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**Enhancing proactivity and inclusion in digital public services
In the context of EU Single Digital Gateway**

Master Thesis

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Date of Submission: 2025-06-02

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Declaration on the Use of Generative AI Tools

In accordance with the KU Leuven guidelines on the responsible and transparent use of generative artificial intelligence (GenAI), I declare the following:

Generative AI tools were used in the preparation of this thesis.

- The tool employed was **OpenAI ChatGPT (GPT-4)**.
- The use of GenAI tools was limited to:
 - Improving grammar, spelling, and sentence structure
 - Refining the clarity of sentence structure

All content generated through these tools was critically reviewed, revised, and integrated by me. The intellectual responsibility for the entire content of this thesis remains fully my own.

Abbreviations

SDG	Single Digital Gateway
OECD	Organisation for Economic Co-operation and Development
NPM	New Public Management
SDGR	Single Digital Gateway Regulation
DEG	Digital-Era Governance
OOTS	Once-Only Technical System
TA	Thematic analysis
TOE	Technology-Organization-Environment
CAS	Complex Adaptive System
DE4A	Digital Europe for All
WCAG	Web Content Accessibility Guidelines
GDPR	The General Data Protection Regulation
CBAS	Community-Based Adult Services
OOP	Once-Only Principle

1 Introduction

Digital transformation and its associated consequences in the public sector are not standalone changes in governance; rather, they represent significant shifts in both governance structures and service delivery mechanisms. Public services are progressively embracing digitalization, building upon earlier practices in public administration such as e-government.

According to OECD (2014), the transition from e-government to digital government has become a central focus for the public sector. Governments are increasingly prioritizing digital tools and data to enhance internal operations, streamline policy processes, and improve public service delivery, aiming to create greater public value through collaboration among diverse stakeholders.



Source: (OECD, 2014)

Figure 1 Digital government evolution

Public organizations are increasingly adopting digital technologies to enhance internal efficiency and improve their interactions with citizens and businesses (Scholta & Lindgren, 2023a). This shift, commonly referred to as the digital transformation of public administration, involves replacing manual or analogue procedures with digital solutions that streamline service delivery and administrative functions (Boban & Klarić, 2021; Savchenko et al. 2024).

Janssen et al. (2012) define digital public services as government services delivered to citizens through digital means. In contrast, some scholars attribute a broader evolutionary role for that. For instance, it is considered to actively contribute to shaping and expanding the broader implications of digital government (Liu et al., 2023).

Reflecting the evolutionary role of digital technologies, their function in public administration has shifted, from supporting internal operations to enabling the generation and delivery of services (Millard, 2023). A similar perspective is offered by Widyarnarko & Lember (2020), who argue that the selection and application of ICT tools depend on the specific administrative processes and policy goals involved.

Building upon the nature of digital public services, a broader evolution of public services can be observed within the changing context of public governance. Different evolutions are emerging under the umbrella of digital government, and several new priorities are becoming apparent. According to the literature (Millard, 2023), it is expected that current services go beyond merely digital channels. Instead, they should support more user-centered and context-aware solutions (see Fig. 2).

	Digitally-supported public services (from early 1990s)	Digitally-enabled public services (from 2000)	Digitally-driven public services (from 2008)	Digital-only public services (from 2015)	New hybrid public services (from 2020, but mainly in future)
Description	Humans provide service but back-office processes are digitised. Typically, these services rely on physical work and/or tangible assets	The potential for digitising public services is huge, but these services are only partly digitised, so digital technology but can only play an enabling role	Public services can be largely digitised, hidden & operate semantically & intelligently in the background, providing personalised & proactive services. They do not normally produce physical deliverables	Artificial intelligence (AI) will analyse available relevant data to deliver insights & automatically intervene to achieve best outcomes via fully joined-up & predictive services	Decentralised web app platforms & APIs, advanced AI & blockchain, etc., to empower people to regain and retain control of digital life & how it mixes with physical life
Human role	Provide the service, supported by the digital technology	Provide all evidence-, value- and judgement-based decisions	Only intervene where necessary	Define & design framework conditions and determine what are 'best' and/or acceptable outcomes	'Whole-of-life' physical & digital control; hybrid of emotional, human & digital interactions.
Digital technology role & generation¹² (cumulative)	Supports humans in providing the service. Gov 1.0 & web 1.0	Enables the service. Gov 2.0 & web 2.0	Both generates & delivers the service. Gov 3.0 & web 3.0	Find & analyse data, make & implement decisions within framework. Gov 4.0 & web 4.0	All tasks, but under full conscious human control and/or predictive & benign intervention. Gov 5.0 & web 5.0

Source: (Millard, 2023)

Figure 2 Tracing the cumulative relationship between digital technology and public services

