

## 6.2 LEGISLATION INTEROPERABILITY TOOLS – LEGIT (2016.38)

<b>cluster</b>	
Service in charge	SG.A1
Associated Services	(DIGIT.B2, DIGIT B.6, Parliament, Council, Publications Office

### 6.2.1 EXECUTIVE SUMMARY

Smart use of technology and exploitation of information can help to address many of the challenges facing the ambitious digital society.

This action aims specifically at modernising and improving the efficiency and quality of the legislative process across the Union, promoting interoperability across its pan-European dimension and facilitating the cooperation between public administrations at EU, national, regional and local levels.

Given the high diversity of legislative traditions encountered across the Union, it is extremely ambitious to provide a universal single turnkey ICT solution that adapts to each specific context. Moreover the adoption of said solution would face several barriers, the strongest one being probably the fact that concerned administrations do not have the same level of maturity in the modernisation of the legislative process, advancing independently at their own pace.

Instead, this action proposes an evolutionary, incremental and easier adoption based on reusable fundamental building blocks. Such approach is optimal for addressing both organisational and technical diversity factors. It allows for sustainable delivery with minimum lead time, i.e. faster production of more useful and reliable custom ICT solutions.

The activities covered by this action are organised in three distinct and complementary clusters.

#### Cluster A: Development of a web-based legislation editor – Continuation of LEOS

The LEOS project (action 1.13 of the ISA program) stressed that drafting legislation in an open and standard XML format would pave the way to efficient interoperability between stakeholders and would enable to automate some legislation processing currently performed manually at each step of the process (translation, amendment phases, consolidation, publication...). After a study on tools currently used by EU and MS public administrations to write their legislation, a need for a new generation of authoring tools was raised and software was developed, currently in prototype status, and released under the EUPL licence at <https://joinup.ec.europa.eu/software/leos/description>. The LEOS Editor is a web-based authoring tool providing drafting features that enable to easily write legal texts in a controlled WYSIWYG environment, organise it in divisions (articles, chapters, sections...), compare versions, generate printable views, insert comments and track-changes, highlight some parts of the texts ... Stakeholders and key users evaluated the prototype, praised the achievements and

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highlighted incomplete or missing capabilities required to properly support their business and ease adoption. This action is supporting development activities to evolve the existing software prototype into a stable, complete and mature product.

Cluster B: Interoperable and re-usable independent products (components, services or applications)

Exposure of the LEOS project and the web-based Editor prototype revealed substantial interest from a diversified audience that is facing some common problems, in one way or another. LEOS has devised and implemented solutions to those problems that could be extended in a more flexible or generic way, exposed as independent products (components or services) easily re-useable in different business applications or technical contexts. This action is supporting development activities to refactor the existing software prototype into more complete and re-usable building blocks.

The Management Board of the Publications Office has decided in March 2014 to create the “Inter-institutional Formats Committee” (IFC). The mandate of this group is to propose common semantic structures for legislative documents exchanged between institutions, and to document how specifications already in place at some institutions are addressing the representation of these semantic elements. This action is funding the development of software components or services for the validation and transformation of the semantic elements between the documented formats. It is following the official output of the IFC to plan the concrete development activities addressing specific content transformations.

Cluster C: Realizing the vision of the legislative process landscaping study

In September 2015 the ISA unit of the European Commission launched a study to draw a comprehensive view of the EU legislative IT environment, characterized by a high degree of complexity and by recent new initiatives. This study is made of:

- A description of the overall lifecycle of the inter-institutional legislative process (AS-IS), including the business processes and roles, the technologies, tools and systems used in each major legislative step by each of the institutions, the specifications used to facilitate the structuring and exchange of information, the governance bodies and committees involved, and any other relevant information;
- Identification of a first set of areas where intervention is considered beneficial (TO-BE). These include areas where opportunities for synergies and complementarities are present, mapping efforts could harmonise existing standards and specifications or tools could be reused or extended to cover new needs. Missing pieces and solutions to create a rationalised domain are also identified and proposed for further development.

This action is funding the development of parts of the missing software components detected and highlighted in the TO-BE vision defined in the study.

