



EUROPEAN COMMISSION

Research Executive Agency (REA)

Inclusive, Innovative and Reflective Societies



Simpatico

Project acronym: SIMPATICO

Project full title: SIMplifying the interaction with Public Administration Through Information technology for Citizens and cOmpanies

Call identifier: EURO-6-2015

Type of action: RIA

Start date: 1 March 2016

End date: 28 February 2019

Grant agreement no: 692819

D7.5 - Market Analysis and Exploitation Plan

Public Version

Executive Summary: This document is the final analysis of the exploitation potential of SIMPATICO outcomes. In this version, a reduced set of information is provided due to its public release. That reduction affected only confidential data related to business models, competitive advantages and initiatives each partner is planning for the future.

WP: WP7 - DISSEMINATION AND EXPLOITATION ACTIVITIES

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Version: 1.0

Status: Final

Deliverable Type: R: Report

Dissemination Level: PU: Public version of a CO deliverable

Official Submission Date: 28/02/2019

Actual Submission Date: 14/01/2019

Version History

Version	Date	Author	Partner	Description
0.0.5	05/11/2018	F.Perossini	SPA	TOC
0.1	30/11/2018	F.Perossini	SPA	Collected content plus revised structure to fit the open peer review being a confidential deliverable.
0.2	18/12/2018	F.Perossini	SPA	Early draft version with missing contributions
0.3	21/12/2018	Fabio Perossini, Carolina Scarton, Marco Pistore, Orazio Tomarchio, Sara Tonelli, Michele Trainotti, Garzoglio Mistral, Diego López-de-Ipiña, Vincenzo Savarino, Raúl Santos de la Cámara, Federica Perossini, Zulf Choudhary, Antonio Pereira Rama, Antonio Filograna	SPA	Draft collection of all contributors
0.4	27/12/2018	F.Perossini, M.Pistore, D.Lopez, M.Trainotti	SPA	New comments and updates
0.5	29/12/2018	F.Perossini	SPA	Early completed draft
0.6	03/01/2019	F.Perossini	SPA	Final draft
0.7	07/01/2019	F.Perossini	SPA	Final release for review
0.8	08/01/2019	F.Perossini, Z.Choudary	SPA	UK Pestle contribution added
0.8.1	10/01/2019	R.Santos del la Camara	HIB	Revisor 1 feedbacks
0.8.2	14/01/2019	M.Gerosa	FBK	Revisor 2 feedbacks
0.8.3	15/01/2019	D. López-de-Ipiña	DEUSTO	Revisor 3 feedbacks
0.9	15/01/2019	F.Perossini	SPA	Final version
1.0	15/01/2019	M.Gerosa, M Pistore	FBK	Final quality check

Statement of originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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Glossary

AAC	Authentication and Authorization Component
AJAX	Asynchronous JavaScript and XML
API	Application Programming Interface
AST	Authoring Support Tool
CDV	Citizen Data Vault
CKB	Collective Knowledge Base
CPD	Collaborative Procedure Design
DA	Data Analysis
DB	Dashboard
DB	Data Base
DOM	Document Object Model
EE	Enrichment Engine
eSM	e-Service Monitor
EIF	European Interoperability Framework
GE	Gamification Engine
GUI	Graphical User Interface
HTML	HyperText Markup Language
HTTP	Hypertext Transfer Protocol
IFE	Interactive Front-End
IL	Integration Layer
JSON	JavaScript Object Notation
LOG	Interaction Log (module)
PA	Public Administration
PDS	Personal Data Store
QAE	Question Answering Engine
RDF	Resource Description Framework
REST	Representational State Transfer
RO	Research objective
SF	Session Feedback
SME	Small and Medium Enterprise
SSO	Single Sign On
TAE	Text Adaptation Engine
UI	User Interface
UPM	User Profile Manager
WAE	Workflow Adaptation Engine
XML	EXtensible Markup Language

Executive summary

This document is the final analysis of the exploitation potential of SIMPATICO outcomes. In this version, a reduced set of information is provided due to its public release. That reduction affected only confidential data related to business models, competitive advantages and initiatives each partner is planning for the future.

The innovation strategy (section 2), that is the base for all actions which are going to enforce the use of project results is driven by the relationships between results themselves, activities performed in the project and stakeholders' needs according to their own vision.

In section 3, the different types of visions are addressed and the relationship map used as a tool, during the project life to trace growing opportunities while keeping the vision updated is discussed. This is also supported by the mission-oriented innovation model which represents an original interpretation that enlarges the view of exploitation embracing all the three pathways described in section 2.

In section 4, lists of the identified exploitable results are identified with their final view in terms of value proposition.

Section 5 addresses the PESTLE analysis done at the European and pilot site countries level to better understand the surrounding conditions for the exploitation of SIMPATICO results. The SIMPATICO strategy is also presented in Section 5.

Section 6 introduces a mixed market analysis that puts together two approaches generally intended incompatible (red and blue ocean ones), but, when talking about research outcomes, they could be complementary in the marked evolution.

After the identification of potential actions in section 7, IPR and joint exploitation directions are investigated and assessed following partners' orientation.

The last section of the document presents a monitoring procedure used to keep the exploitation strategy updated throughout the project life-cycle.

1 Introduction of SIMPATICO

It is SIMPATICO'S aim to improve the experience of citizens and businesses in their daily interactions with a public administration by providing a personalized delivery of e-services based on advanced cognitive system technologies. This will be achieved by promoting an active engagement of users for the continuous improvement of their interaction with these services. The SIMPATICO approach is realisable through a platform that can be deployed on top of an existing PA system which allows for a personalized service delivery without having to change or replace its internal systems: a process often too expensive for public administration, especially considering the cuts in resources imposed by the current economic situation.

The objective of SIMPATICO is accomplished through a solution based on the interplay of language processing, machine learning and the wisdom of the crowd (represented by citizens, business organizations and civil servants) to change for the better the way citizens interact with the PA. SIMPATICO will adapt the interaction process to the characteristics of each user; simplify text and documents to make them understandable, enable feedback for the users on problems and difficulties in the typical interaction, engage civil servants, citizens and professionals so as to make use of their knowledge and integrate it in the system that is both open and dynamic, see (Fig. 1).

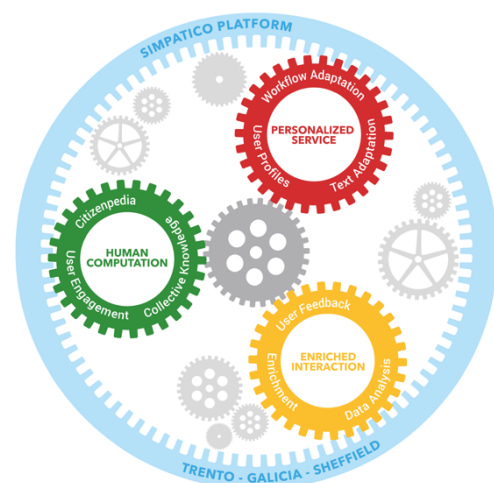


Figure 1 - SIMPATICO concept as a glance

The project can be broken down into the following smaller research objectives (ROs).

RO1. To adapt the interaction process with respect to the profile of each citizen and company (PA service consumer) in order to make it clear, understandable and easy to follow. The process will include:

- A **text adaptation** framework that is based on a **rich text information layer**, on machine learning algorithms capable of **inducing general text adaptation operations** from **few examples** and on **customizing these adaptations to the user profiles**.
- **Workflow adaptation engines** that takes user characteristics and tailor the interaction according to the user's profile and needs.
- A feedback and annotation mechanism that **gives users the possibility to visualize, rate, comment, annotate and document the interaction process** (e.g., underlying the most difficult steps). This will provide valuable feedback to the PA while further refining the adaptation process and enriching the interaction.

RO2. To exploit the wisdom of the crowd in order to enhance the entire e-service interaction process using:

- An **advanced web-based social question answering engine (Citizenpedia)** where citizens, businesses and civil servants discuss and suggest potential solutions and interpretation for the most problematic procedures and concepts.
- A **collective knowledge** database used to simplify e-services and improve understanding among stakeholders.
- An **award mechanism** that engages users and incentivises them to collaborate by giving them reputation (a valuable asset for professionals and organizations) and **privileges** (for the governance of Citizenpedia – a new public domain resource) according to stakeholders' contributions.

RO3. To deliver the SIMPATICO Platform as an open software system that can:

- **Interoperate with PA legacy systems.**
- Combine **consolidated e-government methodologies with innovative cognitive technologies** (language processing, machine learning) at different levels of maturity enabling their experimentation in more or less controlled operational settings.
- Provide an interoperability platform that enables an **agile integration of SIMPATICO's solution with** PA legacy systems to allow the exploitation of data and services from these systems with SIMPATICO's adaptation and personalization engines.

RO4. To evaluate and assess the impact of the SIMPATICO solution through:

- Customising, deploying, operating and evaluating the SIMPATICO solution on **three use-cases in two EU cities** – Trento (IT) and Sheffield (UK) – **and one EU region** – Galicia (ES).
- **Assessing the impact** of the proposed solution in terms of **increase in competitiveness, efficiency of interaction and quality of experience by stakeholders.**

2 Innovation strategy

In the design of SIMPATICO innovation strategy by the consortium, the overall project complexity and the wide range of multidisciplinary competences in place have been considered taking into account that missions of partners involved in the project are focused in at least three areas: Sustainability, Research and Business. In view of this, the SIMPATICO team decided to approach the exploitation and the innovation strategy around these three main partners' missions:

1. *Sustainability driven* – those who, being public bodies, are interested in building the SIMPATICO outcomes' sustainability for the future and possible re-use inside their organisations.
2. *Research focused* – those who, being research centres and/or universities, are mainly interested in implementing these two pathways:
 - a. use of SIMPATICO outcomes as content for university courses;
 - b. activate further research starting from SIMPATICO outputs.
3. *Business oriented* – partners who plan to do business by selling products or services resulting from the SIMPATICO project.

These orientations, collected during the project lifecycle, are in line with the project's objectives as presented in table 2.

Project Objective	Area	Strategy
RO1. To adapt the interaction process with respect to the profile of each citizen and company.	RES	Extensive research activities are running, carried out by research entities in the project giving place to plenty of generating publications and potential further research in the area of text adaptation, workflow adaptation and feedbacks collection, directly related to citizens (including companies), profiles.
	SUS	Out of the three pilot sites running in the project, two of them are planning interaction driven services based on SIMPATICO outcomes
	BUS	Several businesses are going to be launched (<i>not shown in this public version of deliverable</i>), which are going to have the collaboration of traditional actors in the legacy systems market.
RO2. To exploit the wisdom of the crowd in order to enhance the entire e-service interaction process.	RES	Research activities to improve the Citizenpedia concept are underway by both research institutions and universities in the consortium
	SUS	The module related to wisdom of the crowd (Citizenpedia), has been deployed in the project in two pilot sites and, there, the sustainability pathway

		has been activated.
	BUS	A couple of initiatives (see them in section 7), have been planned which are applying the wisdom of the crowd (<i>they are not disclosed in this public document</i>).
RO3. To deliver the SIMPATICO Platform as an open software system.	RES	More than the entire platform, few single components are going to be exploited from the research view point. All those components have been released as open software.
	SUS	Being totally open software, SIMPATICO is going to be exploited from the sustainability perspective by administrations also integrating it with their legacy systems.
	BUS	The platform is released as open software at the status it is at the end of the project which on average is TRL7-7. Any further evolution will be carried on inside business initiatives by selected partners.
RO4. To evaluate and assess the impact of the SIMPATICO solution.	RES	Acceptance and accessibility are one of challenges as well as social impact framework of further research planned by several partners in the consortium.
	SUS	All pilot sites are satisfied by project results and at different level, their engagement to include SIMPATICO outcomes in their sustainability strategy has been confirmed.
	BUS	Evaluation of impact is a key factor for SIMPATICO outcomes marketing. In the project, two rounds of evaluation have been performed to achieve useful data for potential market exploitation.

Table 1 - Objectives vs Exploitation strategy

2.1 Consolidated SWOT analysis

Being SIMPATICO a Research and Innovation initiative, the importance of an analysis addressing opportunities and penalties of the research activities has to be considered a pillar for any future exploitation pathway. The experience gathered during the three years project including the participation of civil servants and citizens to pilot phases provided a reasonable input for a consolidated SWOT analysis which is reported in the following Figure 2.

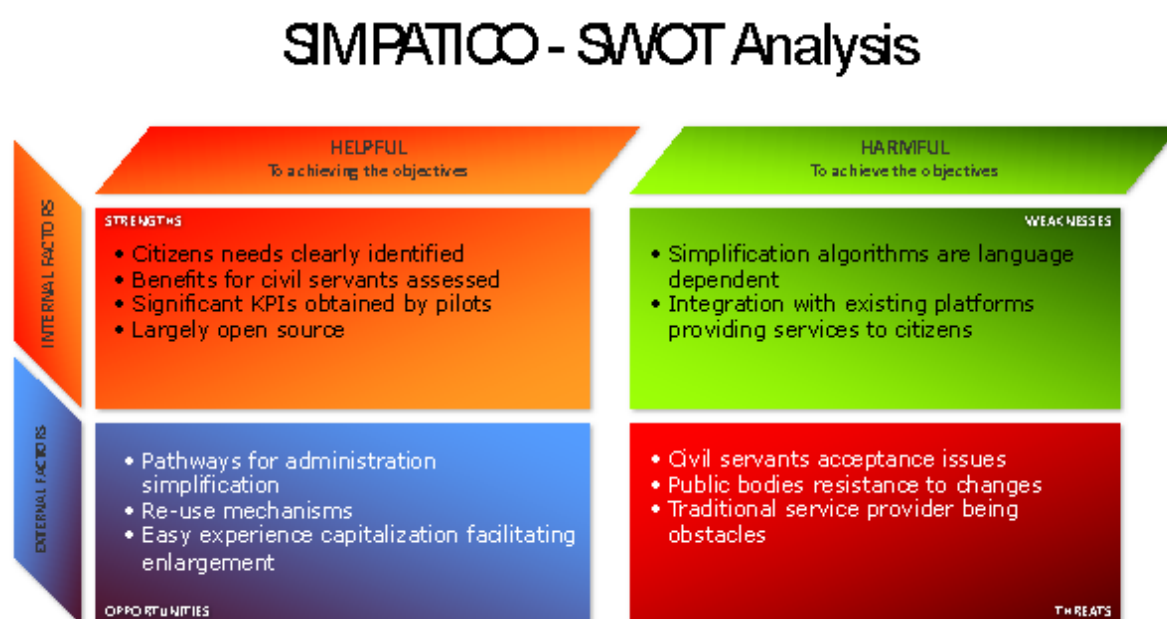


Figure 2 - SIMPATICO SWOT Analysis

- **The current Strengths:**
 - *Citizens' needs clearly identified* – The long activity done during SIMPATICO project to analyse and understand citizens' needs has been capitalised and the research done gained further information from the pilot activities.
 - *Benefits for civil servants assessed* – Front office requirements as well as the need to communicate properly with the back office has been addressed and the lessons learnt capitalised in the achieved outcomes.
 - *Significant KPIs obtained from pilots* – Starting from indicators identified in the project their use in pilot sites was extensively reported.
 - *Largely open source* – Most of SIMPATICO outcomes have been released as “open source” and could be the base for further research as well as for commercial development.
- **Comprehensive Weaknesses:**
 - *Simplification algorithms are language dependent* – There is not a common level of available instruments for all languages to perform text simplification.
 - *Integration with existing platforms providing services to citizens* – Existing public administration front-end legacy systems are often not open to additional modules which could perform specialised services such as text simplification.

- **Dependence on Opportunities:**

- *Pathways for administration simplification* – The need for simplification of bureaucracy is a widespread issue for European public administrations, in view of that SIMPATICO could provide a tangible support to most of simplification strategies in place.
- *Re-use mechanisms* – The Italian experience of potential re-use for SIMPATICO outcomes could be replicated in other countries.
- *Easy experience capitalization facilitating enlargement* – SIMPATICO is providing services which are supporting the capitalization of citizen experiences (Citizenpedia), and that is a key factor for possible enlargement of its use in a wider range of public services.

- **The protection from Threats:**

- *Civil servants' acceptance issues* – From the very beginning in the SIMPATICO test phase, the acceptance issue has been experienced, it is well known¹: the acceptance of new technologies, mostly linked with revised processes, are not an easy result to be achieved.
- *Public bodies resistance to changes* – Regulations, existing procedures and praxis are a big challenge to be faced when introducing SIMPATICO outcomes.
- *Traditional service providers being obstacles* – The existing suppliers' attitude toward external innovations could be an obstacle for SIMPATICO integration.

The following sections 2.2, 2.3 and 2.4, related to single partner strategies, have been considered confidential and not submitted to open peer reviewing.

¹ Zuiderwijk, A., Janssen, M., & Dwivedi, Y. K. (2015). Acceptance and use predictors of open data technologies: Drawing upon the unified theory of acceptance and use of technology. *Government Information Quarterly*, 32(4), 429-440.

3 Mission oriented innovation model

The mission oriented innovation model has been inspired by the Osterwalder and Pigneur methodology². The mission oriented innovation view aims to provide a wider view of innovation model considering a wide range of different missions driving organisations being part of the SIMPATICO framework (to be refined during SIMPATICO execution); here follows a description of its components:

- **Values (social, scientific and economic) Proposition:**
In this section, all SIMPATICO exploitable results identified in the following section 4 of this document are reported, independently from the type of value proposition (Sustainability, Research or Business) that they are focused on.
- **Stakeholders' relationships:** In the first part of the project, 8 types of stakeholders have been identified³. Here, following the relationship map, they are grouped according to the type of exploitation they are supporting in the project. Figure 3 re-proposes the schema presented in D7.2. The particular characteristic of this project that sees, from one side, Business and Research interests and, from the other, Public Administrations requests the engagement of stakeholders from the PA side which should be part of existing networks, so to give visibility to business and research partners for possible further development and related exploitation of SIMPATICO results.

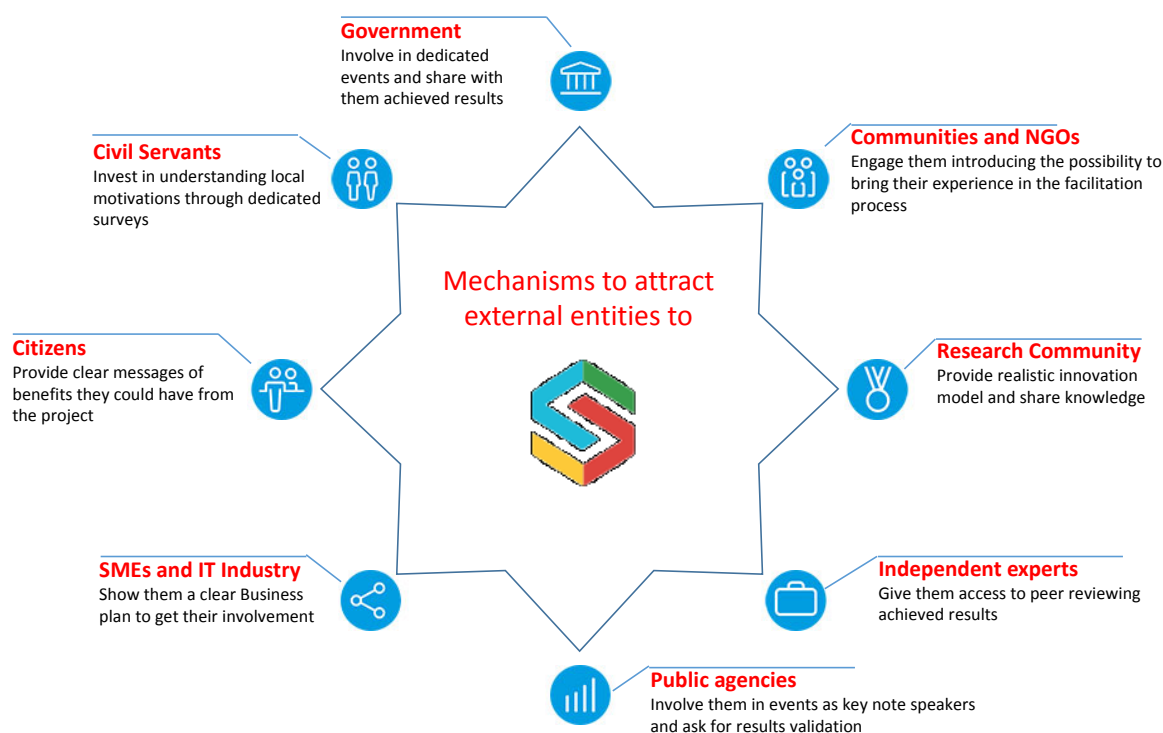


Figure 3 - D7.2 - Stakeholders Categories

² Osterwalder, A., & Pigneur, Y. (2010). Business model generation: a handbook for visionaries, game changers, and challengers. John Wiley & Sons.

³ See D7.2 Dissemination plan pag. 12

- **Channels:** SIMPATICO engagement strategy is based on the involvement of stakeholders in events like workshops and hackathons in the three pilot sites, as well as on the dissemination through social media of project's outcomes. In Figure 4 the flow shown in D6.3 is proposed again to recall the engagement mechanism proposed by the project.

