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Deliverable 2.1 "IPS Holistic Framework"
WP 2 "IPS Holistic Framework"
Task 2.1

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Abstract: This deliverable represents the preparatory work leading to the design of an IPS Holistic Framework. Specifically, its purpose is to develop practical guidelines and recommendations based on existent academic and grey literature, as well as the analysis of existent best practices regarding the main pillars of a holistic framework for integrated public services (IPS).

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Executive Summary

The current report is the first in a series of WP2 deliverables that together aim at devising a holistic framework for integrated public services (IPS) adopting co-creation approaches. Overall, WP2 works towards understanding how the main building blocks related to governance, agreements, stakeholder engagement, and implementation are interrelated in the context of IPS, aiming at constructing a replicable and scalable IPS agile roadmap. To do so, WP2 shall reach a scientific and innovative objective and a business-oriented objective (Grant Agreement, p.6):

- "S.I.O. 1: to investigate IPS Governance"
- "B.O. 1: to construct an IPS holistic framework for IPS co-creation and co-delivery that includes guidelines and recommendations on IPS Governance, on IPS Agreements, on Stakeholders' involvement and on implementation as well as an agile roadmap"

This first report in particular has the ambition to reach S.I.O. 1 and to make significant steps towards reaching B.O. 1.

To do so, the report presents the findings of a theoretical analysis conducted on the five dimensions of the holistic framework, using literature review and documentary analysis methodologies. A practical analysis of these dimensions is also provided, consisting in the empirical case study of five IPS-Co projects in several European countries: Norway, Latvia, Hungary, Italy, and Estonia/Finland and their comparison. This best-practice case study relies on the analysis of publicly available documentation and the interview of key stakeholders involved in the IPS studied. Finally, twenty-three recommendations are provided to practitioners, and contextualised in an agile roadmap.

The report concludes that:

- Needs and problems identification, knowledge generation, stakeholders' roles and their engagement, legal arrangements, inter-organisational agreements, monitoring and accountability are the most important elements in the analysis and conduct of the design, delivery and evaluation of IPS-Co initiatives;
- IPS-Co practitioners are recommended to pay particular attention to these elements, and are advised to use innovative methods and strategies to address them, and stakeholders-related matters in particular, maintaining an agile, and thus iterative, mind-set and practical approach.

The next WP2 deliverable will have the ambition to:

- Refine the work that was already done: enrich the theoretical and practical analyses, should any new information arise, and rethink and enhance the recommendations and the roadmap thanks to further feedback from project partners, in particular practical insights on the implementation of recommendations by inGOV pilots;
- Deepen the analysis of interlinkages between the five dimensions of the IPS holistic framework; provide an operationalisation of the framework through further study, interpretation and graphical visualisation.

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Acronyms and Abbreviations

Acronym/Abbreviation	Description
ABB	Architectural Building Blocks
ADMS	Asset Description Metadata Schema
AI	Artificial Intelligence
API	Application Programming Interface
ASP	Application Service Provider
BR	Business Register
CEF	Connecting Europe Facility
CF	Collaboration Framework
CHA	Collaborative Head Agreement
CIO	Chief Information Officer
CSC	Customers Service Centres
DIFI	National Agency for Public Management and eGovernment
DigComp	Digital Competence Framework
Digisos	Digital application for social security
DAC	Digital Administration Code
EC	European Commission
eID	Electronic identification
EIF	European Interoperability Framework
ELI	European Legislation Identifier
EU	European Union
GDPR	General Data Protection Regulation
GMB	Group Model Building

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ICT	Information and Communication Technology
IPG	Integrated Public Governance
IPS	Integrated Public Service
IPS-Co	Integrated Public Services- Co creation
IT	Information Technology
KIFU	State development agency
KKsZB	Hungarian Central Governmental Service Bus
KÖFOP	Public Service Development Operational Program
KPI	Key Performers Indicators
KS	The Norwegian Association of Local and Regional Authorities
MoU	Memorandum of Understanding
MS	Member States
NAV	Labour and Welfare Administration
NDA	Non-Disclosure Agreement
NGO	Non-governmental organization
NIIS	Nordic Institute for Interoperability Studies
NPG	New Public Governance Model
NPM	New Public Management Model
OECD	Organisation for Economic Co-operation and Development
PA	Public Administrator
PPP	Public Private Partnership
PR	(IO ITALIA)
PS	Public Service
PV	Public Values
RIA	Information System Authority

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SAA	Strategic Alliance Agreement
SBR	Standard Business Reporting
SLA	Service Level Agreements
SME	Small and medium-sized enterprises
TD	Team Digitale
UK	United Kingdom
UNDP	United Nations Development Programme
VARAM	Ministry of Environmental Protection and Regional Development
VISS	State Information System's Integrator
VRAA	State Regional Development Agency
X-Road BR	Exchange of information between Estonian and Finnish Business registers

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Introduction

Purpose of the report

As the inGOV project aims at developing and deploying a new Integrated Public Services (IPS) holistic framework, its second Work Package (WP2) is of particular importance. Building upon the conceptual and theoretical groundwork laid under the first Work Package, WP2 consists in the construction of an IPS holistic framework that will support IPS co-creation and governance. In turn, this will serve as a foundation for the deployment of the four inGOV pilots throughout Europe.

IPS are complex and require a multifaceted approach to implementation, the holistic framework consists in breaking these down into five interrelated operationalisable constructs. Namely, the holistic framework intends to connect IPS governance structures, formal agreements, stakeholder engagement methods and design processes, converging into an IPS agile roadmap.

In this context, Deliverable 2.1 provides both theoretical bases and practical guidance on the main constructs of the IPS holistic framework. The deliverable is envisioned as a stepping-stone, enabling inGOV pilots to proceed with the first stages of IPS deployment. Benefitting from an agile process throughout the project's lifecycle, two more iterations of the holistic framework are planned (Deliverables 2.2 and 2.3). This agile process will enrich the holistic framework by incorporating continuous feedback from pilots, the workshops with case owners the European Commission, and further desk-based and practical research.

Taking all of this into considerations, Deliverable 2.1 makes a first step in accomplishing two innovative objectives - one scientific and one business oriented (Grant Agreement, p.6):

- "S.I.O 1: to investigate IPS Governance"
- "B.O 1: to construct an IPS holistic framework for IPS co-creation and co-delivery that includes guidelines and recommendations on IPS Governance, on IPS Agreements, on Stakeholders' involvement and on implementation as well as an agile roadmap"

Structure of the document

To reach these objectives, this report is divided into three sections, which content is the following.

Section 1 presents a theoretical study of the five dimensions of the holistic framework, using both literature review and documentary analysis methodologies. In greater detail:

- Chapter 1 consists in a literature review presenting the state of the art of academic works on the concept of IPS governance;
- Chapter 2 consists in a documentary analysis of existing IPS agreements aiming at providing a definition and classification of those;
- Chapter 3 consists in a literature review presenting the state of the art of academic works on the concept of stakeholder engagement in the context of IPS;

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- Chapter 4 consists in a literature review presenting the state of the art of academic works on the concept of IPS design and implementation;
- Chapter 5 consists in a documentary analysis of existing IPS roadmaps and a literature review on the concept of agility, to provide a definition of IPS agile roadmaps and a rationale for preferring this method.

Section 2 presents a practical review of existing best practice in the field of IPS co-creation and implementation, aiming at analysing the real-life implications of the dimensions of the holistic framework. In greater detail:

- Chapter 6 consists in the detailed analysis of five best practice cases across Europe, which was conducted through documentary analysis and stakeholder interviews;
- Chapter 7 consists in the cross-case comparison of findings, and aims at delivering generalizable conclusions to the arguments developed under the previous chapter.

Section 3 presents a set of recommendations and an agile roadmap for IPS co-creation and implementation practitioners. In greater detail:

- Chapter 8 consists in the delivery of a number of recommendations for each stage of an IPS project lifecycle. It is aimed at feeding inGOV's own pilots, as well as inspiring IPS practitioners at large. There follows a contextualisation of these recommendations into a visual roadmap, introducing a dimension of agility.

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Research strategy

This research draws on a multi-method approach to serve the overall stated purposes of this deliverable. In the **first section**, a traditional literature review was a necessary step to study the main elements of the framework that influence IPS, and lay the foundations for the following analysis of cases. For this latter section, a qualitative, case study research approach was adopted. This allows for a holistic interpretation of the previously investigated elements in each of the analysed IPS Co-creation projects as a unit of analysis.

According to [1], a review of literature can be carried out following a traditional or a systematic approach to present the summary of an existent body of research and spot relevant gaps for potential contribution. To map the literature on governance modes, stakeholders' engagement, and formal arrangements between key organisations in IPS across sources and contexts, a conceptual review was conducted based on traditional review techniques [1, pp. 77–88].

Traditional reviews consent to critically inquire about a topic adopting a flexible and explorative approach. This type of approach is particularly appropriate when the purpose is to gain understanding on how a particular concept (or in our case various concepts) is used by different scholars or in different disciplines and sharpen the preliminary considerations on the topic under study. Especially in the field of digital public services, a growing amount of literature is available. Therefore, contrary to comprehensive or systematic reviews, the literature searches for this report identified the key literature and included selectively only those sources most relevant and on which we could report in greater detail [2]. To make this selection, we still used a systematic approach. A snowball sampling method was used across all theoretical chapters to locate relevant literature [3], [4]. Snowballing refers to using the reference list of a paper or the citations to the paper to identify additional sources and uses judgment to decide whether to pursue these further [5]. Snowball methods are particularly useful for identifying high-quality sources in different locations [5], and to avoid a bias in the literature and search outcomes [6]. Based on the thematic question each chapter chose to adopt a strategy that included systematic keyword searches in Google Scholar, Scopus, the Digital Government Reference Library, Web of Science, and Google, followed by a 'purposive' sampling that were clearly concerned with the topic under study. Furthermore, existent scientific sources were integrated with a sample of grey literature in which very recent, area-specific, and practical insight is reflected. Finally, various available platforms were searched in to retrieve material, solutions and guidance for the latest technology and interoperability features (i.e., JoinUp, Cordis, IBM Centre for Business of Government, etc.).

Below are succinctly presented the various approaches adopted in reviewing the relevant literature for each chapter, as separately their focus is on one specific element of the framework.

The aim of *chapter 1* was to explore different governance modes in the context of IPS-Co-creation of digital public services, in order to provide an initial theoretical background on the governance of the IPS Holistic Framework. To do so, we reviewed relevant academic literature in (e-)governance [7]–[11] and co-creation/co-production of public services [12]–[17]. Building on the insights of the review, an initial proposal of IPS-Co-creation Governance is presented.

In *chapter 2*, a literature review to identify interorganisational agreements, focusing on the IPS domain was conducted using several search queries (i.e., integrated/digital public service, and agreement). All

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available articles in Scopus were retrieved. Several articles were selected for this review: (1) articles describing research conducted in the framework of "Interoperability Profiles for Command/Control Systems and Sensor Systems in Emergency Management1" (2) a few articles regarding Service Level Agreements (SLA) which is a well-established type of Agreement; (3) material available on Joinup platform for sharing and reusing of Interoperability solutions for public administrations, businesses and citizens [18]. As a result, one relevant technical report was identified, titled: "Guidelines and templates for agreements between public administrations for sharing and re-use" [19].

A similar approach was used for both chapter 3 and 4 for which the Scopus database was selected as the primary source of academic research material. It was recognised that this database encompasses many relevant papers in the fields of Political Science, Business Studies, Management Studies, and Information Science. The Google search engine was chosen to locate European policy documents and associated grey literature. Following Aveyard [3], the sampling strategy deployed for this part was purposive. Specific keywords for each topic were used alone or in combination to retrieve related and relevant sources. It was decided to mainly focus on publications of the past ten years, although known key literature from earlier years was also used. In addition, for chapter 4, analysis and identification of relevant EU eGovernment initiatives and documents was performed.

Finally, in *chapter 5*, using the same identified repositories, relevant resources were selected based on various search queries combining keywords (such as, public service/digital services and roadmap). The selection included literature that provided information on what is a roadmap as well as what elements should be included within a roadmap, especially when designed for a public service. Finally, we selected for further investigation a total of six public service designs and roadmaps that cover all elements identified in our search, providing an overall overview of the subject matter. These roadmaps and public service design guides were selected as they provide informative insights on the principles guiding the design of roadmaps, the steps followed in the process, the main elements to incorporate and two examples of best practices.

The **second section** of this report presents and discusses the findings from a multiple-case study of IPS projects. Qualitative research is privileged when the aim of the analysis is either to acquire a holistic understanding of an investigated topic by considering different perspectives and contextual conditions or to contribute with insight on emerging concepts [2], [20]. From the multitude of available methodologies in qualitative research, a case study design, similar to the one employed in D1.1, was followed here. As Yin [2, p. 14] cogently argues, the case study inquiry "comprises an all-encompassing method – covering the logic of design, data collection techniques and specific approaches to data analysis.". Co-creation approaches in digital public services generally, and integrated public services, as phenomena, are still at early stages of study and evidence about their realisation in practice is relatively scarce or scattered at best. Therefore, the multiple case study design was applied to bring forward various aspects of creating and providing IPS by studying different examples of initiatives (cases) in their own context.

The five IPS projects that are analysed and compared in this report directly derive from the previous deliverable, ensuring consistency and continuity between the different work packages of inGOV project. The five cases can be qualified as IPS best practices, thus fitting both the requirements set out

[1] C2-SENSE project that has been funded under FP7-SECURITY https://cordis.europa.eu/project/id/607729

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for the previous and the present deliverables. Namely, three cases (X-Road BR, Digisos and Municipal ASP 2.0) are defined as IPS best practice by the ISA2 study report [21], in accordance with the Grant Agreement (p.91); and two cases (IO Italia and Latvija.lv/VARAM) were designated as best practice because they display outstanding IPS and co-creation features, as research conducted under the previous work package shows.

Consistent desk research was conducted in the previous deliverable to gather as much available information on each studied case. However, the focus in the current document stretched beyond the one analysed in the preceding report to include additional aspects on the governance of IPS projects, the agreements signed to enable their realisation, and more generally their implementation. Bearing that in mind, we collected supplementary material on the unexplored aspects and conducted semi-structured interviews to write up comprehensive case reports, reproducing the same logic exposed in work package one. Data collection was carried out in a period of two months, with 15 interviews conducted between the second half of August- first half of October 2021.

The process of data collection involved the realisation of semi-structured interviews with informants in different roles for which a new interview guide was designed and shared with consortium researchers for revision (see Annex). All members of the team who conducted interviews were involved in the design of the questionnaire and shared the same guidelines in administering the interview protocol. The questionnaire was prepared to ensure that all relevant areas will be covered during interviews with different people in a systematic and comprehensive manner "by delimiting in advance the issues to be explored" [22, p. 644]. However, the interview guide offers flexibility in adapting the question(s) to the target participant as to consider the specificity of the role the organisation (has) played in the provision of IPS.

Finally, following the same logic of the previous interviewing wave with key informants, during the second wave we were able to interview a larger number of stakeholders striving to cover a wider array of perspectives and roles played in the creation and provision of IPS. Overall, we conducted 15 interviews and received 3 written contributions answering our interview questions. Largely, individual semi-structured interviews were carried out, except two instances when interviews involved a group of 2 or 3 people. Group interviews are treated differently in the literature than focus groups. Focus groups typically have a homogenous structure engaging five to eight participants sharing similar background and experience, engaged on focused issues [22]. Whereas interviews with naturally occurring groups are suitable in cross-cultural settings that aim at putting at ease the participants or when interviewees are not accustomed to one-on-one inquires. However, as Yin [2] explains, group interviews are treated as adjuncts of individual interviews. When doing small group interviews, two researchers were involved in supporting with taking notes, recording and making sure all relevant aspects were covered.

Before the interviews, the participants received an informed consent form in order to collect data in a structured and transparent way. The informed consent form contains information about the InGov project, the purpose of the case studies as well as the measures taken to ensure informants' confidentiality, and the procedures about the treatment of data.

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Literature and document analysis

1.1 Integrated Public Services (IPS) governance domain

1.1.1 Background: A brief recap of the European Interoperability Framework

Interoperability has proven to be key for the digitalization of public administrations. It can help to improve public services while saving time, reducing costs, and increasing transparency. Furthermore, interoperability has been recognized as crucial to overcoming complex societal issues such as climate change, housing, health, energy efficiency and urban mobility [7]. Despite its acknowledged benefits, interoperability is however not easy to achieve, and a lack of interoperability can result in suboptimal public services [7]. Considering its complexity and promises, public administrations around the globe, as well as international organizations, have been working on the concept of interoperability and how to make use of it in order to improve digital public services [23]–[25].

The European Commission in this context developed the European Interoperability Framework (EIF), a policy document that guides the concept of interoperability to public administrations and their staff. First thoughts and reflections about the interconnectivity of the digital public services started in the 1990s followed by the first version of the EIF was published in 2004, and a second version in 2010. The most recent version was published in 2017 [26]. The 2017 EIF aims to "ensure that services are accessible, not only within their national borders, but also across countries and policy areas" [27]. In this latest version, interoperability is defined as "the ability of organisations to interact towards mutually beneficial goals, involving the sharing of information and knowledge between these organisations, through the business processes they support, by means of the exchange of data between their ICT systems."[28, p. 15].

Besides the definition of interoperability, the 2017 EIF is also composed of twelve principles, six layers, and a conceptual model (see Figure 1). Those three elements, together with the definition, form the heart of the 2017 EIF. The principles, layers and conceptual model provide the public administration staff with the information required to work on interoperable digital public services. The principles aim to establish common behaviors on interoperability. The principles are the following 1) Subsidiarity & Proportionality; 2) Openness; 3) Transparency; 4) Reusability; 5) Technological neutrality & data portability; 6) User-centricity; 7) inclusion and accessibility; 8) Security and privacy; 9) Multilingualism; 10) Administrative simplification; 11) Preservation of information; and 12) Assessment of effectiveness and efficiency [28].

Regarding the layers, the 2017 EIF is composed of four interoperability layers (legal interoperability, organizational, semantic and technical), one cross-cutting component of the four layers (integrated public service governance) and one background layer (interoperability governance). These layers and components are summarized below [28]:

- Legal interoperability aims to ensure that the use of different legal frameworks, policies and strategies does not block the provision of digital public services. Furthermore, it is advised that legal frameworks support the development of interoperable digital public services.

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- Organizational interoperability refers to the alignment of business processes, responsibilities and expectations concerning agreed and mutually beneficial goals among different public administration organizations.
- Semantic interoperability ensures that data and information are preserved in a precise format and are understood in the same way when exchanged between different public administration organizations.
- Technical interoperability refers to the different Information and Communication Technology (ICT) applications and technical infrastructures that link technical systems and services.

Integrated Public Service Governance refers to a meta-level where the aforementioned layers need to be considered to (re)develop a specific service. It includes the overarching governance environment where public services are offered by the public administration. It comprises organizational structures, roles and responsibilities and the decision-making process wherein the different stakeholders are involved. It also ensures that interoperability can be achieved within and between individual public services. This aspect of the EIF is of crucial importance for the overall user satisfaction.

Interoperability governance refers to the overall decisions regarding interoperability frameworks, the institutional arrangement, roles and responsibilities, organizational structure, policies as well as agreements to ensure and monitor interoperability at Member State and EU level.

Finally, the Conceptual Model for Integrated Public Services "promotes the idea of interoperability by design. It means that for European public services to be interoperable, they should be designed in accordance with the proposed model and with certain interoperability and reusability requirements in mind" [28, p. 33]. The model is a promoter of reusability which is considered a driver for interoperability. Indeed, a service embraces the overall objective of interoperability when its main components are reusable, therefore, the higher the interoperability of a service, the more reusable the service becomes. It recognizes that European public services should reuse existing information and services. The basic components of the model are 'integrated service delivery', a 'no wrong door' service delivery policy, reuse of data and services, catalogues describing reusable services and other assets, integrated public service governance and security and privacy [28].

below presents the different components of the 2017 EIF.

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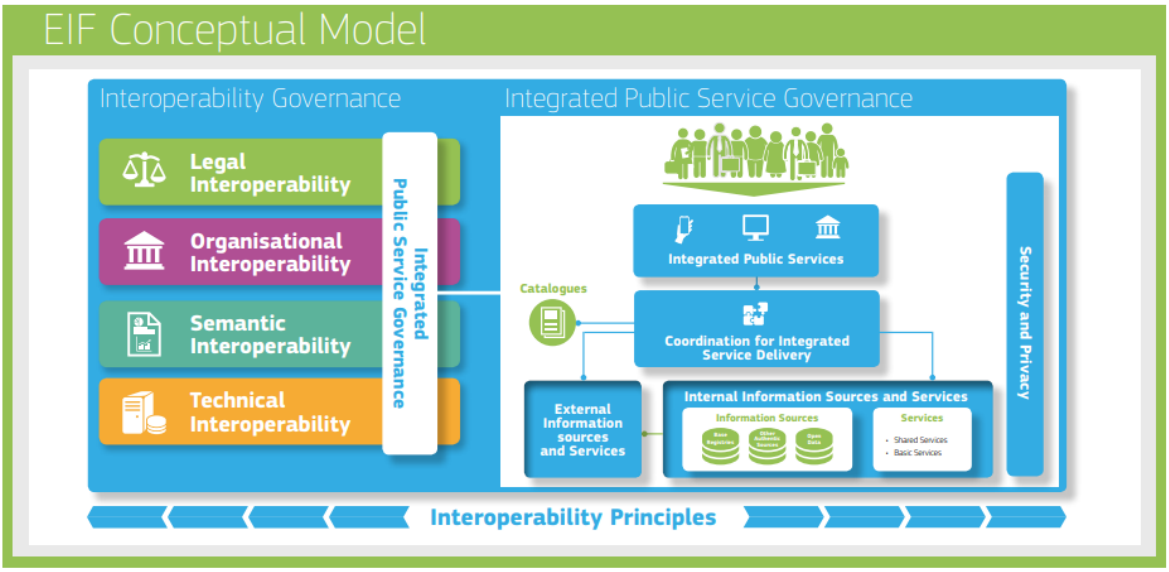
Figure 1: Components of the EIF 2017



Source: EIF [28].

In this 1.1.1 subsection, we focus on the cross-cutting component of the four layers called Integrated Public Service Governance. The aim is to understand the potential governance modes (i.e., organizational structures) in which IPS co-creation can take place in order to develop an initial theoretical background on IPS Co-creation governance. In the remainder of this subsection, we present a theoretical overview of governance and governance modes, and the role of IPS and co-creation, to offer a first glimpse of the potential understanding of IPS Co-creation governance. This element will be key in the definition of the IPS holistic framework. To do, so, we first start defining governance and the three ideal-types: hierarchy, market, and network, and introduce the concept of meta-governance. Second, we reflect on the concept of IPS governance. Third, we introduce co-creation as a potential approach to deal with challenges related to IPS provision. Finally, we conclude with an illustration of the potential role of IPS co-creation within the three governance modes.

1.1.2 From governance to mega-governance

In this subsection, we will discuss the conceptualization of governance, followed by a description of the differences in the modes or styles of governance. Considering the evolution of the concept of governance, and the remaining dominant role of the government [8], we also discuss the concept of meta-governance. Meta-governance will support our understanding of the potential balance of the governance modes to overcome challenges related to the wide array of actors, including their roles and dynamics, involved in the provision of IPS and in co-creation processes.

Concepts

Governance is a complex concept with diverse definitions based on the context, and it is widely used both in academia and practice. It has also been defined to be a “magical concept” [29] or a “buzzword” [9]. Moreover, there is not much consistency in the use or meaning of the governance concept and there are as many ideas about governance as there are researchers in the field [30]. For this reason,

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together with the importance and inter-disciplinarity of this concept, many academics have tried in the last decades to categorize those understandings and meanings [31]. For instance, Van Kersbergen and Van Waarden [32] established nine different meanings of governance.

1. Good governance. This usage "stresses the political, administrative and economic values of legitimacy and efficiency" [32, p. 145].
2. Governance without government or self-organization beyond the market and the state. In this definition, the work of Elinor Ostrom [33] about common pool resources management is included (e.g., overfishing).
3. Economic governance. This definition is related to neo-classical economics. In this case, governance is a broader concept than government.
4. Corporate governance. It is related to the concepts of accountability and transparency in management.
5. New public management. It is about bringing management concepts from the private sector to the public sector.
6. Governance in and by networks. This meaning includes networks from both public and private sectors.
7. Multi-level governance. It refers to the different governmental levels and the participation of public and private sectors at those levels.
8. Network Governance-Private. In this case, the concept is related to inter-firm cooperation.

While Klijn [34] recognized four:

1. Governance as good governance or corporate governance. This definition emphasizes the operation of the government instead of how it is organized.
2. Governance as a new public management. In this definition, the role of the government should be to steer while focusing on the goals instead of prescribing the implementation process.
3. Governance as multilevel governance. In this case, governance is described as multi-layer government or intergovernmental governance.
4. Governance as network governance. In this case, "[g]overnance takes place within networks of public and non-public actors, and the interaction between these groups makes processes complex and difficult to manage" [34, p. 508].

To sum up, based on the different definitions and conceptualizations and in broad terms, governance is about: i) patterns of actions to reach goals, ii) governing arrangements iii) multiple jurisdictions and multiple (private and public) actors, iv) institutions, structures and processes, and v) networks.

Governance modes

Governance can be clustered into three ideal-types in the Weberian sense: hierarchical, market and network governance. These are also known as governance styles or modes, and are understood as "the processes of decision-making and implementation, including the manner in which the organizations involved relate to each other"[9, p. 12]. Moreover, they "refer to the various forms

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through which governance can be realized" [10, p. 7] and are also known as coordination mechanisms [35].

Although the normative approach of the three governance modes is being critiqued for presenting abstract, ideal-types, Pahl-Wostl argues that they "constitute very useful points of departure for more refined analyses" [10, p. 7]. Therefore, in this instance, this approach fits the purpose of subsection 1.1 which is to offer a first glimpse of IPS Co-creation governance in a context characterized by new modalities of coordination and steering, as well as a growing significance of non-governmental actors (e.g., citizens, businesses, users).

Hierarchy is characterized by hierarchical instruments and positions. In this case, the interaction is characterized by authority. Moreover, it provides "a way for standardizing government tasks". Market is mainly based on price and competition, relying on the exchange between actors. Finally, network is based on deliberations and aims for mutual gains, and relies on the cooperation between actors built on shared values and interests [9, p. 89], [36].

The three ideal-types of governance also differ on sub-functions and properties. Below we described a selection of the main aspects based on the work of Pahl-Wostl [10], [37], [38] who summarizes and critically examines these aspects (see also in Table 1):

1. Government sub-functions
    - Policy framing is about the identification of problems, possible causes, and solutions. It will depend on who is part of the problem assessment and whose voice has an impact on it. Therefore, in cases of complex issues, a more pluralistic approach that considers different voices and perspectives is more desirable, such as in the case of a network governance style. On the contrary, a hierarchical style is strongly based on expert judgments, and a market style is mainly focused on profitability, cost and market failure.
    - Knowledge Generation is based on how the different governance styles value different kinds of knowledge and sources. In the hierarchical style, there is a technocratic-focus where the technical experts' view is most valued, while in the network style knowledge is seen as a way to increase competitive advantage. In the network governance style, knowledge is generated and shared among a group and different type of knowledge is valued.
    - Rule-making enables informal social learning processes in order to structure interactions and support the achievement of tangible results. The hierarchical style is characterized by a political parliamentary process. The market style process is based on negotiation on prices. Finally, the network style involves broad negotiations and deliberations while it is open for renegotiations.
    - Resource mobilization: resources are needed for policy implementation, such as funding, expertise and political resources. The resources vary across the governance style: the hierarchical style includes tax and governmental budgets for financing; the market style includes investments; and the network style includes voluntary financing. When mobilizing resources, both legitimacy and leadership are crucial to avoid any difficulties.
    - Conflict resolution refers to the conceptualization of conflicts and framing of the solutions. The mechanisms for conflict resolution in the hierarchical style are mainly

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characterized mainly by legal procedures; the market style by compensation payments; and the network style by aim for consensus.

- Monitoring and evaluation reflect on the way governance styles perform monitoring and evaluate progress. Monitoring serves to measure the extent of the goals achieved and possible unexpected consequences. Evaluation is crucial for adaptive management. In the hierarchical style, the monitoring and evaluation focus on the level of compliance with regulation and quantifiable standards; the market style monitor cost-benefits calculations and changes are made in order to increase profits; the network style is characterized by participatory monitoring based on agreed goals and implements adaptive approaches, e.g., changes are negotiated.

2. Government properties

- Legitimacy refers to "the validity and broad-based acceptance of the authority of an actor or event or a process". In a hierarchical style, the legitimacy assessment mainly considers outputs; in the network style, the focus is on how the outcomes are achieved (i.e., process); while the market style is focused on a combination of both input (efficiency) and output (effectiveness) legitimacy.
- Representativeness is based on which stakeholders are considered to have a major role in a governance process, and it is fundamental to overcome challenges related to the legitimacy of the process as well as the consideration of diverse interests. This aspect will be limited in a hierarchical style which is characterized by the focus on elected representatives only. The market style considers all market players. Yet, the network style focuses on the openness of the process and considers all voices.
- Comprehensiveness is related to an integrated and coordinated approach. The hierarchical style is characterized by a technocratic integration; the market style focuses on the integration of costs and benefits; and the network style is based on a participatory integration. As observed by , open and flexible settings of governance are more likely to enhance comprehensives.
- Leadership styles in a hierarchical mode are based on formal rules and are characterized as command and control; in a market style, leadership is based on delegating and enabling; and in the network style, leadership is about coaching and supporting.

Moreover, Table 2 presents main organizational dimensions that differ among the three governance modes. The governance modes also differ in aspects related to the vision, orientation, structure, actors and results [9]. Some of the main dimensions are illustrated in Table 2.

In the **hierarchy mode**, the government has a dominant role and rules society, the power derives from formal positions in hierarchy, and non-governmental actors are seen as subjects. Steering, control and decision-making are based on authority, and the legitimacy is procedural. Hierarchical governance also accounts for top-down decision-making and strict accountability procedures. The main results include laws, regulations, control, procedures, among others [9], [10], [37], [38].

In the **market mode**, non-state actors are the dominant actor type (e.g., business, companies) while the government role is based on the delivery of services to society. It is mainly based on a combination of formal and informal institutions, and the power derives from access to material resources and capital. The unit of decision-making is individual and the steering and control are based on price and

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economic motives, and so, the legitimacy of the decision-making process is economic. In this mode, the legal authority has a primordial role for accountability procedures, and the typical results can include services, products, contracts, among others [9], [10], [37], [38].

Table 1: Governance Modes based on governance sub-functions and properties

		Governance modes		
		Hierarchical Style	Market Style	Network Style
Governance sub-functions	Knowledge Generation	Technocratic focus; Only technical experts involved.	Knowledge serves to increase competitive advantage.	Knowledge generation as part of group building process; Different types of knowledge acknowledged; Broad sharing of knowledge.
	Conflict Resolution	Jurisdiction; Legal procedures	Survival of the fittest; Compensation payments	Mediation; Aim for consensus
	Resource mobilization	Engage actors with political power; Tax, governmental budgets and financing	Engage actors with market power; Investment	Mobilize broad stakeholder support; Voluntary financing
	Rule making	Political parliamentary process; Jurisdiction and formal procedures for rule extension if needed	Negotiations on prices; As few rules as possible	Broad negotiation of and deliberations on rules; Malleable rules open to renegotiation
	Monitoring & Evaluation	Compliance with regulation and quantifiable standards; Rigid in terms of learning	Cost-benefit calculations; Rapid changes in individual strategies if needed to increase profitability	Participatory; Reflection on agreed goals; Openness to adaptive approaches – change negotiated.
Governance properties	Legitimacy	Legitimacy as representation; Democratic elections of governments; Constitutional rules as the basis for authorities; Output legitimacy.2	Profit counts; Input (efficiency) and output (effectiveness) legitimacy combined.2	Legitimacy as participation; Process-based procedural arguments; Input legitimacy. 2
	Representativeness	Elected representatives; Technical experts on problem domain.	Access for all market players.	All voices heard, openness of process; Those affected participate in decision-making.
	Comprehensiveness	Technocratic integration of relevant issues	Integration of all relevant costs and benefits	Participatory integration of perspectives

[2] "Input and output legitimacy refer to different ways of legitimizing agency. Legitimization by output assesses legitimacy by the product of an action. Legitimization by input assesses legitimacy by the process by which actors acquire particular roles and how an outcome is derived. In a hierarchical style roles and process rules are prescribed" (Pahl-Wostl 2019, 9).

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	Leadership	Prescribed by formal rules; Command and control	Determined; Delegating and enabling	Often emergent in a process; Coaching and supporting

Source: adapted from [10, p. 9] *and* [37, pp. 92–93]

Finally, the **network mode** is mostly governed by informal institutions based on reciprocity, with the involvement of both governmental and non-governmental actors who are considered partners. It is also characterized by a higher degree of informality and flexibility with limited rules and regulations. The power derives from the role in the network while control and steering are ruled by trust. The unit of decision-making is the group and the legitimacy is social. In terms of accountability, it focuses on responsiveness towards the group's needs. Typical results include consensus and agreements [9], [10], [37], [38].

Table 2: Governance modes based on organizational dimensions

Dimensions	Governance modes		
	Hierarchy	Market	Network
Role of actors	Governmental actor as dominant	Non-governmental actors as dominant	Involvement of both governmental and non-governmental actors
Orientation of organizations	Formal institutions; internal; top-down	Combination of formal and informal institutions (e.g., property rights); bottom-up; external	Mostly informal institutions; external; reciprocity
Non-governmental actors	Subjects	Customers, clients	Partners
Structure of organizations	Line organization, centralized control systems, project teams, stable/fixed	Decentralized, semi-autonomous units/agencies/teams; contracts	Soft structure, with a minimum level of rules and regulations
Unit of decision making	Public authority	Individual	Group
Legitimacy of the decision-making process	Procedural	Economic	Social
Accountability	Hierarchical supervision organized vertically.	Legal authority to enforce obligations through hearings, audits.	Low level of control; responsiveness to concerns or desires of individual/group.
Control	Authority	Price	Trust
Typical types of output and outcomes	Laws, regulations, control, procedures, reports, decisions, compliance, output	Services, products, contracts, outsourcing, vol. agreements	Consensus, agreements, covenants

Source: based on [9], [37], [10] *and* [39].

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Both tables (see Table 1 and Table 2) provide a basis to understand the main characteristics and dynamics of hierarchical, market and network governance. While we distinguish between the three governance modes, which are pure types in theory, in practice, it is more likely to find a co-existence among them, also known as "hybrid" mode [16], [36]. Take the case of private-public partnerships that are a combination of market and network governance. Another example is chain management, which is related to network governance but focused on functional relations building its structure in a hierarchical form [9]. In this line, it is pertinent to also understand the concept of meta-governance, which will be developed in the subsequent subsection.