## 6.2.2 OBJECTIVES

The objectives of this action are:

- Making the legislation process more efficient, proposing new interoperability solutions and replacing repetitive manual tasks at the different actors by automatic processing wherever possible
- Develop solutions for common needs, and make them available for reuse under free licence
- Support the work of inter-institutional committees (e.g. IMMC and IFC), providing reference implementations after publication of their specifications
- Ensure the consistency of different initiatives in the area of the EU decision making process, providing pieces of software necessary for better convergence and efficiency
- Promote the usage of interoperability standards by proposing technical analysis, architecture designs and reference implementations

### 6.2.3 SCOPE

This action delivers software implementing specifications and standards defined by other bodies active in the legislation domain (e.g. standardisation committees,...).

In scope:

- Development of software supporting interoperability of the legislation process:
  - tools for drafting legislation in a structured format (XML)
  - tools for providing structured feedback on proposed legislation
  - tools for the transformation of legislation between different structured format
  - tools supporting the electronic exchange of documents and metadata in the context of the legislative process, containing workflow information and

Not in scope:

- semantic assets for the legislative process; the definition of common vocabularies and reference tables remains under responsibility of existing committees or initiatives (SEMIC, ELI, IMMC, IFC...)
- definition of new standard formats for supporting the legislation process interoperability; the action will propose tools supporting formats already available on the market.

### 6.2.4 PROBLEM STATEMENT

Drafting a new legislation is a complex process, involving many actors. Usually the process follows this sequence of tasks:

- Preparation phase: the "drafting" process is usually performed under the leadership of a specific public department, and the draft text is discussed with stakeholders and modified accordingly. The content and structure of the text can be continuously changed during this phase.
- Adoption phase: the draft legislation is submitted to the political entities responsible for its adoption, (Council of the European Union, European Parliament, National parliaments, institutional consultative bodies....) along clearly structured processes. The text is

progressively stabilising and the final version is generally emerging under the control of a central body, which takes care of the format, the legal and editorial quality of the text.

- Entry into force phase (when applicable): ultimately, the text is adopted and enters into force by its publication or its notification to the concerned parties.

The EU legislation process is similar but yet more complex by two additional factors:

- The EU-level processes interact with 28 independent Member state-level processes (e.g. : The Lisbon Treaty gives a.o. to the National Parliaments a greater ability to scrutinise proposed [European Union law](#) and to comment the draft legislation proposed by the European Commission);
- EU legislation addressed to citizens needs to be translated into 23/24 languages and all adopted languages have the same legal value.

The modernisation of the decision making process, taking into account its pan-EU dimension, is beneficial for Member States and citizens as it supports:

- Cost saving: decrease the number of repetitive manual tasks, decrease the volume of new text to be translated...
- Transparency: better traceability of directives implementation, building of consolidated views of legislation, follow-up of amendments and corrigenda...
- Quality of the legislation: control of the legislative drafting rules from early stages of the legislative process...
- Accessibility to legislation: standard open formats, open data, data mining, long-term preservation...

## 6.2.5 EXPECTED BENEFICIARIES AND ANTICIPATED BENEFITS

Beneficiaries	Anticipated benefits
Member States, National parliaments, public administrations and EU Institutions	<p>Re-use of best practices, standards and tools, in order to:</p> <ul style="list-style-type: none"> <li>▪ improve the quality of legislation, preventing drafters to go outside the applicable legislation drafting rules</li> <li>▪ save costs, replacing manual tasks by automatic processing at different step of the decision making process: <ul style="list-style-type: none"> <li>○ review/amending phases</li> <li>○ translation phases</li> <li>○ consolidations</li> <li>○ publication/notification</li> </ul> </li> <li>▪ ease interoperability between stakeholders</li> <li>▪ facilitate the interconnection of legal databases and the performance of search engines</li> </ul> <p>Tools and components developed in the context of this action are designed in a generic way and published under an open source</p>

	licence in order to ease their reuse by national public administrations and EU Institutions.
Citizens, civil society, businesses	Easier access to legislation, providing standards and good quality data facilitating data analytics

