Identity Management in PUbLic SErvices

D2.13 Blueprints for enhanced public governance and public engagement

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Executive summary

The blueprint presented in this deliverable is based on the service blueprint model and builds upon the various activities and results from other work packages. These activities include workshops, interviews, surveys, pilots, and internal and external meetings, as well as formal and informal. Throughout the project, the case owners and the participants in the various activities have given feedback on the services provided by public administrations and the IMPULSE solution, which has been used in conjunction with literature to develop the blueprint.

The purpose of this document is to present the service blueprint designed based on the gathered information. In comparison to the normal service blueprint, the blueprint presented in this deliverable includes recommendations and best practices. It focuses on incorporating public governance and engagement in service design and development.

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Summary (for dissemination)	This deliverable presents the service blueprint designed and developed to consider public engagement and governance in developing public services. The blueprint is based on the results from other work packages within the project and reviewing relevant literature.
Keywords	Service blueprint, digital public service, public engagement, public governance

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Table of contents

List of Figures

List of tables

Abbreviations and acronyms

AI: Artificial intelligence

eID: Electronic identification / electronic identity

TAM: Technology acceptance model

WP: Work package, a collection of activities within the IMPULSE project.

1   Introduction

This deliverable focuses on building a service blueprint that considers public engagement and governance for a public service that utilizes eID. The blueprint is generalized based on the results from the various work packages in the project. It will contain recommendations and best practices for the service provider to consider while designing, implementing or adopting a digital public service. The best practices and recommendations are gathered from the results of the various activities within the project, as well as literature and interviews with public administrations and service providers.

The next section will present the definitions of public governance and public engagement, while the third section will discuss building the blueprint. The fourth section will present the blueprint, recommendations, limitations and other considerations. Finally, the deliverable will have the concluding remarks.

2   Definitions of public governance and public engagement

Involving citizens in decision-making is often considered a beneficial approach as it will bring insights and ideas from the people who are being affected by the decisions made by the higher-ups. With the involvement of citizens, there are different terminologies used based on how the citizens' involvement has been implemented and what the end goal is. In this deliverable, the focus is on *public governance* and *public engagement.*

Public governance: Public governance refers to how the public can govern (manage, control). In reality, this means how the public interests and authority are addressed and considered in decision-making, design, and development. This is important in public services as the services are meant for the public, so their interests should be aligned with the design and development of the service. Many cities, municipalities and nations have open forums for the public to participate and present their interests, but these may be forgotten or skipped by the decision-makers in favour of some other benefits (OECD, 2023).

Public engagement: Public engagement refers to how the public can be involved in the process of design and development. *Public participation* is another term that is used to often refer to the same thing. The idea of using public engagement is to have the public being represented in the processes and decision-making. There are many different levels to engaging the public, such as communication, consultation, involvement, collaboration, and empowerment. The different levels will reflect how much power the public opinion has in decision-making. In the case of the IMPULSE project, the public was involved with participatory design to develop the IMPULSE solution as well as having the public involved in the testing phase of the solution to further give them opportunities to voice their opinions (Rowe & Frewer, 2005, Evans, 2020).

Considering the public's interest and including them in the process of service development is vital. Without public governance, the whole service itself may end up being useless as it does not consider the needs of the public. Without public engagement, the development and end result of the service may be subpar and not used by the public as the service does not meet their needs, demands or expectations. Public engagement is a form of public governance and should always be considered during the design and development of services aimed at the public.

3   Building the blueprint

The blueprint in this deliverable uses the service blueprint technique (Shostack, 1996). The service blueprint is a graphical representation of a service with key contact points in the service processes as well as the various actors related to the service. Everything starts with the need to identify the activities, actions and sequences of activities. The different actions can belong to the customer, front stage, backstage or to the support. In its simplest form, the service blueprint can be used for a simple representation, but it can also be used to diagnose deficiencies in the process as well as for designing new services or improvements.

The blueprint designed in this deliverable will reflect a generic eID scheme and a generic public service. These generic steps are extrapolated from the IMPULSE case studies and external sources. The blueprint will have recommendations and best practices tied to the design. To be able to provide best practices and recommendations, it is necessary to figure out what drives *the acceptance and adoption* of digital services and the use of technology and what kind of *challenges and barriers* exist for the users and policymakers.