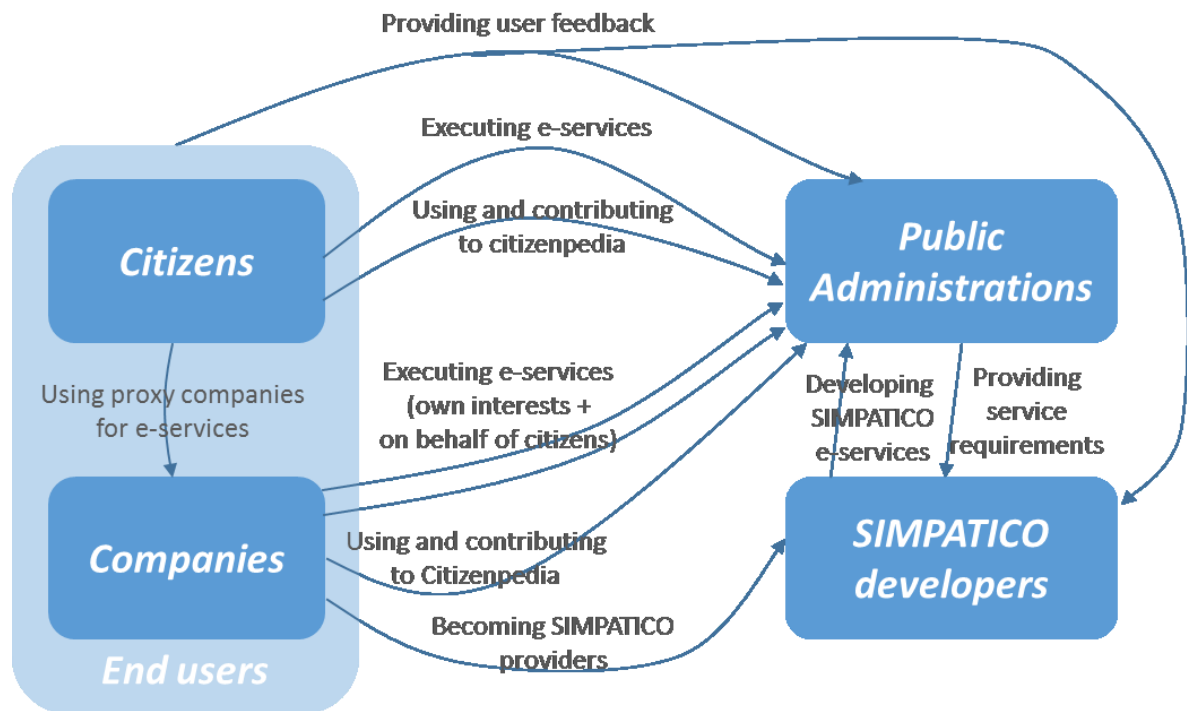


Figure 4 - D6.3 – Stakeholders relationships and interactions

- **Key Resources:** The most exciting challenge in SIMPATICO project is the research dealing with the use of sophisticated technologies to simplify citizens' day by day life while keeping those solutions easy and invisible; this process involves almost all stakeholders acting in field with citizens, and all of them, have to be considered key resources for the project innovation.
- **Key activities:** Requirements collection and Methodology definition, Research and Development, Testing, Training, SIMPATICO outcomes delivery and the definition of policies that could help citizens, starting from those involved in pilots, to have new great experiences with service self-adaptation to their needs.
- **Key Partners:** Starting from consortium partners, the project considered three main categories according to the SIMPATICO exploitation pathway, that are expected to join:
 - Business partners: Bruno Kessler Foundation, Engineering, HI Iberia, Sparta and Beng.
 - Sustainability partners: city of Trento, Galicia region and Sheffield City Council.
 - Research, Academia: Bruno Kessler Foundation, Deusto University and Sheffield University.
- **Beneficiaries:** Four categories of beneficiaries, based on the type of benefit they could gain, have been identified: Cat1: Public administrations/bodies; Cat2: Active actors in the SIMPATICO process; Cat3: Institutional users/sponsors; Cat4: Citizens/users. Type of involvement are classified as follow: FS: Financial support, RS: Resources support, SP: Sponsorship, PR: Service provider, FU: Final user.
- **Cost structure:** The future cost structure to keep SIMPATICO growing and alive could be summarised into three main categories of costs:

- Maintainance of the infrastructure: the core infrastructure on which SIMPATICO environment is built should be kept up and working while services will be enlarged and improved themselves. That means a cloud based and flexible approach is needed in order to guarantee the flexibility in terms of costs over the technical one.
- Support for further research: SIMPATICO is providing outcomes as results of a research project. Those results will need pre-commercialisation activities and, on the same time, further research should keep the environment open to future challenges. Research should also address social aspects related to inclusion of elderly and disabled persons.
- Running costs: All services developed in SIMPATICO will have running costs out of the infrastructure maintenance. For those costs, where the decision is going towards a public domain access, they should be covered by public or private funds dedicated to the specific activity. For services provided under a business mechanism, all running costs should be part of the business model of the entity who will deliver those services. Due to the fact that SIMPATICO is strongly focused on delivery of public services, public administrations are expected to cover those costs.
- Outcome streams: simplification of public services is mostly a matter of public administrations but often services or specific functionalities are provided by external factors such as SMEs or when addressing the structure of the service provision by large enterprises. It is not secondary the potential outcome in terms of facilitation for citizens' inclusion and NGO benefits SIMPATICO can gain, so the proposed approach would be to trace not only revenues stream but in general outcomes stream. Two categories of outcomes have been identified:
 - a) **FINANCIAL OUTCOMES**: for business actors, revenues are coming from having SIMPATICO outcomes (business ones), on the market following the time to market described in the following part of the document.
 - b) **NON-FINANCIAL OUTCOMES**: for non-business-oriented partners, SIMPATICO outcomes (sustainability and research ones), are expected to gain tangible advantages from the research done in the project for those involved in research and to measure visible service improvement for public bodies. Both those outcomes should have a tangible social impact mainly in terms of citizens' inclusion, since project's results are targeted towards achieving a further adoption of e-services by different societal sectors.

An Exploitable results management tool is in place and will allow to keep trace of changes occurred in the single outcome exploitation strategy in short time.

In Figure 5, a canvas summarising the overall picture is reported. The canvas has been regularly updated during the project lifetime and it is now providing the final view at the end of the project.

Mission oriented SIMPATICO Exploitation model

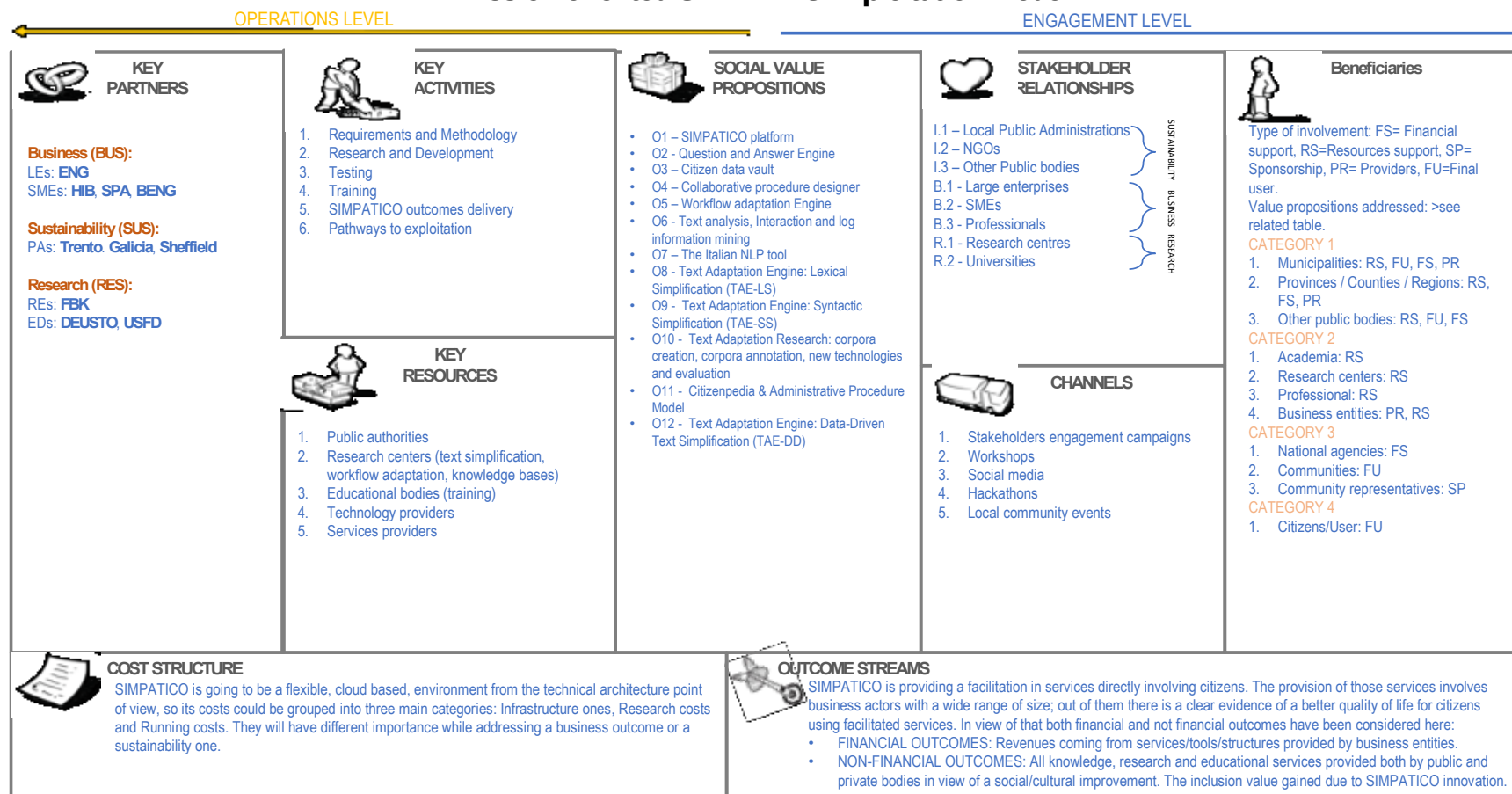


Figure 5 - Mission-oriented SIMPATICO Exploitation model

The Mission Oriented Innovation canvas has been a dynamic dashboard of SIMPATICO project innovation and includes inputs coming from the innovation monitoring tool described in section 9 of this document.

The canvas is intended to be also a presentation tool for new stakeholders to make them be aware of the features and assets SIMPATICO provides for their interest.

An interactive version of that is available for partners, in a dedicated area in the SIMPATICO website (*link not provided for confidentiality*).

4 Exploitable results assessment

In the following section, a relationship map is provided to assess, in the overall innovation strategy, each of the early identified expected SIMPATICO outcomes. This map is intended to drive focused and tailored exploitation activities addressing directly each stakeholder's expectation. Dissemination activities as well are going to be selected and configured according to the added value SIMPATICO results could bring to specific needs.

The idea to use a “relationships map” to drive the innovation strategy in the project has been appointed due to its possible dynamic management during the project life and over.

The main principles applied are the following:

- a) Each expected result is the output of one or more SIMPATICO WPs;
- b) Each result is going to generate outcomes that interest one or more stakeholders' exploitation categories (see section 2 of this document);
- c) Stakeholders groups are dynamic and it is important to identify their priorities in terms of relationships with SIMPATICO exploitation pathways.

The relationships map will be kept updated and on-line during the project lifetime and it will be used in the final phase to consolidate all collected reactions coming from the stakeholders' arena.

Three WPs are not linked to outputs since they are dedicated to project management, dissemination and exploitation plus ethics requirements.

Each node of the map has its own description and where available the link to running documents addressing the specific node. In this document, a detailed snapshot with the related updated innovation strategy including its market view is provided.

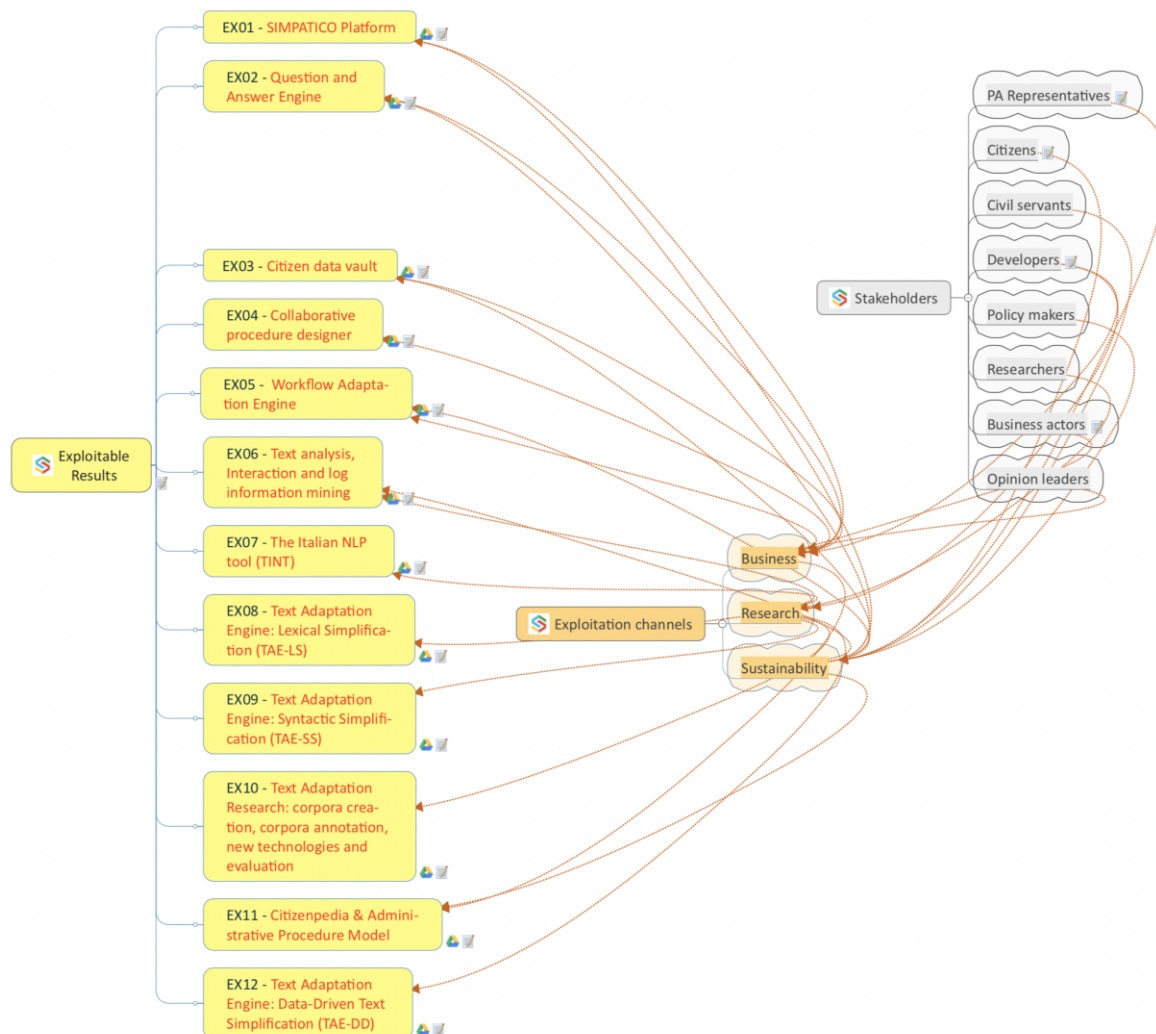


Figure 6 - Relationship MAP

The map could be easily navigated at the following address: *(not available in the public version)*

4.1 Exploitable results

In this section, the identified exploitable outputs achieved by SIMPATICO project are analysed to address their possible participation in the innovation process.

4.1.1 SIMPATICO Platform

Exploitable result	EX01 - SIMPATICO Platform
Description	<p>The SIMPATICO Platform is an open source solution that integrates the advanced techniques developed in the SIMPATICO project and enacts their deployment on top of the existing PA systems for on-line service delivery.</p> <p>The value is in the usage of emergent technology from the cognitive systems and human computation domains, which offer unique opportunities of delivering customer-centric, personalized services and of</p>

	triggering a continuous optimization of services and processes, thus overcoming the existing barriers in the adoption of e-services.
SIMPATICO applications or use cases involved	The SIMPATICO Platform is a key outcome of the project. Its implementation involves all research and technical partners of SIMPATICO, and its evaluation is performed in the three project pilots.
Type(s) of foreground	BUS: Business Oriented Exploitation
Involved stakeholders	<p>The commercial target for this product are the PAs (and in perspective other private sectors) interested to exploit the full potential of service digitalization and engagement.</p> <p>Professionals (and association of professionals) have an important role for the management and update of the knowledge repository in the Citizenpedia component of the Platform (see EX02).</p> <p>In addition to Professionals, users of the SIMPATICO Platform are the Citizens and Companies (as consumers of the e-services) and the Civil Servants (as providers of the e-services).</p>
Exploitation channel(s)	The main commercial target for SIMPATICO Platform are PAs. The main foreseen exploitation channels are the incomes derived from usage of the SIMPATICO platform (both as software product license and in software-as-a-service modality), and the associated customization, integration and operation services.
Replicability in other domains and ecosystems	<p>The SIMPATICO Platform targets the e-government domain. Attention has been paid to ensure the replicability of the platform within this domain: this includes the adoption of interoperability guidelines, the modular design, the possibility to operate as an overlay of existing PA systems for on-line service delivery.</p> <p>While replicability in other domains (in particular in private sectors) is possible, no specific action (e.g., specific replicas for testing in other domains) has been planned yet in this direction.</p>
Business models	<p>The most probable business model for this product is a traditional B2G (business-to-government) model. In the UK, most of city councils outsource specific services so SIMPATICO could be introduced by players used to manage public services delivery such as telecom provider or legacy solution providers.</p> <p>More innovative business models are also foreseeable, where no upfront costs are asked to the PAs, and the revenues come from the savings obtained by (the positive effects of) the adoption of e-services.</p>

Table 2 - SIMPATICO platform

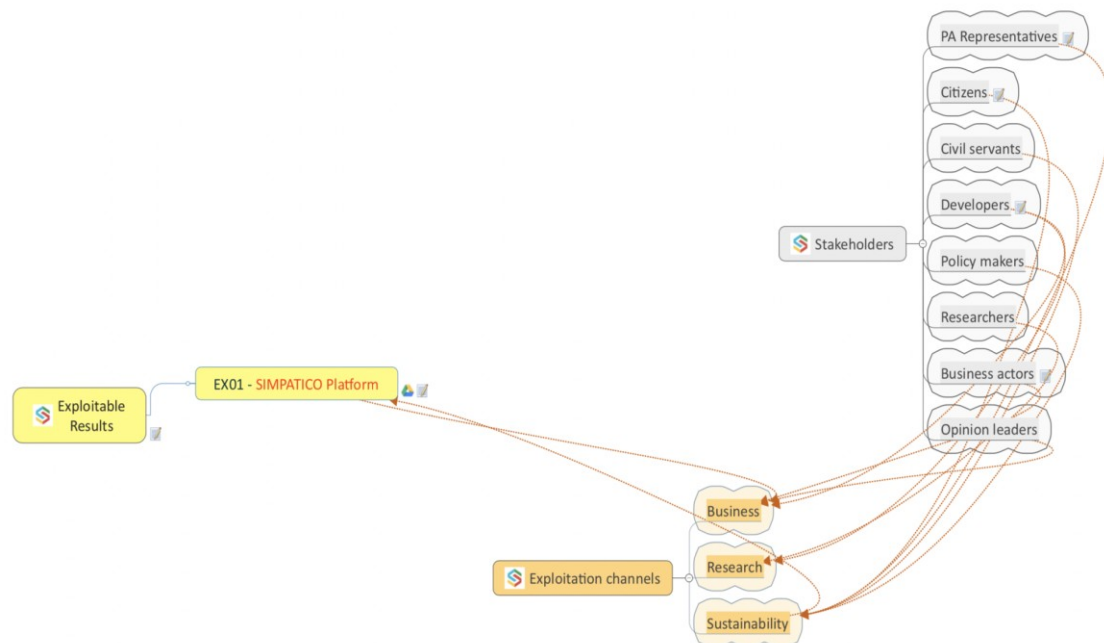


Figure 7 - SIMPATICO platform relationships

4.1.2 Question and Answer Engine

Exploitable result	EX02 – Question and Answer Engine - QAE
Description	<p>The Question & Answer Engine (QAE) is a collaboration environment which provides a mechanism where citizens post and resolve doubts regarding e-services and public administrative procedures. The main functionality of QAE is to allow the creation and answering of questions following a crowdsourcing approach. Users are encouraged to contribute contents (questions & answers) in a public manner, with the goal of keeping the generated information to remain over the time. The QAE design considers having two main roles: user and moderator. Initially, every citizen is a user and every civil servant is a moderator. Users can search along QAE and post content. Moderators have higher privileges, i.e., permission to edit/delete contents from other users, addressing the problem of low-quality contents sometimes resulting from user contributions. To keep the user engaged, a rewarding and reputation mechanism is considered which can promote a standard user with moderator duties. The QAE is one of the three tools part of the Citizenpedia Human Computation component which is detailed in EX11.</p>
SIMPATICO	QAE is deployed in the three SIMPATICO pilots (Trento, Galicia, Sheffield).

applications or use cases involved	It has been tested both by citizens and civil servants. The QAE is tightly coupled with the IFE component, which provides access to the SIMPATICO features.
Type(s) of foreground	The QAE is provided as a web-based application. Once deployed, the users see it as a responsive web application, usable from their PCs, tablets or smartphones.
Involved stakeholders	The stakeholders of the QAE will be citizens and civil servants. The former ones will be the main users of the application, as they will use it to post/resolve doubts. The latter ones will act as moderators. They will also be master providers of contents, helping in the initial initialization and maintenance of questions and answers associated to public procedures.
Exploitation channel(s)	The main exploitation channel will be consultancy to PA, i.e. to provide support for the deployment of the QAE to different Public Administrations. The QAE can also be used as a next generation FAQ for other private organizations willing to enrich the support they offer to their customers, enabling the collaboration of their customers in such support, e.g. completion of complex insurance claim procedures. This could be understood as a clear intend to promote transparency to customers by a given company.
Replicability in other domains and ecosystems	The QAE has been designed to be easily replicable in different PAs/councils or private organizations.
Actions	The QAE as part of Citizenpedia core component has been demoed to SIMPATICO public administration and also to Madrid and Bilbao councils in SPAIN. It has been presented in several international conferences. It has been deployed in the three project pilots. It has been integrated within the Citizenpedia component as described in EX11.