From governance to meta-governance

The concept of meta-governance is generally understood as "the governance of governance" or the "organisation of self-organisation". Through coordination, meta-governance aims at decreasing fragmentation and overlap as well as enhancing coherency. Therefore, it is seen as a potential answer to governance failures, promising for instance to overcome challenges related to networks, such as transparency and accountability. For instance, sometimes government includes participatory approaches (e.g., co-creation) to comply with legal prescriptions in the context of traditional hierarchical governance. This might lead to top-down decisions overriding agreements obtained through network governance approaches, such as participation processes, leading to transparency and trust issues. Another problem might be related to accountability, particularly legal accountability which might present rules that are not compatible with a more decentralized and participative decision-making process [37]. In this context, meta-governance can be not only directed towards networks but also is considered as a way to balance different governance modes [8].

As recently defined by Gjaltema, et al., meta-governance can also be understood "as a practice by (mainly) public authorities that entails the coordination of one or more governance modes by using different instruments, methods, and strategies to overcome governance failures" [8, p. 1771]. This definition is based on a recent systematic literature review where the author also explains both the first-order (i.e., the governance of one specific governance mode) and second-order (i.e., governance with multiple modes and interactions) meta-governance ideal-types [8].

First-order governance

- Network meta-governance: It is the most frequent ideal model where a public meta-governor steers a governance network including different actors of a variety of domains.
- Multilevel meta-governance: In this ideal-type, there are multiple active meta-governors from local to international level steering a specific public-private network.
- Meta-governance of multiplicity: It is related to a network of networks. There is a meta-governor that aims at steering multiple governance networks
- Second-order governance
- Meta-governance of modes: It seeks to balance the three governance models: hierarchical, markets and network. In this case, the meta-governor aims for optimal mixtures between the three governance modes.

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Second-order governance

- Meta-governance of modes: It seeks to balance the three governance models: hierarchical, markets and network. In this case, the meta-governor aims for optimal mixtures between the three governance modes.

The second-order governance called meta-governance of modes is the particular interest for IPS Co-creation. Meta-governance accounts for the relevance of both government and governance and provides insights that enable the analysis of the relationship between governmental actors and governance networks. In a context of many challenges related to IPS (see subsection1.1.3) and co-creation (see subsection1.1.4), meta-governance can support the identification of the best approaches in governance modes and mixes, considering that governance modes are context-specific [8], [9].

1.1.3 Integrated Public Service Governance

As previously discussed, traditional approaches to public service delivery have proved to be insufficient since they cannot overcome contemporary challenges and often fail to meet the expectations of users [40], [41]. Considering these challenges, governments and international organizations have been working on the concept of interoperability and Integrated Public Services to improve digital PS provision [23]–[25].

In the inGOV project, we understand Integrated Public Services (IPS) as "bringing together government services to end-users so that they can access them in a single seamless experience based on their wants and needs" [27]. IPS also constitutes the 'holy grail' of digital public service provision, and is a key condition to accomplish strategic objectives, such as one-stop government, joined-up government, once-only principle, among others [11].

With the adoption of ICT to provide public services, the dynamics are more likely to change due to the involvement of a wider array of stakeholders with greater possibilities of interaction. In digital IPS provision, the nature of communication, and the power-dynamics might also become more complex. Digital IPS also has the potential to make government more efficient, transparent, and effective, while challenging established approaches related to organization, management, administration, accountability, and engagement. Therefore, it entails certain coordination mechanisms and agreements both horizontally and vertically [42]–[44].

Concerning the governance of IPS, the idea of integrated public services governance (IPG) is not new. It was already discussed in what is called the model of integrated governance that has arisen in the 2000s as a four-dimensions model that brings together key governance components, including "resurrection of the central agency as a major actor with more direct influence over departments; whole-of-government as the new expression of a horizontal form of coordination; central monitoring of implementation and delivery; and rationalization of the non- departmental sector"[45, p. 88]. When these aspects are combined, the goal is to improve performance and lay the groundwork for integrated governance, changing the focus from vertical to horizontal and stressing cross-agency efforts and collaborative links. The integrated governance model has some parallels like the joined-up government [45].

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The movement towards IPG is also characterized "by a relative de-emphasis of the hierarchical and market models of public organization", and it promotes the engagement of non-governmental actors in order to improve IPS provision through consultations, partnerships and collaborations [46, p. 242]. This type of governance approach (i.e., IPG) provides the foundation for understanding the governance arrangements and the actors' dynamics in the provision of IPS.

Moreover, IPS provision can take up different organizational models: (1) new agency which the potential to change the culture and focus on user-centricity; (2) multi-agency allows for the coordination of organizations towards common goals across organizational boundaries, although it presents alignment challenges; and (3) merging existing agencies removes organizational boundaries. There is also place for hybrid models, which might contain more than one of the three models presented before. These organizational models are confronted with the main challenge of integrating both vertical and horizontal structures [41]. In addition, IPS provision might also challenge political, structural, operational/managerial and cultural aspects. For instance, there are political challenges such as stress on the vertical dimension of government, and issues related to political support; structural challenges such as limited resources; operational challenges such as performance and monitoring mechanisms; and cultural challenges such as change resistance [45], [46]. In light of these challenges, governments might need to adapt organizational structures based on the particular resources and barriers of each context [46], and in this case, meta-governance of modes can be a potential answer (see subsection 1.1.2).

As an illustration, Table 3 presents some characteristics of (I)PS provision within the three main governance models related to the governance modes from a theoretical perspective. In the context of the inGOV project, these insights should be refined based on the experience with the pilots. In that way, we can identify specific characteristics related to the provision of digital IPS in particular. Moreover, the table captures how public management reform - from classic public administration to NPM and new public governance (NPG) – affects the way IPS is provided. Overall, shifts in governance have broadened the environment and role of stakeholders. Particularly, the role of civil society shifts from the notion of "client" or "consumer" towards a more active role as co-producers/co-creators in the New Public Governance model.

Table 3: Main models of Integrated Public Service Provision

IPS provision	Old public administration model	New Public Management model	New Public Governance model
Organizational values	Hierarchy, control and bureaucracy	Market orientation, focus on performance, contracting in/out	Networks, interorganizational relationships and multi-actor policy-making
Role of the population	Beneficiaries	Consumers/Clients	Co-producers/ Co-creators
Role of public servants	Providers	Commissioners	Directors and mediators
Role of politicians	Masters	Scrutinizers	Facilitators

Source: Adapted from [47], [48] *and* [49].

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1.1.4 Co-creation of IPS

While interoperability, and particularly IPS governance is presented as key for the optimal provision of digital public services, there are still many challenges related to the implementation of interoperability. In this context, one answer is co-creation. Building on Deliverable 1.1, in the inGOV project, co-creation is understood as the voluntary and active involvement of (I)PS end-users in any phase of the design, delivery, and evaluation of (integrated) public services [14]. The design phase involves both the planning and design of public services and is characterized by strategic decision-making. The delivery phase includes the day-to-day activities, while the evaluation of monitoring phase covers an assessment process that entails the identification and correction of issues and the evaluation of the efficacy of the service with the aim to generate opportunities for improvement3 [12], [13].

The implementation of co-creation is expected to deal with the main challenges of interoperability implementation, such as integration of services and data at the local level, adaptation to changing technology and interest of stakeholders (see for more details [14]. Moreover, as revealed by the systematic literature review conducted in Work Package 1 of the inGOV project (see Deliverable 1.1), co-creation might contribute to the enhancement of user-centricity, promote organizational changes to overcome a variety of challenges, support enhancement, personalization and performance of PS provision, improve governmental functions (e.g., decision-making processes), strengthen sustainability of PS provision and collaboration initiatives, and foster innovative ideas and solution, among others.

Similar to other forms of collaborative governance, co-creation initiatives tend to overlook the circumstances and limits under which it would succeed or fail. Nevertheless, each arrangement has its own set of requirements related to the capacities and capabilities of both governmental and non-governmental actors [17], [50]. When setting up co-creation, both PS providers and policy-makers should agree on the governance conditions and modes together with non-governmental actors (e.g., users) in order to stipulate the shared responsibilities and accountability processes [16]. A recent study discusses the different roles of actors in the context of IPS, or what they call inter-organizational services. As the authors argue, the definition of actors' roles is fundamental to overcome challenges related to IPS due to its multi-actor nature [51].

In the same way, one could argue that in the case of IPS Co-creation, where collaboration and coordination processes take place among a wide array of different actors, the definition of the roles becomes even more relevant. This is related to the expectations of co-creation to widen the "repertoire of possible governance roles" [15, p. 152] and to flourish in network governance systems [16]. Moreover, co-creation and co-production processes are also presented as a critique of hierarchical service delivery modes, which are characterized by governmental actors as dominant (see **Table 2** Table 3: Main models of Integrated Public Service Provision).

Yet interestingly, empirical evidence shows that the government seems to mostly retain the central role in co-creation processes [17]. We have also observed this trend in our scoping review of (digital) public services co-creation (see Deliverable 1.1), where it revealed that in most cases, co-creation

[3] For more details on the phases, actors, methods, challenges and benefits of co-creation, see Deliverable 1.1.

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approaches were implemented top-down with the government being the main co-creation actor. Therefore, more comparative studies that consider different IPS contexts with different governance modes and their implications are needed to shed light on not only the implications and potential outcomes of IPS co-creation within different governance styles, but also on the roles and decisions taken by co-creators (including governmental and non-governmental actors).

Building on the previous discussion, when analyzing co-creation, we need to take into account the three governance modes instead of focusing solely on ideal-type network governance. In this way, by considering the three modes, we can present a multi-perspective approach with higher analytical potential.

1.1.5 Moving towards an IPS co-creation governance

Empirical research, for example, found that network governance modes provide a context that enhances co-production processes with users and communities for co-design, co-evaluation, and, to a lesser extent, co-delivery when compared with hierarchical governance modes [16], [40]. Based on this evidence, we expect IPS co-creation to be contingent on the governance modes.

However, while different government styles tend to co-exist in most organizations, there is limited evidence on the types of settings, combinations or networks that could enhance co-creation [16]. Therefore, it is important to understand the role of IPS co-creation within the three different governance modes. In order to present a first glimpse of IPS co-creation governance, we build on the work of Loeffler and Timm-Arnold [16] adapt their theoretical framework of traditional co-production in the context of IPS co-creation. Table 4 aims to provide a first view of how could IPS co-creation works among the different governance modes from the view of the IPS user.

Table 4: IPS co-creation governance

Phases of PS provision	Mode of governance		
	Hierarchy	Market	Network
Traditional IPS design	Beneficiaries have no say in decisions but may provide information to IPS providers on inappropriate service design	Consumers/clients have no say but IPS providers may undertake market research with them	Users have a voice in some aspects of design through their representatives in IPS provider organizations
IPS co-design	Beneficiaries may have opportunities to provide some input on service design	Consumers/clients may have opportunities to provide some input on service design	Users make a significant contribution to the design decisions of IPS providers
Traditional IPS delivery	Beneficiaries have few opportunities to contribute to service delivery, but comply with the regulations set by IPS providers	Consumers/clients have few opportunities to contribute to service delivery contracts but respond to market signals	Users have few opportunities to contribute to IPS delivery, but accept the service offer from the network and comply with its rules

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IPS co-delivery	Beneficiaries may have opportunities to provide some input on service delivery	Consumers/clients may have opportunities to provide input on some aspects of IPS delivery contracts	Users make a significant contribution to effective delivery of IPS
Traditional IPS evaluation	Beneficiaries have few opportunities to provide feedback except through complaints	Consumers/clients have few opportunities to provide feedback, except through satisfaction surveys, complaints and market research	Users can give feedback through their representatives in commissioner and provider organizations, as well as through surveys, complaints, and market research
IPS co-evaluation	Beneficiaries may participate in the evaluation of some aspects of service provision	Consumers/clients may participate in some aspects of IPS quality reviews undertaken by service providers or commissioners	Users can shape evaluation of current IPS, and review future changes

Note: adapted from [16]

As mentioned before, while in theory we divided the table based on the different governance modes, in practice it is more likely that we find a co-existence of the three modes. In these cases, organizations are conceptualized as "hybrids". Therefore, IPS co-creation governance will depend on the specific contexts wherein a mix of governance modes can take place and, in turn, influence the implementation of IPS co-creation processes [16]. The increasing attention towards more hybrid governance modes aims at combining the strengths of the different styles. However, we might encounter issues related to incompatibilities or even contradictions, and in some cases, this can have the opposite outcomes than the expected synergy [10]. We argue that in the case of digital IPS Co-creation, the combination of the strengths of different governance modes can enhance accessibility and quality of services. For instance, digital literacy can be an obstacle to meaningfully contribute to IPS co-delivery, this is why traditional approaches should be combined with collaborative processes, such as co-creation, to ensure satisfaction to service users.

The concept of meta-governance can support the balancing of different governance modes in the context of IPS Co-creation, and particularly the second-order governance defined that meta-governance modes can serve as a starting point in top-down co-creation processes where the IPS providers remains as the dominant actor.

Yet, this is a first step towards an IPS Holistic Framework, and to find answers to these potential challenges, it will entail future research that explores how the governance modes can influence the IPS co-creation development in specific cases. In the inGOV project, we expect that the development and study of the pilots can provide empirical evidence that allows for a refinement of IPS Co-creation governance.

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1.2 IPS Agreements

1.2.1 Introduction

In Integrated Public Service (IPS) lifecycle, a number of public authorities and other stakeholders work together towards providing services according to end-users needs. The settlement of agreements between stakeholders is a prerequisite and a critical success factor for IPS implementation and delivery. Different types of agreements exist and span almost all different phases of IPS life-cycle [21], [52].

The aim of this section is to map the IPS agreements domain and provide a basis for drafting relevant recommendations. This section includes agreements that could be exploited not only in the framework of an IPS development, but also in other contexts as well as, where public authorities work together and with other stakeholders in an official manner. This section begins by outlining related work. The different types of agreements that a public organization might sign with other public or private organisations are described. In the last subsection the conclusions are provided.

1.2.2 Background

McNamara [53] suggested that in interorganisational literature a continuum of increased interaction between organisations, which includes cooperation, coordination, and collaboration is defined. At one end of the continuum, cooperation is defined as an interaction between participants with capabilities to accomplish organisational goals who however choose to work together, within existing structures and policies, to serve individual interests. Coordination is placed in the middle of the continuum and is defined as an interaction between participants in which formal linkages are mobilized because some assistance from others is needed to achieve organizational goals. At the other end of the continuum, collaboration is defined as an interaction between participants who work together to pursue complex goals based on shared interests and a collective responsibility for interconnected tasks which cannot be accomplished individually [53]. Collaboration differs from cooperation and coordination in that it "requires much closer relationships, connections, and resources and even a blurring of the boundaries between organizations" [54].

The EC ISA program has proposed a Collaboration Framework (CF) to be followed by Public Authorities (or Government Agencies) when they are seeking to collaborate [52]. The CF includes five tiers as shown in Table 5. This framework will be used as a basis for classifying different agreements.

Table 5: A five tiered approach for Government agencies collaboration (adopted from [52]

Tier	**Commitments**	**Tools**
Tier One	In principle commitment to collaborate	Statements of Principles to Collaborate: Explicitly recognise and capture the principles and values that guide collaborative service delivery across jurisdictions.
Tier Two	Business commitment to collaborate	Statements of Intent: Agree in advance the business basis to collaborate across multiple initiatives.

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Tier	Commitments	Tools
Tier Three	Collaborative Head Agreement	**Collaborative Head Agreement:** Agree in advance those elements of a cross agency agreement that can be reapplied to multiple collaborative initiatives.
Tier Four	Commitment to collaborate on specific projects	**Project/Initiative Specific Agreements:** Agree those elements that are specific to a particular project/initiative.
Tier Five	Commitment to collaborative tools, standards and procedures	**User Guide:** Includes checklists specific to collaborative service delivery.

1.2.3 Types of Agreements

The desktop research carried out resulted in the agreements listed in Table 6. The agreements with different names but similar contents have grouped under the most representative name. It should be noted that the list of agreements is by no means exhaustive since in reality more agreements exist. In the same table, the relevant tiers of Public Organisations collaboration are provided (tiers are depicted in Table 6). The classification of agreements to tiers is indicative, since in reality agreements' scope can be broader or narrower than mentioned here.

Table 6: Type of agreements and relevant Tier

Agreement	Indicative Tier(s)
Memorandum of Understanding (MoU)	1-5
Non-Disclosure Agreement (aka Confidentiality Agreement)	1
Enterprise Agreement	2-3
Collaboration Head Agreement (CHA)	3
Project Agreement	4
Collaboration Agreement	3-4
Public Private Partnership (PPP) Agreement	3-4
Bilateral Agreement	3-4
Single Agreement on behalf of many Public Authorities	3-4
Outsourcing	4
Buy Contract	4
Trust Federation agreement	4
Service Level Agreement	5
Agreement to abide by specific standards (Interoperability agreement)	5
Data processing agreement	4-5
Data exchange agreement	5

In the rest of this section, a brief overview of each type of agreement is provides, describing its main objectives, stakeholders involved, and contents.

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Memorandum of Understanding (MoU)

A memorandum of understanding is a formal document dictating the willingness of two or more organisations to formally work together. It is a formal document which however is not legally binding for the participating organisations [55]. An MoU can cover some or all of the five tiers of Public Organisations collaboration, that are depicted in Table 5. An MoU might include the following information [52]:

- Purpose: The reason for needing the MoU

- Background: The context within which the MoU fits.

· Scope/Provisions: comprise the key principles for working together, key objectives, indicators of success; and a high level description of the service.

- Out of Scope: Clarify service components that are agreed as being out of scope.

- Terms of agreement: include roles, responsibilities, accountabilities and obligations. Also set out expected activities and key deliverables during the initial exploration, design and migration phases, as well as milestones for their completion.

- Governance: explain how the project will be governed, e.g. who is the senior responsible officer, what are the terms of reference and membership of the Project Board and how often will they meet? Will there be other forums and what will be their role? It may also be useful to set out an agreed series of key checkpoints during the exploration and design phase, at which both organisations can agree whether to proceed to the next phase.

- Dispute Resolution: arrangements for resolving any disputes, e.g. escalation procedures, accountabilities, independent arbitration.

- Termination: set out the criteria and process for termination during the migration period.

- Status: set out the status of the MoU. This section could also provide details of any confidentiality requirements.

- Supporting Information: an MoU should also include a glossary of terms, a list of the assumptions on which the MoU is based, a list of key risks and the risk management process.

An example is the MoU established in the framework of the X-Road business register project, which is a cross-border initiative for making available data contained in Estonian and Finnish business registers to both countries' authorities thanks to the X-Road data exchange layer (more information is provided in section 2).

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Non-Disclosure Agreement (NDA)

A Non-Disclosure Agreement (NDA)4 is an agreement that is concluded between a prospective buying entity and a selling entity at the initial stages of a transaction such a merger or acquisition. An NDA is usually exchanged after the buying entity shows initial interest in the target organisation and its objective is to ensure that any confidential information acquired by the prospective buyer will not be used against the target organisation for the buyer's benefit. The NDA is also referred to as a Confidentiality Agreement. A common structure of an NDA includes the following sections: Parties; Confidentiality; Exceptions to Confidentiality; Disclosure of Information; Destruction of Materials; Period of Enforcement / Termination of Confidentiality; Restraint Provisions; Governing Law and Jurisdiction; Binding Agreement; Implications for Breach of Confidentiality.

Enterprise Agreement

An Enterprise Agreement is usually established between organizations with many users or devices, e.g. 500 or more, and a software vendor or an IT infrastructure vendor5. It simplifies and provides flexibility to license management by consolidating the multiple subscriptions and renewal dates normally required to manage enterprise-wide software licenses down to a single agreement with unified terms and conditions. Organisations can enter into an Enterprise Agreement that meets their business requirements and expand later using the same agreement6.

Collaboration Head Agreement & Project Agreements

In the case of a collaboration between organisations that involves working in multiple projects, a Collaborative Head Agreement (CHA) and Project Agreements could be used. The CHA could include elements of the upper tiers of Public Organisations collaboration (depicted in Table 5).

The contents of a Collaboration Head Agreement could include among others [52]: Objective; Principles to Collaborate; Application of the Objectives and Principles to Collaborate; Duration of Collaborative Head Agreement; Structure of Collaborative Head Agreement; Relationship between the Parties; Admission of new Parties to the Collaborative Head Agreement; No legally binding agreement; Notification to Parties; Application of Commonwealth Procurement Guidelines; Governance of Collaborative Head Agreement.

Additionally, a CHA could be considered as an umbrella document that is used for a group of projects where a group of Public Authorities (or Agencies) are involved and need to work together within the framework of collaborative projects [52].

The contents of a Project Agreement could include, among others [52]: Commencement Date and term; Responsibilities of the Project Parties; Admission of new Project Parties to the Project Agreement; Project Plan; Project Contributions; Project Risk Management; Project change control;

[4] https://corporatefinanceinstitute.com/resources/knowledge/other/non-disclosure-agreement-nda/

[5] https://www.microsoft.com/en-us/licensing/licensing-programs/enterprise?activetab=enterprise-tab:primaryr2

[6] https://www.cisco.com/c/en/us/products/software/enterprise-agreement.html#~true-forward

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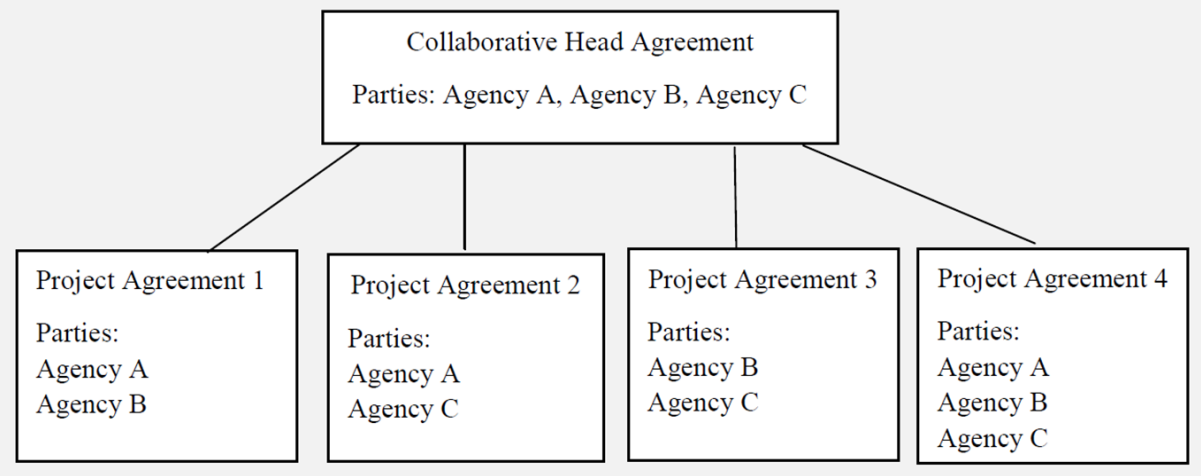
Stakeholder consultation; Training and skill levels; Performance management; Complaint and query handling; Reporting; Steering Committee; Audits; Intellectual Property Rights.

Under the same CHA, various Project Agreements can be established. Different CHA parties can participate to each Project Agreement [52], as shown in Figure 2: Collaboration Head Agreement and Project Agreements (adopted from [52]).

*Figure 2: Collaboration Head Agreement and Project Agreements (adopted from **[52]**)*



Collaboration Agreement

A Collaboration Agreement is an agreement concluded between organisations that intend to collaborate on a project. The Collaboration Agreement is a legally binding document stating how the different parties will work together, how the responsibilities, obligations and benefits will be divided as well as what happens if the parties disagree or want to stop their collaboration and to terminate the agreement [56].

A common structure of a Collaboration Agreement includes the following sections: Details of the Joint Project, Collaboration Period and Schedule, Collaboration on Authorship, Copyright Ownership, Responsibilities of Each Party, Individual Acts, Changes in completed Work, Confidentiality, Force Majeure, Reporting and Project Management [56]. An example is the cooperation agreement established in the "Digital application for social security (Digisos)" case study in Norway layer (more information is provided in section 2). In that case, the agreement governs the cooperation between involved parties regarding the use of digital municipal services.

Public Private Partnership (PPP) Agreement

In some IPS projects, Public Authorities have to collaborate not only with other Public Authorities but also with the private sector. In such a case, a Public Private Partnership (PPP) agreement can be used. A PPP Agreement is a contractual document with the intention to govern the relationship between the public and private parties in a PPP transaction. The PPP Agreement states the rights and

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obligations of the parties, deals with the allocation of risk, and foresees mechanisms for dealing with change7.

A common structure of a PPP Agreement includes the following sections: Preamble; Definitions and interpretations; Concession; Project Site; Engagement of sub-contractors; Concessionaire's/private company's obligations; Government Agency's obligations; Change of scope; Payments and financial matters; Tariff, fees, levy and their collection and appropriation; Capacity augmentation; Change in law; Force majeure; (Normal) Termination of contract; Events of default and termination; Mode of payment by agency; Handover of project facility; Independent auditor; Applicable law and dispute resolution; Representations and warranties, disclaimer; miscellaneous8.

Bilateral Agreement & Single Agreement on behalf of many Public Authorities

In some cases, Bilateral Agreements need to be signed between the involved organisations. An example of a Bilateral Agreement can be found in Standard Business Reporting (SBR) case study in Netherlands [21]. SBR is a nationwide solution for system-to-system submission of business reports in the Netherlands. It is used across a range of sectors and domains (tax, business registers, education). It has also been adopted by the private sector (banks). It enables a company to submit a report (e.g. its corporate tax return) directly from its (SBR-compatible) tax software. Reports submitted to public organisations are sent via a single gateway maintained by Logius, the national government's IT department. To enable this, the bilateral relationship between the Tax and Customs Administration and Logius was formalised in several documents. More specifically, the SBR programme maintains and updates a set of technical, semantic and process standards. These are published in the Netherlands Taxonomy Architecture and the Netherlands Process Architecture.

In some other cases however, the collaboration of a very large number of public authorities is needed, which suggests bilateral agreements are not efficient. For example, if a large number of municipalities would like to provide their services through a national portal, the relevant agreement normally has to be signed by all involved parties. A more efficient alternative would be to have a single agreement that is signed on behalf of all involved public authorities.

An example of a single agreement that is signed on behalf of all involved public authorities can be found in Municipality Application Service Provider (Municipality ASP) case study (more information is provided in section 2). In that case a Single Agreement has been signed on behalf of all participating municipalities. More specifically, the 27 central base registries of Hungary are required to enable automatic data exchange with other government organisations over the government service bus (E-Administration Act, 2016). The Municipality ASP, therefore, has signed just one single contract on behalf of all connected municipalities (over 3100 municipalities) with each of these base registries. That contract describes the data required by the Municipality ASP centre.

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7 https://ppp.worldbank.org/public-private-partnership/standardized-agreements-bidding-documents-and-guidance-manuals#:~:text=What is a PPP Contract,mechanisms for dealing with change

8 https://www.unescap.org/ttdw/ppp/ppp_primer/713_key_sections_of_ppp_contract_agreements.html

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Outsourcing

Outsourcing is defined as the contracting out of IT services/activities to third-party management to obtain a required result. This can also be done on short-term contracts. A further option is insourcing, that is buying in resources from an external supplier to work under in-house management [57].

Typically, an outsourcing agreement includes the following: A detailed description of services; Duties and obligations of each party; Security and confidentiality; Fees and payment terms; Details of staff appointed by a service provider/vendor; Inspection and acceptance; Force Majeure; Governing law and Legal compliance; Termination and exit; Jurisdiction and Arbitration; Severability; Indemnification[9].

Buy Contract

Buy Contract can be seen as a standard purchasing contract for a software application. An example of a buy contract can be found in Digital application for social security (Digisos) case study in Norway (more information is provided in section 2). In that case study, the Municipality's local offices (the NAV office) bought a digital solution from a solution provider to handle its social security services. The agreement includes data systems and their maintenance.

Trust Federation agreement

A Trust Federation agreement allows data exchanges in all administrative levels, including cross-border data exchanges. An example is the trust federation agreement established in the X-Road, Exchange of information between Estonian and Finnish Business registers (X-Road BR), case study which was signed by X-Road Operators in each country (more information is provided in section 2). In this example, the parties agree on the responsibilities and liabilities of each party, commit to cooperation in implementing the technical federation required, and agree on matters including technical features, data security and data protection obligations. It is this trust federation agreement that enables members of each national ecosystem to exchange data with members of the other party, and without it any data exchange between two national public authorities would not be possible.

Service Level Agreement (SLA)

A Service Level Agreement (SLA) is a document concluded between a service provider and a customer that identifies both the services required and the expected level of service. The purpose of an SLA is to provide the user of the service with the information necessary to understand and use the contracted services. It is imperative that an SLA contains the necessary information to use and manage the service delivery. A service level agreement identifies the service commitments of both service provider and service receiver to each other at the boundary of their responsibilities [58].

In the case of public organisations, an SLA can be considered as a specific kind of Project Agreement, which can be usually used for the provision of a service between a Public Organisation and another Public Organisation or a private entity. Either way, SLA's preparation and approval should be finalised

[9] https://blog.ipleaders.in/key-features-outsourcing-agreement/

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before the productive provision of the service. Moreover, SLAs should be revisited at regular intervals, e.g. annually or at the end of the defined contractual period or when a significant change in the service requirements occurs [52].

SLAs vary between vendors, services, and industries. However, the sections usually included in an SLA include: a detailed description of the service; measurable service levels; frequency of reporting; the roles, responsibilities and obligations of both the provider and the consumer of the Service; issues' resolution process; the approach to continuous improvement and service development; Intellectual Property Rights; and Disaster Recovery and Business Continuity [52].

Performance measurement of service delivery, and therefore compliance with the SLAs, is achieved using one or more of the following metrics [58]:

- Availability: Measurement of availability identifies the proportion (percentage) of the time that the contracted service scheduled is actually accessible and useable over a defined measurement period (e.g. weekly or monthly).
- Reliability: Reliability defines the frequency with which the scheduled service is withdrawn or fails over a defined measurement period (e.g. not more than three failures per week).
- Serviceability: Serviceability is an extension of reliability and measures the duration of available time lost between the point of service failure and service reinstatement (e.g. 95 percent of network failures in any working week will be restored within 30 minutes of the failure being reported).
- Response: Response measures the time delay between a demand for service and the subsequent reply. Response time can be measured as turnaround time, transfer time (as in the case of a help desk call) or cycle time (as for recurring system batch processing).
- User satisfaction: A measure of perceived performance relative to expectation. User satisfaction is often measured by survey using a repeatable process to track change over time.

An example of an SLA can be found in X-Road, Exchange of information between Estonian and Finnish Business registers (X-Road BR), case study (more information is provided in section 2). In that case, both involved business registers have a contract with their respective national X-Road operators. These contracts lay out the terms under which the X-Road members are able to use the X-Road infrastructure. This X-Road membership contract is also supplemented by a Service Level Agreement. This describes the conditions under which the member will provide its services to other X-Road users in terms of availability of the service, scheduled and unplanned interruptions, response times, etc.

Agreement to abide by specific standards (Interoperability agreement)

This agreement is used when organisations agree to abide by specific standards and is considered particularly important to safeguard interoperability. An example is the "framework of agreements" established in the Standard Business Reporting (SBR) case study, in Netherlands [21] (for a description of SBR please see above at "7. Bilateral Agreement & Single Agreement on behalf of many Public Authorities"). In that case, there was an agreement by the tax software vendor, Logius, and the Tax and Customs Administration to abide by the SBR standards. This is formalised in the SBR "framework of agreements" that each of the organisations has agreed to. This framework covers technical,

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semantic and process standards. It consists of the Netherlands Taxonomy Architecture, the Netherlands Process Architecture and Governance agreements.

Data processing agreement

Data processing agreement defines the data that can be processed and used by partners, providing protection for the exchanged data [21]. It also regulates the processing of personal data by data processors on behalf of the controller in connection with the collaboration agreement. It regulates the rights and obligations according to the European Regulation10 (General Data Protection Regulation, a.k.a. GDPR), on the protection of personal data of persons in connection with the processing of personal data and on the free exchange of such information. The agreement also describes the technical and organizational security measures, an overview of the data processes, and an overview of the purpose for which the personal data is used.

An example is the data processing agreement established in the "Digital application for social security (Digisos)" case study in Norway (more information is provided in section 2). Digisos provides a digital channel via which citizens can apply for a certain type of social security benefit which is provided at the municipal level. In that case study, the Data processing agreement defines the data that can be processed and used by the national organizations, providing protection for the municipality data. Additionally, it regulates the processing of personal data, as well as the rights and obligations according to the GDPR. The Data processing agreement also describes the technical and organizational security measures, the data processes, and the purpose of personal data usage.

Data exchange agreement

This agreement regulates the terms and conditions of data exchange between organisations. It usually operate at a lower level of Cooperation. It can be considered as a part of the data processing agreement. An example is data exchange agreement that has been established in the "X-Road – Exchange of information between Estonian and Finnish Business registers (X-Road BR)" case study (more information is provided section 2). In that case, the bilateral "Agreement on the Exchange of Register Information" between two businesses registers in different countries governed the terms and conditions of data exchange. This contract includes the type of information that could be exchanged, the purpose for which the data could be used, requirements for data processing security, an agreement that the data exchange between the two organisations would be free of charge, rules on further disclosure of data, and rules for amending, settling disagreements, terminating and enforcing the agreement.

1.2.4 Conclusions

In this section, an overview of inter-organisational agreements that can be established in the framework of a co-operative initiative is provided. This section focuses on agreements that could be

[10] Regulation: (EU) 2016 of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

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established in the framework of an IPS lifecycle. Thus, agreements that are used exclusively in other areas, e.g. investments, are not included.

The academic and grey literature has been reviewed to identify relevant articles and reports addressing interorganizational agreements that can be applied in the public service provision domain. Our review revealed that academic literature on agreements in public service provision domain is limited, including mainly articles on Service Level Agreements. The IPS agreements that have been identified have been listed in Table 6 mapped to the different tiers of collaboration between public organisations presented in Table 5.

In most of the cases found, more than one type of agreements has been established. For example, in X-Road Exchange of information between Estonian and Finnish Business registers (X-Road BR) case study, initially an MoU has been signed between Finnish and Estonian governments. Additionally, a Trust federation agreement has been established between the public authorities that are the national X-Road operators in each country. Furthermore, both Business registers have established a contract with the respective national X-Road operator. This X-Road membership contract is also supplemented by a Service Level Agreement. Finally, a Data Exchange agreement between involved business registers was put in place.