3.1   User acceptance

One major factor in the adoption of a new technology or a digital service is *user acceptance*. The user acceptance can affect how much people will use a specific technology or a digital service.
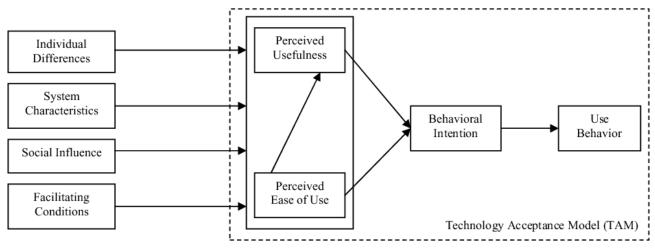

Figure 1: Technology acceptance model (Venkatesh & Bala, 2008).

There are many variables that affect the user acceptance. Two main factors are the *perceived usefulness* and the *perceived ease of use,* where both contribute to the intention to use a given technology and, finally, to actually use it. These two factors are then further influenced by several outside variables, such as individual differences, characteristics of the system/service, facilitating conditions, and social influence.

Based on the context, the variables can be different and more specific. Figure 1 presents a generic technology acceptance model (TAM) (Davis, 1989; Venkatesh & Bala, 2008) with the possible external variables that may affect user acceptance, while Figure 2 presents a case-specific acceptance model related to the acceptance of the self-sovereign identity model (Guggenberger et al., 2023).
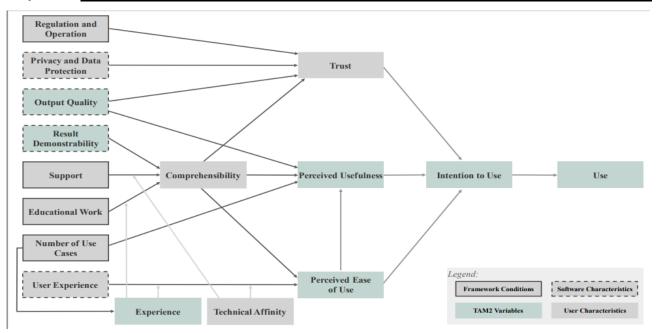
Figure 2: Acceptance of self-sovereign identity model (Guggenberger et al., 2023).

In the case of an eID solution and a public service, major external variables are *user experience*, *support*, *privacy and data protection*, *number of use cases*, *regulation and operation*, and *output quality*. Based on the pilot results described in D2.12 "IMPULSE pilot assessment", privacy and security aspects are very important for many people, and people often require support to be able to fully understand and utilize the given technology.

Utilizing public engagement and governance, many of the external variables can be gathered from the feedback and considered during the development of the public service, thus ensuring a higher possibility for the service to be accepted and used by the public.

3.2 Barriers and challenges

Implementing a new digital service will bring various barriers and challenges to the users as well as the policymakers that should be carefully considered in advance. Table 1 recaps different barriers and challenges that are further explained in the separate subsections. These have been collected from the various activities within the IMPULSE project, such as the end-user pilots and various workshops organized with partners, external experts, and digital innovation hubs, as well as from literature reviews performed for various deliverables for the project.

Table 1: Barriers and challenges.

Barrier / Challenge	Explanation
Age difference	User's age can have an effect on how well they accept and adopt changes in their services.
Level of knowledge and education	The level of education will affect the users' knowledge, competence and willingness to try new things. Users with less knowledge may be more distrustful towards new services and technologies.
Previous experience	The previous experiences users have will have a positive or negative effect on how they perceive similar services and technologies.
Privacy concerns	Users have a varying level of privacy concerns. Some share personal information more willingly than others.
Security concerns	Users will have security concerns that need to be properly explained and shared with users.

Standards and regulations	Different legal and ethical standards and regulations need to be followed based on the country of operation.
Technical competency and available technology	Users have different levels of comfort and knowledge on how to use technology. Some have difficulties using new technology. In addition, not all users have smartphones, tablets, computers and other technology readily available.
Value vs. Required work	The service or technology needs to bring value to the user, and the value needs to be higher than the required work to be able to use the service.

