to become a success. As such the project is much more a political and administrative complex project rather than a technical issue. Thus, the communication plan will be built around this assumption and will rely heavily on gaining political support in the member states. Automatic business reporting can be introduced in different tempi and is thus flexible in the adaption phase.

3.4.11 TECHNICAL APPROACH

The action will first analyse the current state of affairs in the MS and on the EU level. The report will serve as a basis for potential further actions.

3.4.12 COSTS AND MILESTONES

3.4.12.1 Breakdown of anticipated costs and related milestones

Phase: Inception Execution Operational	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Inception	Analysis of the state of affairs in the MS and on the EU level (including existing accounting standards) and potential barriers	150		Q2/2016	Q4/2016
Inception	Creation of a data taxonomy for financial data	200		Q1/2017	Q3/2017
	Total	350			

3.4.12.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Inception	150	
2017	Inception	200	
2018			
2019			
2020			

3.5 BIG DATA FOR PUBLIC ADMINISTRATIONS (2016.03) – FUNDING CONCLUDED

3.5.1 IDENTIFICATION OF THE ACTION

Type of Activity	Study and reusable generic tools
Service in charge	DIGIT D.1
Associated Services	DIGIT.B.2, DIGIT.B.4, DG RTD.E2, DG CNECT.R3, DG CNECT.F4, CNECT.02, ESTAT

3.5.2 EXECUTIVE SUMMARY

The amount of data generated worldwide increases at an astounding pace - by 40% annually and will increase 30 fold between 2010-2020. Due to the segmentation of public services and due to using non-interoperable means to describe data, most of the data generated in the public sector is not available for re-use.

This action, titled 'Big Data for Public Administrations', aims at addressing the use of big data within public administrations' as a means for enabling wiser decision making. With recent technologies such as big data, data mining, social media, cloud etc. organisations have greater potentials in generating, creating and storing data, information and knowledge thus providing greater opportunities for wisdom.

The previous phases of this action, started in 2015 aimed at:

- Carrying out a landscape analysis in order to identify the requirements and challenges of public administrations in Europe and the Commission in the context of big data and data analytics, as well as the on-going initiatives and best practices in these areas.
- Launching a number of pilot projects on big data and data analytics both with European Commission services and Member States public administrations. The output of these pilots (documentation, source code) has been published on the Joinup collaborative website⁹¹.
- Identifying the requirements and designing the architecture of a big data test infrastructure. The big data test infrastructure will be an operational infrastructure with analytics services and supporting tools, which will allow Member States public administrations to experiment with big data and implement their own big Data pilots. The infrastructure has been designed in close cooperation with a working group composed (so far) of 8 MSs. The results were published in Q4 2017. The actual implementation of the infrastructure has

⁹¹ https://joinup.ec.europa.eu/asset/isa_bigdata/home

been proposed to be financed through the CEF programme, as part of the 2018 Work Programme. The proposal has been put forward as a joint effort with the European Data Portal project, already financed through the CEF programme. The European Data Portal will be one of the main sources of data to be processed and analysed on the infrastructure.

This action will continue to build upon the results of the previous phases. Specifically:

- Track 1: further identify big data and data analytics needs through cooperation with the Member States, with the aim of understanding the needed tools and services Member States' public administrations need in this domain. An additional objective is to enlarge the current working group of 8 Member States in 2018, in order to include more Member States interested in the action.
- Track 2: develop re-usable tools, or generalise existing tools already in use in the EC services or in Member States, for big data processing and text/data analytics (e.g. analysis of open public consultations), to be used by Member States in different policy domains. The tools are meant to be shared on Joinup and re-used directly by public administrations, and/or deployed on the big data test infrastructure mentioned above.
- Track 3: implement pilot projects, in cooperation with EC services or Member States public administrations, re-using the tools developed in track 2.

3.5.3 OBJECTIVES

- To further identify concrete opportunities and requirements in public administrations on big data analytics in different policy areas, especially supporting cross-border exchange of datasets and re-use of open data sets (e.g. open data published on the European Data Portal).
- To develop new tools supporting Member States' big data analytics needs and generalise and extend the solutions produced through the already launched pilots.
- To launch new co-operations with policy DGs and MSs through the launch of new pilots supported by the big data test infrastructure, designed in the previous phase of the action, in order to accelerate the data driven transformation.

3.5.4 SCOPE

This action includes in its scope activities related to the development of IT tools and the production of best practices and methodologies for gathering, processing and extracting knowledge from (big) data sources, with the aim of supporting decision-making processes in

public administrations. Additionally, the action will include in its scope activities related to the sharing of knowledge, already available in Member States or EU Institutions, in this domain.

3.5.5 ACTION PRIORITY

This section is used to assess the priority of the proposal to become a programme’s action according to Art. 7 of the ISA² decision⁹².

3.5.5.1 Contribution to the interoperability landscape

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU</i> 	<ul style="list-style-type: none"> • The European Commission has presented a Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions titled 'Towards a thriving data-driven economy'. This communication focuses on the need for framework conditions that enable a single market for big data and cloud computing. The ability to handle and analyse big data is elementary in different areas particularly scientific research, public sector and innovation. • The EIF includes, as main underlying principles, the principles of “openness”, “transparency”, “reusability” and “technological neutrality”. This action will, through the support to the execution of analytics projects on big data, facilitate the sharing of open data between public administrations; increase the transparency of decision-making in public administrations by supporting knowledge sharing on evidence-based policy-making practices; support the re-use of

⁹² DECISION (EU) 2015/2240 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

Question	Answer
<p><i>policy/initiative having interoperability requirements?</i></p>	<p>open-source data analytics tools developed by Member States of EU Institutions; and provide public administrations with the opportunity to test (open source) technologies in this domain before taking a decision on the technical way forward.</p> <ul style="list-style-type: none"> • The action is also contributing to the objectives of the European Data Portal⁹³, funded by the CEF Telecom Programme, whose objective is to “harvest the metadata of Public Sector Information available on public data portals across European countries”. The action will provide the tools to combine the data made available through the portal and to process it using analytical capabilities.
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>Multiple commercial and open-source products are available on the market to support (big) data analytics projects, and the market is rapidly evolving in this domain. However, the selection, set-up, configuration and implementation of such tools/products to cover specific policy needs require significant resources and highly qualified data scientists, which are rarely available in public administrations. This action will contribute to fill in this gap by providing tools and support in this domain to public administrations, and by facilitating the sharing of already existing knowledge.</p>

⁹³ <https://www.europeandataportal.eu/>

3.5.5.2 Cross-sector

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>Potential areas of action, where big data could have a real and direct impact are:</p> <ul style="list-style-type: none"> • Foresight and agenda setting. The vast amount of data that is available to consider when developing a plan or taking an action is massive and in most instances, the limited human resources available do not provide enough manpower to execute such resource intensive work. • Improve evidence for evaluation assessments. In evaluation assessments, the use of big data could bring more accuracy by detecting complex and subtle patterns in bigger, all-encompassing datasets and by increasing the capability to analyse short term patterns. • Stakeholder consultations analysis. The action will provide a re-usable tool to facilitate the analysis of structured and unstructured (textual) feedback of citizens and other stakeholders, gathered in the context of public consultations. • Identification of unsafe/dangerous products on e-Commerce websites. A pilot has been launched in Q2 2017, aiming at using text mining techniques on users' feedback posted on e-Commerce website to spot potentially unsafe/dangerous products sold on the website.
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<ul style="list-style-type: none"> • Research and innovative medicine. The objective of the pilot was to identify the main trends in innovative medicine by analysing the content of the scientific publications coming from internal (e.g. CORDIS) and external (e.g. PubMed) sources. • Transposition of European Legislation. This pilot project aims at supporting the manual checks performed by staff members who need to verify whether a European directive is correctly and completely transposed in national legislation (in all 28 countries). • Social inclusion. A pilot project has been conducted in

Question	Answer
	collaboration with the Comunidad de Madrid (Spain) in 2017 in this policy domain. The pilot aimed at identifying the impact of the social policies developed by the Madrid region the in different segments of the population.

3.5.5.3 Cross-border

Question	Answer
Will the proposal, once completed , be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.	In 2017, a long list of requirements has been collected from different Member States to understand their needs in the area of (big) data analytics for policy making, especially with regards to analytics use cases and infrastructure needs. The needs have been collected through a consultation of the ISA network, through the creation of a working group. MSs on-board so far are: Czech Republic, Estonia, Hungary, Malta, Norway, Slovenia, Spain, and Portugal. The working group has shown significant interest in the action and its outputs. Additionally, the action has been presented to the ESS Big Data Task Force: the representatives have highlighted their interest in the action, and shown availability to (re-)use its outcomes.
For proposals completely or largely already in operational phase , indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.	A pilot has been conducted with the Comunidad de Madrid (Spain), as already mentioned in section 1.1.5.2. The outcome of the pilot has been presented during the SEMIC conference 2017 in Malta. The results of the Scientific Papers text mining pilot have been evaluated and re-used by the CSC of DG RTD, which deals with analysis of the output (deliverables and documents) of research programmes (e.g. Horizon 2020).

3.5.5.4 Urgency

Question	Answer
<p>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</p>	<p>The above-mentioned Communication from the Commission titled 'Towards a thriving data-driven economy', highlights that the annual growth of the big data sector is equivalent to 40%, making it one of the strongest assets for economy growth, posing substantial opportunities that have so far not been reaped by the European market players. It identifies a number of key actions for the EU to help seize the opportunities of this sector amongst which is the provision of the enabling technologies and underlying infrastructures and skills as well as the provisioning of public data resources and research data infrastructures.</p>
<p>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</p>	<p>The only additional funding source covering the activities in this proposal could potentially come from DGs interested in participating in one or more pilots or in re-using the outcomes of the action. However, such additional budget has not yet been identified for 2018. In any case, this additional budget will only cover the specific needs of the participating DGs and will not be used to support wider re-use. ISA is the best fit to support knowledge sharing on IT tools and services with and among Member States, and to support development of tools that can be widely re-used by European public administrations.</p>

3.5.5.5 Reusability of action's outputs

<p>Name of reusable solution to be produced (for new proposals) or produced (for existing actions)</p>	<p>Big data analytics for policy making</p>
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Description	The study investigates big data and data analytics initiatives launched by public authorities in Europe in order to provide insights. It analyses the potential or added-value of big data analytics to help public administrations to reach their goals, and captures valuable lessons learnt and best practices.
Reference	https://joinup.ec.europa.eu/asset/isa_bigdata/document/big-data-analytics-policy-making-report
Target release date / Status	Published
Critical part of target user base	All staff in MSs public administrations willing to launch big data / data analytics projects to support policy-making.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Study has been distributed to a set of different stakeholders, both internal (e.g. data4policy group) and external (e.g. ISA Member State representatives).

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Pilots Software Components
Description	<p>The software components developed as part of the different pilots carried out under the ISA² action:</p> <ol style="list-style-type: none"> 1) Scientific papers analysis pilot (with DG RTD) - clustering of scientific documents) 2) National implementing measures pilot (with DG GROW) – comparison of EU Directives with National Implementing Measures using text analytics 3) Social inclusion pilot (with Comunidad de Madrid – Spain) – segmentation of population for evaluation of social policies 4) Identification of unsafe products on e-Commerce websites (with DG JUST) – use of webscraping and text analytics techniques to identify potentially unsafe products sold

	<p>on e-Commerce websites.</p> <p>5) Overcost prediction in public construction projects is a project that analyses data with the objective of predict the cost deviation in public construction projects managed by Landesbetrieb Straßen, Brücken und Gewässer (LSBG Hamburg)</p> <p>6) and 7) two new pilots to be selected and implemented</p>
Reference	<p>1) https://joinup.ec.europa.eu/asset/isa_bigdata/asset_release/scientific-health-papers-text-mining-pilot</p> <p>2) https://joinup.ec.europa.eu/asset/isa_bigdata/asset_release/positions-big-data-pilot</p> <p>3), 4) and 5) to be published</p>
Target release date / Status	<p>Pilot 1), 2) and 3 have been published. Pilot 4 and 5)) completed and to be published in Q4 2018. Pilot 6and 7) to be launched in Q4 2018.</p>
Critical part of target user base	<p>Member States and EU Institutions staff dealing with similar policy issues.</p>
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	<p>As explained in section 1.1.5.3.</p>

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	<p>Big Data Test Infrastructure study</p>
Description	<p>The purpose of this study is to identify the main key features of a “Big Data Test Infrastructure” and design its architecture. The infrastructure will be made available to any interested EC</p>

	DGs, PAs and EUIs in Europe in order to facilitate the launch of pilot projects on Big Data, data analytics or text mining, and foster knowledge sharing in this area.
Reference	First phase: https://joinup.ec.europa.eu/document/big-data-test-infrastructure-data-sources https://joinup.ec.europa.eu/document/big-data-test-infrastructure https://joinup.ec.europa.eu/document/big-data-test-infrastructure-design
Target release date / Status	First part completed and published, see reference, the second part to be completed and published in Q4 2018
Critical part of target user base	Member States public administrations and EC services needing and infrastructure to launch pilot projects on big data and data analytics.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	The intermediate deliverables of the study have been used as a basis to propose the implementation of a big data and data analytics test infrastructure, currently proposed to be financed by the CEF programme, in combination with the European Data portal.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	DORIS – stakeholders' feedback analysis tool
Description	Nowadays, all public administrations are running public consultations to listen to their citizens. They are then confronted to the challenge of analysing the results, quickly and efficiently. The Doris Public Consultation Dashboard, originally developed by DG CNECT, has been proven to effectively address these needs within the European Commission. The objective is to continue the work started on the Doris tool by the ISA action 2016.04 – Participatory Knowledge for Decision Making, now concluded, and make it

	downloadable and usable by any public administration in Europe. The tool is originally designed to handle the answers received through EU-Survey, which is already available on Joinup. The Doris ISA2 system would be able to interface with other citizen engagement tools, including Futurium. The ISA2 version of Doris would therefore swiftly complement and inter-operate with the existing EU survey module and both tools would work together to deliver a great value to the interested public services and end-users.
Reference	https://joinup.ec.europa.eu/solution/isa-action-122-providing-big-data-opportunities-public-administrations https://joinup.ec.europa.eu/release/doris
Target release date / Status	Q3 2018
Critical part of target user base	Member States public administrations and EC services staff dealing with analysis of stakeholder's feedback.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	DORIS has been already used by several EC services to analyse the outcome of open public consultations.

3.5.5.6 Level of reuse of existing solutions

Question	Answer
<i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i>	Action 2016.36 - Sharing and re-use: The reusable practices and guidelines as well as the reusable software solutions delivered through this proposed action can adopt the strategy defined in Action 2016.36 in order to ensure that the outputs are shared and re-used with public administrations in Europe. Action 2016.20 – Joinup – European Collaborative Platform And Catalogue: The Joinup collaborative platform shall be used as a means for sharing the experiences as well as the deliverables of this action with the Member States' public

Question	Answer
	administrations. Action 2016.07 – SEMIC: Reusable interoperability solutions, core vocabularies, the linked data pilots, studies (e.g. on the business value of linked data) and other resources made available through Joinup and which might be relevant to this action shall be explored and reused as much as possible in order to ensure interoperability as well as continuation of existing efforts.
<i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i>	To date, the Joinup platform has already been used to promote the action and publish some of its outputs.

3.5.5.7 Interlinked

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	This action is linked to the following EU actions/policies: Digital Agenda <ul style="list-style-type: none"> • Pillar I: Digital Single Market pillar. • Pillar II: Interoperability & Standards. This action contributes to both pillars by providing methodologies, best practices, and solutions that allow processing and visualising of vast amounts of information, thus supporting re-usability of information and interoperability.

Question	Answer
	COM(2014) 442: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. This action addresses the need to provide the right framework conditions for a single market for big data and cloud computing as a means for helping accelerate the transition towards a data-driven economy.

3.5.6 PROBLEM STATEMENT

The problem of	lack of skills, tools and methodologies to consume, process and extract relevant insights from large data sets, both external and internal, whose quantity, resolution and frequency is nowadays massively increasing thanks to digital technologies,
affects	European Institutions and public administrations in the Member States
the impact of which is	that, despite being at their disposal, this amount of information is not properly exploited to make evidence-based decisions
a successful solution would be	to provide administrations with tools, methodologies and good practises to properly gather, combine, and analyse data coming from different sources, and to support and help knowledge sharing between administrations in this domain.

3.5.7 IMPACT OF THE ACTION

3.5.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	The availability of tools to be re-used by public administrations will save	Tools have already been	EU Institutions

Impact	Why will this impact occur?	By when?	Beneficiaries
	investment to be done in market studies or in buying commercial tools (where open source solutions are a valid alternative)	published on Joinup by this action. Additional tools will be published in 2018.	and Member States' Public Administrations
(+) Savings in time	Tools and methodologies for big data and data analytics can significantly increase the time spent by administrations' staff in data analysis, especially when the amount of information to be processed is large and the sources are diverse.	As above.	As above.
(+) Better interoperability and quality of digital public service	Tools to combine and analyse data, including data ingestion APIs, can facilitate data interoperability between different administrations. Tools to extract insights from (large amount of) data are key to increase the performance of public services and evaluate their impact.	As above.	As above.
(-) Integration costs	Integration and configuration costs need to be considered when integrating the user's data sources (or other IT systems, if necessary) with the open source tools.	When the user decides to integrate the open source tools with other IT systems or data sources.	As above.

3.5.7.2 User-centricity

The previous phases of the action have been carried out in close cooperation with EC services Member States' representatives, both inside and outside the ISA² network (e.g. ESS Big Data Task Force, CEF expert group). Requirements, needs, use cases and priorities have been discussed and agreed upon with these stakeholders, through bilateral interviews and online workshops. Pilots carried out for EC services and Member States administrations have been implemented only after a detailed collection of requirements with relevant stakeholders. In 2018, the action will focus on widening the user base (including more Member States) and executing additional workshops.

3.5.8 EXPECTED MAJOR OUTPUTS

Outputs are described in section 3.5.5.5.

3.5.9 ORGANISATIONAL APPROACH

3.5.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
DIGIT.D1	HoU, Project officer	Unit in charge of the action
ISA Member States representatives	As appointed by members of ISA coordination group.	Provide needs and requirements, prioritise activities.
DG CNECT.R3	DORIS team	Contributes to the generalisation of the DORIS tool, originally developed by this unit.
DG CNECT.G1	European Data Portal responsible	This unit is in charge of the management and implementation of the European Data Portal. The European Data Portal project will provide requirements to this action and re-use its outputs.
ESS Big Data	ESTAT Big Data	The ESS Big Data Task Force has expressed

Stakeholders	Representatives	Involvement in the action
Task Force	Task force members, representatives appointed by National Statistical Institutes	interest in participating to the action, by providing requirements for tools to be developed and participating to pilot projects.
Data4Policy group (DIGIT, OP, CNECT, ESTAT, JRC, EPSC)	As appointed by the different DGs	The Data4Policy group is an internal EC group formed to implement a number of actions set out in the “Communication on Data, Information and Knowledge Management at the European Commission”. The group will be consulted to prioritise the activities carried out by the present action.
CNECT.H4	CEF Programme Manager	Ensures alignment of the action's output with the objectives of the CEF programme.
DIGIT.D3	CEF PAO (project architecture office) responsible	Ensures architectural alignment of the action's output with CEF architectural principles.
Policy DGs	Policy officers appointed by policy DGs	Provide needs and requirements; prioritise activities, follow-up the business angle of the developed pilots.

3.5.9.2 Identified user groups

This action targets management and staff members of the European Union Institutions and Member States public administrations needing to leverage internal and external data to support decision-making. This includes both IT and non-technical users.

3.5.9.3 Communication and dissemination plan

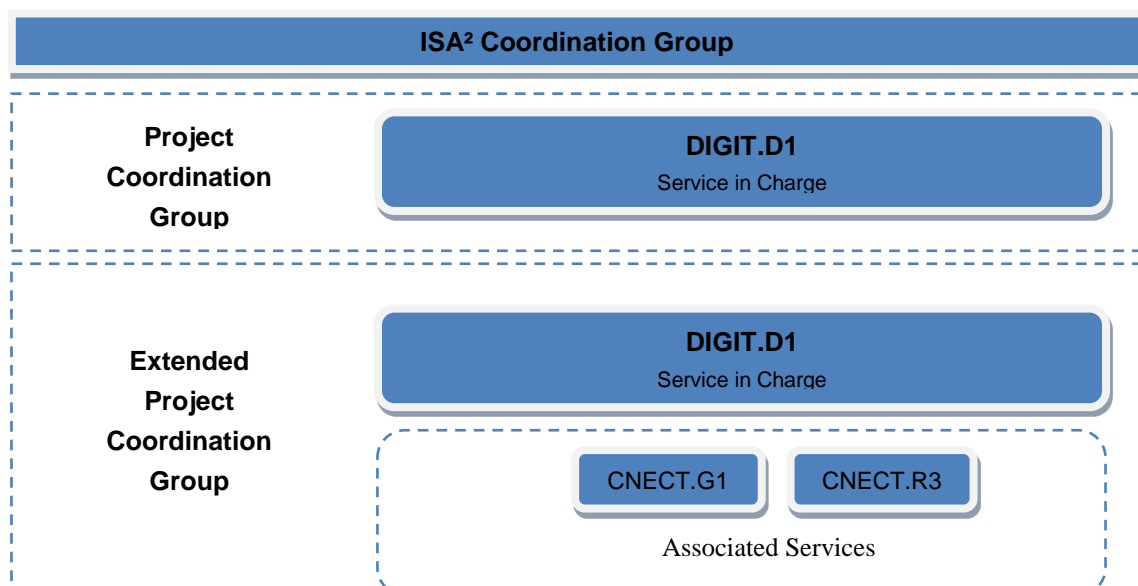
Bilateral interviews and workshops with Member States representatives will be conducted to gather requirements and priorities the activities. This includes the organisations of webinars, as well as presentations during events and meetings, e.g. ISA² coordination group meetings, SEMIC conference, ESS Big Data Task Force meetings, internal EC workshops on data and data analytics, Data for Policy conference (international conference on data analytics for policy-making). The output of the action (studies, source code) will be published on Joinup or other publicly accessible source code repositories (e.g. Github).

3.5.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected time for target
Number of MS involved in the working group	10	Q4 2018
Re-use of software components produced by the action in pilot or operational projects	10	Q4 2018
Number of pilots involving multiple MSs (at least 2)	2	Q4 2018

3.5.9.5 Governance approach

This action is part of the ISA² programme and therefore it follows the ISA governance structure with the action reporting back to the Member States' representatives pertaining to the ISA² committee. This action will actively involve all associated services at each of the different stages. The governance structure for this action is depicted in the diagram below.



3.5.10 TECHNICAL APPROACH AND CURRENT STATUS

During the previous phases, this action focused on the execution of a landscape analysis in Europe, in order to gather needs and best practices in the area of big data, and in the design of a big data test infrastructure, which can support the EC and Member States' public administrations in the execution of pilot projects on big data analytics. Additionally, the action has executed a set of pilots to demonstrate the capabilities of big data analytics for policy-making. In 2018, the action will be divided in 3 tracks:

- Track 1: further identify big data and data analytics needs through cooperation with the Member States, with the aim of understanding the needed tools and services Member States' public administrations need in this domain.
- Track 2: develop re-usable tools, or generalise existing tools, for big data processing and data analytics, to be used by Member States in different policy domains. The tools are meant to be shared on Joinup and re-used directly by public administrations, and/or deployed on the big data test infrastructure mentioned above.
- Track 3: implement a new wave of pilot projects (at least 3), in cooperation with EC services or Member States public administrations, re-using the developed tools.