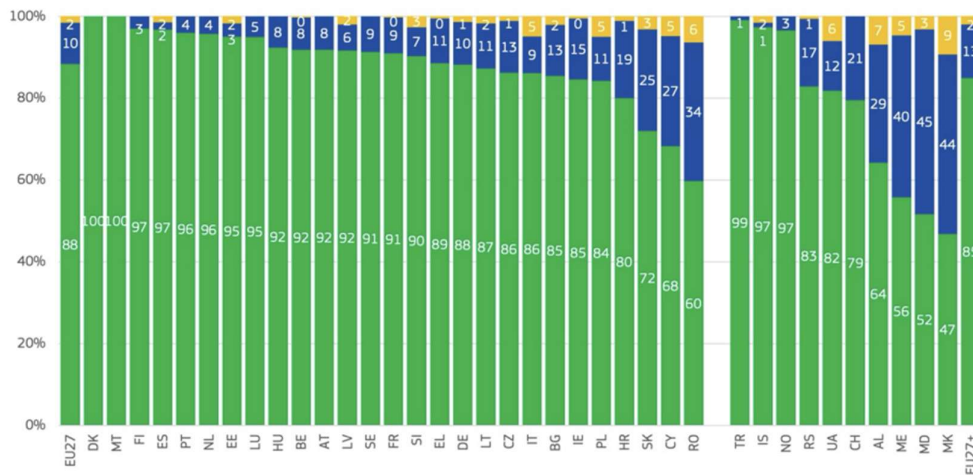
On the other hand, beyond the technological dimension, there is a societal function, that can shape its interaction with citizens and clarifies digitalization transforms key aspects of how citizens interact with government (Widyanarko & Lember, 2020).

In the light of evolutionary role of digital public services, scholars emphasize that proactivity is increasingly seen as a prerequisite for an inclusive, fair, and just society, as it has the potential to enhance citizens' equal access to public services (Bharosa, Oude Luttighuis, et al., 2021a). Building upon techno-societal aspects related to digital public services, two dimensions of digital public services are explored in the scope of current study; Proactivity and Inclusion.

1.1 Motivation for research

Statistics and policy reports from OECD, and European commission reports highlight the increasing importance of proactive public services (European Commission, 2024; OECD, 2024). For instance, according to the report by (OECD, 2024), one of the reasons that governments want to have a proactive service is due to rapidly evolving circumstances, and to ensure resilience through proactive approaches.

Another perspective is provided from the EU Commission. (European Commission, 2024) In this report the current statistics related to the online services is provided and it projected the next step after ensuring services are available online, it is better for governments to deliver services proactively. As their statics demonstrated that the current online availability of services is comparatively high (see Fig. 3).



Source: (European Commission, 2024)

Figure 3 Online availability of services across Europe 2022/2023

While these policy perspectives are promising, academic literature approaches the topic from a more critical and conceptual perspective. For instance, based on the finding that carried out by (Scholta & Lindgren, 2023b), there is a need for clear theoretical framework to define and classify proactivity in public services. More broadly, the study calls for further research to clarify the concept of proactivity in digital public services and its implications for stakeholder practices.

Another limitation identified in the literature is the misalignment between proactivity and administrative burden. As studies suggest, unless proactivity is designed with administrative simplification in mind, it may unintentionally lead to increased complexity or even exclusion (Larsson, 2021).

While existing taxonomies of proactive public services are valuable, they remain limited in empirical scope and require broader validation and application (Pawlowski & Scholta, 2023). Beyond classification and implementation challenges, the shift toward proactivity raises fundamental questions about the evolving role of citizens in service delivery.

As Bharosa et al. (2021) note, while automation has already reduced reliance on public officials, proactivity may further diminish, or even eliminate, the citizen's role in co-producing services. This transformation could significantly alter the nature, logic, and underlying values of public service delivery.

Consequently, scholars, such as Bharosa, et al. (2021) emphasize the need for further investigation into the intersection of proactivity and inclusion. In contrast to this optimistic trajectory, according to Kirjavainen & Jalonen (2025) argue that the success of the transformation remains limited when citizens experience challenges related to digital inclusion. Recognizing these contradictions, governments are increasingly seeking to make public services more personalised and proactive. The aim is to reduce psychological burdens and administrative frictions, often referred to as "sludge", while enhancing accessibility, inclusion, and empowerment, particularly for individuals and groups in vulnerable or disadvantaged situations(OECD, 2024b).

Given the diverse and often contradictory perspectives on the dimensions of inclusion and proactivity, this study focuses on reviewing both aspects in tandem. While the topic itself is not entirely novel, the persistent inconsistencies and tensions in the literature, particularly regarding the alignment between proactivity and inclusion, highlight the need for further investigation.

1.2 Research questions

To determine the two dimensions of proactivity and inclusion in current research, the research question is:

“What are the barriers to proactivity and inclusion in digital public services in the context of single digital gateway, and how can they be evaluated and addressed?”

The research question follows several objectives as:

To identify and categorize the main barriers to proactive and inclusive digital public service.

To apply an integrated evaluation framework with regards to proactivity and inclusiveness

To propose actionable recommendations for enhancing proactivity and inclusion in digital public services.

The scope of research question is in the context of EU Single Digital Gateway

1.3 Structure of thesis

Chapter 2 reviews the key theoretical and conceptual frameworks relevant to digital public administration, proactivity, inclusion, and the Single Digital Gateway (SDG). It also introduces theoretical frameworks that support the identification and analysis of barriers to proactive and inclusive digital public service delivery.

Chapter 3 describes the research design, outlining the methodological choices made in this study. It explains the rationale for the selected qualitative approach, the sampling strategy, and the profile of interview participants. This chapter also details the application of Braun and Clarke's (2006) thematic analysis as the method of data analysis, and discusses validity and reliability related to research.

Chapter 4 presents the empirical findings. It identifies the main barriers to proactivity and inclusion and highlights relevant strategies, practices, and contextual factors aimed at addressing these challenges.

Chapter 5 provides a critical discussion of the findings considering the theoretical frameworks and prior research. It offers recommendations to address the identified gaps and improve the design and delivery of proactive and inclusive digital public services.