## 6.2.6 RELATED EU ACTIONS / POLICIES

Action / Policy	Description of relation, inputs / outputs
Promoting Semantic interoperability Amongst the European Union Member States SEMIC – Action 1.1	Reusable semantic interoperability assets in the area of legislation can be shared with other public administrations, both at level of the EU and Member States.
Trusted Exchange Platform e-TrustEx - Action 1.8	At the EU decision-making level, the text being exchanged between Institutions, Member States and National Parliaments are sent using the e-TrustEx exchange platform.
European Legislation Identifier (ELI)	The structured representation of legislative content supports the extension of the European Legislation Identifier to additional elements.
DRS – Document repository services for EU policy support (ISA action 2.9)	The open source release of these services could be a solution for archiving/storing the drafted solution.
ISA <sup>2</sup> Action 'Participatory knowledge for supporting decision making'	Reusable solutions that allow the electronic participation of stakeholders, the analysis of the captured opinions and the discovery and generation of knowledge will be taken into account for designing and developing building blocks (i.e. software, tools etc.) that support and improve the electronic exchange of documents and metadata in the context of the legislative process.
ISA <sup>2</sup> Action 'Interinstitutional framework for digital OLP management'	The proposed interoperable ways of structuring the content of the documents that need to be exchanged between the institutions for the purposes of the ordinary legislative procedure will be taken into account for designing and developing building blocks (i.e. software, tools etc.) that support and improve the electronic exchange of documents and metadata in the context of the legislative process.
'ISA <sup>2</sup> Action ICT implications of EU legislation'	Results and conclusions related with the properly preparation and evaluation regarding the ICT implications will be taken into account for designing and developing building blocks (i.e. software, tools etc.) that support and improve the electronic exchange of documents and metadata in the context of the legislative process.
ISA <sup>2</sup> Action 'European Legislation Identifier (ELI)'	The proposed approach for identifying legislation documents and the supporting assets and solutions will provide input for designing and developing building blocks (i.e. software, tools etc.) that support and improve the electronic exchange of documents and metadata in the context of the legislative process.

ISA <sup>2</sup> Action 'Application of EU law: provision of cross-sector communication and problem solving tools (THEMIS)'	Reusable tools and the underlying semantic structures and data standards for monitoring the application of EU law will be taken into account for designing and developing building blocks (i.e. software, tools etc.) that support and improve the electronic exchange of documents and metadata in the context of the legislative process.
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## 6.2.7 REUSE OF SOLUTIONS DEVELOPED BY ISA, ISA<sup>2</sup> OR OTHER EU / NATIONAL INITIATIVES

This action strives for an efficient and pragmatic vision by relying heavily in interoperable standards and re-usability of existing solutions, to avoid duplication of efforts and achieve sustainable business impact. The very open nature of the project is the first factor to consider when analysing the problems, designing the solutions and implementing the ICT products (components, services and applications) to be delivered under free public licenses.

A considerable number of existing solutions or ongoing efforts, under EU or other initiatives, were identified as important building blocks for the activities in the scope of this action:

- LEOS - Legislation Editing Open Software (ISA action 1.13)
  - LEOS Editor prototype
  - LEOS technical studies
- LegalDocML (OASIS)/ Akoma Ntoso (UN-funded project)
  - XML standard for legal documents
- IFC - Inter-institutional Formats Committee
  - Common Vocabulary working group
  - Formats Guidelines working group
- ELI - European Legislation Identifier (ISA action)
  - legislation URI - Uniform Resource Identifier
  - legislative resource metadata
  - information exchange format ontology
- DRS – Document repository services for EU policy support (ISA action 2.9)
  - potential solution for storing/archiving
- IMMC - Inter-institutional Metadata Maintenance Committee
  - IMMC Core Metadata exchange protocol
  - IMMC institution specific extensions
- Metadata Registry of definitions and specifications (Publications Office):
  - Named Authority Lists (Common Authority Tables/Value lists)
  - OP Core metadata element set
  - EuroVoc - thesaurus and alignments
  - Formex - Formalized Exchange of Electronic Publications