3.5.11 COSTS AND MILESTONES

3.5.11.1 Breakdown of anticipated costs and related milestones

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
Execution	<u>Phase 2.1</u> D.1.- MS and EC requirements assessment D.2.- Inventory of tools and solutions, standards and vocabularies available for reuse	100	ISA ²	Q2/2016	Q1/2017

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
	<u>Phase 2.2</u> D.3.- Specification definition D.4.- Generalisation of core platform and modular components D.5.- Extension of core and modular components in the context of the pilots	250	ISA ²	Q2/2016	Q1/2017
	<u>Phase 2.3</u> D.6.- Pilot requirements assessment D.7.- Specification definition D.8.- Implementation of core and modular components in the context of the pilots	250	ISA ²	Q3/2016	Q1/2017
Execution	<u>Phase 3.1</u> D.1.- MS and EC requirements assessment D.2.- Inventory of tools and solutions, standards and vocabularies available for reuse	100	ISA ²	Q2/2017	Q1/2018

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
	<u>Phase 3.2</u> D.3.- Specification definition D.4.- Generalisation of core platform and modular components D.5.- Extension of core and modular components in the context of the pilots	241	ISA ²	Q2/2017	Q1/2018
	<u>Phase 3.3</u> D.6.- Pilot requirements assessment D.7.- Specification definition D.8.- Implementation of core and modular components in the context of the pilots	250	ISA ²	Q3/2017	Q1/2018
Execution	Requirements assessment for new pilot projects and developments of tools	150	ISA ²	Q2 2018	Q4 2018
Execution	Implementation of tools and support in the execution of pilots	450	ISA ²	Q4 2018	Q4 2019
	Total	1791			

3.5.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Execution	600	600
2017	Execution	591	591
2018	Execution	600	
2019			
2020			

3.5.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
A vision for Public Services	http://ec.europa.eu/digital-agenda/en/news/vision-public-services	
Data for Policy - A Study for big data and other innovative data-driven approaches for evidence-informed policy making	http://www.data4policy.eu/	

3.6 IMPROVING STATISTICAL DATA AND METADATA DISCOVERABILITY AND ANALYSIS (2018.03)

3.6.1 IDENTIFICATION OF THE ACTION

Service in charge	ESTAT B.1
Associated Services	ESTAT B.5, ESTAT A.3, DIGIT D.1 Publications Office (PO)

3.6.2 EXECUTIVE SUMMARY

Semantic technologies have created new opportunities and expectations with respect to metadata and data discovery and analysis. In order to retain its position as leading providers of statistical information and to contribute to the modernisation of public administration by engaging more with citizen and businesses, National Statistical Institutes (NSIs) in charge of collecting and disseminating official statistics in the EU must uplift their data accessibility, discovery and analytics capabilities and follow a proactive approach in meeting the needs of their key users.

Firstly, end users of EU statistics are looking for better discoverability of open/public data. In this context, this action aims at improving discoverability and use of official statistics data through leveraging the rich European Statistical System (ESS) statistical metadata assets (concepts, codes, nomenclatures ...) using semantic technologies. To this end the project will built on existing and, where needed, develop semantic models for describing these statistical metadata assets. The statistical metadata will thus be made machine readable, discoverable and active in data querying and data integration jobs. This will contribute, on one side, to easing access to EU statistics and, on the other side, create the conditions for a wider semantic interoperability and accessibility of statistical data produced by public administrations in general. External data brokers (collecting and reusing data) will also benefit from well-established semantic metadata standards encouraging them to align with these standards and thus boosting the (re)use of statistics published by government agencies.

Secondly, policy analysts in charge of the design and evaluation of government policies have to embrace the complexity of societal and economic changes. This requires analysing always more detailed official statistics and enriching them with available external information. Currently the official data are publicly available but their usage is rather tedious as they require quite some technical skills to access and combine them and a good knowledge of the

concepts involved. In this context, this action will provide an intuitive and integrated data analytics workbench and metadata driven services to explore, combine and analyse seamlessly a broad variety of data sources (potentially crossing borders) leveraging the wealth of official statistics and the richness of metadata assets compiled in the ESS. The technical infrastructure will be designed and built with a view to being shared across statistical organisations (common statistical metadata platform, reusable metadata services) but also to being reused by any public administration willing to improve the accessibility of its own data assets.

Sustainability will be achieved by ensuring that deliverables are integrated in standard metadata dissemination activities and services of Eurostat. In addition, Eurostat pursues an open source sources policy enabling the community to reuse and enrich data analytics scripts. Finally, development will be based on corporate development on going in the Data Platform action of the DataStrategy@EC initiative⁹⁴.

The project will be based on business outcome driven pilots and on collaborative work.

The deployment of the enhanced capabilities in member states will build on the existing tied cooperation between European Statistical System agencies and their links with government service providers making use of data.

3.6.3 OBJECTIVES

The main objectives of the action are

- 1) to improve semantic interoperability and discoverability of official statistics produced by national statistical institutes by a) exposing as machine readable objects (semantic Web) the key ESS statistical metadata assets; b) packaging and deploying a set of services for statistical metadata management
- 2) to improve the accessibility of EU statistics and to provide data analytics capabilities to end users and policy analysts while ensuring adequate data protection.

⁹⁴ <https://webgate.ec.europa.eu/fpfis/wikis/spaces/viewspace.action?key=DataEcosystem>

The actions will benefit a wide range of stakeholders including end-users of statistics, policy analysts, citizen data scientist and NSI's statisticians and are aligned with the priorities of the eGovernment Action Plan by improving the conditions for accessing public sector data and services and facilitating their re-use by third parties not only confined to official statistical data but enhancing broader data use benefitting citizen.

3.6.4 SCOPE

The project will set up a statistical metadata platform based on semantic technologies and expose on there the existing ESS statistical metadata assets. It includes the identification of the relevant semantic technology standards and models and will build on the well-established Statistical Data Metadata Exchange (SDMX) standards. It will develop or reuse services for metadata management and metadata discovery and will put in place an appropriate governance. The project will also set up data analytics services and infrastructure that will use the existing metadata assets to support and streamline discovery and integration of open (and possibly confidential) data. As data access and data protection will be challenged by the newly offered capabilities, the project will also cover the data security aspects. The project is in synergy with the existing linked open data initiatives by contributing to the open data discovery by setting standard for and exposing statistical metadata assets. However, the project does not aim to expose new datasets as open data.

3.6.5 ACTION PRIORITY

3.6.5.1 Contribution to the interoperability landscape

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe? In particular, how does it contribute to the implementation of:</i></p> <ul style="list-style-type: none"> <i>the new European Interoperability Framework</i> 	<p>The project will create and make available reference semantic resources to access and analyse official statistics. It will improve interoperability among public administrations that produce and exchange statistics (NSIs and beyond). . It contributes to boosting the use of open data and reinforcing open data initiatives at EC level.</p> <p>At ESS level, it contributes to the realisation of the ESS Vision 2020 objectives by</p>

Question	Answer
<p>(EIF),</p> <ul style="list-style-type: none"> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>supporting the Digital Communication project (DIGICOM) improving statistical information delivery by means of enhancing digital communication</p> <p>At EU level, it contributes to the implementation of the EC Communication on Data, Information and Knowledge Management in the European Commission⁹⁵, in particular focusing on maximising the use of data for policy-making (Data4Policy)</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>Public administrations need to exchange statistical data across borders and combine them with other sources to inform and monitor policy making. The reference ontology for statistics will not only enable public administration to improve semantic interoperability of the statistical data exchanges it will create the conditions of external data brokers (data providers and re-users) to align with and develop synergies with public administration.</p>

3.6.5.2 Cross-sector

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>The realisation of all Commission political priorities relies heavily on the quality and accessibility of the European statistics. The demand for information from various policy domains has evolved following the significant societal and economic changes. More and timely data and on the fly analysis based on different</p>

⁹⁵ https://myintracomm.ec.europa.eu/sg/info-management/Documents/communication_en.pdf

Question	Answer
	<p>sources and across domains and borders are necessary for the EC and Public Administrations to achieve their overall policy objectives.</p> <p>This work will take into account and will contribute to the realisation of the DataStrategy@EC Action Plan, whose objective is to improve the way data is used for policy-making purposes.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<p>N.A.</p>

3.6.5.3 Cross-border

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<p>Yes, National Statistical Institutes (NSIs) from FR, IE, IT, NL are leveraging semantic web technologies to improve accessibility to the statistical products and to manage their increasingly large and diverse data assets. Eurostat in cooperation with these NSIs is currently realising proof of concepts in the domain. This proposal aims to develop standards, infrastructure and solutions that will certainly be (re)used by the forerunning NSIs in the first instance but most probably all the ESS and the surrounding statistical data ecosystem in the longer term.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i></p>	<p>N.A.</p>

3.6.5.4 Urgency

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	On one side, “Data, Information and Knowledge Management” in the EC has received much attention in the last year and is calling for quick improvement in the years to come. In this context, this proposal will contribute to strengthen the EC open data initiatives by enhancing discoverability to open EU statistics. On the other side, many national statistical institutes and external data brokers are engaging in web technology to manage data and outputs and there is a risk of seeing similar but competing standard emerging in the statistical community. Joint developments and publication of standard reference semantic assets will avoid duplication of work and ensure better interoperability.
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	ISA2 financial capacity will secure building the capabilities and making them available for a wide range of stakeholders.

3.6.5.5 Reusability of action’s outputs

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Common ontology for official statistics
Description	Common ontology for statistics will provide a reference conceptualization of official statistics establishing links between standard concepts, definitions and datasets. It aims at fostering semantic interoperability and comparability of statistics produced by public statistical agencies and public

	<p>administrations in general. Common ontology enables to bridge data and concepts across statistical domains and across organisations. It will support statistical organisations to manage increasingly large amount of data assets and end-users discovering the large amount of open data.</p> <p>The ontology should not only cover the statistical products but also the production of these statistics. It can capitalise on the rich set of concepts, nomenclature and reference models already existing for official statistics. I will complement and boost the benefit of specifications like StatDCAT-AP.</p>
Reference	This will be based on establish statistical standard (e.g.: GSIM, GSBPM, the SDMX standard information model) and on established standard ontologies and specification (e.g. (Stat)DCAT-AP, SKOS/XKOS, Data Cube Vocabulary and PROV).
Target release date / Status	December 2020
Critical part of target user base	<p>32 National Statistical Institutes and other national authorities engaged in the production of EU statistics</p> <p>Public Administrations producing statistics</p> <p>EC DG's involved in open data initiatives</p> <p>Major commercial and non-commercial data brokers</p>
For solutions already in operational phase - actual reuse level	N.A.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Data analytics platform for user of EU statistics
Description	<p>Provide a platform accessible to policy analysts to analyse EU statistics in combination with other sources</p> <p>The workbench builds on the ontology allowing cross-domain and possibly cross-database search. It provides a set of data analytics reusable components that can be combined and reproduced.</p>
Reference	N.A.
Target release date / Status	December 2020 (beta release)
Critical part of target user	32 National Statistical Institutes and other national authorities engaged in the production of EU statistics

base	EC DG's (policy analyst) End users (in particular data scientist) of statistics
For solutions already in operational phase - actual reuse level (N.A.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Common ESS statistical metadata platform
Description	<p>A shared platform available for publishers and users to expose ESS metadata assets to be used as a reference by ESS partners and external data brokers. It would include for instance reference statistical classifications and statistical concepts and definitions and actionable representations of GSBPM and GSIM</p> <p>The shared platform should also allow for experimenting new data access and data sharing use cases benefiting from ESS metadata. In particular, it should provide sustainable hosting of the relevant reference metadata which have been identified as key enablers for integrating national datasets by ESSNet on Linked Open Statistical Data</p> <p>The infrastructure will preferably be hosted on EC platform ensuring its sustainability and based on existing and open source solutions. Interoperability with MSs infrastructure will be ensured by the use of established standards. It will provide basic utility service for metadata management: bridging with existing data resources, upload and visualisation of metadata ...</p>
Reference	ESSnet on Linked Open Statistical Data Existing EC platform and commercial/open source semantic technology products
Target release date / Status	December 2020
Critical part of target user base	32 National Statistical Institutes and other national authorities engaged in the production of EU statistics Other Public Administration producing statistics Major commercial and non-commercial data brokers
For solutions already in operational phase - actual reuse level	N.A.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Services for statistical metadata management and discovery
Description	<p>It will include</p> <ol style="list-style-type: none"> 1) Services for mapping data and concepts (ontology): It will in particular extend the SDMX-RI utility services for data mapping and develop new services to map new data sources (IoT, administrative and transactional data...) 2) Advanced data and metadata search/discovery services : it will provide enhance functionalities for the ESS Metadata Handler (ESS MH), it will in particular provide a new integrated user interface to established reference metadata like the reference statistical classifications (RAMON) and concepts and definitions (CODED)
Reference	SDMX-RI – ESS Metadata Handler – RAMON and CODED reference metadata
Target release date / Status	December 2020
Critical part of target user base	32 National Statistical Institutes and other national authorities engaged in the production of EU statistics End users (in particular data scientist) of statistics
For solutions already in operational phase - actual reuse level	N.A.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Advanced ontology based interface to query EU statistics and other related sources
Description	Provide an intuitive (ontology based) interface to query EU and related statistics and possibly

	confidential data sets (remote execution).
Reference	N.A.
Target release date / Status	December 2020
Critical part of target user base	32 National Statistical Institutes and other national authorities engaged in the production of EU statistics EC DG's (policy analyst) End users (in particular data scientist) of statistics
For solutions already in operational phase - actual reuse level	N.A.

3.6.5.6 Level of reuse of existing solutions

Question	Answer
<p><i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i></p>	<p><u>Joinup</u> The reusable semantic assets delivered by the project will be made available to anyone by means of Joinup,</p> <p><u>EIRA - European Interoperability Reference Architecture</u> EIRA will be used to document the solutions for data analytic and semantic metadata services.</p> <p><u>DCAT Application Profile for data portals in Europe in particular StatDCAT-AP</u> The statistical ontology will seek full compatibility with StatDCAT-AP specification</p> <p><u>EIC - European Interoperability Cartography</u> This tool will be use to look for existing building blocks and to inventorise new solutions</p> <p><u>EC Data Platform⁹⁶ and CEF BDTI⁹⁷</u></p>

⁹⁶ <https://webgate.ec.europa.eu/fpfis/wikis/display/DataEcosystem/data+platform+action>

Question	Answer
	<p>The Data ata analytics platform for user of EU statistics will reuse as much as possible the components developed for the EC Data Platform and the CEF Big Data Test Infrastructure.</p> <p><u>Interoperability Academy (2019.01)</u></p> <p>All training material or of educational nature will be indicated in the catalogue of the Interoperability Academy.</p> <p>SEMIC</p> <p>The project contribute the development and deployment of semantic assets and capabilities</p>
<i>Has the action reused existing interoperability solutions?</i>	N.A.

3.6.5.7 Interlinked

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i>	<p>The proposal contributes to the priorities of the eGovernment Action Plan by improving the conditions for accessing public sector data and services and facilitating their re-use by third parties not only confined to official statistical data but enhancing broader data use benefitting citizen.</p> <p>The proposal contributes also to the Commission corporate strategy on maximising the use of data for policy-making and transforming the EC in a data-driven organisation, as envisaged in the DataStrategy@EC</p>

⁹⁷ <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Big+Data+Test+Infrastructure>

Question	Answer
	Action Plan. By providing enhanced data discovery, integration and analytics capabilities to EU and related statistics, the proposal will facilitate policy making and evaluation.

3.6.6 PROBLEM STATEMENT

Firstly, Web technologies have created new opportunities and expectations with respect to metadata and data discovery and analysis. In order to retain its position as a leading provider of statistical information in this rapidly evolving context, these agencies must upgrade their data integration capabilities and follow a more proactive approach in meeting the data needs of their key users. These technologies are not yet fully exploited by government statistical agencies.

Secondly, for a long time, statistical organisations in the ESS and beyond have been collaborating to harmonise concepts and definitions used in statistical production with a view to improving coherence and comparability of statistics produced for the EU. Standards and infrastructure for the exchange of statistical of data and metadata across the ESS have been developed and are operational. Despite the important metadata assets available their full potential to improve accessibility and boosting data analytics capabilities is not yet exploited.

The problem of	Still not satisfactory discoverability of open statistical data produced by government statistical agencies and capabilities for combining them with other sources
affects	End users and re-users of EU statistics
the impact of which is	Lowering value creation based on the existing data and difficulty to leverage new data sources (“big data”)
a successful solution would be	Provide and expose the rich set of metadata available in the ESS as linked data to serve as reference for public administrations and external data brokers producing statistics

The problem of	Policy analysts that have assemble and analyse the statistical data to monitor and evaluate public policies requires technical skills to access official statistics and to combine them with other sources
affects	the depth and the timeliness of policy recommendations
the impact of which is	a risk to look for alternative data services and data brokers despite the inherent issues
a successful solution would be	Provide an intuitive and integrated data analytics workbench and services to combine and analyse seamlessly a broad variety of data sources and leveraging the wealth of official statistics produced in the ESS

The problem of	Increasing numbers of data sources coming from survey, public administrations and external sources generated by the digital world are still organised in silos making difficult to realise data integration
affects	NSIs statisticians that have to produce robust and high quality statistics combining these different sources
the impact of which is	difficulty for the industrialisation of the production of new statistics based on new information sources
a successful solution would be	To provide them with a rich metadata ecosystem and services that fosters the use of the various information sources available and provide capabilities to set up complex workflows combining different sources while ensuring traceability and reproducibility

3.6.7 IMPACT OF THE ACTION

3.6.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Avoid duplication of tasks in developing national centric ontologies for statistics	2019	NSIs and related public administration
(+) Savings in money	Economies of scale sharing a metadata platform in the ESS and reusing data/metadata platform building blocks and services	2020	NSIs and related public administration
(+) Savings in time	Straightforward and flexible access to ESS statistical data and resources	2020	External users and policy makers
(+) Savings in time	Speeding up uplifting of data architecture in MSs through reuse of semantic standards and building blocks	2020	NSIs
(+) Better interoperability and quality of digital public service	Reference ontology for statistics and related utility services to map data to reference concepts will boost cross domain and cross organisations data exchange and queries	2020	Public administration collecting and consuming data
(-) Integration or usage cost	Easier access and integration of official statistics data into analysis	2020	External data brokers and private companies

3.6.7.2 User-centricity

End user focus in the proposal is ensured by the close coupling of this initiative with the ESS Vision 2020 DIGICOM project that engaged proactively in a regular dialogue with end-users to understand deeper their needs. For instance, the LOD pilots to be carried out by a consortium of NSIs (ESSnet) funded by the DIGICOM project will right from the beginning engage with potential users to drive the benefits of LOD approaches for statistical dissemination.

NSIs which will be the main beneficiaries of reusable components will be associated to the project from the onset through the collaboration mechanisms put in place in the ESS (ESSnets projects, ESS Vision Implementation Network, ESS Enterprise Architecture Board).

EC policy DGs will be a central focus when developing the data analytic capabilities and will be actively involved during the collection of requirements. For this purpose, the project will benefit from the coordination mechanisms already in place at EC level for the implementation of the Data4policy strategy

3.6.8 EXPECTED MAJOR OUTPUTS

Output name	Enhanced governance for ESS statistical metadata
Description	The current metadata governance will be upgraded to integrate new functions like URI management, versioning, more decentralised management, coordination with other standards (SDMX, DDI, INSPIRE, W3C, LOD – standard vocabulary – DCAT, upper level ontologies ...) Guidelines and policy for using and publishing on the shared platform will be provided.
Reference	
Target release date / Status	June 2020

Output name	Data protection and security
Description	Guidance and support for the handling and protection of confidential data (in the context of data analytics and remote execution) in line with ESS IT Security framework and with other relevant corporate guidance and legislation.
Reference	ESS IT security framework
Target release date / Status	This artefact will not be developed. Security will be integrated in the different architecture and systems.

3.6.9 ORGANISATIONAL APPROACH

3.6.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
ESTAT	Unit B1 – B5 – A3	Project coordination, Project managers (Task 1 & 3) and solution providers (Task 2), respectively
SEMIC community	StatDCAT-AP Working Group	Coordination and synergies
DIGIT	Unit D1 – Data Services	Solution provider for the Data Analytics Platform (Task 4)
EC DGS (DG CNECT, JRC, DIGIT, PO)	EC DGs involved in EU open data policy and the DataStrategy@EC Action Plan	Coordination , feedback, reuse and integration with existing solutions
ESS NSI's	DIGICOM WP3 steering group and ESSnet Linked Open Data members	Expertise, consolidation of requirements
UNECE	Official statistics community involved in Modernisation of official statistics	Feedback, awareness, synergies

3.6.9.2 Identified user groups

Solution name	End users
Common ontology for official statistics	Data architects in 32 ESS NSIs (and potentially more, considering the role of the ESS in the

	global statistics environment) and in EU public administrations External data brokers (reusing EU statistics and producing statistics) (Citizen) Data Scientists
Common ESS statistical metadata platform	32 ESS NSIs and other (international) statistical organisations
Services for statistical metadata management and discovery	Users of EU statistics in general 32 ESS NSIs, EU public administrations and other (international) statistical organisations Any organisation dealing with data production
Enhanced governance for ESS statistical metadata	32 ESS NSIs and other international statistical organisations
Advanced ontology based interface to query EU statistics and other related sources	Users of EU statistics in general 32 ESS NSIs, EU public administrations and other (international) statistical organisations External data brokers (reusing EU statistics and producing statistics)

3.6.9.3 Communication and dissemination plan

The proposal contributing both to the ESS Vision 2020 implementation project on Digital Communication and to the Commission initiative on Data4policy it will benefit from well-established communication channels respectively, inside the ESS community, and, inside the EC Data information & knowledge management community

The main stakeholders and tentative related communication channels are:

European Commission	MyIntraComm Data Information and Knowledge Management and Local Data Correspondant network. Leaflets
Eurostat staff	Eurostat-Cybernews Eurostat-Infos Lunchtime presentations Ad hoc seminar and workshops
NSI staff	European Statistical Training Program (Linked Open Data course)

	Quarterly newsletter on Vision implementation Videos and webinars on the Vision implementation
NSI management	Regular presentation of project advances (Vision Implementation Group) ESS Website Circabc and CROS Portal Leaflets
General Public	Eurostat website (ESS vision dedicated section) Joinup
Official statistics Community	Conferences, Workshops at UN(ECE) level Leaflets

3.6.9.4 Key Performance indicators⁹⁸

Description of the KPI	Target to achieve	Expected time for target
Number of semantic assets (URIs) published on the ESS common metadata platform	50% of ESS metadata assets are published as LOD resources	By 2020
Number of members of the Join up community	At least 30 member increase per year	Till 2022
Number of NSIs and other public administrations reusing metadata management and query services	5 32+	By 2020 By 2025
Number of policy DG and NSIs using data analytic workbench and service	8 All relevant DG's and 50% of ESS NSI	By 2020 By 2025
Number of statistical domains providing advanced data analytics service to DG through the ISA2 solution	8	By 2020

⁹⁸ KPI will be refined in the initiation phase of the project

3.6.9.5 Governance approach

Project owner: Eduardo Barredo Capelot, Director - Methodology; Dissemination; Cooperation in the European Statistical System (ESTAT.B), chair of the Project Management Board (PMB).