Age difference

The user group of any public service is heterogeneous, with different ages, backgrounds, and competencies. Users of different ages may be more or less competent in utilizing technology, and many elderly people will have internal barriers set up against change. For example, if a service has been provided in one way for years and suddenly it is being transformed and changed, the users will more than likely reject the change and only over time will they start to accept it. Younger users are more easily accepting of new digital solutions and services if they have grown up in such a digital environment. The policymakers should consider all various ages and try to first encourage the younger people to start utilizing the new service or technology and slowly have the older generation shift from the previous method. This means that the change cannot be immediate as it needs to be inclusive to everyone, and people will take time to get used to the new service and technology, and there are bound to be issues or problems in the beginning (Friedhoff et al., 2023).

Level of knowledge and education

Another major difference between users is the level of education and level of knowledge. Even within the same age group, people will have varied levels of education and knowledge on how everything works. Some users will have vast amounts of knowledge and require less help and education to trust and use the new service or technology, while other users may have limited to no knowledge and need support, explanations and convincing to fully accept and adopt new services and technologies. As evidenced by the pilot results described in D2.12, users would like to know how the technology they use works on a basic level, at the very least. This means that policymakers should consider some methods of education or knowledge transfer to all users so that everyone would have at least a basic level of knowledge to work with. The information should be provided as clearly and simply as possible so as to not confuse users with overly technical terms and explanations that provide nothing more than more confusion and frustration to the users (Cubric, 2020; Friedhoff et al., 2023; Guggenberger et al., 2023).

Previous experiences

Another possible barrier and challenge can be the previous experiences of the users. If users have negative experiences or views on specific technology, such as AI or blockchain, they are more hesitant to try and accept new solutions that use the same technology. On the other end, the novelty of a technology can act as a barrier for users. Users may be uncomfortable with systems and technology that do not work as they expect or use technology completely unknown and unfamiliar to them. For example, many users have not used voice or iris recognition for logging in and may be hesitant to use them. The novelty of an approach can be difficult to accept by the majority of people (Cubric, 2020; Friedhoff et al., 2023; Guggenberger et al., 2023; Portz et al., 2019).

Security and privacy concerns

People have different levels of comfort with sharing personal information. Some people are more willing to share personal information with any reliable and credible service provider, while other people are strict and read different consent forms and agreements carefully before accepting to share any kind of information. Privacy concerns are also heavily related to security concerns. If a service provider or technology has been deemed unsecure, people will have more privacy concerns and are unlikely to trust or use them (Keil et al., 2022). However, if the concerns are due to a lack of knowledge of the technology or service, these can be alleviated with proper education and explanation. Service providers should be ready to explain to users how the service works and how it protects personal information and privacy in case any user has these concerns (Andersen, 2021; Guggenberger et al., 2023).

Standards and regulations

The ethical and legal standards and regulations may be an unknown variable in many ways. While the usage of standards and regulations does have a positive aspect, the actual implementation of the standards can be difficult. In some cases, the implementation of a standard can lead to more complex solutions due to the requirements of the standard. There may also be many standards and regulations that give generic rules that should be followed, but there are no details on how to properly implement any of these rules. Finally, the standards and regulations may not be international and have a high degree of variance among different countries (Custers et al., 2017).

Technical competency and available technology

Finally, the various users will have different levels of technical competencies and available technologies and items that they can utilize (Keil et al., 2022). Some people will have various mobile devices, such as tablets, smartphones, laptops, and many other things, while other users may have old mobile phones, no access to computers and rely on physical services. Implementing an eID scheme in a situation where not all users have a digital identity can be detrimental to service adoption by the public. It is necessary to make sure that all possible users have an equal opportunity to access the service, and if an eID is necessary, all users should have the possibility to get a valid digital identity. If the person does not have a valid passport or ID card, they would not be eligible for a digital identity within the solution. It is possible that there is a person who does not have a valid ID card or passport anymore, though unlikely. A more limiting feature of the IMPULSE solution is the facial recognition requirements. It is entirely possible that the camera on the phone does not function properly or they do not own a smartphone, and thus, the IMPULSE solution cannot be used without getting a new smartphone. This acts as a limiting factor that would place users on unequal grounds.

Value vs. required work

Any service and technology that users want to use brings them some kind of value. The value can be tangible, such as money and time, or intangible, such as enjoyment. Whenever there is competition, users would select the one service or technology that brings them the most value with the least required work. The required work can be things such as installation of software, creating accounts, complexity of a system and so on. This means that the service and technology need to be as convenient as possible and bring the most value to the user. If a system is too difficult to use, users will quickly stop using it unless it is absolutely necessary, i.e., it brings tremendous value. Even without any kind of competition, users need to perceive some kind of value in the usage of the service unless it is mandated by the public administration (Andersen, 2021; Portz et al., 2019; Sohn & Kwon, 2020).