Chapter 6 concludes the thesis by summarizing how the research question has been addressed. It reflects on the study's limitations and proposes directions for future research.

2 Literature review

2.1 Foundations for inclusive and proactive services

So far, theoretical models and conceptual frameworks developed to guide the transformation of public services. In this regard, shifts in governance philosophy, evolving citizen expectations, and the integration of new technologies played a critical role in redefining the concept of public services. To evaluate how governments can advance toward proactivity and inclusion, the first step is to develop a clear understanding of these frameworks.

From a public administration perspective, the evolution of public services, related to the New Public Management (NPM), which emerged in the early 1990s, as a modernization of traditional public administration. Utilizing the NPM approach is characterized by results-oriented and decentralized approaches that put emphasis on efficiency, financial control, target-setting and transparent performance measurement (Bhattarai et al., 2019; Schedler & Proeller, 2002).

However, the NPM approach did not result in the complete replacement of earlier administrative models. Instead, the public sector went through a cumulative reform process. To clarify that, according to Olsen (2010), this phenomenon is considered as a mixed order, where successive waves of reform coexist rather than replace one another. A complementary perspective, according to Christensen (2012a), the hybridization means reforms do not oscillate strictly between centralized government and decentralized governance. Rather, each wave builds upon the previous one, resulting in increasingly complex and hybrid organizational forms. Consequently, tensions and trade-offs between competing administrative logics, such as control versus collaboration, have become central to the design and delivery of public services.

Building upon this concept, a key development in the evolution of public services is the increasing emphasis on coordination and integration. The shift toward the post-NPM era advances a more holistic approach to governance. According to Bogdanor (2005), this new phase in public administration aimed to reduce fragmentation and overcome siloed administrative structures. Similarly, within this context, concepts such as “*joined-up government*” and “*whole-of-government*” (Christensen, 2012b; Hood, 2005) have

emerged as efforts to foster cross-sectoral collaboration and policy coherence. As a result, recent reforms increasingly reflect a drive toward seamless inter-institutional cooperation, with the aim of delivering more coherent, aligned, and responsive public services.

Grounded in the values and assumptions, according to Christensen (2012b) post-NPM paradigms were not intended to replace earlier models, but rather to complement them by addressing their limitations. This shift emphasized values such as collaboration and public value creation as alternatives to the market-based principles that supported NPM (Funck & Karlsson, 2024; Pollitt & Bouckaert, 2011; Torfing et al., 2016).

In digital-era governance (DEG), the principles put emphasis on the reintegration and restructuring of public services through digital technologies (Christensen, 2012b; Funck & Karlsson, 2024). DEG includes several dimensions and waves, such as, according to Dunleavy & Margetts (2023) reflecting evolving approaches to digital public services.

In conclusion, different paradigms and shifts reinforce the evolution of public service to digital ones. The strategic use of digital solutions to enhance public service delivery is a key objective for many governmental and non-governmental organizations, highlighting the importance of aligning digital transformation with inclusive and proactive service design.

2.2 Proactive digital public services

Digital public services are widely recognized as a key component of digital transformation in public administration. Building on this recognition, many scholars argue that digital public services are considered as a central element of digital government, since services are increasingly delivered to citizens using digital technologies (Lindgren et al. 2019; Lindgren and Jansson, 2013). In the context of digital government, the transformation of traditional services into digital ones, includes the complex interplay of organizational, technological, and cultural dynamics within the public sector. This interplay is driven by recent digital government reforms, while also being shaped by longstanding traditions of public sector governance (Roy, 2017).

The literature indicates that, in the case of digital public services, the interaction between client and public organization is assisted partly or completely through internet-based IT systems (Scholta & Lindgren, 2023b). This view has been further extended by some

scholars (Al-Muwil et al., 2019a; Pethig et al., 2021a), who argued that government services should primarily deliver digitally. However, there is an alternative view toward public services that living in this era requires services that perform only on people's experiences and needs rather than being driven on technology. This view emphasizes the increasingly blurred boundaries between the physical and virtual worlds (Tinjan, 2024). Beyond the digital dimension, public services aim to address fundamental social and economic challenges. To achieve this, their provision may involve public, private, or third parties (Nasi et al. 2024).

2.2.1 Proactive digital public services

This section focuses on the conceptual and empirical literature that is related to definition and emergence of proactive public services, and discussion on the barriers hindering their realization.

It can be said that the idea of proactive services is not new in the context of public administration. According to Scholta & Lindgren (2023a), the emergence of proactive services backs in 1970s, the current momentum stems from the recent digital innovations in artificial intelligence and machine learning OECD (2020), that creates a new avenue for public organizations to act aligned with citizen needs (OECD, 2020; Scholta & Lindgren, 2023a).

The concept of proactive services has varied definitions across the academic literature.

Bertot et al. (2016), put emphasis on anticipation based on life events or demographic data or other context-dependent conditions. Linders et al. (2018), highlighted the shift from pull to push approach, where government flawlessly and continuously delivers real-time information and services. Scholtz et al. (2019b), defined proactivity as the delivery of services without any user action and Erlenheim et al. (2020a), considered proactivity with multi-layered approach.