The **PMB** includes the 3 Eurostat units (B1, A3, B5) and DIGIT D.1 involved in the project, other Eurostat stakeholders (e.g. geospatial unit, dissemination unit) and key EC stakeholders (Publications Office,)

The project will report/link to different governance/advisory body

In Eurostat

- Eurostat IT Advisory Committee
- Eurostat Director's Meeting

In the ESS

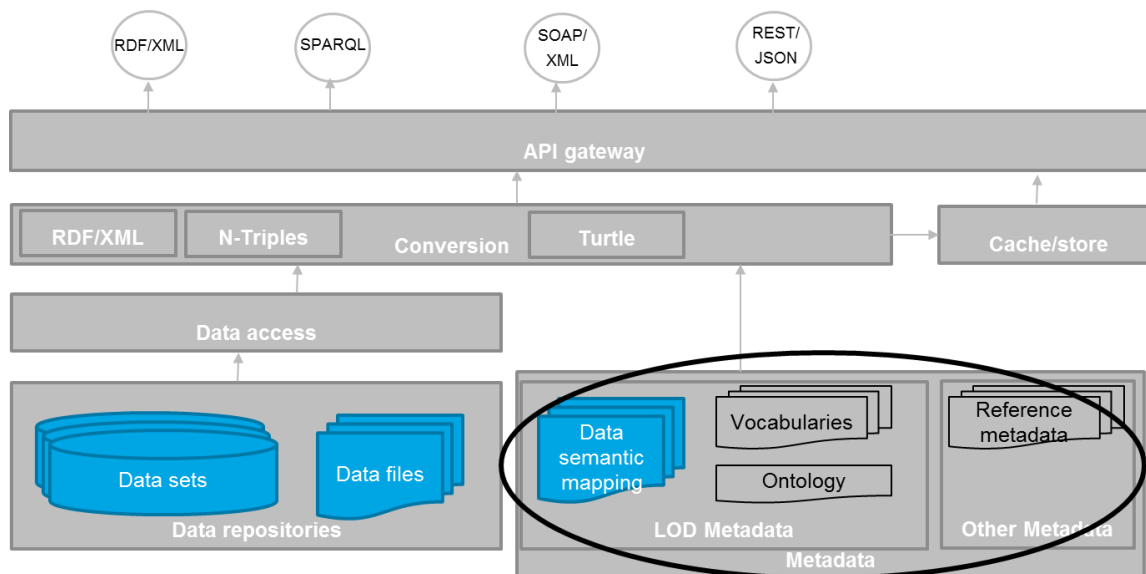
- The ESS Task Force on Digital Communication;
- The ESS Working Group on standards and IT;
- The ESS Expert Group on IT security
- ESS IT Director's Group (ITDG);

At EC level,

- IT Governance: the [Information Technology and Cybersecurity Board](#)
- ISA2 Governance bodies (through monitoring & evaluation reports, reporting about sub-delegated credits usage)
- The Data4Policy - Data Ecosystem Coordination Group and thereby to the EC Data, Information and Knowledge management stakeholders

3.6.10 TECHNICAL APPROACH AND CURRENT STATUS

The project will align with the Reference Data Architecture for Official Statistics that is being developed at UNECE level. It leans on standard reference architecture for LOD focusing on the metadata component (see below). Architecture design for data analytics workbench will aligned with EIRA recommendation and models.



Task 1: Develop reference ontologies for statistics

Activities: Stocktaking of existing LOD initiatives and resources (EC, ESS, WW), analysis and review of ESS metadata assets, identification, development and testing of relevant standard models, collection of requirements, ESS governance for the new artefacts and standards, hands-on and guidelines.

Deliverables: Documentation of ESS metadata assets including their structure and characteristics, user requirements for the target data model, implementation of actual data models and resources, linkage possibilities between ESS metadata assets and data assets and other Linked Open Data/Metadata sources; Guidelines and hands on; Governance document.

Current status: Action is launched and builds on synergies with other developments around ontologies for statistics. It is expected that standard vocabulary will be established to support Stat DCAT AP. Work is extended to also cover knowledge graph to support semantic search capabilities.

Task 2: Build a shared platform and services for ESS metadata

Activities: Definition of use case, collection of requirements, architecture design, review of existing infrastructure building blocks (EC, ESS), solution design, acquisition/resue of technology/products, service and UI development/tailoring, configuration and deployment, testing and training

Deliverables:

- Solution architecture for the shared platform
- Integrated solution for the ESS metadata platform and service
- Where relevant : open source code for services
- Guidelines for usage, training and on site coaching

Current status: Launched in 2019. Scope is extended to cover overhaul of RAMON and CODED

Task 3: Expose and provide access to ESS metadata

Activities: Conversion of existing metadata assets into the target model/format, quality and consistency checks, mapping with data resources and URIs

Deliverables:

- Key metadata assets exposed as RDF
- Catalogue of metadata, user documentation, hands-on

Current status: Architecture work to streamline ESS metadata ecosystem has started

Task 4: Build a metadata driven data analytics workbench

Activities: Definition and piloting of use cases, collection of data analytics requirement for policy DG's, architecture design, review of existing infrastructure building blocks and solutions (EC, ESS) and market (open source) solutions, solution design, acquisition of technology/products, service and UI development/tailoring, configuration and deployment, testing and training

Deliverables:

- Solution architecture for the data analytics workbench platform and technical documentation
- Integrated platform for data analytics services
- Where relevant : open source code for services (e.g. cross organisation queries)
- User guidelines and hands-on, training and on site coaching

Current status:

Blue print architecture and requirements established.. Development will be implemented on reusing EC data platform component when available. Synergies with Eurostat Data as a Service project will be foster. Prototype will be running by end 2020

Task 5: Develop guidance and support for the security and management of confidential data in the context of data analytics

Activities: Define data classification scheme and the related risks. Analyse and develop guidance for required protection. Amend the ESS IT security framework to cover data analytic uses cases. Support to implementation including incident management

Deliverables:

- Risk analysis on data analytics services based on public and confidential datasets
- Updated ESS IT security framework and IT security policies
- Architecture patterns for “secured” data access and analytics

Current status: Cancelled

3.6.11 COSTS AND MILESTONES

3.6.11.1 Breakdown of anticipated costs and related milestones

Inception	Project plan	0	ESTAT	Q4/2017	Q1/2018
Inception	Requirement and design for a shared metadata platform	100	ESTAT (ESSnet)	Q1/2018	Q1/2019
Execution	Reference ontology for statistics and metadadata asset release	400	ISA2	Q4/2018	Q1/2020
Execution	Shared ESS metadata platform with basic services	650	ISA2	Q4/2018	Q2/2020
Inception and Execution	Advanced metadata management and querying services for ESS	200	ISA2	Q1/2020	Q4/2020
Inception	Requirement and design for a data analytic platform and service	200	ESTAT	Q3/2018	Q3/2019
Execution	Data analytic platform prototype	200	ISA2	Q1/2020	Q4/2020
Execution	Security guidance, architecture	0	Not executed	-	-
	Total	1750	ISA2 1450 ESTAT 300		

3.6.11.2 Breakdown of ISA2 funding per budget year


Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016			
2017			
2018	Execution	800	650
2019	Execution	400	400 (estimate as of 1 st August 2019)
2020	Execution	400	

3.6.12 Planning for the tendering procedures to be launched for the action

Call for tenders foreseen Global amount in KEUR	Call for Tenders Duration in years	Indicative planning of publication (QX/YYYY)
Specific contracts: advanced service for metadata query and management (200 k)	1 year	Q3 2020
Specific contracts: data analytic platform configuration (200 k)	1 year	Q3 2020

3.6.13 ANNEX AND REFERENCES

Description	Reference link	Attached document
ESS Vision 2020	http://ec.europa.eu/eurostat/web/ess/about-us/ess-vision-2020	-
Digital Communication DIGICOM) project factsheet and business case	http://ec.europa.eu/eurostat/documents/7330775/7339647/DIGICOM+fact-sheet+04032016/5b61143f-ca4d-4983-9436-fa8b72956800 http://ec.europa.eu/eurostat/documents/7330775/7339647/DIGICOM+Business+Case+1.0/8a2f1b42-4101-4208-9c49-1d1819604047	

Description	Reference link	Attached document
Call for proposal ESSnet Linked Open Data		 Annex I - Technical specifications.docx
ESS key metadata assets	http://ec.europa.eu/eurostat/data/metadata	
SDMX Standard	https://sdmx.org/	
SDMX Reference Infrastructure (SDMX-RI)	https://webgate.ec.europa.eu/fpfis/mwikis/sdmx/index.php/SDMX_Reference_Infrastructure_SDMX-RI	
Reference Data Architecture for Official Statistics	https://statswiki.unece.org/display/DA/Data+Architecture+Home	

3.7 COMPARED - TEXT MINING SOLUTION TO SUPPORT THE EVALUATION PROCESS OF RESEARCH GRANT APPLICATIONS (2018.07)

3.7.1 IDENTIFICATION OF THE ACTION

Service in charge	JRC.I.3
Associated Services	RTD

3.7.2 EXECUTIVE SUMMARY

Public funding agencies are investing billions of Euros in research and innovation (R&I) projects every year. Funding mechanisms can be improved to reach higher funding efficiency e.g. by aiming at the reduction of unnecessary duplication or overlaps between research proposals, increasing the quality of incoming proposals and decreasing the number of submitted R&I projects. There is also no doubt that the process of evaluating research proposals should be based as much as possible on scientific evidence. One way funding agencies could work towards this is by facilitating the sharing to other agencies of data related to public funding of research in Europe. But not all funding agencies have sufficient expertise in data analytics to act on this issue and the European context, with many funding mechanisms at regional, national, or European levels, does not help. This diversity of funding mechanisms is an asset but also a burden as it makes connecting funding schemes together difficult.

Through the development of a semantic similarity platform that would select documents relevant to the evaluation process, COMPARED aims at supporting evidence-based decision-making in the field of public funding of R&I. The project aims to achieve data interoperability but not interoperability of IT systems. Indeed, overall interoperability does not hinge on data availability of funded research alone and actually depends on systems design, processes and rules, which are context specific and therefore legitimately localised. By giving funding agencies, applicants and other stakeholders access to a semantic platform for the assessment of research proposals, the project aims to contribute at reducing unnecessary research duplication, reducing scientific overlap between funded projects, and at increasing the quality of R&I proposals while reducing the number of incoming proposals. Recent publications have identified these issues as key to maximise the impact of publicly-funded R&I^{99,100,101}. This was also confirmed in a recent report by an independent high-level group recommending the European Commission to align national and EU R&I investment schemes, establish synergies

⁹⁹ *Concentrating on the Fall of Labor Share; CEP Discussion Paper No. 1476; Grell, Kevin Berg – Marom, Dan – Swart, Richard (2015): Crowdfunding, The Corporate Era, Elliott and Thompson, London, 218 p.*

¹⁰⁰ *Funding agencies urged to check for duplicate grants, Nature, January 2013, volume 493.*

¹⁰¹ *The Economic Rationale for Public R&I Funding and its Impact, European Commission DG Research & Innovation, ISBN: 978-92-79-65270-7*

with other funding programmes in Europe, and increase the impact of publicly-funded research in Europe¹⁰².

Applicants to publicly-funded research programmes could also benefit from means to verify how similar their proposal is to funded R&I projects and other documents (e.g. scientific publications or patents). This would help applicants submit more original projects or help justify why research has to be duplicated, and will contribute to increasing the quality of research proposals entering the evaluation process at public funding agencies. Another benefit of giving access to grant data to applicants would be to reduce the incoming number of grant applications for funding agencies, as applicants would receive indications on similar projects already funded. This reduction of incoming proposals would have been a significant added value for funding agencies as it could reduce operational costs related to grant evaluation. In addition, as most of R&I today is privately funded, making some parts of COMPARED publically accessible would also allow private actors of R&I (companies, investment firms) to use the platform to reduce duplication in R&I investments and overlap between research projects.

The first phase of the project (2018-2019) delivered a pilot platform, the first version of the database containing grants data and a report containing a set of recommendations for possible further extension and full deployment of the system. Building on this, the JRC aims now at extending the scope of the Compared tool by further consolidating the platform, by collecting data from R&D funding agencies in Member States to enrich the database of grant data and by disseminating the tool and promoting its use in Member States. Compared aims at supporting grant evaluators in funding agencies throughout all of Horizon Europe, the new framework programme for research of the European Commission starting 1st January 2021 and lasting for 7 years. A certain level of sustainability is therefore expected and will be ensured mainly through IT support (see below).

The Joint Research Centre of the European Commission has a solid expertise in text and data mining in which it is active for more than 15 years¹⁰³. The present project will be located in the Text Mining Competence Centre recently launched by JRC to serve the Commission with text mining solutions.

3.7.3 OBJECTIVES

The overall objective is to further consolidate and develop the Compared tool and promote its use by R&I funding national agencies.

1. Consolidate and further develop the Compared web application that evaluators of R&I proposals can use to obtain similar documents relevant to the evaluation process. Among other things, the translation mechanism will be consolidated, etc.
2. Enrich the database containing the grant data needed for the semantic comparison of research proposals. Data will be collected from R&D funding agencies in Europe (National funding agencies but also at European level).

¹⁰² "Lab-Fab-App, investing in the European future we want", Report of the independent high level group on maximising the impact of EU research & innovation programmes. European Commission DG Research & Innovation, ISBN: 978-92-79-70069-9

¹⁰³ Check <http://emm.newsbrief.eu> and <http://www.timanalytics.eu> for concrete examples of IT solutions.

3. Reach out to users of the platform to promote its use. In addition to the benefit of using the platform, the creation of a community of practice will foster the exchange of best practices on the use of modern text mining and scientometrics techniques to support evaluation of research proposals.

3.7.4 SCOPE

This project aims to support the decision-making process in evaluation of R&I grant proposals with more evidence e.g. information about similar proposals submitted or grant awarded in the past. The IT platform where users can retrieve documents semantically similar to the proposal they are evaluating at the time and the text mining techniques will be further developed. A community of practice will be created to foster the use of text mining and scientometrics techniques in the evaluation of research proposals. It should be noted that the semantic similarity platform does not aim to replace IT systems used to perform evaluation of proposals, neither does it aim to harmonise evaluation processes for research proposals throughout Europe or data standards. Rather, it aims at complementing processes operated in Member States by creating a bridge between evaluation processes and connecting stakeholders together.

3.7.5 ACTION PRIORITY

3.7.5.1 Contribution to the interoperability landscape

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the</i></p>	<p>The project aims at data interoperability in a field where a real need for more cross-border collaboration exists, but for which there are no IT solutions yet. Some initiatives like the Lead Agency Model offer models for cross-border collaboration but there exists today no means to compare R&I grants at a European scale. The first benefit of the project will be to establish data interoperability between funding agencies in different member states. This will be done with minimum disturbance to processes operated today by funding agencies: there will be no direct impact of the COMPARED platform on IT systems operated by public funding agencies.</p> <p>The project is in line with 2 ERA priorities¹⁰⁴ and with a recent report by an independent high-level group delivered to</p>

¹⁰⁴ "More effective national research systems that include increased competition within national borders and sustained investment in research" and "Transnational cooperation and competition which define and implement common research agendas on challenges, raise quality through Europe-wide open competition, and construct and run key research infrastructures on a pan-European basis".

Question	Answer
<p><i>implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>DG Research and innovation, which encourages the European Commission to align national and EU R&I investment schemes, to establish synergies with other funding programmes in Europe, and to increase the impact of publicly funded research in Europe¹⁰⁵. The project will also contribute to opening up access to grants data, which is common practice in some countries but not in all. Dissemination and access to data will be royalty-free, but restricted to non-profit activities.</p> <p>The project also contributes to the EC Data Information and Knowledge Management initiative.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>There are today no IT solutions for addressing the lack of informed decision-making when it comes to the evaluation of research project proposals. Some local solutions exist, however they cannot work in isolation. The real issue is related to the fragmentation of the funding mechanisms in Europe and the difficulty to gather the relevant corpus of data, combined to the possibility for project applicants, organised in consortia, to submit grant proposals across borders. An EU-wide approach including grant data from R&D funding agencies in Member States, from the Framework program and ERC program of the EU would guarantee a meaningful volume of data.</p>

¹⁰⁵ "Lab-Fab-App, investing in the European future we want", Report of the independent high level group on maximising the impact of EU research & innovation programmes. European Commission, DG Research & Innovation, ISBN: 978-92-79-70069-9

3.7.5.2 Cross-sector

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>Should the project be successful, it could contribute to enhanced evidence-based decision making and provide some elements for more cross-border collaborations in that field. Data interoperability (and not system interoperability) would be achieved through collecting data from the different funding mechanisms in Member States via the COMPARED platform. Funding of research projects by public organisations is a cross-sector activity. Once implemented, the IT solution proposed here will contribute to more informed decision-to-fund in various policy fields like energy, environment, ICT, health, transport, and many more.</p>

3.7.5.3 Cross-border

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Member States? Detail your answer for each of the concerned Member State.</i></p>	<p>1) Administration to Administration. Once completed, the platform will be used by as many funding agencies of Member states as possible, ideally by agencies in all Member States, as well as in other countries. The project will establish close interaction with National funding agencies and with Science Europe (gathering funding agencies from many Members States), with the goal to involve the final users as soon as possible in the project. We will also aim for a maximum of these funding agencies to contribute to COMPARED with data about grants. The main advantage for funding agencies will be to obtain information about prior research projects funded in other Member States. Funding agencies will also gain from sharing best practices in the evaluation of research proposals and of their impact.</p> <p>2) Administration to citizens & administration to business. Whenever possible, COMPARED will be publically accessible allowing applicants to R&D funding to build more innovative proposals and investment funds or companies to better evaluate requests for R&I funding.</p>

3.7.5.4 Urgency

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	Although there is as such no urgency, evidence-based decision-making in the funding of R&I projects by public agencies is critically needed. Evaluators of grants have no means of knowing if a particular research project has already been funded elsewhere, or if the research has already been performed. Experts use their vast knowledge and experience to evaluate the originality of projects, but there are no actual systematic prior art searches being performed as part of the evaluation process. Knowing more about the past will help evaluators to assess the quality of research proposals and justify their decision on more factual elements. Ideally the platform should be fully operational for the start of FP9 in 2020.
<i>How does the ISA2 scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	This project fits with the ISA ² interoperability goals. There are no other identified available sources of funding for this project.

3.7.5.5 Reusability of action's outputs

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	COMPARED platform
Description	The platform will be accessed through a web application and will therefore be re-usable by any additional funding agency or other entity wishing to use it, subject to certain limitations related to ownership of data. No personal data will be needed for the project.
Reference	
Target release date / Status	Re-use is part of the project. Platform accessible and available as the project evolves and on request.
Critical part of target user base	Funding agencies.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	COMPARED data
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existing actions)	
Description	To the extent that is possible, the dataset on which the platform will rely will be made available to funding agencies and possibly other stakeholders, with the condition that the data can be exclusively re-used for non-profit activities.
Reference	
Target release date / Status	Re-use is part of the project. Data will be made available from the onset, depending on specific legal or data protection issues.
Critical part of target user base	Funding agencies, scholars in the field of scientometrics, economics, innovation and research management.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	COMPARED code
Description	JRC code will be made available through licensing schemes without royalty compensations. EUPL could be envisaged but choosing the adequate licence scheme requires in depth analysis of the developed code. Should licensing be envisaged, JRC will follow the recommendations of the Central IP Service of the Commission that will run a thorough analysis of the software and its various components.
Reference	
Target release date / Status	Re-use is part of the project. JRC code will be made available as much as possible as the project evolves and on requests.
Critical part of target user base	Developers of text mining solutions.

3.7.5.6 Level of reuse of existing solutions

Question	Answer
Does the proposal intend to make use of any ISA2, ISA or other relevant interoperability solution(s)? Which ones?	EUPL whenever possible. PM ² . Synergies with other actions will be actively sought.

3.7.5.7 Interlinked

Question	Answer
<i>Does the proposal directly contribute to at least one of the Union's high political priorities such</i>	Contribution to "Boosting competitiveness through interoperability and standardisation". Less duplication of research means more original research

Question	Answer
<i>as the DSM? If yes, which ones? What is the level of contribution?</i>	funded, hence some impact on competitiveness.

3.7.6 PROBLEM STATEMENT

The problem of	The difficulty to perform prior art search before evaluation of grant proposals
affects	The amount of evidence useful to assess whether a particular proposal should be funded or not.
the impact of which is	No evidence-based decision-to-fund.
a successful solution would be	Provide a semantic similarity platform that will automatically deliver to the evaluator a set of documents similar to the proposal under evaluation.

The problem of	Variety of local IT legacy systems.
affects	Technical interoperability
the impact of which is	Difficult to link systems together and exchange data
a successful solution would be	A centralised repository for data on grants, accessible through a semantic web application easy to integrate or embed in existing processes, with data exchange using RSS format and specific semantics and syntactic.

The problem of	Heavy workload related to processing of research projects.
affects	Efficiency of funding agencies.
the impact of which is	Reduced capacity for sound decisions and to accompany applicants.
a successful solution would be	Give access to a semantic platform to applicants may help in reducing the number of proposals for funding.

The problem of	Limited access of applicants to data on previously funded research projects or to other relevant scientific documents.
affects	The quality and novelty of research projects.
the impact of which is	Proposals entering the evaluation process are of lower quality and novelty than expected, which has an impact on competitiveness and innovation potential.
a successful solution would be	Give access to a semantic platform to applicants may help in increasing the quality and novelty of proposals for funding.

The problem of	High fragmentation of many funding schemes operating in Europe.
affects	Cross-border collaboration, which is low, and exchange of data, which is rare, and therefore the capacity to detect multiple funding of research and overlap of research grants.
the impact of which is	Lack of novelty in proposals, overlap between research grants, and duplication of research.
a successful solution would be	Give access through a semantic platform to a corpus of data on research projects funded in EU Member States, at EU level, or outside.

3.7.7 IMPACT OF THE ACTION

3.7.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Detection of overlaps in research projects (scientific and financial) and subsequent reduction in overlaps and research duplication.	Q1 2020	Funding agencies (Member States and others)
(+) More innovation	More innovative R&I projects.	Q2 2020	Member States
(+) Interoperability	There is no interoperability in this field.	Q4 2020	Funding agencies (MS and others)
(-) Integration or usage cost	Any new tool is associated to some costs: training, integration in IT, licensing, data exchange... But costs will be limited, as the platform will consist in a web application. Impact on agencies will be minimal, in particular because the use of the platform will have no impact on the IT systems in operation locally.	Q1 2020	Funding agencies (MS and others)
(+) More evidence-based funding decisions	Evaluators would have access to prior art documents retrieved through a semantic process.	Q1 2020	Funding agencies (MS and others)
(+) Open access to data on research grants	Catalyse open access to grant data and provide a central access point	Q4 2020	All innovation stakeholders.

3.7.7.2 User-centricity

Users are at the core of the project. They have accompanied the project since its inception. User requirements have been collected prior to starting the development and will be continuously collected to maximise the usefulness of the tool. A panel of experts, specialised in grants evaluation process accompanies the project (e.g. experts from Science Europe). The community of practice will ensure that future developments stay in line with user requirements and will help with the dissemination and use of the platform.