4   Service blueprint for digital public service using eID

Based on the various outputs from the literature and the IMPULSE project activities, the general service blueprint was developed. The outputs refer to the many different activities done in different work packages within the project, such as the workshops organized by WP6 or the end-user pilots done in WP2. Additionally, various meetings and short interviews were arranged with different partners separately in the course of the project that served as gathering feedback in relation to how public administrations can launch a new service. Originally, the blueprint focused only on the usage of the eID part, but after some consideration, it was realized that the steps before are really important. Afterwards, the blueprint was extended from just the usage part to include the previous steps as well.

The blueprint was designed to be as generic as possible in terms of the eID service steps, as different eID schemes work differently, but each has a relatively similar outline.

Figure 3 presents the whole service blueprint for developing and accessing a public service utilizing eID. There are various colours used to show the actions done by the end-user, technology providers, technology, or public administration, as well as different colours for recommendations and best practices. The colours and actors in the blueprint are as follows:

- Public administration – Represents actions done by the public administration relevant to the left side of the blueprint. Coloured with purple
- Technology providers – Represents actions done by the technology or service providers relevant to the left side of the blueprint. Coloured with ocean
- Citizen actions – Represents actions done by citizens, coloured with scarlet.
- Technology actions – Represents actions done by the technology relevant to the right side of the service blueprint (Step 1). Coloured with aqua
- Best practices – Notes the different best practices for the steps, coloured with light green.
- Recommendations – Gives recommendations for the different steps, coloured with dark green.

On the left side of the service blueprint, there are five different rows. The first row is fully representing the customer actions that, in this case, are the citizens using the service. Front-stage interaction refers to what the customers (citizens) are communicating with directly. In the case of this service blueprint, the citizens will directly communicate with the public administration before the launch of the service and then with the technology (step 1). Backstage interactions relate to actions happening behind the scenes that the customers are not in direct contact with. Finally, support processes refer to anything that supports the overall functionality of the service.

The blueprint will be further explained in section 4.1, where the blueprint is divided into two parts to improve the readability.
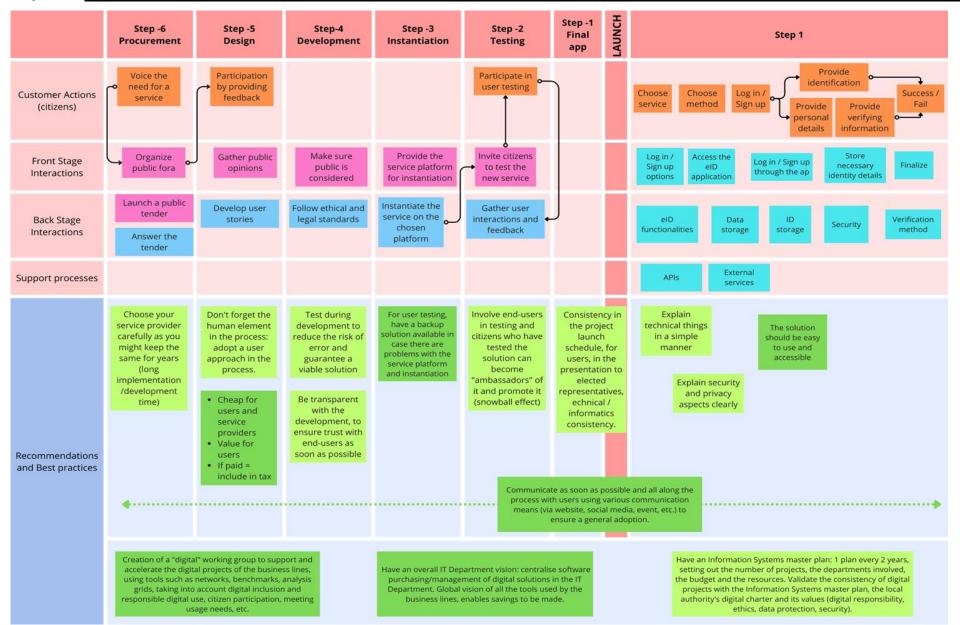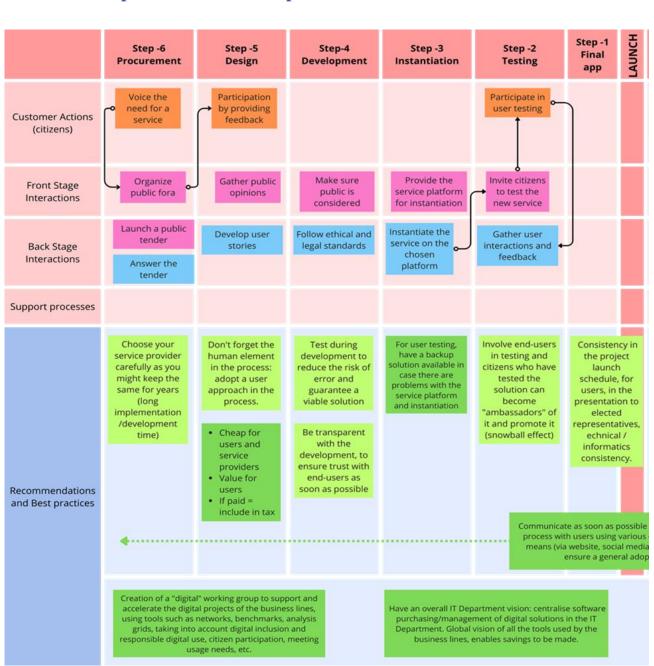
Figure 3: General service blueprint for utilizing eID.