- SEMIC - Promoting Semantic interoperability Amongst the European Union Member States (ISA action 1.1)
  - Core Vocabularies (Core Person, Core Location, Registered organisation, Core Public service)
  - Interoperability of open data portals (DCAT-AP)
  - Linked Open Government Data (LOGD)
  - Asset Description Metadata Schema (ADMS)
  - Community of Interoperability Solution Repositories (CISR)
  
- Legislative process landscaping study (ISA-funded project):
  - AS-IS report
  - TO-BE vision
  
- Joinup Platform (ISA-funded project):
  - communication facilities
  - dissemination of materials
  - collaborative development

### 6.2.8 EXPECTED RE-USABLE OUTPUTS (solutions and instruments)

Output name	Technical analysis
Description	Research activities, feasibility study, conclusions driving solutions' implementation
Reference	N/A
Target release date / Status	Yearly update

Output name	Architecture design
Description	Based on the conclusions of the technical analysis, architecture guidelines driving the implementation
Reference	N/A
Target release date / Status	Yearly update

Output name	LEOS Editor Reference implementation
Description	Software components following the architecture guidelines, released under open licence
Reference	N/A
Target release date / Status	Ad-hoc releases as of 2016

## 6.2.9 ORGANISATIONAL APPROACH

### 6.2.9.1 Expected stakeholders and their representatives

Stakeholders	Representatives
IMMC	Inter-institutional Metadata Maintenance Committee
IFC	Inter-institutional Formats Committee
Akoma Ntoso/LegalDocML Oasis Technical Committee	<a href="https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=legaldocml">https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=legaldocml</a>
ISA <sup>2</sup> Coordination Group (or ISA CG equivalent)	The group assists the Commission in translating priorities into actions and to ensure continuity and consistency in their implementation.
Secretariat-General of the European Commission	Unit SG.A1 (Advice, developments and logistics) Unit SG.R3 (Information Technology)
Legal Service of the European Commission	LEG Team (Quality of Legislation) Unit SJ.RHIF.IT (Informatics)
Directorate-General for Translation of the European Commission	DGT.C (Translation) and DGT.S (Customer relations) Unit DGT R3 (Informatics)
Directorate General for Informatics of the European Commission	Unit DIGIT.B.2 (Information systems for document management and corporate decision making processes)
Organisations in Member States	Members States representatives of administrations either working on similar initiatives or interested in using produced software.

### 6.2.9.2 Communication plan

The project team will systematically drive development activities after consultation of interested parties. As example, committees like the IMMC and the IFC will be consulted before launching any development activities in the area of transformation between formats or the implementation of new metadata extension. The communication with these committees will be handled during the respective meetings (plenary or working group meetings) in which presentations for information or for discussion will be put on the agenda.

As regards the development activities related to the LEOS drafting tool, the Joinup platform will be used to support the communication and the dissemination of material (software, documents...) between interested stakeholders. In case a Community of interest is emerging (made of representatives of some national organisations and Institutions working on similar projects) some workshops could be organised in order to share experiences (lessons learnt, technical issues, change management strategies...) and also to identify and plan development synergies, the Joinup platform being also able to support collaborative development activities.

### 6.2.9.3 Governance approach

The coordination of the project is handled by 3 different groups:

- The steering committee, including representatives at head of unit level of:



- Secretariat-General of the EC (service in charge)
- DIGIT.B2 and DIGIT.B6 (associated services)
- The project management team, including project officers from:
  - Secretariat-General of the EC (service in charge)
  - DIGIT.B2 and DIGIT.B6 (associated services)
- The extended project management team, including project officers from:
  - Secretariat-General of the EC (service in charge)
  - DIGIT.B2 and DIGIT.B6 (associated service)
  - DGT (adviser service)
  - Legal Service of the EC (adviser service)

The project steering committee meets on a regular basis (2 times a year):

- to ensure the project is progressing satisfactorily
- to take strategic decisions

In case any critical risk or issue is raised, the steering committee may also meet on request of the project managers, in order to decide on actions to be launched.

Project status meetings (review of the project progress) are held between entities of the project management team, to ensure the timely delivery of the project. Project managers of the extended project management team may join the status meeting depending on the agenda.