3.7.8 EXPECTED MAJOR OUTPUTS

Outputs are described in section “Reusability of action’s outputs”

3.7.9 ORGANISATIONAL APPROACH

3.7.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
Hungarian Innovation Agency (NKFIH)	Endre Spaller, vice-president	Member of the advisory board, providing expertise in the evaluation process of research proposals, test pilot platform, provide data.
Spanish foundation for science and technology (FECYT) + funding agencies	Cecilia Cabello, director S&T Indicators and R&D and Innovation Policy Monitoring	Member of the advisory board, providing expertise in the evaluation process of research proposals, test pilot platform, provide data.
Science Europe	Stephan Kuster, Acting Director	Member of the advisory board, providing expertise in the evaluation process of research proposals
Joint Research Centre	Olivier Eulaerts, team leader	Member of the advisory board, providing IT expertise (text mining, data, ...)
RTD	Common support Centre	Ensure alignment to RTD grant policies + provide data
ERCEA	Alexis Michel Mugabushaka, Head of Sector Monitoring & Evaluation.	Member of the advisory board, providing expertise in the evaluation process of research proposals, test pilot platform, provide data.

3.7.9.2 Identified user groups

Public R&I funding agencies in Member States

Public R&I funding agencies in H2020 Associated States.
 R&I agencies at international level.
 Applicants to R&I grants.
 Private funding agencies.

3.7.9.3 Communication and dissemination plan

The key to getting Compared used by evaluators is to create a community of practice. This will be facilitated by the existing network of Science Europe (partner of the project), which brings together 40 national funding agencies from all Member States. These agencies are the primary users of Compared and will be approached through Science Europe. Presentation of the tool to the Science Europe working group on grant evaluation took place in Q4 2019 and the working group recommended the scaling-up and wide adoption.

Dissemination will also be done through the ESOF conference 2020, where JRC will have a 450m² dedicated to technology transfer and the funding of research. ESOF is a major scientific event in Europe where researchers and administrators of science will be present. Further dissemination will be done via the funding agencies themselves. Simple online presence will be ensured. ISA² communication channels (e.g. ISA² website, ISA² Newsletter) will also be used to reach potential users of the platform. Corporate dissemination via the ISA² network of Member States coordinators will also be considered as a means to disseminate.

3.7.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected delivery (months after k-o)
Meetings with the partners	2 meetings	+M1, +M11
Platform	New developments will be added to the platform.	+M12
Users	10 funding agencies using Compared in the first year	+M12
Community of practice	1 workshop to exchange best practices	+M12
Data	At least 3 new datasets of grants in the first year	+M12

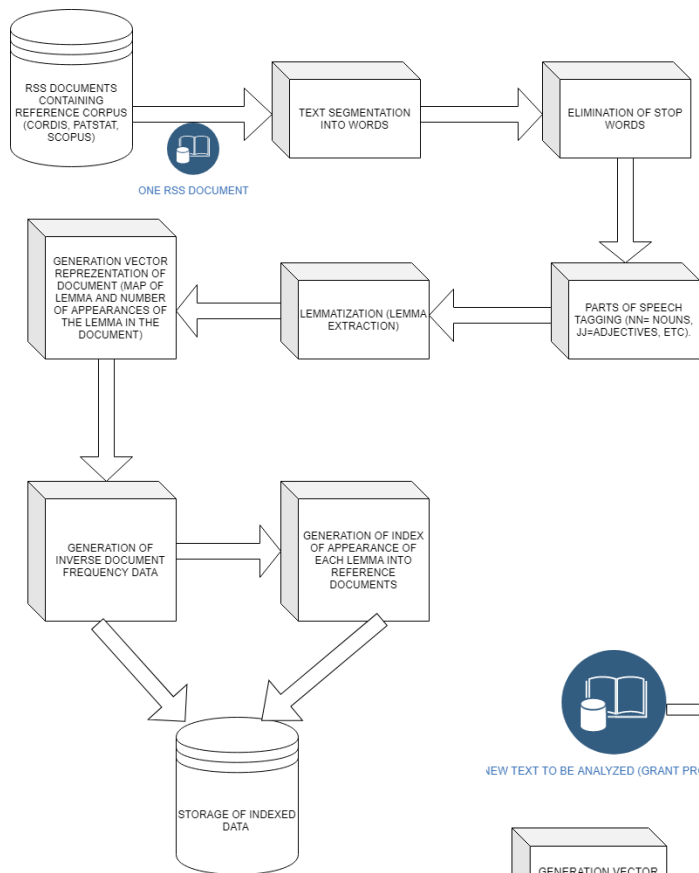
3.7.9.5 Governance approach

To limit the cost in case of project failure, COMPARED was designed as a two-phase project. As the pilot phase 2018-2019 was completed successfully, the project is now entering its full operation phase. Experts will be involved throughout the whole pilot project by monitoring and driving the developments. The project will be managed by JRC which will consult and rely on an advisory board composed of representatives from JRC, the Hungarian Innovation Agency (NKFIH), the Spanish foundation for science and technology (FECYT), and Science Europe. Compared will be sustainable if the user requirements are continuously monitored

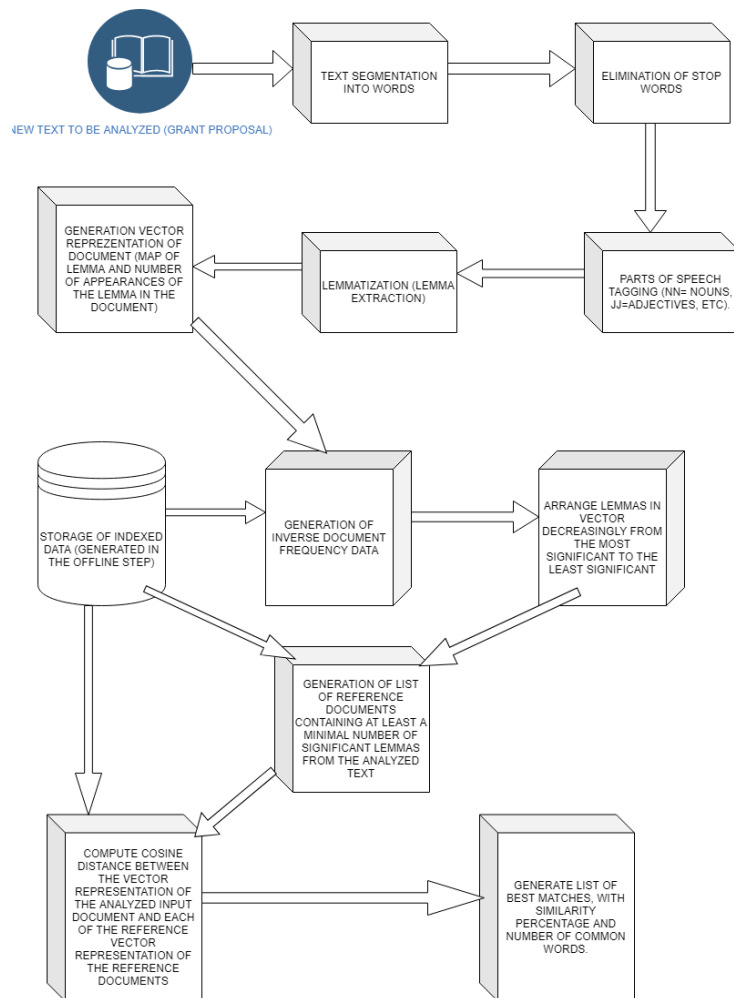
and taken into account and if grants data are updated regularly. This means that, irrespective of where the Compared servers are hosted, there will always be a cost related to software maintenance and data updates. This cost can be estimated to 1.5 full time equivalents of IT experts (~210k€/year), for the whole duration of the Horizon Europe programme. Needless to say, a review of the project after the 1st year of the scaling up phase will take place to decide on a go/no go.

3.7.10 TECHNICAL APPROACH AND CURRENT STATUS

The process for generating the index containing data about prior art and grants and the process by which proposals are compared to the indexed data are both described here.



Process for generating the index containing data about prior art and grants



Process comparing incoming proposal documents to the index containing data about prior art and grants.

IT development for the full operation phase is scheduled to start as soon as funding is made available. Some developments are already foreseen following recommendations and needs expressed by the expert group. Adapting modules developed in other JRC projects (TIM, EMM) will be considered in priority to avoid duplication of work.

1. Automatic Detection of Authors, Title, etc of the Proposal

- Develop AI module to “understand” the structure of a grant proposal and to extract authors, organisations, title, etc. This will prevent manual work of the users/evaluators of the grants. A specific GUI will be developed to allow users to verify the result of this step and make corrections if needed.
- Automatically match authors of proposals to existing companies, universities, etc to which they belong.
- Develop algorithms to detect conflict of interests between authors of grant proposals and evaluators.

2. Dictionaries / Data indexing

- Implement utilization of acronyms.
- Implement utilization of N-words (currently only one single word/lemma is used for TF-IDF).
- Implement utilization of synonyms and adapt similarity computation to take into account this aspect.
- Optimization of search. Optimization in the algorithm used for similarity detection (which can be slow/computationally intensive for some requests like plagiarism detection).
- Ability to easily and seamlessly incorporate other Reference Corpus (such as additional database of granted research projects from different National Authorities).

3. Translation

- Implement JRC solution for translation (EMM translation system).
- Flexibility in deployment - full autonomous/on premise with EMM translation versus general deployment with Internet connection to allow usage of different translation tools - Google, Microsoft, IBM, etc).

4. Authentication / Authorization

- Implement ECAS identification system.
- Flexible Authentication/Authorization configurable (between ECAS and own protocol - existing).
- Own protocol of Authentication/Authorization - user management - ability to create/update/delete users - in process of being implemented.

- Implement monitoring tool for user activities.

5. Usability

- develop features to enable centralized management of all proposals:
- ability of a “manager” to assign grants to different evaluators
- ability of a “manager” to audit the activity of a certain evaluator - see what similarity tests the evaluator had performed, what were the results, corroborate similarity results with the general conclusion of the evaluator (suggest to finance or not), etc.
- assess activity of evaluators, for reference / history and subsequent activities.

6. Integration with TIM environment

- further developments based on current modern microservices architecture and closely integrate with the already existing powerful TIM search environment, such that to offer users an enlarged set of functionalities drawn from both programs.
- develop a relevant GUI to offer users this united set of functionalities from one single place, with minimal user input/number of mouse/keyboard clicks.

7. Sustainability

Compared aims at supporting evaluators in funding agencies throughout all of Horizon Europe, starting 1st January 2021. Sustainability of Compared during this period will be ensured by paying attention to the quality and freshness of data. Collections will be updated regularly (frequency will vary from funding agencies) and made readily available through the platform. It will also be essential to regularly collect requirements of Compared users to update front-end and back-end components. Sustainability and relevance will be at that price. The cost of this can be estimated to 1.5 FTE IT expert, but this estimation will have to be reviewed Q4 2020.

3.7.11 COSTS AND MILESTONES

3.7.11.1 Breakdown of anticipated costs and related milestones

Phase	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line	Start date	End date
Initiation and planning	- Kick off workshop - User requirements document	30k€ experts + 32k€ IT	ISA ² JRC	April 1 2018	May 2018
Execution	- Logistics (meetings, missions) - Platform design, customisation, testing. - Data collection, gathering, formatting, storage, integration,	339k€ IT +10k€ missions-	ISA ² - JRC	April 1	May 2019

Phase	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line	Start date	End date
	indexing. - Setting up of a network of funding agencies from Member States - Setting up of network of expert evaluators - Interface with funding agencies and business analysis (IT requirements, data requirements, etc.) - Exploration of legal issues related to data access and sharing. - Hardware	logistics + 15k€ hardware		2018	
IT supervision	IT supervision and architecture	25k€	JRC	September 2018	November 2019
Closing and Final decision	- Testing of platform. - Closing meeting - Final go / no-go for full deployment.	30k€ experts + 32k€ IT	ISA ² - JRC	April 2019	November 2019
Initiation and planning	Kick off meeting	10k€ IT + 1 man month JRC	ISA ² - JRC	Jan 2020	Jan 2020
Execution	- Logistics (meetings, missions) - IT developments. - Data collection, gathering, formatting, storage, integration, indexing. - Setting up of the community of practice. - Interface with funding agencies and business analysis (IT requirements, data requirements, legal issues related to data access and sharing, etc.).	270 k€ IT +10k€ missions- logistics + 2 man month JRC	ISA ² - JRC	Jan 2020	April 2021
IT supervision	IT supervision and architecture	30k€ IT	ISA ²	Jan 2020	April 2021
Overall supervision	Overall supervision of the project	2 man month JRC	JRC	Jan 2020	April 2021
	Total	730k€			

3.7.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2018	Pilot phase	250	
2019	Pilot phase	230	
2020	Deployment year 1	250	

4 GEOSPATIAL SOLUTIONS

4.1 EUROPEAN LOCATION INTEROPERABILITY SOLUTIONS FOR EGOVERNMENT (ELISE) (2016.10)

4.1.1 IDENTIFICATION OF THE ACTION

Service in charge	EC Joint Research Centre (JRC)
Associated Services	DIGIT, CNECT, ENV, ENER, MOVE, ESTAT, GROW, AGRI.

4.1.2 EXECUTIVE SUMMARY

Location information underpins policy assessment, digital services and applications for public administrations, businesses and citizens. However, interoperability barriers hinder the optimal performance of underlying ICT systems and obstruct the creation of economic value from location information. Although the PSI and INSPIRE Directives and the ISA Programme have started to remove interoperability barriers, more needs to be done to reach the potential of location information, supporting Digital Single Market (DSM) Strategy goals. To address this need, the European Location Interoperability Solutions for e-Government (ELISE) Action is a package of solutions facilitating efficient and effective electronic cross-border or cross-sector interactions between European public administrations, citizens and businesses, in the domain of location information and services.

In 2020, ELISE will perform transitional activities to maintain momentum on key topics (such as GDPR¹⁰⁶ support, solution re-use, AI pilot study scoping), while consolidating most of the work across the Action. A key output of this activity will be to develop a policy-relevant summary document to show the results of ELISE in supporting a domain-specific interoperability framework. Work will also involve activities with stakeholders to understand how ELISE outputs have been applied, the resulting benefits and what more could be done, including the processes that should be involved to maximise impact. In parallel, work will analyse the outputs of ELISE's Location Interoperability Framework Observatory (LIFO) to understand common needs in the Member States in any follow-up activity, as well as aiming

¹⁰⁶ <https://joinup.ec.europa.eu/collection/elise-european-location-interoperability-solutions-e-government/news/gdpr-and-location-data>

for a full European coverage for outputs towards DIGIT's National Interoperability Framework Observatory (NIFO) Action.

ELISE will also initiate two activities within the scope of ELISE towards the forthcoming Digital Europe Programme (DEP), addressing location interoperability issues in the digital transformation of government: (i) location intelligence and (ii) data spaces, assessing, reusing and reforming much of its outputs in recent years to begin to shape these new topics.

For the duration of the Action, ELISE will continue supporting the implementation of the INSPIRE Directive through tools and pilots making use of the interoperability assets of the Directive, especially in the Energy domain. Capacity building, communication and engagement activities will also be a key focus, including further development of knowledge transfer activities, including joint actions with EU Digital Innovation Hubs and the 'rapid studies' to help fill the remaining gaps in sharing knowledge on topics such as AI, IoT, APIs and HPC from technological, semantic, organisational and legal perspectives relevant to location interoperability.

4.1.3 OBJECTIVES

ELISE aims to provide location-related solutions for all four levels of the EIF. It supports the ISA² Programme's basic objective to identify, create and operate interoperability solutions implementing Union policies. It will remove barriers to the sharing and reuse of location information in Europe, and build effective interactions between public administrations, citizens and businesses. ELISE will promote a holistic approach towards 'location interoperability' by helping to optimise the contribution of location information in the digital transformation of public administrations for both policy and online service delivery activities.

4.1.4 SCOPE

In scope:

- a) Evaluate and promote the role of location information in the digital transformation of government;
- b) Provide a Geo Knowledge Base Service for ISA² Programme stakeholders;

- c) Develop pre-operational ‘common services’ for decision-making and value-added applications;
- d) Develop and evolve reusable tools supporting location interoperability;
- e) Run application pilots covering different policies/sectors;
- f) Evaluate and pilot new technologies in support of digital government transformation;
- g) Communicate effectively and disseminate the results by actively engaging stakeholders.

Out of scope:

Create or develop solutions already in place or being produced by other initiatives. ELISE will re-use or promote them, where relevant.

4.1.5 ACTION PRIORITY

ELISE contributes to the interoperability landscape by ensuring that the ‘location’ dimension has an impact, adds value and is appropriately addressed within solutions across borders and sectors, in line with DSM objectives and in support of digital government transformation. ELISE is linked strongly to various other ISA² Actions, and has harmonisation and reuse as core themes in its approach.

ELISE also targets a wide range of EC and Member State stakeholders, with specific focus on the links between public administrations, businesses and citizens. Geospatial data not only has relevance to the policy and service delivery activities of the Member States and the EC but also great potential for the European digital economy, as recently recognised in the new Open Data and Reuse of PSI Directive (EU 2019/1024), highlighting its value, both as Open Data and as high-value datasets.

4.1.5.1 Contribution to the interoperability landscape

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe? In particular, how does it contribute</i></p>	<p>ELISE will continue assessing location interoperability enablers and barriers related to the digital transformation of government, including contributions to the EIF and the Interoperability Action Plan (e.g. Actions 4,6,17 & 19).</p>

Question	Answer
<p><i>to the implementation of:</i></p> <ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan</i> • <i>the Connecting European Facility (CEF) Telecom guidelines</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>ELISE pilots are designed to test cross-border and cross-sector interoperability and deliver pre-operational and reusable solutions. Their outputs contribute to different EU initiatives; including supporting the implementation of the INSPIRE Directive 2007/2/EC, promoting the Once Only Principle (OOP, recommendation no.18 of the e-Government Action Plan) and the CEF by providing building blocks for Member State deployment.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>ELISE is the only action in ISA² focusing on location interoperability. It will promote widespread uptake and the reuse of good practices through the development its Geo Knowledge Base Service.</p>

4.1.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>Location interoperability is relevant to almost all EU policies and many of the outputs apply in any policy context. The ELISE pilots will be tested in domains such as environment, transportation, energy, statistics, health and the digital economy.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy</i></p>	<p>The Re³gistry and INSPIRE test framework / validator are available online for free for all Member States, as well as reusable software for others to explore, and have already been</p>

Question	Answer
<i>sectors.</i>	used in the environmental and energy domains. The GeoDCAT-AP specifications for reusing metadata from a range of sectors in open data catalogues (in collaboration with the SEMIC Action) have led to Member State implementations (e.g. Italy).

4.1.5.3 Cross-border

Question	Answer
<i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i>	The common data services and interoperability tools will be designed to be accessible and reusable across Member States. All Member States are actively encouraged to participate in development and trialling of these interoperability solutions. The Geo Knowledge Base Service will offer guidance, advice and solutions for EU institutions and Member States.
<i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i>	Road safety data-exchange solutions piloted and implemented in Norway and Sweden are being rolled-out to 14 other Member States using CEF Programme Support Action ¹⁰⁷ . INSPIRE Registry services (see below) have managed to obtain over 1.8 million hits in 2018 from many different Member States.

¹⁰⁷ Reference call: CEF MOVE/B4-2017-63

4.1.5.4 Urgency

Question	Answer
<i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i>	ELISE is active in supporting several EU policy initiatives, such as the EIF (Actions 4, 6, 17 & 19); the new Open Data and Reuse of PSI Directive; the introduction of GDPR (2018); INSPIRE Directive implementation (next deadline end 2020) and its use for data-sharing in other legislation (e.g. MMTIS); the Digital Single Market Strategy; the eGovernment Action Plan 2016-2020 (COM(2016)179 final; Action 19), and the Tallinn Declaration on e-Government (2017).
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	The ISA ² Programme offers a unique opportunity to investigate how to reuse and build on the cross-sector/cross-border approach of INSPIRE to create synergies between location and wider ICT interoperability solutions and frameworks. The Programme is the only funding source to address interoperability issues in the scope of ELISE.

4.1.5.5 Reusability of action's outputs

Name of reusable solution	Geo Knowledge Base Service – Knowledge Transfer
Description	The Service will continue fostering the reusability of solutions in the context of location interoperability. It is disseminating acquired knowledge from specific studies, successful pilots, tools and frameworks or guidance performed in ELISE. Innovative channels are being established in 2019 for finalisation in 2020 through Digital Innovation Hubs, including re-usable workshop “packs”, quizzes, and hands-on activities.
Reference	https://joinup.ec.europa.eu/collection/european-union-location-framework-eulf/eulf-blueprint
Target release date / Status	Q4/2018- Q4/2020 (operational solution)

Critical part of target user base	Service: usage by 10 Member States and 3 EC DGs Approach: reuse of approach or basic ‘knowledge elements’ in 2 other initiatives
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	N/A

Name of reusable solution	Pilots and testbeds for applications, technologies, and common data services
Description	These help test concepts and develop reusable solutions towards operational activities. Outputs include application pilots in transport and energy efficiency domains, an evaluation of EU gazetteer services, testbeds for publishing spatial data on the web and the use of APIs and AI. A focus is on cross-border use cases in the geospatial domain. The work will also engage with agricultural data through the Farm Sustainability Tool (FaST, detailed below).
Reference	https://www.youtube.com/watch?v=jnny5ATwTYE https://joinup.ec.europa.eu/community/eulf/og_page/eulf-energy-pilot
Target release date / Status	Q1/2018 – Q4/2021 ongoing programme of pilots
Critical part of target user base	Services: integration into applications/portals by 10 public bodies or businesses Pilots: Take up by public bodies and/or businesses in 10 Member States
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Transportation pilot outputs already used in NO, SE, UK, BE (Flanders), IE.

Name of reusable solution	Re ³ gistry software
Description	Maintenance and extension of the open source Re ³ gistry software to ensure support for the INSPIRE Registry and

	cross-sector register federations. Handover options will be assessed, such as release as a full open source project or as a DSI building block in the CEF.
Reference	https://joinup.ec.europa.eu/software/re3gistry/description http://inspire.ec.europa.eu/registry/ http://inspire-regadmin.jrc.ec.europa.eu/ror/
Target release date / Status	Q4/2018 operational solution
Critical part of target user base	Re-use of software by 5 public bodies and high levels of usage through the online INSPIRE Registry service.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Already re-used in several Member States (AT, ES, IT, FI, FR and SK) and for managing ISA Core Vocabularies. Indicators are part of quarterly reporting on the ISA ² Dashboard. Promotion for uptake will continue for the duration of the Action.

Name of reusable solution	INSPIRE test framework / validator
Description	Extended testing frameworks to ensure that reuse of INSPIRE and other geo-ICT data infrastructures provide reliable and appropriate content across INSPIRE's data themes, supporting public administrations in their implementation tasks.
Reference	https://github.com/inspire-eu-validation/
Target release date / Status	V1 Q3/2017, V2 Q1/2019, V2.x Q4/2019
Critical part of target user base	Re-use by 10 public bodies
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Version 1.0 was released in July 2017 and V2.0 in January 2019, with an update due by the end of 2019. Reuse will be monitored periodically. Promotion for uptake will continue for the duration of the Action.