Agreements that include elements of the upper tiers of public organisations collaboration, which is depicted in **Error! Reference source not found.**, as for example in the X-Road BR case study, usually precede agreements that include elements of the lower tiers. Agreements in the upper tiers usually describes the agreed principles and general terms and they might concern more than one project. Thus, they formalize the framework in which agreements of the lowers tiers can be defined. Sometimes, agreements of the upper tiers may be applied to more than one project or service development. Agreements in the lower tiers usually concern a specific project or service and describe in detail the specific terms of that specific project or service.

Finally, as it becomes obvious from the analysis of this Section, there is no consensus on the types and the titles of the different (types) of agreements that should be established in the framework of an IPS development. Thus, we suggest that initially, the context of an IPS should be explicitly defined and subsequently based on this, various types of agreements should be studied in order to conclude to the final agreement that would be appropriate for a specific IPS.

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1.3 IPS Stakeholder engagement

1.3.1 Identification of Stakeholders in Integrated Public Services (IPS)

Defining the Stakeholder Concept

Stakeholder theory has its origins in management literature, with the basic stakeholder model illustrating the relationships between different sets of actors in and around a given organisation [59]. It has been widely argued that in order for an e-government initiative to fully succeed and be effective, it is important to align e-government objectives with stakeholder interests [60]. This is all the more important during processes of co-creation in public service provision wherein a better understanding of stakeholders paves the way for more effective stakeholder communication, greater stakeholder engagement and, ultimately, improved public services design and delivery. For this, the precise identification of stakeholders and the development of a typology of stakeholders is considered essential. The aim of this chapter is to first examine the concept of stakeholders as a theoretical construct, then discuss how they have been classified in the literature, and consider how they can be categorised according the roles they assume during the design and delivery of co-created public services.

Central to stakeholder theory is the concept of the stakeholder - but how is this defined? Mitchell et. al. [61] note that there is general agreement in the management literature as to who qualifies as being a potential or actual stakeholder of a firm - these include persons, neighbourhoods, institutions, groups, organisations, society, and the environment. However, the term stakeholder is generally recognised as being a contested concept, in that there is currently no universally accepted definition [62]. For a comprehensive review of stakeholder definitions, Benn et. al. [63] recommend the work of Laplume et al. [64] who reviewed 179 definitions, and Miles [65] who reviewed 435 definitions. Mainardes et al. [66] claim that although the term “stakeholder” is widely used in business, media, and government, many who use the term are unable to furnish sufficient evidence to support their particular understanding of what a stakeholder actually is.

The term is a compound word consisting of the word stake (defined as an interest) and the agent noun of the verb hold McGrath & Whitty [67]. At its most basic, therefore, a stakeholder can be defined as an entity that possesses a specific interest in a given activity. The centrality of stakeholders to the long-term success of an organisation was first put forward by Freeman [68], who provides us with an initial definition of the term:

‘a stakeholder in an organization is (by its definition) any group or individual who can affect or is affected by the achievement of the organization’s objective’ (p.25)

It is important to note here the two-fold nature of being a stakeholder implicit in Freeman’s definition: that a given actor could either be directly have an impact on, or be responsible for, the activities of an organisation, but equally could be willingly or unwillingly impacted by them, or both. Mitchell et. al. [61] argue that this quality of interpretation makes the definition one of the broadest in the literature as it leaves the notion of “stake” and the field of possible stakeholders open to virtually anything and anybody. Actors not included in the are only those who do cannot affect the activities of the organisation and/or who are not affected by them.

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Following this definition, the term "stakeholder" may be considered as being usually involved, to a greater or lesser degree, in a particular activity and hence have responsibilities within it and take a measure of interest in its success. Benn et. al. [63] note that a number of other definitions are evident in the management literature, including: Alkhafaji [69] "groups to whom the corporation is responsible"; Thompson, Wartick and Smith [70] "...[groups] in relationship with an organisation", and Clarkson [71] "persons or groups that have, or claim, ownership, rights, or interests in a corporation and its activities, past, present, or future". All these definitions imply, according to Benn et. al., that the given actor(s) have dealings with the organisation in question, or are directly involved in the organisation's activities.

Mitchell et. al. [61] argue that Freeman's definition, and indeed those of his successors, in encapsulating the idea that each stakeholder group "can affect or is affected by" the activities of the organisation, is lacking a bi-directional "give-and-take effect" when propounding the notion of "stake". According to the authors, those stakeholders who have no effect, or are not affected by the organisation, have consequently no stake. Focusing on the idea of legitimacy, Hill and Jones [72] define stakeholders as "constituents who have a legitimate claim on the firm". Carroll [73] nuances this further by stating that by virtue of legitimacy – a notion also encompassing power – groups or individuals can be considered as stakeholders. Jensen [74] argues for a form of stakeholder theory wherein managers make decisions by accounting for the interests of all stakeholders in the organisation, and discusses whether or not organisations should maximize value.

Public managers take their cue from management science in defining stakeholders [75]. Eden and Ackermann [76] introduce the concept of power when they define stakeholders as "people or small groups with the power to respond to, negotiate with, and change the strategic future of the organization" (p. 117). To Eden and Ackermann stakeholders can only be people or groups who have the power to directly affect the organization's future - without that power, actors are not stakeholders. Bryson argues that although this definition echoes some of its management counterparts, it is narrow in its coverage of actor groups. He holds up Johnson and Scholes' [77] definition - "Those individuals or groups who depend on the organization to fulfil their own goals and on whom, in turn, the organization depends" (p. 213) - as being more inclusive and more compatible with approaches to democracy and social justice.

The identification of stakeholders in public management science can also benefit from being nuances by Kaler [78], who argues that definitions of the stakeholder concept can - and should be - divided into three categories: claimant definitions, requiring actors to have some sort of claim on the services of a business; influencer definitions, implying that an actor possesses the capacity to influence the workings of the business; and combinatory definitions, allowing for either or both of these requirements. By extension, stakeholders in integrated public service delivery are either impacted by the provision of a public service, come to bear influence upon the nature and direction of public service delivery, or (in cases of co-creation) experience a combination of both. For instance, an individual person can stand to benefit from the introduction of a new service once it has been developed, contribute his/her knowledge expertise towards its design and delivery, or engage with the public authority or service provider in a manner where they assume the role of a 'prosumer' of a given offering. In other words, the actor can be a claimant as a private citizen entitled to a particular public good, an influencer who shapes the nature and direction of the provision of that public good with no direct benefit, or a combination of both roles under conditions of public service co-creation.

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In a similar vein, Rowley [60] remarks that the correct identification of the various stakeholder groups involved in e-government projects is vital to ensuring the long-term success of these undertakings. A look through existing literature suggests that the public sector in general consists of a variety of stakeholder groups, and that this complexity has been transposed onto the e-government arena [60]. This is because the roles of different actors are different, complex, and changing, and are often not well understood: for instance, different government agencies are constituted differently, and interact with citizens and businesses in different ways. Similarly, citizens and businesses can at once be either co-producers and consumers of public services. Furthermore, there is a noticeable difference between public and private sector cultures [79].

Classifying Stakeholders

The recognition that the concept itself is an essentially contested one has important implications for the type of classification system adopted and subsequently developed [62]. At its most basic, stakeholders can be classified according to the degree to which they are involved in the activities of an organisation, the influence they come to bear on it, and the extent of the impact that they experience as a consequence of these activities [80], [81]. In keeping with this idea, Clarkson [71] first classified stakeholders into primary and secondary stakeholder groups. Primary stakeholders are those that hold a direct interest in an organisation, and whose actions have an immediate impact upon the organisation's activities. Similarly, this group of stakeholders are directly impacted by the actions of the organisation. Fassin [82] notes that this group of stakeholders enjoy a direct, contractual relationship with the organisation; which makes them highly visible. On the other hand, secondary stakeholders are those stakeholders that neither have a direct stake in the organisation, nor experience any direct impact as a result of decisions made by it [71]. However, this type of stakeholder does exert some influence – strong or weak – over the activities of the organisation, and, as such, is responsible in part for the eventual outcome of its undertakings. Clarkson argues that although these stakeholders do not have any direct contractual obligation to the organisation, and are thus not essential to its survival, their actions nonetheless have the potential to cause significant disturbance to its activities. A particular shortcoming of this typology is that those actors who do not have influence themselves but are impacted by the activities of the organisation have no place in either grouping. This is fundamental flaw, particularly in a public management context where governments need to take into account the voices of those stakeholders who are otherwise marginalised and are impacted by the actions of other, more powerful actor groups.

Wiewiora et. al. [83] further classify stakeholders as being internal or external to an organisational undertaking. They define internal stakeholders as those actors that possess a contractual or legal obligation to deploy resources and exercise authority to support a given project's objectives. The authors argue, therefore, that this type of stakeholder includes core members of the project network that have direct strategic and authoritative roles in the planning, design, delivery, and maintenance of a service. By contrast, external stakeholders are those that have a stake or strong personal interest in the project's progress, will use a provided service, and live with the consequences of the project outcomes. This type of stakeholder, however, is not (in classical top-down models of service delivery) under any legal or contractual obligation to participate in design or deliver a service. However, from a public management perspective, it is important to remember that government still holds a responsibility towards these stakeholders. Furthermore, while external stakeholders are not obliged to participate in public service design and delivery, the whole point of co-creation as a paradigm is to get these actors more involved.

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Yet another typology developed by Mitchell, Agle and Wood [61] considers stakeholders on the basis of 'salience'. This categorisation asserts that stakeholders are not equal, and that their claims can be differentiated according to the possession of one or more of three basic attributes: the relative power of the stakeholder to influence the organisation, the legitimacy of the stakeholder's relationship with the organisation, and urgency of the stakeholder's claim on the firm. Mitchell et. Al. argue that their typology permits the correct identification of stakeholders, together with the relative pertinence of stakeholder needs, thus facilitating a managerial response that is both appropriate and timely. Building on this, Tullberg [84] suggests that stakeholder groups can be differentiated by influences that are powerful and important to the organisation, and claimants, those less powerful and vulnerable to the actions of the organisation. In doing so, Benn et. al. [63] remark that Tullberg further agrees with Kaler [78] in arguing for a narrow definition of the stakeholder concept that excludes influencers, and includes only so-called qualified claimants - thereby excluding competitors, NGOs, and media from the definitional purview.

Other simple dichotomous groupings are prevalent in the literature, and are outlined in Miles [62]. These include: Freeman and Reed's [85] differentiation between 'wide' and 'narrow' stakeholder definitions, moral/strategic [86], active/passive [87], voluntary/involuntary[71], primary/ public [88], normative/derivative [89], and core-fringe/peripheral stakeholders [90]. Miles [62] argues that a significant drawback of simple typologies is their inability to assess relational attributes such as proximity, connection, co-dependence, or mutual exclusivity, as most imply a binary either/or categorisation rather than a nuanced mix of variables. More recently, classifications based on multiple evaluation criteria have been put forward in the literature. Miles [62] again highlights the contribution of Henriques and Sadorsky [91] (organisational/community/regulatory/media), Friedman and Miles [92] (necessary–contingent/compatible–incompatible), Post et al. [59] (resource-based/ industry structure-based/socio-political-based), Sirgy [93] (internal/external/distal), Fassin [94] (stakeholder/stakewatcher/stakekeeper), and Vazquez-Brust et al [95] (institutional/ organisational/social). Furthermore, Sachs and Maurer [96] have proposed four stakeholder categories, differentiated according to stakeholder position in the wealth creation process.

Categorising stakeholders

Rowley [60] presents a summary of stakeholder group categorisations according to social demographic type as found in the e-government literature. Four broad categories of actors can be identified here as potential stakeholders in e-government initiatives: (1) citizens – individuals and/or groups considered as either service users, community representatives involved in co-creation, or taken as a broader audience impacted by the provision of a particular service; (2) government - those agencies either directly involved in service provision and/or service co-creation, or with only a peripheral interest in the process; (3) business organisations – participating either directly as service providers and/or service users, or indirectly as actors within the wider business community; and (4) third sector organisations, such as jurors, volunteer fire fighters [97] involved either as representatives/organisations involved in co-creation processes, such as purely as service users, or as merely actors interested in the impact of the service being provided.

A stakeholder typology based on roles

Governments need to know more about who their stakeholders are, and what they want, to succeed in e-government service adoption, to encourage participation and e-democracy, and to enhance the impact of e-government investment [60]. It has been noted in the literature that one major drawback

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of categorising stakeholders according to socio-demographic type is that these groups are largely static in their relationship to e-government initiatives. Instead, Rowley [60] argues for a typology of stakeholders based on 'roles' rather than groups, wherein each group of stakeholder participates in the process of digital service provision in more than one capacity. It has already been noted elsewhere in Deliverable 1.1. that both individual actors and group entities can fulfil multiple roles in public service provision and use. Rowley argues as individuals and organizations can play several roles, either concurrently or in sequence. An individual can be a service user, as well as key decision maker in the service co-creation process. Similarly, a business entity can be a service provider, whilst at the same time be a constituent element of a wider industry that consumes a given service. Government agencies and third sector organisations themselves can develop services, and benefit as users [97]. More recently, the role of users, such as citizens, in public service eco-systems has been addressed by Strokosch and Osborne [98] who adopt an ecosystem view of co-production. Service ecosystems represent the integration of actors, resources and technologies, and the interactions between them, as well as the various actors' multiple and competing agendas [98] that will influence how policy goals are implemented.

According to Payne et al. [99], the use of roles allows a more holistic view of stakeholders. Payne et. al. emphasise that "roles" are to be understood as relationships between the organisation and its publics. A role therefore includes defining the stakeholders' value propositions, the value delivery design, the stakeholder relationships (market) plans, measurement and feedback. Focusing on one stakeholder group only may lead to a narrow perspective on their interests, objectives and benefits sought. This reflects Flak & Rose [100] who consider stakeholder theory [68] as appropriate for studying the public sector setting as government "can be conceptualized as the management of relationships and interests of societal stakeholders" [100] and has to manage "successful technological innovation in a complex stakeholder environment" [100]. Originally a management theory, stakeholder theory advocates addressing the concerns of all stakeholders rather than just the interests of a few, such as senior managers and stockholders and as a practical, effective, and ethically responsible way of managing private companies. Freeman's [68] definition of a stakeholder points out that any group or individual who can affect or is affected by the achievement of the organization's objective can be considered a stakeholder. Scholl [101] points out that in the public sector, stakeholder theory is useful in the context of managerial decision-making in e-government, but also that in such initiatives, stakeholder stances may change over time as their objectives change, making it necessary to understand the needs of the stakeholders in such settings. Understanding stakeholders enables project teams to „work on the bases of relative consensus and sufficient rather than comprehensive participation among salient stakeholders" [102]. It also means that stakeholders may work towards different ends, but that they may also incidentally align and collaborate for a limited time or scope [102].

The typology by Rowley [60] includes roles that can be adopted by individuals and those that can be adopted by organizations and considers the issues mentioned above, that is, according to the differing interests and benefits stakeholders may have:

- People as service users
- People as citizens
- (Larger) businesses
- Small-to-medium enterprises

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- Public administrators (employees)
- Other government agencies
- Non-profit organizations
- Politicians
- E-Government project managers
- Design and IT developers
- Suppliers and partners
- Researchers and evaluators

1.3.2 Stakeholder engagement methods in IPS

Stakeholder engagement methods are methods aimed at eliciting views, information, and opinions of stakeholders. Additionally, they are means by which stakeholders can be involved in decision-making progress [103].

Furthermore, according to International Association for Public Participation [104], it is possible to identify five levels of stakeholder engagement. Starting from the simplest levels, those are: informing, consulting, involving, collaborating, and empowering. Each level has several different stakeholder engagement methods applicable to it. They are described, within the engagement level context, in the following sections.

Given the focus of inGov project on digital public services (and the distinction also adopted in D1.1., p. 43), below the role of ICT technologies in public service co-creation is reflected.

Informing

As Bryson [75] notices, this level of engagement is low, and it is suitable for stakeholder engagement when urgency, influence, importance, or interest are low.

Methods used in this approach are limited to simple content consumption found on websites, fact sheets, newsletters, or merely an observation of policy discussions.

However, large number of governments (including those at national level, but also regional and local administrations) are using social media networks like Twitter, Facebook, and Instagram to inform and spread news about their work, as well as about digitalization and e-government services. One specific study covering these efforts is Twiplomacy11.

[11] https://twiplomacy.com

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Consulting

Consulting is a more involving stakeholder engagement level. It is used to gather views, interests, ideas, and relevant information held by stakeholders.

According to Bryson [75], methods associated with this level are interviews, surveys to gather information and public consultations on draft policies. Additionally, web-based tools can also be used to facilitate the process of information gathering and data analysis.

As mentioned in the previous section, social media is actively used as a means of communication. Governments are also using Twitter and other social media channels to improve and enhance consultation processes with the public. Although social media does allow for some deeper involvement (for example, Facebook groups), primarily, its role is visible withing Informing and Consulting levels of stakeholder engagements.

Involving

Involving is a relatively intensive engagement level. As such, it encourages stakeholders to work together during the policy or service development process. Within the inGOV project context, it could be correlated with co-creation during different stages.

Methods used for this level reflect its relative intensity. Regardless of the method used, their goal is to ensure consistent understanding and address ideas, concerns, and interests [103].

Wimmer et al., [105] based on their work on the OCOPOMO project, suggest scenario building as one of the more appropriate methods for this level of stakeholder engagement. Authors went beyond the theoretical framework – instead, they introduced an approach for collaborative policy development and integration of scenario development and formal policy modelling (made possible by their software packages).

Panel discussions and engagement of experts are suitable within the Delphi method context. Moreover, while there are some open questions related to the current validity of the Delphi method in social sciences [106], it is still a viable approach especially when consensus-building around specific policies is required, as described by Rayens & Hahn [107]. Another usage of the Delphi method within this context is as a driver of idea generation and exploration within different policy and other contexts [108].

Group model building (GMB) is another appropriate engagement method. As noted by Andersen et al. [109], at least six distinct approaches related to stakeholder participation are all covered under the GMB umbrella:

- Reference group approach [110]
- Strategic forum [111]
- Stepwise approach [112]
- Modelling as learning [113]
- Strategy dynamics [114]

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- Hines' Standard method [115]

GMB, as such, includes activities like role-playing, simulation, and modeling of policy choices and games. This connects with Black & Andersen [116] and their innovative approach using visual representations as boundary objects. Although they applied their approach for conflict-resolution scenarios, the collaborative nature of model-building approaches is feasible within the context of stakeholder engagement.

Lastly, as Helbig et al. [103] posit, all these levels (different stakeholder positions, different levels of engagements) focus on the flow of information among them; however, the direction and intensity of those flows vary.

Collaborating and empowering

The highest impact on the decision-making process is achieved within the Collaborate and Empower spectrum elements of the International Association for Public Participation's [104] for public participation.

Collaboration, in this context, means active elicitation of advice and innovation in solutions formulation and incorporation of recommendations in the final decisions. Conversely, Empowerment grants the highest possible impact to the public – everything that the public decides will be implemented and the final decision-making is in the public's hands.

Taking a more pragmatic view, both Collaboration and Empowerment are defined by the legislative framework or within institutional policies [103]. As such, there will inherently be certain constraints and limitations. That implies the need for finding common ground and consensus-building efforts.

Several approaches are suitable for these activities. They include more engaging methods like citizen juries [117]. Citizen juries are finding their way into more open, deliberative democratic processes. Furthermore, they have been actively used at local levels (Cologne, Germany; Camden, UK) and in broader contexts dealing with the future of electricity, genetic tests, and numerous other social, ethical, and environmental issues.

Klievink et al. [118] also suggest that the creation and modeling of governance boards can be an effective tool. They emphasize earlier findings where stakeholders are more likely to change their positions when involved in a process where their ideas and points of view are deliberated and even challenged.

Finally, "Living labs" is also one of the useful approaches within the inGOV project context. Defined by Niitamo et al. [119] as "an emerging Public Private Partnership (PPP) concept in which firms, public authorities and citizens work together to create, prototype, validate and test new services, businesses, markets and technologies in real-life contexts, such as cities, city regions, rural areas and collaborative virtual networks between public and private" Living Labs offer stakeholders participation in the real-life and everyday life contexts. As such, they can stimulate and challenge research and development. This is achieved thanks to their inclusive nature, where public authorities, civil servants, citizens (and any other types of stakeholders) get the opportunity to participate and contribute effectively to the entire process. Although this is listed under the Collaboration/Empowerment part of the engagement spectrum, Living Labs can benefit other parts of this spectrum. Later in this chapter, recognized

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methods will be mapped to different parts of the PS cycle, and the suitability of several methods to span different parts of the cycle will become more obvious.

Classification of engagement methods

Within the inGOV project context, we decided to try and classify researched engagement methods based on their delivery approach – broadly into offline and online (digital) methods.

However, it became obvious that some, traditionally considered offline and analog methods, can be exercised and be actively used in online and digital mediums. For example, surveys and interviews can be conducted both online and in person. With this in mind, we envisioned a division to analog (offline), digital (online), and cross-medium (for approaches that can be used in both environments).

Table 7 summarizes recognized engagement methods and their division between analog, digital and cross-medium.

Table 7: Classification of Stakeholder Engagement Methods

Method	Offline	Digital/Online	Cross-medium
Newsletters and info websites		X	
Social media		X	
Webinars		X	
Fact sheet distribution			X
One-on-one interviews			X
Focus groups			X
Surveys			X
Brainstorming and idea generation			X
Idea gathering		X	
Public consultation			X
Face-to-face workshops/meetings	X		
Scenario building	X		
Policy modelling (including SW toolbox)			X
Panel discussions / Delphi			X
Group model building	X		

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Citizen juries	X		
Modelling of governance boards	X		
Living Labs	X		

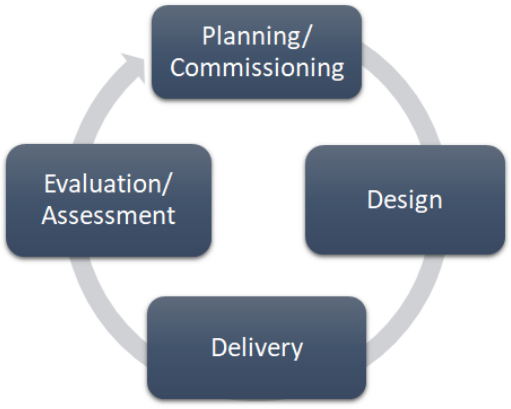
1.3.3 The public service cycle & stakeholders and engagement methods

The public service cycle

The focus on public service reform through private sector innovation methods has increased with the advent of the New Public Management Model (NPM) from the 1980s onwards [120]. However, the more collaborative aspects of providing public services have only become the focus more recently in the New Public Governance Model (NPG) [121], which avoids some of the criticism on the NPM while providing a compromise between the structure and rigidity of the public sector as well as the continuing strive for innovation.

In both these governance models, iterative frameworks, such as the policy cycle and the public service cycle, play a significant role. In contrast to the policy cycle and its phases topic identification and agenda setting, analysis and policy discussion, policy formulation, decision-making, implementation and evaluation [122], the public service cycle focuses on the phases of developing and providing public services. The public service cycle may include a variety of phases, such as commissioning, design, delivery, and assessment [123] and becomes most apparent in the context of co-production literature.

Figure 3: The Public service cycle according to Sicilia et al. (2016) [48] *and* [124]



Most often, the public service cycle is presented in the context of co-production. Deliverable 1.1 shows how co-creation can interact with the different phases of the public service cycle and how it will be included in the overall framework of the inGOV project. The application of these phases might range from a very detailed and dedicated view that includes co-planning, co-design, co-prioritisation, co-

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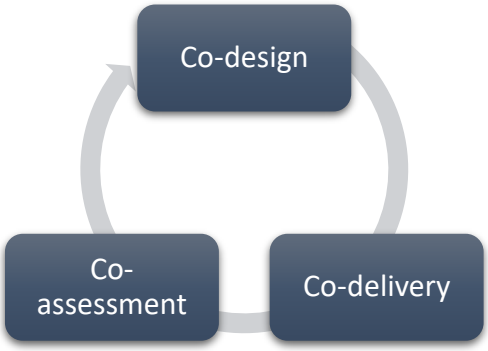
financing, co-implementation/management, co-delivery, and co-assessment/ evaluation [12], [125], [126], to a more focused version that only includes the main structural phases. Notable examples for such a strategic approach can be found in Bovaird and Loeffler [97] and Nabatchi et al. [124], who specify the four phases co-commissioning, co-design, co-delivery, and co-assessment, and Loeffler and Bovaird [127], who break the co-commissioning phase further down into the commissioning cycle (Analyse, Plan, Do, Review). In the inGOV project, we decided to focus on the three main phases of the public service cycle that Linders [12] describes, namely co-design, co-delivery and co-assessment (see also Deliverable 1.1).

Figure 4: Phases of the public service cycle as used in inGOV (based on [12]*)*



Co-design, as the first phase in the observed framework, focuses on the design of a respective application or service [48], while including stakeholders through consultation formats [126] or even in the basic design [97]. The essential element of this phase of the public service cycle is the generation of trust between service users and providers, which supports an active usage and adoption of the service later on [48]. Co-delivery includes service users in the phase of service provision, allowing for active formats and sharing of experiences between peers, often in training formats [124]. Co-delivery allows for the active integration of users and requires effective communication strategies [48]. Co-assessment (sometimes also referred to as co-evaluation or co-monitoring) mainly has the goal to learn from (or further improve) a specific service with the support of the respective stakeholders. In this phase, their experiences are used to provide even more user-centric services in the future and even empower stakeholders and their involvement in the public service cycle [48].

The next section will look more closely at the involvement of the stakeholders in each phase.

Stakeholders involved at each stage of the public service cycle

The main objective of this step is to identify which stakeholders are involved in the different stages of the public service cycle. Ignoring relevant stakeholders can have terrible consequences for process success [102]. Moreover, Rowley [60] argues that the correct identification of stakeholder groups in e-government projects, is key to ensure long-term success. Furthermore, for a successful and effective e-government initiative it is important not only to identify stakeholders but to align their needs and interests to the e-government objectives.

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As mentioned previously, stakeholders in integrated public service delivery are those that are impacted by the provision of the service, influence the nature and direction of the public service delivery, or as is relevant to the inGOV case, in co-creation stakeholders represent a combination of both. Rowley [60] presented four broad categories of actors identified as stakeholders in e-government initiatives: citizens, government, business organisations and third sector organisations. For the InGOV project the involvement of the four categories of actors throughout the co-creation of IPS could bring forth very interesting outcomes. Nevertheless, as stated in the previous sections, these broad categories are quite static, and do not represent the actual way in which the stakeholders are involved in a public service. For example, a citizen can be both, a user of a service, a non-user of a service but a subject matter expert that acts as a consulting expert for a certain domain in the co-design phase [60], [128]. Therefore, to determine which stakeholders can be involved in each phase of the PS cycle Rowley's [60] typology of roles will be used. It is important to highlight that many, and in fact all these stakeholder roles can be involved in the three phases.

It is important to note that depending on the service being designed, and the methods used to engage stakeholders, the involvement of these stakeholder groups may differ from one service to another. Also, the relevance and salience of the different stakeholders will impact on their desire to participate in the different service delivery phases; identifying the exact stakeholders that should participate or can participate in each phase of the PS cycle would require a deeper understanding of the service at hand. For example, a non-profit organization might not have any direct impact on a particular service, yet they, as an organization, may be experts in the field of the service, their involvement in the co-assessment of the service will depend greatly on the politicians/public administrations power to convince them to participate, as their input is valuable for the service. In this example, the non-profit organization would represent a secondary stakeholder role as stated by Clarkson [71] and an external stakeholder as classified by Wiewiora et al. [83]. Moreover, the non-profit organization represents a low salience because they do not have a high legitimacy or urgency claim in this service [61].

Co-design

This phase provides the conception and layout of the service to be designed. The inclusion of stakeholders in this step not only helps create mutual trust between the authorities and stakeholders, but also helps provide a more user-centric experience. The involvement of users also increases their willingness to actually adopt the service [48].

People as users are a key stakeholder in this phase, as they will in the end be the main beneficiaries of the service, as well as creating shared value [129], But direct users are not the only stakeholders involved, experts, researchers and designers can also aid in designing a service that can be useful for the community [126]. To manage and conduct the different stakeholder engagement and consultation processes the e-government project managers, public administrators and other government agencies, should be involved in this phase. On the other hand, businesses and SME enterprises could be involved as users of the end service, as service providers, or as experts in the topic. Therefore, the involved stakeholders in this phase may differ in regard to their salience and their relationship to the service, this means they can be directly impacted by the service, primary stakeholders or secondary, as stakeholders involved in the design that provide their expertise.

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Co-delivery

Including stakeholders in the service delivery phase, such as users and expert professionals is relevant for the success and effectiveness of service co-delivery [48]. The users are key stakeholders as they help determine if the service delivery is complying with the specifications agreed upon in the co-design phase [127]. Other stakeholder roles involved in the co-delivery phase include the agencies providing the service, service developers and project managers. Again, it is safe to say that the salience of the stakeholders involved in this phase may differ, the managers of this step in the process must find a way to understand the relevance of each stakeholder group participation.

Co-assessment

The co-assessment phase has the objective to evaluate and learn from the service delivered, in order to improve and take into account feedback from respective stakeholders. Therefore, the experience of stakeholders, may they be businesses, citizens, SMEs or the service providers themselves, is key to be able to have a broader view of the service provided. The involvement of stakeholders in this phase can increase not only user-centricity but can improve communication with involved stakeholder [48]. In this phase, internal and primary stakeholders with a high salience level have a key role to identify the things that have worked throughout the service. As they are impacted directly by the outcomes of the service, their feedback and analysis is highly recommended and sought after.

Possible stakeholder engagement methods used in each phase of the public service cycle

Methods and approaches earlier identified and shown in Table 8 are applicable and meaningful at various stages of a PS cycle. In the previous section, the public sector cycle as used in the inGOV project was introduced based on Linders [12].

In this section, a breakdown of recognized methods and approaches is introduced and mapped to different PS cycle elements.

Table 8 "maps" the different engagement methods to phases of the introduced PS cycle.

Table 8: Engagement Methods & PS Cycle Phases

<table>
<tr><th>Method</th><th>Co-design</th><th>Co-delivery</th><th>Co-assessment</th></tr>
<tr><td>Newsletters and info websites</td><td colspan="3" rowspan="4">All these methods can be used across different phases. Their primary aim is to inform and raise awareness. In some cases, they can be used as recruiting tools for stakeholder identification and engagement in later cycle phases.</td></tr>
<tr><td>Social media</td></tr>
<tr><td>Webinars</td></tr>
<tr><td>Fact sheet distribution</td></tr>
<tr><td>One-on-one interviews</td><td>X</td><td></td><td>X</td></tr>
<tr><td>Focus groups</td><td>X</td><td></td><td>X</td></tr>
</table>

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Surveys	X		X
Brainstorming and idea generation	X		
Idea gathering	X		
Public consultation	X		X
Face-to-face workshops/meetings	X	X	X
Scenario building	X		
Policy modelling (including SW toolbox)	X	X	
Panel discussions / Delphi	X		X
Group model building	X		
Citizen juries	X		X
Modelling of governance boards		X	
Living Labs	X	X	

Several methods listed on top of the table do not squarely fit within a single phase of the PS cycle since they are used for relatively low engagement intensities. However, they are useful in cases where stakeholders need to be kept informed and aware. Additionally, using social media, for example, can be utilized as a method of recruitment of stakeholders.

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1.4 IPS implementation

This chapter addresses political, cultural, technical, semantic, managerial and organisational, and legal aspects in designing and delivering IPS-Co. This document is divided into several sections.

The first section deals with political aspects. As such, it explores concepts like political will needed for IPS provision. Furthermore, it addresses issues of political capacity, decision makers and their commitments, and appropriate environment.

The second section outlines and discusses cultural aspects.

Following the cultural aspect, the third section deals with technical aspects in designing and delivering IPS-Co. It outlines key issues, barriers, and enablers.

Following the virtually identical structure, the fourth section deals with semantic aspects, again recognizing and outlining key issues and barriers, followed by enablers.

After that, the fifth section covers managerial and organizational aspects. It recognizes and outlines elements related to training, leadership skills, data sovereignty (and management), organizational structures, and individuals with their networks.

And lastly, the final, sixth, chapter outlines and covers legal aspects. It discusses regulations and policies for promoting and limiting data and services availability and their use and regulations and policies covering relationships between stakeholders. The additional section addresses relevant policies and regulations dealing with cross-border public service interactions.

1.4.1 Political Aspects

A number of political factors can be identified as having a significant impact on the nature and direction of IPS-Co design and delivery based in part on work undertaken previously in Deliverable 1.1. Five have been selected as having significant impact – political will, political capacity, commitment to public values, political environment and community participation – and are are discussed in some detail below.

Political Will for Integrated Public Service Provision

An oft-cited reason for the underperformance or outright failure of public sector reform programmes is the “lack of political will”, or an absence of genuine intent on the part of a political leader to conduct reform within a given policy making context [130]. Brinkerhoff [131] provides us with a basic definition of political will, which is “...the commitment of actors to undertake actions to achieve a set of objectives and to sustain the costs of those actions over time”. He argues that the concept of political will is complex for three broad reasons: a) it involves intent and motivation, which are intangible and difficult to measure; b) it can exist at both individual and collective levels, reflecting both the characteristics of the individual and aggregated opinions of the group; and c) while it may be articulated in spoken or written words, political will is only truly manifested through action. Political will to provide high quality public services implies not only an expression of intent to pursue a particular course of public service reform, but also the sustained manifestation of that intention as concrete actions until the objectives of the intervention are achieved [132], [133]. The notion of

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political will is, therefore, particularly salient within the context of IPS-Co design and delivery, which requires both a significant departure from conventional bureaucratic mindsets and practices, and the mobilisation of ordinary citizens and other stakeholders to actively participate in co-creation processes. Political will in this context can be understood as the well-defined intent shown by leaders to initiate and sustain public service reform, and its presence or absence has the potential to determine the eventual outcome of the IPS-Co initiative.

Political Capacity to Support Integrated Public Service Provision

Closely connected to the idea of political will is the notion of political capacity, or the ability of governmental actors to implement public policy interventions [131]. In other words, Kugler and Arbetman [134, p. 1] define political capacity as "an expression of the political effectiveness of an elite in achieving governmental goals". Elsewhere, Arbetman and Kugler [135] break down the concept into two distinct, yet complementary components: relative political reach, which focuses on human resources and measures the scope and extent of government influence on a target population, and relative political extraction, which is concerned with material resources and ability of the governmental authority to acquire the revenue necessary to implement a decided-upon intervention. Tambouris et al. [136] contend that the capacity of political elites to mobilise resources has a significant impact on the way in which ordinary citizens behave and respond to reform initiatives, and hence comes to influence the outcome of reform programs. Morrissey [137] observe that political actors' assessments of their capacity to implement reforms often influence their willingness to make commitments upfront. Thus, Brinkerhoff argues, what may appear from the outside to be a mere lack of political will can actually be linked instead to the prevalence of insufficient capacity and a reluctance on the part of political actors – in this case, elected representatives, civil servants, and public administrators – to commit to a course of action that they cannot sustain. This nuanced understanding of political capacity, and its closer interlinkage with political will, is of immense importance in the context of IPS-Co design and delivery. Interventions that require the acquisition of new skills, the development of new mechanisms and procedures, and the diversion of resources may fail to secure political will from governmental actors, particularly elected representatives, where they are not confident that they have at their disposal sufficient capacity for implementation. This in turn can be detrimental to the mobilisation of other stakeholder groups, who would be reluctant to actively participate in IPS-Co interventions. A way out of this quandry is proposed by [138] who argue that elected politicians can bolster the quality of their political leadership and capacity for policy innovation by engaging in processes of multi-actor collaborative governance.