Table 3 - Question and Answer Engine

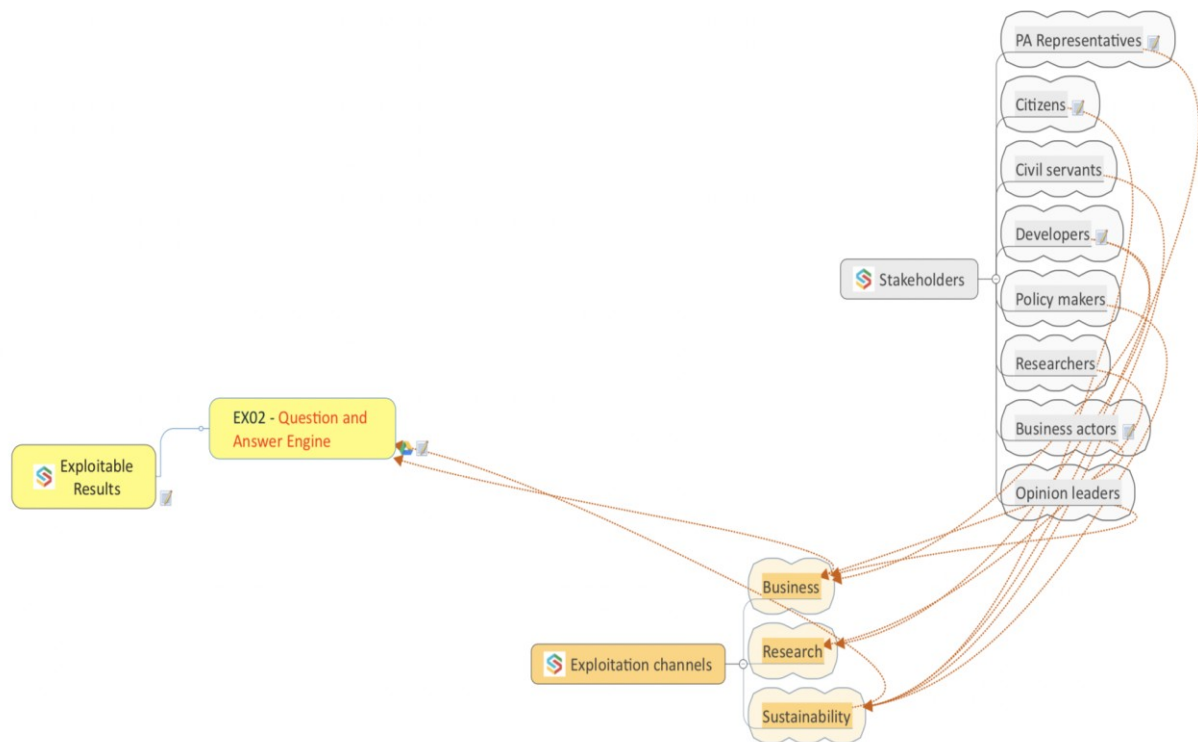


Figure 8 - Question and Answer Engine relationships

4.1.3 Citizen data vault

Exploitable result	EX03 - Citizen data vault
Description	<p>Citizen Data Vault (CDV) is a Personal Data Store providing a secure repository of Personal Data of the stakeholders (citizen, company) used during their interactions with the personalized services provided by the PAs using the SIMPATICO Platform. The CDV enables citizens (and companies) to gather, store, update, correct, and share personal data. Of particular importance is the ability to grant and withdraw consent to third parties for access to data about oneself in adherence with GDPR requirements⁴.</p> <p>With the CDV, citizens have a practical mean to manage their data and privacy. They became empowered actors, not passive targets, in the management of their personal information. In particular data users (data owner, data consumer, data providers) can:</p>

⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R0679&from=IT>

	<ul style="list-style-type: none"> • Manage Personal Data and Metadata (Ontology) • Register Services • Map Data service and Personal Data Ontology • Manage Data consent • Store Personal Data • Retrieve Personal Data. <p>The above features are provided by means of a set of modular components which compose the entire CDV.</p> <p>According to the Hype Cycle for Digital Government 2018 Gartner⁵, the market for Personal Data Vault (CDV) is embryonic, with limited penetration by major players such as Facebook, Google, Microsoft, Mydex CIC, PayPal, Qiy Foundation. In order to grow, the CDV must resolve both technical issues (interoperability, latency, guaranteed availability, security) both cultural and legal difficulties. It is not expected before the next 5/10 years a marked spread of these systems but, according to Gartner, the impact of a massive adoption of CDV could be "disruptive" and systemic and causing a paradigm shift that put the citizen at the centre of its data and the PA at its service.</p>
SIMPATICO applications or use cases involved	Citizen Data Vault is deployed in the three pilot use cases (Trento, Galicia and Sheffield) and interacting with the SIMPATICO Interaction Front End (IFE), it enables users (citizen and companies) to store and retrieve data during the interaction with public e-services.
Type(s) of foreground	BUS – Business Exploitation SUS – Sustainability Exploitation
Involved stakeholders	Among potential main stakeholders we can firstly consider municipalities of varying size including large, medium and small. In addition to the municipality partners of the project, which are currently using the SIMPATICO Platform in the three pilot sites (Trento, Sheffield and Galicia), we are going to propose the solution to other municipalities by means of our PA business units
Exploitation channel(s)	The main exploitation channels for the CDV asset which will be investigated are: <ul style="list-style-type: none"> • The SaaS/PaaS model by using our commercial infrastructures; • A sandbox providing the functionalities of the platform for commercial demos

⁵ <https://www.gartner.com/doc/3884179/hype-cycle-digital-government-technology>

	<ul style="list-style-type: none"> • Integration in custom on-premises solution (i.e. PA premises) • New solution component for others Open Platform/framework (i.e. FIWARE⁶)
Replicability in other domains and ecosystems	Citizen Data Store has a wide applicability in several domains and ecosystems where the use, management and preservation of personal information are key aspects for the design of Information Systems based on “Privacy By Design” ⁷ Principles.
Actions	During Engineering workshop “Public Services and Social Inclusion”, in which various ENG business units were attended, in particular Municipia ⁸ , the Engineering Group's new company for Local Bodies, a preliminary presentation about the CDV was performed. The great interest shown led to the planning of a detailed presentation of CDV features and to discuss its commercial exploitation.

Table 4 - Citizens data vault

⁶ FIWARE: <https://www.fiware.org/>

⁷ Privacy by Design: <https://gdpr-info.eu/art-25-gdpr/>

⁸ MUNICIPIA: <http://eng.it/gruppo/scheda-descrittiva-societa.dot?com.dotmarketing.htmlpage.language=3&id=0649c496-41d9-442f-8ccb-c7a13cf5e310>

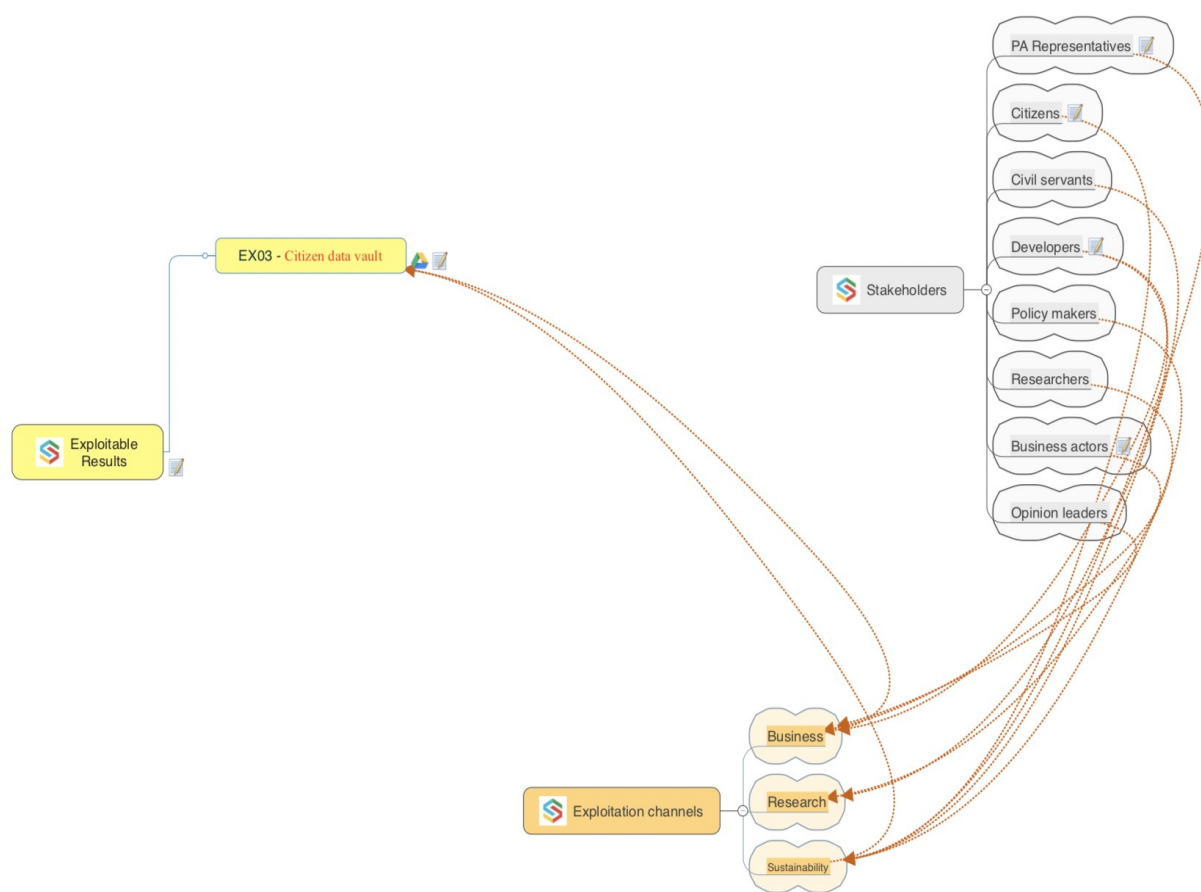


Figure 9 - Citizens data vault relationships

4.1.4 Collaborative procedure designer

Exploitable result	EX04 - Collaborative procedure designer
Description	<p>The Collaborative Procedure Designer (CPD) is a collaborative environment in which different SIMPATICO stakeholders (more specifically citizens and civil servants) cooperate to the design and the improvement of administrative procedures.</p> <p>The CPD allows to graphically describe administrative procedures implemented by the Public Administration (PA) in the form of flowcharts/diagrams and enables citizens to comment on them.</p> <p>The core of the CPD is a model that allows for the definition of multiple hierarchical views, each providing a representation of the procedure with a growing level of details: the value-chain view, the interaction view and the business process view. The <i>value-chain</i> provides information concerning the sequential phases that the procedure is broken into. By expanding a specific phase, an interaction view gets displayed: this view shows a flow of the interactions between the citizen and the PA that are carried out in that phase.</p>

	<p>For any interaction, it is pointed out who of the two actors is the interaction's initiator. Also, the communication channel through which the interaction will occur is explicitly indicated by means of specific icons. Finally, the <i>business view</i>, which is realized by means of standard notations like the BPMN⁹, is meant to represent the workflow of PA activities going on behind the scenes to serve the citizens' needs.</p> <p>While the citizen is the user that will benefit of these views, the civil servant is in charge of drawing the views. In fact, the latter is provided with a graphical designer and a set of drawing tools that they can use to create the hierarchical views of an administrative procedure. In the role of citizen, the user is also allowed to interact with the diagram by asking specific questions, through the QAE, in all the cases that some information is not perfectly clear to them or further information is needed.</p> <p>Citizens are also allowed to post suggestions and useful feedbacks whenever they realize that, for a specific procedure's step, some improvement might be achieved.</p> <p>To the best of our knowledge, the possibility for the citizen to see the workflow of the administrative procedure in a simple and graphical way, together with the possibility to online comment and/or ask clarifications, is a unique and distinctive feature of the CPD tool.</p> <p>Even if some public administration use software tools to model administrative procedure, their usage is mainly meant for IT specialists or business analysts, being the process notation (usually the BPMN or a similar one) not very simple to understand for citizens or even civil servants.</p>
SIMPATICO applications or use cases involved	<p>Collaborative Procedure Designer (CPD) is deployed in the three pilot use cases (Trento, Galicia and Sheffield) within the Citizenpedia environment (see EX11). It allows the civil servants to model public procedures and workflows to access and use services provided by public administration, and the citizens to comment and/or ask question about those procedures, getting then some feedback.</p>
Type(s) of foreground	BUS – Business Exploitation
Involved stakeholders	<p>Since the Collaborative Procedure Designer (CPD) is deployed in the three pilot use cases (Trento, Galicia and Sheffield), the first stakeholder involved will be the PAs partner of the SIMPATICO project itself.</p> <p>Secondly, since the CPD can be used together with other SIMPATICO components, particularly those belonging to the Citizenpedia parent component, the other technological partners of SIMPATICO will be important</p>

⁹ BPMN: White, S. A. (2008). BPMN modeling and reference guide: understanding and using BPMN. Future Strategies Inc..

	<p>stakeholders.</p> <p>Complementary stakeholders involved in the exploitation strategy of SMEs will include, from one side, local public administration, and on the other one, PA consultants.</p>
Exploitation channel(s)	<p>The main exploitation channel will be consultancy services targeting PAs: even though the CPD can be offered in a Software as a Service model, BEng could provide consultancy services for modelling administrative procedures of interested PAs and training for their civil servants.</p>
Replicability in other domains and ecosystems	<p>In principle, the CPD could be used by all organizations that intend to let the customers play an active role by contributing to the modelling of all the processes whose main target is delivering a service to the customers themselves.</p> <p>However, at the moment, the exploration of the business replicability is not among BEng priorities.</p>
Actions	<p>The CPD as part of Citizenpedia core component has been demoed to SIMPATICO public administration and also to Madrid and Bilbao councils in SPAIN. It has been presented in several international conferences. It has been deployed in the three project pilots. It has been integrated within the Citizenpedia component as described in EX11.</p>

Table 5 - Collaborative procedure design

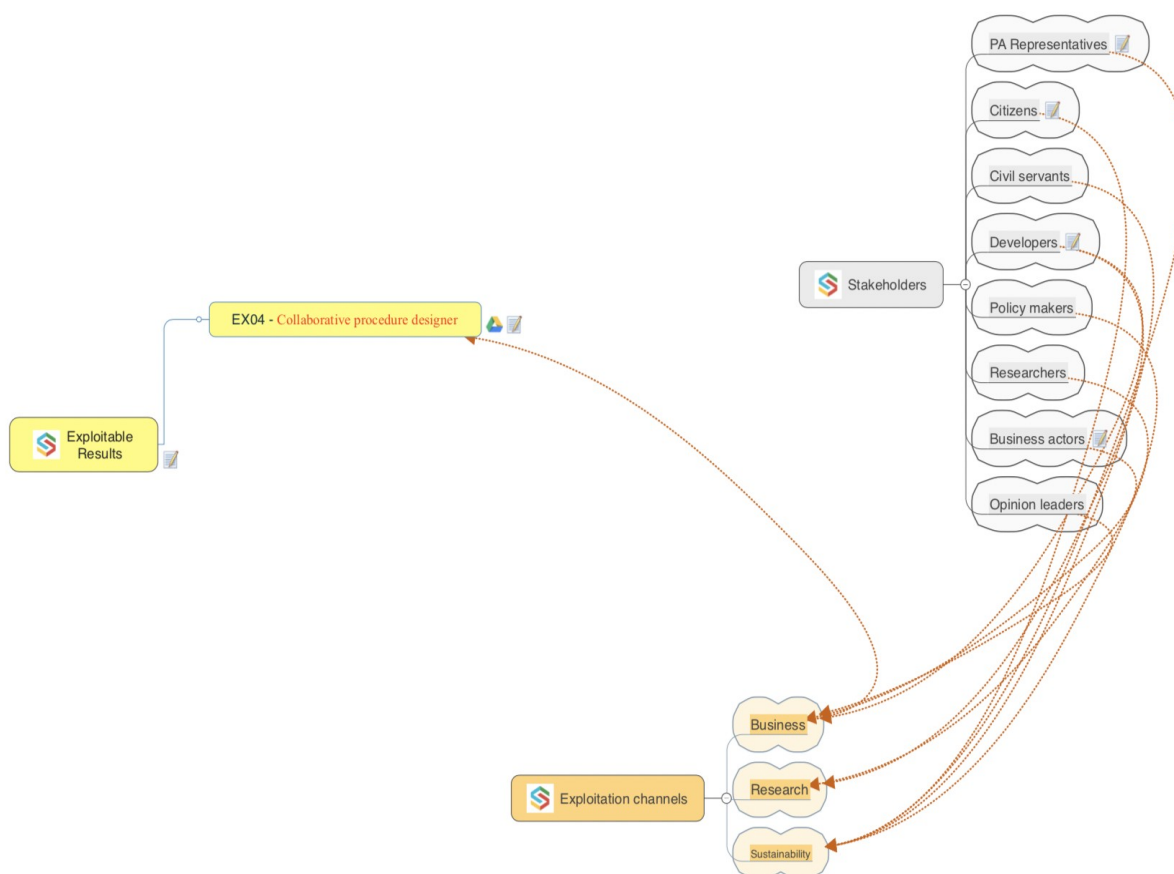


Figure 10 - Collaborative procedure design relationships

4.1.5 Workflow Adaptation Engine - WAE

Exploitable result	EX05 - Workflow Adaptation Engine - WAE
Description	<p>In many cases, the structure of the e-service forms is very complex, mainly because forms are composed as a sequence of a large number of atomic information units (e.g. user registry, services specific information and data, declaration, ...).</p> <p>Usually, the design of the e-service replicates the paper forms, which usually have a complex structure and have been implemented considering the possibility to engage a professional or a civil servant to support the citizens in filling them. This situation puts the citizen in the unfortunate position of having to manage the complex interaction in a self-service way.</p> <p>The Workflow Adaptation Engine (WAE) introduces interface adaptation techniques for simplifying the interaction, by exploiting the structure of the form in the different information units, by assisting the users in filling each information unit and in navigating among the different units, and in general by</p>

	<p>adapting the complexity of the interaction to the specific user competences and capabilities.</p> <p>The integration of the WAE on an existing on-line service delivery system is easy – it requires the integration of a JavaScript library and some tagging of the structure of the form – and the visual impact on the e-service page is minimal.</p>
SIMPATICO applications or use cases involved	The WAE has been used in the pilots in order to adapt the e-service interaction workflow according to the specific user competences and capabilities.
Type(s) of foreground	BUS – Business Exploitation
Involved stakeholders	Public (e.g. municipalities) and/or Private (e.g. insurance companies) Bodies which provide e-services requiring complex interaction.
Exploitation channel(s)	The main exploitation channel would be a mix of Software as a Service, consultancy, and customization.
Replicability in other domains and ecosystems	<p>Public and/or Private Bodies which provide e-services requiring complex interaction:</p> <ul style="list-style-type: none"> • PAs (local and/or central) • Agencies • Insurance companies, banks, ...
Actions	The Workflow Adaptation Engine has been presented to GLOBO ¹⁰ , the company providing Sportello Telematico to Trento, to the National Association of Italian Municipalities and to some Italian municipalities. Moreover, WAE is part of a technology transfer initiative held by Comune di Trento named SPRINT project. The project aims to package some of the SIMPATICO tools in a reusable solution which initially will be evaluated in four Italian municipalities.

Table 6 - Workflow adaptation engine

¹⁰ GLOBO srl: <http://www.globogis.it/>

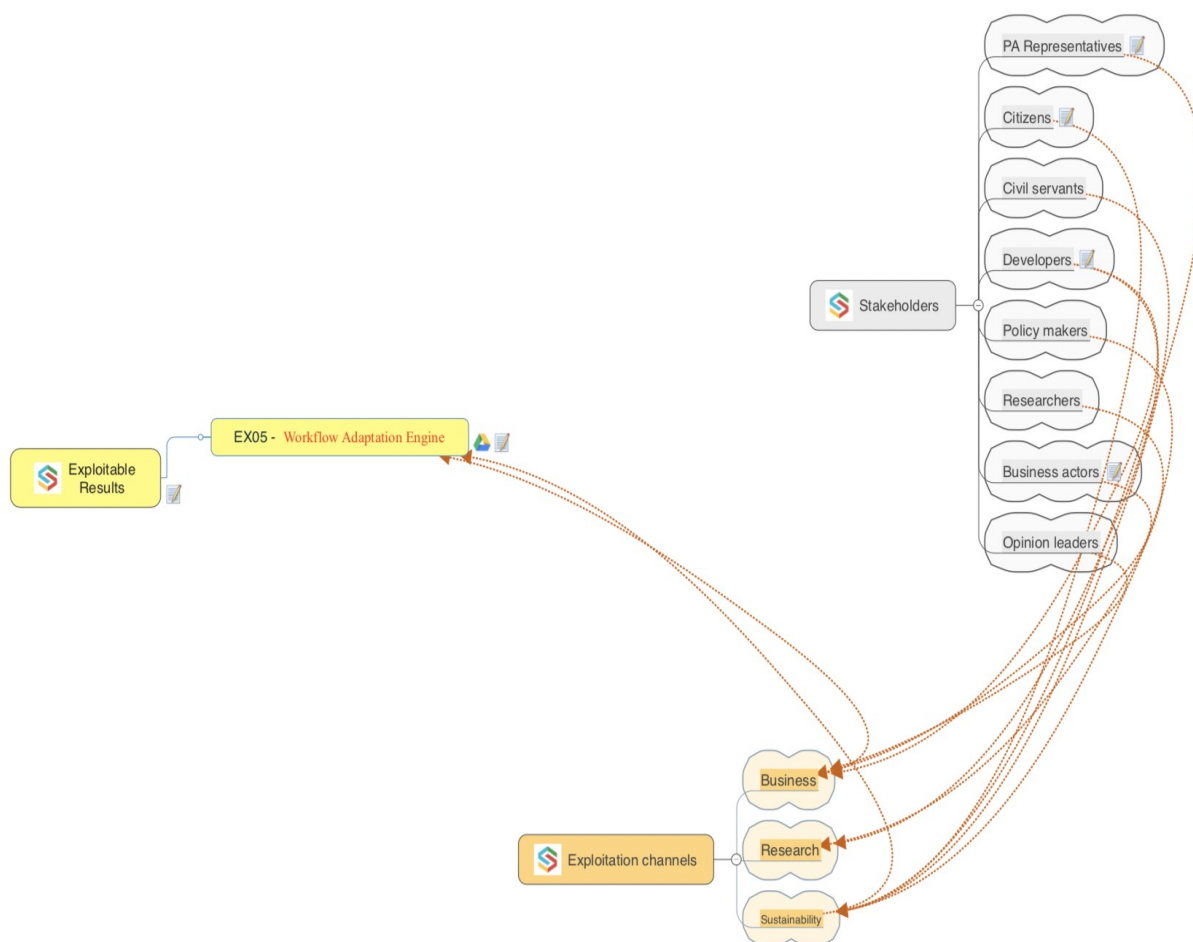


Figure 11 - Workflow adaptation engine relationships

4.1.6 Text analysis, Interaction and log information mining

Exploitable result	EX06 - Text analysis, Interaction and log information mining
Description	<p>The team intends to exploit several of the analysis stages proposed in SIMPATICO:</p> <ul style="list-style-type: none"> • Text Analysis as used in early stages of text adaptation. Specifically, automated assessment of text complexity. • Text Adaptation and simplification, specifically summarisation and clusterisation applied to the analysis of multiple feedback from the users. • Interaction analytics, applied to the understanding of how users interact with software user interfaces and how the common problems can be semi automatically identified and quantified.
SIMPATICO applications or use	All the Text Simplification and Data Analysis components for the Galicia and Trento Pilots. Concretely the following components:

cases involved	<ul style="list-style-type: none"> • Text Adaptation Engine: to analyse and manipulate textual assets • Data Analysis: to gather statistical feedback from the interaction by the users. • Session Feedback: to gather explicit feedback from users by asking them via interactive forms. • Log (auxiliary component, not related to the core functionalities to be exploited for billing purposes)
Type(s) of foreground	<p>RES – Research Exploitation</p> <p>BUS – Business Exploitation</p>
Involved stakeholders	<p>The following stakeholders still being identified:</p> <ul style="list-style-type: none"> • Internal actors in HI Iberia: business units for related products such as SAMi2¹¹, technology strategists such as the company's CTO. • Interested PAs <ul style="list-style-type: none"> ◦ Madrid City Council: have provided preliminary feedback of the intended results from SIMPATICO (see 'Actions'). ◦ Madrid City Police: users of the SAMi2 solution. • Providers of Free/Open Source components reused in HIBs developments. This includes for example: <ul style="list-style-type: none"> ◦ Stanford NLP components ◦ Apache products Spark and Hadoop ◦ R/GNU Octave for data analysis
Exploitation channel(s)	<ul style="list-style-type: none"> • Incorporation in current products: <ul style="list-style-type: none"> ◦ SAMi2: (http://sami2.hi-iberia.es/) <ul style="list-style-type: none"> ▪ The current application is a semantics powered monitor of user activity in social media. It uses NLP to analyse text in Tweets to try and detect useful scenarios. The core application domain is safety provision by Police forces and the detection of illegal activities. ▪ SIMPATICO NLP work is expected to improve the general text analytics capabilities of the used NLP stack. ◦ hiSchoolBook (http://hischoolbook.io/) <ul style="list-style-type: none"> ▪ hiSchoolBook is a collaborative e-learning platform aimed primarily at university education and also to education in professional domains. The platform provides tools (similar to Google Docs) that enable teachers and pupils to create content and evaluate progress. ▪ The platform generates large quantities of text and also enables users to produce new and upload third party contents (e.g., textbooks). It is expected that SIMPATICO