4.1.5.6 Level of reuse of existing solutions

Question	Answer
<p><i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i></p>	<p>ELISE will promote re-use and build on EULF, ARE³NA and other ISA/ISA² solutions, including:</p> <ul style="list-style-type: none"> i) publishing outputs on JoinUp, carrying out surveys using EUSurvey, and sharing solutions based on the EIF and EIRA; ii) making ‘location’ contributions to the assessment of ICT implications of new legislation and to the NIFO; iii) following recommendations/methods of the Sharing and Re-use strategy and the Interoperability Maturity Model; and iv) supporting various SEMIC activities (especially in relation to vocabularies and GeoDCAT-AP). <p>ELISE will also reuse or promote solutions from other initiatives, including, i.e.:</p> <ul style="list-style-type: none"> i) the European Data Portal; ii) ESTAT geocoding services; iii) the interoperability assets from INSPIRE; iv) European projects, such as ELF, OpenELS and GeoSmartCity; v) Danish and Czech approaches to core registries; and vi) relevant legal and organisational assets (e.g. business cases, licensing approaches, Public Private Partnership (PPP) models, training modules).
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	<p>Examples include the Transportation pilot reusing the TN-ITS data specifications and INSPIRE approach to location (linear) referencing.</p> <p>The INSPIRE test framework is partly based on the OGC CITE test engine for web services.</p>

4.1.5.7 Interlinked

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union's high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<p>ELISE contributes directly to the DSM Strategy, as it actively supports the EIF, the Open Data and Reuse of PSI Directive and INSPIRE Directive implementation, as requested by the EU eGovernment Action Plan 2016-2020.</p> <p>By assessing demand, opportunities and barriers through specific studies and thematic pilots, ELISE creates targeted guidance and (location) interoperability tools.</p> <p>ELISE contains actions that correspond to the vision laid out in the Tallinn Declaration on e-Government from October 2017, specifically on open access (including data licencing and promoting open EU gazetteer services), usability (guidance on user-driven design), trust (knowledge sharing on GDPR within the geospatial community); development of the data economy (assessment of data flows and data value, understanding and overcoming barriers); cross-border (EU-wide common data services and cross-border pilots); and interoperability by default (applying the EIF and monitoring through ELISE's LIFO).</p> <p>FaST brings digitalisation benefits to the agricultural sector and related authorities. It creates cross-border market opportunities for Copernicus and Galileo-based digital products for the sector and EU-wide re-use of solutions for MS authorities.</p> <p>FaST's implementation will help mitigate emissions as part of the Energy Union and</p>

Question	Answer
	Climate priority, while contributing to Common Agricultural Policy objectives in terms of digitalisation and effective agro-environment and climate interventions.

4.1.6 PROBLEM STATEMENT

<i>The problem of</i>	barriers to location interoperability
<i>affects</i>	many policy areas and public services
<i>the impact of which is</i>	higher costs due to inefficiencies in current governmental processes and barriers in the creation of economic value. Data are undervalued, not managed efficiently or misinterpreted, with impacts on decision-making as a consequence.
<i>a successful solution would be</i>	sharing best practices, guidelines and tools, supported through the ELISE Geo Knowledge Base Service, including training and pilots to demonstrate the feasibility and identify the benefits of solutions. For example, different data specifications are used in different contexts, whereas ELISE pilots use INSPIRE to have a harmonised approach.

<i>The problem of</i>	limited data-sharing of location data
<i>affects</i>	European data economy
<i>the impact of which is</i>	over-investments / spending using often poor quality information and barriers to innovation, especially in the private sector
<i>a successful solution would be</i>	to understand the needs of different users and the extent to which data is required across borders and the barriers to sharing this data and to promote collaborative efforts to improve the extent and impact of EU location data sharing. This includes actions relating to simplified, harmonised, and open licensing, use of common data formats, improvements in searching for data, as well as capacity building and

	knowledge transfer. These efforts need to be in line with the Open Data and Reuse of PSI and INSPIRE Directives, and the protections afforded by GDPR.
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<i>The problem of</i>	delayed reaction in government to advances in the technology landscape
<i>affects</i>	inhibits public service innovation and timely take-up of policy measures
<i>the impact of which is</i>	reduced policy impact and public administration satisfaction levels (as expectations increasingly rise)
<i>a successful solution would be</i>	to use agile knowledge gathering and dissemination processes to improve the readiness of public sector. ELISE contributes to mitigate this issue by disseminating specific studies on the impacts of new technologies in government environments (e.g. digital platforms, APIs, AI, IoT), by facilitating the testing through pilots, developing specific tools, and facilitating knowledge transfer through guidance, ‘rapid studies’ and webinars.

4.1.7 IMPACT OF THE ACTION

4.1.7.1 Main impact list

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Savings will occur thanks to avoiding duplicated efforts and reusing cost-efficient solutions in e.g.: data procurement, software development and service delivery	Once solutions are in an operational phase in Public Administrations	Public administrations, businesses and citizens
(+) Savings in time	Time savings will occur thanks to avoiding duplicated efforts and, again, reusing cost-efficient solutions	As above	Public administrations, businesses and citizens

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Better interoperability and quality of digital public service	Interoperability objectives will be realised through fostering collaboration between actors, sharing of best practices, highlighting optimal business processes and (user-centric) services, promoting harmonised policy approaches (e.g. INSPIRE, GDPR, ITS, EPBD) and deploying new technologies effectively to support digital government transformation, with developments monitored through LIFO.	The duration of ELISE and the operation of its Geo Knowledge Base Service	All stakeholders
(-) Integration or usage cost	Effort will be needed to integrate 'location' in other initiatives, across all the EIF	ELISE supports such integration until 2021	EU and MS policy makers
(+) Improved policy-making where location plays a role (including cross policy alignment)	Considering location information at the early stages will provide a cohesive approach to analysing status/problems throughout the policy cycle	Within the policy implementation and review timeframe (e.g. 5 years approx. for new policies)	EU and MS policy makers
(+) Effective skills	Organisations will improve their geospatial literacy and other skills to make best use of available data	ELISE duration and operation of Geo Knowledge Base Service	All
(+) Creation of a collaborative	The Geo Knowledge Base Service is a focal point for facilitating	Initial benefits will occur	Various stakeholder

Impact	Why will this impact occur?	By when?	Beneficiaries
network	<p>partnerships between organisations/ initiatives, offering expert advice about location data and services/ sources, reusable software etc.</p> <p>The best practices identified through the Location Observatory will be promoted for reuse across the ELISE and broader ISA² stakeholder communities.</p>	<p>when partnerships are set up, such as via pilots or the roll-out of interoperable services</p>	<p>relationships, including with research and businesses. Examples of best practice in the geospatial domain are often of interest to other interoperability activities.</p>

4.1.7.2 User-centricity

Collaboration is core to ELISE’s approach, involving key stakeholder input through workshops, consultations, surveys and co-development of solutions. In particular, the ISA² Working Group on Geospatial Solutions is invited to propose priority actions. Inputs are sought from public and private sector stakeholders, academia, key industry bodies and thematic communities. ELISE’s use cases and feasibility studies help assess demand for particular solutions and priorities. Validation in the field ensures that needs are met in a practical way, with improvements through direct feedback from users. As well as practising a user-centric approach, the ELISE Blueprint incorporates user-driven service delivery best practice in its guidance framework.

4.1.8 EXPECTED MAJOR OUTPUTS

ELISE outputs form a holistic proposal, including evaluating benefits, outcomes and impacts, with clear links to key ISA² selection criteria. It will act as a ‘solution incubator’ to develop and pilot solutions, a ‘solution bridge’ to bring them to maturity and a ‘solution broker’ to find new users. ELISE also involves a number of feasibility studies to scope and assess requirements/options for key topics before launching pilots, alongside engagement and

knowledge-sharing activities. The major outputs for the 2020 Work Programme are summarised below.

Output name	Location intelligence landscaping
Description	This work will focus on location intelligence in the public sector, which combines AI, data analytics and geospatial technologies/techniques (including data visualisation) to aid decision-making.
Reference	https://joinup.ec.europa.eu/community/eulf/og_page/eulf-blueprint https://ec.europa.eu/knowledge4policy/ai-watch_en
Target release date / Status	Q3/2021

Output name	Data space interoperability pilot
Description	Scoping and initial setup of a pilot for investigating interoperability issues within and between data spaces involving location information in different sectors (e.g. energy, health, environment, transport, agriculture), addressing all levels of the EIF.
Reference	https://ec.europa.eu/digital-single-market/en/news/digital-europe-programme-proposed-eu92-billion-funding-2021-2027 https://ec.europa.eu/knowledge4policy/ai-watch/topic/data-cornerstone-ai-%E2%80%93-toward-common-european-data-space_en
Target release date / Status	Q3/2021

Output name	Consolidated ELISE outputs towards policy-relevant advice
Description	For the remainder of the Action, ELISE will aim to close pilot and application developments for potential handover, ensuring that findings are well documented towards a domain interoperability framework for the EIF related to location. This will include a final update of the EULF Blueprint

	<p>towards this destination and final findings from the LIFO activity (see below).</p> <p>Feedback from the knowledge transfer activities will be included, where appropriate, and ELISE will share its findings via JoinUp and in a final conference, to be organised with stakeholders in the Member States to help promote and validate final policy recommendations.</p>
Reference	https://joinup.ec.europa.eu/community/eulf/og_page/eulf-blueprint
Target release date / Status	Q1 2021

Output name	Location Interoperability Landscape-analysis and Technology Watch
Description	<p>Evidence will continue to be gathered on EULF Blueprint recommendations through the LIFO assessments with MS representatives, with an aim for full European coverage as a secondary data source for NIFO. Country factsheets and an overall state-of-play report will be produced and contributions to the analytical tools of NIFO.</p>
Reference	https://joinup.ec.europa.eu/collection/elise-european-location-interoperability-solutions-e-government/location-interoperability-framework-observatory-lifo
Target release date / Status	Q1/2021

Output name	Geo Knowledge Base Service – Knowledge Transfer
Description	<p>2020 will see further knowledge assets developed beyond the activities started in 2018 and the new examples being setup in 2019, with a specific exploration of Digital Innovation Hubs as knowledge brokers.</p> <p>Feedback from stakeholders will help to finalise outputs such as the initial primer on geospatial literacy, location interoperability and the digital transformation of</p>

	<p>government; the reusable workshop pack (with new topics added); and more practical exercises, including hackathons.</p> <p>Work will also explore how contributions can be shared with the Interoperability Academy ISA² Action and the JRC's EU Academy for further exploitation as part of sustainability assessments. The reusability of the activity will be further tested, for example by including relevant project resources from JRC citizen science activities.</p>
Reference	<p>See, for example the Rapid Studies: https://joinup.ec.europa.eu/collection/elise-european-location-interoperability-solutions-e-government/elise-rapid-studies-and-webinars</p>
Target release date / Status	Q2/2021

4.1.9 ORGANISATIONAL APPROACH

4.1.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
ISA ²	Member State representatives in the ISA ² Working Group on Geospatial Solutions and the ISA ² Committee. Plus, other ISA ² Actions	Inputs to Work Programme, governance, identifying best practices, partnerships and synergies with other activities
Commission Services	ENV, ESTAT, CNECT, DIGIT, MOVE, ENER, GROW. EC Inter service group on Geographic information (COGI)	Scoping solutions / pilots, IMSB Action 5.4 related to work on capacity building in geospatial data
INSPIRE Governance	Maintenance and Implementation Group (MIG), National Contact Points (NCPs),	Identifying needs, promoting reusable

Stakeholders	Representatives	Involvement in the action
	Legally Mandated Organisations (LMOs), European Environment Agency (EEA)	solutions, participating in pilots
Geospatial Solution providers	Businesses (including SMEs) and research bodies	Knowledge base content and solution development
Thematic Policy domains	Committees, working groups, including those related to location data, such as Copernicus (GROW) and GEO (RTD)	As relevant for application, solution or pilot activities
UN-GGIM: Europe	ELISE will collaborate with ESTAT on the promotion of geospatial data management for public administrations.	Uptake of results of work on geospatial data and statistics
Member State organisations, groups and projects	Location / e-Government coordination bodies, Government digital agencies, National mapping and cadastral agencies, Private sector actors	Solution providers and users
Pan-European interest groups, organisations and projects	Such as OSGeo and other communities; open data communities, research / academic groups, European umbrella organisations (e.g. EuroGeographics)	As data sources and pilot partners and inputs to feasibility studies
EEA/EIONET, National agencies	EEA/EIONET national focal points (NFPs), National Reference Centres for Information Systems.	As partners in potential INSPIRE environmental pilots
Network of businesses, or individual private companies	Smespire (and similar) networks of enterprises, private companies working in specific thematic domains. A selection of Digital Innovation Hubs relevant to geospatial activities and digital transformation	Pilot partners and stakeholders for scoping solutions

4.1.9.2 Identified user groups

Existing stakeholder groups are defined above but ELISE will also cover businesses and citizens by exploring successful models and solutions (e.g. to support innovation, provide

funding, put PPPs into practice, take on board citizen inputs, including establishing a link to JRC citizen science activities).

4.1.9.3 Communication and dissemination plan

Documentation will be published on the ISA² website and on JoinUp. Cross-references will be made to, for example, INSPIRE’s knowledge base¹⁰⁸ and relevant ‘partner’ websites.

The source code of solutions developed under ELISE will be published in well-accepted open source repositories such as GitHub.

Training will be carried out in face-to-face events, webinars, and through access to online resources.

Videos, brochures, and platforms, including social media will also be used. Engagement activities such as surveys will also help to raise awareness about the Action and the ISA² Programme.

Key events are summarised in the following table:

Event	Representatives	Frequency of meetings / absolute dates of meetings?
ISA ² Committee and Coordination Group Meetings	MS representatives	Twice yearly
ISA ² Working Group on Geospatial Solutions	MS and Commission representatives	2-3 times per year
ELISE workshops, partner events, webinars	MS and Commission representatives, thematic groups, invited experts, including awareness raising and capacity building events	8-10 times per year
INSPIRE Conferences	INSPIRE stakeholders	Once per year
INSPIRE Maintenance and Implementation (MIG) Group and Sub-Group meetings	MS representatives and invited experts	To be determined

¹⁰⁸ <http://inspire.ec.europa.eu/>

Event	Representatives	Frequency of meetings / absolute dates of meetings?
Meetings of standardisation groups (CEN, ISO, OGC, W3C)	Standards experts	2-3 times per year
Business innovation events, e.g. apps incubators, hackathons, competitions	Web / mobile developers Geo ICT SMEs	1-2 times per year
Other thematic conferences	Transport, Energy as well as FOSS/ICT conferences, including ISA ² 's SEMIC and Sharing and Reuse Conferences	Once per year
ELISE final conference	All stakeholders from government and business	One-time event

4.1.9.4 Key Performance indicators

Description of the KPI	Target to achieve	Expected time for target
Number of interventions where ELISE has aided European Commission policy makers in advancing location interoperability good practice in their policies and initiatives with relevant studies and recommendations	10	Q4/2020
Number of MS public services where ELISE guidance, tools, support or pilots have helped them improve the integration of location information in their processes	5	Q4/2020
Number of positive impacts, collaborations, stakeholder (Member State organisations and DGs) feedback or implementation of results in MS/EC from outputs of ELISE activities	10	Q4/2020
Number of hits on the INSPIRE Registry	700,000	Q4/2020

Description of the KPI	Target to achieve	Expected time for target
service (based on the Re ³ gistry software)		

4.1.9.5 Governance approach

The broad reach of ELISE involves engaging with work in the Member States and the EC. The ISA² Working Group on Geospatial Solutions¹⁰⁹ will continue to play a vital advisory and facilitating role (e.g. for ELISE WP updates, Geo Knowledge Base Service content/scope, promoting take-up).

ELISE focusses on user-centricity, co-creation and shared ownership of results for wider reuse. WG representatives are, therefore, encouraged to contact others (e.g. GI and digital government communities in their Member States, UN-GGIM: Europe, Group on Earth Observations, standards bodies and thematic actors) to aid communication / coordination / promotion of location interoperability.

As JRC.B06 is the chair of the WG, ELISE can also connect with other groups, such as COGI, IMSB and INSPIRE governance structures, including the MIG EC expert group, where ELISE helps to deliver some aspects of its work programme 2016-2020¹¹⁰.

In 2019, ELISE established 'User Panels' to allow small teams of Working Group members to provide inputs to key activities in their development phase, with an aim to support their wider uptake/application in the Member States.

4.1.10 TECHNICAL APPROACH AND CURRENT STATUS

The focus of the ELISE work packages for 2020 is described in detail in Table 1.

Table 1. Focus of ELISE work packages for 2020

Work package	2020 focus
1. STUDIES	
Location intelligence landscaping	A series of small studies, stakeholder workshop findings and architecture documents will help to conceptualise and document the potential further

¹⁰⁹ The ISA² WG on Geospatial Solutions is the successor of the ISA WG on Spatial Information and Services (SIS), which was the governance group for the EULF and ARe3NA ISA actions.

¹¹⁰ <https://ies-svn.jrc.ec.europa.eu/documents/58>

Work package	2020 focus
	<p>development of location intelligence in the public sector, as a bridging activity towards the forthcoming DEP.</p> <p>Inputs will include the EULF Blueprint and AI-related studies by ELISE alongside others from the JRC’s AI Watch project with DG Connect.</p> <p>Work will involve mapping key public services using geospatial data, how data is shared and an analysis of their business processes for using AI to improve decision-making and service delivery. Issues of current and necessary capacity and data/service quality to support location intelligence will be explored with stakeholders.</p> <p>The work will include analysing: how geospatial data can be combined with other data (e.g. from IoT sources) to enhance/enrich processes; selected geo-AI solutions to better understand their behaviour in practice; and economic and social aspects, including the added-value generated and the potential ethics/privacy issues involved (continuing some of the work ELISE has already done on GDPR).</p>
2. FRAMEWORKS AND SOLUTIONS	
<p>Consolidated ELISE outputs towards a Location Interoperability Reference Framework</p>	<p>The EULF Blueprint (plus its related guidance), several technical studies, the outcomes and components of ELISE pilots/applications and materials such as good practices from the ELISE’s knowledge base provide the basis to fully document and illustrate a domain interoperability reference framework for location.</p> <p>This activity will, therefore, involve the successful closure of relevant activities, including the incorporation of Member State best practices in the EULF Blueprint and the EI Cart. A key output will be a policy-relevant document as an addition to the EIF drawing on evidence and key examples from across the Action.</p> <p>Developments will be performed in discussion with stakeholders as a ‘jointly agreed framework’, especially members of the Geospatial Solutions</p>

Work package	2020 focus
	Working Group and the outcomes will be published along with promotion through a video and the planned ELISE final conference (see below).
Location Interoperability Tools and Testbeds ¹¹¹	<p>Work will support the maintenance and implementation of additional features of the Re³gistry software, in close collaboration with stakeholders in the Member States.</p> <p>The INSPIRE validator software and service will be maintained. In addition, work will explore extending INSPIRE validation rules to cover requirements from Reporting Obligations to support those public authorities that must deliver data compliant to both.</p> <p>The benefits of this work will also be explored and showcased, for example, through a brief promotional video.</p>
3. APPLICATIONS	
Application Pilots	Following successful closure ELISE’s Multi-Modal Transport Information Services (MMTIS) pilot, 2020 will see finalisation of the Energy Efficiency of Buildings pilot, where packaging of results will help consortium members take the results further and where an analysis of the work will contribute to the above-mentioned policy advice.
Data space interoperability pilot	<p>The DEP has brought data spaces to the fore, where they will be developed in a number of sectors (e.g. statistics, energy, health, environment, transport and agriculture) and geographical areas. Many of these will have a location component or would benefit from being combined with geospatial data.</p> <p>In order to avoid creating new data silos, there is a need to ensure that these data spaces will be interoperable across domains, borders and between stakeholders. The work will, therefore, design and create the initial setup of a pilot to explore solutions</p>

¹¹¹ Formerly entitled “Geospatial Interoperability Tools”

Work package	2020 focus
	<p>to enable interoperability within and between data spaces across all levels of the EIF. The piloting, with stakeholders, will aim to capture a complete view of data flows between data providers and users, so that the specific barriers and possible solutions for interoperability are fully understood.</p> <p>The outcomes of this work will provide the basis for further development of the pilot in the DEP. Outputs will also be relevant to both the sharing of high-value datasets under the Open Data and Reuse of PSI Directive and to the evolution of INSPIRE.</p>
FaST	<p>The Farm Sustainability Tool (FaST) and platform proposes to pilot a solution developed jointly by DG AGRI, DG GROW, DG DIGIT, DG ENV, DG CLIMA and JRC's MARS Unit, which already has a blueprint architecture and tool prototype. The pilot will allow the EU-wide mutualisation of digital solutions and costs for MS agricultural authorities in CAP-related IT developments through a common micro-services platform. It will also boost the uptake of geospatial solutions based on Copernicus (remote sensing) and Galileo (geo-location), and the use of EU-funded cloud-based data and information access capabilities (DIAS). In general, it will provide a EU-wide tool for data-driven digital decision-support solutions at field and farm level, powered by the sharing and re-use of public datasets through the management of micro-services for FaST's foreseen web services.</p> <p>Of interest to Paying Agencies, the work foresees pilots with the National Agricultural Research Institute <i>Pollumajandusuringute Keskus</i> (Estonia); Spanish Agrarian Guarantee Fund/FEGA. Coordination body of Paying Agencies (Spain); and Piemonte Region, Agricultural Directorate <i>Regione</i></p>

Work package	2020 focus
	<p><i>Piemonte – Direzione Agricoltura (Italy), including farmers in these areas.</i></p> <p>FaST will reuse and build on ELISE activities by evaluating the EULF Blueprint’s recommendations in the practical context of this important policy and economic context, mixing public and private sector actors as both geospatial data providers and users. It will also identify and make use of key INSPIRE data applicable to farm-level sustainable development, including data from themes such as Protected Sites and Land Use, complemented with data from Copernicus and Galileo.</p>
<p>4. GEO KNOWLEDGE BASE SERVICE</p>	
<p>Location Observatory</p>	<p>Following initial assessments and factsheets for some Member States in 2019, the 2020 activity will aim to capture and publish a full picture of location interoperability across Europe. The 2020 assessment model and process will build on the lessons learnt in 2019.</p> <p>The results will fully align with the NIFO and will make use of its technical platform to ensure that stakeholders have one resource to contribute and compare their activities on interoperability, while showcasing the contribution from location-related stakeholders. Support for the activity will involve tools on JoinUp helping to build online links between LIFO, the Blueprint/online guidance, linked with training materials under the Knowledge Transfer activity.</p> <p>The work will also involve analysing gaps and priorities with stakeholders towards a common direction of travel to maximise impacts for any future activities. This will include applying the EIF to examine where there have been strengths and weaknesses in location interoperability in cross-border activities. This will include exploring issues related to moving from pilots to operational location-enabled public services and the legal frameworks underpinning them.</p> <p>This will include reviewing sectoral and technology trends from digital transformation studies and external research, translating 2019’s “Future of SDIs”</p>

Work package	2020 focus
	<p>outputs into a model for the future and priority actions to facilitate evolution, including the future role of INSPIRE in the digital transformation of Europe and relevant strategic priorities.</p>
<p>Knowledge Transfer, communication and stakeholder engagement</p>	<p>All the above actions will identify sustainability paths and focussing on increasing user-uptake and impact of ELISE outputs. Suitable dissemination channels and dedicated events will be agreed in close collaboration with the Member States for relevant outputs such as papers sharing best practice, guidance materials, workshops, regional events and ‘hot topic’ webinars.</p> <p>An ELISE final conference will also be organised with stakeholders, to showcase the Action’s and partners’ activities. This event will help launch the Location Interoperability Reference Framework and to present the transition of ELISE to the DEP.</p> <p>In addition, ELISE will further explore the role and potential of Digital Innovation Hubs for digital transformation of government, making best use of geospatial technologies, data and digital skills. This will include exploring the role of more standardised professional profiles for Geo-ICT related to knowledge, skills and competences, such as in the context of European e-Competence Framework (e-CF) and continuing work on geospatial literacy. Defining such professional profiles will help to meet the pressing demand for qualified professionals with digital and geospatial skills in both the public and private sectors. Work will also include a training package agreed with stakeholders, including potential support to SMEs engaged with the public sector, a series of communication events, as well as improvements to ELISE’s resources in JoinUp.</p>

4.1.11 COSTS AND MILESTONES

4.1.11.1 Breakdown of anticipated costs and related milestones

The proposed ELISE Work Programme spans five years and has three phases, with **Initiation** (year 1) completed in 2016/2017. **Execution** (years 2-4) contains activities and new studies and other outputs, with the maintenance of existing tools. Work has also included several contributions to the mid-term evaluation of the ISA² Programme.