Commitment of Public Actors to Public Values

In organisational theory, values are considered as being essential components of organisational culture that determine, guide and inform actor behaviour [139]. In consequence, identifying and understanding public values remains fundamental to the study of government and public administration [140]. Indeed, [141] argue that 'there is no more important topic in public administration and policy than public values'. Broadly defined, public values (PV) are "...the normative principles on which governments and policies should be based" [142]. Drawing on the example of Irish civil service [139], identifies a range of values associated with public service, including efficiency, impartiality, honesty, loyalty, risk-aversion, equity, hierarchy, integrity, accountability and fairness. Adherence to public values has been identified as a critical element of charismatic leadership in bureaucratic contexts [140] and public servants should be committed to upholding core public values

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as they endeavour to provide the best administration possible [139]. In this way, this set of actors public administrators are committed to the improvement of the policy-making and service delivery abilities of the state at all levels of government. This commitment in essence involves adherence to fair, accountable and transparent governance, and to a stewardship of government funds that maximizes efficiency and cost-effectiveness. Public values are seen to legitimize the activities public administrators, and in general provide guidance for their actions (Deliverable 1.1). As such, they can be considered as key inputs for IPS co-creation. Acknowledging and adhering to core public values is critical for IPS-Co design and delivery as upholding key value principles results in the formulation and implementation of initiatives to the very highest of standards. In remaining visibly committed to core public service values during IPS-Co design and delivery, governmental actors build trust between themselves and other stakeholder groups, creating the perfect environment for renewed co-operation and innovation [143]. Furthermore, [139] notes that the relative importance of the various public values within a given administration, as well as from a national and/or European perspective, determines the level of political engagement and the degree to which other stakeholder groups are involved in processes of governance. This observation is important for IPS-Co initiatives, as the prevailing dominant public values will determine the nature and scope of stakeholder involvement, and the direction of integrated public service design and delivery [144]

Political Environment: Structures and Governance Dynamics

The socio-political and bureaucratic environment within which actors operate circumscribes, to a significant extent, whether they are willing and able to initiate and sustain reform programs [131]. Andrews [145] argues that the emergence of political will emerges in those situations wherein governmental actors have access to, and can create, space for reform. Effective political engagement in reform programs is manifest in those organisations in which political actors establish a space in which authority structures that foster a culture of acceptance, creativity and dynamism, whilst at the same time supporting rule-based accountability, exist. Malena [146] paraphrased in [131] discusses how political will is influenced by political “can” (or capacity) and political “must” (or public pressure and citizen engagement, organisational rules and regulations, and a sense of individual civic duty). Brinkerhoff [147] argues that in order to facilitate reform a positive enabling environment founded on principles of good governance must be achieved. This view is supported and further nuanced by [146] who contends that good governance cannot be achieved by governments alone, instead it requires not only strong governmental actors but also the active involvement of citizens and civil society organisations. Voorberg et al. [40] make the point that the environment produced through the adherence to particular state and governance traditions (for example, the prevalence of a political culture of authority sharing or consultation) strongly impacts the outcome of co-creation initiatives. Thus, the importance of developing an enabling environment to support IPS-Co design and delivery interventions cannot be overstated. Such an environment should be created to support government actors as they consult with, engage, and mobilise other stakeholders. Decision-makers should reach out to private sector and civil society actors to tap into their unused resource capacity, and increase allocative efficiency.

Nature and Degree of Community Participation in Public Service Provision

Understanding the nature and extent of community involvement in integrated public service design and delivery is exceedingly important within the context of the inGOV project given the particular emphasis of the IPS-Co framework on the co-creation and co-maintenance of innovative digital public

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services. It is widely recognised that community engagement can be used to support the delivery of key public services, and that the nature and degree of their interactions with government determine the direction and scope of public service innovation [148]. From a global perspective, a report by the UNDP [148] suggests that reform-minded public officials can improve governmental initiatives through harnessing civic involvement to elicit information and ideas, support public service improvements, defend the public interest from 'capture' and clientelism, strengthen the legitimacy of the state in the eyes of citizens and bolster accountability and governance in the public sector. In Europe, the Treaty of Amsterdam states that all EU institutions should make open decisions close to citizens, who should be involved in the government decision-making process [149]. The Tallinn declaration [150] further acknowledges the importance to recognise the needs of citizens and businesses as they interact with public administration. Indeed, signatories to the Tallinn Declaration commit to designing and delivering services guided by the principles of user-centricity; including, digital interaction, reduction of the administrative burden, digital delivery of public services, citizens engagement, redress and complaint mechanisms. This idea was taken one step further in the Berlin Declaration [150] whose signatories actively committed to widening public participation in policy making by involving society in the co-creation of public services. In taking a close look at community participation at the local government level in Ireland, [151] emphasise the role of the state in creating an environment of inclusivity, mutual respect and trust, paving the way for increased community stakeholder participation in public service design and delivery. In particular, they highlight the need, on the one hand, for increased efforts to include hitherto marginalised individuals and actor groups, and, on the other, to provide funding support to civil society organisations to enable them to play a dual role as advocacy groups and service delivery agents. These findings are underlined in more recent work by Cheng [152] who advocates the involvement of citizens and non-profit organisations in the design and delivery of public services in a process he calls "cogovernance". Showcasing examples from the Czech Republic, [153] similarly argue for community-based collective action to improve the delivery of public goods in a land management context. Chretham and Lever [154] examine the attempt made by a local authority in North England to develop an innovative public sector sharing economy environment to deliver welfare services to its constituents.

1.4.2 Cultural Aspects

In order to design, deliver, and evalute IPS-Co, there are some cultural aspects that must be taken into account for a smooth delivery. Culture represents a key point in the European context: the European Union consists of 27 member states, countries speaking different languages, having different cultural backgrounds, and ethnic groups, often within national borders. These differences have a significant bearing on the political systems throughout the European Union [155]. The European Council states that culture has an intrinsic value that contributes to social development and economic sustainability. Moreover, that the language and cultural diversity throughout the EU is a key asset [156]. Nevertheless, this aspect may also provide a series of challenges that will be further addressed below.

In order to be able to identify and comprehend the cultural aspects in the design and delivery of IPS-Co, it is important to first note what is understood by culture. There are many definitions of culture, and anthropologists around the world are still discussing what is the most wholesome definition, but one thing agreed upon is that culture shapes human behaviour [157]. Some authors define culture as and can also be defined as "the integrated pattern of human behaviour, that includes thought, speech, action and material creations and which depends on human capacity for learning and transmitting knowledge to future generations" [158], this will be the definition used throughout this document.

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Moreover, governmental institutions, and the actors therein are usually a mere reflection of the different cultural systems in which they are embedded [155]. This can have a substantial influence on the decision-making process, the design of services, policy implementation and of course the relationship with the citizens [155].

Interoperability is essential for IPS-Co, which favours services to be delivered in an effective and efficient way. Cultural interoperability was mentioned in the 2017 European Interoperability Framework (EIF) as an aspect that poses a significant challenge due to the different linguistic, cultural, and administrative environments within the European MS [28]. Recently, the EIF for Smart Sustainable cities (European Commission, 2021b) defined cultural interoperability as "the steps taken by individuals and organizations to take into consideration their social and cultural differences and, if applicable, organisational cultural differences" [7]. The recommendation set forth by these frameworks is to ensure collaboration and communication between the different stakeholders, so that different needs and requirements are addressed, ideally throughout the co-creation of services [7].

As it has already been established throughout the inGOV project, in order to develop and deploy modern and integrated public services, the service providers must know who they are trying to serve. It is important to understand the needs and priorities of service users by involving them in the co-creation process, through the IPS-Co model proposed. Resistance to managing the relationships with stakeholders could result in counterproductive clashes. Simmons et al. [159] bring forth the importance of institutional culture: there should be appropriate institutional commitment and effort to ensure the service culture fits with the user's expectations. As user-driven services become more ubiquitous, there needs to exist a cultural shift within those working in public service, to address and promote user involvement [160]. In this direction, the institutional culture of public service should aim to have a user-driven focus, complementing the public service ethos, rather than conflicting with it [160].

Finally, cultural attributes have a significant impact on citizens' propensity to engage in the co-creation process. One of the most commonly cited issues is users' trust in government; If there is a lack of trust, user participation tends to be reduced as citizens who are suspicious of government or government officials are less likely to engage in co-creation [161]. On the other hand, public administrators' administrative culture should be participation led and the trust they have in citizens participating is key for co-creation of public services to take place [162]. As stated by Bovaird [127] the co-creation process means that both citizens and governments must take risks, the user has to trust the professional and the professional must trust the user, rather than dictate what they should do. Moreover, providing IPS-Co in different cultures, might thus present different degrees of challenges.

Therefore, the cultural aspects that must be considered when designing and delivering integrated public services are several, from considering the semantic interoperability, the languages in which the services need to be provided, the importance of having a governmental institutional culture aiming towards user involvement, and the importance of creating trust between users and governmental officials.

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1.4.3 Technical Aspects

Issues

In recent years, the paradigm of e-government has created new opportunities for governments to serve and inform stakeholders with improved quality, accountability and efficiency. However, there exist several factors that lead to a failure in the implementation of e-government initiatives and impede the adoption of e-government services. Particularly, technical and interoperability issues can pose greater challenges to e-government implementations. For example, the availability of high quality internet services, such as the internet bandwidth capacity, or the quality of mobile services provided are key for the successful adoption of e-government services by the citizens and stakeholders. Another major concern over the e-government implementations is the security and privacy of the e-government services and data sharing applications that may compromise the transparency of such systems. The secure environment dimension is used to reflect the degree to which appropriate security protocols for data, applications, systems, and networks exist and whether the policies, training, and management practices to support them are in place [163]. Finally, the possible differences in local or national approaches to handling specific types of data may pose greater challenges to e-government implementations.

Barriers

Due to their reliance on heterogeneous information and process models, technical and semantic interoperability barriers are recognized among the most challenging problems for modern cross organizational information systems and particularly in e-government implementations. The term technical interoperability refers to ensuring that the applications and infrastructures operate under the same linking systems and services. Aspects of technical interoperability include interface specifications, interconnection services, data integration services, data presentation and exchange, and secure communication protocols. Semantic interoperability means that the precise format and meaning of exchanged data and information is preserved and understood throughout exchanges between parties. In such a context, several factors depending on interoperability have been identified as technical barriers that government agencies face while planning and implementing e-government projects [28].

For example, although the existence of a plethora of e-government resources and data that could be utilized in an ever-growing number of applications, data is not being utilized in a manner that facilitates and advances the current e-government services. To this end, several barriers related to the information exchange may limit down the possibilities to develop common access tools to various data sources.

These may include [164]:

- Differences in the type and quality of data or metadata that is being exchanged, or difficulties in assessing data quality.
- The existence of different data models, or the inconsistent definitions of data elements.
- Particularities of databases and information systems that may also pose issues in databases and data handling systems, such as unclear ownership of databases, differences in data

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handling systems, and fragmentation leading to uncertainties in the broader e-government infrastructure.

- Data publishing incentives in repositories can contribute to the transparency, reproducibility, and improved quality of repository infrastructures. In that sense, imperfect incentives for data quality and repository infrastructure, and limited possibilities to develop common access tools for non-base repositories [165].

- Limited possibilities to develop common access tools for non-base repositories access to distributed data sources and query-based access to data

- Lack of availability and accessibility of digital services, technical and informational breakdowns, or system complexity and incompatibility may impact success in implementing e-government initiatives [166].

These may be related to the differences in the type and quality of data or metadata that is being exchanged, the difficulty in assessing data quality, the existence of different data models, or the inconsistent definitions of data elements. Finally, the particularities of databases and information systems may also pose issues in databases and data handling systems, such as unclear ownership of databases, differences in data handling systems, and fragmentation leading to uncertainties in the broader e-government infrastructure [164]. Other significant barriers may include imperfect incentives, and limited possibilities to develop common access tools for non-base repositories, access to distributed data sources and query-based access to data [164]. Other significant technical barriers that may impact success in implementing e-government initiatives refer to lack of availability and accessibility of digital services, technical and informational breakdowns, or system complexity and incompatibility [166].

Enablers

The success of e-government services requires the ability to use technology innovatively in order to solve unique problems. Therefore, technical infrastructure is a key for advancing the development, implementation, and efficiency of e-government systems and services. Taking the lead in innovation activities and engaging in continuous improvement will strengthen e-government initiatives' technological orientation and aid in the formation of successful e-government programmes. As the technological platforms used in the context of e-government must be evolutionary in design, there exist several technical enablers that may drive the success of e-government implementations [167].

Around the world e-government initiatives are recently beginning to grasp the potential of blockchain and other distributed ledger technologies, especially with regard to providing decentralized information management solutions and making public digital platforms more transparent and efficient. Blockchain technology combines cryptography and distributed computing to provide a multiparty consensus algorithm to securely exchange value [168]. A great advantage of blockchain is that it contributes to both security and transparency, as well as decentralization and flexibility in dealing with digital government information. Moreover, recent advances in Artificial Intelligence (AI) and deep learning techniques have opened the way for new capabilities in e-government systems and services. Such technologies can endow e-government services with a higher degree of intelligence and

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accessibility, significantly improving the current state of services and systems as well as the e-government-citizens interactions. To this end, more and more government agencies are starting to utilize advanced deep learning techniques and algorithms to address e-government challenges and needs [169]. The needs and requirements of an ever-growing information industry, such as the e-government case can be highly benefited by the introduction of knowledge graphs. In a graph-based knowledge representation, data is enriched with contextual information, while the concepts and/or entities of the graph are connected through relations. Through this connection, complete and structured knowledge repositories are formed, facilitating thus the management, retrieval, usage and understanding of information [170].

1.4.4 Semantic Aspects

The interaction and integration of public services requires an environment where semantic interoperability between disparate public administration ICT systems and the data they produce, handle and exchange are seamless. According to the European interoperability Framework (EIF) [28] "Semantic interoperability ensures that the precise format and meaning of exchanged data and information is preserved and understood throughout exchanges between parties, in other words 'what is sent is what is understood'". Semantic interoperability covers both semantic and syntactic aspects. The semantic aspect refers to the meaning of data elements and the relationship between them, while the syntactic aspects refer to the format and syntax of the information to be exchanged. This section presents issues/barriers that hinder semantic interoperability and enablers (e.g. recommendations, vocabularies, architectures and software) that facilitate semantic interoperability under the frame of IPS-Co. Specifically, semantic interoperability issues/barriers and enablers for the IPS-Co are "translated" to issues about the data produced, handled and exchanged between the ICT systems of the public services. The aforementioned issues/barriers also hinder co-creation within specific cases. For example different actors (from government, business, non-profit, users) attaching different meanings/semantics to concepts.

Issues & Barriers

A number of issues/barriers hinder semantic interoperability between public services and are mainly related to the heterogeneity of the underlying ICT systems and the data they produce and exchange either at national or international (cross-border) level. The following list summarizes the issues and barriers identified:

- Differences of concepts and meanings [164], [171]. For example, the meaning of the concept 'public service' varies in breadth across Member States or even at local/national level (e.g. in some cases the public service is perceived as a service offered only by a PA will in some other cases other entities such as businesses or non-profit organizations could also be involved in the service offering).

- Heterogeneity of data types and representation formats [164], [171]. For example the address may be expressed in different order "Street name + number" or place the number first or use post code and house name or number.

- Different data models and standards [164], [171]. For example, use different models to represent a public service.

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- Language differences at cross-border cases [164], [171]. The original data produced by a public service are only available in the national language. Thus a valid/trusted translation is needed.

Enablers

In order to tackle semantic issues/barriers, a set of enablers has already been proposed including recommendations, vocabularies, architectures and software solutions. The adoption of these enables will facilitate integrated public services to exchange data in a way that helps them understand the data and draw valid conclusions. The following paragraphs summarize the enablers identified.

EIF [28] defines three recommendations related to semantic interoperability

- Recommendation 30: Perceive data and information as a public asset that should be appropriately generated, collected, managed, shared, protected and preserved.

- Recommendation 31: Put in place an information management strategy at the highest possible level to avoid fragmentation and duplication. Management of metadata, master data and reference data should be prioritised.

- Recommendation 32: Support the establishment of sector-specific and cross-sectoral communities that aim to create open information specifications and encourage relevant communities to share their results on national and European platforms.

ISA2 (Interoperability Solutions for European public administrations) has proposed a set of e-Government Core Vocabularies, that capture the fundamental characteristics of data entities in a context-neutral fashion. These vocabularies enable the semantic interoperability among PAs in the exchange of information, and data integration. The core vocabularies include:

- The Core Person Vocabulary captures the fundamental characteristics of a person, e.g. the name, the gender, the date of birth, etc.

- The Core Business Vocabulary [172] captures the fundamental characteristics of a legal entity, e.g. the legal name, the activity, address, legal identifier, company type, and its activities.

- The Core Criterion and Core Evidence Vocabulary [173] supports the exchange of information between organisations defining criteria and organisations responding to these criteria by means of evidences.

- The Core Public Service Application Profile [174] captures the fundamental characteristics of a service offered by public administration and the associated life and business events.

- The Core Public Organisation Vocabulary [173] describes public organisations with links to public services, relevant legislation, policies and jurisdictional coverage.

- The Core Assessment Vocabulary [175] defines what an “Assessment” of “assets” is and how to perform the assessment based on “Criteria”.

- The Core Standards and Specifications vocabulary [176] is used for the information exchange related to standards and specifications amongst software solutions.

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ISA2 has also proposed other vocabularies that can foster semantic interoperability at the PA and IPS:

- DCAT Application Profile (DCAT-AP) [177] provides a common specification for describing public sector datasets in Europe to enable the exchange of descriptions of datasets among data portals.

- Asset Description Metadata Schema (ADMS) [178] is a specification used to describe interoperability solutions helping everyone to search and discover them.

- European Legislation Identifier (ELI)[12] offers a consistent and elaborated mechanism to identify, reference and reuse legal information on the web.

Additionally, the EU has published and maintains a set of controlled vocabularies (i.e. authority tables, thesauri, taxonomies)[13] that facilitate the harmonization of concepts to improve institutional and inter-institutional communication. EuroVoc[14] is one of the most popular thesaurus that covers the activities of the EU.

Finally, a set of architectures, libraries, building blocks and software have been proposed by the EU to enable semantic interoperability including:

- European Interoperability Reference Architecture (EIRA)[15] is an architecture defining the most salient architectural building blocks (ABBs) needed to build interoperable e-Government systems.

- EIRA Library of Interoperability Specifications (ELIS) [165] is a family of interoperability specifications that define the interoperability aspects of the Architecture Building Blocks (ABBs) contained in EIRA.

- CEF Building Blocks[16] (Big Data Test Infrastructure, Context Broker, eArchiving, eDelivery, eID, eInvoicing, eSignature and eTranslation): offer basic capabilities that can be reused to facilitate the delivery of digital public services across borders and sectors.

- eCertisv[17] is a free online tool mapping documents requested in public procurement procedures across borders. The system identifies and links certificates necessary as proof of compliance with tender criteria in various areas of administrative verification

- Interoperability Quick Assessment Toolkit[18] allows solution owners to assess the potential interoperability of their software solutions supporting public services.

[12] https://eur-lex.europa.eu/eli-register/about.html

[13] https://op.europa.eu/en/web/eu-vocabularies/controlled-vocabularies

[14] http://publications.europa.eu/resource/dataset/eurovoc

[15] https://joinup.ec.europa.eu/collection/european-interoperability-reference-architecture-eira/solution/eira/release/v410

[16] https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/CEF+Digital+Home

[17] https://ec.europa.eu/isa2/solutions/e-certis_en

[18] https://joinup.ec.europa.eu/collection/cartography/document/interoperability-quick-assessment-toolkit

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- ISA² Interoperability Test Bed[19] is a platform for self-service conformance testing against semantic and technical specifications.
- Re3gistry[20] is a reusable open-source solution for managing and sharing 'reference codes' through the use of persistent URIs, ensuring concepts are correctly referenced in any domain.
- IMAPS Solution[21] is an online questionnaire, designed as a self-assessment tool to assist public service owners to evaluate interoperability aspects of digital public service.
- VocBench3[22] is a multilingual platform for collaborative thesaurus management by public administrations to support interoperability.

1.4.5 Managerial & Organisational Aspect

Managerial and organisational factors can be differentiated according to different focus points. Organisational factors mainly concern process and structural aspects [179] while managerial factors specifically highlight leadership and managerial support [161]. Still, there are significant overlaps between the areas. Sicilia et al. [123] show that managerial aspects can be seen as a part of the overarching organisational factors. With respect to these overlaps and unclear definitions, this section will include an observation of both organisational and managerial aspects. From the relevant academic literature and European policy reports, a variety of managerial and organisational factors in the design and delivery of IPS co-creation has been identified.

Training to build digital skills and competences

One of the most important factors that is mentioned in the strategic European documents is the necessity to build digital skills and competences, which is a prerequisite for not only developing IPS but also using them and taking part in co-creation processes. The Tallinn declaration demands launching initiatives for the improvement of digital skills [150]. The newer Berlin Declaration has extended the importance of this factor and mentions plans for improving digital literacy, awareness, and skills among citizens, businesses as well as public servants and managers [177].

One framework, in which these digital skills are already becoming formalised on a European level, is the Digital Competence Framework (DigComp). It presents eight proficiency levels for competences in the areas "information and data literacy", "communication and collaboration", "digital content creation", "safety", and "problem solving" [149]. These skills can be applied to all educational levels and provide a basic framework for the future development of digital competences. Technical skills for digitalisation form a basic knowledge for citizens and public servants [161]. While the development of

[19] https://www.itb.ec.europa.eu/itb/

[20] https://joinup.ec.europa.eu/collection/are3na/solution/re3gistry/about

[21] https://joinup.ec.europa.eu/collection/imaps-interoperability-maturity-assessment-public-service/solution/imaps/release/v120

[22] https://ec.europa.eu/isa2/solutions/vocbench3_en

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these skills is especially relevant in economic sectors, an improved digital literacy also furthers the capacity of citizens to use digital public services and to take part in IPS co-creation processes.

Leadership skills

An additional emphasis is given to the development of digital managerial skills that are necessary for co-production. Sicilia et al. [123] mention the responsibility of public managers to create fora for knowledge exchange and the improvement of digital skills. This exchange of knowledge and skills might also include the experience of external partners, which can especially be achieved in co-creation processes. The factor of leadership and leadership skills is also an important aspect that is able to significantly influence digital skills [123], [150].

Data sovereignty and management

Another factor that is mentioned repeatedly, especially by the relevant European documents, is the ability of citizens to manage their personal data. Building on the digital literacy that is mentioned above, the self-reliant use and management of personal data allows for a greater data sovereignty of the European citizens. The Tallinn Declaration already mentions the necessity to make digital data management possible and increase openness and transparency concerning personal data use [150]. The Berlin Declaration highlights these efforts and the control of data and digital identities for citizens (European Commission 2020). Changes and advances in these areas will have a significant impact on the future design of integrated public services.

Individuals and (their) networks

Another factor that extensively builds on digital skills and digital literacy are the physical and mental capabilities of IPS users to take part in co-creation processes. These personal factors might heavily influence the design and development of IPS, as do the participants of the co-creation process. Consequently, the recruitment of the participants is a key element of the co-creation process. Public managers are asked to consider active enrolment of stakeholders and to provide resources that support an active knowledge transfer [123].

Organisational structures

Besides these factors that concern personal aspects in the co-creation process, organisational capacities and managerial tools are key elements of a successful IPS co-creation process. Organisational cultures and capacities might vary a lot and consequently influence the development and success of implementing co-creation processes [180]. In the European Interoperability Framework (EIF) organisational interoperability is one of the layers that form the requirement for co-creation in Europe. Organisational interoperability in that context includes the alignment of goals, processes and knowledge transfer between organisations [28].

To further enhance these capacities and the potential of co-creation, special tools might be used. Managerial tools can be understood as “tools that help professionals (and lay actors) understand their roles in, and the importance of co-production across the public service cycle.” [123, p. 5]. These tools might be able to positively influence the process design, which is an important factor to improve the outcome of co-creation processes [123].

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1.4.6 Legal Aspects

In order to assess the legal challenges that arise in the design, delivery and evaluation of Integrated Public Services, one needs to have an insight in the scope and composition of the applicable legal framework. The legal framework consists of a broad set of rules, regulations and policies, aiming to organize a particular element in the society. Rules, regulations and policies, in general, are not necessarily developed specifically for this particular subject, but may have been created for other purposes in the society and are now applied to the management of integrated public services. This can include legislation that deals with information, data, services or content, such as freedom of information, intellectual property rights or the protection of personal data. It can also involve legislation and policy with an even broader scope, such as tort liability and contract law, which apply to any kind of actor, situation or object falling within the field of application.

The regulatory framework for integrated public services consists of three categories of laws, regulations and policies [181]: i) Regulations and policies for promoting data/services availability and use, ii) Regulations and policies for limiting data/services availability and use and iii) Regulations and policies dealing with the underlying relationships between the stakeholders (e.g. public organizations and businesses for the case of IPS). Additionally, in the frame of IPS the legal landscape related to cross-border public service interactions is also important and discussed in this section.

Regulations and policies for promoting data/services availability and use

This section includes regulations and policies that promote the availability and use of data and integrated public services. Within this first category, four types can be distinguished:

- Particular laws organise the exchange or sharing of data between public authorities for the purpose of policy making or service delivery to the citizens, i.e. for the performance of public services or public tasks. A well-known piece of legislation that facilitates data sharing is the European Union's INSPIRE Directive on establishing an Infrastructure for Spatial Information in the European Community [182].
- There is an extensive body of legislation that provides access to datasets for the citizens, in order to increase transparency, government accountability and public participation. Examples of such legislation include national Freedom of Information Acts; the 1998 Aarhus Convention on access to information, public participation in decision-making and access to justice in environmental matters [183]; and the European Union directive on public access to environmental information [184].
- The economic interests in the availability of datasets are represented by legislation or policies addressing the use or re-use of key datasets for economic purposes, such as the creation of added value information products or services. The most well-known example of this category of rules is the revised 2019 European Union directive on open data and the re-use of public sector information [185]. Another example of this type refers to the G8 Open Data Charter [186].
- Regulations related to the accessing of services. Specifically, the Single Digital Gateway Regulation [187] aims at "offering to citizens and businesses easy access to the information, the procedures, and the assistance and problem-solving services that they need in order to exercise their rights in the internal market" and also "facilitate the interactions between citizens and businesses, on the one hand, and competent authorities, on the other hand, by providing access to online solutions,

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facilitating the day-to-day activities of citizens and businesses and minimizing the obstacles encountered in the internal market".

Regulations and policies for limiting data/services availability and use

This section includes laws, regulations and policies that have or effect of restricting the availability of key datasets. These protect legitimate interests and place controls or limits so that key data may not always be freely available for any use. At least four types of interests can be considered:

- The availability of key datasets may sometimes infringe on the privacy of the individual, as these datasets may allow others (e.g. government, law enforcement, commercial companies) to obtain information on his/her behaviour or his/her relationship to a particular place or area. Legislation on the protection of privacy includes the European Convention protecting Human Rights and Fundamental Freedoms [188], the 1995 European Union directive on the processing of personal data [189] and the well-known 2016 General Data Protection Regulation (GDPR) of the European Union [190]. According to GDPR the "protection of natural persons in relation to the processing of personal data is a fundamental right" where personal data is "any information relating to an identified or identifiable natural person ('data subject')" while the processing "means any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction".
- A second interest that may lead to a limited availability of key datasets is that of national security. The security of a State or nation may be put at risk by any publication on the location of e.g. critical infrastructure. An example of a policy restricting the availability of geospatial datasets for (national) security reasons is the limited availability of imagery for the critical areas. In addition, legislation related to cybersecurity [191] help to secure or protect nations and also individuals from harm or intrusion over the internet.
- Liability provisions may result in dataset providers placing strict controls on what happens with their data. Particular key datasets may have been created for a certain purpose, and their use for other objectives may lead to errors or accidents and subsequent damage to persons or goods [192]. The provider of key datasets may be held liable for the damage [193], [194], or may have to fulfil certain conditions when making his/her data available. Applicable legislation includes national rules on tort and contract liability.
- The fourth type of regulations that restrict the availability of key dataset is the legislation on the protection of intellectual property rights (IPR) - Rights to protect "creations of the mind" against unwanted imitation. These IPR-regulations include patents, copyrights, industrial design rights, trademarks, plant variety rights, trade dress, geographical indications, and/or trade secrets. The objective of IPR is to stimulate innovation and creativity by rewarding authors for their work with an exclusive right to decide on its publication or further use. Provisions protecting IPR can for instance be found in the 1996 European Union directive on the legal protection of databases [195], and numerous national IPR legislations dealing with copyrights, patents and trademarks.

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Regulations and policies dealing with the underlying relationships between the stakeholders

This section discusses laws, regulations and policies that are part of the legal framework for datasets deals with the underlying relationships between the stakeholders. Three main types of relationships can be considered here. Firstly, the conflicting relationship between private competitors or between the public and the private sector on the market which is dealt with by competition law, by antitrust and by rules on the maintenance of a level playing field. Secondly, the more cooperative relationship between the stakeholders is dealt with by rules on coordinating bodies, public-private partnerships, citizen representation, procedures for cooperation agreements, etc. Thirdly, ethics dealing with the relationship between the creation, organization, dissemination, and use of data and services, and the ethical standards and moral codes governing human conduct in society.

Regulations and policies dealing with the cross-border public service interactions

Public administrations contributing to the provision of European public services work within their own national legal framework. The European Interoperability Framework – EIF [28] defines legal interoperability to ensure that organisations operating under different legal frameworks, policies and strategies are able to work together in a cross-border setting. This might require that legislation does not block the establishment of European public services within and between MS.
Existing EU regulation deal with cross-border public service interactions including: i) the Single Digital Gateway Regulation (SDGR) which aims to create a legal basis for the electronic exchange of evidences between competent authorities in different Member States and the Cross-border access to online procedures (Article 13) and ii) the Regulation on electronic identification and trust services (eIDAS) [196] which provides a homogeneous legal framework for electronic identification and certain trust services (including electronic signatures) across the EU.
However in a cross border setting a set of challenges still need to be addressed [197] including: i) translation of data/evidences, ii) trusting data exchanged between member states and iii) management of user consent transitivity across borders between authorities.

1.4.7 Conclusion and Summary

This chapter offers a detailed view of different aspects and their relationship with the design and co-delivery of integrated public services co-creation efforts. Several key areas were analyzed, and discussion about each was encouraged. To prepare content for this section, relevant EU documents related to eGovernment initiatives were recognized and then carefully examined.

The entire spectrum of different aspects was analyzed.

Starting with the political aspects, the authors investigated challenges related to the political will for IPS provision efforts. But, having a will is not sufficient – a necessary political capacity is also required, which has been covered in this section. Closely related to the dimensions mentioned above, authors deep dive into the organizational theory and dissect the public actor's commitment to public values, followed by an overview of the structure and governance dynamics within the political environment. Finally, to address the idea of the involvement of the general public, the authors investigate the nature and degree of community participation within the public service provision context.

The cultural aspect is another dimension that was analyzed. A special emphasis has been put on the European context. Being a supranational organization with 27 member states, each with diverse

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cultural contexts, the cultural aspect is a crucial element of the IPS provision and co-delivery within the EU context.

Discussion about technical aspects follows a simple yet effective structure. First, the authors recognize and identify key barriers related to technical context. After that, enablers are introduced, and the role of technology, in general, is emphasized. Finally, blockchain, deep (machine) learning, knowledge graphs, and artificial intelligence are specifically outlined with their enabling role.

Semantic aspects were the following section. Similar to the technology section, semantic aspects are analyzed through issues and barriers on the one side and enablers on the other. In addition, this section makes meaningful connections with EIF and EIRA and their enabling role within the IPS co-creation and provisioning activities, especially concerning the pan-European scope of interoperability and discoverability.

Managerial and organizational aspects are the next context authors analyzed. The necessity and role of training to build digital skills and competencies have been described in detail. Although from a somewhat different perspective, they are closely related to leadership skills and abilities and their recognition as a significant factor related to digital skills and their uptake. This section also addresses one of the key challenges European citizens face – their ability to manage their personal data – data sovereignty and management are described within the relevant context and references both the Berlin and Tallinn declarations. Building on top of those discussions, organizational structures and individuals and their networks are described.

Lastly, legal aspects are addressed by analyzing regulations and policies promoting data and services' availability and use. In contrast – the authors also analyzed situations where regulations and policies can limit data and services' usage and availability – thus providing a complete perspective. Elaborating legal aspects further, relationships between stakeholders and regulations and policies affecting those are investigated. Finally, this section, once again, addresses the overarching topic of this entire chapter – the pan-European context and discusses regulations and policies related to cross-border public service interactions.

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1.5 IPS roadmap

1.5.1 State of art and limitations of existent roadmaps (UoM)

This section includes an overview of roadmaps as identified with focus on the public sector, and how they are used for public service design. The main goal of this section is to introduce the main elements that are to be included during the design and development of an agile roadmap for IPS in the context of the inGOV project.

Roadmap definition

Literature on roadmaps definition states that a roadmap is a well-defined plan that aims to support organizations and business in their future objectives. Roadmaps are stated to be a way for organizations looking forward towards a set of goals that will provide competitive advantage to their domain and contribute in a positive way to economic or societal growth [198]. The support roadmaps provide in this direction is threefold:

- Planning specific tasks and organizing the work to be done over time.
- Aligning on a way forward in order to reach a common understanding on what are the outcomes that will and can be delivered during the timeframe and resources available.
- Regulating the desired outputs in retrospect of the domain's needs and expected contributions.

Thus, roadmaps are important and usually involve a small group of people in the higher levels of the involved organizations, e.g., decision makers in the service or product design and development process, as they consult the roadmaps to decide on market placement, resources allocation and potential competition/challenges.

Visual roadmaps and their descriptive elements are considered to be extremely helpful, as they are easy to view and understand [199]–[201]. The "map" part of the roadmap entity revolves around the different ways a roadmap can help stimulate innovation, build knowledge, encourage communication between stakeholders based on what they are seeing.