## 6.2.10 TECHNICAL APPROACH

### 6.2.10.1 Strategy

The swift implementation and deployment of complementary, standardised and interoperable ICT solutions is a critical element to drive innovation, ensure sustainability, increase re-usability, reduce fragmentation and avoid duplication of efforts.

This action is driven by an agile, efficient and pragmatic technical approach by combining established and emerging standards, industry best practices and state of the art technologies to empower the delivery of high quality and highly reusable software products that can either be used in isolation or composed together to implement interoperable ICT solutions. Reliable and sound ICT solutions are essentially achieved by composing independent products (components, services and even applications), leading to strong architectures and resilient systems. These are better prepared to deal with failures by providing graceful degradation of the affected capabilities and guaranteeing overall system availability.

Independent products, complying with the principle of single responsibility, translate to sustainable evolution in both business and technical perspectives. Independent teams are masters of their own business specificities. Usually they are focused on a particular business domain inside an organization, easily coping with business changes, able to avoid the barriers and coordination overhead of dealing with a large and complex organizational structure, inevitable when addressing a

wider business domain. Independent products are supported by independent teams, which are establishing well-defined boundaries and focusing on contracts, interfaces, communication and data. These are key concepts to achieve unconstrained product evolution, responding to business changes by incorporating new features and capabilities or deprecating obsolete ones, but still maintaining backwards compatibility. Single responsibility products have clearly defined behaviour and are designed to be easy to understand, to test and to validate against predefined key metrics. Each product should be enriched with instrumentation capabilities to report meaningful usage and performance statistics as an added value.

Software components (frameworks or utility libraries) should be implemented at least in one mainstream programming language (e.g. Java), with the possibility to provide bridge application programming interfaces (APIs) for other languages. This strategy ensures sustainable development of a main reference implementation, high re-usability through thin bridge APIs and lower maintenance efforts.

Software services (SOAP web services, RESTful services or micro-services) should exchange data in well-defined open formats. The focus is on the exchange of rich data structures where data, together with its schema, is fully self-describing. Such principle is the strongest foundation to build reliable data exchange and processing systems where producers and consumers can exchange data schemas, facilitating the understanding of the exchanged data and enabling seamless data adaptation to comply with divergent schema versions or even disparate schemas altogether. This strategy ensures easier consumption and flexible composition of services, independently of programming languages and execution platforms.

The LEOS Editor is considered a single responsibility application, reusable in multiple stages of the legislative process workflow, as demonstrated by the delivered prototype implementation. Activities performed under the LEOS action focused on improving the drafting of legislation using open source tools and an open document format. Rapidly we faced several, apparently unrelated, hidden challenges for which solutions were found and implemented. Later we identified these as common problems, in different contexts, waiting for coherent solutions. We realized the opportunity and usefulness of exposing LEOS internal implementations in the form of reusable software components or services to support other efforts. The continuation of the LEOS development activities requires an adaptation of the current architecture to adhere to a design based on reusable components and services. Lessons learned from the LEOS action guide the re-evaluation of some design decisions and applied technologies, leading to the selection of suitable replacements, where needed. Stakeholders and key users evaluated the LEOS Editor prototype and highlighted missing capabilities required to properly support their business and ease adoption. Such capabilities should be delivered in new releases, involving technical analysis, design and implementation. Standards compliance is always a major concern in LEOS and the release of LegalDocML by OASIS (a.k.a Akoma Ntoso 3.0) must be covered by an upcoming release.

### **6.2.10.2 Programme**

The governance board of the action will decide on the agenda and the priorities of the activities to be carried out. The following list gives a view on the kind of research and development tasks which will be

addressed. It is definitely not a final program as new products or trends will appear on the market as the action is being executed and the output of some items could simply discard some other ones.