Closing (year 5) will involve readying of solutions for operation/handover, final evaluation and transition of results to either “operational governance” or continuation under the DEP. Details of each activity, with dates and costs for each year in the Work Programme are shown below.

Phase: Initiation Planning Execution Closing/Final Evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date	End date
1. STUDIES					
Initiation	1.1 Assessment of economic opportunities and barriers related to geospatial data in the context of the DSM	160 - - -	ISA	Q3/2016	Q4/2017
Execution	1.2 INSPIRE and spatial data standards in support of EU-wide Multimodal Travel Information Services	- 100 - -	ISA	Q3/2017	Q1/2019
Execution	1.3 Supporting better uses of location data and statistics	- 90 - -	ISA	Q4/2017	Q4/2018
	1.4 The role of location	-	ISA		

Phase: Initiation Planning Execution Closing/Fin al Evaluation	Description of milestones reached or to be reached	Anticipat ed Allocatio ns (KEUR)	Budget line ISA/ others (specify)	Start date	End date
Execution	information in digital	230		Q4/2017	Q3/2018
Execution	government transformation	400		Q3/2018	Q3/2019
Execution		620		Q2/2019	Q3/2020
		-			
Execution	1.5 Location-Enabled Digital Platforms Benchmark	- 260 - -	ISA	Q3/2017	Q2/2018
	1.6 Location intelligence landscaping	- - - -	ISA	Q2/2020	Q3/2021
Initiation		350			
2. FRAMEWORKS AND SOLUTIONS					
Initiation	2.1 Guidance (2020: Consolidation and Policy advice)	110 50 40 100 150	ISA	Q1/2017 Q3/2017 Q4/2018 Q3/2019 Q2/2020	Q2/2017 Q4/2018 Q4/2019 Q4/2020 Q2/2021
Initiation	2.2 Location Interoperability Tools and Testbeds	220 240 300 540 300	ISA	Q4/2016 Q4/2017 Q4/2018 Q2/2019 Q2/2020	Q4/2017 Q3/2018 Q3/2019 Q4/2020 Q2/2021
Initiation	2.3 References and inventories	60 100 -	ISA	Q4/2016 Q2/2017	Q3/2017 Q4/2018

Phase: Initiation Planning Execution Closing/Final Evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date	End date
		- -			
3. APPLICATIONS					
Initiation Execution Execution Execution Closing/Final	3.1 ELISE Application Pilots	80 260 300 280 170	ISA	Q4/2016 Q3/2017 Q3/2018 Q2/2019 Q2/2020	Q4/2017 Q2/2018 Q4/2019 Q4/2020 Q2/2021
Initiation Execution Execution	3.2 Common services – EU Gazetteer	85 150 270 - -	ISA	Q4/2016 Q3/2017 Q3/2018	Q3/2017 Q3/2018 Q1/2020
Initiation	3.3 Location-powered data spaces	- - - - 350	ISA	Q2/2020	Q3/2021
Initiation Execution	3.4 FaST	- - - 400 500	ISA	Q4/2019 Q4/2020	Q4/2020 Q4/2021
4. GEO KNOWLEDGE BASE SERVICE					
Initiation	4.1 Geo Knowledge Base service definition and piloting	81 - - -	ISA	Q4/2016	Q4/2017

Phase: Initiation Planning Execution Closing/Fin al Evaluation	Description of milestones reached or to be reached	Anticipat ed Allocatio ns (KEUR)	Budget line ISA/ others (specify)	Start date	End date
		-			
Initiation Execution Execution Execution Closing/fin al	4.2 Location interoperability observatory, landscape analysis and technology watch	91 65 360 350 180	ISA	Q2/2016 Q4/2017 Q3/2018 Q3/2019 Q2/2020	Q3/2017 Q2/2018 Q4/2019 Q4/2020 Q1/2021
Initiation Execution	4.3 Location input to ICT assessment of new legislation	36 50 - - -	ISA	Q2/2016 Q4/2017	Q3/2017 Q4/2018
Initiation Execution Execution Execution Closing/Fin al	4.4 Knowledge Transfer, communication and stakeholder engagement	60 240 230 310 300	ISA	Q3/2016 Q2/2017 Q3/2018 Q3/2019 Q2/2020	Q2/2017 Q4/2018 Q4/2019 Q4/2020 Q3/2021
	2016	983			
	2017	+1835			
	2018	+1900			
	2019¹¹²	+2000			
	2020	+2300			
	Total	=8718			

The proposed work elements are also important to the JRC in supporting the evolution of INSPIRE and its wider scientific interests in data and technology. Consequently, ISA

¹¹² The 400k Euros for FaST in 2019 did not use the ELISE budget and is not accounted here.

resources will be complemented by JRC institutional staff resources for management, ELISE governance support and technical support on INSPIRE issues.

4.1.11.2 Breakdown of ISA2 funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Initiation	983	983
2017	Execution	2240	1835
2018	Execution	1900	1900
2019	Execution	2000	1870
2020	Initiation, Execution and Closing	2300	

4.1.12 Planning for the tendering procedures to be launched for the action

Call for tenders foreseen Global amount in KEUR	Call for Tenders Duration in years	Indicative planning of publication (QX/YYYY)
Intramuros: 750k	n/a	Q2 2020
Framework contracts: 450k	1 - 1.5 years	Q3 2020
Small/expert contracts: 100k	0.5 - 1.5 years	Q2 2020
Open calls: 500k	1-1.5 years	Q2 2020

4.1.13 ANNEX AND REFERENCES

Description	Reference link	Attached document
INSPIRE resources	http://inspire.ec.europa.eu/	
EULF	https://joinup.ec.europa.eu/community/eulf/description	
ARE3NA	https://joinup.ec.europa.eu/community/are3na/description	
ELISE	https://joinup.ec.europa.eu/community/elise/home	
Digital Europe Programme	https://ec.europa.eu/digital-single-market/en/news/digital-europe-programme-proposed-	

	eu92-billion-funding-2021-2027	
Open Data and Reuse of PSI Directive	https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1561563110433&uri=CELEX:32019L1024	
Towards a common European data space	https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2018:0232:FIN	
FaST: Feasibility Study for joint Space-Agriculture Solutions on Nutrient Management	https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/news/presentations/fast-final-review-meeting_en.pdf https://embedded.fast.sobloo.io/static/farmer_mobile_app/embedded.html	

5 E-PROCUREMENT / E-INVOICING – SUPPORTING INSTRUMENTS

5.1 EUROPEAN PUBLIC PROCUREMENT INTEROPERABILITY INITIATIVE (2016.05)

5.1.1 IDENTIFICATION OF THE ACTION

Type of Activity	Reusable generic tools, common frameworks
Service in charge	Sub-action eProc-01: DIGIT.B1 Sub-action eProc-02: GROW.G4 Sub-action eProc-03: Publications Office OP.C3 Sub-action eProc-04: Joint activity between GROW.G4, OP.C3 and DIGIT.D2
Associated Services	CNECT.H3, DIGIT.D1, DIGIT.D2, GROW.F3, GROW.R3, Publications Office (OP) A1, A2

This action is split into three sub-actions, the three Directorate Generals mentioned as services in charge have the overall responsibility for the sub-action allocated to them, however they will work in collaboration with mutual consultation.

5.1.2 EXECUTIVE SUMMARY

The window of opportunity to achieve a true digital single market in Europe for public procurement within the next few years is within reach. By combining the different elements, contributing to electronic public procurement a strong basis is formed to reach this goal:

- The Digital Single Market Strategy (DSM) recognizes that Information and Communications Technology (ICT) is the foundation of modern economic systems and that public procurement plays an important role in promoting standards and interoperability.
- The public procurement Directives [2014/23/EU](#), [2014/24/EU](#) and [2014/25/EU](#) specifically mention that tools and devices used for communicating electronically should be non-discriminatory, generally available, and interoperable. eProcurement is gradually becoming the default in the EU for all contracting authorities, in particular since October 2018, the mandatory milestone for eSubmission. In addition, eCertis and the European Single Procurement Document will become mandatory from the time Member States have transposed the new directives. They are cornerstones to achieve the once only principle in Europe. The eInvoicing Directive [2014/55/EU](#) makes the reception and processing of electronic invoices complying with the EU

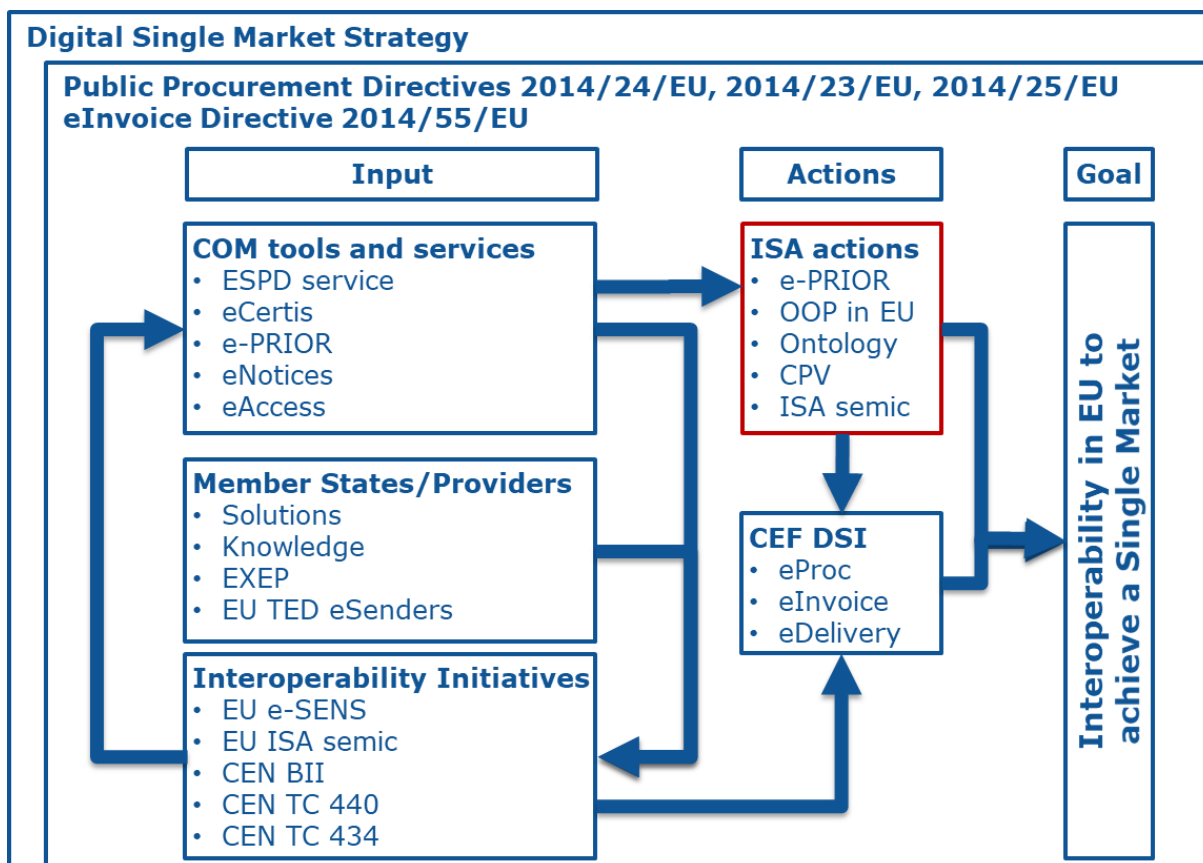
standard mandatory as of 17 April 2019. In certain Member States, which decided so, a derogation is possible for their sub-central authorities until April 2020.

- The Connecting European Facility (CEF) is an important financial instrument to support interoperability in public procurement and other domains. The CEF eProcurement DSI (Digital Service Infrastructure) will be fed with results from the ISA² programme and through interoperability initiatives. Beside the CEF eProc DSI, there is as well a separate DSI to support eInvoice. The CEF programme goes until 2020.
- There are several interoperability/standardisation initiatives in Europe that have been working in public procurement for several years, such as CEN BII which are reaching a high level of maturity, especially around post award. The EU interoperability pilot e-SENS worked on how to make eTendering systems interoperable. The CEF eProc DSI supports the results to make eTendering solutions interoperable. The governance of the eTendering interface is done through OpenPEPPOL.
- The European Commission provides tools and services for public procurement. The Publications Office is mandated to publish notices about procurement procedures above certain thresholds¹¹³. The eTendering application of the Publications Office publishes tendering documents from the Commission and the European Institutions and bodies. eCertis and the eESPD will be a cornerstone to achieve the once-only principle in Europe and are supported through the CEF eProc DSI. e-PRIOR, a procurement tool, covering processes developed by DG DIGIT uses standards coming from for example CEN BII. It is an important potential asset to improve and support interoperability on a European scale.

The ISA² programme will not only help to update existing tools like e-PRIOR or eCertis but it will also foster interoperability through a common public procurement ontology and will support the implementation of the once-only principle in Europe. ISA2 lasts until 2020.

The figure below shows the overall relationship of the ISA2 actions in relation with the other points mentioned above.

¹¹³ https://ec.europa.eu/growth/single-market/public-procurement/rules-implementation/thresholds_en



Combining the legal backing, the technical experience and financial instruments, we have now the possibility in the EU to achieve a true single market for public procurement. Therefore, action should be taken to make full use of this window of opportunity.

In 2019, the responsibility of maintaining the ESPD EDM was handed over to the Publications Office. Therefore, the budget foreseen in 2020 of 200 KEUR was moved from eProc-02 to eProc-03.

Within the last four years, a lot has been achieved in the Member States. However, further work is required to consolidate and improve the digital single market.

State of Play since 2016	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK	
Phase																													
eNotice																													
eAccess																													
eSubmission																													
eEvaluation																													
eAward																													
eOrdering																													
eInvoice																													
ePayment																													
Functionalities																													
eESPD																													
eContract Registers																													
eAuctions																													
eDPS																													
eCatalogues																													
Legend	(Above EU thresholds)																												
	■ This capability existed in 2016									■ This capability was gained since 2016									■ This capability is currently being implemented										
	How to read this table														At least one service offers this capability It does not indicate the quality It may not cover the whole country														

The current ISA² and CEF programme have greatly contributed to the above mentioned achievements. The work needs to continue to support cross-border digital transformation and the move towards a data driven approach. The Digital European Programme (DEP) would be the natural choice to continue the successful activities.

The maintenance of the Public Procurement Ontology and the ESPD data models will be ensured by the Publications Office of the European Union in the framework of its normal activities as soon as they are complete and mature.

REMARK:

Open e-PRIOR activities within this action have been reviewed at the light of:

- the issues experimented during the execution of 2016 budget for eSubmission,
- the decision to avoid risks of competition with market solutions (Front Office part),
- the internal decision by the European Commission to define a new Corporate Target Architecture combining the support of Grants and eProcurement and based on eGrants “proprietary” building blocks.

This leads to the reduction of the scope and objectives of sub-action eProc01.

5.1.3 OBJECTIVES

This action has the following objectives:

1. contributing to the definition of standards for interoperability and supporting interoperability initiatives. Thus ensuring barriers are reduced in public procurement procedures, especially concerning SMEs and solutions implemented by big buyers;
2. facilitating the implementation of eProcurement for European Public Administrations by providing open source software solutions;
3. supporting the implementation eProcurement and especially tools necessary for the implementation of the once-only principle (OOP), that reduce the administrative burden and simplify procedures for buyers and suppliers. Hence encouraging cross border public procurement;
4. supporting Member States to better digitize eProcurement and enhance digital transformation combining contract register, business intelligence, data analytics and emerging technologies;
5. improving the overall data quality and reusability in view of the European interoperability strategy via the ontology;
6. enhancing transparency in public procurement by making available public procurement linked open data;
7. facilitating better monitoring of public procurement data at the regional, national and EU level, in order to foster effective government spending, active common policy-making and Single Market competitiveness.
8. revision of the Common Procurement Vocabulary (CPV) in order to simplify its structure and to make the CPV easier to use.

5.1.4 SCOPE

Following the defined objectives, the scope of this project is divided in activities grouped in 3 sub-actions:

Sub-action	Activity	Related Objectives
eProc-01 (DIGIT B1)	Provide an open source software solution to help Member States comply with the eInvoice and public procurement directives.	Objective 2
	Align solution produced by ISA action 1.7 to evolution of	Objective 1

Sub-action	Activity	Related Objectives
	standards.	Objective 2
	Contribution to standards evolution	Objective 1
	Share experience and lessons learnt with Member States in the context of eInvoice.	Objective 1
	Support and maintenance of the open source software provided to the Member States.	Objective 2
eProc-02 (GROW G4, DIGIT D2)	Facilitate OOP in Europe in the area of public procurement by reinforcing the use and update of eCertis and the implementation of the ESPD data model	Objective 1 Objective 3
	Support and assess Member States in the implementation of eProcurement, contract register, business intelligence, data analytics and emerging technologies	Objective 3 Objective 4
eProc-03 (Publications Office C)	Development of a public procurement ontology	Objective 1 Objective 5
	Harmonisation of code lists in eProcurement systems	Objective 1 Objective 5
	Modernisation of the CPV	Objective 1 Objective 6
	Management of the ESPD data model	Objective 1 Objective 3
eProc-04 (Publication Office, GROW G4, DIGIT D2, DIGIT D1)	Develop a framework to analyse public procurement data and identify the data to gather to support the strategic objectives and policies.	Objective 4 Objective 6
	Developing, maintaining and promoting an infrastructure to gather, process, analyse and publish public procurement data.	Objective 5 Objective 6 Objective 7

Sub-action	Activity	Related Objectives
	Re-usable open source tools for e-procurement data analytics that can be implemented in the national (or regional) eProcurement infrastructure to carry out specific analysis	Objective 6 Objective 7

5.1.4.1 OUT OF SCOPE:

- Infrastructure elements/services (e.g.: communication services are provided by eTrustEx and/or e-Delivery, eSignature services are provided by external services)
- Financial support for public and private entities (aggregators, service providers). CEF will be used to support aggregators, service providers and national registers to make their solutions interoperable

5.1.5 ACTION PRIORITY

This section is used to assess the priority of the proposal to become a programme's action according to Art. 7 of the ISA² decision¹¹⁴.

5.1.5.1 Contribution to the interoperability landscape

The contribution of the action to the interoperability landscape, measured by the importance and necessity of the action to complete the interoperability landscape across the Union

Question	Answer
<p><i>How does the proposal contribute to improving interoperability among public administrations and with their citizens and businesses across borders or policy sectors in Europe?</i></p> <p><i>In particular, how does it contribute to the implementation of:</i></p>	<p>eProc-01</p> <ul style="list-style-type: none"> • The proposal includes activities that will allow the European Commission to achieve compliance with the Directive. By doing so, possible barriers to interoperability may be detected and solved without hindering the compliance

¹¹⁴ DECISION (EU) 2015/2240 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

Question	Answer
<ul style="list-style-type: none"> • <i>the new European Interoperability Framework (EIF),</i> • <i>the Interoperability Action Plan and/or</i> • <i>the Connecting European Facility (CEF) Telecom guidelines,</i> • <i>any other EU policy/initiative having interoperability requirements?</i> 	<p>deadline set out by the eInvoice directive.</p> <p>eProc-02</p> <ul style="list-style-type: none"> • The Public Procurement Directive 2014/24/EU supports interoperability of eProcurement across the EU (article 22 (6)). • The eGovernment Action Plan 2016-2020 asks the Commission to support Member States towards full eProcurement and the use of contract register (Action 1) • ISA² ensures coordination between eCertis, ESPD and the EU large scale pilot “TOOP” (The Once-Only Principle) • Results of this action are used for the CEF eProc DSI to make procurement solutions interoperable across Europe <p>eProc-03</p> <ul style="list-style-type: none"> • The ontology will make available semantic definitions of the different concepts used in public procurement. It will also specify the relationships between the different concepts. The use of the OWL ontology will enable different systems throughout Europe to reuse and access data without needing complicated conversions. The CPV codes are essential to categorise the subject of procurement procedures and to

Question	Answer
	<p>support SMEs to find opportunities within Europe. They are also important for effective European policy making by allowing more granular analysis e.g. by sectors such as health.</p> <p>eProc-04</p> <ul style="list-style-type: none"> • The action will build a set of analytical and visualisation services and tools on top of the e-procurement ontology. In line with EIF recommendation 28, it will be the result of agreements between EXEP representatives. This will constitute an organisational asset that the various MS can use and extend. • It implements EIF recommendation 30 supporting the development of the common public procurement semantic across member states making an extensive and popular use of the e-procurement ontology providing information as linked open data. <p>The proposal will contribute to the implementation of the CEF Telecom Guidelines by:</p> <ul style="list-style-type: none"> • supporting the functioning of the internal market by fostering the competitiveness of the European businesses, including small and medium-sized enterprises (SMEs). Suppliers will be empowered with access to more data and better quality

Question	Answer
	<p>data that could allow submitting competitive bids; while the Civil Society could use the data to assess whether a level playing field has been ensured.</p>
<p><i>Does the proposal fulfil an interoperability need for which no other alternative action/solution is available?</i></p>	<p>eProc-01</p> <ul style="list-style-type: none"> • eProcurement standards are maturing. The proposal participates in defining the standards and implements them. A two-way interaction is foreseen: <ul style="list-style-type: none"> ○ participation to standardisation initiatives to provide input, ○ alignment to standards when it comes to cross-border interoperability of the software solutions produced by the Commission. <p>eProc-02</p> <ul style="list-style-type: none"> • eCertis: There is no alternative solution to eCertis. The Commission manages eCertis and the EU countries are obliged under Article 61 of the directive to make sure the information is accurate and up to date. • ESPD data model: The use of the ESPD is mandatory and there is no alternative. The ESPD data model is a fundamental tool to ensure the interoperability of the national ESPDs; While DG GROW is still the business owner of the data model, the maintenance is ensured

Question	Answer
	<p>by the Publications Office.</p> <ul style="list-style-type: none"> • ESPD service: The ESPD service was developed by DG GROW, under this action, and was phased out in May2019 by DG GROW. It was a tool to help Member States to use the electronic ESPD in the initial phase of implementation. Member States have developed or are developing their own versions of the services (CEF supports MS in this regard). • OOP in public procurement specifications: The EU large scale pilot TOOP which started beginning 2017, is working on specifications that can be used also for public procurement. To avoid duplication of work, eProc-02 will not work on its own set of specifications but will leave this to TOOP. eProc-02 will support TOOP to make sure that TOOP's specifications build up on the tools and services which are used in public procurement (eCertis, ESPD, pre-qualification services). There is no alternative at Member State level ensuring EU wide interoperability of OOP. The results of TOOP could require further adjustments to eCertis and the ESPD data model, which will be implemented through this

Question	Answer
	<p>action.</p> <p>eProc-03</p> <ul style="list-style-type: none"> • Currently there is no common ontology covering pre-award and post-award. The ontology will provide links between the concepts to allow the efficient reuse and access to data across the procurement domain. • There is no alternative. The CPV codes are provided by the Commission (Commission Regulation (EC) No 213/2008, OJ L 74, 15.3.2008, p. 1). They have to be used in procedures in Europe above the threshold. <p>eProc-04</p> <ul style="list-style-type: none"> • Yes, European Public Procurement Analytics using a common format aligned with the eProcurement Ontology does not exist.