¹¹ SAMi2: <http://sami2.hi-iberia.es/>

	<p>may help in simplifying complex contents and provide automatic readability indices for the shared contents.</p> <ul style="list-style-type: none"> ○ REVITA: (http://revita.hi-iberia.es) <ul style="list-style-type: none"> ▪ REVITA is a remote care application for elderly people and medical patients that enable a small workforce of carers to help them in a 'virtual nursing home' paradigm. The platform provides a virtual agent to help the users when no human carers are available. ▪ The 'virtual caretaker' uses NLP techniques to gather information from the user and also to produce useful outputs. This can benefit from SIMPATICO progress in NLP as elders are one of the key user groups that require particular care with text complexity and may need simplification. Additionally, the system has a large interactive part which may benefit from the analytics pipeline proposed by the DA and SF combination. • Addition of Text Analytics assets to company portfolio: New products may be possible when new capabilities produced by HIB in the NLP domain (e.g., Galician language simplification) become available. • Consultancy for external customers: All of the improvements mentioned above may result in HIB developing a significant know-how in some technology domains that may be offered by our consultants working for external companies. Regular customers of HI Iberia consultancy services include large enterprises such as Telefonica, INDRA Sistemas and Banco Santander.
Replicability in other domains and ecosystems	<p>Potential for reuse of the text analytics components is very strong, with very high number of possible applications in any system that collects large number of inputs from users using natural language: feedback systems, suggestion inboxes, etc.</p>
Actions	<p>Meeting with potential external stakeholders like Madrid City Council. Presentation of research activities of SIMPATICO in which the City Council's top responsible of transparency was interested in methods for semi-automatic analysis of citizens' feedback through the proposed online channels of Madrid City Council. No concrete follow-up was defined but the participants from HIB noticed a keen interest -- monetization might be difficult due to the manner business are conducted in City Councils, but there are exploitation outlets.</p> <p>Internal analysis of potential exploitations options with HIB's business units for product SAMi2 as defined in Exploitation channels.</p>

Table 7 - Text analysis, Interaction and log information mining

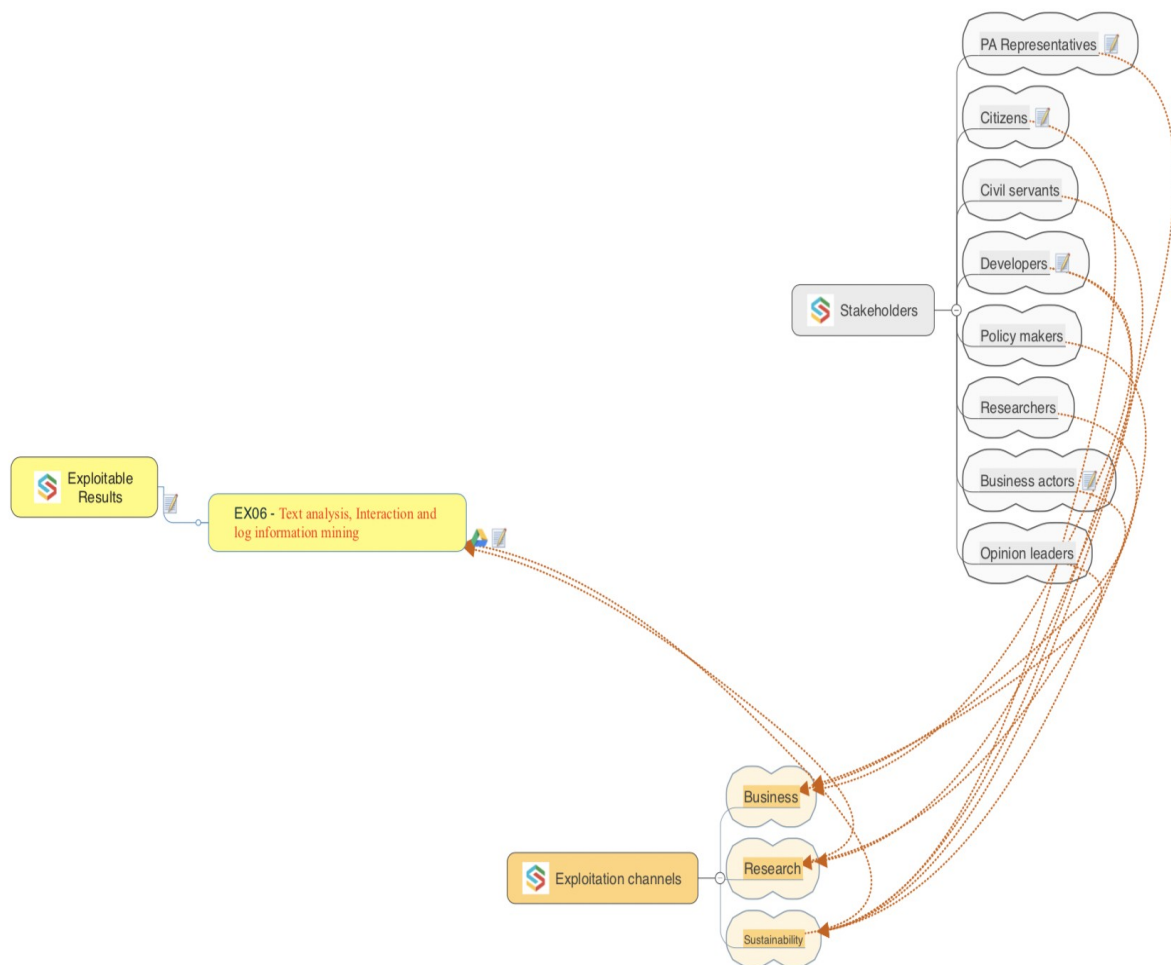


Figure 12 - Text analysis, Interaction and log information mining relationships

4.1.7 The Italian NLP Tool (TINT)

Exploitable result	EX07 – The Italian NLP tool (TINT)
Description	<p>Natural Language Processing of Italian suffers from a lack of good performing tools with open source license. Tint is the first NLP suite of this kind that, based on the Stanford CoreNLP infrastructure, makes available to users and developers different processing tools in a pipeline with the respective models. For some of these tools Tint yields state-of-the-art performance.</p> <p>Technically, Tint (The Italian NLP Tool) is a Java-based pipeline for Natural Language Processing (NLP) in Italian. It is very fast and accurate, and implements most of the common linguistic tools, such as part-of-speech tagging and dependency parsing. The tool can be used as a stand-alone tool, included as a Java library or as a REST API service. Tint also includes wrappers (for third-party applications) that use the CoreNLP paradigm and therefore can</p>

	be applied to languages other than Italian.
SIMPATICO applications or use cases involved	The TAE Engine and the Text Analytics platform rely on TINT for the processing of Italian texts.
Type(s) of foreground	RES – Research Exploitation BUS – Business Exploitation
Involved stakeholders	Tint is a technical tool that works in background and analyses text in Italian. It is used as an API by the Textual Adaptation Engine (TAE).
Exploitation channel(s)	The main exploitation channel would be a mix of Software as a Service, consultancy and customisation.
Replicability in other domains and ecosystems	Tint is a general-purpose tool, which can work every time a text analysis for Italian is needed.
Actions	Tint is one of the reference tools for textual analysis in Italian. It is widely used by Italian researcher around the world.

Table 8 - THE ITALIAN NLP TOOL (TINT)

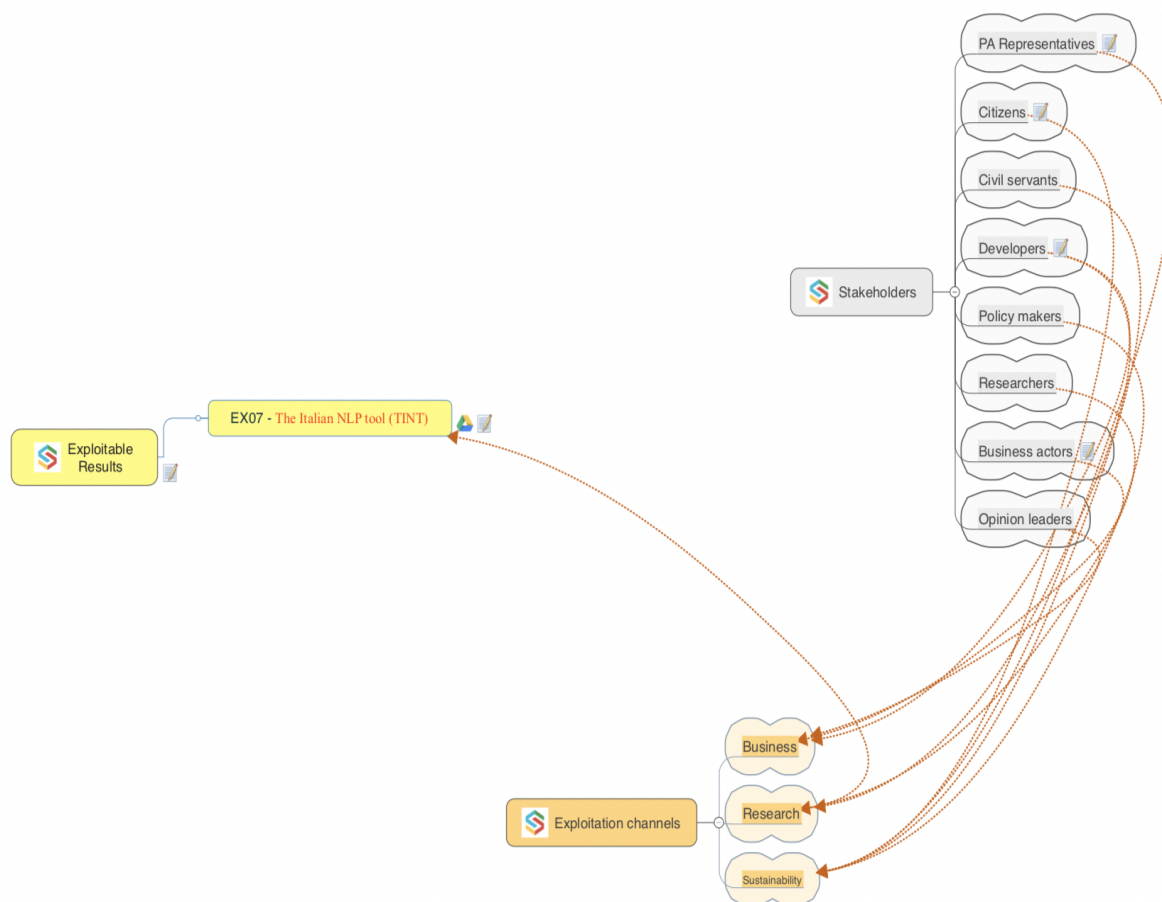


Figure 13 - THE ITALIAN NLP TOOL (TINT) relationships

4.1.8 Text Adaptation Engine: Lexical Simplification (TAE-LS)

Exploitable result	EX08 - Text Adaptation Engine: Lexical Simplification (TAE-LS)
Description	<p>Although more and more services are available online, it is common that their users face difficulties in using them. Complex e-services and technological barriers are probably the most recognised problem, however, the content available may also be barrier for the users. The complex language used for business and government is usually a problem for different types of users, even though they are familiar with technology (e.g. non-native speakers, elderlies, cognitively impaired users, among others).</p> <p>It is common that the content creators do not have expertise in producing simple and accessible documents and it is also very difficult to produce such documents in a way that it would attend the needs of different types of users.</p> <p>Therefore, within the SIMPATICO project, there is a component designed to provide text adaptation for different types of users (called Text Adaptation</p>

	<p>Engine - TAE). TAE needs to deal with different types of content from public administrations and different languages. Finally, it is also expected that TAE will provide personalised text adaptations, targeting individual user needs.</p> <p>More specifically, TAE-LS provides simplification at lexical level: replacing words/phrases considered complex by the user with simpler words/phrases.</p> <p>This component can be easily integrated with minor impact on the e-service interface and it is independent from the syntactic simplification engine (TAE-SS). Moreover, the user has full control over the use of the component, deciding which parts of the text to adapt and being given the choice to revert its output at any time.</p>
SIMPATICO applications or use cases involved	<p>The TAE-LS has been used in the three pilots in order to adapt the e-services content. In the first phase, the text simplifications are of general purpose, without personalisation. For the second phase, personalised simplification has been enabled and the TAE component evolved based on user interactions.</p>
Type(s) of foreground	<p>In its current version, TAE has been implemented as an independent module (https://github.com/SIMPATICOProject/SIMPATICOTAEServer), which is integrated with SIMPATICO platform as an external module. TAE-LS is a sub-component of TAE and partially reused from previous work done at USFD: LEXEnstein. LEXEnstein had been released as open source and has been extended in the context of SIMPATICO to improve its models for English and add models for Italian, Spanish and Galician.</p>
Involved stakeholders	<p>Public administrations and/or private companies (e.g. banks) which provide e-services for a wide audience with complex content. Other stakeholders could benefit from the general TAE component include content creators/providers, such as publishers, news agencies, etc.</p>
Exploitation channel(s)	<p>The main exploitation channel would be a mix of software as a service, consultancy, customization of open source software released.</p>
Replicability in other domains and ecosystems	<p>Public and/or private companies which provide e-services for a wide audience:</p> <ul style="list-style-type: none"> • PA (local and/or central) • Agency • Insurance • Bank • News agencies • Publishers
Actions	<p>The TAE-LS demo has been presented to SIMPATICO public administration and industry partners. TAE-LS has also been presented in research</p>

	<p>conferences.</p> <p>TAE-LS has been deployed in the SIMPATICO platform being the main component for text adaptation in English. Further developments may be done in improving the interaction of TAE-LS component and different front-ends. Improving the way complex words are selected is also an important future work.</p>
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Table 9 - Text Adaptation Engine: Lexical Simplification (TAE-LS)

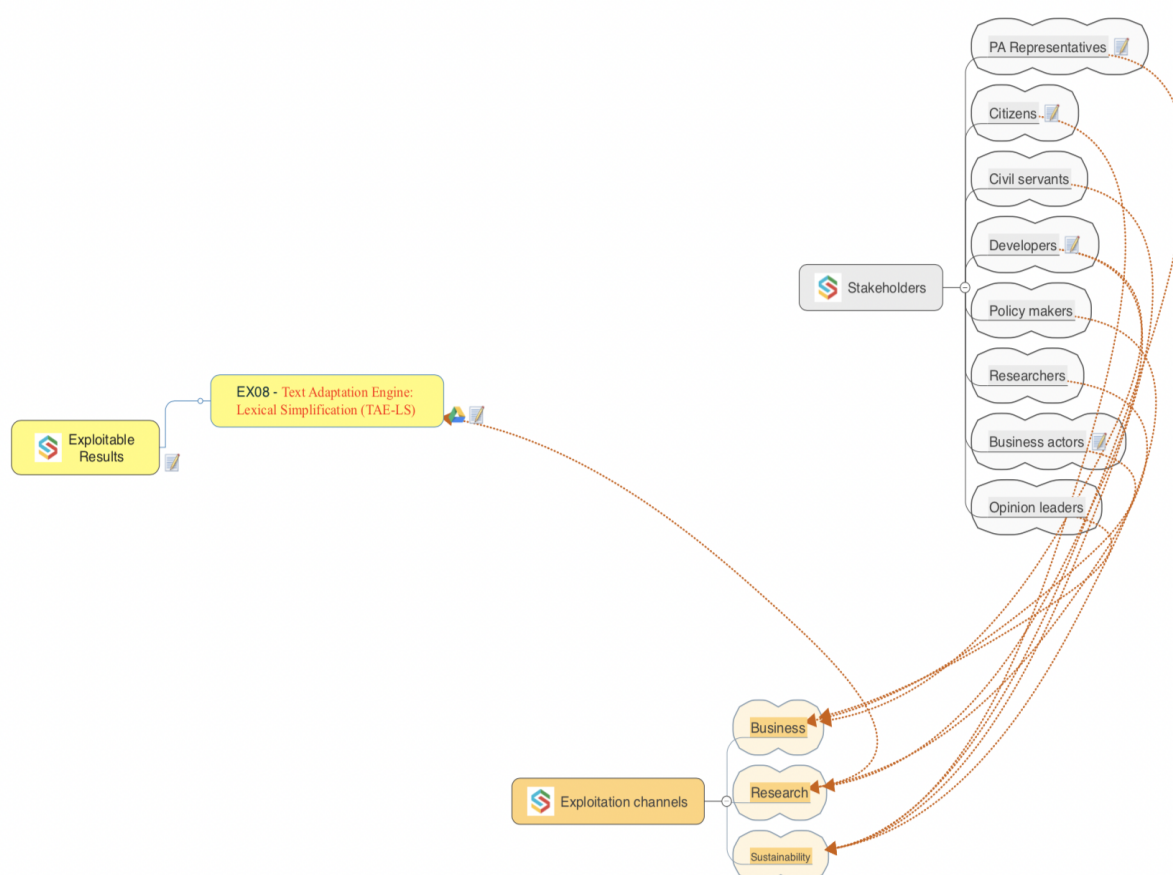


Figure 14 - Text Adaptation Engine: Lexical Simplification (TAE-LS)

4.1.9 Text Adaptation Engine: Syntactic Simplification (TAE-SS)

Exploitable result	EX09 Text Adaptation Engine: Syntactic Simplification (TAE-SS)
Description	<p>Although more and more services are available online, it is common that their users face difficulties in using them. Complex e-services and technological barriers are probably the most recognised problem. However, the content available may also be a barrier for the users. The complex language used for business and government is usually a</p>

	<p>problem for different types of users, even though they are familiar with technology (e.g. non-native speakers, elderlies, cognitively impaired users, among others).</p> <p>It is common that the content creators do not have expertise in producing simple and accessible documents and it is also very difficult to produce such documents in a way that it would attend the needs of different types of users.</p> <p>Therefore, within the SIMPATICO project, there is a component designed to provide text adaptation for different types of users (called Text Adaptation Engine - TAE). TAE needs to deal with different types of content from public administrations and different languages. Finally, it is also expected that TAE will provide personalised text adaptations, targeting individual user needs.</p> <p>More specifically, TAE-SS provides simplification at syntactic level: complex sentences are re-written (e.g. long sentences can be broken, passive voice can be turned into active voice) to provide a simpler version for the user.</p> <p>This component can be easily integrated with minor impact on the e-service interface and it is independent from the lexical simplification engine (TAE-LS). Moreover, the user has full control over the use of the component, deciding which parts of the text to adapt and being given the choice to revert its output at any time.</p>
SIMPATICO applications or use cases involved	Although this module was not deployed in the SIMPATICO pilots, the TAE-SS is available in the SIMPATICO TAE component for deployment.
Type(s) of foreground	In its current version, TAE has been implemented as an independent module (https://github.com/SIMPATICOProject/SIMPATICOTAEserver), which is integrated with SIMPATICO platform as an external module. TAE-SS is a sub-component of TAE and currently it follows a rule-based approach with hand-crafted rules for each language. The technologies for different languages can be used independently.
Involved stakeholders	Public administrations and/or private companies (e.g. banks) which provide e-services for a wide audience with complex content. Other stakeholders could benefit from the general TAE component include content creators/providers, such as publishers, news agencies, etc.
Exploitation channel(s)	The main exploitation channel would be a mix of software as a service, consultancy, customization of open source software released.
Replicability in other domains and ecosystems	Public and/or private companies which provide e-services for a wide audience: <ul style="list-style-type: none"> • PA (local and/or central) • Agency

	<ul style="list-style-type: none"> • Insurance • Bank • News agencies • Publishers
Actions	<p>The TAE-SS demo has been presented to SIMPATICO public administration and industry partners. TAE-SS has also been presented in research conferences.</p> <p>TAE-SS was integrated as part of the SIMPATICO component, although it has not been explored by the pilots. Future work includes improvement of simplification rules and adding new languages do the platform.</p>

Table 10 - Text Adaptation Engine: Syntactic Simplification (TAE-SS)

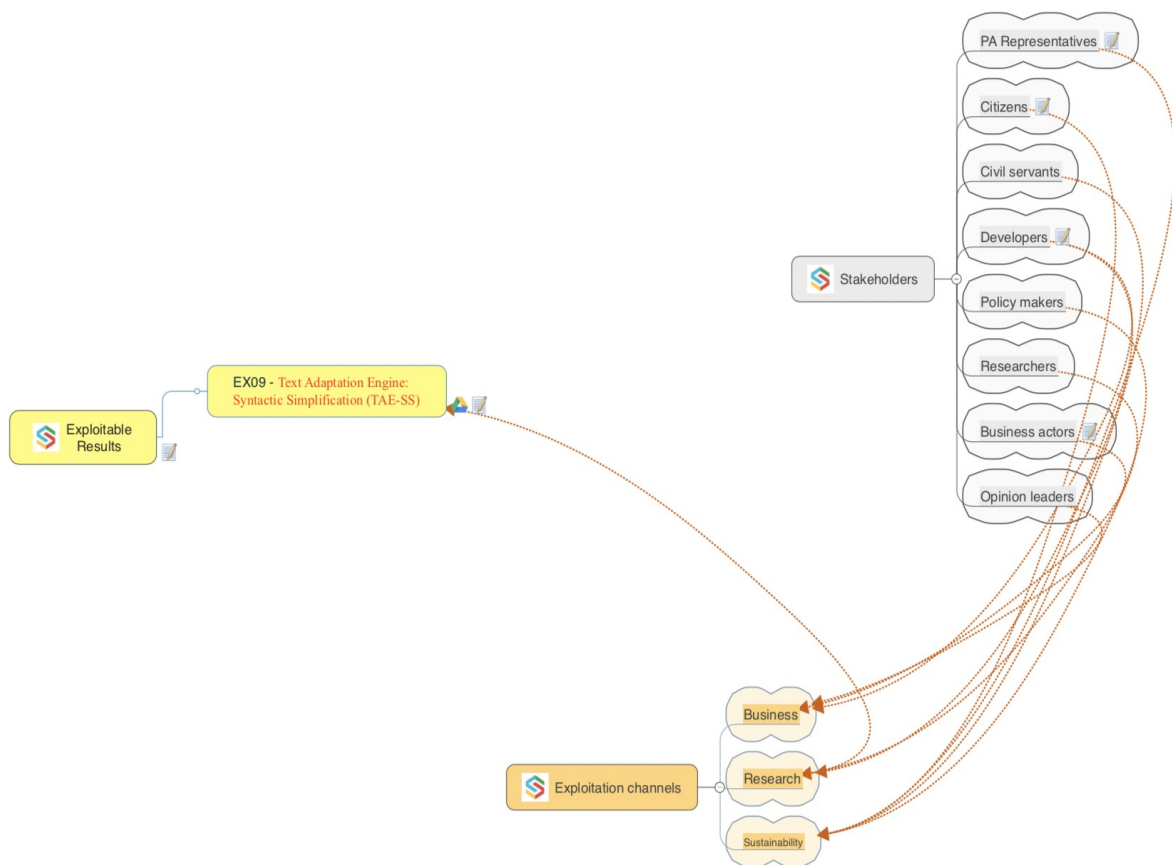


Figure 15 - Text Adaptation Engine: Syntactic Simplification (TAE-SS)

4.1.10 Text Adaptation Research: corpora creation, corpora annotation, new technologies and evaluation

Exploitable result	EX10 Text Adaptation Research: corpora creation, corpora annotation, new technologies and evaluation
Description	<p>Research in text adaptation for different domains and languages has received more attention in the recent years, however, there is still a lot to be done. Especially in topics such as user personalisation, syntactic simplification (beyond rule-based systems) and the use of deep learning for text simplification have not been widely explored. Moreover, simplifications for specific domains such as public administrations are also underrepresented in the area. Therefore, research that tackle the basis of text simplification are also needed to enable the development of SIMPATICO technologies. Even though some of the outcomes of such research are not a product to be directly exploited by the project (e.g. TAE and WAE), they are vital for the development and improvement of SIMPATICO engines, bringing the novelty required to a project of this level.</p> <p>Then, this exploitable result includes sub-products of our research towards the text adaptation for SIMPATICO. These include corpora creation, corpora and dataset annotation, analysis of corpora (including Galician one which was attempted in the project first phase), datasets and tools and the evaluation of existing and newly created resources. For example, as part of the USFD activities within the SIMPATICO project, we have created a corpus with sentences from the PA domain. We also crowdsourced simplifications at lexical and syntactic levels of such sentences and created a resource with original sentences aligned to two levels of simplified sentences. Although such resource is not a direct product to be used within the SIMPATICO architecture, it will definitely be used to improve our engines. It is also a valuable resource for the NLP research community as a whole and will probably be widely used.</p>
SIMPATICO applications or use cases involved	The resources developed under this exploitable result will be used for improving the text adaptation engines (namely, TAE-LS - EX08 and TAE-SS - EX09).
Type(s) of foreground	<p>Corpora:</p> <ul style="list-style-type: none"> • Creation of PA corpus with sentences from the SCC website <p>Annotation:</p> <ul style="list-style-type: none"> • Crowdsourced simplifications of the PA corpus (creating a corpus with two levels of simplification) <p>New technologies:</p> <ul style="list-style-type: none"> • Algorithms for automatic alignments of existing text simplification corpora (e.g. Simple Wikipedia and Newsela)

	<ul style="list-style-type: none"> • Automatic annotation of simplification operations (e.g. split, replace, rewrite) • Deep learning approach for text simplification using sequence-to-sequence neural networks <p>Evaluation:</p> <ul style="list-style-type: none"> • Analysis of existing corpora for text simplification (Simple Wikipedia and Newsela) • Analysis of existing tools for text simplification
Involved stakeholders	Researchers interested in NLP, more specifically text simplification. Companies that develop technologies/content for text simplification/adaptation may also use these outcomes
Exploitation channel(s)	Scientific papers, demonstrations and resources/software released under open source license.
Replicability in other domains and ecosystems	<p>NLP research community, more specifically researchers working with text simplification/adaptation, including:</p> <ul style="list-style-type: none"> • Academic researchers • Industry researchers
Actions	Results have been published in academic conferences. Recently, the Natural Language Processing research community has increased its interest into text adaptation. USFD will keep pursuing this topic to further improve methods, algorithms and resources for text adaptation.