4.1   Explanation of the blueprint

Figure 4: Service blueprint, part 1.

Figure 4 presents the first half of the service blueprint. This half considers the steps before the actual eID and service are accessed. Everything starts from the procurement stage and then goes through design, development, instantiation, and testing before going to final implementation and launch in Figure 5.

Procurement stage:

Everything should start with *public governance*, where the public can voice their needs and requirements and direct the procurement of services. To enable public governance and engagement, the public administrations should have some open forum available, either physical or online forum. At the same time, the public administrations need to launch tenders to find possible service providers and developers. For the procurement step, there are two recommendations that the public administration should follow. One is to have an *overall IT vision* for managing and purchasing digital solutions to save money and not buy several different software to do the same thing. Another is to create a *working group* to support and accelerate the projects that would use

different tools for analysis, benchmarking, considering digital inclusion and being responsible for involving the target users and meeting their needs.

For best practices, the two important things are to *choose the service provider carefully* as they would be in a long relationship with implementation and development taking time, as well as *having an information system master plan that is updated every few years*. The service provider should be trustworthy and not have a bad reputation amongst target users because the public may be unwilling to support, use or trust the solution if it is being developed by a corporation that has a bad reputation. However, the company is not necessarily prestigious and can be a relatively unknown company, and the users would still be willing to use the solution. For the master plan, important aspects are to set the number of projects, budget, security, ethics, data protection and other relevant designs for all projects to follow.

Design stage:

After the procurement of the service has been decided, it is time to move on to the design phase. During the design, it is important to engage the public and have them involved in the design process. If the public is not involved in any way, there will be problems in the design as not all scenarios and use cases are thought of. It would be highly advised that technical partners would develop user stories based on the public's feedback and opinions. In addition to these activities, there are three recommendations for this stage: *if the solution has to be paid, it should be included in the taxation*, the solution *should provide value for users* (often by involving multiple services), and it should be *relatively cheap for users and service providers*. Most participants in the IMPULSE pilots said that they would prefer if the solution requires payment, the payments should be included in the taxes and that they would be unwilling to pay other fees for a public service. For private services, this can be different. The value provided to the users can be tangible, like money and time, or intangible, such as ease of use or better than alternative solutions. These provided values should also be advertised and mentioned to the public to encourage their usage of the solution. For the best practice, designers should *not forget about the human element* and adopt a user-centric approach in the process.