To better understand how proactive services are framed RORANDELLI (2021) distinguished between normative and descriptive aspects of proactivity and explained it as follows (see Table 1).:

Table 1 Normative and descriptive aspects of proactivity

Normative aspects	Descriptive aspects
Push services toward citizens (Serendib et al, 2016)	Citizen action still needed (Scholta et al., 2019)
Seamless service delivery (OECD, 2020)	Underused infrastructure (Milakovic, 2012)
Minimization of bureaucratic burden (OPSI, 2020)	Limited automation triggers (Estonia/NZ)
Citizen-centric design (Schuppan et al., 2017)	Automation as driver but not always applied (Erlenheim, 2019)

The distinction among normative and descriptive aspects indicates that as proactive service delivery aims to be seamless and automated, however in reality it lacks legal, technical factors.

To solve the confusion around implementation of proactivity, Pawlowski & Scholta (2023), developed a taxonomy for proactive services (see Fig.4). As its helps both scholars and practitioners and provides criteria for proactivity.

Dimension	Characteristics				
Purpose of Proactivity	Information	Offer	Delivery	Education	Evaluation
Timing of Proactivity	Before Core Event			After Core Event	
Need for Additional Data	Additional Data Needed			No Additional Data Needed	
Change of Proposed Data or Delivery Options	Change Possible		No Change Possible		No Proposal
Choice of Service Receipt	Opt-In		Opt-Out		No Choice
Medium for Proactive Communication	Electronic			Non-Electronic	
Timing of Communication in Proactive Delivery	No Proactive Delivery		Before Proactive Delivery	Simultaneous to Proactive Delivery	
Type of Core Service	Informational		Communicational	Transactional	

Source: (Pawlowski & Scholta, 2023)

Figure 4 Taxonomy of proactive public services

2.2.2 Challenges and barriers to the proactive services

To address the research question through the lens of the literature review and previous studies on the challenges and barriers to proactivity, a set of key findings was identified. While some focus on legal and technical aspects, others indicated governance, ethical concerns.

Linders et al. (2018) , adopting a socio-technical perspective, reviewed the challenges faced by concrete e-government services. The findings highlighted the presence of institutional fragmentation, emphasizing that lack of coordination among agencies serves as a barrier for implementing seamless and proactive public services. In the finding, the technical limitations were identified, such as the absence of integrated back-end systems. Furthermore, the study found the challenges related to the deployment of personalized delivery.

Scholta et al. (2019b), examined three case-studies and identified several key barriers to proactive service delivery. Although they did not offer an explicit classification, the barriers were among legal, technical, behavioural, and potentially ethical domains. Legal constraints included issues related to citizen consent and procedural triggers. On the technical side, challenges such as legacy systems and problems with back-end integration were prominent. Moreover, the study emphasized that citizen trust and ethical concerns regarding data use were significant impediments to proactive service implementation.

Building on this discussion, Erlenheim et al. (2020b) , stress the importance of unified data infrastructures in supporting proactive services. The study highlights how fragmented databases, and the absence of back-end integration significantly hinder the scalability of automation. Moreover, the study points to the need for high-level political support and effective coordination among public institutions as foundational elements for successful implementation. Additionally, Ethical consideration, particularly those related to transparency and the implications of personalized service delivery, also recognized as major findings.

Wilson & Mergel (2022) focused on cultural barriers related to proactivity. The study indicated that public administrations often lack long-term vision and are resistant to anticipatory actions, primarily due to a risk-averse organizational culture.

In the case of New Zealand's realized federated digital services, McBride et al. (2023) illustrated that the complex interplay between technical, legal and governance-related barriers in advancing toward more proactive service delivery. The study indicated that achieving proactivity required significant restructuring of data management systems, consent mechanisms, and institutional cooperation. Beyond infrastructure, the authors highlighted the importance of developing organizational standards and operational methods to support proactive delivery at scale.

Sirendi & Taveter (2016), approached the issue from a political and institutional perspective. The study indicated that slow reform in processes and policy misalignment, make the adoption of proactive services particularly challenging. The findings also referred to tension between technological ambitions and political feasibility.

According to the (OECD, 2020, 2024a), several factors are critical for enabling proactive public services, including strategic coherence, leadership, and legal clarity. As emphasized in Felipe's report, earlier studies also underscore the importance of political commitment in driving digital transformation

As stated by Bharosa et al. (2021), found that the General Data Protection Regulation (GDPR) affects data sharing and can impede proactivity. Drawing on Dutch government examples, they argue that while the GDPR enhances citizens' control over personal data, it also limits opportunities for automated and personalized service delivery.

Finally, reflection by Tinjan (2024), argues that proactive transformation is not merely a technical evolution but a shift in public sector logics and institutional processes. From this perspective, digital reforms must be viewed as embedded within broader socio-political systems, where institutional inertia, traditions, and power dynamics shape what is possible.

2.3 Inclusion in digital public services

To explore and address the research question concerning barriers to inclusion, this section draws on both conceptual and empirical studies related to inclusion in digital government and digital public services.

The concept of inclusion in digital public services differs slightly from how it is usually addressed in other domains. According to Alshallaqi & Al-Mamary (2024) , inclusive digital engagement should be seen as a multidimensional concept that requires a comprehensive strategic approach. To be effective, inclusion must be integrated throughout the entire public service lifecycle. This includes ensuring that users can participate actively, are treated fairly, and have the option to stop using the service without facing any harm or disadvantage. In other words, inclusion must be addressed throughout the full user lifecycle (Fisk et al., 2023).

Several scholars approached digital inclusion using existing frameworks and models. Al-Muwil et al. (2019b), identified several models that explain different aspects of digital inclusion. The model that developed by Bradbrook and Fisher (2004), outlines five dimensions of e-inclusion, so called “5Cs”. In this model inclusion has five different aspects including connection, capability, content, confidence and continuity. Another model, proposed by Helsper (2008), groups digital inclusion into four categories: access to ICT, digital skills, user attitudes, and the extent of engagement with digital technologies.