Developing a roadmap

One-page views of visual representation of the most important information and strategic activities can successfully provide the bigger and same picture that every involved stakeholder can clearly see and understand. This page can also encourage focus on only the key points and put boundaries into the work that needs to be done in a specific timeframe.

The design and development of a roadmap requires the definition of the structural blocks that will bring forth the final common vision of the work to be done [202]. Each block must contain information architecture, with the main concepts to be considered and a layout that corresponds to the workflow of each process item. These blocks regard any data that is relevant to the theme, any software requirements and UI components for technical roadmaps.

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The dimension of time (timeline) should be explicitly stated within a roadmap. It is the element that makes such a visual mechanism dynamic [203]. The three main questions that should be answered in respect to time in the framework, as also depicted in Figure 5 are:

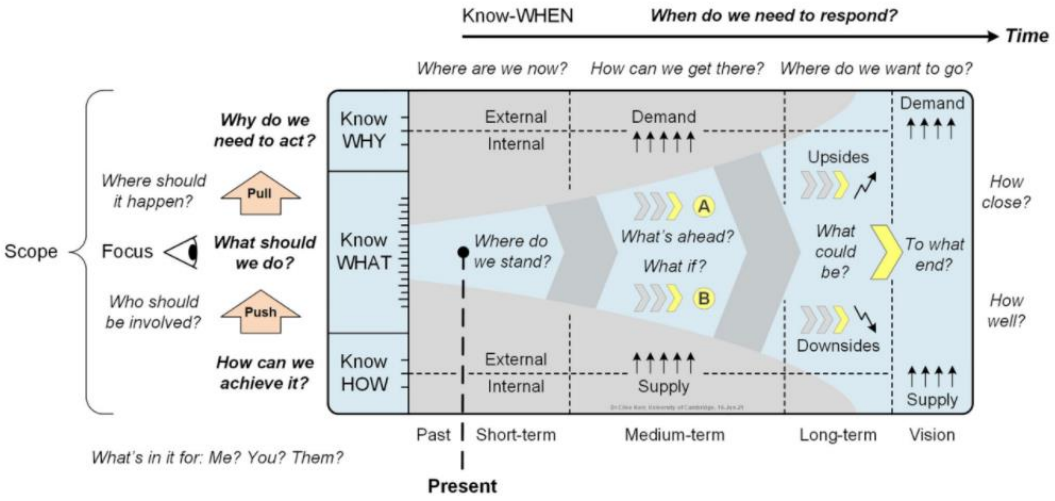
- Where do we want to go? → Final vision
- Where are we now? → Diagnosis of current situation
- How can we get there? → Planning

The "Where do we want to go?" question corresponds to the final vision that should lead all the work to be done. This question aims to also provide answers regarding a) time restrictions, b) domain orientation, c) resources availability and d) long-term benefits and drawbacks.

The "How can we get there?" question corresponds to the organization of the work-plan, the delimitation of tasks and the identification of the order in which activities should take place.

The "Where are we now?" question corresponds to the diagnosis of the current situation. A state of play of the domain, stakeholders and existing cfontext are essential in order to identify gaps and potential opportunities. This diagnosis will also feed as input the planning stage and provide insights as to the next steps, who will undertake them, when and how.

Figure 5: Governing framework of a roadmap [198]



A roadmap (see Figure 5), aims to engage all involved stakeholders in iterative versions of design and development, capitulating on ICT inclusion to improve public service delivery and provide multiple back-end and front-end alternatives for citizen-government communication. This is very close to the process of creating designs for services that aim to improve customers' and citizens' needs, where customers are involved and engaged in all steps towards creating high quality services (see Figure 5).

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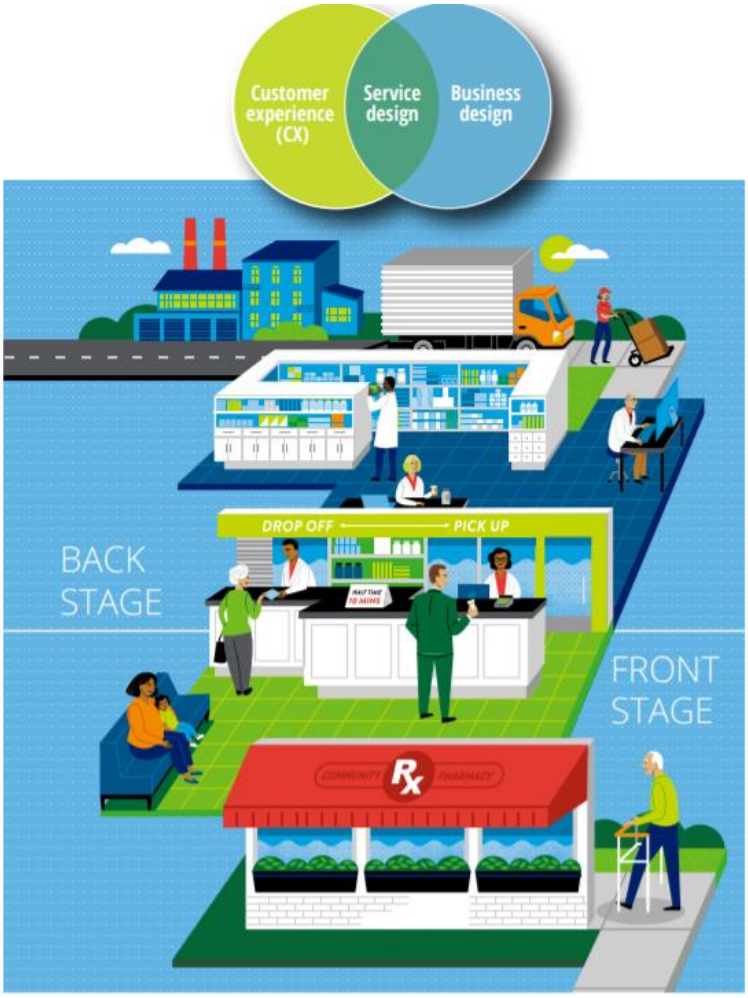
Figure 6: Service design in government (Deloitte Insights, 2019[23]



The design and delivery of a roadmap should follow a set of principles that will allow the production of the end objectives.

As proposed by the UK Government[24] and OECD[25], such principles can include:

- **Work towards a long-term vision.** The end goal of the roadmap should be supported by all the tasks that precede it. The vision should be clear, possible to achieve at a given timeline and with given resources and show the user needs it aims to fulfil.

[23] https://www2.deloitte.com/us/en/insights/industry/public-sector/implementing-service-design-in-government.html

[24] https://www.gov.uk/service-manual/agile-delivery/developing-a-roadmap

[25] https://oecd-opsi.org/guide/service-design/

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- **Show the value of the outcomes.** The roadmap should demonstrate the type of value users will receive from each service or product to be delivered. Such values may be a) making users' process delivery faster, b) provide simpler interfaces for accessing information or a service, c) reduce steps of a service that cause additional effort and time to users etc.
- **If necessary, design individual roadmaps per service.** If the long-term vision is complex and comprises of multiple different outcomes, it is wise to design roadmaps for each of these outcomes, in order to clarify each path and the steps that need to be taken to achieve the wider end-goal.
- **Open up the roadmap to the public.** The involvement of outside individuals that will perform as end-users will help form the roadmap in a way that will meet their needs more efficiently.
- **Make the roadmap simple and comprehensive.** Simple visuals, simple language and clear blocks can allow anyone to understand the roadmap and perform the set tasks without misconceptions that may lead to delays and drawbacks.
- **Map tasks with time constrains and milestones.** The clear definition of milestones can help monitor and delimitate the work done more consistently. This way, different phases of the work are flagged with time limits, so that all parties are aware of the deadlines approaching, any delays or needs for time extensions required. Make sure to expect time changes if the roadmap follows an agile approach, to allow flexibility.
- **Show and plan the work division based on priorities.** Not all tasks depicted in the roadmap require the same workload, or have the same importance for reaching the end-goal. The visual representation of the tasks that should be prioritized over others will help guide stakeholders on what needs to be done first and which tasks can be delayed with less impact to the end-goal.
- **Capture future intent and allow for change based on lessons learnt.** Roadmaps usually aim to deliver the intended outcomes and objectives, and not present finalized products. This allows for all elements within the roadmap to change and adapt base on the work done in the different phases of the process development.
- **Show the involved stakeholders and the order of processes.** The roadmap should clearly state the different stakeholders that will be a part of the work to be carried out. Clear knowledge and work effort allocation as well as categorization of the work order can support efficient progress and minimum overlapping.
- **Make the roadmap reusable.** Reuse encourages the effort required to design a well-defined roadmap. When a roadmap is not too specific and can be reused with minimum adaptations it can benefit multiple domains, organizations and stakeholders. This is also the case for roadmaps designed by private organizations and can be used in the context of public service delivery for the public sector.
- **Create agile roadmaps, collaborate and iterate the roadmap regularly.** The design of a roadmap should follow the agile methodology and include the participation of all interested stakeholders. The bigger picture can be better presented and visualized when multiple and multidisciplinary involved parties contribute to shaping it. Additionally, the first version of a roadmap does not necessarily mean it is the final one. Adaptations and changes can and should be made across all phases of the public service design and delivery.

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All above principles provide useful guidelines when, e.g., governments aim to proceed with designing services that will improve citizens' lives and meet existing needs. This process that can and should be demonstrated in a visualization format such as a roadmap can help governments and public bodies tackle innovation and fundamentally transform the workflow of public services as well as the relationships between citizens and the public sector in general.

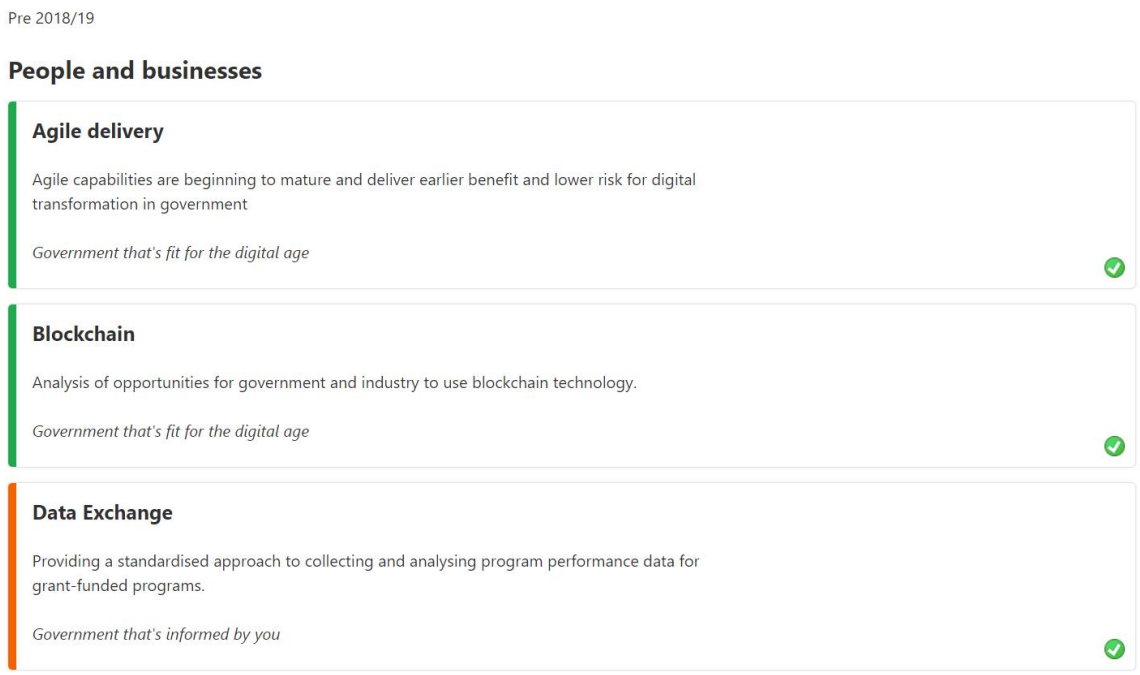
Existing public service design roadmaps

A series of roadmaps that have been suggested by national public and private organizations are presented in this section. Each proposal depicts the significance roadmap hold to modelling the process towards the development of a multifunctional, complex, and multidimensional public service.

Australian Digital Transformation Strategy

The Australian Government has launched the Digital Transformation Strategy roadmap, which consists of a diverse set of steps towards the digitalization of public services until 2025[26]. A small part of the roadmap is shown in *Figure 7*, as it comprises of many steps that lead to 2025's final goals.

Figure 7: Roadmap for Australian Digital Transformation Strategy[27]



[26] https://www.dta.gov.au/digital-transformation-strategy/digital-transformation-strategy-2018-2025

[27] https://www.dta.gov.au/dts-roadmap

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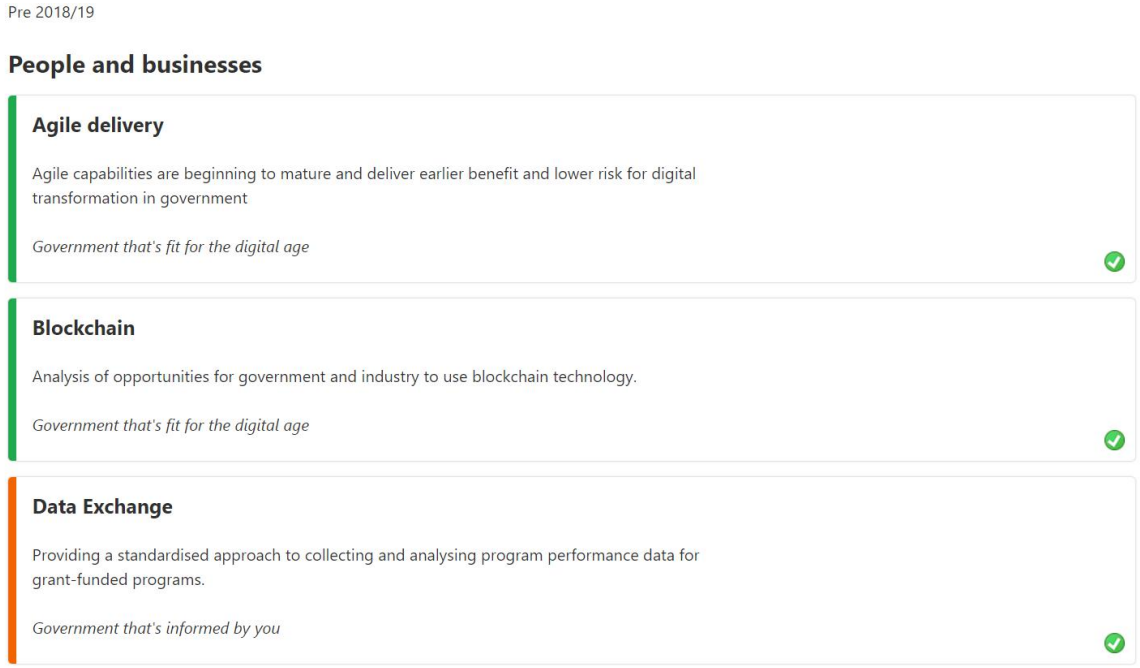

According to the Digital Transformation Strategy and roadmap, public service design should follow the following rules[28]:

1. **Use intuitive tools that help the disadvantaged citizens.** Virtual assistants and voice recognition are important features that bring disabled and physically remote citizens closer to the public sector.
2. **Create integrated services that support existing needs and life events.** The documentation of different services that are inter-connected will allow governments to make all individual services available to you as one seamless and holistic experience.
3. **Allow digital identity.** The constant effort of proving one's identity in almost every step of the public service is time consuming, stressful, and un-motivating for citizens. One digital identity will prevent having to own multiple accounts in different digital public portals, or having to bring identification papers to different employees of the public service.
4. **Create smart data-based services.** Digital services should adapt to the needs of the specific citizen that is performing them.

EIF Roadmap for IPS

The EIF Roadmap developed in the context of the ISA2 EU programme, provides a set of steps that should be followed when designing a new integrated public service, as shown in Figure 8: EIF Roadmap for IPS design. The roadmap is in line with the European Interoperability Framework (EIF) and consists of 4 main points, as follows:

[28] https://www.dta.gov.au/sites/default/files/files/digital-transformation-strategy/digital-transformation-strategy.pdf

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1. **Detect the need for change.** This step includes the identification of needs and requirements that could lead to the design of a new integrated public service. These needs should be recorded and translated into specific requirements for a public service. The identification of stakeholders is also required, for the determination of who the key players that will be involved in the new public service are. It is also important that the need for this change gains enough momentum that it initiates actual change.
2. **Plan and select.** This step includes all the planning and decisions that need to be made towards the design of the new public service. This includes the setting up of the relevant government bodies, the preparation for the integrated public service and the legitimization by law as well as the definition of an organizational model.
3. **Provide framework and set standards.** All interoperability layers should include a set of standards (e.g. business process, semantic, technical) for their seamless operation and integration. Additionally, this step will provide the legal and organizational framework for the service.
4. **Monitor and maintain.** Once the IPS starts operating, it is important that we monitor all stages, record any issues and maintain as well as update its standards when required.

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Figure 8: EIF Roadmap for IPS design[29]

Findings and shortcomings

The above sections provide a representative overview of what is a roadmap in the context of public services and describes existing guidelines that have proposed a set of steps and principles for successfully designing public services.

The examples of roadmaps provided emphasize the need for active engagement of citizens in all steps of the public service design in order to target their needs more successfully. The Australian Digital Transformation Strategy highlights the need for integrating digital elements, such as the utilization of intuitive tools that will help disadvantaged citizens and facilitate the public service execution (e.g. virtual assistants, voice recognitions etc.), while the EIF roadmap focuses on the need for proper

[29] https://ec.europa.eu/isa2/publications/roadmap-developing-new-integrated-public-service_en

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planning and monitoring of the public service design as well as the inclusion of standards that will guide successful integrated public service delivery.

However, the concepts of interoperability and agility are lacking, as the majority of solutions and suggestions focus on single public service design and delivery, and a sequential model that allows little to no flexibility or adaptability to user feedbacks.

1.5.2 The concept and principles of agility in IPS roadmapping

The "agile" concept is related to iterative, flexible and adaptive approaches that help teams deliver outcomes in small but usable increments. The "agile" concept became known from the a set of methods in the area of software development, such as Scrum [204], Adaptive Software Development [205] and Extreme Programming [206]. The creators of these methods prepared the "Manifesto for Agile Software Development"[30] that introduced 12 principles that are essential in a process to be considered as agile. According to Sidky et al. [207] these 12 principles can be captured and summarized to the following: i) Embrace change to deliver customer value, ii) Plan and deliver software frequently enabling end-users to review and provide feedback (feedback is essential for the process of planning for upcoming iterations), iii) Human centric: the reliance on people and the interactions among them is a cornerstone in the definition of an agile processes, iv) Technical excellence is essential in highspeed, agile development environments and v) All stakeholders collaboration ensures that the product being developed satisfies the business needs of the stakeholders. Based on the above, five levels of agility have been defined [207]:

- Level 1: Collaborative. This level denotes the fostering of communication and collaboration between all stakeholders.
- Level 2: Evolutionary. Evolutionary development is the early and continuous delivery of software.
- Level 3: Effective. This level concentrates on increasing the efficiency of the development process by adopting practices that will lead to the development of high quality products.
- Level 4: Adaptive. This level constitutes establishing the agile quality of responding to change and to multiple levels of feedback in the process.
- Level 5: Encompassing. This level concentrates on establishing an all-encompassing environment to sustain and foster agility throughout an organization.

Although the agile principles were initially introduced for the software development, they can also be applied to other domains [208]. Under this perspective "agility" can be perceived as the "ability to change" quickly and continuously in response to emerging needs, trends or opportunities.

From a roadmapping point of view, agility is related to a continuous and living process for creating/updating a roadmap based on the evolving needs of organizations as well as on the

[30] https://agilemanifesto.org/

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continuously changed organizational environment. Towards this direction [209] propose three stages for the agile roadmap management:

- Stage 1: Planning the continuous roadmap updating: this step includes activities about the deployment of the roadmap, the definition of the update processes that will applied at stage 2 and the definition of KPIs to make the roadmap measurable.
- Stage 2: Manage the updating cycle: this step includes monitoring activities of the roadmap implementation, control and feedback activities (i.e. receive feedback from stakeholder and measure the defined KPIs).
- Stage 3: Analyze the strategy: having performed the updating cycle for implemented roadmaps, enough information has been collected to update/tailor the roadmap and analyze it from the perspective of the organization's strategy.

Agility in roadmap management is a very important aspect, since it allows roadmaps to evolve based on feedback received**Error! Reference source not found.** shows a comparison between the more traditional waterfall development methodology and the incorporation of agility in roadmap management.

Figure 9: Waterfall versus Agile roadmap[31]

	Waterfall roadmap	*Agile roadmap*
Goals	Business-centric (e.g., financial KPIs)	Customer-centric (e.g., user growth or customer satisfaction)
Planning horizon	Years	Months or quarters
Planning cadence	Annually	Quarterly
Resource / capacity planning	Dedicated upfront by major project	Allocated by sprint velocity or team size
Investment	Committed annually	Incremental based on feedback and data
Collaboration	Sequential and segmented by department	Concurrent and cross-functional
Flexibility	Limited	Limitless

In the frame of the IPS Holistic Framework, inGov will provide an IPS agile roadmap. In this case, the roadmap "ability to change" is related e.g. to changes in the organizational structure between the different phases of an IPS project (e.g. design, delivery and evaluation). In order to achieve agility, agile management will be applied at two phases:

[31] https://www.aha.io/roadmapping/guide/product-roadmap/how-do-product-managers-build-an-agile-roadmap

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- Agile roadmap development (during the inGov project): adopt agile methods for the development and updating of the roadmap. Towards this direction, a collaborative, evolutionary, effective, adaptive and encompassing process should be followed for the roadmap development. The process will include processes related to the planning and management of an update cycle as well as the analysis of the organizations' strategy.
- Agile roadmap per se (during and after the inGov project): the final roadmap will provide processes and guidelines capable of updating or tailoring the roadmap to specific PA needs and requirements. This phase will also include processes related to the planning and management of an update cycle as well as the analysis of the organizations' strategy.

This approach will enable the development of an IPS agile roadmap capable of adapting to the specific needs of inGov pilot as well as to other public administrations that are willing to adopt the IPS-co paradigm.

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Analysis of Integrated Public Service practices

Introduction

The first section of this study has illustrated how burgeoning is the field of research and work around IPS and the concept of co-creation. Likewise, in the recent years, the interest of governments on these topics has intensified in the attempt to tackle complex issues of public interest with the support of ICT. As much as there is a growing consensus among researchers and practitioners that the path towards providing better digital services lies in the adoption of interoperability and the involvement of service users, the public administration still struggles in re-organising governmental functions and re-conceptualising services from a user centred perspective. In this context, analysing how existent practices organise and provide IPS through co-creation approaches, provides a better understanding of their advantages and challenges, as well as the means to overcome such challenges.

This second section provides empirical evidence from the analysis of five practical cases of IPS which adopted co-creation approaches. To provide a fine-grained analysis, the investigation is set up to reflect the theoretical elements discussed in the earlier chapters. Additionally, as the inGOV project adopts a co-creation approach to IPS, the cases are examined throughout their entire service lifecycle (design, delivery, and evaluation) with a special focus of public service users' involvement.

On this backdrop, in the following pages we propose to analyse the governance of IPS in the selected cases by bringing to light the modes of governance adopted and how the different modes consider the involvement of service users. As IPS favours the involvement of a wider array of stakeholders in the decision-making process and implementation of IPS, here we analyse what role and responsibilities the various stakeholders take, in particular the service users, in the creation and delivery of IPS; and what means are employed to collect and take advantage of the variety of experience and knowledge the stakeholder might bring at any stage of IPS cycle. Finally, by their nature, IPS confront not only with the challenge of bringing together multiple actors but also of integrating both vertical and horizontal structures which challenge the political, legal, operational and technical domains.

Summarising, this section aims at answering the following questions:

- *Which governance model prevail in the creation and delivery of IPS and to what extent each of them favour co-creation of IPS?*
- *What normative and regulative architecture is needed for IPS-Co?*
- *How are different stakeholders engaged throughout the IPS cycle?*
- *What are the challenges (or enablers) in designing and implementing IPS?*

To provide evidence to the above questions the domains of governance, stakeholder engagement and challenges to creation and delivery of IPS are broken down into dimensions of analysis to facilitate the comprehension of each case. Table 1 and Table 2 in the first theoretical chapter serve as the basis of analysis for IPS governance, as well as the aspects to include in analysis of practical cases. The other elements rely on the analysis provided in dedicated theoretical chapters. Following is a thorough description of which variables were considered for each dimension.

More specifically, as far as the **governance and stakeholders** of IPS are concerned they stretch across all phases of IPS design, delivery and evaluation phases. Thus, the design phase during which activities

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for needs identification (planning) and design of solutions take place, corresponds to the policy framing and knowledge generation sub-function of governance. Similarly, at the design stage but not limited to it, are defined (2) the stakeholders, their roles and contribution to the IPS; (3) the methods and channels of their engagement; and (4) the decision-making process. As far as the delivery phase is concerned, (5) the resources (in terms of financing and human talent); (6) the organisational model were analysed. Finally, in the last phase of evaluation, monitoring and accountability is part as well of governance sub-functions.

The framework of agreements is often linked to charters, collaborative arrangements and contracts as participatory instruments. In this context we looked of the relevant agreements and regulative adaption that were required to develop IPS.

Finally, the **design and implementation** of any ICT project, even more so of IPS, can be positively or negatively influenced by multiple factors. Enablers and barriers can be found both on government-organisational and individual-citizen level. In this work we take the organisational perspective to understand the challenges an IPS creation and delivery can encounter. Specifically these refer to: (1) *political factors* (especially political will to support online and even integrated services, with actors sharing data, can be considered an enabler); (2) *technical/semantic factors* (broadly speaking they aspects refer to the type, quality and systems used to store and exchange data); (3) *organisational/managerial factors* (the type of changes inside the organisation required to smoothly adopt new or redesigned services) and (4) *legal*.

The remainder of this section is structured as follow. First, a detailed analysis of cases is presented, which covers the main dimensions explained above. Chapter 7 presents the cross-case results and the main themes emerged during the analysis. The section closes with a discussion about the implications of results for the next section in formulating recommendations.

1.6 Detailed case analysis

The analysis of the cases is carried out following a similar structure. First, a general description of the aims of the project is provided. It is a concise presentation given that a more thorough background description of each project was detailed in Deliverable 1.1. Likewise, the aim here was to focus on examining each dimension and relevant variables rather that describing the genesis or timeline of the project. Therefore, for each phase of design, delivery and evaluation corresponds an examination of our variables of interest as discussed previously.

1.6.1 X-Road Business Register (Estonia/Finland)

The X-Road Business Register project is a cross-border attempt of dematerialising the activity of the Estonian and Finnish business registers, and making them available to both countries' authorities thanks to the X-Road data exchange layer (see below). This project aims at facilitating business activity and reduce administrative burden of service users across borders.

Design

The origin of the need to establish the X-Road Business Register (BR) predates the formalization of the project that came later through high-level political commitment and formal decisions. The motivation

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for digitalising the business register activity in Finland was based "on the findings of a research and the presentation of a business case." (EF04). Collecting real business needs represented the background on which the proposal to politicians was later made. Likewise, in the Estonian context there was a strong interest in digitalising this area of activity (EF05). It appeared highly consistent that "the cross-border activity of the two business registers also required electronic communication" (EF02), as to even out with the advanced levels of digitalisation of other public services. The later "political decision was just cementing, that sort of understanding and background" (EF05).

On this backdrop, informal contacts (meetings, emails) were first established between political decision-makers of both Finland and Estonia (responsible Ministers) to lay the grounds for future joint projects. In 2013, the collaboration was formalised with a Memorandum of Understanding (MoU) signed at the top political level between the two governments [210]. The document, as a cooperation arrangement, sought to identify areas for cross-border cooperation by exchanging data between the Finnish and Estonian authorities. This was followed by a roadmap stipulated in the Joint Declaration. Hence, following these general provisions, the two responsible business register parties had to find a practical solution considering national data protection regulation and the costs of data sharing contingencies in both countries (EF01).

The initial stage of the project consisted of informal talks and meetings upwards with members of ministries in charge of the future project in each separate country. At that stage, no direct contacts or communication was established across the borders between the two registrars, which could have been effective to avoid misunderstandings in the long run (EF01). After informal talks, the two responsible entities signed the data exchange agreement to simplify and make mutually available the data of the business registers. The project has entailed a piloting stage, which allowed the two country authorities to understand "what does it take and how much effort does it take to actually get it going with not only inside one country, but between the two countries and on the way of course there were some technical challenges" (EF02).

Stakeholders: roles and responsibilities

- Politicians: Prime Ministers of both countries. They have been involved at the initial stage (given the high-level political nature of the initiative). The two heads of government provided the political support that led to the federation of the Estonian and Finnish data exchange layers under the X-Road infrastructure. The political commitment contributed to laying down the regulative foundation of the project.
- Public administrators: Ministry of Justice in Estonia, Ministry of Finance in Finland. Senior managers and the employees of these ministries were involved in translating political will from politicians into actionable objectives for e-Government public managers but also for their role of data holders. They have been tasked with overseeing the project.
- E-government public managers: Centre of Registers and Information Systems (Estonia), Finnish Patent and Registration Office. The two organisations are the service owners and hold the domain knowledge. They have been involved in all the stages of the development of the service (design, delivery, evaluation). In the initial stage, they took the information from the business registries and wrote down technical specifications for the development team.
- IT developers and in-house IT firm: X-Road operators (Information System Authority - RIA, Estonia; Population Register Centre, Finland). RIA is the host of the digital platform. Whenever

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changes are needed, even opening the doors to external systems (in the case of BR to Finland), RIA is managing it, keeping it secure and developing it. They had to implement the technical specifications laid out by the public managers. Moreover, the Nordic Institute for Interoperability Studies (NIIS), since 2018 when it took over the development and management of X-Road technology, favours a co-creation approach in the deployment of X-Road [211]. Namely, it facilitates the participation of developers and small organisations in developing extensions and integrating information systems to implement the platform, and supports a global community of developers, service-users, service providers who help test and improve the code.

- The business community (large and small-medium companies) in both countries as beneficiaries yet not directly involved in the design of the initiative or pilot implementation.

Stakeholders: relationship and engagement

Government officials provided the momentum, political guidance and regulatory support needed for the project to start, operate and to be successfully implemented. Informal discussions and agreements acted as groundwork for full-fledged official accords and guidelines. First, Heads of Government officialised their will to cooperate for mutual benefit in the development of digital society, economy and government, signing the Memorandum of Understanding (MoU) and then the Joint Declaration. However, the government-level agreement cemented the path determined by the 'champions' within the two governments who started by evangelizing for the project and who provided support all along the way through standstill moments in the implementation. Second, both Governments signed technical agreements allowing for the operation of X-Road. Among those, a particularly important agreement concerned the free exchange of data between the two countries, which could only be permitted by regulatory changes. Furthermore, the two X-Road operators have been represented in the decision-making structures of the Nordic Institute for Interoperability Studies (NIIS), being responsible for the development and strategic management of X-Road, and for ulterior system updates, which adds to their formal relationship.

Between the teams of the two PAs responsible for the implementation of the project (Centre of Registers and Information Systems of Estonia and Patent and Registration office of Finland – henceforth the business registrars [212], both formal and informal relationships have existed. Besides the data exchange agreements, formal relationships between the business registrars and X-Road operators materialized in a number of binding agreements established between them ("Framework of Agreements" below).

In parallel, within the business registrar of both countries a team composed of a Project Manager, lawyers and technical experts operates. Both teams have been in close, informal contact to design and implement the project. Designing activities happened only with back-end service users which in this case correspond also to the e-gov managers responsible for the implementation of the project. This largely informal structure provided a way to circumvent lengthy approval processes, which was particularly useful to kick-start the project at its onset.

Communications among the project teams and decision-making stakeholders occurs either through e-mail exchanges or physical meetings. Finally, the X-Road BR project did not foresee the involvement of businesses as end-users at this piloting stage. Within the project, business registrars are responsible for determining the modality of access to this X-Road business register in their respective countries.

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Decision-making process and organisational structure

High-level, **strategic decisions**, among which the very decision to launch works enabling the project were made jointly by the Estonian and Finnish governments. After the formalisation of the cooperation, informal talks between the two countries followed, which later materialized in written agreements and regulations. The involvement of ministries was crucial at that stage as the holder of authority to bind necessary agreements, especially in cross-border projects.

Tactical and **operational decision-making processes**, as the above-mentioned suggests, largely consisted in informal arrangements between the project teams within each business registrar.

The two agencies have been responsible for implementing the projects on their own. As a consequence, this can be qualified as a multi-agency programme. Across its delivery, the project has been co-funded by both partaking countries. No financial challenges were emphasised for this project. This was confirmed by both sides, also due to the small proportions of the project and the possibility of financing the activity by the two registrars unaided.

Challenges and enablers

- Political enablers. At the outset, the project, due to the series of bi-lateral agreements, was widely supported by political representative of the moment. High-level commitment reinforced the support already coming from inside 'champions' who evangelized for the project throughout. It is worth noting that advocacy or 'guardianship' coming from top or middle-level public managers (can be CIO or ministerial), is especially relevant in 'dire' times when for instance the political will of governmental actors can weaken due to electoral shifts. Particularly in cross-border projects, political alignment of priorities is a precondition to overcome any legal or technology challenge.
- Technical/Semantic enablers. The pre-existence of an ecosystem solution for data exchange, in this case the X-Road infrastructure in both countries[32], has reduced some potential challenges during the design phase, related to semantics and ontology, as it covers aspects related to standards and communication. X-Road uses common APIs and has adopted open standards for data exchange [211], which follow European standards.

Legal arrangements and inter-organisational agreements

There were some legal challenges regarding the free-of-charge exchange of data across borders. Originally, Estonian law provided it should be free of charge among Estonian public administrations only. Legal changes were required as to cover the Finnish counterparts as well. The solution was the adoption of the data exchange agreement mentioned previously, though it defines the terms regarding the queries made only between the two business registrars. In addition, the respondents on both sides mentioned that the aspect of fees is gradually disappearing (EF02, EF01). More generally, on one side this is related to the overall concept of the Digital Single Market supporting the use of open data from and across the government agencies. On the other side, the spread of Application Programming Interfaces (API) will make in the future company data accessible to private interlocutors without intermediaries. Equally important, all the processes must comply with GDPR and privacy

[32] *X-Road®* is the data exchange layer software used in Estonia, whereas *Suomi.fi Data Exchange Layer* is the X-Road enviornment in Finland brought into use in November 2015 [232]

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regulations. In that sense the law departments on both sides had to establish the terms and conditions of data use (EF02). On the Finnish side, signing agreements between parties holding and using information is a way to tackle challenges coming from data protection regulation. Such agreements would be required in the perspective of opening the access to business registries data for all authorities on both sides. To comply with national legislation regarding data protection, Finnish authorities need to agree with parties that possess information to access and use it.