Table 11 - Text Adaptation Research: corpora creation, corpora annotation, new technologies and evaluation

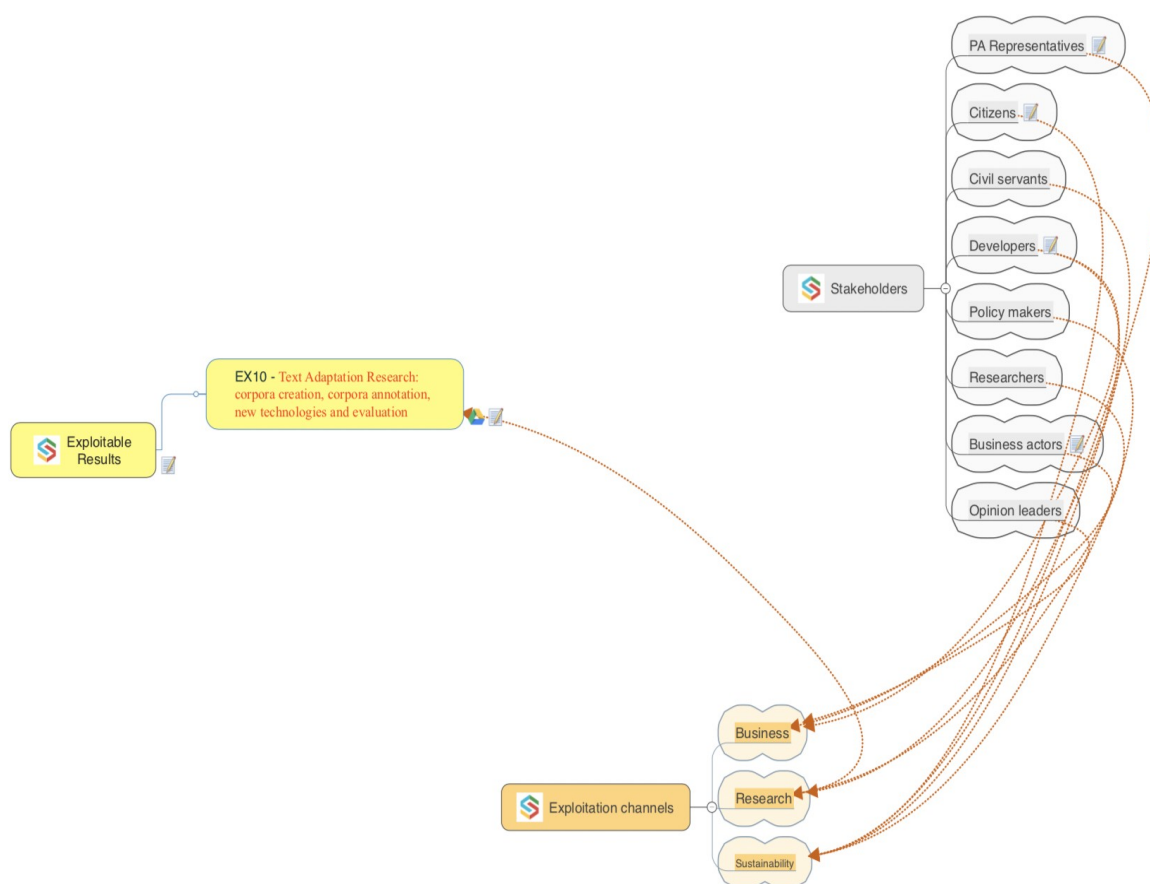


Figure 16 - Text Adaptation Research: corpora creation, corpora annotation, new technologies and evaluation

4.1.11 Citizenpedia & Administrative Procedure Model

Exploitable result	EX11 Citizenpedia & Administrative Procedure Model
Description	<p>SIMPATICO has defined a common knowledge model, namely Administrative Procedure Model, for representing public administrative procedures and the interactions that stakeholders can have with them. An administrative procedure is the most generic concept of the model and is composed of different steps that have to be accomplished in order to complete the procedure. To accomplish a step, one or more e-services could be needed. An e-service is a web page through which a citizen fills one or more forms to complete a step. Likewise, e-services are composed of Forms, Blocks, Fields and Paragraphs (Phrase and Words). Besides, e-services' components can be annotated with questions, their associated answers, term definitions, text simplifications, personal data or interaction workflow models.</p>

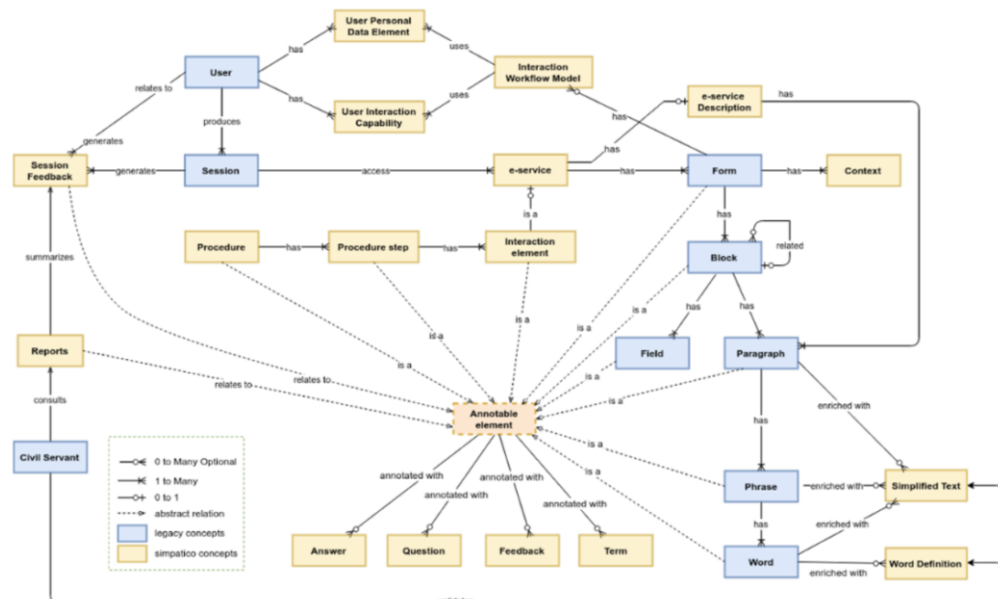


Figure 17 – SIMPATICO interaction model for Administrative procedures based on e-services

The Citizenpedia is the human computation framework that leverages the SIMPATICO project with the collaborative knowledge provided by its stakeholders. It complements the SIMPATICO environment with a knowledge repository where citizens can solve their doubts and interact in an amenable way with the public administration. It exposes three tools to the stakeholders: the first one is a Question Answering Engine (QAE), where citizens are able to post and solve doubts, and also to look up for terms and definitions. The second one is a Collaborative Procedure Designer (CPD), where civil servants describe current e-services in the form of flowcharts/diagrams and citizens are able to comment on them. The third one is the Servicepedia, based on the interaction model, visually depicts the representation of a given public procedure. Hence, Citizenpedia enables an easy way for citizens to take part in the continuous enhancement of bureaucratic procedures.

Indeed, Citizenpedia complements e-government environments with a collaborative space where citizens and civil servants share and exploit accessible knowledge about public procedures. To that end, Citizenpedia has been designed, as an aggregation of three complementary tools, which are described next.

- The **Question & Answer Engine (QAE)** is a tool which provides a mechanism where citizens post and resolve doubts regarding e-services and public administrative procedures. See EX02 for more details.
- The **Collaborative Procedure Designer (CPD)** is a tool to describe current administrative procedures in the form of flowcharts/diagrams that enables citizens to comment on them. See EX04 for more details.
- **Servicepedia** integrates the descriptions of the e-services with the information on the QAE and CPD to have all the elements contextualized. This tool is the one which visualizes in an easily understandable manner the concepts of the interaction model. Through the Servicepedia, Citizens can access to information about procedures, procedure steps, e-service, e-service description forms,

	fields, blocks, paragraphs and interaction workflow model. In addition, citizens have the chance to see all the questions, answers and terms related to all these elements. In essence, it offers a simple to grasp bird's eye view of administrative procedures.
Unique selling point	The Citizenpedia approach enables to model any complex procedure belonging to either the public administration or other entities, e.g. insurance companies or banks, where users need to interact with such organizations by completing a set of steps each of which requiring to deal with involved forms, domain specific contents and the submission of supporting physical documentation. Although ideally integrated with the machine intelligence components of SIMPATICO, e.g. Text Adaptation Engine (TAE) or Workflow Adaptation Engine (WAE), it can be deployed and offer on its own to organizations willing to democratize the consumption of the interaction procedures that they offer.
SIMPATICO applications or use cases involved	Citizenpedia is deployed in the three SIMPATICO pilots (Trento, Galicia, Sheffield). It has been tested both by citizens and civil servants. The Citizenpedia is tightly coupled with the IFE component, which provides access to the SIMPATICO features.
Type(s) of foreground	The Citizenpedia is provided as a software application. Once deployed, the users see it as a responsive web application, usable from their PCs, tablets or smartphones.
Involved stakeholders	The stakeholders of the Citizenpedia will be citizens and civil servants. The former ones will be the main users of the application, as they will use it to post/resolve doubts and collaboratively improve the status of public procedures. The latter ones will act as moderators. They will also be master providers of contents, helping in the initial initialization and maintenance of questions and answers and described procedures.
Exploitation channel(s)	The main exploitation channel will be consultancy to PA, i.e. to provide support for the deployment of the Citizenpedia to different Public Administrations. As earlier mentioned, there is also scope for the usage of such a tool in private organizations offering complex interaction procedures to their customers.
Replicability in other domains and ecosystems	The Citizenpedia has been designed to be easily replicable in different PAs/councils.

Actions	<p>The Citizenpedia composed component has been demoed to SIMPATICO public administration and also to Madrid and Bilbao councils in SPAIN. It has been presented in several international conferences. It has been deployed in the three project pilots. It has been integrated with QAE and CPD components described in EX02 and EX04, respectively.</p>
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Table 12 - Citizenpedia & Administrative Procedure Model

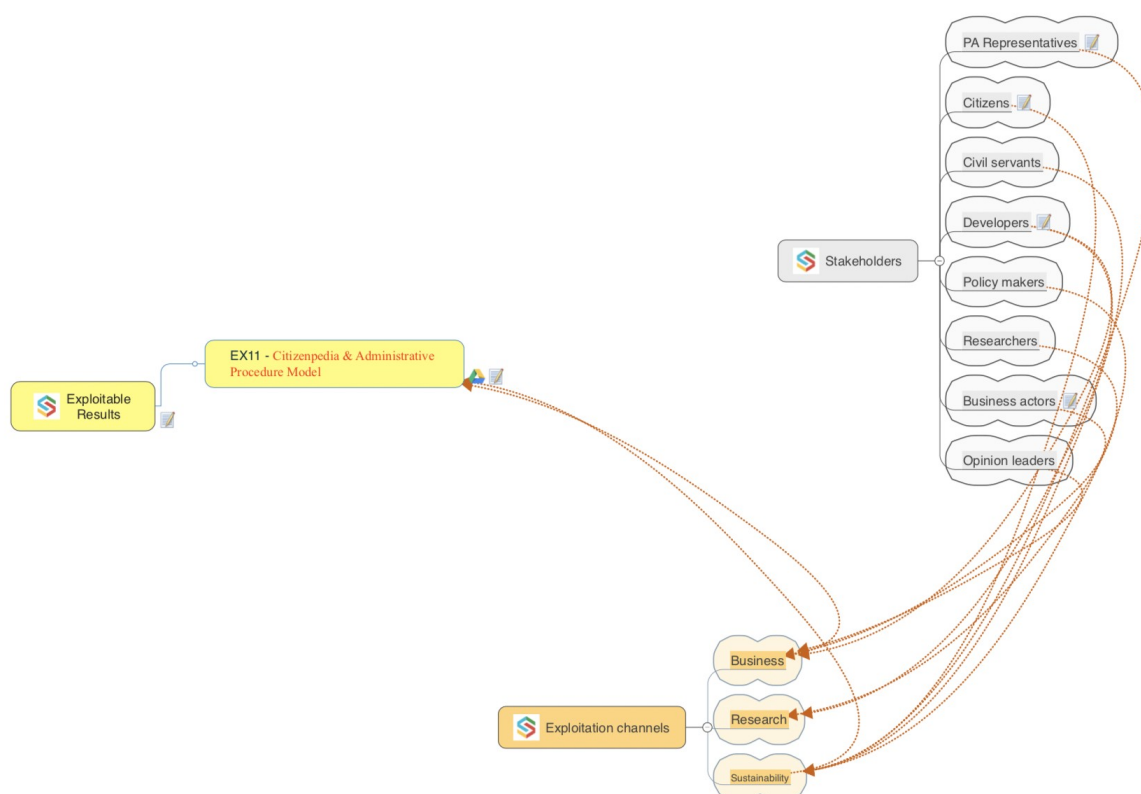


Figure 18 - Citizenpedia & Administrative Procedure Model

4.1.12 Text Adaptation Engine: Data-Driven Text Simplification (TAE-DD)

Exploitable result	EX12 Text Adaptation Engine: Data-Driven Text Simplification (TAE-DD)
Description	<p>Although more and more services are available online, it is common that their users face difficulties in using them. Complex e-services and technological barriers are probably the most recognised problem, however, the content available may also be barrier for the users. The complex language used for business and government is usually a problem for different types of users, even though they are familiar with technology (e.g.</p>

	<p>non-native speakers, elderly, cognitively impaired users, among others).</p> <p>It is common that the content creators do not have expertise in producing simple and accessible documents and it is also very difficult to produce such documents in a way that it would attend the needs of different types of users.</p> <p>Therefore, within the SIMPATICO project, there is a component designed to provide text adaptation for different types of users (called Text Adaptation Engine - TAE). TAE needs to deal with different types of content from public administrations and different languages. Finally, it is also expected that TAE will provide personalised text adaptations, targeting individual user needs.</p> <p>More specifically, TAE-DD provides simplification at sentence level: complex sentences are re-written (e.g. long sentences can be broken, passive voice can be turned into active voice) and complex words/phrases are replaced by simpler synonyms in order to provide a simpler version of the sentence for the user.</p> <p>The data-driven model uses parallel corpora (original sentences aligned to simplified sentences) and deep learning approaches to build a simplifier able to perform lexical and syntactic simplifications.</p> <p>This component can be easily integrated with minor impact on the e-service interface and it is independent from the lexical simplification engine (TAE-LS) and the syntactic simplification engine (TAE-SS).</p>
SIMPATICO applications or use cases involved	TAE-DD is not deployed as component of the SIMPATICO platform.
Type(s) of foreground	In its current version, TAE has been implemented as an independent module (https://github.com/SIMPATICOPROJECT/SIMPATICOTAESEVER), which is integrated with SIMPATICO platform as an external module. TAE-DD will be a sub-component of TAE.
Involved stakeholders	Public administrations and/or private companies (e.g. banks) which provide e-services for a wide audience with complex content. Other stakeholders could benefit from the general TAE component include content creators/providers, such as publishers, news agencies, etc.
Exploitation channel(s)	The main exploitation channel would be a mix of software as a service, consultancy, customization of open source software released.
Replicability in other domains and ecosystems	<p>Public and/or private companies which provide e-services for a wide audience:</p> <ul style="list-style-type: none"> • PA (local and/or central) • Agency • Insurance • Bank

	<ul style="list-style-type: none"> • News agencies • Publishers
Actions	<p>TAE-DD has presented in a research conference in July 2018 and to SIMPATICO partners during our meetings. However, the deployment of this component is not available due to copyright constraints regarding the data used to train the TAE model. We are negotiating with the data owners to see if there is any way that we can use our models.</p> <p>Future work will explore deep learning techniques and adding external information (e.g. grade level of the TAE user) into such deep learning architectures.</p>

Table 13 - Text Adaptation Engine: Data-Driven Text Simplification (TAE-DD)

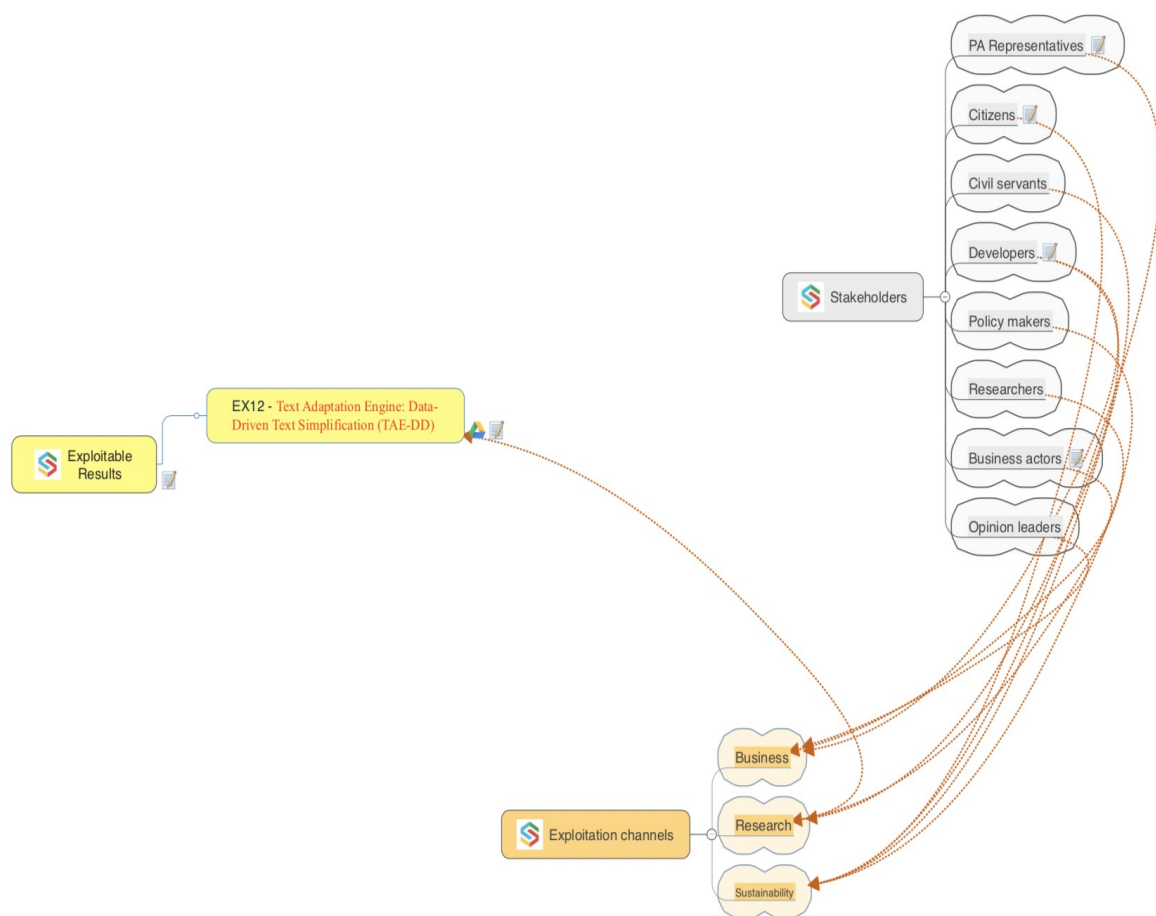


Figure 19 - Text Adaptation Engine: Data-Driven Text Simplification (TAE-DD)

5 P.E.S.T.L.E. Analysis

The SIMPATICO innovation is conditioned by the contextual surrounding environment considered from several angles. In this chapter, we introduce the PESTLE (evolution of PEST)¹² analysis done at European and local levels in order to facilitate the overall innovation pathway.

The PESTLE analysis is going to provide the SIMPATICO team information that could better tailor the local offer of services and/or solutions. In the meantime, the team will also better understand larger context which could be the added values to be emphasised in the deployment phase.