Development stage:

During development, the public administration should make sure that the voices and opinions of the public are considered so that *public governance* is improved. The technical partners should follow ethical and legal standards within the development process of the solution. For this step, there are no recommendations, but there are two best practices that are important to the public administration and the technical partners: *being transparent* and *testing during the development*. Being transparent refers to the technical team being clear on how the solution is developed and how the solution would work so that the public has a better idea of how it would work and gives their opinions and feedback. The public administration, on the other hand, should be transparent on how the public is being considered with the development. These can be actions, such as public notices or announcements, involvement of the public in the development and being open about how the concerns and voices of the public are being considered and implemented. The second best practice is necessary in any good development cycle, where the solution is tested while under development. The testing can be internal testing and not require outsiders, but it would be advisable to have some public members in the internal testing as well to reduce risks and be more likely to achieve a viable solution.

Instantiation stage:

The fourth step in the process is the instantiation of the solution, and for this, there should be a platform for the service providers to use. The main recommendation is to have *a backup platform or solution* before the final testing phase in case there are problems with the instantiation process. Instantiation is the process of initializing software with the initialization arguments. It is the step that is done after installation, the "first launch" of software.

Testing stage:

Finally, the last activities are in the testing phase, final implementation and launch (the last two are shown in Figure 5). As best practice, the testing should *involve the public* as much as possible, and a diverse group and the citizens involved in the testing *would become "ambassadors"* and promote the solution. This means that the public administration should invite citizens to participate, and the technical partners should use this opportunity to gather user interactions and feedback. During final implementation and launch, the public administration should be the one to *advertise the new solution* so that as many people as possible would know

about it. If it is not advertised at all or by the developing company, people might not know or trust the solution as much. As a best practice, there should be *consistency with the launch schedule*.

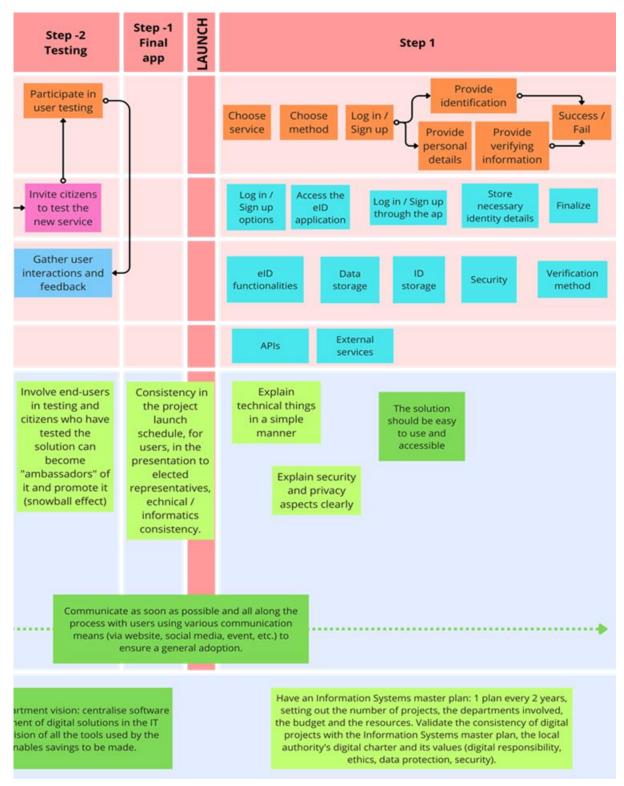**Implementation and launch stage:**

Figure 5: Service blueprint, part 2.

Figure 5 presents the second half of the blueprint that focuses on the eID aspect of the service. The generic actions done by the end user are described in the first row, while the second, third and fourth rows describe the technical aspects of the eID solution. The second row focuses on the interactions between the end user and the

solution, while the third row describes what happens in the background of the solution in generic terms, and the fourth row includes the few supporting processes that are required for the eID functionalities.

The most important aspect of the service blueprint is in the last row, which includes the best practices and recommendations. The given recommendations include *easy to use*, *accessible*, and *needs to function*. These three are all technical recommendations, and they should be fulfilled. There are also two best practices that *explain technical things in a simple manner* and *explain security and privacy aspects clearly*. These reflect on the differences in users' knowledge and competencies as well as on the aspects that most users find important. The technical, security and privacy aspects need to be explained clearly and simply, not with just a privacy policy that is long and tedious to read by everyone as not all users would spend time to read them, nor would they necessarily understand the legal and technical jargon within the document. Of course, the official documents need to be available, but there could be a short and simplified version for users to read and access. In addition, the service providers should be clear on how the solution works and how data is possibly being stored and processed. This information should be easily found somewhere.