In the context of the project, several agreements were made:

- Between the Finnish and Estonian governments: Besides the previously mentioned MoU and Joint Declaration by both Heads of Government, several political agreements set out the favourable conditions under which the project could start and operate.
- Between the Patent and Registration Office (Finnish business registrar) and the Estonian Ministry of Justice, which has the Centre of Registers and Information Systems (Estonian business registrar) under its jurisdiction: a contract (complemented by a technical annex) was signed, providing the framework defining the perimeter and depth of data exchange between the two organisations. Notably, it regulates the broad technical requirements of the exchange solution, the type of information to be exchanged, the purpose of exchange, the processing security requirements, data exchange free of charge, and the general terms and conditions of the agreement. In essence the contract specifies that only the two registrars can reciprocally access and use the information exchanged for their professional work (EF02).
- Between the Estonian business registrar and X-Tee (X-Road's Estonian data exchange layer operator): a member contract and service level agreement was signed, defining the perimeter and depth of the collaboration between the two organisations.
- Between X-Tee and its Finnish counterpart (Suomi.fi): a trust federation agreement was signed, setting out the responsibilities and liabilities of each party, the perimeter of their collaboration, the technical features, as well as data protection and cybersecurity requirements.
- Between the Finnish business registrar and Suomi.fi: a member contract and service level agreement defining the perimeter and depth of the collaboration between the two organisations.

Delivery

Similar to the design phase, the Finnish and Estonian business registrars, under the same decision-making process and involving the same stakeholders, drove the project delivery. No official body or board was foreseen for the project due to the reduced size of the project as well as the need of flexibility. Once the perimeter of the project was defined through political agreements, the responsibility of carrying out the project is of the two business registrars (as service owners).

Considering the advanced stage of digitalization and integration in the Estonian administration [213], carrying out such project presented no challenge or complexity. In part, this is due to the already existent ecosystem solution for data exchange (X-Road and Suomi.fi infrastructure) in both countries which presented very few limitations in its use and no required legal changes. In Finland, although the project has been running smoothly, information security legislation and policies need to be accounted for whenever a project deals with data exchange. Nevertheless, no changes at the organizational level

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were adopted as the project did not require any redesign of functions or processes at this stage. However, if the scope of the project is going to be extended in the future (opening the access to other authorities on both sides) this might require a new or different role for the business registrars.

Challenges and enablers

- Technical/semantic challenges. even though the existing X-Road infrastructure represented a facilitating factor at the design stage, one of our interviewee noted that "X-Road is a technical solution. On top of that you need semantic interoperability, processes and legal base." (EF04). For this reason, data agreements were necessary. Two organisations are in charge of solving technical issues as they arise: NIIS and RIA. Estonia being much more advanced in eGovernment matters than Finland, most technical/semantic requirements and standards originated from there [213]. In this context, a great challenge was that Finland had to allow Estonian experts to access their systems and databases in test environments in order for Estonian services to conduct experiments leading to an exchange the technical specification and the semantics between the two countries across the project's delivery.

Evaluation

Monitoring and accountability

The business registrars must ensure that relevant data is provided access to, and data transfer systems respond to, high standards of cybersecurity, that formal agreements between the Finnish and Estonian governments are complied with, and that data definitions and semantic interoperability are duly updated and maintained.
Because the registrars in each country are responsible to develop their end of the system, general timelines at the beginning were hard to estimate and establish. However, taken individually each organization uses internal timelines to oversee the development of the project with intermediate releases (EF02). Managing the project by priorities is especially important towards the responsible Ministries. For instance, in the Estonian case, the project team uses tools and systems for management such as Atlassian, JIRA; Confluence, with incorporated dashboards that can be directly checked by responsible line managers in the Ministry. Moreover, the cross-country teams meet periodically to check the status of progress.

1.6.2 Digital social security – Digisos (Norway)

The Digisos project, which was successfully completed in 2019 and became a full-fledged service, consisted in the development of a single digital access point to social welfare services in Norway. The project aimed at facilitating procedures both for caseworkers and applicants/beneficiaries by eliminating paper trails and by providing a unified online interface across the country.

Design

The provision of social services in Norway (including financial assistance, pensions, employment etc.), is a shared responsibility between municipalities and the central government. In the Labour and Welfare Administration (NAV), both municipalities and the state collaborate in offering solutions and

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delivering services across the country. The complexity for users when applying for these services, before Digisos, was related to identifying who is the owner and the right procedures to follow. In addition, the back-end process across municipalities varied greatly and required changes in the software supporting the system.

On this backdrop, the idea of Digisos was to simplify the process of requesting social assistance for the users [214]. "Unlike other NAV services, there were no self-service solutions for social service users at that time." (NO01). In this context, the need to develop a digital extension of the service was validated by an in-depth research (cost-effectiveness) to identify: the volume of requests (an estimate of 140 000 per year), the maturity of target groups (several other services were available online) and the expected gain in efficiency and quality the new service would bring to municipalities after the implementation of the project (NO06). Concurrently, at the early stage, NAV workers gathered insights from beneficiaries to understand their needs (see below). The city of Oslo was the first in 2016 "to start work on the development of a comprehensive digital service for social services." (NO02).

Since its early days, the initiative was conceived as a collaborative endeavour between different actors – at different jurisdiction levels, both public and private. This allowed at the design stage to map what information/data was already available in the system, and take stock of available technical solution. Likewise, at the early stage, legal assessments were important to understand the mechanics of disclosing information to NAV using the common components used by the Association of Local and Regional Authorities (KS, see below).

The project was split into 2 phases. Initially a piloting phase (2017-2018) was foreseen with the participation of five municipalities (Bergen, Baerum, Oslo, Stavanger, Trondheim). At that stage, a guide for social services and the digital application for economic social support was developed, providing an in-depth description on how the municipalities can make use of the solution in a transparent way [215]. In the second phase (2018-2019), a new product for the end-users with a different organizational structure was developed.

Stakeholders: roles and responsibilities

- Public administrators in the central and local governments. The Ministry of Labour and Social Affairs, the Labour and Welfare Administration (NAV) and municipalities played a facilitating and coordinating role, providing financial investment and initial impetus.
- Social players: The Association of Local and Regional authorities (KS). KS is the largest organisation representing the interests of local governments in Norway and it is the provider of technical solutions and eGovernment platforms for municipalities. Although "KS was not involved in any feasible manner at the initial stage, (…) in a later stage, KS had a leading role during the implementation of the project" (NO04), fulfilling two roles. On one side, advocating for and ensuring the interest of all local councils was represented. On the other side, it acted as a service provider (ensuring the financing and delivery of the solution) and technical consultant, as previous solutions for accessing social welfare services online were supplied by KS. KS acts as a data processor on behalf of municipalities in the communication between users, municipalities and NAV.
- E-government project managers. A 22-NAV-worker project team was set up to accomplish the tasks required for the project and manage day-to-day operations and technical requirements. As the project followed a pilot approach, being first rolled out in 5 large cities before being

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generalized, these large cities (and particularly the city of Bergen) played a key role, next to NAV, in managing the project.

- People as service users. In Digisos these are both caseworkers and citizens. Caseworkers were involved in co-designing the back-office infrastructure. In at least one instance, Oslo, to favour a wider dissemination of the application super-users were designated. In each Welfare office, a few caseworkers became super-users, meaning that they received specific training through workshops and were tasked with providing constant feedback to the project team and train their fellow colleagues (NO02). Citizens, who cannot be ruled out as potential service users or beneficiaries, were involved in co-designing the front-end of the applications.
- Suppliers: private IT companies acted both as service providers, for instance maintaining the IT platform used by KS, and technical consultants for the municipalities. Currently, there are three different systems in use developed and maintained by private suppliers.

Stakeholders: relationship and engagement

Various stakeholders were engaged during the design and execution period of the project, as well as in co-designing and co-evaluating activities. Citizens as beneficiaries of the service were involved in co-designing the front-end of the applications. This was done through interviews and beta testing (NO05, NO02). First, interviews were conducted with service users (both citizens and case workers) to understand and define their needs, which were assessed by the project team. The project team conducted interviews by directly visiting NAV local branches on the field, and randomly selecting citizens waiting in line, "until a "satisfying" [sic] representation of the population was sampled" (NO05). Second, sketches and mock-ups (beta versions) were designed and presented to end-users who were asked to test and provide feedback [216] (NO05). Data gathered during the sessions was integrated with observations on user behaviour while using the mock-ups which fed into the layout of the prototype version of the application. "There was a lot of focus on the application itself, because that's what the users see, right? So, a good application form is vital for the solution to be successful. And I believe that the focus on the user and the application form is actually one of the key factors for its success." (NO01).
Case workers, besides being engaged in the definition of needs and requirements, were involved in co-designing and co-assessment of the back-end process and interface of the application. Workshops for co-designing activity with case workers were organized. It is worth mentioning that case workers were also involved as researchers in gathering citizens' needs. Likewise, frontline staff was involved in testing the application. For instance, during the pilot stage in Bergen, the application was installed in the test system of the municipality where its functions were tested by a couple of chosen test officers and case workers before being extended to the other users. The feedback was collected and sent to the central office of the project which analysed and provided support around the emerged issues.
Finally, IT suppliers were involved already during the piloting. In particular, KS and the municipalities were actively engaged in identifying the best strategic move towards the suppliers and also their financing (NO01). The involvement of the suppliers was important to develop a solution close to users' needs and new requirements, which would be tested and then improved iteratively.

Decision-making process and organisational structure

In a first phase of the project, two project coordinators were appointed. One was nominated by NAV, and the other by the municipalities, and both were endowed with equal responsibilities and authority. Both project coordinators had to coordinate their work: "*NAV was in charge of the design of the*

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architecture, the development of application/products, while the municipalities had the knowledge of what kind of data or input, they needed, in terms of processing the application." (NO05). Later on, a unified leadership was appointed to tighten collaboration between State and municipalities. Furthermore, local caseworkers were also brought in as researchers to understand the needs of users (NO05, NO01).

Strategic decision-making was mostly a joint competence of NAV leadership and the city of Bergen. Tactical and operational decision-making, on the other hand, was mostly left to the project team where consensus had to be reached every time the team had to decide on an orientation. Even though NAV leadership, Bergen and the project team wielded a large amount of "power" in taking decisions, all involved parties had the right to question those and to propose alternative courses of action during working group meetings.

Legal arrangement and inter-organisational agreements

A local government staff member we interviewed commented that an important challenge in this project "was the agreements that had to be signed because we had to decide who would own these solutions after developing. The ownership discussion was kind of difficult." (NO01). Due to GDPR provisions, it was necessary to identify new procedures for data management that would comply with legislation. Nevertheless, this was time consuming and put extra pressure on the legal experts involved. Members of the project team described the alignment of the project's input, throughput and output with personal data legislation as "a project within the project." (NO01). The project's successful completion has brought to light the necessity of changes in laws and regulations, especially on the handling of personal data, in the future (NO04).

Considering this legal backdrop, the design and delivery of Digisos was regulated by several agreements [217]:

- Between every user municipality, KS and NAV: a data processing agreement (defining the perimeter and depth of data sharing between central and municipal Governments) and a collaboration agreement (defining the perimeter of collaboration between the municipality, NAV and KS), which templates are provided by NAV and KS, with a low level of individual differentiation allowed.

- Between every user municipality and private service providers: a commercial contract, determining the terms and conditions under which the municipality can use private solutions, as well as a data processing agreement defining the perimeter and depth of data sharing between municipal Government and the service provider. Tailored "pilot" contracts were signed between the private sector and the 5 pilot cities, allowing service providers to play a greater role in Digisos software development.

- Between KS and NAV: a data processing agreement, stating each party's obligations and responsibilities.

- Between NAV and third parties: collaborations agreements, through which third party Government organisations can access Digisos data to enrich their own IT systems.

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Delivery

The delivery of Digisos was ensured by the wide variety of stakeholders involved in the design phase. Given the consensual and participatory nature of the relationship among stakeholders, the project was characterized by a relatively complex organizational structure were every partaking organisation was represented and given a say. Different jurisdictional levels and different types of parties, from central government and NAV, to local government administrations and civil service, KS and private IT development and maintenance companies worked hand in hand to roll out Digisos. No new structure was created for its management, and no existing organization had to merge at any point. Digisos thus corresponds largely to the multi-agency organisational model that allowed coordination among the involved stakeholders toward the common.

In spite of this relative continuity at a structural level, the delivery of the project led to organisational change at the operational level, regarding the work distribution within welfare services across the country. Caseworkers were discharged of some procedures that were transferred to "sub-caseworkers" (secretaries). All procedures were made paperless, impacting the overall workload for these employees (NO01).

In terms of resources employed, in the first stages of delivery costs were covered by NAV and the five pilot municipalities (NO06). Later, the project was co-financed by KS and DigiFin, a funding scheme devised and managed by NAV and the National Agency for Public Management and eGovernement (DIFI) [218]. When other municipalities got involved in the implementation of Digisos, the service started being financed by municipalities' budget in function of their demographic importance and by NAV's operational budget. The municipalities financed the purchase and development of the required IT systems themselves (NO05, NO02). In terms of human resources, most of the project's protagonists were already operational NAV, KS, local government, and private IT development companies' staff (NO01).

As far as the technical delivery of Digisos is concerned, the initial division of roles between the different stakeholders was rather unclear. NAV had the tough mission to bring everyone together in order to make atomized administrative procedures seamless for users. Concerning the technical and semantic requirement, KS wanted to play a greater role than what NAV planned, which was not easy to mitigate. Eventually, three different service providers currently manage three different types of architecture underlying the unified Digisos interface. Each municipality can choose one of the providers and their respective architecture (NO01). Finally, as an integrated solution, Digisos enables the information it holds to be reused by different public organisations and by service users (applicants) themselves for other services (for instance a citizen when applying for housing benefits or tax returns) [219].

Evaluation

Monitoring and accountability

The project team was placed under the direct leadership of project leaders, NAV and Bergen. In parallel, working groups were set up as forums where all parties involved could present their remarks, questions or objections to project management decisions, and the work in progress. In phase two of project implementation, the team was accountable to the working groups, which was strictly

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regulated by a body of contracts and binding agreements, requiring accurate reporting and a clear repartition of responsibilities. However, most of the selected orientations were consensual, agreed upon by the different parties involved. This is largely explained by the policy processes tradition in Norway, which usually seeks inclusion and consensus among stakeholders.
The above-mentioned arrangements and contracts signed between the different parties also ensured a satisfactory monitoring of progress. The most important indicator, gathered monthly, was the number of applications sent digitally. The data was then reported to the central team that could oversee the rate of service uptake. "So, it was a good way to see that it was really something that the users longed for and wanted to use." (NO04). Concurrently, in the first phase of the project, there was a project plan with binding timelines. According to an interview, "the most important measure that had to be delivered, within the timeframes, were the new requirements for implementing a functionality into the system from the suppliers." (NO01).
In the second phase, the establishment of a weekly meeting between representatives from each pilot and the central project team improved the supervision of the project's progress. This change helped not only monitor the progress and send scheduled reports much more efficiently but also any issues related to budget, delays and eventual re-prioritisation (NO01, NO04).

1.6.3 Municipal Application Service Platform – ASP2 (Hungary)

Since 2016, the Municipal ASP 2.0 project has aimed at providing a single, unified digital architecture (back and front-end) to all municipal public services across Hungary. The project's main ambition is to allow an equal access to digital municipal services to all citizens, irrespective of whether they come from rural or urban areas.

Design

The initial Municipal ASP pilot project sought to develop a preliminary version of the final software. It was first rolled out across 55 pilot municipalities [220]. ASP 2.0 had the scope to generalize this software to the whole country. This occurred in two phases, under the responsibility of a project consortium led by the State Development Agency (KIFU). First, the new software was rolled out to small-to-medium sized municipalities. Second, it was rolled out to larger municipalities (HU02).

Stakeholders: roles and responsibilities

- Politicians: Members of Government provided initial impetus and legislative support
- Public administrators: State civil servants working at the Ministry of the Interior, which is responsible for e-government policy as well as local government policy within the Government and the State of Treasury which is in charge of the public finances. Both led and supervised the project. Local government civil servants were not formally part of the project team, but were consulted throughout the process.
- Social players: a number of associations representing the different levels of local government (counties and municipalities) acted as intermediaries between central and local governments and civil services.

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- Design and IT developers: The State IT apparatus consists of: KIFU (project leader) and several state-owned IT companies (NISZ Zrt., IdomSoft Zrt., KDIV Kft., KINCSINFO Nkft.), which were responsible for the technical functions, the developing of the application and the hardware infrastructure.

- People as service users: municipal civil servants were consulted, invited to share their requirements and observations both as back-end managers and as front-end users. This consultation was mainly done through the intermediary of social players. "Ordinary" citizens were not directly consulted throughout the process. (HU01, HU02, HU03)

Stakeholders: relationship and engagement

The ASP project is the result of a political decision taken at the highest level by the Hungarian government to unify the digital interface between local governments and citizens. As a consequence, the Hungarian Ministry of the Interior and the State Treasury were appointed responsible for the design and implementation of the Municipal ASP service. In this context, local governments played a limited role, though they were regularly consulted throughout the project cycle, through their representative interest groups. The State IT apparatus, composed of the State Agency for IT Development and several state-owned IT corporations, was also involved in the project (HU03).

As such, it can be said that the central Government played a facilitating role, providing initial impetus and regulatory accommodation. Therefore, State Treasury and Ministry of Interior civil servants took part in the project consortium and played a leading role supervising the project, setting priorities and objectives, and ensuring those were met. The State IT apparatus (incl. the State IT development agency and state-owned IT companies) made up most of the project consortium, which was formally led by KIFU, and acted as service provider and technical consultant. It managed the concrete aspects of the project and accomplished most of the groundwork, while inter-stakeholder coordination rather remained a competency of Ministry of the Interior and State Treasury officials. Local governments played a more marginal role. They provided feedback in a service-user (as back-office managers) and in an end-user capacity (the ~20 000 officials involved were also using the online services as end-users). These officials were consulted throughout the project lifecycle through written consultations, interviews, and user experience evaluations. All exchanges between the project team and local officials transited through several local government interest groups involved in the project. Two team members were in direct and permanent contact with those interest groups. (HU01, HU02, HU03)

Decision-making process and organisational structure

The cooperation between these different parties, gathered within a purpose-made project consortium led by KIFU [220], [221], occurred through a structured series of boards and bodies:

- High-Level Support Body, which was attended by high-level representatives of the parties above and chaired by the State Secretary of Administration

- Project Steering Committee, which gathered high-level representatives of the parties above, monitoring the project on a weekly base

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- Project Management Board, which was composed of all the ASP project managers from each party (HU02)

Strategic decision-making was a competence of the central government (and especially the Minister of Interior, State Secretary of Administration and State Treasury leadership), even though it was formally 'shared') with the High-Level Support Body. The Project Steering Committee exercised tactical decision-making. Finally, the Project Management Board was in charge of operational decision-making (HU02).

Legal arrangement and inter-organisational of agreements

The main legal challenge was the initial legislative framework on the repartition of competences between central and local governments. As a response, the Hungarian Parliament voted new laws to facilitate the centralizing aspects of the project. More concretely, being a new state service, which had no legal history and basis, the law regulating the rights and duties of municipalities had to be amended. A separate government decree on the extension and operation of the Local Government ASP was also necessary [222].(HU02, HU03)

In the context of the project, and against this legal backdrop, a number of agreements were made:

- Between Municipalities and Hungarian State of Treasury: a Service Agreement stating each party's obligations and responsibilities, including data content and quality. It also includes the terms and conditions of ASP provision, including cybersecurity requirements.

- Between the ASP center and IdomSoft: The Single Agreement on behalf of all Municipalities, which allows IdomSoft and municipalities to exchange data, and which specifies which ones.

- Between IdomSoft, all of the ministries and the relevant building blocks (eID, eAuthentication, ePayment, etc.): a Service Agreement, which sets out the rules of data exchange between the relevant databases and IdomSoft which acts as an intermediary with municipalities. In particular, it stipulates which public administrations IdomSoft is allowed to exchange data with (HU02).

Delivery

Once the service started being rolled out, a specific State Treasury department was set up to supervise the effective implementation of the service on the field. This roll-out required a huge effort from the State Treasury, which had to create and develop a whole training apparatus ex-nihilo to make sure all relevant state and local civil servants possessed the necessary skill and knowledge to operate the new system. This required hiring and training the trainers themselves, developing the relevant learning material for dissemination among users, and involving the network of State Treasury Country Directorates, which provided the decentralized facilities needed to train all required local civil servants in classroom (the training was a mix of e-learning and classroom sessions). As specified previously, the transition from early development to more grounded implementation led to significant adjustments in the governance of Municipal ASP 2.0, transiting from a simple project to a full-fledged operational public service. (HU02)

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As a consequence of the above, the organisational model evolved as project delivery unfolded. First, during the initial stages, the multi-agency model, whereby different organisations (different services from different Ministries, public sector companies and agencies) collaborated while maintaining their autonomy, was predominant. Later, as Municipal ASP 2.0 was about to become a full-fledged service, the State Treasury created the Department for Support of Local Government ASP Applications to ensure the operation and maintenance of the platform. Hence, it transited to an organisation that fits better with a new agency model.

Concerning material aspects, the project was kickstarted with resources from EU funds via the European Social Fund under Project Public Service Development Operational Program (KÖFOP), which provided the necessary funds. The total initial cost was EUR 66 million, from which EUR 51 million funded central development [223], the rest being available for use directly by the municipalities (e.g. to acquire the necessary IT equipment[220]). As the project has progressively become a regular state service, its functioning and maintenance is funded by the state budget. Human resources consisted of already operational state and municipal civil servants, as well as employees of KIFU and the rest of state IT apparatus. In addition, the State Treasury had to hire a number of trainers, tasked with teaching local civil servants how to use the new digital tools provided to them (HU02, HU03).

Challenges and enablers

- Technical/Semantic challenges. The integration and generalization of the IT infrastructure was a challenge. In fact, it was difficult to integrate the different systems that already existed in large cities to the wider infrastructure, and to compensate the relative lack of technical skill and equipment in more rural areas. What facilitated the implementation of the project was the division of the project into progressive, sequential stages. (HU01)

Evaluation

Monitoring and accountability

Progress towards the completion of the project's objectives is monitored through a systematic approach based upon established reporting criteria and timelines. Regular reporting is delivered to the project management committee and sectoral managers from the Ministries of the Interior and Finance. During the active development and rollout phases, this involved writing up weekly written reports, as well as more episodic on-the-spot checks, ad hoc data provisions, data warehouse reports and analysis of system statistics. Now that the project is near completion, with only few minor development tasks remaining, the service was embedded in the Hungarian institutional system. A specific, hierarchised department was set up within the State Treasury, which reports to Treasury leadership and the Interdepartmental Maintenance Forum (where all involved parties are represented) (HU02).

The core project team was held accountable of the project's progress through a system of monitoring, which also revolved around a number of established quantitative Key Performance Indicators (KPIs). Throughout the development and rollout phases, these KPIs mainly consisted in ratios measuring the rate of extension of the service (e.g.: joined municipality/all municipalities, active users/all users). In short, numerical and quantitative indicators were used to monitor the expansion of the service. Now that the service has reached a greater level of maturity, and that its rollout is almost complete, more qualitative KPIs are used. They aim at monitoring the way in which Municipal ASP is used by the

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municipal authorities and citizens. Additionally, user numbers and technical indicators (e.g. notifications of error, information questions etc.) continue to be reported (HU02).

1.6.4 App "IO Italia" project (Italy)

Since 2018, the "App IO" project has aimed at providing a single interface to a wide range of national, regional and municipal public services through a mobile app. Besides deepening the digitalisation of Italian public services, the main ambition of the project is to offer citizens a simplified and unified access to public services using a digital solution.

Design

The initial impetus for the project came from political decision-makers, at the highest levels, who formulated their ambition to speed up the digitalization of the Italian public administration. The idea of having a single digital gateway to public services was first introduced in the Digital Administration Code (DAC) of 2005, article 64bis [224]. "Italia Login" was the first project to pursue this objective, sharing many commonalities with "Io Italia". Among the preconditions for making real a one-stop shop of public services was the parallel development of the main digital building blocks of the country, such as base registries, eID, and payment systems. It was in this context that the Team Digitale (TD), who would oversee the early stages of IO's development, was formed in 2016.

To lay down the foundations for creating modern IPS some legislative changes were suggested [225]. First, a guidelines approach was introduced to overcome issues related to regulations describing the technology architecture for new service creation. The DAC establishes the neutrality of law with respect to technology and instead proposes a flexible solution, which should be linked to the results of an online public consultation. Second, a national register of citizen digital residence was developed, with legal value in the communication between PA and citizens. Not less important, in this process, a new interoperability model based on API was launched and specific tools to support the public administration were developed [226].

The process of needs identification that underlined the exact perimeter of the future IO project was conducted by the Team itself initially via user research. The preliminary stage consisted mainly of mapping "out some of the public services corresponding to citizens' needs during specific moments of their life, in which citizens interact with the public administration, ordering them by the frequency of average use and percentage of the population involved" [227]. Table 9 presents the results of the research, which analysed the number of users using a certain service and the frequency. This allowed the team to get the picture of real needs of service users (including back office users) based on which 'customisable' solutions could be later developed.

The exercise had set out the stage for all the co-creation activities later organised around the project. The co-designing phase consisted of various iterations and followed the principles and guidelines of designing and developing public digital services in Italy (available since 2017 and constantly updated [228]). At first, based on an interactive mock-up, the concept of the application was validated with the participation of citizens. The validation confirmed the soundness of the application and launched the project into a new phase of developing a minimum viable product on top of which feedback could be solicited (alpha version). In parallel, some backend components started to be developed. A closed-beta version and usability testing followed afterwards. Finally, an open beta version was released in

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2020, accessible to any citizen[33]. In a nutshell, the team used an agile development approach built around users' needs and which integrated feedback throughout the entire process to ensure service user satisfaction.

Finally, it is worth mentioning that the national "Strategy for Technological innovation and digitalization" has identified Io Italia as a national strategic project which aims a providing a single point of access for all digital public services [229]. In the long run, according to the vision of the strategy, the app should ensure that all citizens, regardless of their geographical position and digital abilities, have equal access to effective public services. This provides an important political support as national strategies represent a binding commitment for both policymakers and public managers.

Table 9: Public service utilization map. Reproduced based on Io Italia public information

	LESS THAN 30%	MORE THAN 30%	MORE THAN 60%	MORE THAN 90%
SEVERAL TIMES A MONTH			Road access changes Weather alerts	
MANY TIMES A YEAR		Tuition fees Fines Meetings and report cards Competitions and tenders	Tax status Medical certificates Payments for domestic workers	Medical receipts Refunds for drug purchases
A FEW TIMES A YEAR	Social security contribution Bonus status	Taxes School enrolment School absences Parking permit Asylum status Business activities PA payment history	Stamp duty tax deadline Driving license points Insurance expiration date Medical examination reports	Medical expenses
EVERY NOW AND THEN	Tax collection portfolio Judicial documents	Changing residence Parental leave Passport expiration date Car towing	Payment preferences Vaccine reminders Real estate status Driving license expiration date	Identity card expiration date Electoral card expiration date Birth certificate Family status Choice of general practitioner Vehicle service deadline

Stakeholders: roles and responsibilities

- Politicians: the Presidency of the Council of Ministers and the Department for Digital Transformation supervise the project and monitor the completion of its objectives
- E-government project managers: Team Digitale/PagoPA, under the supervision of the Italian Government, conducts project activities (incl. co-creation) and all IT development tasks (Ibid.)

[33] IO Factsheet

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- Public administrators: Municipalities and national public organizations act as partners of the project team, having provided feedback throughout design stages and having helped in the co-designing part with user samples for the testing activities.
- People as service users/citizens: citizens were involved from the onset of the project by being asked to participate as co-creators, mainly in successive testing phases during the development of the app (IT01).
- Developers and designers: since the app has been developed on the basis of an open source code, any developer (or skilled citizen) could contribute with improvements to the app.

Stakeholders: relationship and engagement

The first steps of the project were initially launched in 2017 by the Team for Digital Transformation (Team Digitale) following an informal approach. As introduced above, the Team started with ideating the concept of the product based on the research of user needs and expectations (Table 9). At that same point, the team involved directly, yet informally, various stakeholders (national service providers, small and bigger municipalities), who could share their own experience and knowledge on ideating and developing digital solutions (IT01, IT05). Overall, it was relevant "to understand which services were already digitalised, how they were provided both from a technological and business process point of view." (IT 02).

At the stage of concept validation, using the talk-aloud technique, forty participants (people as service users) were invited to accomplish various tasks on the app while commenting their impressions and experience in the use of the prototype. As mentioned earlier, this confirmed the initial idea of the app and revealed the need for some design improvements. The results fed into the first functional demo (alpha version) of the app. Before arranging the development of the app, around one hundred citizens (including policymakers, public servants) were involved as co-evaluators, in testing and giving feedback on problems or doubts of the version of the app installed on their devices. The feedback was collected and used by designers and developers to define the features of the next, closed beta-version.

Before the release of the app, a large sample of citizens (around one thousand) were involved in conducting user testing. By installing the beta version of the app, citizens were able to co-experience several real services such as receiving notifications from local administration regarding fees, appointments, make payments etc. Throughout that stage, public administrators across levels of jurisdiction were engaged with and involved in the project. In some cases, public events, supported by local administrators, were organized for the citizenry (IT02). In other cases, public administrators engaged with citizens through social media or using other outlets, in presenting and inviting citizens to become 'beta testers'. No prespecified profile was used (i.e. to gather the most diverse and representative samples possible) as to optimize the quality of testing phases.

During the experimentation phase, the citizens were able to rest in touch with the development team via asynchronous chat to report bugs and errors, suggest feature improvement and potential services for integration. Moreover, several workshops were organized on specific features of the app (IT02). The feedback was collected and, most important used to improve the solution based on users' needs. Several suggestions from ordinary citizens were integrated to the app, such as providing access to a dematerialized fiscal identification document. In the latest open beta version, citizen continue to provide feedback to the project team (IT02).

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Decision-making process and organisational structure

With the end of Team Digitale mandate, IO Italia became the specific responsibility of a state-owned company, with its own internal hierarchy, reporting and accountability mechanisms. PagoPA's relation to the national government is the same as any other public company, as provided by Italian law (refer to normative links). Before the creation of this purpose-made structure, the IO project was introduced and managed by Team Digitale, which operated under the direct supervision of the Head of the Government's office (Presidency of the Council of Ministers). Therefore, the project's structure used to be more directly subordinated to national policymakers and integrated in regular ministerial operations and procedures. In this context, strategic decision-making has been the responsibility of the Presidency of the Council of Ministers and now of the Department of Digital Transformation. The Team Digitale initially, and PagoPA currently, have been in charge of tactical and operational decision-making (IT02).

Framework of agreements

Adhesion Contracts formalise each PA's decision to deliver services through the IO Italia app. It lists the terms and conditions of the use of the IO Italia platform and of its publicity by PAs. It also identifies specific civil servants acting as administrative and technical delegates for each PA. Administrative delegates act as intermediaries between PagoPA and their PA. Technical delegates are given access the IO Italia's back-office and are responsible for the technological integration of the PA's services to IO Italia. Physical persons working for third-party organizations can also be mandated by PAs to act as their delegates [230].

Delivery and evaluation

The IO project responds to a new agency organizational model. Indeed, as was previously mentioned, a specific public company (PagoPA) was created with the development and operation of IO Italia as its explicit purpose. At the initial stage, the IO project was directly funded by the Italian state's budget, which provided for the entirety of its needs of financial resources. Currently, PagoPA is in charge of financing the project. In the future, the purpose of Io Italia is to become fully self-financed (IT02). As far as human resources are concerned, the initial setup of the project under Team Digitale consisted of eight members of the TD in charge of IT development and project management and service design activities (including co-creation). When PagoPA was created, more human resources have been allocated to the project. Today, PagoPA employs over a hundred people (IT02).

The implementation process eyeing towards a general, adaptable portal that aggregates access to any number of public services has required a close collaboration between Team Digitale/PagoPA and the providers of said services (municipal, regional and national public organisations) (IT02). As a consequence, IO Italia has been executed in a fairly decentralized way: since it is not attached to any particular PA, PAs themselves are responsible for initiating proceedings to begin delivering services through IO Italia. For its services to be made available to IO Italia users, a PA must:

- Choose which services it wishes to deliver, within the functionalities of the app (i.e. information messages, deadline reminders, and tax payment)

- Register to the IO Italia back-office and initiate technological integration (associate services with dedicated API keys, integrate own software to IO to allow messages and notifications to be sent, effectuate pre-launch tests in partnership with PagoPA)

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- Conduct a data protection assessment, publish a data protection information notice, designate administrative and technical delegates and sign the Adhesion Contract with PagoPA (see above)

- Once the chosen services are operational on IO Italia, communicate the availability of said services to citizens along duly regulated PR guidelines defined in the Adhesion Agreement (contract templates can be downloaded from the Internet [231]).

Evaluation

Monitoring and accountability

The project's progress is programmed by a roadmap, which outlines the schedule for releasing new services and functionalities on the platform, and for rolling out its next versions. The team is accountable of the completion of the roadmap's objectives towards tutelary government officials, who monitor the advancement of the project through public dashboards (IT02). Overall, the official website of the project displays available dashboards referring statistics on the number of app downloads, the modes of identification, the number for some nationally available services (users, transactions etc.) and available local-level services.
Additionally, the team constantly monitors anonymised usage data to identify potential stress points where improvements could be made. For instance, this helped the team understand that the e-ID solutions provided by the app were not adequate, and prompted them to launch development of potential solutions [227].

Challenges and enablers

- Legal. The necessity to ensure the compliance of the app with GDPR provisions proved an important challenge for the team, which had to balance the need to personalize the app to each user (in order to provide relevant suggestions and deliver the best service possible) and the requirements to respect data protection rules (IT02). In this respect, PagoPA collaborates closely with Italy's Data Protection Authority to ensure a satisfactory end-result.
- Technical/Semantic. While developing this all-encompassing open-source gateway to so many different public services, the team was faced with a great technical challenge. This was addressed by intensively researching the technical characteristics of each service and making sure the final product is adapted to them. Constant exchanges with public administrators also facilitated the resolution of this issue. On another note, pre-existing e-ID systems in Italy proved to be under-scaled for this kind of wide-ranging eGovernment solution. This has represented an obstacle which PagoPA is still working on overcoming (IT01).
- Organisational/managerial. Initially, one of the main challenges consisted in the reduced size of the team, and in its large degree of dependence on government hierarchy. Addressing this issue, the creation of PagoPA went hand in hand with an enlargement of the project team (from eight to a hundred employees) and with a greater autonomy.