5.1 European level

Political

Offering affordable and accessible services through the public sector is a duty that Governments of member States are expected to provide without failure. Such an effort, traditionally dealt with at the national level is now the subject of a widespread push and commitment, at the EU level, for innovation of the public sector then is critical. With the 'Europe 2020 Flagship Initiative Innovation Union'¹³ the Commission aims at reaching a deeper understanding of public sector innovation, so to tackle new societal challenges while initiating the convergence of member States on the issue thanks to a unified approach to the subject. As an immediate step towards this objective, the Commission launched in 2013 the pilot 'European Public Sector Innovation Scoreboard' (EPSIS) as a basis for further work to benchmark public sector innovation¹⁴. While the EU had been striving towards a new kind of awareness centred on the importance of state-of-the-art e-government practices, recent political turmoil, which has seen the rise of populist and nationalist political movements in multiple European countries, is threatening the overall convergence towards a unified European standard of the public sector.

Impact on SIMPATICO: the modernization of the public sector is recognized as a fundamental factor of economic growth, thus representing a primary objective for the EU and its quest for an overreaching stability. Such a political framework provides the best conditions for a project like SIMPATICO to excel, given its potential to homogenize the fragmented reality of national public administrations, and its aim at enhancing them until they will reach a new level of efficiency, without having to disrupt their core systems.

Unlike the predominant performance measuring approaches of government management of services, the new co-evaluation approach focuses on measuring four key components of

¹² PESTLE Analysis: https://en.wikipedia.org/wiki/PEST_analysis

¹³ Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "Europe 2020 Flagship Initiative Innovation Union" SEC(2010) 1161, COM(2010) 546 final (Brussels, 6/10/2010).

¹⁴ Report by the European Commission "European Public Sector Innovation Scoreboard" (EPSIS), (Brussels, 2013). Available at http://ec.europa.eu/growth/industry/innovation/policy/public-sector_en.

developing the new services being pursued by a smart city - processes, activities, outcomes and impacts (see also Duignan, 2009)¹⁵.

Economic

In the whole of the European Union public procurement constitutes almost 20% of the GDP representing one of the major sources of employment. As a sector that is meant to mitigate market failures through the intervention of the government¹⁶, the growing budgetary burdens caused by almost 10 years of austerity prove to be extremely damaging to its efficiency. A high-quality public sector, in fact, can function as a driver of business performance¹⁷ and, according to recent estimates, investing an average of 3% of the EU GDP on the innovation of it could create 3.7 million jobs by 2020 and increase annual GDP by close to €800 billion by 2025¹⁸.

Impact on SIMPATICO: at a time where the prolonged impacts of austerity measures has become the norm for the EU, the innovation of the public sector with its resulting efficiency is considered to be a pillar for economic growth. A project like SIMPATICO and its cost-effective structure is thus likely to be highly favoured and possibly further endorsed.

Social

Although it is difficult to come up with a uniform measurement of the outcomes of the multitude of government policies that constitute the public sector, there is one constant driving factor amongst all EU member states: to create a system that will have as an outcome high social returns. The EU's commitment to the public-sector innovation has the ultimate objective of responding efficiently to the new societal demands through a more efficient administration of service delivery.

Impact on SIMPATICO: a significant part of the innovation of the public administrations rests in the intention to tackle the ongoing trend of uncontrolled development of the bureaucracy that accompanies the public-sector practices. These ends up weighing on the shoulders of civil servants, but mostly are detrimental to citizens. These circumstances create a more than favourable reception of a project like SIMPATICO built around citizens' needs and fuelled by their contribution.

Technological

The need for a heightened public value that adequately responds to new societal needs has been consistently considered throughout the EU by different governments, which have been engaging e-government strategies to transfer a number of core services online¹⁹.

Impact on SIMPATICO: the innovation of the public sector is pursued at the EU level, but still somehow fragmented and anchored to national levels of technological development, which

15 Paskaleva, K., & Cooper, I. (2018). Open innovation and the evaluation of internet-enabled public services in smart cities. Technovation.

16 Alvarez, R., G. Crespi and G. Cuevas, (2012), "Public Programs, Firm Performance and Employment: Evidence from Chile", Inter-American Development Bank Technical Notes, IDB-TN-375:1-46.

17 *Supra* note 2 at 55

18 Zagamé, P., (2010), "The Cost of a Non-Innovative Europe". Available at https://ec.europa.eu/eip/ageing/library/costs-non-innovative-europe-what-can-we-learn-and-what-can-we-expect-simulation-works_en

19 *Supra* note 1 at 23

is why SIMPATICO with its cutting-edge use of ‘hybrid cognitive and human computation systems’ will be regarded as a breakthrough for its capability to adapt equally to different administrations and their peculiar frameworks.

Environmental

The EU provides a defined set of rules that are meant to function as a framework for an environmental-friendly public procurement. The innovation of the public sector has as one of its outcomes the ability to strengthen the implementation of regulations and environmental standards²⁰. The objective is to set the path for a sustainable growth that will reduce the environmental impact of the delivery of services²¹, particularly relevant in fields such as the regulation of construction or energy supply²². The ‘eco-innovation’ of the public sector will morph the concept of environmental sustainability from something that is perceived as a pressure to a remarkable opportunity.

Impact on SIMPATICO: Environmental sustainability is a growing concern amongst Member States, and more often than not it proves to be a challenge for them to be able to comply with the directives that the EU provides. Public sector innovation could not only facilitate this process, but it could also reduce the cost of it while doing so. SIMPATICO, fostering usage of e-services might help reducing usage of paper, completion of paper forms, reduction of transport to reach to PA offices, since more citizens and companies will be able to accomplish their interactions with the public administration through electronic means. Hence, further financing SIMPATICO could only mean for Member States a guaranteed return both in sustainability and cost-effectiveness, with an indefinite number of positive spill-overs.

Legal

The innovation of the public sector proves a particular challenge at the EU level which, regardless of its supranational nature, is composed by extremely different legal systems²³ which cannot possibly be compared nor dealt with without the appropriate modifications. The activation of GDPR²⁴ in May 2018, has been deeply considered in the second phase of the project.

Impact on SIMPATICO: it is extremely ambitious of the EU to initiate such a complicated convergence towards a somewhat unified standard of the public sector through an EU-bolstered innovation plan. Henceforth SIMPATICO, with its capability to adapt to the single national legal systems, also including adherence to GDPR regulations, could help from one

²⁰ Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC. Available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014L0025-20160101>.

²¹ *Supra* note 2 at 14

²² Report of the Expert Group on Public Sector Innovation, “Powering European Public Sector Innovation: Towards A New Architecture”, Directorate-General for Research and Innovation Innovation Union, (Brussels, 2013). Available at https://ec.europa.eu/research/innovation-union/pdf/psi_eg.pdf.

²³ The public sector is by definition a prolongation of the State’s legal system thus we will have core differences between the public sector of a country such as Italy that has a Civil law tradition and a country like Britain that has a Common law tradition.

²⁴ GDPR: <https://gdpr-info.eu/>

side Administrations in introducing new e-services compliant with new rules and from the other side facilitate citizens with its features.

EUROPE - Summary

The following table summarises the main analysis outcomes at European level:







EU	     					
Issues	Priority to offer affordable and accessible services	Public procurement represents 20% of the GDP of EU countries	The need to implement a system with high social returns	Growth of new e-government strategies	Environmental-friendly public procurement	Extremely different legal systems
	Heightened efficiency of the public sector through innovation	Diminished efficiency because of the economic crisis	New societal challenges	Transfer of core procedures online	Strengthening the implementation of environmental regulations and standards	Modifications are necessary to craft a unified approach
	Convergence of member States on the subject	Improved public sector as driver of business performance	Responding to the new needs through an efficient administration of service delivery	Creation of a European standard of the public sector through innovation	Sustainable growth and delivery of services	Public sector as a prolongation of the national legal system
Impact	Innovation of the public sector is a primary objective	Innovation of the public sector as pillar for economic growth	Intention to tackle the uncontrolled development of the related bureaucracy	Fragmented levels of national technological developments	Sustainability is a growing concern among member states	SIMPATICO can adapt to the single legal systems
	Positive political disposition towards the possible outcomes of the project	SIMPATICO has a highly-favoured cost-effective structure	SIMPATICO can provide a citizens-fuelled solution	Cutting-edge technology renders SIMPATICO optimal for this purpose	Further financing SIMPATICO is a cost-effective step with guaranteed sustainable returns	Potential overreaching tool that can bring different jurisdictions together

Table 14 - PESTLE EU level

5.2 Italy

Political

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Trento is working towards transforming itself into a Smart City and is already among the top smart-cities in Italy.

In particular, the digitalisation of all interactions between the PA and its citizens is a priority for Trento, and the city is currently working on strategic projects in this area.

In the last years Trento Municipality has launched a strong modernization campaign of the public sector, starting a process of digitalisation of his services and data.

Impact on SIMPATICO

In such a political framework SIMPATICO project perfectly fits, aiming at enhancing the public administration's offered services to a higher level of efficiency.

Economic

In recent years Trento Municipality experienced an income reduction. In response to this decrease, the Municipality has made considerable reductions in spending, with an overall saving in the period 2012-2017 around €8,900,000. This has been made possible also *“through a higher attention in the public services' quality, a simplification of the procedures and of the accesses to those services; but also through a continuous process of digitalisation of data and services and an increased level of transparency. In addition, a particular focus has been put on the consumers' satisfaction and their active contribution in the common growth and improvement.”* [Municipality of Trento, DUP 2017-2019].

Despite of this income reduction, the Municipality's will of giving citizens the best possible services as always makes the push towards cost saving a fundamental imperative.

Impact on SIMPATICO

Successful testing and adoption of the SIMPATICO tools offers a real opportunity to significantly reduce costs and time, simplifying the bureaucratic procedures and helping citizens in using the Municipality's services.

Social

Trento has already done much to improve interactions with its citizens.

The city website is an important reference for citizens and contains all relevant information of city services. Also, the Municipality of Trento already supports submitting applications through certified e-mail, by sending the filled application documents and a scan of identity documents and signature.

Impact on SIMPATICO

Aiming at becoming a more efficient administration, it appears necessary to reduce the time of the bureaucracy which accompanies the public-sector practices. SIMPATICO's feature could really lighten the shoulders of civil servants and, being strongly time-saving, limit the citizens' stress.

Technological

The innovation of the public sector has already started with a strong campaign of data digitalisation.

As part of its “smart city” strategy, Trento is working to realise a new e-service portal, named “Sportello Telematico Unificato”.

It will make it possible for citizens and businesses to authenticate using smart service cards or one-time password devices, and to complete the interaction online.

“Sportello Telematico” is an end-to-end solution provided by company GLOBO srl, specifically targeting the digitalization of modules for service provision by public administrations. Within this solution, the digital module is a composition of sections of organic information (e.g., birth data section, residence data section, real estate registry data section). The logic of the interaction with an information section is explicitly mapped by the module designer. The integrations with legacy systems are handled via a centralized REST web service, which routes the proper service request to the right data source service. Finally, the solution supports module hierarchy, which guarantees the definition of a well-organized digital module library.

Impact on SIMPATICO

A first goal in this environment will be the online availability of a big number of forms from different services (nursery school, environment, buildings) enriched with SIMPATICO's features.

Environment

In 2015 Trento Municipality agreed on the Action Plan for Sustainable Energy (PAES), which expects among its actions the digitalisation of the bureaucratic procedures through the realisation of a digital portal - Sportello Telematico Unificato - and its wide diffusion.

Trento Municipality supports a technological sustainability model based on the digitalisation of its procedures, enhancing the interactions between citizens and the administration.

In this context, some actions are planned, involving different aspects of the town's life, such as e-Government, Health and Well-being, Energy Efficiency and Smart Building, Integrated Tourism and Smart Mobility.

Impact on SIMPATICO

SIMPATICO will give all the citizens the possibility to access all the available services, in a simplified and personalised way, increasing their feeling of being active part of their town's life and quality. This will limit the use of paper and often the need to move to the administration's office, so definitely will have environmental impact.

Legal

Trento Municipality – as the other Italian City Councils - has to follow the “Plan for the digitalisation of the procedures for application”. [Law 11 August 2014 n.114]

This law converted with modifications, the D.L. 90/2014, introducing the clause 3-bis in the art. 24, which states that “...the public administrations, the Government, Regions and local bodies must adopt a plan for the digitalisation of the procedures for application, declarations and warnings, which makes available the online completion of guided forms and procedures, authenticating through the Public System for the Digital Identities of citizens and companies' management.

Forms must guarantee the procedures' fulfilment, the applications' tracking, allowing the identification of the responsible figure and, where applicable, the terms by which the applicant should obtain an answer.

This plan is expected to be completely digitalised.”

Impact on SIMPATICO

In this environment SIMPATICO will enhance and enrich the digitalisation process through useful tools and features.

Italy - Summary







     						
Issues	Priority to offer affordable and accessible services	Diminished efficiency because of the economic crisis	The need to implement a system with high social returns	Growth of new e-government strategies	Strengthening the implementation of environmental regulations and standards	Modifications are necessary to craft a unified approach
	Heightened efficiency of the public sector through innovation	Improved public sector as driver of business performance	New societal challenges	Transfer of core procedures online	Sustainable growth and delivery of services	Public sector as a prolongation of the national legal system
Impact	Strong innovation campaign launched. Digitalization of all interactions between the PA and its citizens.	Give citizens the best possible services, pushing towards cost saving procedures	Support submitting applications through certified e-mail	Realisation of Sportello Telematico Unificato, allowing citizens and businesses to authenticate using smart service cards or one-time password devices, and to complete the interaction online.	Technological sustainability model based on the digitalisation of the procedures	Follow the "Plan for the digitalisation of the procedures for application
	SIMPATICO enhances the public administration's offered services to a higher level of efficiency	SIMPATICO's tools offer a real opportunity to significantly reduce costs and time	SIMPATICO's feature could really lighten the shoulders of civil servants and, being strongly time saving, limit the citizens' stress.	Online availability of a big number of forms from different services enriched with SIMPATICO's features	SIMPATICO will give all the citizens the possibility to access all the available services	SIMPATICO enhances and enriches the digitalisation process through useful tools and features

Table 15 - PESTLE Trento level

5.3 United Kingdom

Political

The political landscape in the UK has experienced considerable change over recent years, and as a country, it approaches yet another period of potentially prolonged uncertainty caused by decision to leave the European Union (EU) along with added potential vulnerabilities and or opportunities presented by a “Hard Brexit”. Hence, it is becoming increasingly difficult to predict the full extent and impact will have both domestically and internationally.

Impact on SIMPATICO

In the immediate term any technology which has the potential to reduce costs associated with accessing services for non-native speakers, which does not also create additional administrative burden, will receive a positive reception. Definitely, it will depend on the sentiment of BREXIT as to the terms that can be negotiated to use the technologies and the appetite after the divorce by other public bodies.

Economic

Local authorities have experienced unprecedented income reductions in recent years. From 2010/11 to 2015/16, Sheffield City Council’s net revenue budget will have reduced by 30% and money from Government will have fallen by £124m. In response to this reduction, together with additional costs, as a council we’ve made considerable reductions in spending. £240m has been cut from our service budgets over the last four years. While SCC has been required to do more with less over that same period the expectations of the general public have increased.

With the ever-increasing budgetary challenges, squeezes felt both within public services and the public sector mean growing demands being placed on local authorities with this trend not expected to diminish. For this reason, making the best use of public money has never been more important, rendering the push towards finding increased cost savings a financial imperative.

Impact on SIMPATICO

Successful testing and adoption of the SIMPATICO tool offers a real opportunity for previously excluded members of the public to move towards the more cost effective, self-service, 24-hour accessibility model in areas with high demand by non-native speakers of English, which have traditionally been fulfilled by phone or in person. The language simplification will assist in the removal of barriers originally created by language, resulting in the costs associated with these labour intensive resources being reduced.

Social

Sheffield’s population has grown and become more diverse over the last 10 years, and a growing population brings challenges to consider, such as how these diversifying needs are going to be met in the future. SIMPATICO offers a greater deal of opportunity in helping to prevent the language-related digital exclusion of migrant and non-native speakers. The city’s communities are more diverse than at any point in the past. Sheffield has proportionally more young people and elderly people now, than ever before. Our ethnic minority population was 19% at the last census; up from 11% ten years before. Sheffield’s diversity is

to be celebrated, but the scale of change varies across the city, with some areas having a very different population today than a decade ago.

At the same time, as a result of the changes in personal customs and habits, shifts in societal norms and values, as well as changes in work patterns and home life, have led to a greater willingness to interact and share information online. Indeed, most of our customers are also ready for the convenience of 24-hour self-service and want to interact with us at a time that suits them. SIMPATICO's social impact is expected to be great as it will reduce customer delays and costs.

Impact on SIMPATICO

As a council, Sheffield has to be clear about the roles people can and should play. Helping people help themselves means working with communities to both develop solutions and promote the adoption of SIMPATICO tools, e.g. Citizenpedia, which support people to be more self-reliant, using the knowledge, ideas and resources that exist in families and communities, however caution needs to be exercised in respect of managing the expectations of end users, especially in respect of response times from PA and accuracy of non-PA supplied information. As of January 2019 Sheffield does not expect anything but positive impacts from SIMPATICO project.

Technological

Technological advancement and adoption have increased both the realms of what is possible as well as the parameters of what is expected and, in order to remain current within this ever-changing landscape, councils need to continue to adapt to meet the evolving needs of the citizen and organisation it serves.

The express aim for Sheffield is to be amongst the most connected cities in the UK where businesses can access the technology to grow, making the City Region an attractive location to run a business and work in. We are working with private sector partners to accelerate the roll out of next generation broadband and will explore options for the city centre, including wireless technology. We also want to support local businesses and will explore ways to reduce their upfront costs of accessing this technology.

One of Sheffield's five priorities in its Corporate Plan 2015-18 is being an in-touch organisation. Being an in-touch organisation means listening; being connected and being responsive to a range of people and organisations; ideas and developments. This includes local people, communities and Government, as well as keeping pace with technology.

This means understanding the increasingly diverse needs of individuals in Sheffield, so the services we and our partners provide are designed to meet these needs. It also means understanding how to respond. This priority is about empowering individuals to help themselves and providing opportunities to do this, so they and their communities are increasingly independent and resilient. We need to be clear about the roles people can and should play. Helping people help themselves means working with communities to develop solutions and supporting people to be more self-reliant, using the knowledge, ideas and resources that exist in families and communities. Making the most of technology also means having digitally literate local people; people with the ability and confidence to teach themselves and adapt to continually changing digital tools and services. Building on the strength of the Adobe Experience Manager (AEM) content management system, the

customer experience model means Sheffield is transitioning to eServices that are less obtrusive/ more discrete and hardly resemble conventional forms, in that online interaction / screening / pre-validation questions, triage users into the correct areas of eServices and it's only then that relevant information is requested.

Impact on SIMPATICO

For PAs who are still at the early adoption stage of eService modules like Citizenpedia and Workflow Adaptive Engine (WAE), SIMPATICO provides a practical method to reduce the complexity, which in the longer term may encourage PAs to think more creatively and holistically about their approach to eServices, moving beyond simple like for like replication of offline forms to digital versions, eliminating the need of WAE. One thing we have learnt is that the UK being ahead in simplifying digital standards and services (<https://gds.blog.gov.uk/>) and the fact that most services are outsourced make it more difficult than the rest of Europe to integrate and harmonise e-services from a unknown or potentially competing entity.

Environment

As personalisation and tailored services are becoming more prevalent, Sheffield aims to keep abreast of changes by revolutionising the eServices delivery model to citizens and organisations. The ambitious and innovative Customer Experience Strategy and the initiatives that are derived from it, focus on delivering the part of the Corporate Plan which refers to Sheffield City Council being an 'in-touch organisation'. More specifically, it looks at how we should design our services in the future, working with our customers and our partners, to make sure that the SIMPATICO tools present an opportunity for the technology to sit at the heart of that journey.

Impact on SIMPATICO

Moreover, with Sheffield's adoption of the Adobe Experience Manager content management platform, sophisticated forms, powerful analytics and changes to overall user experience and user journey, it is felt that there will be a transition away from use of the Citizen Data Vault, (or at least a version fully integrated with SIMPATICO). Instead in the longer term the changes to the usability would create a more sophisticated sifting and pre-validation stage for potential applicants, making engagement with e-services more meaningful with information collected at appropriate stages and populated via the council-based user account which would capture and securely store user data. The overall approach described is going to produce a tangible reduction in the use of paper-based documents while also enhancing the e-interaction with citizens that will improve remote use of service with the related decrease in citizens transportation needs.

Legal

Sheffield council has both gained and welcomed new significant responsibilities, whilst at the same time also experiencing significant changes to legislation and national policy.







Any technology which has the potential to change the meaning and or nature of legal instruments, statutory language may create concern and extra consideration for local authorities

It is not yet clear at what level the Brexit will affect, from the legal point of view, the SIMPATICO adoption. The impact of GDPR has not been as disruptive as through due to good planning and been very successfully adopted by the council from mid-2018.

Impact on SIMPATICO

Rules and legislation (including any changes) relating to privacy, information governance, information sharing, access to, security, data vulnerability and retention of personal data will have major ramification to this project.

UK - Summary

UK						
Issues	<p>Political uncertainty, potential changes in the flow of migrants.</p> <p>Potential increased austerity measures</p>	<p>Public sector funding cuts means that PAs are required to find new ways to reduce spending and cut costs, to generally do more with less.</p>	<p>Considerable changes in public habits and greater adoption of and familiarisation with online services, greater connectivity and expectation to be able to engage in the digital space.</p>	<p>Increased expectation from the public to be able to engage with public services digitally 24/7</p>	<p>Movement towards greater personalisation with services being accessed and tailored to respond to the needs of the end user</p>	<p>Rules and legislation (including any changes) relating to privacy, information governance, information sharing, access to, security, data vulnerability and retention of personal data.</p>
	<p>BREXIT is casting a huge shadow and drain on council resources</p>	<p>Resources and costs associated with translations costs, face-to-face meetings as a result of complexity of services and or absence of existing eServices</p>	<p>Increased risk of digital exclusion and further expansion of the digital divide.</p>	<p>Public administer are embarking on ambitious e-service strategies to enhance the customer experience</p>	<p>No effect</p>	<p>New responsibilities devolved from central government</p>
Impact	<p>Potential for reducing the cost / burden associated with translations for migrant /</p>	<p>Potential opportunity to reduce costs and time through adoption of the SIMPATICO tool</p>	<p>Empowering and providing autonomy to members of vulnerable groups, migrants and</p>	<p>Further opportunities for SIMPATICO's integration with the eServices.</p>	<p>Greater opportunity for Big data solutions through open data synergies to extend the</p>	<p>The SIMPATICO tool handles the removal and deletion of personal data and will</p>

	non-native speakers		non-native speakers to engage with eServices		Citizenpedia offer.	continue to evolve to become compliant with General Data Protection Regulation
	Isolationist activities by UK government means the reduction of migrant workers entering the UK leading to reduced applicability of some other language functionalities of SIMPATICO.	The squeezes on government are highly likely for the foreseeable period. Similarly, the lack of clarity about post project shutdown along with the uncertainty regarding the business-as-usual arrangements, associated business model, (and or monetisation), long term support, on-going funding, and maintenance costs beyond the lifetime of the project it difficult to “sell the value” to a wider audience	1. Rising / unrealistic expectation by end user around response times, 2. Potential inaccuracy / misleading information arising from crowd sources information. 3. Unfeasible / increased administration for PA around Citizenpedia’s policing / moderations	Potential obsolescence / feature redundancy as PA requirement move beyond like for like replication of forms	The landscape of interaction with Public Administration will inevitably change as the adoption and maturity of eServices increases, which in turn will change the importance and usefulness of the SIMPATICO	Increasing incidents of cyber-attacks and with it risk of data breaches / loss and/ or issues associated with third party account integration Elements of SIMPATICO functionality may change the meaning and or nature of legal instruments, statutory language may create concern and extra consideration for local authorities

Table 16 - PESTLE Sheffield level

5.4 Galicia (Spain)

Political

The Galician autonomous government, Xunta de Galicia, approved on April 21st 2016 the so-called “Digital Inclusion Plan for Galicia 2020” continuing the social challenge to move from “literacy to digital autonomy”. The Digital Galician Agenda 2020 promotes a new model of digital inclusion developing an action plan for all citizens – regardless of their digital level – in order to advance, mature and access the highest knowledge and use of ICT. Therefore, this action plan is designed for all citizens, taking into account – specifically - those needs of more vulnerable groups, those at risk of digital inclusion, namely the population in rural areas.