When comparing the two parts of the blueprint, it can be seen that the public administration has a larger part in the first half of the blueprint, and technology providers have a larger part in the second part.

4.2   Recommendations for use, limitations and other considerations

Usage recommendations

The blueprint recommended to be used to develop or improve a digital public service that would utilize eID. The blueprint can be used as:

- A building template to be followed
- An example of what can be done
- A comparison or reflection point to check if there has been anything that was forgotten or that could be changed.

The blueprint is designed to be as general as possible, which is a benefit as well as a drawback. The blueprint can be adapted to various different situations, but it does not provide specific instructions for any specific case, and thus, the details need to be separately designed by the service provider.

While the blueprint is designed for a digital public service, it could also be used for the private sector if the plan is to consider the end-users (public) in the service design and development. Additionally, the blueprint uses eID as the sign-up and login mechanism for the service, but the blueprint can be adapted to other situations, or the eID section can be discarded from the design.

To help with the service development, other tools are recommended to be used in conjunction with the service blueprint. For example, to make full use of the blueprint and guarantee acceptance by future users, it is possible to go through the steps of highlighting the needs and the process for meeting those needs. This can be done in three stages, which can be iterative depending on the need and its response:

1. **Framing and formulating the problem/need** (*what, why, from where, for whom, by whom, etc.*). It can be done by filling a table (that can be updated after each iteration to get a progress report on the solution/product), such as the one as follows:

Stakeholders (who/to whom/by whom)	Stakeholder 1	Stakeholder 2	Stakeholder 3
Needs/ Issues/ Expectations (what/why)			
State of the art (current how)			
Dispositions/ Requirements (what/how)			
Barriers/ Obstacles/ Brakes (what/why)			
Involvement (when)			

A similar stakeholder and need analysis was performed during the IMPULSE project in D2.1 "Stakeholder analysis and evaluation criteria". The purpose of this analysis is to map out the important *Stakeholders* so that everyone knows who they are designing and developing for. The *Stakeholders* act as the header for all subsequent rows, and each cell would target the specific stakeholder while focusing on the key aspect mentioned in the leftmost column. For example, finding the *Needs, Requirements, Barriers,* and *Involvement* of these stakeholders as well as how the stakeholders are currently being considered (*State of the art).*

2. **Set up the collaborative resolution methodology** (*how, for what purpose, with whom*). The involvement of end-users in collaboration with the design and development is used to ensure the suitability and better acceptance of the final product. For the methodology, it is important to note:
    - Primary users (what we have called internal and semi-internal stakeholders – see D7.11 "Community management and stakeholders' engagement – v2") for the first phase of reflection and creation of mock-ups, beta versions, etc.
    - Definition of the various tests to be carried out, the method used, and the requirements for obtaining the desired results.
3. **Carry out the tests**, preferably iteratively, in order to achieve a final version of the product or service that responds to the problem defined in Stage 1.

4.3   Blueprint limitations

As noted before, the blueprint is not an all-inclusive service design tool that will guarantee the best outcome by itself. The main purpose of the blueprint is to provide a set of recommendations and best practices. Based on the context, the given recommendations and best practices may not be fully applicable and should be independently viewed for each scenario. The blueprint does not include the specific tools and methods that should be used to follow the given recommendations and best practices, as those are dependent on the service designer and provider. For example, design, development and innovation processes vary across organizations, and the blueprint does not take into consideration what particular process should be followed. Similarly, the stakeholder and needs analysis can be performed using any kind of tool or process that the organization is accustomed to. The blueprint only offers recommendations and best practices to be followed within the different processes of service development.

5   Conclusion

This deliverable has presented the digital service blueprint that aims to enhance public engagement and governance by including the public in the different steps from design to development and, finally, the usage of a digital public service.

The blueprint includes recommendations and best practices that can be followed to improve public governance and engagement with the provided service and to increase the acceptance and adoption of the new service. The described recommendations and best practices are extracted from the WP2 pilots, WP3 legal and ethical findings, and WP4 and WP6 social and economic recommendations to provide a clear overview of the different aspects necessary to provide a service for the public.

While the blueprint is designed to be used with a digital public service that utilises a digital identity, it can be adapted to the private sector or to hybrid services (physical and digital) as well as to services that do not utilize digital identities.

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