1.6.5 Portal "Latvija.lv" (Latvia)

The portal 'Latvija.lv' is a comprehensive digital platform that provides Latvian residents a centralized source of information on available state and local government public services and their electronic use;

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as well as a secure communication with state authorities and an array of e-services that are directly accessible on the platform.

Design

Within the broader Latvian strategy of developing the e-services ecosystem (under the e-Government Development Programme 2005-09), the "latvija.lv" citizen portal was first released in 2006 (refer to joinup report). Since then, it underwent a major revamping with a successive version in 2013. Currently, a new version is planned, and its development is well underway (LV01).

The first version of the portal was an initiative led by several Latvian government bodies as a result of EU fund allocation (Secretariat of the Special Assignments Minister for eGovernment Affairs with the State Chancellery), as Latvia was lacking a centralized, government and citizen digital communication platform. At first, Latvija.lv was designed as a mere repository of information on public services and of links to the relevant websites of ministries and state agencies. During that period, the focus was rather the compliance with national programmatic goals of digitalising public services, whereby the fragmented and top-down approach was reflected in the low use of e-services by citizens (refer to UNU study). It is worth mentioning that in the portal's continuous (re-)design process, service users were engaged primarily through focus groups to set out the main development specifications of the portal.

From 2008 on, taking user feedback and government political agenda into consideration, the portal was enriched with an array of e-services (digital procedures that are directly accessible on the portal). Since then, the amount of directly accessible e-services has constantly increased. The current version in use was developed to make those e-services more visible and to ameliorate user experience.

Just as the portal evolved continuously throughout its lifecycle, this evolution was made possible by constant input from various service users using different channels (digitally, and through Unified Customer Service Centres). Currently, VRAA is working on an improved, new version. The agency aims at a 2023 launch and has already developed a functioning concept, which is currently being tested. The next planned version of the portal will feature a new design and new functionalities, allowing for an even better experience and simpler access to a greater number of e-services. It will also increase the compatibility of the portal with mobile devices. Like its predecessors, the new version is developed thanks to user input (focus groups, phone, email, feedback forms) and is also expected to take inspiration from the conclusions of the CITADEL co-creation sessions. Currently, Latvian administrations have an obligation to provide at least a description of all their services on the portal. The electronic availability of these services on the portal provided at the discretion of each service-owning administration (LV01, LV02, LV03, LV04).

Stakeholders: roles and responsibilities

- Politicians: the Latvian government provided the initial impetus and later regulatory support to make the development and operation of the portal possible;
- Public administrators: VARAM civil servants supervise the portal's operations and maintenance and act as intermediaries between VRAA, the government, and citizens. VARAM also represents the portal at an international level (i.e. EU institutions). Other ministries' civil servants as well as municipalities (and unified customer service centers) supervise the provision of their proprietary e-services on the portal and, in this regard, also have a advisory

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role towards the operational team and they have the possibility to submit user experience feedback to VRAA;

- E-government project managers: VRAA acts as the manager of the portal. It sets out general needs and requirements for the portal, monitors its uptake and progress, oversees day-to-day operation and maintenance and the development of new versions. It acts under the jurisdiction of VARAM;
- Suppliers: the responsible IT development company, a government subcontractor, is tasked with the technical implementation of VRAA's decisions when it comes to the portal's development, operation and maintenance, and with the management of focus group sessions
- Non-profit organisations: special interest representative orgranisations are regularly consulted by VARAM and VRAA to gather feedback on the portal's features and functioning from the perspective of the group they represent;
- People as service users: citizens, sampled in function of their socio-demographic characteristics, and businesses are regularly consulted by VARAM and VRAA to gather feedback on the portal's features and functioning, and they have the possibility to contact VRAA by phone or e-mail every time they encounter a problem while using the service. VRAA also provides them with a feedback form (user experience questionnaire) which they can fill directly from the portal. (LV01, LV02, LV03, LV04)

Stakeholders: relationship and engagement

When it comes to the Latvija.lv portal, members of government have had a double role as 'initiators' and regulators. In this context, they have demonstrated a rather formal approach to engaging with the other stakeholders, imposing their will through legislation (i.e. government decrees). Within this formal regulatory framework, VARAM civil servants set out broad directives and perform monitoring. They do so in a formal manner, exerting legal authority over an implementing agency. Indeed, e-government project managers from VRAA being hierarchical subordinates, their relation to VARAM is regulated by ordinary administrative procedures, although occasional informal exchanges related to the portal take place. Civil servants from other ministries also have a formal relationship with their colleagues from VARAM and VRAA, as provided by regular administrative procedures. Civil servants working for ministries that own services provided through Latvija.lv mainly exchange their views directly with VRAA on these matters by two means. First, they can fill user feedback forms on the portal itself. Second, they occasionally participate in quarterly Content Coordination Board meetings, where they can voice their opinion on the provision of their own services by the portal (LV02).

As an implementing agency, VRAA also operates within the formal environment set out by law, administrative procedures and hierarchies with other state institutions, and by contractual agreements with its IT contractors. Relations within the project team itself are bound by the hierarchical arrangements of the government agency it is part of, although informal exchanges among the team take place on a regular basis. The agency's IT subcontractor is bound to VRAA by a contractual agreement, which establishes a formal relationship between the two entities, and is responsible for the technical aspects of the project (a VRAA project officer stressed that agency staff "are not programmers" (LV01). VRAA states a number of specifications which the subcontractor must comply with, and the two parties regularly meet in person to monitor progress, to clarify stress points, and to fine tune details. The subcontractor also organises user focus groups and analyses their results. VRAA is only provided with a synthesis of conclusions from those focus groups a posteriori.

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Special interest groups have been formally engaged through two main channels. First, they take part in the Content Coordination Board meetings. Second, they are regularly consulted in a less formal capacity by VRAA to understand the stance of the social groups they represent concerning the portal. Citizens themselves are regularly engaged in several possible ways. First, as service users, they are able to get assistance by sending emails or get in touch with Customer Service Centres (CSCs) , as well as send built-in error messages through the portal when they encounter technical difficulties/ malfunctions. Second, citizens are provided with a questionnaire feedback form directly on the portal, where they can account for their user experience. Those forms are examined by VRAA on a regular basis and contribute to the portal's development.

As briefly mentioned earlier, co-creation activities have been organised during the development phases of each version of the portal to understand user requirements and develop accordingly the service offer. Throughout 2012, user focus groups were conducted to gather feedback and requirements that could be used to feed a better version of the portal. This was complemented by consultations with government services, non-governmental organisations (e.g. association representing visually impaired citizens), and the government's IT development subcontractor. In the last redesign iteration of 2019 for a planned new version, citizens together with representatives of NGOs, were involved in co-creation activities supported by researchers of CITADEL project (see D1.1). These activities consisted in workshops and focus groups where project officers assembled separately different groups of people as service users and people as citizens (two general citizens group, one with IT students, another for elderly people, etc.) whose purpose were to understand how to improve the uptake and the user journey of the portal, and gather insights from all identified stakeholders. The meetings were designed to gather only few people at the same time to optimise each participant's chance to express themselves (LV01, LV02, LV03, LV04). All these efforts have resulted in services becoming more user friendly.

Finally, by adopting the 'digital by default' principle, the Latvian administration facilitated the access to all citizens, including those who do not use the internet, directly at Unified Customers Service Centres spread all over the country. National and local level services, related to life situations, are available both in-person and electronically and are accessed by CSC personnel via latvija.lv portal. According to a recent OECD report, "the proportion of people who only download official forms has fallen, with more people completing forms online, and […] an above average proportion of users use the Internet to interact with public authorities." (refer to OECD, p 109).

Decision-making process and organisational structure

Based on the above, it can be said that VARAM political leaders and public administrators have been in charge of strategic decision-making. On the other hand, VRAA E-government project managers have been in charge of tactical decision-making. Finally, operational decision-making has been a shared competency of e-government project managers and the subcontracting supplier.

The development of the portal has resulted in the establishment of a Content Coordination Board in 2018. Board members represent 22 organisations, from service-owning state institutions to special interest groups. The Board meets every quarter and discusses all aspects relating to the operation and development of the portal. For instance, board members are invited to put forward suggestions and remarks to ameliorate the portal in the context of the development of its new versions, or to resolve malfunctions or shortcomings their organisation may have identified. The project team is also accountable to the Board, to which it reports the progress of its work. During its meetings, the Board

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monitors various KPIs and discusses the completion of the project's objectives. The Board does not hold any binding power with respect to the Portal, it is purely consultative (LV01, LV02, LV03)

Legal arrangements and inter-organisation agreements

The portal has operated within a tightly knitted regulatory net. This especially comprehensive legal framework, in addition to the GDPR, rendered Latvija.lv's implementation relatively straightforward for the project team from a strictly legal point of view. As a consequence, this has not been a particularly challenging aspect of the project for the team. (LV01)

Indeed, a body of government decrees adopted in 2016 and 2017 regulates the portal:

- Regulation No. 374 (Protocol No. 29 § 30, 2016) establishes the State Information System's Integrator (VISS), which is a central, shared IT infrastructure shared by all Latvian state administrations. VISS acts as a common back-office for state information systems. The existence of this interconnector implies that all state software solutions and data processed by and exchanged among all Latvian public services must respond to common technical and semantic requirements. This allows data and software interoperability, which is instrumental in allowing Latvija.lv to act as a bridge between different services provided by different administrations.
- Regulation No. 399 (Protocol No. 33 § 25, 2017) provides the procedures for "accounting, quality control and provision of state administration services, and the procedures for maintaining the catalogue of state administration services and information to be included therein". This regulation is crucial in the implementation of the portal because it provides a framework for state administrations to delegate the provision of public services to third parties and delineates the rules governing this delegation. Since the portal consists in receiving delegation to provide services from other state administrations, this regulation is instrumental in its governance.
- Regulation No. 400 (Protocol No. 33 § 26, 2017) outlines the general framework of rules and procedures surrounding the portal itself. It delineates the features of the portal and the minimum requirements it must satisfy. It also prescribes VRAA's responsibilities and accountability as the "portal manager" and regulates the obligations the portal is submitted to when operating services owned by other administrations. The regulation also provides the conditions of progress and performance monitoring, and sets out quality and maintenance requirements VRAA must comply with.
- Regulation No. 402 (protocol No. 33 § 28, 2017) governs the operation of e-services provided by Latvian state administrations. In particular, it outlines the requirements every state administration must comply with when digitalizing public services and attributes responsibilities in the context of the operation of digitalized public services. It also states the conditions under which an administration has an obligation to provide services electronically.

It must also be stressed that VRAA is bound to its IT service provider by a contractual agreement, which posits the terms and conditions of the commercial relation between the two entities, delineates the perimeter of the tasks delegated to the subcontractor and attributes each party's responsibilities. (LV01, LV02, LV03)

Delivery

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In the early years of the portal's delivery, it became a responsibility of the State Regional Development Agency (VRAA), which operates centralized services for municipalities and state agencies under the supervision of the Ministry of Environmental Protection and Regional Development (VARAM). Therefore, it can be said that Latvija.lv sits somewhere in-between two theoretical organizational models. On one hand, it roughly corresponds to the new agency model, since VRAA was created after its initial release and entrusted with its management. It is important to stress, however, that VRAA was not created with the sole purpose of managing the portal, as it is also in charge of all E-government matters throughout the Latvian state administration. In this sense, it somewhat depart from this model. On the other hand, the portal also corresponds to the multi-agency model since it depends on many different organisations, from civil servants to social players and the private sector who play important roles in the management of the project. It must be stressed that unified customer services center, one-stop-shop administrative helpdesks spread across the country, also played a key role in the delivery of the portal as they were tasked with delivering guidance and assistance to users.

While the regular operation and maintenance of the portal is funded by the state's budget (through VRAA direct expenses and subcontracting), EU funds have been used to finance the initial development of V1 and every major re-development processes resulting in new versions (V2 and V3), as well as extraordinary actions (as the 2019 CITADEL co-creation sessions, under Horizon 2020). Concerning human resources, the operation of the portal has not necessitated hiring new people (outside of the regular VRAA staff) and has not directly led to any significant re-organisation within its responsible organisations. (LV01, LV02, LV03)

The technical delivery of the project largely relied on two factors. The first factor is VRAA's delegation of work to its IT subcontractor, which takes care of the IT development and programming. VRAA's role in this respect is the compilation of requirements and specifications. These are then transmitted to the subcontractor, which is tasked with the technical realization of VRAA's vision within the boundaries of the two parties' contractual agreement, and of Regulation No. 374. The second factor is the Regulation itself, which provides a pre-existing back-end infrastructure for Latvian state digital public services, VISS. This has meant that the underlying technical structure upon which the portal relies does not need to be purpose-built from scratch, and that the integration of all public services to the portal is conducted using a common interoperability framework. These two factors mean that the technical/semantic implementation of the portal has also been relatively straightforward for the project team. (LV01, LV02, LV03)

Challenges and enablers

- Organisational/managerial challenges. First, financial resources have been an issue. If major re-development projects have benefitted from ample EU funding, the regular operation and maintenance of the portal has relied on VRAA's budget allowance. It has thus been challenging to meet particularly stringent legal requirements (see Regulation No. 400) with sometimes limited funding. Second, the portal's implementation requires highly qualified staff. While this has not been a particular issue at first, a relatively high turnover makes it challenging to maintain a constant level of skill and knowledge about the specific characteristics of the portal within VRAA. Third, and finally, VRAA has sometimes struggled to keep up with shifts in top management. Indeed, changes in governing parliamentary coalitions have meant that the portal has had an unstable position within the governmental agenda in function of successive transfers of powers from one parliamentary majority to the next. This represented a challenge

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for the project team, which it has attempted to mitigate by punctuating this long-term project with manageable milestones to achieve in shorter periods of time. (LV01)

Evaluation

Monitoring and accountability

The portal is subjected to a comprehensive mechanism of monitoring, and the project team is accountable of the portal's performance both to its hierarchy (VRAA leadership and VARAM) and to the public at large. Indeed, as set out in Regulation No. 400 (see above), measurement of a number of KPIs and their regular publication to the wider public are mandatory. Article III of the Regulation constrains VRAA to "perform quality control of the operation of the portal and accounting and publication of the basic indicators of the operation of the portal" and to "collect statistics on the use of the content of the portal and the performance of the e-services placed on the portal and publish it on the portal at least once a quarter". The same article also posits that "at least once a year, the end-user satisfaction of the portal shall be measured, and the results of the measurements shall be published on the portal". While the Regulation does not set out any evaluation mechanism, i.e. it does not provide any notion of rating system which could determine whether KPIs are satisfactory or not, the interviewed project officers confirmed that these indicators are discussed during every meeting of the Content Coordination Board. Anyways, the Board being deprived of any binding authority, VARAM is the only party which can decide whether the monitored indicators are satisfactory. The Ministry does this during regular information exchanges and work meetings with VRAA (LV04). VRAA publishes the results of this mandatory monitoring on the Latvian State Open Data Portal .

1.7 Results of cross case analysis

In the previous pages, the comparison of the five cases along the dimensions of governance, stakeholder engagement, framework of agreements throughout the various phases of IPS-Co was conducted on the basis of the tenets discussed in the theoretical section (Section 1). In the following pages we present the most salient factors emerged from the analysis of cases. All analysed dimensions are mapped together in the Table 10. However, here we propose a more thorough discussion on the most important themes identified during the analysis of best practice cases:

- Needs and problem identified and knowledge generation
- Stakeholders' roles and their engagement
- Legal arrangements and inter-organisational agreements
- Monitoring and accountability

Identification of needs, problems and knowledge generation

Overall, the results of the case analysis show that there is still a prevailing emphasis on hierarchical models in the way problems and needs are identified. Likewise, how different, or new information is taken into account in the process of problem definition is still largely conform to the hierarchical model, although the co-existence of different models is common (especially over time). In at least two analysed cases (ASP2, X-Road BR), the demand for the service was determined by organizational/department objectives and professional/expert judgement. In the other remaining

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cases, different approaches were combined, whereby some form of market or hierarchical model of needs identification was enriched with the participation of service users.

For instance, in the case of latvija.lv portal, the need to launch the first version was driven primarily by a national interest to digitalise service provision, complying with strategic programmatic goals (and low rates of citizen uptake). Over time, the approach changed. In the current and the expected re-designed versions of the portal, service users will be given the opportunity to share their perspective on what their demands in using the service offer are, and will be able to contribute with their knowledge and experience. Similarly, in the Digisos example, the definition of the problems and requirements followed a mixed approach. Market research involving cost-effectiveness analysis and the profiling of target users was complemented with actual service users sharing their needs and subsequently involved as co-designers at the next step of the project's lifecycle. Finally, the case of App IO is the one that more closely adheres to the network style of identifying needs and framing the future solution, by recognizing different perspectives and collecting available knowledge from different groups of stakeholders.

However, none of the projects analysed have directly involved people as (front-end) service users or as citizens to understand their needs or expectations. This group of stakeholders rather was later engaged as co-designers or co-evaluators as argued below.

Finally, it is worth mentioning that in three analysed cases (X-Road BR, Digisos and App IO) the preliminary identification of problems and needs was accomplished using a research methodology (i.e. market research, cost-effectiveness, user research etc.). While it is true that in these cases the research was conducted either to yield a clearer description of users' needs (both back and front-end), or to estimate potential gains in efficiency and effectiveness using both quantitative and qualitative approaches, it was also used for legitimization purposes. The literature identifies this approach as "input legitimacy", whereby the legitimacy of an outcome is assessed according to the process by which actors acquire precise roles [10].

Stakeholders' role and engagement

This is by far one of the most important themes to have emerged in the analysis of cases, for much variation is observed in terms of stakeholders' involvement and their contribution.

The cases analysed are all examples of public services that introduce an integrated solution (cross-border, cross-jurisdictional or cross-organisational) supported by the use of ICT. In this context, one observed trend was the involvement of a wide array of stakeholders in the phases of project planning/ execution or later in the service provision. This stands in contrast to previous arrangements in which government was the dominant or even the single actor during the whole cycle of service provision. Multiple forms and methods of engagement have been adopted variously by our analysed cases, based on the phases of the project and the role of stakeholders.

Increasingly, people as service users and people as citizens take part, to different degrees, as co-designers, co-deliverers and co-evaluators, although in all cases the e-government public managers were the main co-creator. Mostly formal approaches were adopted to engage service users via all available tools (i.e. analogue, digital or hybrid).

Across all cases back-office service users were involved as co-designers, and were able to contribute significantly to the design decision of IPS providers

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People as service users or citizens were also actively engaged as co-designers, although this was most noticeable in three of the five identified cases (Digisos, App Io and Latvia portal)

Most of our analysed cases focus on services to citizens as opposed to businesses. The only case of IPS for business activity (X-Road BR), the business community was not engaged, as the procedural simplification brought about by the new service was deemed beneficial to businesses a priori. Public administrators in all cases assume both a service provider (thus launching initiatives) and an oversight role. Within projects they are generally in charge of strategic decision-making and are engaged through different means both formally and informally. Public administrators are key stakeholders as, after the piloting stage, the service becomes the full ownership and responsibility of service providers and their constant and active involvement entails higher chances of service uptake afterwards.

Our analysis focused on IPS projects, thus, e-government project managers were deemed crucial for the creation and execution of the projects. The often acted as co-designers (X-Road BR) and their involvement was important throughout all stages and creating a bridge between the decision-makers and other stakeholders (all cases).

Politicians played either the role of initiators or providing political support. Policymakers' advocacy was especially important at the initial stage by the need to pass legislation that would provide the legal base for the new service (ASP 2, Latvija.lv). Political stakeholders acted as initiators by launching strategies which, at least indirectly, provided the background for the project (App IO, X-Road BR). During later stages of service design and delivery, this group of actors played the role of facilitator, when roadblocks appeared in the execution phase.

Legal arrangements and inter-organisational agreements

As with any type of public services, IPS are set up under an existing regulatory framework. Commonly, this framework includes rules, regulations and policies that either promote or limit the availability and use of information, data, service/content (Chapter 4). In all analysed cases, explicitly or implicitly, the creation and delivery of the IPS were framed by national policies or strategies. Moreover, in the case of Latvian portal, adopted regulations provided the necessary framework for service provision, and to our best knowledge no agreement was needed.

However, because the legislative landscape is broad enough to organise various elements in the society, organisations that increasingly interact with different actors to accomplish shared goals (such as integrating public services) may also avail themselves of collaboration agreements. The types of agreements that facilitate the creation and delivery of IPS vary widely depending on the nature of project (cross-border, cross-jurisdictional or cross-organisational), and the phase of the project (pilot, initial or advanced implementation) and the involvement of external suppliers such as software houses. However, some commonalities across the cases can be observed:

Almost all cases analysed adopted agreements governing terms and conditions of data exchange. This type of agreement is crucial in enabling the access and use of data owned by various authorities to realise the new service. For instance, such agreements were signed between KS, NAV and municipalities in the Digisos case; between the two business registrars in the case of X-Road BR.

Bilateral or single agreement on behalf of multiple (public) organisations. This type of agreement is the most common across all cases. For example, bilateral agreements must be signed between a government organisation and PagoPA Spa in the case of App IO to make available their service offer on the national platform. The project management team has, over time, updated and made available a template of "contract" which entities must sign prior to their subscription. In contrast, in the case of

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ASP2, a single agreement was signed on behalf of all participating municipalities and the ASP Centre to enable their connection to the government service bus (which support multiple national base registries).

Finally, service level agreements (SLA) prevail in the IPS creation and delivery between a public entity/project team and a software development firm (in-house or external). This is was found in the case of X-Road BR, Digisos (between municipalities and the software house developing the solution) and App IO for which public entities have an SLA with their suppliers.

In addition to the above-mentioned agreements, in case of cross-border projects, formal arrangements are signed as part of broader initiatives to govern multiple collaboration projects. For instance, in the case of the X-Road BR cross-border project, a Memorandum of Understanding and a Collaboration Head Agreement, and one for the connection and operation of the data exchange layer across the two countries involved (X-Road-Suomi.fi) were signed and a trust federation agreement was established.

Monitoring and accountability

As with any initiative requiring the use of public funds, IPS projects and the teams managing their design and execution can be held accountable to both oversight institutions and officials, and to the public. To demonstrate the effectiveness and efficiency of their strategic, tactical and operational choices, project teams across the cases observed monitor the performance, robustness and quality of their IPS. Although the principle of monitoring seems universal among the identified best practices, it is conducted differently from one case to another. Nevertheless, certain generalizable trends appear when it comes to the analytical methods used to monitor IPS:

- Almost all analysed cases use some type of formal indicators to oversee the progress of the project or monitor the performance of the service. Most commonly, at the pilot or project stage, planning involved the establishment of a timeline and a formalised means of reporting on the evolution of formal indicators to politicians and public administrators; through written progress reports, periodic meetings of supervisory boards, or continuous monitoring of dashboards and other analytics by officials.
- All the analysed cases that reached a (quasi-)functional state (except X-Road BR) use at least one key performance indicator (KPI) to monitor the uptake of their digital solution, either by public administrations encouraged to delegate their services, or by citizens as services users. This can consist in counting the number of user per month (e.g. IO Italia, Latvija.lv) and tracking its evolution across time, for instance.
- In some cases, once the pilot becomes a developed service (App IO and ASP2), data and indicators on the operation of the service are partially (IO Italia, ASP2) or fully (Latvija.lv) made available to the public on dashboards, or government open data portals. For example, during the piloting phase, ASP2 tracked the extension of the service using indicators on joined municipality/all municipalities, active users/all users. During the delivery, more qualitative data continued to be collected for monitoring. In other cases, various KPIs employing mostly web analytics tools were used for monitoring and understanding the behaviour of users while interacting with the service online.
- Although citizens are not necessarily informed of the results of evaluation (formal indicators), they are always involved in evaluation activities. All analysed cases that reached a functional

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state rely on user satisfaction surveys, error notifications and user feedback. This means that citizens themselves most often provide the quantitative and qualitative data that allows formal indicators to be set up, acting as co-evaluators.

A classification of reporting and accountability praxis across the best practices observed can also be done to correspond with the style of project management:

- Hierarchical-style projects (such as X-Road, ASP and Latvija.lv) focus monitoring and reporting activities on the level of compliance with regulations & quantifiable standards.
- Market-style projects (such as Digisos) focus monitoring and reporting activities on cost-benefit calculations.
- Network-style projects (such as IO Italia) focus monitoring and reporting activities on agreed goals, feeding the negotiation of changes among stakeholders.

The table below presents the results of the complete findings from the analysis of cases, classified per dimensions of analysis and cases.

Table 10: Generalised findings across cases

	Dimension of analysis	**X-Road BR**	**Digisos**	**ASP**	**IoApp**	**Latvija.lv**
DESIGN	*Identification of problems and needs (policy framing)*	Findings of market research found business register activity as area for digitalization. Use and presentation of a business case. Expert judgement.	Mixed approach of market and network style. Service users' voices were considered in need formulation. Combined with findings of cost-effectiveness analysis on target users and expected gains in efficiency/ effectiveness.	Technocratic analyses and political impetus justified the need for a single national gateway to municipal services. Expert judgement	Pluralistic approach in considering the voice of multiple stakeholders. Findings of user research identified and prioritized service areas.	Mixed approach of hierarchical style (expert judgement) and a pluralistic style, service users' voices were considered during the development of the current version of the portal.
	Knowledge generation	Technocratic focus, technical experts view prevailed	A group of different stakeholders contributed with their knowledge and experience, including service users as co-creators	Technocratic focus, technical experts view prevailed	A group of different stakeholders contributed with their knowledge and experience, including service users as co-creators	A group of different stakeholders contributed with their knowledge and experience, including service users as co-creators
	Stakeholders' role	Politicians: initiation and support Public administrators: project oversight;	Public administrators: initiation and support. E-gov project managers: service ownership, project	Politicians: initiation and support. Public administrators: service ownership,	Politicians: initiation and support, project oversight in the early stages. Public administrators:	Politicians: initiation and support. Public administrators: project oversight, service provision.

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	Dimension of analysis	**X-Road BR**	**Digisos**	**ASP**	**IoApp**	**Latvija.lv**
		E-gov public managers: service ownership, project management, technical oversight. IT developers and in-house IT firm: technical management, system maintenance and operation. Business community: beneficiary, no direct role	management, coordination. People as service users: co-creation, feedback and knowledge provision. Social players: advocacy and mediation, technical management of certain digital systems. Suppliers: technical management, system maintenance and operation	project and technical oversight. People as service users: feedback and knowledge provision Social players: advocacy and mediation. Design and IT developers: project and technical management, system's maintenance and operation.	feedback and knowledge provision, service provision. E-gov project managers: service ownership, project and technical management; system maintenance and operation. People as service users/citizens: feedback and knowledge provision, co-creation and co-testing. Design and IT developers: co-delivery (contribution to open source code)	E-gov project managers: service ownership, project management, technical oversight. People as service users/citizens: feedback and knowledge provision. IT suppliers: technical management, system maintenance and operation. Non-profit organisations: Advocacy and mediation.
	Stakeholder engagement (methods)	Regular administrative procedure. Formal agreements; Informal discussions; E-mails; Physical meetings	Regular administrative procedure; Formal agreements; E-mails; Physical meetings; Interviews; Beta-testing; Workshops; User feedback	Regular administrative procedure; Legislation; Formal agreements; Physical meetings; E-mails; User feedback	Regular administrative procedure; Formal agreements; Beta-testing; User feedback; Public events; Social media Communication; Asynchronous chat; Workshops	Regular administrative procedure; Legislation; Formal agreements; Informal discussions; E-mails; Physical meetings; User feedback; Focus groups; Workshops
	Decision making	Strategic decision-making: Politicians and public administrators; Tactical and operational decision-making: e-government public managers	Strategic decision-making: public administrators; Tactical and operational decision-making: e-government public managers	Strategic decision-making: politicians and public administrators; Tactical decision-making: e-government public managers; Operational decision-making: e-government public	Strategic decision-making: politicians and public administrators; Tactical and operational decision-making: e-government public managers	Strategic decision-making: politicians and public administrators; Tactical decision-making: e-government public managers Operational decision-making: e-government public

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	Dimension of analysis	**X-Road BR**	**Digisos**	**ASP**	**IoApp**	**Latvija.lv**
				managers and IT developers		managers and suppliers.
Legal arrangement and agreements		Estonia- Finland Memorandum of Understanding; General contract defining the project's characteristics between Finnish and Estonian administrations; Member contract and service level agreement between Finnish Suomi.fi and Estonian X-Road and their respective business registrars; Trust Federation between Finnish Suomi.fi and Estonian X-Road	Data processing agreement between KS and NAV; Data processing and collaboration agreement between each municipality, NAV and KS; Commercial contract between each municipality and their respective IT provider; Collaboration agreement between NAV and each PA seeking to take inspiration from Digisos as own digital solutions	Service agreement between municipalities and the State Treasury; Single agreement between KKsZB and the ASP centre on behalf of all municipalities Service agreement between KKsZB, all the ministries and the relevant building blocks	Adhesion contracts between each partaking administration and PagoPA	Various Government Regulations precisely outlining the conditions and perimeter of operations of the portal; Contractual agreement between VRAA and its IT supplier
DELIVERY	*Organisational model*	Multi-agency	Multi-agency	Multi-agency, then transition to new agency	New agency	Multi-agency/new agency
	Delivery: (organisational change, operational decision making)	No organisational change; Operational decisions made by the two business registrars	Procedural simplification led to re-allocation of workload for caseworkers; Operational decisions made by project team (inter-stakeholder)	Creation of a new State Treasury Department to manage the new solution; Operational decisions made by project team (inter-stakeholder)	Creation of a state-owned company to manage the new solution; Operational decisions made by project team with citizen contribution	Creation of a specific government agency to handle the portal (among other policy matters); Operational decisions made by the agency and its external supplier

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	Dimension of analysis	**X-Road BR**	**Digisos**	**ASP**	**IoApp**	**Latvija.lv**
EVALUATION	*Monitoring and accountability*	Internal timelines & priorities; Use of monitoring tools & systems; Dashboards; Periodical physical meetings to check on progress status	Periodical physical/online meetings to check on progress status; Signing of contracts and binding agreements; Project plan with binding timelines; Scheduled reports; Indicators: number of applications (gathered monthly) new requirements to implement a functionality into the system	Regular reports and timelines; Episodic on-the-spot checks; Ad hoc data provisions; Data warehouse reports; Review of system statistics; Indicators: rate of extension of the service (joined municipality/all municipalities, active users/all users); numerical; quantitative; qualitative; user numbers; technical indicators (notifications of error, information questions)	Roadmap; Dashboards; Indicators: statistics on the number of app downloads; the modes of identification; the number for some nationally available services (users, transactions etc.; available local-level services; anonymised usage data	Measurement and open publication of KPIs (service use analytics); Content Coordination Board; End-user satisfaction surveys Indicators: service use web analytics; user satisfaction rates; anonymised usage data, technical indicators (notifications of error)

The table below consists in a summary of the most salient political, technical/semantic, organisational/managerial and legal challenges and enablers that have characterised the cases analysed.

Table 11: Summary of emerged challenges and enablers across the cases

Challenges and enablers	**X-Road BR**	**Digisos**	**ASP**	**IoApp**	**Latvija.lv**
Political	Necessity to ensure total support from decision-makers (overcome thanks to the work of "guardians" on both sides).	None	None	None	Necessity to keep up with changes in Government priorities and orientations (partly overcome thanks to a decomposition of the project agenda into manageable short term objectives)

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Challenges and enablers	**X-Road BR**	**Digisos**	**ASP**	**IoApp**	**Latvija.lv**
Technical/ semantic	Necessity to ensure total interoperability between the systems of the two countries (overcome thanks to the use of the X-Road infrastructure and the signing of agreements beforehand)	Each partaking organisations had their own requirements that they sought to impose on the entire project (overcome thanks to the adoption of three different architectures compatible with the portal that each organisation can choose from)	Necessity to integrate pre-existing municipal IT infrastructure with the new, generalised architecture (overcome thanks to the division of the project into progressive, sequential phases)	Necessity to integrate very different services to a single platform (overcome thanks to intensive research and consultations with stakeholders), and necessity to re-scale Italy's eID infrastructure to face increased demand (work still ongoing to overcome this issue)	Necessity to integrate very different services to a single platform (overcome thanks to the remedy to a specialised IT supplier and the utilisation of the Latvian state single IT infrastructure and interoperability framework)
Organisational/ managerial	Necessity to mitigate the gap between the two countries regarding the level of government digitalisation (partly overcome thanks to concertation and legislative change in Finland)	None	Necessity to normalise ASP as a regular public service (overcome thanks to the creation of a specific department within the State Treasury)	Necessity to make timely progress with a very small team (overcome thanks to an enlargement of the team during the transition to PagoPA)	Necessity to make do with a limited budget (partly overcome thanks to EU contributions in re-development project phases), necessity to hold on to qualified and experienced staff in an environment of high turnover (partly overcome thanks to competitive working conditions)
Legal	Necessity to ensure compliance with personal data protection laws (overcome thanks to thorough legal analysis); Necessity to ensure free-of-charge data exchange between the two countries (overcome thanks to the adoption of new legislation).	Necessity to ensure compliance with personal data protection laws in co-creation activities and the portal's operation (overcome thanks to thorough legal analysis)	Necessity to adapt to the existing legislation on the repartition of competences between the central government and local authorities (ultimately overcome thanks to legislative change)	Necessity to ensure compliance with personal data protection laws in co-creation activities and the app's operation (overcome thanks a constant collaboration with Italy's Data Protection Authority)	Necessity to be provided with a clear and comprehensive regulatory environment (overcome thanks to the very precise and wide-ranging Government regulations adopted to facilitate the portal's operation)

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Recommendations

Based upon the analysis of existent IPS cases and the findings of recurrent themes crosswise the main constructs of the framework, a number of recommendations are presented below. The constructs cover the domain of governance, stakeholder engagement, formal arrangements and the roadmap necessary to consider when envisioning and developing an integrated public service. Similar to the structure used in the analysis of existent IPS cases, the recommendations stretch out across the three main phases of co-creation activity: design, delivery, and evaluation, covering aspects related to organisation, management, political, and technical nature of IPS projects.

As defined in the first section of this report, the concept of governance of IPS comprises organisational structures, roles and responsibilities and the decision-making process wherein the different stakeholders are involved (refer to literature review for IPS governance). The basis of the relationship of stakeholders involved in IPS can be found in existent legal provisions or this can be formulated on a combination of formal arrangements and regulation. Finally, the analysis of IPS projects presented various challenges and achievements in adopting co-creation process. Based on these observations, future similar initiatives can adopt and adapt the models proposed to enhance IPS-Co provision.