The Galician Government is fostering the use of ICT in key areas like personal autonomy, active aging and security. Taking into account the “lifelong learning” approach, digital knowledge and skills will be also promoted to activate the employability of all citizens.

Finally, within the “Digital Agenda” framework, digital social innovation will also be an objective. Through direct dialogue and collaboration with main stakeholders (citizens, innovators and communities), new opportunities for local entrepreneurs will be generated and social challenges will be also addressed with a digital vision.

Therefore, the “Digital Agenda”²⁵ action plan is structured into three main strategic axes: digital literacy, digital training and digital /participatory social innovation.

Impact on SIMPATICO:

Taking into account the needs of those groups of population most vulnerable to the digital divide (seniors and people with disabilities) and the objectives of the Digital Agenda in Galicia, SIMPATICO solution will facilitate a more friendly and inclusive access to public e-services, contributing to carry out a more autonomous lifestyle to these groups.

Economic

The Xunta de Galicia has also delivered a Technological Modernization Plan for Galician Social Services System; a key area for the Community given that it currently provides assistance and care services to 1.6 million people in Galicia.

The above-mentioned strategic policy aims to support the digital renewal of the Galician Social Services System.

Impact on SIMPATICO:

The integration of ICT in social services system will ensure the sustainability of the system, improving the capacity and quality of care, reducing administrative burden and optimizing existing resources in line with e-administration and SIMPATICO service objectives.

Social

Galicia is a large territory in Spain, managed by a regional-level (Comunidad Autónoma) government (Xunta de Galicia). The region comprises four provinces over an area of roughly 30,000 square kilometres and a total population of approximately 2.7 million. The landscape of the region is rugged and has historically led to rural development and a sparse population distribution.

²⁵ Digital Agenda for Galicia (Galician language): <https://amtega.xunta.gal/sites/default/files/axenda-dixital-de-galicia-2020.pdf>

The socioeconomic indicators for Galicia show several particular needs that make it especially suited for e-services improvement. Among these are:

- **A sparse distribution of the population**, especially in the rural centre of the region, from where people often migrate to the richer coastal areas and other Spanish regions. This has resulted in large rural areas with a low population density, where the access to public services is harder.
- **An aging population**: Galicia is third from bottom in Spain in aging perspectives as noted by the EU (just 1.1 children per woman compared to the 1.4 average in Spain, while the zero-growth threshold is 2.1). Latest data also shows a big gap in the use of e-services in the Galicia region between the segment of population older than 55 with respect to rest of people: while 66.63% of the people between 30 and 39 years has used e-services during the last year, this rate is only 13.81% for people older than 55 years.
- **Added complexity in the administrative procedures**. This complexity is not only due to linguistic reasons (two official languages, Galician and Castilian Spanish) but also to inherent difficulties in administrative processes and lack of information.

Impact on SIMPATICO:

GALICIA's main goal with SIMPATICO project is to simplify its current e-services system and improve its efficiency, with special attention on more vulnerable groups: seniors and people with disabilities.

SIMPATICO tools like “text adaptation and simplification” or the “Citizenpedia”, will be essential to clearly define the steps towards the democratization of public e-services, taking into account all stakeholders needs and creating a new way of communication between PA and citizenship. Therefore, SIMPATICO project will enable the development of inclusive tools that can be applied in an agile way to the delivery of Xunta e-services allowing any group to make use of them. In the case of people with disabilities or the elderly, this will have a high impact on their self-determination, that is, on having control over their own lives, which directly implies empowerment and social participation and, consequently, an increased quality of life.

Technological

Since 1990, Xunta de Galicia has made great strides in the development of a strong e-government strategy. Galicia was a pioneering region in Spain in the deployment of e-services for some aspects such as workplace accidents or professional diseases. Currently, a modern public portal is offered (eServizos²⁶) from which a wide array of services can be performed in fields such as education, health or housing. Further improvements and acceleration on the deployment and adoption of new services are envisaged in the commission of e-services and security promoted by the Xunta since late 2014.

As mentioned before, the Digital Inclusion Plan constitutes the commitment of the Galician Government for the achievement of a fully digital society in Galicia. To achieve this objective, the Plan was defined with a time horizon of 2020. The aim of this initiative is to ensure that all people have the opportunity to access, know and use ICT, in order to ease the existing digital divide and promote the digital society.

²⁶ eServizos from Xunta: <http://www.xunta.es/eservizos>

At the operational level, the Plan is structured into three main strategic axes, which will give continuity to the digital society's momentum, while preparing Galicia for the new challenges that are already a reality in the digital world.

The first axis is the reduction in the digital divide and the creation of societal habits of use of ICT. The second axis is the increase of digital skills and knowledge in order to promote a more advanced use of ICT. Finally, beyond the challenges that will be addressed in the two axes described above, there is a third area of work which will actively work on the preparation of Galicia for new uses and digital applications, encouraging the use of ICT as an innovative way of solving social challenges.

Impact on SIMPATICO:

SIMPATICO will leverage cutting edge technologies for the improvement of the e-services using a person-focused approach in which the technology is not used for its own sake but to ease the problems without over burdening the citizens with new concepts. It is also expected that the piloting process itself will be a significant driver of dissemination of the existence of these e-services which were severely underutilized before the project.

Environment

The autonomic government of Galicia is working on a sustainability management model with the aim of reducing costs and increase productivity in the economic, technological and environmental fields. According to this, public administration entities have the challenge of building effective models for public resources management.

Therefore, the Strategic Plan of Galicia 2015-2020, in its axis “Environmental sustainability and Territorial Equity” includes the objective of a balanced and sustainable development of the territory by eliminating regional disparities and integrating Galicia as a unique city.

Impact on SIMPATICO:

SIMPATICO will enable that any citizen of Galicia region, regardless of their place of residence (so reducing transportation impact), or profile, can access to the public e-services (reducing the use of paper and civil servants engagement), of the Xunta de Galicia in a simplified and personalized way, facilitating equitable access to all the population in line with the provisions of the Strategic Plan of Galicia 2015-2020, having a special impact on key stakeholders like the elderly and people of disabilities.

Legal







The number of fully online administrative procedures that are offered through the electronic services (sede electrónica) of the Xunta de Galicia to all citizens is steadily increasing. This has been strategically strengthened by the obligations of the national Law (Law 39/2015 of October 1, 2015) regarding common administrative procedures for public administrations. In articles 13 and 14 of this Law the possibility of citizens to communicate with the Public Administration using electronic means is being established as a citizen right, as well as to be assisted in the use of electronic means in their relations with public administrations.

In addition, it should be noted that a distinction is made in that regulation between physical persons and legal persons: where physical persons may choose to communicate with administrations through electronic means or not for certain procedures, legal persons are obliged in any case to interact with the administration by electronic means.

Impact on SIMPATICO

Although the road is long, the challenge will be that any public administration could communicate with any citizen through its electronic procedures, whether individual or legal. It is important to take into account that technological solutions should be efficient, inclusive (like SIMPATICO), humanizing and, in any case, compatible with direct attention in those cases that refer to it.

Galicia – Summary

Galicia	     					
Issues	<p>Digital Inclusion Plan for Galicia 2020: three main strategic axes: digital literacy, digital training and digital and participatory social innovation.</p>	<p>The Xunta de Galicia has also delivered a Technological Modernization Plan for Galician Social Services System to support its digital renewal.</p>	<p>The socioeconomic indicators for Galicia show a number of particular needs that make it especially suited for e-services improvement:</p> <p>A sparse distribution of the population</p> <p>A wide percentage of population over 55 (36.3% in Galicia vs 29.6% in Spain vs 30.9% in UE).</p>	<p>Galicia was a pioneering region in Spain in the deployment of e-services for some aspects such as labour accidents and professional diseases</p>	<p>The autonomic government of Galicia is working on a sustainability management model with the aim of reducing costs and increase productivity in the economic, technological and environmental fields. According to this, public administration entities have the challenge of building effective models for public resources management.</p>	<p>The number of fully online administrative procedures that are offered through the electronic services (sede electrónica) of the Xunta de Galicia to all citizens is steadily increasing. This has been increased by the obligation of the national Law (Law 39/2015 of October 1, 2015) regarding common administrative procedures for public administrations.</p>

	Digital Agenda of Galicia 2020 aims to move from "literacy to digital autonomy".	The Social Services System currently provides assistance and care services to more than 1.6 million people in Galicia.	Added complexity in the administrative procedures (two official languages, Galician and Castilian Spanish).	Currently a modern portal is offered (eServizos) from which a wide array of services can be performed in fields such as education, health and housing.	The Strategic Plan of Galicia 2015-2020, in its axis "Environmental sustainability and Territorial Equity" includes the objective of a balanced and sustainable development of the territory by eliminating regional disparities and integrating Galicia as a unique city.	In articles 13 and 14 of this Law, the possibility of citizens to communicate with the Public Administration using electronic means is being established as a citizen right, as well as to be assisted in the use of electronic means in their relations with public administrations.
Impact	SIMPATICO can facilitate more equitable and inclusive public services throughout Galician geography contributing to the objectives of the Digital Inclusion Plan of Xunta de Galicia.	The integration of ICT in the management of social services seeks to ensure the sustainability of the system, improving the capacity and quality of care, reducing administrative burden and optimizing existing resources in line with e-administration SIMPATICO objectives.	SIMPATICO tools like text adaptation and simplification or the Citizenpedia, will be essential to define the steps towards the democratization of public e-services, taking into account all stakeholders' needs and creating a new way of communication between PA and citizenship.	SIMPATICO will leverage cutting edge technologies for the improvement of the e-services using a person-focused approach in which the technology is not used for its own sake but to ease the problems without overburdening the citizens with new concepts.	SIMPATICO will enable that any citizen of Galicia, regardless of their place of residence or profile, can access to the public services of the Xunta de Galicia in a simplified and personalized way, facilitating equitable access to all the population in line with the provisions of the Strategic Plan of Galicia, having a special impact on key stakeholders like the elderly and people of disabilities.	Although the road is long, the challenge will be that any public administration could communicate with any citizen through its electronic headquarters, whether individual or legal. It is important to take into account that technological solutions should be efficient, inclusive (like SIMPATICO) humanizing and, in any case, compatible with direct

						attention in those cases that refer to it.
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Table 17 - PESTLE Galicia level

6 Market analysis

6.1 Competitive forces and the Blue Ocean Strategy

When facing the issue to design a market analysis for SIMPATICO we had to consider the nature of its outcomes: most of them will have a direct impact on citizens' quality of relationship with the Public Administration and could be provided both in a free way or as a business product. For these reasons, we decided to use a mixed approach merging the so-called Blue Ocean Strategy with the traditional competition approach.

SIMPATICO outcomes are going to be ready in a deep innovation period for public services among Europe, and following the three exploitation pathways defined, will face a very dynamic market situation in the future. In this document, a mixed strategy that is taking into account both the Porter five forces²⁷ (so called Red Ocean), model and the Blue Ocean Strategy²⁸ (traditionally incompatible)²⁹, is going to be used: the first model has been applied to service provision and the second to service inclusive simplification.

Blue Ocean strategy seeks to turn strategic management on its head by replacing "competitive advantage" with "value innovation" as the primary goal where organisations must deal with users demand and exploit untapped markets. In the case of SIMPATICO project, due to this high level of innovation, the blue ocean one seems to be closer to the creation of a new "needs area" based on innovation more than on competitive advantage. However, we are conscious that, dealing mainly with public bodies, a competitive advantage for administrations will be a key factor for the project success from the business perspective.

In Table 18 - Red & Blue Ocean strategies

main concepts of both strategies are summarised.

Red Ocean Strategy	Blue Ocean Strategy
Compete in existing space.	Create uncontested market space.
Beat the competition.	Make the competition irrelevant.
Exploit existing demand.	Create and capture new demand.
Make the value/cost trade-off	Break the value/cost trade-off
Align the whole system of an organisation's activities with its strategic choice of	Align the whole system of an organisation's activities in pursuit of differentiation and low

²⁷ Rice, John F. Adaptation of Porter's five forces model to risk management. DEFENSE ACQUISITION UNIV FT BELVOIR VA, 2010.

²⁸ Kimball, Michael. "Our Heritage Is Already Broken: Meditations on a Regenerative Conservation for Cultural and Natural Heritage 1." Human Ecology Review 22.2 (2016): 47.

²⁹ Wee, Chow Hou. "Think Tank—Beyond the Five Forces Model and Blue Ocean Strategy: An Integrative Perspective From Sun Zi Bingfa." Global Business and Organizational Excellence 36.2 (2017): 34-45.

differentiation or low costs	cost.
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Table 18 - Red & Blue Ocean strategies³⁰

All this indicates that SIMPATICO providers may want to consider a blend of the two approaches. For instance, by slowing down profit erosion with an effective competitive strategy for an existing market, they can increase the funds available for blue-ocean investments and thus their chances of finding an untapped market with plenty of users.³¹

The social need of public bodies to establish a more comprehensive relationship with citizens should facilitate the creation of new market areas where the major cost of SIMPATICO based solutions could demonstrate their added values. On the other hand, the strict procurement policy public administrations should follow will request a deep work to be done at level of bids preparation and related evaluation grids, in order to give the opportunity to emphasise SIMPATICO added values.

Having to face the competition in the existing scenario, in the following paragraph an early identification of competitive forces that are affecting the expected SIMPATICO output is presented. Those forces are going to be analysed for each foreground during the exploitation assessment of the project covered by D7.5.

SIMPATICO will introduce very innovative and multidisciplinary exploitable outcomes, so we are now in a phase with high flexibility in designing them. Competitive forces as well as the blue ocean pathway must be monitored to assess final results.

³⁰ Kim, W. C., & Mauborgne, R. (2004). Blue ocean strategy. If you read nothing else on strategy, read these best-selling articles., 71.

³¹ BURKE, Andrew E.; VAN STEL, Andre J.; THURIK, Roy. Blue ocean versus competitive strategy: theory and evidence. 2009.

The following Table 19 is providing the SIMPATICO assessment against those forces:

	Substitutes: At this stage, there are several technologies providing service simplification (and democratization), working as modules without the SIMPATICO flexible approach.	Threat of Substitutes: SIMPATICO is expected to provide a level of effectiveness higher than potential substitute but the need to be integrated into existing platform could be a threat.
Suppliers: SIMPATICO is considering the possibility to create specific channels to involve service providers so concentrating in possible consortia with existing actors.	Industry Competitors: In the area of e-services for citizens there is a big struggle that sees from one side ad-hoc simplification solution and on the other hand simplification engines that could follow more dynamic services evolution.	Buyers: Main buyers are going to be public bodies. The procurement regulation based mainly on the price of a solution is not facilitating the SIMPATICO solution.
Bargain Power of Suppliers: If the supplier will have the right level of professional approach, pricing will have a reduced impact in the deal.	Intensity of Rivalry: The intensity of rivalry is not very high at the moment since this is considered a niche market and big players are not so interested in it but more and more simplification of services for citizens is going to be a key selling factor for service providers in the area of public services provision.	Bargaining Power of Buyers: Efforts should be invested to modify the evaluation of service provision for public bodies so to emphasise SIMPATICO features.
	New Entrants: The evolution of technologies in deep learning will push new potential entrants to propose new solutions.	Threat of New Entrants: Technical solution not involving citizens in the needs definition could lose their power.

Table 19 - Competitive forces

Applying the blue ocean strategy to make the competition irrelevant is easier said than done. Many companies, especially the incumbent players within an industry and those lacking resources and expertise, face numerous practical challenges in trying to find blue oceans. The SIMPATICO strategy is conditioned by being mainly ruled by public procurement regulations so it could be the case that when a company succeeds in finding a blue ocean, it may not be sustainable. The risk is also that sensing the opportunities and profits to be gained, competitors will soon come in with similar or better products, services, and offerings. The SIMPATICO team cannot assume that competitors will

not catch up to or even supersede it, in view of that the two pathways related to sustainable and research-oriented exploitation are key to keep business exploitable results updated.

6.2 Competitor analysis

Being in the last phase of the project life, here the exercise is to identify potential competitors in the area of “services simplification/automation for the public administration”.

The first consideration is about those companies being mostly addressing domestic governments without a European view; that is possible coming from the wide range of different procedures used among different European countries.

	Lepida (IT)	INDRA (SP)	Capita (UK)	CAP GEMINI (FR)	XEROX (US)
Positioning	Being owned mainly by the Emilia Romagna Region its view is exclusively to that territory.	One of the main global consulting and technology companies	UK's leading provider of business process management and integrated professional support service solutions.	A global leader in consulting, technology and outsourcing services. Capgemini creates and delivers business, technology and digital solutions enabling to achieve innovation and competitiveness.	One of the big players at world level. Huge offer of products and services also integrated with professional consulting
Target Group	Local public administrations	Public administrations at all levels	Public administrations at different levels	Local public administrations	Public administrations at all levels
Pricing	Activation fee, Annual fee related to number of citizens reached.	Various cloud offers: PaaS, SaaS.	All cloud offers: PaaS, SaaS	Various cloud offers: PaaS, SaaS.	Product sales and various cloud offers: PaaS, SaaS.
Value Offering	<u>IcarER</u> is the infrastructure for the applicative cooperation among public administrations. It allows for the exchange of data among the information systems of different public bodies, in an interoperable	AMARA ATIENDE: The multi-channel face of the platform for society and the public: Institutional portal Citizen folder eOffice	Capita is UK's leading technology solutions provider working closely with local councils, supporting them in the challenges they face by delivering a variety of services – ranging from specific software tools to	Capgemini helps governments use Data and Insights to place their citizens at the heart of public services. Deliver better public services, more quickly and cost effectively by unlocking the value in data. Online	Xerox Workflow automation solution for public sector. From automated routing and digital repositories to integrating tablets and capturing analytics, these workflow solutions make document processes fast

	<p>manner.</p> <p><u>PayER</u> is the platform for on line payments to public administrations, implemented by LepidaSpA.</p> <p><u>TappER</u> is a system to help public administrations develop applications offering citizens a simple access to on line services from mobile devices.</p> <p><u>SuapER</u> is the regional platform supporting local authorities in Emilia-Romagna in managing the on-line front office related to the one stop shop for manufacturing/trading activities.</p>	<p>AMARA CITAS: Integral multi-channel appointment management for organizations and institutions</p> <p>AMARA TRAMITE: System in charge of controlling and managing the procedural administrative case file processing flow</p> <p>AMARA eSCRIBE: A corporate system for creating documents and templates based on reusable blocks and paragraphs</p> <p>AMARA NETPLUS: System responsible for the payment gateway with an associated administrative procedure</p> <p>AMARA NOTIFICA: System responsible for the service and the monitoring of notifications required by procedures</p>	<p>significant joint working on achieving tangible external outcomes.</p> <p>Main sectors covered:</p> <p>Social Care, Economic growth, Housing, Public Health, Education.</p> <p>Capita Local Government delivers a wide range of specialist services to local authorities, schools, academies and other public sector organisations, including IT and digital transformation, customer management, revenues, benefits, finance, property development and regulatory services, education support and back office processing.</p>	<p>transactions and mobile and connected devices are generating a wealth of data.</p>	<p>and efficient. automated</p> <p>Child Support Services, Customer Service, e-Childcare Solutions, Electronic Benefits Transfer (EBT), Electronic Payment Services, WIC Services.</p> <p>Converting paper to images. Keeping IT at capacity. Routing requests for service.</p>
Reach	Emilia Romagna Region (IT),	Madrid, Valencia, Valladolid, Navarra,	Salford, London and in large number of local	All over Europe, heavily commercialised	All over the world, heavily commercialised

		Agencia Tributaria (SP)	bodies.		
Strength and weakness	1) Good example how to face cloud services dedicated to simplification in the PA, 2) Mainly oriented to the captive market of its region.	1) Strong and wide player, offer very varied, 2) Lack of flexibility.	1) Leading player in UK, 2) Complete cloud-based offer, 3) Focused on local communities	1) Strong and wide player, offer very varied, 2) Not affordable for small services.	1) Strong and wide player, offer many services in bundles or standalone 2) Expensive prices

Table 20 - Competitors



As explained before, none of these products could offer the simplification engine and the workflow adaptation that are key components of SIMPATICO project. Nevertheless, all these competitors are very strong in the market and to introduce SIMPATICO we should consider at least three possible pathways to face them:

- 1) Try to integrate SIMPATICO in their solutions and go to the market together;
- 2) Propose SIMPATICO as a complete solution to provide services to citizens pushing all the added values of the entire solution.
- 3) A possible third option could be SIMPATICO being considered a toolset for those two previous options.

7 Exploitation opportunities

This chapter is not fully provided in the version for open peer reviewing for confidentiality reasons. The full version includes Joint exploitation options, IPR management among project partners and extract from consortium agreement policy.

7.1 Early identified Initiatives (reduced to match confidentiality)

Initiatives have been grouped according to the three pathways identify in the innovation strategy: Research and Education, Sustainability and Business oriented.