To assess national approaches to digital inclusion, researchers have built on established theoretical models, most notably van Dijk’s (2005) Digital Divide Phases framework. This model has been widely applied to evaluate how policies address different stages of the digital divide, including access, skills, and meaningful usage. Drawing on this foundation, several studies have developed multidimensional indicators to assess digital inclusion. These indicators typically encompass: (a) technological conditions, such as infrastructure and e-government platforms; (b) levels of technology utilization; and (c) the conditions of vulnerable groups, including digital skills and socioeconomic status (Aziz, 2020; Ciesielska et al., 2022; Prabawa et al., 2023; Liu et al., 2023).

As the concept of vulnerable group is considered as wicked issue, several approaches used to address it. In some countries, guidelines such as Web Content Accessibility Guidelines (WCAG) are used to accessibility in digital public services (Park & Humphry, 2019) .

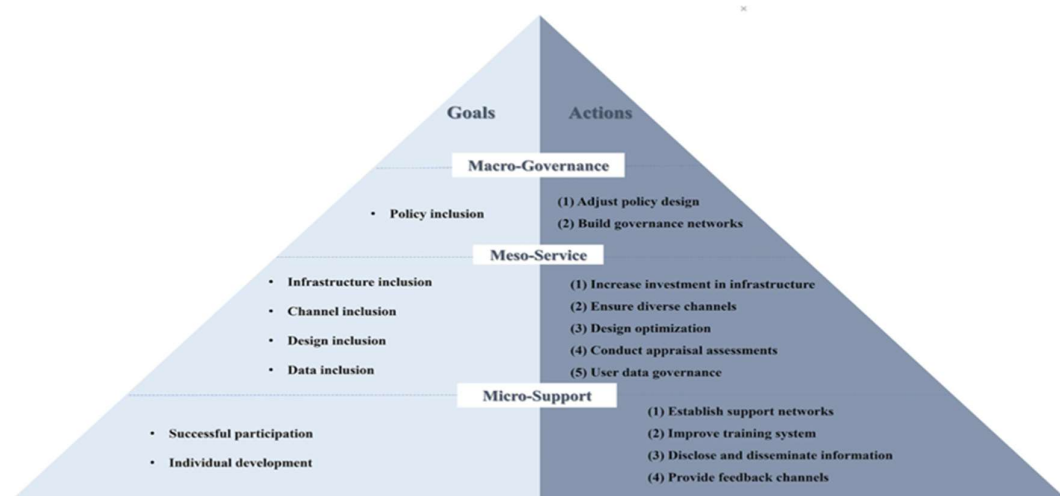
A more recent and comprehensive understanding of digital inclusion is provided by Liu et al. (2023), through a systematic review (see Fig. 5). Their Goal-Action Framework

conceptualizes digital inclusion as a multi-level phenomenon involving three interrelated dimensions:

Macro-level: focused on policy development and governance structures.

Meso-level: addressing systemic challenges such as administrative burden, automation-related exclusion, and the role of front-line service providers.

Micro-level: concerned with individual skills, user experience, and personal engagement.



Source: (Liu et al., 2025)

Figure 5 The Goal-Action framework for vulnerable groups

Recognizing digital inclusion as a “wicked problem”, that requires cross-sectoral responses (see Fig .6). To address this complexity a conceptual taxonomy proposed to enhance understanding of the issue. The framework provided a foundation for policy development targeting vulnerable groups. It provided several solutions related to the common issues in digital inclusion from access, connectivity, digital skill and digital literacy (Pérez-Escolar & Canet, 2023a).

Accessing technology	Internet Spaces Network	Bridging the digital divide	Information Technology in Education	Health information technology	Active ageing	Libraries	Digital literacy
			<ul style="list-style-type: none"> • Educational apps • Inclusive Digital Literacy Framework (IDLf) • Low-cost devices for low-resource environments 				<ul style="list-style-type: none"> • Health literacy • Social interaction skills • Development of collaborative initiatives
<ul style="list-style-type: none"> • Access to social media platforms • Universal digital inclusion policy, e.g. BH 	<ul style="list-style-type: none"> • Telecenters as public spaces • Personal learning environments (PLE) 	<ul style="list-style-type: none"> • New digital inclusion policies and privacy • New practices and techniques of online surveillance 	<ul style="list-style-type: none"> • Mobile learning model • Open Access Repositories 	<ul style="list-style-type: none"> • Health Information Technology • Online Social Networks through E-Health Systems Design 	<ul style="list-style-type: none"> • Collaborative projects to address • Promoting the autonomy and independence of older people, e.g. the project Sus-IT in the UK 	<ul style="list-style-type: none"> • Access to digital content • Inclusive place for sustainable communities 	<ul style="list-style-type: none"> • Job skills • Life skills
Digital Program			<ul style="list-style-type: none"> • Collaborative learning and sustainable online education –e.g. universities– • Participatory Action Research (PAR) 				<ul style="list-style-type: none"> • Computer skills
<ul style="list-style-type: none"> • Free Internet coverage • Proxy internet use (PIU) 							<ul style="list-style-type: none"> • Computer education • Online participation skills: enhance a sense of empowerment • Encourage Internet engagement • Abilities in the use of different devices, e.g. tablets and smart-phones • Abilities in the use of Internet

Source : (Pérez-Escolar & Canet, 2023a)

Figure 6 Solutions for assisting vulnerable groups in the context of digital inclusion

2.3.1 Barriers related to inclusion

Digital public services and digital transformation in broader sense, promoted as means to improve efficiency and service quality within the public sector (Lindgren et al., 2019b). However, such improvements do not necessarily lead to higher or more equitable utilization of digital services (Morte-Nadal & Esteban-Navarro, 2022).