### **Cluster A: Activities in scope of the continuation of LEOS:**

#### Research activities:

- identify general document edition rules
- identify EC type specific document edition rules
- identify language specific document edition rules
- investigate declarative definition of document rules (e.g. LegalRuleML)
- identify EC type specific document templates
- investigate declarative definition of document templates (e.g. XML)
- investigate advanced PDF layout and rendering engines (e.g. SILE Typesetter)
- identify differences between Akoma Ntoso versions (2.0 vs 3.0)
- investigate advanced structured document comparison algorithms
- identify fundamental access control rules for EC documents
- investigate access control frameworks (e.g. CMIS ACL or Apache Shiro)
- investigate technologies and design the User Experience to provide document content quality enhancements:
  - dictionaries and thesaurus, available services and communication protocols (e.g. DICT, XDXF, ADL or EuroVoc)
  - archives of published documents, document formats and retrieval services (e.g. database of PO)
  - archives of translated documents, document formats and translation services (e.g. database of DGT)
  - user experience design, user interface prototype and usability studies
- investigate technologies and design the User Experience to provide document content semantic enhancements:
  - investigation of metadata standards (e.g. Dublin Core or FOF)
  - investigation of ontologies and datasets (e.g. DBpedia or Geonames)
  - investigation of semantic web and linked data (e.g. RDF, SPARQL or JSON-LD)
  - investigation of semantic engines (e.g. Apache Stanbol or Apache Marmotta)
- document archive, content indexation and search:
  - investigation of semantic content management systems (e.g. CKAN)
  - investigation of archiving technologies (e.g. CMIS standard open implementations)
  - investigation of indexing technologies (e.g. Apache Lucene)
  - investigation of search technologies (e.g. Apache Solr)
- integration of independent products (components, services or applications):
  - investigation of integration strategies
  - evaluation of integration frameworks and tools
  - documentation of integration guidelines and trade-offs
- evaluation of open-source remote telemetry solutions:
  - product performance statistics
  - product health monitoring
  - product usage reporting

#### Implementation activities:

- provide multi-language application user interface
- support multi-language document content edition
- create general and specific document edition rules
- create templates for EC document types
- implement advanced PDF export capabilities

- support for Akoma Ntoso 3.0 (LegalDocML)
- improve structured document comparison
- support extensible document metadata fields
- validation of content against document schema
- validation of content for correctness (e.g. invalid references)
- support reuse of content from existing documents
- support for images/tables in document editor
- allow cross-references between and inside documents
- support proposals for change (amendments)
- ensure access control of documents
- enable sharing of documents
- improve performance of key capabilities
- implement back-office for helpdesk users
- full support for modern browsers (IE, Firefox, Chrome, Safari)
- support document rendering and edition on mobile devices (tablets)
- integration with tools supporting EU's legislative process workflow
- implement computer assisted designer (CAD) for templates
- document content quality enhancements:
  - match content against language dictionaries and thesaurus for corrections and suggestions
  - match content against published documents for increased coherence and quality
  - match content against translated documents for reduced translation efforts
- document archive, content indexation and search:
  - development of proof-of-concept services based on selected technologies
- remote product telemetry:
  - development of proof-of-concept services based on selected technologies

## **Cluster B: Activities related to delivering re-usable independent products (components, services or applications)**

### Research activities:

- evaluate alternatives and trade-offs for modularization of LEOS prototype:
  - re-usable independent components
  - re-usable independent services
- investigate semantic related EU efforts:
  - SEMIC - Semantic interoperability Community (ISA Action):
    - Core Vocabularies (Core Person, Core Location, Registered organisation, Core Public service)
    - Interoperability of open data portals (DCAT-AP)
    - Linked Open Government Data (LOGD)
    - Asset Description Metadata Schema (ADMS)
    - Community of Interoperability Solution Repositories (CISR)
  - IKS - Interactive Knowledge Stack (EU-funded project):
    - VIE.js - Vienna IKS Editables for semantic web applications
    - Create.js - a comprehensive web editing interface for CMS
- XML document validation
  - investigation of Document Schema Definition Languages framework (DSDL)
  - evaluation of validation definition languages (e.g. DTD, XML Schema, Relax NG, Schematron, NVDL or CAM)
  - evaluation of validation engines (e.g. Probatron or CAMV)
- XML document transformation:
  - specification of transformations between formats identified by IFC working groups
  - investigation of transformation definition languages (e.g. XSLT or XProc)