7.2 Research and Education

7.2.1 Initiative 1 (FBK)

Initiative description	Lexical Simplification (LS) for Italian: automatic simplification of words or phrases. FBK developed state-of-the-art approaches for LS in Italian, including a module to adapt simplification choices to the user native language.		
Lesson learnt	The models developed are the core of the SIMPATICO TAE server for LS.		
Participating partners/role	FBK		
Outcome	Type of availability	Owner	Research/Use model
SIMPATICO TAE server		FBK	SIMPATICO platform component
1 paper to be presented at CLIC-it 2018		FBK	Dissemination

7.2.2 Initiative 2 (FBK)

Initiative description	Interaction simplification: FBK developed state-of-the-art approach for digital form interaction adaptation (WAE).		
Lesson learnt	The proposed approach is effective, usability must be improved.		
Participating partners/role	FBK		
Outcome	Type of availability	Owner	Research/Use model

SIMPATICO WAE server		FBK	SIMPATICO platform component
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7.2.3 Initiative 3 (FBK)

Initiative description	TINT: an NLP Suite for text processing of Italian texts, from part-of-speech tagging to syntactic analysis, including readability indices, multiword recognition and semantic linking. Released with GPL v.3 license.		
Lesson learnt	The models developed are used to pre-process Italian documents before simplification. They are included in the SIMPATICO TAE Server for LS and SS		
Participating partners/role	FBK		
Outcome	Type of availability	Owner	Research/Use model
SIMPATICO TAE server		FBK	SIMPATICO platform component
1 paper to be presented at CLIC-it 2018		FBK	Dissemination

7.2.4 Initiative 4 (USFD)

Initiative description	Lexical Simplification (LS) for English, Spanish and Galician: automatic simplification of words. USFD developed state-of-the-art approaches for LS in the three languages above.		
Lesson learnt	The models developed were used are the core of the SIMPATICO TAE server for LS.		
Participating partners/role	USFD		
Outcome	Type of availability	Owner	Research/Use model
SIMPATICO TAE server		USFD	SIMPATICO platform component

7.2.5 Initiative 5 (USFD)

Initiative description	Syntactic Simplification (SS) for English, Italian and Spanish: automatic simplification of sentences structure. USFD developed state-of-the-art approaches for SS in the three languages above, with support from FBK and HIB.		
Lesson learnt	The models developed were used are the core of the SIMPATICO TAE server for SS.		
Participating partners/role	USFD, FBK, HIB		
Outcome	Type of availability	Owner	Research/Use model
SIMPATICO TAE server		USFD, FBK, HIB	SIMPATICO platform component

7.2.6 Initiative 6 (USFD)

Initiative description	Sequence-to-Sequence models for English text simplification: automatic simplification of sentences. USFD developed new state-of-the-art approaches for TS.		
Lesson learnt	The models developed are the new state-of-the-art in the research area. Deployment still needs to be evaluated since neural models can produce fluent outputs that do not always preserve the correct meaning.		
Participating partners/role	USFD		
Outcome	Type of availability	Owner	Research/Use model
Publication of papers in scientific conferences (submitting for NAACL 2018)		USFD	Dissemination
SIMPATICO TAE server (under negotiation with data owners)		USFD	SIMPATICO platform component

Use the develop methods to improve other NLP applications (e.g. MT)		USFD	Research
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7.2.7 Initiative 7 (USFD)

Initiative description	User Profile Manager component for storing demographic and user interaction information. This component will gather demographic information from IFE and adaptation from DA, process this information and store in a database. The data will then be used by TAE and WAE for performing personalised adaptation		
Lesson learnt	The module being developed has several dependencies with other components and needs to deal with authentication.		
Participating partners/role	USFD		
Outcome	Type of availability	Owner	Research/Use model
SIMPATICO UPM server		USFD	SIMPATICO platform component
UPM database		Municipalities	Understanding users' needs in terms of content adaptation

7.2.8 Initiative 8 (DEUSTO)

Initiative description	Administrative procedure model which encompasses all the concepts and interactions needed when describing and executing a public procedure with the support of Internet technologies. The front-end of this model is the Servicepedia component, which describes in a concise graphical manner a public procedure and offers hyperlinks to questions, answers, e-services and other elements assembling a public procedure.
Lesson learnt	An administrative procedure consists of several procedural steps, some of which are represented by e-services, consisting of various forms, each of which having several blocks including fields and paragraphs. All the mentioned elements (forms, blocks, fields and so on) can be commented, questions, answers and terms defined associated to them. Phrases and words can be simplified. Interaction flows simplified. This tool has several dependencies with other components (QAE,

	CPD) and needs to deal with authentication.		
Participating partners/role	DEUSTO, BENG, FBK, ENG		
Outcome	Type of availability	Owner	Research/Use model
Servicepedia component		DEUSTO	SIMPATICO platform component
1 paper presented at UCaml 2018		DEUSTO, BENG	Dissemination

7.2.9 Initiative 9 (DEUSTO)

Initiative description	<p>Citizenpedia: Based on the interaction model, the Citizenpedia component has been implemented inside the SIMPATICO project. It aims to complement e-government environments with a collaborative space where citizens and civil servants share and exploit accessible knowledge about public procedures, and more specifically, where citizens can solve their doubts and actively take part in the enhancement of e-services. To that end, Citizenpedia has been designed, a participation (one of the key pillars of Open Government) fostering component, as an aggregation of three complementary tools:</p> <ul style="list-style-type: none"> • The Question & Answer Engine (QAE) is a tool which provides a mechanism where citizens post and resolve doubts regarding e-services and public administrative procedures. • The Collaborative Procedure Designer (CPD) is a tool to describe current administrative procedures in the form of flowcharts/diagrams, that enable citizens to comment on them. The core of the CPD is a model that allows the definition of multiple hierarchical views, each one providing a representation of the procedure with a growing level of detail. • Servicepedia integrates the descriptions of the e-services with the information on the QAE and CPD to have all the elements contextualized. This tool is the one which uses, directly or indirectly, most of the concepts of the interaction model.
Lesson learnt	<p>As a Human Computation framework, Citizenpedia highly relies on the continuous engagements from citizens and civil servants that retrofit each other continuously improving the procedures commented, questioned and answered. The creation of a critical mass is, therefore, essential to make this component useful. Further, more intuitive mechanisms to recommend questions and answers closest related to selected areas of text or sections in an e-service should</p>

	be considered. Finally, mechanisms to promote key contributors' rights regarding the human generated knowledge management could be of interest as the Gamification strategy integrated within QAE component.		
Participating partners/role	DEUSTO, BENG		
Outcome	Type of availability	Owner	Research/Use model
Citizenpedia framework		DEUSTO	Human Computation framework composed of Servicepedia, QAE and CPD components.
1 paper to be presented at UCAmI 2018		DEUSTO, BENG	Dissemination

7.2.10 Initiative 10 (DEUSTO)

Initiative description	Question and Answer Engine (QAE): citizens can post doubts and look up for terms and definitions through this component. From the civil servants' side, this component is an easy channel to rapidly solve doubts associated to different parts of public procedure.		
Lesson learnt	It is not enough with having an intuitive component deployed. It is critical to have a good range of high-quality questions and associated answers. Curation from Civil Servants is necessary. Campaigns to incentivize contributions from e-service, administrative procedure consumers is needed.		
Participating partners/role	DEUSTO		
Outcome	Type of availability	Owner	Research/Use model
QAE component		DEUSTO	SIMPATICO platform component
1 paper to be presented at UCAmI 2018		DEUSTO, BENG	Dissemination

7.3 Sustainability initiatives

7.3.1 Initiative 1 (TRENTO)

Initiative	SPRINT project aims at the development of a reusable kit based on Sportello
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description	<p>Online, ComunWeb and the SIMPATICO tools for other Italian municipalities.</p> <p>Trento uses Sportello Online as e-service portal while and it uses ComunWeb as web service portal. In both of the platforms there are detailed description pages which give all the information about the e-services and the related administrative process.</p> <p>The SIMPATICO tools that will be exploited are TAE, WAE, Authoring Tool, CPD and, if possible, Q&A.</p>		
Lesson learnt	<p>Having a seamless integration between SIMPATICO tools and Sportello Online will be the key to improve e-service usability.</p> <p>The integration of the tools within both the e-services and the services portals is able to really simplify the interaction with the PA for citizens and professionals.</p>		
Participating partners/role	TRENTO, FBK, BEng		
SIMPATICO outcome	Type of availability	Supplier	Pricing model
<i>TAE</i>	<i>TBD</i>	<i>FBK</i>	<i>TBD</i>
<i>WAE</i>	<i>TBD</i>	<i>FBK</i>	<i>TBD</i>
<i>Authoring Tool</i>	<i>TBD</i>	<i>FBK</i>	<i>TBD</i>
<i>CPD</i>	<i>TBD</i>	<i>BEng</i>	<i>TBD</i>
<i>Q/A</i>	<i>TBD</i>	<i>Deusto, HIB, FBK</i>	<i>TBD</i>
Exploitable result or aggregation of more than one	Business Leader	Further participants/type of contribution	Sustainability Canvas
<i>Sportello Online and ComunWeb portals</i> <i>SIMPATICO tools</i>			Added value for your organisation:
			Example of good practises and pilot site to test new and improved solutions
			Reason for SIMPATICO choice:
			The involvement in SPRINT project gives the possibility to re-use the SIMPATICO solutions as good practises in other sites

			Target expected outcomes:
			<p>SIMPATICO tools adopted in other municipalities.</p> <p>Raise the awareness of other bodies (not involved in the SPRINT project) about Sportello and ComunWeb environments and the SIMPATICO tools.</p> <p>Moreover, the SIMPATICO tools will be published on https://developers.italia.it/ as a re-use kit and could be adopted by other realities and public bodies (through an appropriate licensing system).</p>
			Actions planned:
			Calls and meetings

7.3.2 Initiative 2 (Galicia)

Initiative description	Propose the use of SIMPATICO to the ICT department of the Xunta de Galicia (Amtega) in order to be integrated in one of the e-services tested in the project.		
Lesson learnt	SIMPATICO is a tool that helps citizens with the e-services formularies and it also works in the background with a no-intrusive interface over the web pages		
Participating partners/role	<i>GALICIA: promotor</i> <i>DEUSTO and HI-IBERIA: technical support</i>		
SIMPATICO outcome	Type of availability	Supplier	Pricing model
SIMPATICO tools over the real environment	Personalization and integration needed	DEUSTO and HI-IBERIA	To be negotiated: focused on development services
Exploitable result or aggregation of more than one	Business Leader	Further participants/type of contribution	Sustainability Canvas
<i>SIMPATICO tools</i>	HI-IBERIA	Xunta (receptor) and	Added value for your

		DEUSTO (technology provider supporting HI-IBERIA)	organisation:
			Simplifying the e-service
			Reason for SIMPATICO choice:
			To be analysed (public contract and its legal requirements)
			Target expected outcomes:
			Improving electronic presentation ratio of the e-services selected
			Actions planned:
			Contact and meet the IT heads in Amtega
			Action planned:
			Calls and visits

7.4 The Business Champion approach

7.4.1 Initiative 1 (ENG)

Exploitable result or aggregation of more than one	Business Leader	Further participants/type of contribution
CDV	Engineering	
Value proposition:		
CDV is a transversal suite for privacy enhancement, providing functionalities for lawful data sharing processes based on an explicit consent agreement. It allows to grant and withdraw consent to third parties for Personal Data usage, ensuring compliance to the GDPR during the data sharing of Personal Data among services.		
Unique selling point:		
CDV follows the MyData model to liberate the potential of Personal Data, facilitate its control and		

the opening of new business opportunities in compliance with the GDPR. With CDV Citizens and Businesses can manage and trace their own data and the general confidence towards the use of personal data is increased

Target users:

Companies, Municipalities, PAs and Citizens as legal roles involved to personal data processing (Data Subject, Controller, Processor).

Competition:

From a Digital Single Market study, in Europe more than 20 organisations are active in the field of platforms or services enhancing privacy protection in the online world. Besides the report outlines that "the sector is still in its early stages". There are a number of players that either already have or are about to launch commercial offerings. These players are mainly small in size, or telco providers experimenting with a personal information management service offer.

Action planned:

Starting from SIMPATICO experience, CDV could be "re-adapted" in several scenarios to assess and validate its impact in managing personal data exchange. ENG is planning the upgrade of the CDV itself to include further features and cover a wider set of needs identified. This activity has already started and will be continued during next year. .

The starting point for business activities will be ENG's market positioning in the smart city domain, where ENG has a specific company , MUNICIPIA, that will represent the main sales channel towards the PA . ENG is also analysing the possibility to include CDV in the "Industry&Services" offer of the company.

Expected business model/s

ENG aims to launch an ICT suite for a consent based, user centric personal data management. We foresee two main configurations of CDV commercial offer , according to the different target customers' needs: i) as a Service, ii) as a software deployed on premise.

Prospects:

It is currently expected to achieve 2 business prospects in 2019. The business scenarios will be extended creating further business opportunities also in other domains/sectors beyond the end of 2019 according to the following estimation:

7 in 2020, 10 in 2021, 15 in 2022.

7.4.2 Initiative 2 (FBK)

Exploitable result or aggregation of more than one		Business Leader	Further participants/type of contribution	Business Canvas	
Interaction Simplification This result integrates the text adaptation and the workflow adaptation functionalities of SIMPATICO - covering both basic simplification and personalized simplification approaches.		FBK	USFD	Value proposition:	
				Supports the adoption of e-services by citizens, by providing them a simplified and personalized interaction.	
				Unique selling point:	
				Advanced AI techniques for natural language and interaction.	
				Target users:	
				TBD: <ul style="list-style-type: none">• Public Administrations• IT providers of PAs	
				Competition:	
				TBD	
				Action planned:	
				To identify a commercial partner willing to invest with us in the solution	
Expected business model/s	FBK is working in the development of a platform enabling the exploitation of the research result in a business context. This platform will facilitate a business champion in the adoption of the SIMPATICO components. The access to the platform and to SIMPATICO results is subjected to a agreement under fear condition.			Prospects:	
				Together with Comune di Trento FBK is involved in the SPRINT project aiming at exploiting the interaction simplification functions developed in SIMPATICO. The SPRINT consortium involves Trento, Bergamo, Siracusa as public administrations and final users and Globo and Open Content as business partners. The project	

		intend to develop a reusable kit starting from the actual implemented SIMPATICO components.
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7.4.3 Initiative 3 (HIB)

Exploitable result or aggregation of more than one	Business Leader	Further participants/type of contribution	Business Canvas
NLP and text simplification for Spanish PAs feedback analytics	HIB	TBD	Value proposition:
			<p>PAs in Spain have open many feedback flows so that citizens send their inputs (e.g., @lineamadrid in Twitter, decide.madrid.es). However, the received inputs are too vast for the PA personnel to analyze fully on their own and they are overflowed. This proposed initiative would repackage some of SIMPATICO's tools into a dashboard for PAs to handle this.</p>
			Unique selling point:
			<p>Using automatically NLP (sentiment analysis, topic detection and clustering of similar feedback) to make the received inputs more manageable.</p>
			Target users:
			<p>PAs that offer open feedback channels that generate a lot of traffic. Integrating with some existing platform (e.g., a plugin to the software used in decide.madrid.es, the open source CONSUL project, could mean instant access to over 90 PAs and an aggregate 70 million</p>

			citizens.
			Competition:
			Action planned:
			Repackage the SIMPATICO NLP and dashboard tools to build a complete feedback management solution for PAs.
Expected business model/s	Since this is thought for PAs, it should be financed by a call for tenders or similar procedure. If it was extended to other organizations that gather large quantities of feedback, it could be priced for bulk text that is processed (e.g., 0.1€ for megabyte of text processed) or in a flat-rate pricing scheme which is easier to understand for non-technical end-users.		Prospects:

7.4.4 Initiative 4 (BENG)

Exploitable result or aggregation of more than one	Business Leader	Further participants/type of contribution	Business Canvas
Citizenpedia The Citizenpedia framework integrates two main results of the SIMPATICO project: the Question Answering Engine (QAE), where citizens will be able to post and solve doubts, and the Collaborative Procedure Designer (CPD), where civil servants will describe current e-services in the form of flowcharts/diagrams and citizens will be able to comment on them. Besides, the Servicepedia component acts as	BENG	DEUSTO	Value proposition: Citizenpedia offers opportunities for more collaborative and participatory relationships across stakeholders to actively collaborate in the design of public services and participate in their delivery. It will provide a place where citizens can find answers to their questions/doubts and interact in an amenable way with the public

<p>visual front-end of the SIMPATICO interaction model and conveniently links e-services to the CPD and QAE tools.</p>			<p>administration.</p> <p>Unique selling point:</p> <p>The possibility for the citizen to see the workflow of the administrative procedure in a simple and graphical way, together with the possibility to online comment and/or ask clarification, is a unique and distinctive feature of the CPD tool. Even if some public administration use software tools to model administrative procedure, their usage is mainly meant for IT specialist or business analyst, being the process notation not very simple to understand for citizens or even civil servants</p> <p>Target users:</p> <ul style="list-style-type: none"> • Municipalities • Public Administrations • IT providers of PAs • Civil servants, Citizens <p>Competition:</p> <p>TBA</p> <p>Action planned:</p> <p>Repackage the SIMPATICO Citizenpedia to build a complete e-service description solution for PAs.</p>
<p>Expected business model/s</p>		<p>There are different possible business models:</p> <ul style="list-style-type: none"> • SaaS: the Citizenpedia tools could be offered as services. In this model BENG will be the service provider, carrying out all of the IT operations on his premises. The public 	<p>Prospects:</p> <p>Sicilian municipalities Basque country municipalities</p>

	<p>administration will be charged with a pay per use model.</p> <ul style="list-style-type: none"> • Product: the Citizenpedia tools could be sold as a product. In this model BENG is the product owner, and will will also be in charge of the system integration within the PA infrastructure. The public administration will be charged using the standard model. • Royalties: the Citizenpedia tools could be licensed to the business partner (mainly IT provider of specific PAs) which will then integrate and deploy the solution on PA premises. In this model, the business partner will be charged with a royalty base fee. <p>In addition, BEng could provide consultancy services for modelling administrative procedures of interested Pas and training for their civil servants.</p>	
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8 Innovation radar inputs

The following section addresses the consolidation of inputs given to the EU related to Innovation radar questionnaire which have been considered key information for the exploitation strategy. The section provides a complementary view point to business initiatives planned by SIMPATICO partners.

This section has been considered confidential and is not released in the public version of the deliverable.

9 Monitoring the Exploitation strategy

Following the principles defined in section 2 of this document, the innovation carried on in SIMPATICO project is going to be monitored using a methodology having different steps and contingency actions.

The first monitoring activity is going to be performed on project outputs generation activities. The innovation team is engaged to monitor work packages in order to early identify possible issues that could affect the outputs release. In that case, a contingency plan including a plan revision or removal of planned output as it was defined is considered, possibly, to leave room for new outputs better defined.

The second phase is going to assess a view of inputs needed to evaluate growing outputs toward their outcomes, against existing identified exploitable results. In this phase, they could be modified, added or removed; the main goal is going to be the adherence between planned outputs and real ones. From this phase on the openness to networking activities to investigate possible re-use of results as a way to enlarge the exploitation plateau should be managed starting from the engagement of stakeholders involved in existing networks.

In the third phase, a first outcome analysis based on the Mission Oriented Innovation Canvas is going to be done to identify possible further investment needed to consolidate the outcome itself and or to better focus planned activities.

The last phase is going to address the final exploitation pathway and the long-term strategy for each outcome.

In Figure 21 a summary of actions is provided as a graphic tool to help achievement of Innovation goals referring to Mission Oriented Innovation Canvass (MOIC):

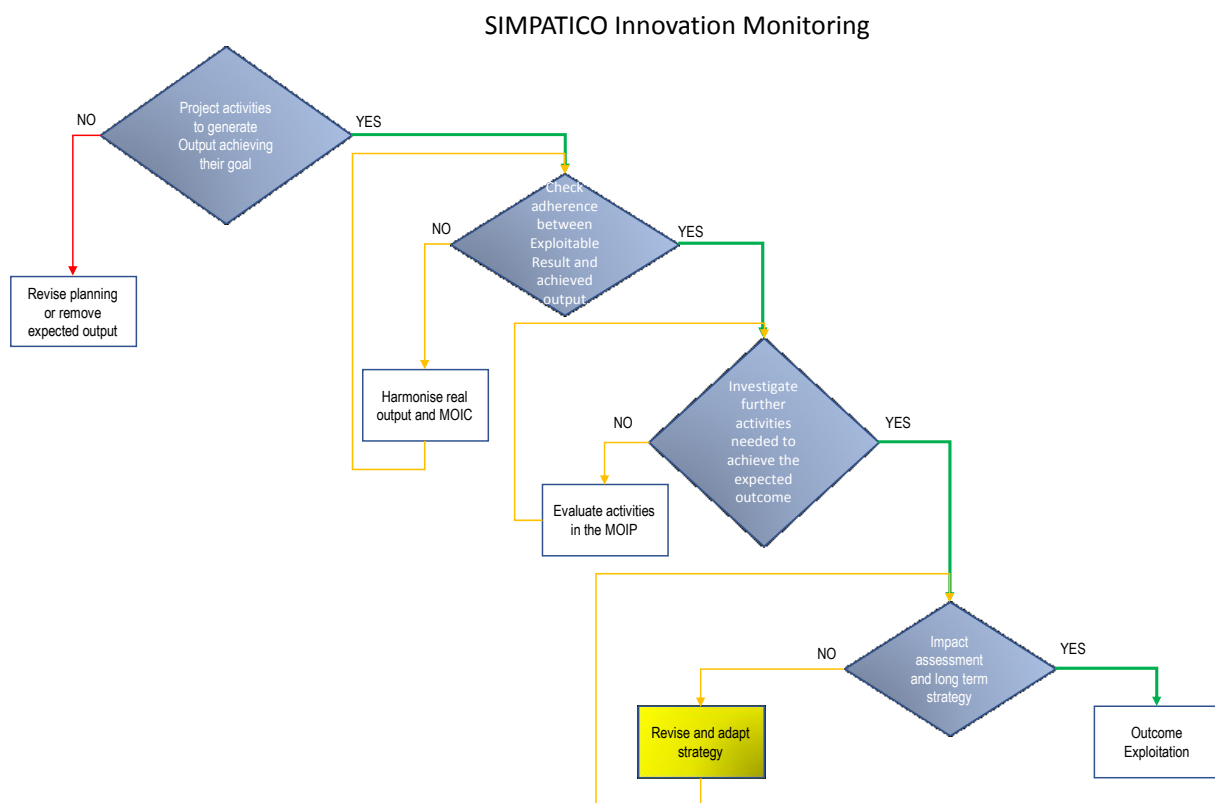


Figure 20 - Exploitation Monitoring pathway

The monitoring process has been used to achieve the vision presented in this document. Most of activities have been carried on using dedicated calls with partners and having dedicated workshops



during general assemblies. The methodology used has been considered valid and useful by SIMPATICO members and presented initiatives are the final outcome of it.

10 Conclusion

The public version of this deliverable could not disclose specific strategies due to confidentiality constraints.

The innovation strategy defined in D7.4 gave its results and they have been reported in this document. Starting from an early identification of 8 potential exploitable results, SIMPATICO now achieved 12 of them. From the research point of view, the project, in line to the fact that it is a Research and Innovation Action, it has produced several research exploitable outcomes which are going to be exploited by research and education oriented partners.

The three pilot sites consolidated their views and now two of them have a clear strategy to implement SIMPATICO in a sustainable way for tested services and in some cases also to enlarge to other services. In particular, the Italian pilot is participating in a re-use initiative based on SIMPATICO results.

Business initiatives are in their early stage, the project in the TRL 7 level so still not ready to be directly exploited. Nevertheless the consortium has several initiatives which include direct industrialisation of some components and the re-use of other components, also in collaboration with external partners.

The project overcame its original exploitation objectives having some enlargement initiatives running before the end of the project itself also applying a wider range of outcomes compared with what planned in the starting phase.