Design

Needs identification

Recommendation 1: Integrated public services (IPS), which stretch out across different governmental functions or levels of jurisdiction, use an evidence-based approach for scanning problems perceived by the community, users' needs and specific aspects to develop or redesign in a public service.

Suggested methods: Mix traditional approaches of market research or translation of political decisions with the engagement of various stakeholders, including at the definitional/diagnosing stage, to recognize users' service needs. There are both qualitative and quantitative research approaches to better understand problems, users' needs and the context. For instance, user research mixes quantitative and qualitative data to get insights about users' attitudes, habits and preferences, and in turn supports the design of services which better fit users' expectations.

Rationale: Bringing in stakeholder knowledge in the definition of services is seen as a departure from traditional hierarchical and market-based models of organisation, and contributes to reach a common understanding of the problem and grounding the service offer in real needs instead of assumptions. Although the practice of needs analysis by involving service users is still limited, or implemented top-down with the government as the main actor, some of the analysed cases have emphasised the need to define problems to be solved and understand users' experience by directly engaging with users (io Italia, Latvija.lv).

Stakeholders' role

Recommendation 2: Favour a pluralistic approach at the design stage by bringing in diverse skills and perspectives from government agencies, service owners and providers, service users or people

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with lived experience who can provide knowledge and guidance regarding the IPS. Start with a mapping of relevant stakeholders and outline their roles and responsibilities in the IPS project.

Suggested methods: Use of stakeholder or ecosystem mapping. Seek verbal (interviews, participative town hall meetings, focus groups) or written interactions (questionnaires, data analytics, online forms, surveys, business cases).

Rationale: Every IPS project is bound to involve a wide variety of stakeholders, with sometimes-competing interests and priorities (Chapter 3). Across the cases analysed, the practice shows that it is essential to ensure each of the stakeholders are engaged, consulted and listened to at an early stage, and is kept on board (through information about progress and concertation) during the project lifecycle. Because not all stakeholders have to be involved in the same way/frequency (depending on their salience), IPS project start by first identifying users, then primary and secondary actors involved in the IPS provision. (across cases)

Stakeholders' engagement

Recommendation 3: Make sure that every identified stakeholder is contacted, informed, and given the opportunity to contribute to the co-design of the IPS early on. The project team must create and maintain spaces in which various stakeholders and service users can interact to express and align their interests and needs with each other.

Suggested methods: Use service design or design thinking methods (i.e. double diamond34) that help engage stakeholders in defining the solution, its prototyping and early testing; another relevant approach is the living lab, in which stakeholders get the opportunity to participate and contribute effectively to the entire process. Interaction spaces can be virtual, physical or hybrid in function each project's characteristics and context (see here).

Rationale: IPS projects with an ambition to involve stakeholders, respectively users, rely on their ability and knowledge to reach out to them and to ensure they are informed about the project's existence and that they are effectively engaged, which sometimes requires innovative approaches such as those mentioned in the "methods" above. (IO Italia)

Recommendation 4: Formalise communications with stakeholders to instil a sense of transparency, predictability and stability to the IPS project. Avoid relying on informal communication (meetings, e-mails) only.

Suggested methods: Seek to establish written arrangements, specifying each parties' responsibilities and establishing "official" channels of communication.

Rationale: In at least one of the cases, a rather informal approach was selected to engage stakeholders taking part in project development. That means that no specific board was created,

34 https://www.designcouncil.org.uk/sites/default/files/asset/document/DesignCouncil_Design%20methods%20for%20developing%20services.pdf

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no fixed common project agenda was agreed upon, etc. In general, this represents a difficulty because it lowers accountability and regularity and fosters uncertainty. (X-Road)

Organisational/managerial aspects

<u>Recommendation 5:</u> Ensure the IPS project plan for implementation is structured reasonably, spreading it across well-defined work packages, aiming at reasonable deadlines, and by assigning clear responsibilities to each contributing stakeholder.

Suggested methods: Plan the completion of pilot(s) as a preliminary step. Then, the project should be divided into small, short-to-medium term manageable objectives that can be used as milestones to structure the project (which is helpful/beneficial/interesting for accountability as well as organisation). Ensure each of the contributing stakeholder is assigned clearly identified tasks.

Rationale: Most best practice cases adopted a phased, progressive plan for implementation, often beginning with a pilot phase and then progressing gradually towards the roll-out of a full-fledged service. This has helped coping with the large number of contributing stakeholders involved and with a number of adverse factors affecting complex, medium-to-long term projects, such as changes in political priorities across a project's lifecycle. (*Digisos, ASP, IO Italia, Latvija.lv)*

<u>Recommendation 6:</u> To keep every stakeholder active and feel involved throughout the IPS project lifecycle, plan regular information meetings to report on project progress, or set up a specific supervisory/steering board.

Suggested methods: Plan a precise project agenda early on and organise fixed-frequency meetings, where project progress is discussed, and next steps are agreed upon. Depending on the complexity of the project members can meet quarterly or semi-annually.

Rationale: In the case of complex IPS projects (Digisos, ASP) it was useful to establish a Steering Committee to allow for the coordination of all partaking stakeholders and for the monitoring of project progress at a fixed frequency. Moreover, these were occasions during which identified challenges and next steps were discussed.

Legal/normative aspects

<u>Recommendation 7</u>: Inscribe the IPS project's design within the existing legal framework, considering all the relevant legal provisions that can affect it, especially concerning data exchanges and technical architecture and requirements, to ensure perfect compliance. Also make sure every aspect of the co-creation process is legally compliant (e.g. use of personal data).

Suggested methods: Involve lawyers or legal experts from the very earliest stages of an IPS project, to precisely map relevant laws and regulations and adapt project design to those.

Rationale: In general, legal issues were an extremely important aspect of the cases examined. Either a thorough legal assessment is conducted to understand what applicable legislation is and how it can be complied with or an amendment of specific regulatory provision is proposed to lay the legal foundations for the IPS. (across cases)

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Recommendation 8: Where the pre-existing relevant legal framework does not set out sufficient provisions to cover all aspects of the IPS project, ensure the legal framework is complemented by formal agreements signed between the parties involved, especially concerning data exchanges and the type of technical architecture and requirements agreed upon.

Suggested methods: In case no specific legal framework regulates the IPS project and the cooperation among its stakeholders, all relevant parties should sign written agreements to ensure the necessary responsibilities and obligations are ascribed to each stakeholder. This is especially important when it comes to data management and exchange between institutions.

Rationale: In general, where no legal framework existed, best practice resorted to written agreements (data sharing, service level, subcontracting, etc.), to ensure a perfect assignment of responsibilities and liabilities among the stakeholders.

Political aspects

Recommendation 9: Secure political commitment by engaging policy makers at the earliest stage of IPS project to gather their own needs and requirements. This will ensure their support, which is crucial during the next phases of IPS implementation.

Suggested methods: On the individual level, resort to informal contacts via in person meetings, phone calls or e-mails. Organise meetings with relevant policymakers in which you can demonstrate the benefits of the project using early prototypes, future projections, among others. Try to identify "champions" who can act as a bridge between politicians and the project team. On the aggregate level, aim at aligning project priorities with overarching policy priorities.

Rationale: The support and determination of political decision-makers, the so-called political will (refer to 2.1-4), to develop and implement a project is essential, and it is often the starting point of any e-government initiatives. It was observed that in some cases, finding relevant figures who "evangelise" for the project at the policy level proves useful at the beginning of IPS project and in some cases also in the context of delivery. Concurrently, understanding the political priorities for digital transformation can help chart the way for a new IPS. In general, existent governmental strategies or laws provide the background on which new service offers can be built. Project owners who aligned proposed IPS with identified national policy priorities have steadily progressed on their timeline. (ASP, Io Italia, X-Road)

Technical/semantic aspects

Recommendation 10: Where available, use pre-existing technical solutions (overarching infrastructures such as national service buses, national cloud platform, public API catalogues) that can facilitate the integration of the public service under development with other existent services, which in turn can save development costs and reduce risks. Ensure the solution adopts common standards and vocabularies, as well as open specifications and consider open-source applications.

Suggested methods: Refer to EIRA to facilitate the development of interoperable solutions as it offers a reference model for architecture, useful documents and reusable solutions. Map existing

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data-sharing and interoperability solutions that could facilitate the integration of services and take the necessary steps to select the most suitable option and implement it.

Rationale: In some cases, new IPS were built upon a pre-existing technical/semantic architecture. In all those cases, this greatly facilitated the integration of services, as architecture provided a common semantic, ontological, and technological standard each party involved could refer to. Likewise, the adherence to European interoperability principles increases the possibility for other countries or organisations to adopt similar solutions. (X-Road, Latvija.lv)

Table 12: Summary of recommendations for the design phase

Recommendation	
Needs identification	1. Use a research approach for scanning the issues perceived by the community
Role of Stakeholders	2. Engage holders of data, service owners and service users (frontline staff, citizens) from the earliest stages
Stakeholder engagement	3. Contact, inform and provide an opportunity to contribute to every identified stakeholder early on
	4. Formalise exchanges with stakeholders
Organisational/managerial aspects	5. Structure the project across successive phases, and aiming at reasonable deadlines__ _
	6. Plan regular information meetings, or of a specific supervisory board
Legal/normative aspects	7. Inscribe the project's design within existing legal frameworks
	8. Ensure the legal framework is complemented by formal agreements signed between the parties involved
Political aspects	9. Secure political commitment by engaging policy makers from the start of the project
Technical/semantic aspects	10. Use pre-existing technical solutions that can facilitate the integration of public services

Delivery

Role of stakeholders

<u>Recommendation 11:</u> Keep stakeholders constantly informed throughout the IPS lifecycle to maintain their interest and support for the project.

Suggested methods: Consider devising didactic tools and monitoring instruments that can stimulate stakeholders' interest, involvement, and ultimately support, for the IPS project. Such tools and instruments can consist in distributing factsheets or using public dashboards to show progress.

Rationale: Ensuring that stakeholders are kept on board (through information about progress and concertation) throughout the IPS lifecycle is essential. If stakeholders lose interest or do not feel involved/heard enough, they may decide the project should go down their list of priorities or be

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taken out of it altogether. It is important to maintain interest and exchanges about the project high. (across cases)

Stakeholders' engagement

<u>Recommendation 12:</u> To ensure smooth reception of a new IPS by its users, it is essential that everyone can use it to its fullest extent. To do that, devise ways to develop digital competences and train service users.

Suggested methods: Developing support material (tools, kits, handbooks, guidelines) and offer training to facilitate the implementation of the IPS. Several channels, including digital, analog and physical interactions, should be provided to ensure everyone has the opportunity to receive support. Another relevant method consists in selecting some potential "super-users" within the network, who then provide training to other users. "Super users" or peer users need to be motivated, adequately trained, and have the right reporting instructions to inform the project team about potential user feedback.

Rationale: Throughout best practice cases, the training of users has represented a significant share of the overall project effort. While convenience of use, user-centricity and simplicity should be a basis of each IPS co-creation project, one should keep in mind the great variety of digital skill that exists within a population. To ensure the IPS developed is taken up regardless of each user's proficiency, it is thus necessary to propose solutions to develop the necessary skills.

<u>Recommendation 13:</u> Keep stakeholders actively engaged during the delivery of IPS to ensure every relevant point of view is considered and incorporated. Provide different channels and opportunities for users to significantly contribute to service delivery.

Suggested methods: Collect feedback from service users through special channels such as forums, customer support points, emails, dedicated sections in the portal/app to signal flaws or offer suggestions. Use results and input to optimise the solution and its delivery. Publish in the public domain the source code of the solution so that anyone (such as people as citizens, developers or designers), can contribute to the solution based on their expertise.

Rationale: The evidence from examining the cases with portals or apps has shown that users eagerly contribute to service delivery using the available interface or even enhancing some of its features based on their skills or experience. When the software solution is based on open-source code, available on public repositories (such as GitHub), anyone, including users, can contribute to its maintenance, development, or improvement. Likewise, the direct involvement of users in the provision of service is crucial for the next phase of service evaluation.

Organisational/managerial aspects

<u>Recommendation 14:</u> Have a unified and consequential management for the project team, coordinating the different stakeholders that are directly involved at the operational level, and establishing operational priorities and approaches, be result oriented.

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Suggested methods: Designate a coordinating project manager among operational stakeholders, which can act as a bridge between participants and as a representative to higher hierarchical levels. The unified project management, based on an established general project timetable compliant with all parties, can use project management tools to increase predictability and visibility of the project's progress. The manager(s) themselves may change along project phases, in function of their skill and availability.

Rationale: Despite the wide variety of stakeholders involved, successful project teams have a unified leadership across organisations so that conflict in the execution of operational decision-making is kept at minimum. In some cases, project operations were led by two different managers, which led to incoherencies, lack of visibility and predictability across the operational staff. In one of the cases, the setup had to be changed, establishing a single project management later on, to increase effectiveness and efficiency. In those cases where technology development (software, application, website) was foreseen, the responsible manager and their team used supporting tools for collaboration, version control and monitoring. (across cases, Digisos & XRoad for dual leadership)

Legal/normative aspects

Recommendation 15: In the case of cross-border IPS projects, ensure that political decisions between governments are grounded in a written agreement, possibly laying down an explicit roadmap.

Suggested methods: Before the start of the project, partaking governments should sign a Memorandum of Understanding (MoU),, setting out the IPS's objectives, the perimeter of cross-border cooperation, and operational solutions for data protection regulation and costs of data sharing.

Rationale: In the case of cross-border IPS projects, political decisions were formalised by a MoU between the two partaking governments, which provides a legal basis for the project to be conducted and settles potentially difficult questions, such as conditions for data sharing. (X-Road)

Political aspects

Recommendation 16: Seek political involvement when it can harness stakeholder involvement or help with overcoming roadblocks.

Suggested methods: The project team should conduct Informal talks and mediation (through direct oral interactions, phone calls or e-mails) with the relevant political decision-makers in order to engage them and to ensure their cooperation.

Rationale: Complex projects such as IPS projects that involve many organisations and even different countries need constant political support to avoid running out of "steam". Project "guardians" identified at the outset can prove useful in nudging policymakers when roadblocks appear. However, political involvement should be minimal at the delivery stage.

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Technical/semantic aspects

<u>Recommendation 17:</u> In the case of services that are integrated across jurisdictions (across local governments or national borders), consider devising ways of bridging the gap, if existent, between the technical skill and equipment of each partaking authority, to ensure no one is lagging behind in the delivery of the service.

Suggested methods: Ensure the authorities with the highest level of technical skill and equipment do not impose unrealistically high requirements which the rest could not follow. Make sure that these more skilled cooperate with the less skilled to provide them advice and training. Within the project's budget, plan the provision of decent IT equipment to each partaking authority which would need it.

Rationale: It was noted that, if not dealt with appropriately, an imbalance in IT skill and equipment could create difficulties for the project studied. For instance, when projects brought large urban cities and small rural villages together, special training and material equipment had to be provided to the often less IT-ready rural areas. Another example confronted one of the most advanced E-government promoter, Estonia, and its neighbour, Finland. The imbalance in IT preparedness between the two countries caused delays and misunderstandings.

Table 13: Summary of recommendations at the Delivery phase

Recommendation	
Role of Stakeholders	11. Keep stakeholders constantly informed throughout the project lifecycle to maintain their interest and support for the project
Stakeholder engagement	12. Devise ways to develop digital competences and train service users
	13. Provide relevant opportunities for service users and other stakeholders to bring them into the delivery of service
Organisation/managerial aspects	14. Have a unified and consequential management for the project team
Legal/normative aspects	15. In the case of cross-border projects, ensure that political decisions between governments are grounded in a written agreement, possibly laying down an explicit roadmap
Political aspects	16. Seek political support when it is instrumental for civic support or solving roadblocks
Technical/semantic aspects	17. Consider devising ways of bridging the gap that can exist between the technical skill and equipment of each partaking authority

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Evaluation

Role of stakeholders

<u>Recommendation 18:</u> Identify the stakeholders who will monitor and carry out performance-related activities. Clearly emphasise the importance of the whole range of diverse stakeholders as co-evaluators of IPS provision.

Method: specify the role of stakeholders in co-evaluating the way services are delivered and how their feedback will be used in IPS optimisation.

Rationale. In all examined cases, the project team had undertaken almost all performance-related activities. In most cases, it involved collecting statistics regarding the use of service, reporting on main established key performance indicators, the timeline etc. However, in addition to 'hard numbers', citizens participated as co-evaluators of their own experience in using the service offer. This provided an insider view on the use of service and helped improving the service offer.

Stakeholders' engagement

<u>Recommendation 19:</u> Devise specific channels and opportunities for service users and other stakeholders to significantly contribute to IPS evaluation, in order to provide dedicated spaces for qualitative evaluation. Ensure the availability of evaluation results to the wider public.

Method: the team should conduct citizen or user surveys, focus groups or individual interviews, and use rating tools and social media channels to involve stakeholders in IPS evaluation.

Rationale: in those cases where service users were actively engaged as co-evaluators, this provided concept validation for the product, evaluation of service accessibility (access, responsiveness, ease of use), identification of flaws and bugs, potential areas of development. In general, various digital tools enabled the co-assessment activity.

Organisational/managerial aspects

<u>Recommendation 20:</u> Establish a clear repartition of roles within the project team, designating one or several team member(s) as responsible for the evaluation of the IPS.

Method: while devising the organisational chart of the project team, make sure one or several team members are assigned the role of evaluation leaders. For instance, from the preliminary phase of the project, a specific person should be responsible for user testing and analysis, ensuring the alignment of the software functionalities to the collected feedback, needs criticism.

Rationale: Best practice shows that the thorough evaluation of any IPS project is crucial to bring to successful completion. For instance, following agile development principles, the team responsible for App IO iteratively carried out user testing during various development 'sprints'. The same team responsible for development ensured that the service was iteratively built to respond to users' needs by carrying out user testing for each prototype. Therefore, assessment throughout the IPS

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lifecycle, using different research approaches (e.g. qualitative vs. quantitative indicators) is essential to plan sufficient human resources to ensure evaluation is taken care of in a satisfactory manner. (across cases).

Legal/normative aspects

Recommendation 21: Having gained experience and understanding of the legal context of the project and its shortcomings, suggest relevant legislative changes to decision-makers.

Suggested methods: Conduct an evaluation of regulatory challenges faced by the project team throughout the project lifecycle and put forward a number of operationalisable proposals, which would make the implementation of similar projects more straightforward in the future.

Rationale: Best practice demonstrates that some legislative changes can occur when suggested by project teams, as their experience provides them a certain legitimacy. (Digisos, Latvija.lv)

Technical/semantic aspects

Recommendation 22: Devise a set of relevant quantitative key performance indicators (KPIs), which can be used to assess the adequacy of the technical solutions selected and to drive change or continuity.

Method: In function of each IPS project's objectives and characteristics, the project team should choose (or comply with, if any legislation or official guideline applies) certain quantitative KPIs which constant monitoring can help pinpoint where technical change or continuity are needed. These can relate to the uptake of the project's outcome (e.g. number of connections per day), for instance. These indicators can be made public to ensure transparency, and to stimulate the public's interest.

Rationale: Best practice shows that quantitative KPIs are systematically used to assess whether new IPS solutions satisfy the expectations of their initiators. These play an essential role in allowing decision-makers, and the public at large (when made public) to monitor the project's progress and to hold the project team accountable. Combined with qualitative indicators (see recommendation 19), they can help identify needs for change or continuity (across cases).

Table 14: Summary of recommendations at the Evaluation phase

Recommendation	
Role of Stakeholders	18. Establish the stakeholders who will provide feedback and the role of service users as co-evaluators
Stakeholder engagement	19. Adopt specific qualitative indicators for users to help identify service weaknesses
Organisation/managerial aspects	20. Establish a clear repartition of roles within the project team
Legal/normative aspects	21. Suggest relevant legislative changes to decision-makers
Technical/semantic aspects	22. Devise a set of relevant quantitative KPIs for evaluation

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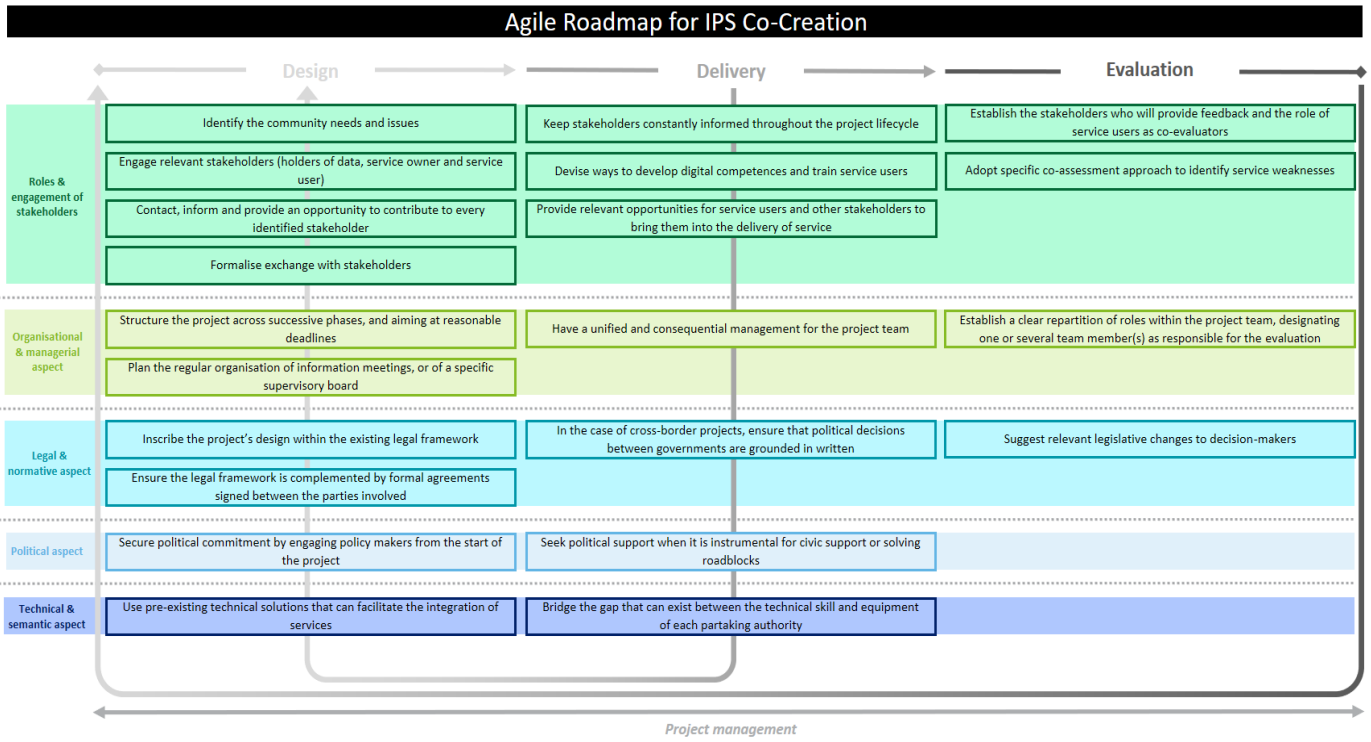
General Recommendation, across phases:

Build your digital solutions (or IPS) iteratively by breaking it down into shorter cycles (sprints) and sharing prototypes early and often. Conduct user testing, collect feedback and revise the design accordingly through user research and early protypes to gain a minimum viable product (MVP) as early as possible.

Agile roadmap



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Deliverable 2.1 General Conclusions: First Draft of the IPS Holistic Framework

This deliverable represents a first, preliminary step towards the formulation of the IPS Holistic Framework, the *raison d'être* of the inGOV Project. The holistic framework consists of four main pillars (governance, agreements, stakeholder engagement, design and delivery), which transferred to the context of an IPS project, requires a well-defined plan – the agile roadmap as the fifth pillar – to support organisations in the achievement of set goals. As such, this report paves the way towards addressing the following scientific and innovative objective, and business objective:

- "S.I.O. 1: to investigate IPS Governance"
- "B.O. 1: to construct an IPS holistic framework for IPS co-creation and co-delivery that includes guidelines and recommendations on IPS Governance, on IPS Agreements, on Stakeholders involvement and on implementation as well as an agile roadmap"

To do so, the report is divided into three distinct though interconnected sections. The first section sets out to produce a comprehensive theoretical analysis of the five dimensions of the IPS holistic framework. This has consisted in the thorough review of relevant academic literature, institutional material and publicly accessible primary or secondary documentation. This analysis explores the current state of the art of each of the five dimensions studies, across five chapters.

Chapter 1 analyses the different approaches and debates surrounding the concept of governance applied to IPS, and provides an array of analytical tools that can be used in the study of real-life practice and in the actual conduct of this practice. Chapter 2 defines, classifies and contextualises the different types of formal agreements that have been observed in and around IPS projects. Used as a means to enhance sometimes-incomplete legal and regulatory frameworks, these are instrumental in implementing data exchanges and interoperable solutions. Understanding them is thus crucial in studying or developing IPS. Chapter 3 reviews the relevant literature discussing stakeholder engagement methods. More particularly, it analyses academic debates surrounding the identification and engagement of stakeholders throughout the lifecycle of co-created IPS initiatives. This is essential in analysing or implementing IPS co-creation, as the ambition to involve and empower the relevant stakeholders is one of the very specificities of this type of public service provision. Chapter 4 analyses the academic literature discussing the various aspects characterising the implementation of IPS, from design to delivery. It covers a wide range of factors that can influence the implementation of co-created IPS, from politics to culture, technical and semantic issues, management, organisational setting, and legal framework. This chapter provides key analytical tools to analyse challenges and enablers in IPS co-creation initiatives for researchers and practitioners alike. Finally, Chapter 5 defines the concept of a public policy roadmap, and reviews its limitations and real-life occurrences. Subsequently, the concept and principles of agility in the context of IPS roadmaps are analysed. This provides the theoretical basis for the elaboration of an IPS agile roadmap in the recommendations section.

The second section of the document is meant as a practical counterpart, and a validation exercise, of Section 1. The section sets out to present how the concepts investigated and developed throughout the theoretical analysis of the five dimensions of the IPS holistic framework apply to the real-life practice of IPS co-creation. To this end, five best-practice cases are compared through the lens of the

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framework's conceptual and theoretical tenets. Each case is investigated by conducting a documentary analysis of publicly available material, and a comprehensive series of key stakeholder interviews.

First, Chapter 6 presents the detailed results of the study of X-Road BR (Estonia/Finland), Digisos (Norway), ASP (Hungary), App IO (Italy), and Latvija.lv (Latvia). The selection of these cases derives from the multiple case study conducted under Deliverable 1. This continuity in the sample of cases allows for a direct coherence between work packages, and reflects the relevance of this group of cases in relation to the concept of IPS-Co. The real-life implications of the holistic framework's components in each case are examined across the successive phases of the co-creation process as described under Deliverable 1 (design, delivery and evaluation). This case analysis duly validates and illustrates the conceptual and theoretical insights distilled throughout the previous section. Second, Chapter 7 consists in the comparison and discussion of the previous chapter's findings. This process of comparison and discussion leads to the identification of the four most important themes across the cases observed: identification of needs/problems and knowledge generation, stakeholders' roles and engagement, legal arrangements and inter-organisational agreements, and monitoring and accountability. These themes are of great analytical relevance across the cases observed, reflecting the value of the work made under the previous section. Real-life challenges and enablers are also identified, mostly within the following aspects of implementation: Legal, technical/semantic, organisational/managerial and political.

The third and last section of this report, which consists in Chapter 8, is built upon the theoretical and practical foundations provided by the two previous sections. Based on the findings enunciated above, the section is intended to present a first set of actionable recommendations to IPS practitioners, inGOV pilots included, regarding the design phase in particular. Therefore, twenty-three recommendations are formulated, including ten recommendations on the design phase, seven on the delivery phase, five on the evaluation phase, and one general recommendation reaching across phases (that suggests implementing agile methodology throughout the project lifecycle). Most of these recommendations (roughly half of the total) cover stakeholder engagement, confirming the crucial importance of involving citizens, businesses and public administrations in any IPS-Co initiative. There follows a first iteration of an IPS agile roadmap, which contextualises the content of recommendations in a graphical representation, and emphasises the notion of agility.

It is argued that this first deliverable addresses S.I.O. 1 successfully, as the theoretical and practical investigation conducted under Sections 1 and 2 provides sufficient contextualisation, analysis and validation of inGOV's approach to IPS Governance. Conducting this investigation on IPS Governance allows for the first steps towards reaching B.O.1 to be made. Indeed, it is argued that this deliverable already provides solid foundations for the final, operationalisable version of the IPS holistic framework for IPS co-creation and co-delivery, and already includes valuable guidelines and recommendations on IPS governance, agreements, stakeholders' involvement and implementation as well as a first iteration of an agile roadmap. Providing recommendations and a draft agile roadmap, already at an early stage, was essential in providing inGOV pilots with empirically backed guidance. This is instrumental to advise pilots on how the conduct of their design phase, and is thus a priority for this report.

However, limitations keep this report from addressing B.O. 1 fully. First and most importantly, due to the necessity to provide inGOV pilots with guidance on time for them to be able to consider it in their design phase, this report, which requires complex theoretical and practical analytical tasks, had to be delivered within a short period that covered summer vacations. Given times constraints, leading partners for each chapter agreed to carry out a more purposive review of literature, focusing on the most relevant sources. As consequence, a more traditional rather than systematic literature review was

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conducted. Yet, the authors have used systematic searches and used defined criteria to select the relevant material, including grey literature. Despite the limited timeframe, the number of best practice stakeholders interviewed had to be kept manageable. However, the purpose of identifying and interviewing stakeholders from various organisations with different perspectives was fairly reached, although a longer time frame would have allowed for an even more comprehensive analysis of practical cases. It is also important to highlight that the analysis of best practice cases is limited by the lack of access to the field, because of persisting Covid-related travel restrictions.

In this sense, the next deliverables planned in Work Package 2, which are planned to be prepared until the end of the project period, will allow for a refinement of the work that has been carried out in this study. In particular, the theoretical and practical analyses are expected to be enriched, and recommendations and the roadmap will be ameliorated by further feedback from case owners, project partners, and in particular by practical insights on the implementation of recommendations by inGOV pilots. The next deliverable is also meant to deepen the analysis of interlinkages between the five dimensions of the IPS holistic framework, and to provide an operationalisation of the framework through further study, interpretation and graphical visualisation.

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Annex

Template of questionnaire

Interview Guide

INITIATION/DEFINITION STAGE

1. How was the need for this service first identified?

*The following question is only for respondents of organizations that are **not** initiators*

1a. How did you contribute at the stage of need identification/definition?

2. Which groups were considered as being the key stakeholders at the needs identification stage?
3. How were stakeholders engaged at the stage of needs identification? (e.g. large consultations, surveys, informal meetings)

PLANNING STAGE: GOVERNANCE & AGREEMENTS

If information is available for Q4, Q5, and Q6 please skip directly to Q7

4. Which of the following stakeholders were involved at the planning stage?
   - □ Political representative/decision-makers
   - □ Public organization(s) (public managers, civil servants, frontline staff)
   - □ State-owned enterprises
   - □ Private actors (e.g. companies providing service solutions)
   - □ Third sector organisations
   - □ Citizens
   - □ Other _____
5. How were stakeholders involved?
6. What was their role and responsibility at that stage?
7. Compared to the initial phases of the project, were there:
   a. Any changes in the composition of stakeholders involved, which one?
   b. Any changes in their responsibilities?
8. How are resources (funds and people) secured for this project/service?

8a. Did the financing scheme change since the launch?

9. Is there a board or a body with a mandate for this project/service?

□ YES □ NO

9a. Are you represented there, who is? 9c. Is there a Steering Committee?

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9b. How often do the members meet?

9d. Are you represented there? Who is?

10. How is progress monitored?
11. Are there any reporting obligations on partners' side?
    a. If YES, which ones?
12. What kind of performance indicators do you use, if any?
13. Were any legislation changes required to adopt the service?
    a. If yes, which amendments were adopted?
14. Have you formalized the working relationship with the involved stakeholders?
15. How is data exchange and data processing ensured between sources/databases? Please specify:
    a. Any technical arrangement
    b. Any operational arrangement
    c. Any interoperability arrangement
    d. Other
16. What kind of data need to be exchanged? Could you please describe them?

IMPLEMENTATION

17. Could you please describe the nature and extent of service users involvement during:
    a. Delivery phase
    b. Assessment phase
18. What type of methods have been used to engage participants at:
    a. Delivery phase
    b. Assessment phase
19. How can service users contribute to the optimization of the service process?
20. Did your organisation enact any of the following to adopt & implement the service?
    a. Change in the organisational structure
    b. Change in business processes (e.g. eliminating steps after process mapping)
    c. Redesign of functions
    d. Redesign of information systems
    e. Other
21. Was any support provided for these changes inside or across the organisations? (training, workshops)
22. What type of challenges have you encountered during the implementation?

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23. How did you tackle those challenges?
24. Could you please share any lessons you have learned since the beginning of the project?

CONCLUDING

- Would you like to add anything else to what has been discussed?
- Would you like to receive the transcript and validate it?
- Would you like to participate in a workshop validating the draft of the framework?

Thank you so much for your time and contribution!

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List of interviews and anonymisation

Name of the Initiative	Organisation	Anonymised title	Date of interview	ID Number
X-ROAD Business Registries	Ministry of Economic Affairs (Estonia)	High-ranking official in charge of the project	15/09/2021	EF05
	Ministry of Justice (Estonia)	High-ranking official in charge of the project	09/09/2020	EF03
	PRH (Finland)	Leading project officer	12/08/2021	EF01
	Ministry of Finance (Finland)	High-ranking official in charge of the project	13/09/2021	EF04
	RIK (Estonia)	Leading project officer	01/09/2021	EF02
Digital application for social security (Digisos)	NAV	Leading project officer	28/04/2021	NO05
	Municipality of Bergen	Project officer	31/08/2021	NO03
		Project officer		NO04
		Leading project officer		NO01
	City Council of Oslo	Policymaker	31/08/2021	NO06
	Municipality of Oslo	Project officer		NO02
Municipality Application Service Provider (ASP2)	Governmental Information-Technology Development Agency (GITDA)	Project officer	30/08/2021	HU01
	The Hungarian State Treasury	High-ranking official in charge of the project	08/09/2021	HU02
	Ministry of the Interior	High-ranking official in charge of the project	28/04/2021	HU03

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Latvija.lv	State Regional Development Agency	Leading project manager	15/09/2021	LV01
	State Regional Development Agency	Project officer		LV02
	State Regional Development Agency	Project officer		LV03
	VARAM	Leading project officer	06/05/2021	LV04
App IO Italia	Io Italia	Leading manager	04/06/2021	IT02
	Team Digitale	Leading Manager	27/05/2021	IT01
	ACI	Senior Manager	26/10/2021	IT05
	Municipality of Milano	Leading project officer	25/10/2021	IT03
	Municipality of Valsamoggia	Senior Manager	25/10/2021	IT04

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