In this regard to achieve inclusive engagement in digital public services requires addressing a range of structural and individual barriers. As van Deursen & van Dijk (2014) ,argue digital inequalities often stem from user-related factors such as digital skills, motivation, and the ability to effectively use and benefit from technology.

Beyond individual factors, Okunola et al. (2017), emphasize that highlight those socio-cultural limitations, such as restrictive norms and lived experiences, can further hinder engagement among underprivileged individuals

This perspective developed further in the argument suggesting that digital public services, especially when delivered through digital-by-default policies, may unintentionally enhance existing social inequalities. Vulnerable groups such as older adults and

individuals with disabilities often lack the necessary resources or competencies to navigate digital systems effectively (Pethig et al., 2021b).

Empirical evidence supports digital vulnerability and identifies them in different groups. For instance, the Lloyds Bank Consumer Digital Index (2019), as cited by Brown & Warner-Mackintosh (2024), identifies at-risk groups. These groups are including older adults, people with disabilities, individuals with poor socio-economic status, those who are unemployed, and those with low levels of education.

Although digital services, especially proactive ones, promise to improve citizen engagement, their implementation often reveals new barriers or reinforces existing inequalities.

Bharosa, et al., (2021b), argue that the application of proactivity in digital public services can lead to improvements across multiple dimensions, including responsiveness, user-friendliness, transparency, security, efficiency, legal certainty, personal data management, interoperability, and privacy. However, these benefits are not experienced equally by all citizens. To mitigate such disparities, governments are increasingly exploring innovative service delivery channels, such as mobile-based platforms, within broader proactive governance models (Kim & Lee, 2024).

Still, inclusion remains a challenge. As van Deursen & van Dijk (2014), point out, disparities in digital service usage often stem from differences in digital skills and literacy. Pethig et al. (2021b), further emphasize that patterns of technology use are a critical dimension of exclusion, particularly under digital-by-default policies.

Administrative burdens play a significant role in shaping individuals' access to public services. Importantly, the impact of such burdens is not experienced the same across the users; certain groups are disproportionately affected depending on the specific context, highlighting the distributive nature of these burdens (Alshallaqi & Al-Mamary, 2024).

2.4 Single Digital Gateway

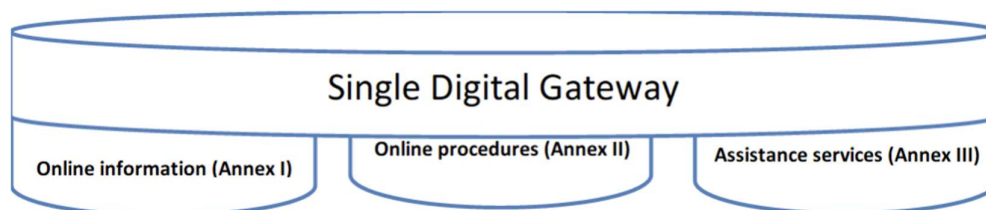
The primary objective of the Single Digital Gateway (SDG) is to enable citizens and businesses to carry out administrative procedures entirely online, without considering the national borders. To this end, the SDG provides access to official information and

administrative services, thereby facilitating seamless interaction with authorities and enabling cross-border transactions within a unified digital environment (Bhattarai et al., 2019; Council of the European Union, 2018).

The SDG is underpinned by the Single Digital Gateway Regulation (SDGR), which establishes the legal and practical requirements for its implementation. Framed within the broader context of the Digital Single Market Strategy and the eGovernment Action Plan, the SDGR aims to improve openness, efficiency, inclusiveness, and interoperability of public services by addressing legal and administrative obstacles to digital transformation (European Commission, 2016;Reyskens Jade, 2023).

According to the European Commission (2018b), the SDGR pursues three core objectives: (1) to reduce administrative burdens for individuals and businesses exercising their internal market rights; (2) to promote non-discrimination and equal access to services for all EU citizens; and (3) to ensure the proper functioning of the internal market. These objectives position the regulation not only as a legal mandate but also as a strategic instrument supporting the EU's digital transformation agenda (European Commission, 2015, 2016, 2018b). Serving as the “front office” of public administrations, the Gateway does not harmonize Member States' internal procedures. Instead, it operates through interoperability between national systems. This includes mechanisms for cross-border user authentication using national digital identities and facilitating the reuse of previously submitted data (Council of the European Union, 2018; Rinne, 2019).

In the context of SDG, three main pillars are perceived (See Fig. 7), it includes online information, online procedures and assistance services.



Source: (European Commission, 2023)

Figure 7 Three main pillars in SDG

Online information is aligned with Article 2 of SDG. *It aims to make sure that good quality online information about these rules and rights is available and findable.* Several

criteria are set for this section, including user-friendliness and comprehensiveness, up-to-date content, references to relevant legal and contextual documents, and translation into English (European Commission, 2023).

In the section related to online procedures, it is explained that when a citizen identifies the applicable rules, they need to contact the relevant authorities to obtain a decision or service. The SDG aims to make these procedures easy to find, available online, and accessible for non-national users.