- evaluation of transformation engines (e.g. Saxon XSLT, Apache Cocoon or xmlsh)

**Implementation activities:**

- refactoring of LEOS prototype into components and services:
  - document text and table of contents viewer UI components
  - document metadata extraction library or management service
  - document transformation services for HTML, PDF and PDF/A
  - document comparison library or service
  - document comparison view UI component
  - document consolidation library or service
- XML document validation:
  - creation of schemas originating from IFC working groups
  - validation of document against schema with comprehensive error information
- XML document transformation:
  - creation of transformations between formats identified by IFC working groups

**Cluster C: Activities that may emerge from the legislative process landscaping study:**

**Research activities:**

- N/A (nothing was identified so far)

**Implementation activities:**

- development of IMMC extensions to support new metadata or data formats
- adaptation of existing tools in order to simplify the legislative process
- development of integration services to break application data silos
- development of automation services to reduce manual tasks in the workflow

## 6.2.11 COSTS AND MILESTONES

### 6.2.11.1 Breakdown of anticipated costs and related milestones

Phase: Inception Execution Operational	Description of milestones reached or to be reached	Anticipate d Allocation s (KEUR)	Budget line ISA <sup>2</sup> / others (specify)	Start date (QX/YYYY)	End date (QX/YYYY)
Inception	Project charter, clusters A, B and C	100	ISA <sup>2</sup>	05/2016	09/2016
Execution 1	Feasibility study, Technical analysis 1.0	100	ISA <sup>2</sup>	09/2016	09/2017
	Architecture design 1.0 Reference Implementation V1.0	300	ISA <sup>2</sup>	09/2016	09/2017
Execution 2	Technical analysis 2.0 Architecture design 2.0	240	ISA <sup>2</sup>	09/2017	09/2018
	Reference Implementation V2.0	840	ISA <sup>2</sup>	09/2017	09/2018

Execution 3	Technical analysis 3.0 Architecture design 3.0	240	ISA <sup>2</sup>	09/2018	09/2019
	Reference Implementation V3.0	840	ISA <sup>2</sup>	09/2018	09/2019
Execution 4	Technical analysis 4.0 Architecture design 4.0	240	ISA <sup>2</sup>	09/2019	09/2020
	Reference Implementation V4.0	840	ISA <sup>2</sup>	09/2019	09/2020
Execution 5	Technical analysis 5.0 Architecture design 5.0	240	ISA <sup>2</sup>	09/2020	09/2021
	Reference Implementation V5.0	840	ISA <sup>2</sup>	09/2020	09/2021
<b>Total</b>		4820			

The breakdown of research, technical analysis and development effort per cluster is expected as follow:

- cluster A: 50%
- cluster B: 30%
- cluster C: 20%

The governance board of the action will regularly review this allocation based on the decided business priorities.

### 6.2.11.2 Breakdown of ISA<sup>2</sup> funding per budget year

Budget Year	Phase	Anticipated allocations (in KEUR)	Executed budget (in KEUR)
2016	Inception	100	
2016	Execution 1	400	
2017	Execution 2	1080	
2018	Execution 3	1080	
2019	Execution 4	1080	
2020	Execution 5	1080	

## 6.2.12 ANNEX AND REFERENCES

Description	Reference link	Attached document
LEOS as-is study	<a href="https://joinup.ec.europa.eu/elibrary/document/isa-leos-final-results">https://joinup.ec.europa.eu/elibrary/document/isa-leos-final-results</a>	
LEOS editor release	<a href="https://joinup.ec.europa.eu/software/leos/release/all">https://joinup.ec.europa.eu/software/leos/release/all</a>	

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Metadata registry of the Publication Office (IMMC, ELI, Formex...)	<a href="http://publications.europa.eu/mdr/">http://publications.europa.eu/mdr/</a>	
Akoma Ntoso web site	<a href="http://www.akomantoso.org">http://www.akomantoso.org</a>	
LegalDocMI technical committee	<a href="https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=legaldocmi">https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=legaldocmi</a>	