5.1.5.2 Cross-sector

The scope of the action, measured by its horizontal impact, once completed, across the policy sectors concerned.

Question	Answer
<p><i>Will the proposal, once completed be useful, from the interoperability point of view and utilised in two (2) or more EU policy sectors? Detail your answer for each of the concerned sectors.</i></p>	<p>The results of this proposal will be used in more than one EU policy areas because of the spill over effects.</p> <p>Examples policies:</p> <ul style="list-style-type: none"> • Public Procurement Directives 2014/24/EU, 2014/23/EU, 2014/25/EU • Digital Single Market Strategy COM(2015) 192 • eIDAS Regulation (EU) No 910/2014 • eCertis is currently made multi-domain to potentially be extended to other areas (e.g. business mobility). With the multi-domain release, eCertis will be extended to Defence Procurement (Commission recommendation 2018/624¹¹⁵). • In TOOP the eESPD/eCertis will be piloted in the Business Mobility scenario. There are showcases how an ESPD service is retrieving data from different national databases using TOOP. Changes to eCertis and the ESPD data model will be implemented via ISA².

¹¹⁵ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.102.01.0087.01.ENG&toc=OJ:L:2018:102:TOC

Question	Answer
	<ul style="list-style-type: none"> • This action will explore linking eCertis/ESPD with other Commission initiatives like ECRIS, BRIS, the insolvency registers interconnection and the SDG. • The action will also explore the re-use of eProcurement analytics framework and tools in other sectors where information from systems (e.g. BRIS) can be gathered and made available.
<p><i>For proposals, completely or largely already in operational phase, indicate whether and how they have been utilised in two (2) or more EU policy sectors.</i></p>	<p>eProc-01:</p> <ul style="list-style-type: none"> • e-PRIOR is used by several EU bodies and some components are used by the Belgian administration. As eProcurement is a domain supporting all sectors of activities, e-PRIOR is de facto used in a cross-sector context. <p>eProc-02</p> <ul style="list-style-type: none"> • the ESPD and eCertis are not so far been used for other policies. Nonetheless, eCertis will be extended to cover Defence Procurement (this is mentioned in the Commission recommendation on Defence procurement). For the time being the extension of eCertis to business mobility is being considered as the model is neutral to any specific area and may be extended to cover other sectors. <p>eProc-03: Not applicable</p> <p>eProc-04: Not applicable</p>

5.1.5.3 Cross-border

The geographical reach of the action, measured by the number of Member States and of European public administrations involved.

Question	Answer
<p><i>Will the proposal, once completed, be useful from the interoperability point of view and used by public administrations of three (3) or more EU Members States? Detail your answer for each of the concerned Member State.</i></p>	<p>The results of this proposal will have an effect on all Member States and in the EEA.</p>
<p><i>For proposals completely or largely already in operational phase, indicate whether and how they have been utilised by public administrations of three (3) or more EU Members States.</i></p>	<p>eProc-01: e-PRIOR is used by several EU bodies and some components are used by the Belgian administration. In particular in the EU Bodies context, Economic Operators using the ePrior system are from various EU countries.</p> <p>eProc-02:</p> <ul style="list-style-type: none"> • For eCertis: The eCertis system was interconnected by summer 2019 at least in 18 countries (AT, BE, BG, CZ, DE, DK, EE, EL, FI, FR, IT, MT, NO, PT, RO, SE, SK, UK). • For ESPD services: By summer 2019 there were more than 40 ESPD services available in at least 28 countries (AT, BE, BG, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IS, IT, LT, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK, UK) <p>eProc-03: Not applicable eProc-04: Not applicable</p>

5.1.5.4 Urgency

The urgency of the action, measured by its potential impact, taking into account the lack of other funding sources

Question	Answer
<p><i>Is your action urgent? Is its implementation foreseen in an EU policy as priority, or in EU legislation?</i></p>	<p>The implementation of eProcurement is foreseen by the Directives. The deadline for the transition to eProc was October 2018. To successfully implement this policy, it is essential to develop the actions indicated in ISA² (eProcurement, eCertis, ESPD data model, contribution to OOP/TOOP) by this timeframe.</p> <p>As of 17 April 2019, eInvoicing is mandatory for contracting authorities in all Member States. With the exception of those Member States that made an option for a derogation at sub-central level until April 2020.</p> <p>Although standards (TC 434) and building blocks (e.g. Open PEPPOL) to enable eInvoice at cross-border level are mature, significant investments are still required from Member States to integrate these solutions with their national infrastructure.</p> <p>This action is urgent to streamline the e-procurement data strategy at Member State level and to avoid duplication of efforts. The public procurement domain could take leadership in applying the PSI directive recast. The urgency is not so much in the legislative constraints but in the</p>

Question	Answer
	benefits that the analytical tools would have on the economic, social and environmental context.
<i>How does the ISA² scope and financial capacity better fit for the implementation of the proposal as opposed to other identified and currently available sources?</i>	Because of the high volume needed during the development, alternative financial options are not available or sufficient.

5.1.5.5 Reusability of action's outputs

The re-usability of the action, measured by the extent to which its results can be re-used.

5.1.5.5.1 Related sub-action eProc-01

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Software - Open e-PRIOR downloadable package
Description	<p>The downloadable package allows installing and configuring the e-PRIOR exchange platform implementing web services to exchange procurement documents. This allows setting-up, after tailoring and adaptations to the specific target environment (e.g.: interfaces with back-office systems of the contracting authorities), a node playing the role of intermediary between the back-office applications of the public administration and system connected to the PEPPOL network or between the back-office applications of the public administration and Economic Operators/Service Providers systems.</p> <p>The e-PRIOR package includes a component (a.k.a. Adapter) to connect e-PRIOR to the PEPPOL network, allowing the reception of eInvoicing business documents using the UBL 2.1 syntax. It also</p>

	includes a sample back-office web-based application to consult electronic invoices received through the PEPPOL network. The software package can be used by contracting authorities as a transitional solution to comply with the eInvoice Directive, or, simply, to test the reception of PEPPOL invoices.
Reference	https://joinup.ec.europa.eu/software/openeprior/home
Target release date / Status	New versions of e-PRIOR progressively available thanks to ISA ² funding starting from end of STAGE 1. Updates available as results of sub-action eProc-01 STAGE 2.
Critical part of target user base	Public or private entities providing services in MS around eProcurement
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	e-PRIOR is used by several EU bodies and some components are used by the Belgian administration. The ePrior solution provides an Open Source alternative solution that can help Public Administrations of any Member State in switching to eProcurement / evaluating the benefits of eProcurement

5.1.5.5.2 Related sub-action eProc-02

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	eCertis
Description	eCertis is provided by the European Commission as a service to Member States, buyers and suppliers. The service provides a web service, which can be accessed from solutions to offer added value for end users.
Reference	http://ec.europa.eu/isa/actions/02-interoperability-architecture/2-17action_en.htm
Target release date / Status	Q2/2016 – eCertis is operational Q4/2017 – Release of eCertis with a new UI Q2/2019 – Release of eCertis with a new UI for editors Q2/2020 – Multi-domain release of eCertis
Critical part of target user base	Public or private entities providing services in MS making use of the web service. The access to the service is increasing (June 2019 around 7000 visits).
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	As it is online since Q2/2016 MS have started their development to link their systems to eCertis. Services have already implemented the interconnection to eCertis. This ensures reuse of eCertis data.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	ESPD service
Description	The European Commission provided an ESPD service. The source code is available under the European Union Public License v 1.1. Additional artefacts like the exchange data model or the results

	developed under Action 1.1 have been made available
Reference	Service run by Commission: Source code: https://github.com/ESPD/ESPD-Service
Target release date / Status	Q2/2016 – The ESPD service was operational and updated on a regular basis. It was phased out by DG GROW in May 2019.
Critical part of target user base	Public or private entities providing services in MS around eProcurement. Until April 2019, it had since the beginning 4 million visits, on some days more than 10 thousand visits.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	The open source version of the ESPD service is used by some MS like LT, NL, BE, BG, DE, PL and PT.

5.1.5.5.3 Related to sub-action eProc-03

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Public procurement conceptual data model of the ontology
Description	The conceptual data model will illustrate all data relations from pre-award to post-award. This model would provide a backbone of information when conceptualising platforms, systems and data exchange.
Reference	Not available so far
Target release date / Status	A draft version of the conceptual model was created in 2017. In Q1/2018 V.2 was made available covering a draft version for eNotification and eAccess In Q1/2020 V.2.0.1 should be made available covering eNotification In Q1/2021 V.3 should be made available covering pre-award In Q3/2021 V.4 should be made available covering post-award
Critical part of target user base	Public or private entities providing services in MS around eProcurement. Public buyers and economic operators
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not applicable

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Formalised public procurement ontology and vocabularies and codes in OWL
Description	The public procurement ontology and code lists will be the basis of creating linked data for the public

	procurement domain. It is envisaged to use this ontology for diffusing the data available on TED and could also be implemented across Europe by tendering platforms and governments.
Reference	Not available so far
Target release date / Status	<p>A draft version V.1 of the ontology OWL file was produced in 2017.</p> <p>In Q4/2018 V.2 of the OWL file is available on GitHub covering a draft version for eNotification and eAccess</p> <p>In Q3/2020 V.2.0.1 of the OWL file should be made available covering eNotification</p> <p>In Q2/2021 V.3 of the OWL file should be made available covering pre-award</p> <p>In Q4/2021 V.4 of the OWL should be made available covering post-award</p>
Critical part of target user base	Public or private entities providing services in MS around eProcurement. Public buyers and economic operators
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not applicable

Name of reusable solution	Updated and modernised Common Procurement Vocabulary (CPV)
Description	The CPV establishes a single classification system for public procurement aimed at standardising the references used by contracting authorities and entities to describe the subject of the procurement contracts. A study on how and what role CPV plays in an environment with new emerging technologies is currently done.
Reference	Not available so far
Target release date / Status	Q1/2021

Critical part of target user base	Public buyers
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Public buyers in Europe already use the current CPV codes.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	Provision of harmonised code lists used in eProcurement including the CPV codes within the EU Vocabularies website (previously called the Metadata Registry (MDR)).
Description	Many code lists used in eProcurement are used by different platforms and do not necessarily use the same versions nor sources. It is foreseen to integrate the CPV and other eProcurement code lists on the EU Vocabularies website which will provide reusable access to the CPV and other codes for tendering platforms and any system that wants to integrate the codes.
Reference	Not available so far
Target release date / Status	The code lists will gradually be made available on the EU Vocabularies website as from Q3/2019.
Critical part of target user base	Public or private entities providing services in MS around eProcurement. Public buyers and economic operators
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not applicable.

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	ESPD exchange data model
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Description	The ESPD exchange data model is essential to ensure interoperability of the ESPD services developed at national level and their technical compliance with the ESPD form set out by the Regulation. While DG GROW is the business owner of the model, the Publications Office is leading the maintenance of it.
Reference	https://github.com/ESPD/ESPD-EDM
Target release date / Status	Q2/2016 operational The latest release was available as of January 2019.
Critical part of target user base	Public or private entities providing services in MS around eProcurement.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	The reuse level of the data model is very high. It is used in almost all EU countries.

5.1.5.5.4 Related to sub-action eProc-04

Name of reusable solution to be produced (for new proposals) or produced (for existing actions)	EU Public procurement Analytics service and tools
Description	A set of reporting functionalities providing timely alerts and insights on the public procurement domain using the state-of-the-art open source libraries.
Reference	Not available so far
Target release date / Status	Not started
Critical part of target user base	Public buyers and economic operators as well as service providers in MS around eProcurement.
For solutions already in operational phase - actual reuse level (as compared to the defined critical part)	Not applicable

5.1.5.6 Level of reuse of existing solutions

The re-use by the action (following this proposal) of existing common frameworks and interoperability solutions.

Question	Answer
<p><i>Does the proposal intend to make use of any ISA², ISA or other relevant interoperability solution(s)? Which ones?</i></p>	<ul style="list-style-type: none"> • eTrustex 2016.19 • European Interoperability Architecture (EIA) 2016.32 • SEMIC 2016.07 • Joinup 2016.20 • Test bed 2016.25 • CEF eDelivery • CEF eSignature • Interoperability Maturity Model (IMM) 2016.37 • EU Vocabularies • VocBench • E-procurement ontology to be used by the new eForms and the e-Procurement analytics services • The CEF Building Block for Big Data Test Infrastructure will be re-used for the testing phase.
<p><i>For proposals completely or largely already in operational phase: has the action reused existing interoperability solutions? If yes, which ones and how?</i></p>	<ul style="list-style-type: none"> • eTrustex 2016.19: Used in e-PRIOR • Joinup 2016.20: Used for the sub-actions • SEMIC 2016.07: A core criterion/evidence vocabulary was created (based on the ESPD data model) • Test bed 2016.25: A test bed for the ESPD service is provided. The same test bed is used for

Question	Answer
	eSubmission as well as eInvoicing

5.1.5.7 Interlinked

The extent to which the action (following this proposal) contributes to Union’s initiatives such as the DSM.

Question	Answer
<p><i>Does the proposal directly contribute to at least one of the Union’s high political priorities such as the DSM? If yes, which ones? What is the level of contribution?</i></p>	<ul style="list-style-type: none"> As mentioned above, the Digital Single Market Strategy (DSM) recognises that Information and Communications Technology (ICT) is the foundation of modern economic systems and that public procurement plays an important role in promoting standards and interoperability. The activities supported by this proposal will help to further create or improve standards. The ISA² programme together with the CEF are a perfect instrument to pave the way to interoperability. The DSM also supports the building of a data economy. The availability of public procurement information initially through the standard forms and then eForms enables their exploitation as open data. Commercial operators could

Question	Answer
	<p>leverage public procurement open data to offer value added services.</p> <ul style="list-style-type: none"> • The proposal contributes to the creation of a common European data space ¹¹⁶ - a seamless digital area with the scale that will enable the development of new products and services based on data. • As mentioned above, the eGovernment Action Plan 2016-2020 asks the Commission to support Member States towards full eProcurement and the use of contract register (Action 1). Here we use this action to directly engage with Member States through workshops to give advice and learn from them. So far three workshop rounds have been done in each country which proved to be very successful.

¹¹⁶ <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2018:0232:FIN>

5.1.6 PROBLEM STATEMENT

The problem of	the evolution of many different systems within the public procurement
Affects	the possibility of reusing data across the different public procurement platforms within Europe
the impact of which is	economic operators especially SMEs are not fully exploiting the benefits of the Single Market in the field of public procurement. Member States use different eProcurement systems, different certificates, set different requirements, use wrong CPVs, etc. The administrative burden could be worsened if solutions put in place are not interoperable Inefficiencies in the monitoring of public procurement.
a successful solution would be	one that allows to correctly identifies business opportunities (using correct CPVs), allows the effective reuse of data throughout the procurement chain to improve cross-border participation (such as the ESPD), from SMEs and all suitable economic operators and clarifies the equivalence of certificates in use across the EU (eCertis). Such solutions combined with the use of the eProcurement ontology would ensure that data is of quality and unambiguous transparency to the citizen. The physical transparency to citizens being provided by contract registers.

5.1.7 IMPACT OF THE ACTION

5.1.7.1 Main impact list

5.1.7.1.1 Sub-action eProc-01

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	MSs will be able to adopt a production-ready solution (Open e-PRIOR) already connected to PEPPOL for the reception of electronic invoices. This will allow savings when it comes to integrating the national infrastructure with Open PEPPOL	Q3/2018	National public administrations and economic operators
(+) Savings in time	By adopting Open e-PRIOR, MSs will save time in implementing the connection of national infrastructure to Open PEPPOL.	Q3/2018	National public administrations and economic operators
(+) Better interoperability and quality of digital public service	Open e-PRIOR is fully aligned with the latest version of the standards for the exchange of electronic invoices. This will guarantee interoperability at the national level, as well as across borders.	Q3/2018	National public administrations and economic operators
(-) Integration or usage cost	The integration of national systems to the Open PEPPOL network will entail several investments	Already happening	National public administrations

Impact	Why will this impact occur?	By when?	Beneficiaries
	for Member States. By adopting Open e-PRIOR, Member States will be able to rely on a production-ready solution, already connected to Open PEPPOL for the reception and consultation of eInvoices.		

5.1.7.1.2 Sub-action eProc-02

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	The transition to eProcurement and the implementation of the ESPD can reduce process cost and increase competition. According to a study from the Commission about eGovernment and the Reduction of Administrative Burden 5 billion Euro could be saved through OOP in Europe ¹¹⁷ .	Gradually based on the maturity of the country. After the mandatory milestones of the Directives introducing eProcurement, Member States are moving faster in terms of OOP by connecting their eProc services with national databases through their	Hundred thousands of authorities and millions of businesses

¹¹⁷ http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=5155

Impact	Why will this impact occur?	By when?	Beneficiaries
		ESPD services.	
(+) Savings in time	According to a study from Finland a well implemented ESPD service could save suppliers for each proposal 2 to 3 hours' time.	Depending on the type of the implementation in Member States.	Public administration, SMEs.
(+) Better interoperability and quality of digital public service	Interoperability will be significantly increased by the use of the ESPD and the transition to eProcurement as long as the actions planned in ISA ² are fully implemented. Interoperability is key to the internal market.	For ESPD services this is already the case in 28 countries.	Hundreds of thousands of authorities and millions of businesses. 12 Member States started not only to implement an ESPD service but also connecting it to their databases which improves the service for public buyers and suppliers.
(-) Integration or usage cost	The costs of integration are supported by European funds namely the CEF eProc DSI up to 75%. The usage cost depends on the business model of the providers.	Already happening.	Public/private entities who are implementing the service.
(+) Moving towards	Currently digital	Already	Hundred

Impact	Why will this impact occur?	By when?	Beneficiaries
digital processes supporting the digital transformation	procurement is becoming the default. Many countries consider improving the processes by using new technologies.	happening.	thousands of authorities and millions of businesses. Hundred thousands of authorities and millions of businesses.

5.1.7.1.3 Sub-action eProc-03

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	Easier reusability of data and reduction of manual interventions in workflows and exchange of data; CPV – more relevant offers for authorities and less search cost for business opportunities for companies	2020	All stakeholders
(+) Savings in time	Easier reusability of data and reduction of manual interventions in workflows and exchange of data; CPV – easier to find in the classification relevant codes and better match between buyers and sellers.	2020	All stakeholders

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Better interoperability and quality of digital public service	Easier reusability of data via automatic workflows and data exchange. Improvement of data quality. The ontology will create a common semantic base for different platforms to work from.	2020	All Stakeholders
(-) Integration or usage cost	The uptake and use of the ontology in all areas of eProcurement as linked open data may not be immediate in all areas of eProcurement (e.g. data protection rules in certain areas, high number of systems required to implement the ontology).	2020	All Stakeholders

5.1.7.1.4 Sub-action eProc-04

Impact	Why will this impact occur?	By when?	Beneficiaries
(+) Savings in money	The provision of an infrastructure and data analytics tools for monitoring will reduce the costs for Member States to set up similar tools at the national level, while ensuring a consistent	In a first phase, when the data from the current standard forms will be used; in a second phase the new eForms will be used and	Government departments and entities in charge of public procurement and contracting

Impact	Why will this impact occur?	By when?	Beneficiaries
	<p>approach. Moreover, MS will also be provided with open source tools if they wish to implement them in the national eProcurement infrastructure.</p>	<p>will carry additional information; and in a third phase when identified information gaps will be addressed.</p>	<p>authorities. Businesses participating in public procurement.</p>
<p>(+) Savings in time</p>	<p>Availability of data centrally gathered and analysed saves time to governments in carrying out similar activities; and provides businesses and the Civil Society with a single and user-friendly reference point for monitoring purposes.</p>	<p>By the time the first version of the monitoring tools will be available.</p>	<p>Governments , buyers, businesses participating in public procurement and citizens interested in monitoring government spending.</p>
<p>(+) Better interoperability and quality of digital public service</p>	<p>The data for the analysis will be gathered from the standard forms and then the eForms which are aligned to the eProcurement Ontology, thus ensuring interoperability also for the reporting phase and better quality of data and monitoring services provided.</p>	<p>Interoperability and data quality will improve with the adoption of the new eForms.</p>	<p>Public authorities responsible to gather, process and monitor procurement data; implementers in the public and private sector. Businesses and citizens monitoring</p>

Impact	Why will this impact occur?	By when?	Beneficiaries
(-) Integration or usage cost	Open source analytic tools will be provided to entities interested in integrating them in the national infrastructure. CEF eProc DSI could potentially be used to support implementers. There will be no usage costs for the monitoring services provided.	No usage cost for the services provided. Integration costs will arise if entities decide to implement the open source tools and artefacts, once these will be available.	Public and private entities using the services provided or implementing the open source tools.
(+) Better spending and data-driven decision making	The availability of better quality of data and the provision of dashboard to visualise procurement dynamics (e.g. contract performance, spending forecasts, anomalies, etc.) will empower governments and contracting authorities to make more informed decisions on public spending, supporting the required policies and objectives.	The initial benefits will be evident since the first implementation phase when the data provided by the current standard forms will be used for data analytics.	The whole European economy will benefit from more effective public spending, since public procurement represents 14% of the EU GDP ¹¹⁸ .

¹¹⁸

https://ec.europa.eu/info/sites/info/files/file_import/european-semester_thematic-factsheet_public-procurement_en_0.pdf

5.1.7.2 User-centricity

5.1.7.2.1 Sub-action eProc-01

Since 2009 the work on Open e-PRIOR has been carried on in collaboration with some Member States, which expressed their interest in adopting the solution. DIGIT established bilateral exchanges and provided technical support when it came to setting up and operating the Open e-PRIOR solution. In addition, DIGIT is leading by example in the implementation of end-to-end eProcurement, and has provided invaluable input for the definition and evolution of standards that will eventually be adopted at cross-border level. Interactions with some Member States (e.g.: Luxembourg) led to the identification of the need of an Open Source basic back office allowing to view invoices received via PEPPOL.

5.1.7.2.2 Sub-action eProc-02

The work on eCertis, the ESPD, OOP, contract registers and eTendering is done on many different levels with Member States. At EU level, the multi-stakeholder expert group on eProcurement (EXEP) and the eCertis National Editors group (ECNE) ensures the exchange of practices and policies. There are subgroups to discuss individual topics like eCertis, eESPD or contract register. In addition, through this ISA² action workshops are done on an individual basis, at a national level, to discuss specific topics. This has proved to be a very efficient approach not only to provide information to Member States but also to learn from them.

5.1.7.2.3 Sub-action eProc-03

The work of the ontology is carried out within a working group with representatives of all stakeholders. Consensus is built on the work prepared by editors working for the group and a public review will be held before publication of the different versions of the ontology.

The work on CPV is done in different stages. First an expert group in classifications discussed how the CPVs could be improved. Since the current CPV was created more than 10 years ago, it was decided that before continuing the work, to undertake a study to understand the relevance of CPV in an environment where new technologies like artificial intelligence, machine learning or automated translations could potentially replace or complement the CPV. Depending on the results it will be decided how to continue this project.