Two specific rules are outlined in this context. First, Article 6 *explicitly states that these procedures must be fully available online by December 2023*. This means that users should be able to complete all steps remotely via the internet. *If physical presence is still required, Member States must provide justification, and such exceptions must be documented in a special repository for verification* (European Commission, 2023; European Union, 2018).

Beyond the digitalization of procedures, the SDG also defines the concept of accessibility, which differs from the general use of the term. Under the SDG, accessibility includes the availability of instructions in English, the ability for users to log in using their national eID, the option to pay electronically, and the right to receive the same outcomes as national users, as specified in (Article 13) of (European Union, 2018).

The third pillar of the SDG concerns the provision of assistance services. It focuses on how additional support are made available to citizens when the information provided on the SDG web portal is insufficient, or when users encounter difficulties with online procedures. This assistance is intended to address various user needs, ranging from general inquiries to more specific, procedural challenges. According to Article 11 of the SDG Regulation, these assistance services must adhere to specific requirements. For example, procedural information must be clearly and comprehensively presented on the relevant webpages, including estimated response times, available languages, relevant contact details, applicable fees, and accepted payment methods (European Commission, 2023; European Union, 2018).

The content mandated by the SDG is detailed in the regulation's annexes. In Annex I, list of areas of information is provided for citizens and business exercising their internal market rights referred to in point related to article 2. In annex II, list of Procedures referred to be made available online, and in Annex III, specific assistance and problem-solving is provided (European Union, 2018).

2.4.1 Enablers in the context of Single Digital Gateway

The Single Digital Gateway (SDG) incorporates several enabling mechanisms that support the advance provision of services. One of the SDGR's most significant guiding principles is the once-only principle, which ensures that individuals and businesses are not required to submit the same information multiple times to different public authorities (Bhattarai et al., 2019; Krimmer et al., 2021).

According to Wimmer (2021), the once-only principle offers multiple benefits for the stakeholders involved. These include a reduction in administrative burden, enhanced transparency and trust, improved efficiency and effectiveness, and a general increase in the quality of data. However, according to Leosk et al. (2021), the implementation of this principle is not without significant challenges. Beyond the well-documented technical issues, a range of organizational and institutional barriers persist.

Once-Only Technical System (OOTS) and the European Digital Identity Wallet (EUDI Wallet). Both are designed to facilitate the secure and efficient provision of citizen or business data in the context of SDG (Lampoltshammer et al., 2025).

The OOTS serves as the technical infrastructure underpinning the Once-Only Principle (OOP), and its primary benefits align with those of the OOP itself—namely, reducing administrative burden and enhancing data reuse. In contrast, the EUDI Wallet represents a user-centric approach to data sharing, placing the citizen at the centre and granting them full control over which data is shared and with whom (Lampoltshammer et al., 2025).

These mechanisms exemplify innovative digital flagships associated with the SDG. In this context, the SDG should not be understood merely as a regulatory framework; rather, it encompasses a broader ecosystem of enabling technologies that collectively support the transformation of digital public service delivery in the EU.

Apart from the technical mechanisms mentioned above, another important initiative related to the SDG is the feedback mechanism, which is explicitly emphasized in various documents concerning the SDG. Users are expected to provide feedback on the quality of SDG-related webpages and services. The feedback tool includes simple questions, rating scales, and optional free-text fields, and may also invite users to complete more detailed surveys following the initial submission. Feedback is automatically transmitted to a central data repository along with the corresponding webpage URL, enabling targeted

and service-specific analysis. The primary aim of this mechanism is not only to support the continuous improvement of digital public services, but also to contribute to the identification and analysis of persistent barriers within the Single Market (European Commission, 2023).

2.4.2 Implementation challenges of SDG

Despite the regulatory clarity and technical innovations that are underlying part of the SDG, literature identifies several persistent challenges in its implementation.

One of the core issues is the fragmentation of regulatory and technical standards across Member States. Variations in legal requirements, such as legally authorized surveillance of communication, data privacy, or data localization continue to undermine the needed interoperability for fully functional cross-border digital services (European Round Table for Industry, 2024).

User-centred design also presents significant challenge. While the SDGR defines a broad definition of users, for instance EU citizens, residents, and legal entities. This broad range of users has complex legal and technical implications. Addressing the needs of such a diverse user requires consistent implementation across Member States, which remains difficult in the absence of enforceable standards at the EU level (Bhattarai et al., 2019; Krimmer et al., 2022). Furthermore, the EU does not have the legal capacities to harmonize administrative procedures across Member States. This limitation prevents the enforcement of uniform service structures, leading to variation, fragmentation, and diminished user experience (Krimmer et al., 2021).

Governance challenges are considered a critical factor in the context of SDG. According to Lampoltshammer et al. (2025), technical infrastructures such as the SDG and the European Digital Identity Wallet (EUDIW) cannot be managed solely by expert groups. Instead, effective governance practices such as, broader community building and active stakeholder engagement can address the diverse service requirements and user expectations.

Another important aspect is the level of decision-making. Evidence from expert interviews indicates that implementation decisions must first be taken at the national level, before any progress can be achieved. However, many interviewees were unable to

clearly specify how SDG-aligned services should be operationalized in practice (Sellung & Lampoltshammer, 2025).

Based on the literature by addressing these challenges, the SDGR can evolve into a more effective enabler of services in digital government and considered beyond legal framework.