5.1.7.2.4 Sub-action eProc-04

The governance will involve the multi-stakeholder expert group on eProcurement (EXEP) for defining the requirements for the EU Public Procurement Analytics services, recognising the relevant role of the organisation promoting this sub-action (AgID, Italy). A dedicated EXEP subgroup is envisaged to allow focusing on the topic, while testing facilities will be provided along the development of the tools to collect early feedback.

5.1.8 EXPECTED MAJOR OUTPUTS

Sub-action eProc-01

Output name	Compliance with the -invoice directive – lessons learnt
Description	Formalisation of findings resulting from the actions that will be undertaken by the European Commission to comply with the eInvoice directive.

Reference	
Target release date / Status	Stage 2 Q3/2018

Output name	Compliance with the –public procurement directive – lessons learnt
Description	Formalisation of the experience acquired by DIGIT over the last years on eSubmission concerning the technical issues faced related to ensuring confidentiality of tenders
Reference	
Target release date / Status	Stage 2 Q3/2018

Sub-action eProc-02

Output name	eCertis and ESPD
Description	Development and operation of eCertis, working with the Publications Office on the ESPD data model.
Reference	
Target release date / Status	Q4/2020

Output name	Transition to eProcurement
Description	Support to MS in the transition, including eSubmission, implementation of the ESPD, development of contract registries, use of business intelligence or data analytics tools and use of emerging technologies.
Reference	
Target release date / Status	Q4/2020

Output name	Development of OOP
Description	Support to MS in achieving OOP, adjustment to eCertis and the eESPD to ensure readiness for OOP and ensure articulation with TOOP project.

Reference	
Target release date / Status	Q4/2020

Sub-action eProc-03

Output name	Development of governance and maintenance plan
Description	Document defining the governance and maintenance plan for both the ontology and code lists
Reference	
Target release date / Status	Q3/2020

Output name	Development of implementation specifications
Description	Document defining how the OWL ontology and code lists are to be implemented
Reference	
Target release date / Status	Q3/2020

Output name	Development of the CPV methodology
Description	Under the coordination of the CPV Task Force, a contractor (from an ESTAT framework contract) will develop the underlying methodology for a new CPV. This action is suspended for the results of the study on the impact of new technologies.
Reference	https://ec.europa.eu/docsroom/documents/27821
Target release date / Status	Q1/2017-Q4/2021

Output name	Development of actual codes of the new CPV based on an underlying methodology
Description	Under the coordination of the CPV Task Force, a contractor (from an ESTAT framework contract) will write a simplified structure of a new CPV based on codes. This action is suspended for the results of the study on the impact of new technologies.
Reference	
Target release date / Status	Q3/2018 – Q4/2021

Output name	Undertaking a study on the impact of new technologies on CPV codes
Description	The study should support the Commission to understand the necessity to maintain CPV codes in the light of new emerging technologies.
Reference	
Target release date / Status	Q4/2020

Sub-action eProc-04

Output name	eProcurement Analytics Test Infrastructure
Description	Development of an infrastructure to gather, store and process procurement information from TED; coupled with data analytics tools. The use of the CEF Building Block for Big Data Test Infrastructure is envisioned for the testing phase.
Reference	Not available
Target release date / Status	Q2/2021

Output name	eProcurement Analytics Open Source Tools
Description	The infrastructure and analytic tools should be provided as open source.
Reference	Not available
Target release date / Status	Q2/2021

5.1.9 ORGANISATIONAL APPROACH

All three sub-actions will be carried out in parallel by three distinct Services (DIGIT B4, GROW G4, Publications Office OP.C3) with mutual consultation.

5.1.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives	Involvement in the action
ISA ²	ISA ² Committee/ Coordination Group/ ISA ² expert group	ISA ²
Member States	EXEP (Multi-stakeholder Expert Group on eProcurement), ESWG (Economic and Statistical Working Group), European Multi-Stakeholder Forum on eInvoicing (EMSFEI), eCertis editorial team, ISA ² expert group (or ISA ² equivalent) Publications Office and EUROSTAT, selected national representatives from Italy (AgID)	Member States
Aggregators	Established aggregators in several Member States	Aggregators
Standardisation initiatives	CEN TC 440, CEN TC 434, ISA ² Team	Standardisation initiatives
European projects	TOOP, CEF, DIGIWHIST Opentender	European projects
EC	Other DGs in the European Commission	EC DGs
Economic operators	European Business Associations	Economic operators
Academia	Universidad Politécnica de Madrid	eProcurement ontology

5.1.9.2 Identified user groups

List the main group of end-users of your solutions.

- Central Purchasing Bodies (CPBs)
- SMEs
- ERP Software Vendors

- Service Providers and other procurement data users like EUPLAT (European Association of public eTendering providers) or organisations identified in the TED LOD project, eSenders
- European Public Administrations
- Economic operators and service providers

5.1.9.3 Communication and dissemination plan

Provide information about how you plan to communicate with the identified stakeholders and your users (see section above) and dissemination beyond during the lifetime of the proposed action. In particular, explain user engagement activities. (See explanatory notes for more details)

Event	Representatives	Frequency of meetings/absolute dates of meetings
Multi-stakeholder forum on eProcurement (EXEP)	Member States representatives, Standardisation initiatives, users, etc.	2 times a year
EXEP, ESWG subgroup meetings	EXEP, ESWG representatives	As necessary
General events	For all stakeholders	Constantly
eCertis editorial team Meeting	eCertis editorial team	1 times a year
eSender meetings	eSenders	Min 1 a year
ISA ² expert group	Meeting	2 times a year
e-SENS	Meeting	3 times a year
TC 440	Member States representatives	2 times a year
TC 434	Member States representatives	2 times a year
Workshops	Service Providers, Standardisation initiatives, EC	As necessary
EC Multi-Stakeholder Forum on e-invoicing	Service Providers, Standardisation initiatives, EC	2 times a year
Conferences on eProcurement, eInvoicing or eGovernment	Depending on conference, EC	+/- Monthly
Websites of DG DIGIT, DG GROW, OP	For all stakeholders	Online
eProc Wiki	For all stakeholders	Online

Event	Representatives	Frequency of meetings/absolute dates of meetings
e-practice	For all stakeholders	Online
Joinup	For all stakeholders	Online
LinkedIn e-PRIOR Group	For all stakeholders	Online
Written consultation	EC DGs	Online
Written consultation	European Business Associations	Online
ISA ² Website	All stakeholders	Online
ISA ² Newsletter	All stakeholders	Online

5.1.9.4 Key Performance indicators

5.1.9.4.1 Sub-action eProc-01

Description of the KPI	Target to achieve	Expected time for target
Number of Public Administrations using ePRIOR (EU Institutions/Bodies + Member States)	43 Remarks: At the end of Q2/2018 42 EU Institutions/Bodies are actually using e-PRIOR either for eSubmission or to receive eInvoices (mainly for DIGIT framework contracts). Some components are used by the Belgian administration	Q2/2018
% of eInvoices senders via OpenPEPPOL vs via ePRIOR WS by end 2017	5% of invoices Remarks: The pilots that were setup to assess the integration with OpenPEPPOL ran throughout 2018 before being the solution was approved for Production. Therefore, no live traffic was achieved in 2018	Q4/2018
Re-use of Architectural /	3	Q4/2018

Description of the KPI	Target to achieve	Expected time for target
Solution building block by Member State public administrations (measure based on meetings/interactions with interested entities).	Remarks: The Open Source version of the eInvoice viewer appeared on JoinUp in Q4/2018	
Help Desk efficiency: tickets solved in < 1 week	90% Remarks: The Operations for STAGE 2 will be extended to Q4/2018. The target has been respected.	Q4/2018
Number of significant interventions to upgrade the norm=> (e.g.: number of architecture documents produced for TC 440, change requests to UBL standards)	3 Remarks: In 2018 TC440 has frozen its activities due to IPR related issues	Q3/2017

5.1.9.4.2 Sub-action eProc-02

Description of the KPI	Target to achieve	Expected time for target
eCertis: Number of countries who have implemented the eCertis interface	20 countries	Q4/2020
ESPD service: Number of countries who are providing at least one ESPD service	28 countries	Q4/2020
Contract register: Number of central contract register	20 Member States	Q4/2020
Business intelligence: Number of business intelligence services used on contract registers	10 Member States	Q4/2020

5.1.9.4.3 Sub-action eProc-03

Description of the KPI	Target to achieve	Expected time for target
Number of use cases used to update the conceptual data model (the use cases are defined as competency questions) the area to be covered is eNotification and eAccess. They are to be tested in the proof-of-concept developed during 2018	14	Q4/2018
Number of code lists reviewed	74	Q4/2018
Number of code lists put on-site.	38	Q4/2019

5.1.9.4.4 Sub-action eProc-04

Description of the KPI	Target to achieve	Expected time for target
Number of Member States testing the infrastructure with their own data	4%	Q2/2021

5.1.9.5 Governance approach

A working group with members from DG DIGIT, OP, DG GROW and DG CNECT, will discuss all ISA² and CEF eProcurement actions to make sure that the objectives are met. The main Member State governance body who will provide advice to the Commission will be the Multi-stakeholder Expert group on eProcurement (EXEP) and the Member State representatives proposing a specific sub-action (AgID). The European Public Procurement Interoperability Initiative (this action) will work closely with the relevant interoperability initiatives to assure coherence. In addition, the communication and development of this project will be done in an open and transparent way with all stakeholders and at all possible events.

5.1.10 TECHNICAL APPROACH AND CURRENT STATUS

5.1.10.1 Sub-action eProc-01

The Sub-action ePROC-01 creates an open source solution of the ePRIOR platform to help Member States implement end-to-end eProcurement, with a focus on the legal obligations set out by the eInvoice and public procurement Directives. DIGIT implements eProcurement in the European Commission ecosystem using the internally developed ePRIOR platform, when it comes to enabling cross-border interoperability. On the one hand, DIGIT shares reusable and interoperable software solutions that could be adopted by Member States to implement eProcurement at the national level. On the other hand, DIGIT has provided contribution to standardisation bodies to increase the maturity of standards around eProcurement.

Current status

Since 2009, DIGIT is providing a freely downloadable software package of the ePRIOR platform (a.k.a. Open ePRIOR). In Q2/2017, Open ePRIOR has been upgraded to support the UBL 2.1 syntax for eInvoices. The solution is integrated with the PEPPOL network for the reception of eInvoices thanks to the implementation of an adapter enabling the routing of invoices received through the PEPPOL Access Point to ePrior/eTrustEx. This solution has been extended in 2018 with a basic back-office system, based on the integration with the eTrustEx Web module and connected to Open ePRIOR/PEPPOL, to be made available to small public administrations / Member States to consult eInvoices/credit notes received through the PEPPOL network.

In 2017 issues in the EC Pilot Production environment affected activities about eSubmission. This caused putting aside planned development activities to provide Open Source solution for eSubmission and the consequent update of the action and the reduction of the budget in 2017. Nevertheless the experience acquired by DIGIT over the last years on eSubmission concerning the technical issues faced related to ensuring confidentiality of tenders is going to be formalised.

- DIGIT made further developments in order to align its eInvoicing solution to the European norm for eInvoicing, based on the Directive. The main activities that were carried out were the following: Identification of the adaptations required to make the existing eInvoicing solution at the European Commission - based on the e-PRIOR platform - compliant with the eInvoice Directive. During the activity, various barriers to

interoperability were detected and solved. The support of PEPPOL BIS 3.0 is covered as well in this endeavor.

- Pilot of reception of invoices through PEPPOL: set-up of the infrastructure, test support of [PEPPOL BIS 5A Billing](#) in view of support of PEPPOL BIS 3.0 (aligned to the Invoicing Directive). DIGIT ran two successful pilots to test its end to end infrastructure, which would be later further adapted to support PEPPOL BIS 3.0, and therefore enhance the European Commission's capabilities to receive electronic invoices from different channels.

Following the conclusion of the pilots, which ended in Q4 2018, the newly updated eInvoicing solution was deemed ready and approved for roll-out to Production.

The participation to the TC 440 committees meetings to provide contributions to standards evolution has been very limited starting from Q3/2017 because of lack of available expert resources and in 2018 TC440 has frozen its activities due to IPR related issues.

5.1.10.2 Sub-action eProc-02

Technical approach

eCertis and ESPD play an integral part of the activity on OOP. For the work on OOP this action will work together with TOOP to ensure that due consideration is given to the tools and services already used for public procurement will be included in the results of this EU large scale pilot building up on the experience developed in the public procurement domain. The results will have an impact on eCertis and ESPD, which will be updated through this ISA² action. Beside this, individual workshops are done with Member States to support, assess and learn from them.

Current status

The EC ESPD service, which is provided as open source, was online from Q2 2016 until Q2 2019. The ESPD service was widely used, with an average of 10 thousands visits per day. The ESPD exchange data model has been published and the latest release is v2.1. While DG GROW was in charge of maintaining the data model, the Publications Office took over the lead in maintaining the data model in Q2/2019. DG GROW is still the business owner. eCertis is online since April 2016 and has seen two major updates to improve the usability.

Next steps

The joint work with TOOP will be continued. As DG DIGIT has taken over the work from TOOP and works on the SDG, we started to support them on OOP and evaluate how eCertis

and the ESPD data model or CCCEV can help them in their effort to achieve cross-border OOP. We will continue the successful workshops with Member States around eProcurement.

Technical approach

Contract registers play an important part in getting a data driven approach in public procurement using business intelligence and data analytics tools it is possible to identify past and future trends. They are necessary to understand the procurement market and to make evidence-based policy. Beside the communication in the expert group EXEP, individual workshops in each country are done to assess the situation.

Current status

In many Member States contract registers are already in place.

Next steps

A new workshop round will cover emerging technologies, data governance policies and topics on digitization and digital transformation.

Sustainability

The current ISA² and CEF programme have greatly contributed to implement ESPD services, move towards the once only principle (OOP) and make eProcurement a standard in Europe. The Member States have taken ownership in the use of eCertis, which has been updated continuously and integrated with eProcurement services. The upgrading towards a multi-domain service will enable other domains to reuse the service. The Single Digital Gateway is planning to reuse eCertis as a building block to achieve OOP.

Member States are moving towards a data driven approach and OOP still needs to be implemented on a cross-border basis.

Therefore, new challenges will arise and the work towards digital transformation will be key for modernizing not only eProc services but also public services in general. The Digital European Programme (DEP) to support this route, would be the natural choice to fund these activities.

5.1.10.3 Sub-action eProc-03

The ontology has so far been developed in the area of eNotification and eAccess which provides a broad base for its further development in the area of pre-award and post-award. The work has evolved in this area to provide synergies with the eForms consultation of DG GROW and to ensure a solid foundation on which the other phases can be developed. The code lists will be gradually made available on EU vocabularies as from 2019. Some delays have occurred due to contractual issues and the evolution of the Metadata Registry to EU vocabularies.

Delays have also occurred due to the limited availability of experts in certain areas in the Working Group. The number of meetings held are more than originally foreseen to ensure that the working group is fully involved in the development of the ontology, which in turn has increased contractual costs. A proof of concept has also been developed in the area of eNotification which will be used as a basis for the implementation guidelines.

Over the next year the governance and maintenance plan of the ontology will be developed along with the implementation guidelines (in a first instance covering eNotification). During this period the glossary of terms will be further developed as will the rest of the pre-award phase with regard to the conceptual model and the OWL file.

The conceptual data model, the OWL ontology and the code lists used in eProcurement will be disseminated on the EU Vocabularies website (previously the Metadata Registry (MDR)) at the Publications Office.

Further work will provide specifications for using the ontology, maintaining the ontology taking into consideration stakeholders needs and promoting the reuse of the ontology throughout Europe.

The actions on CPV revision are for the moment suspended until the study to understand the relevance of CPV in an environment where new technologies like artificial intelligence, machine learning or automated translations could potentially replace or complement the CPV is finished. The results of the study will be used to decide which policy line to take for the CPV revision projects.

Sustainability

The ontology, code lists and the ESPD data model will be published on the EU Vocabularies website, which is maintained by the Publications Office. The hosting of these models is therefore ensured. It is expected that the evolution of the ontology, code lists and the ESPD data model will be covered by the Digital European Programme.

5.1.10.4 Sub-action eProc-04

This sub-action is split into three activities:

- An EXEP subgroup, lead by DIGIT.D2 will gather requirements from relevant stakeholders in terms of analytical needs. The analysis will cover different aspects starting from strategic objectives and policies to be supported. Existing initiatives will also be taken into account, such as the dashboard made available in the opentender

portal¹¹⁹, and the initiatives of World Bank in this field, identifying the available information and potential gaps.

- To have data to work with, OP.C3 will map notices to the eProcurement ontology and will export the data as linked data (RDF).
- The CEF BDTI team will provide an infrastructure, to allow to store the data from OP and attach a basic analytical tool to it.

These parallel threads will share results on a regular basis. The outcome of this phase will be:

1. a **prioritized list of requirements** for the public procurement analytics service, identifying the eProcurement ontology elements supporting those requirements, or the missing ones as the gap,
2. a **data store** of linked data based on the eProcurement Ontology provided,
3. an **infrastructure that has the data together with basic open source online monitoring tools**.

5.1.11 COSTS AND MILESTONES

5.1.11.1 Breakdown of anticipated costs and related milestones

5.1.11.1.1 Sub-action eProc-01

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Stage 0: Initiation	<ul style="list-style-type: none"> • Project charter • First step of activity in eSubmission Back Office in EC environment to support Restricted Procedures • Activity Report for Standards 	150	ISA ²	Q2/2016	Q3/2016

¹¹⁹ <https://opentender.eu/start>

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	Contribution				
Stage 1: Execution	<ul style="list-style-type: none"> • Upgrade eSubmission in EC Pilot environment to support Restricted Procedures [not delivered because of issues in Front Office] • Replace Applet in eSubmission Front Office in EC Pilot environment [not delivered because of issues in Front Office] • Open Source version of eInvoicing solution integrated with OpenPeppol (UBL 2.1) • Start set-up in EC Pilot Environment of eInvoicing solution integrated with OpenPeppol • Activity Report for Standards Contribution STAGE 1 	1100	ISA ²	Q3/2016	Q2/2017

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Operational	<ul style="list-style-type: none"> • Support • Maintenance and fixing • Pilot Deployment Publication in JoinUp 	250	ISA ²	Q2/2016	Q1/2017
Stage 2 Execution	<ul style="list-style-type: none"> • Open Src Basic Back Office solution for administrations to receive and view eInvoices • Complete set-up of EC Pilot Environment of eInvoicing solution integrated with OpenPeppol • Compliance with the eInvoice directive – lessons learnt • Lessons Learnt from experience acquired on e-Submission about technical issues related to ensuring confidentiality of tenders 	300	ISA ²	Q3/2017	Q3/2018
Stage 2 Operational	<ul style="list-style-type: none"> • Support • Maintenance and fixing 	150	ISA ²	Q2/2017	Q4/2018

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	<ul style="list-style-type: none"> Pilot Deployment Refresh Publication in JoinUp 				
	Total:	1950			

5.1.11.1.2 Sub-action eProc-02

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Operational	Maintenance and helpdesk for eCertis and the ESPD service	250	GROW G4	Q1/2018	Q4/2018
Operational	Further development eCertis; maintenance of the ESPD service, operation of eCertis	1100	ISA ²	Q3/2016	Q4/2020
Operational	Support and assess situation in MS to check ESPD compliance, contract registers, business intelligence, emerging technologies	1000	ISA ²	Q3/2016	Q4/2020
Inception	OOP in PP <ul style="list-style-type: none"> • Project initiation • Drafting concept 	300	ISA ²	Q4/2016	Q3/2017
Execution	OOP development and implementation <ul style="list-style-type: none"> • Input to TOOP for public procurement 	685	ISA ²	Q3/2017	Q2/2020

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	<ul style="list-style-type: none"> Implementation of results in eCertis and in ESPD service Dissemination and communication 				
	Total	3435			

IMPORTANT: Closing phase not yet planned since additional Execution Phases will be described in future update of the Proposal

5.1.11.1.3 Sub-action eProc-03

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Inception/ planning phase	<ul style="list-style-type: none"> Definition of the methodology Analysis of available information Project Charter 	50	ISA2	Q4/2016	Q3/2017
Execution	<p>Ontology:</p> <ul style="list-style-type: none"> Requirements and design. 	480	ISA2	Q4/2016	Q4/2020

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
	<ul style="list-style-type: none"> • Conceptual model • Definition / creation/ adaptation of vocabularies and code lists • Presentation in OWL • Evolution of ontology in pre-award area • Development of ontology in post-award area 				
Execution	<p>Ontology:</p> <ul style="list-style-type: none"> • Development of governance and maintenance plan • Development of implementation specifications • Maintenance via working group consensus • Promotion training 	100	ISA2	Q3/2018	Q4/2020

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Execution	CPV: Updating the CPV codes	400	ISA2	Q4/2016	Q4/2020
Execution	ESPD: Maintaining the ESPD EDM	200	ISA2	Q1/2020	Q4/2020
	Total	1230			

5.1.11.1.4 Sub-action eProc-04

Phase: Initiation Planning Execution Closing/Final evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Execution	<ul style="list-style-type: none"> • Activity 1 <ul style="list-style-type: none"> ○ Prioritized list of requirements • Activity 2 <ul style="list-style-type: none"> ○ Data from OP • Activity 3 <ul style="list-style-type: none"> ○ Infrastructure and basic online monitoring tools ○ 	200	ISA ²	Q1/2020	Q2/2021

Phase: Initiation Planning Execution Closing/Financial evaluation	Description of milestones reached or to be reached	Anticipated Allocations (KEUR)	Budget line ISA/ others (specify)	Start date (QX/YYYY Y)	End date (QX/YYYY Y)
	Total	200			

5.1.11.2 Breakdown of ISA² funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Inception eProc-01	150	150
	Execution eProc-01	1100	1100
	Operational eProc-01	250	250
	Inception eProc-02	300	275
	Operational eProc-02	350	350
	Inception eProc-03	50	50
	Execution eProc-03	200	150
2017			
	Execution eProc-01	300	0
	Operational eProc-01	150	0
	Execution eProc-02	392	282
	Operational eProc-02	343	269
	Execution eProc-03	260	170
2018			
	Execution eProc-01	0	0
	Operational eProc-01	0	0
	Execution eProc-02	193	150

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
	Operational eProc-02	650	86
	Execution eProc-03	220	159
2019			
	eProc-01	0	0
	Execution eProc-02	200	100
	Operational eProc-02	407	80
	Execution eProc-03	200	36
2020			
	eProc-01	0	
	Operational eProc-02	500	
	Execution eProc-03	300	
	Execution eProc-04	200	

5.1.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
Directive 2014/24/EC	http://ec.europa.eu/growth/single-market/public-procurement/modernising-rules/reform-proposals/index_en.htm	Directive 2014/24/EC
eIDAS Regulation	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.257.01.0073.01.ENG	eIDAS Regulation
Digital Single Market	http://ec.europa.eu/priorities/digital-single-market/docs/dsm-communication_en.pdf	Digital Single Market
Digital Agenda	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF	Digital Agenda
CEF	https://ec.europa.eu/digital-agenda/en/connecting-	CEF

Description	Reference link	Attached document
	europe-facility	
Directive 2014/55/EU	https://ec.europa.eu/growth/single-market/public-procurement/e-procurement/e-invoicing_en	Directive 2014/55/EU