2.5 Theoretical frameworks

The initial step in identifying a suitable theoretical framework involved clarifying its definition and role within the research. As discussed in the literature, a theoretical framework constitutes a structured foundation that informs and shapes the research process through the application of established theoretical perspectives. It provides a lens through which the research problem is examined and offers conceptual guidance for exploring the phenomenon under study. Fundamentally, the selection or development of a theoretical framework requires the setting of criteria that ensure alignment with the study's problem statement, objectives, and research questions (Grant & Osanloo, 2014).

Accordingly, this section provides a detailed account of the theoretical framework, including its core dimensions, underlying assumptions, and relevance to the research objectives.

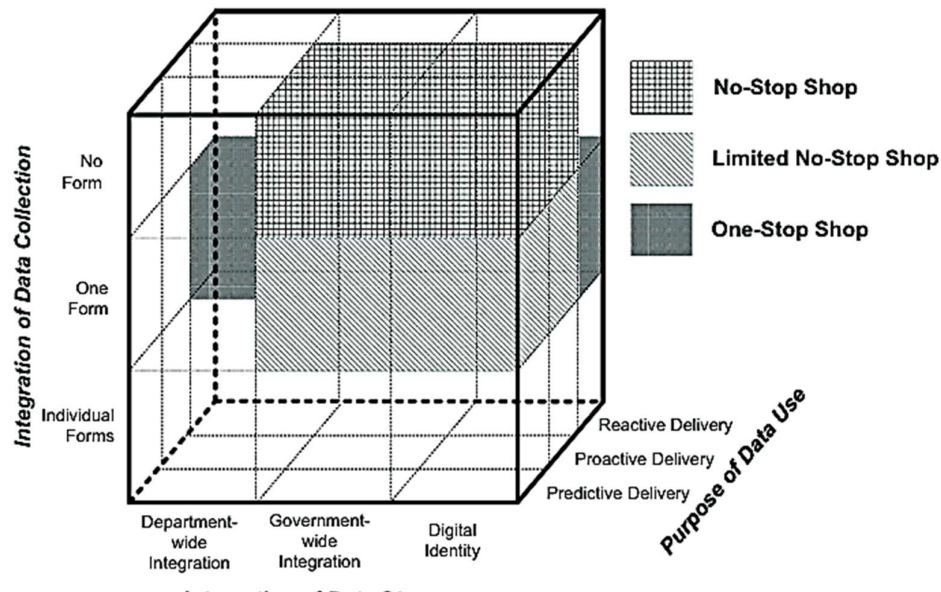
2.5.1 Defining dimensions related to proactivity

Proactivity, in the context of the present study, is based on the definition which is provided by (Pawlowski & Scholta, 2023; Scholta et al., 2019b; Scholta & Lindgren, 2023b), which conceptualizes proactive services as those delivered by public organizations without relying on the client's consent or will.

Addressing the research question and identifying the barriers to proactivity is considered as a multifaceted approach. In this regard, for the design aspect and its related conceptual foundation, the study adopts the taxonomy model provided by (Pawlowski & Scholta, 2023). The taxonomy is presented as a common ground for scholars, offering a shared understanding of proactive public services (see Fig.6).

The progress of proactivity in the context of one-stop-shop also contributed to the current study. In this model, proactivity categorized into three distinct levels, based on the initiatives taken by government and the degree of user involvement (see Fig.10). Several enablers supporting the progress identified for instance institutional factors. Similarly,

challenges identify such as legal constraints (mandatory user consent), fragmented back-end systems, lack of semantic alignment, and low levels of citizen trust in the automated use of data (Scholta et al., 2019b). Given the structural similarities with the Single DigitalGateway, the aforementioned elements were applied within the context of this study.



Source:(Scholta & Lindgren, 2023a)

Figure 8 E-government stage model

2.5.2 Defining dimensions related to inclusion

The theoretical framework for analysing inclusion in this study is grounded in a synthesis of key findings from the literature review, with a particular emphasis on van Dijk's (2005) Digital Divide framework. This model has been widely adopted to assess how policies respond to various stages of digital exclusion, including access, digital skills, and meaningful usage. In the context of this study, the framework is applied by focusing on several critical dimension, namely access, connectivity, digital competencies, and language barriers. Additionally, given the complexity of digital public services, the model is extended to account for service design and complexity as a replacement for meaningful usage.

2.5.3 Barrier identification framework

To identify and categorize the barriers, several theoretical frameworks were examined. For instance, the Technology-Organization-Environment (TOE) framework was reviewed due to its strength in offering a holistic perspective. This model integrates IT adoption by examining technological, organizational, and external environmental factors (Madaki et al., 2023). However, given the study's specific focus on inclusion and implementation barriers across both sectors, rather than on adoption aspects, the TOE framework was ultimately excluded.

Another framework considered was the Complex Adaptive Systems (CAS). While the CAS framework provides a comprehensive approach to analysing systems across multiple environments (Carmichael & Hadžikadić, 2019), the model was excluded from the theoretical framework as its wide-ranging structure did not align with the operational needs of this study. A similar evaluative approach was applied to other models. Ultimately, the study adopted a barrier framework developed for identifying obstacles to eGovernment services in the context of the DE4A initiative (Sellitto & Pavleska, 2024). This framework categorizes barriers into six dimensions, as outlined below (see Table 2).

Together, these theoretical foundations and frameworks were employed in the present study to address the research question and support the research objectives, particularly within the context of the Single Digital Gateway.

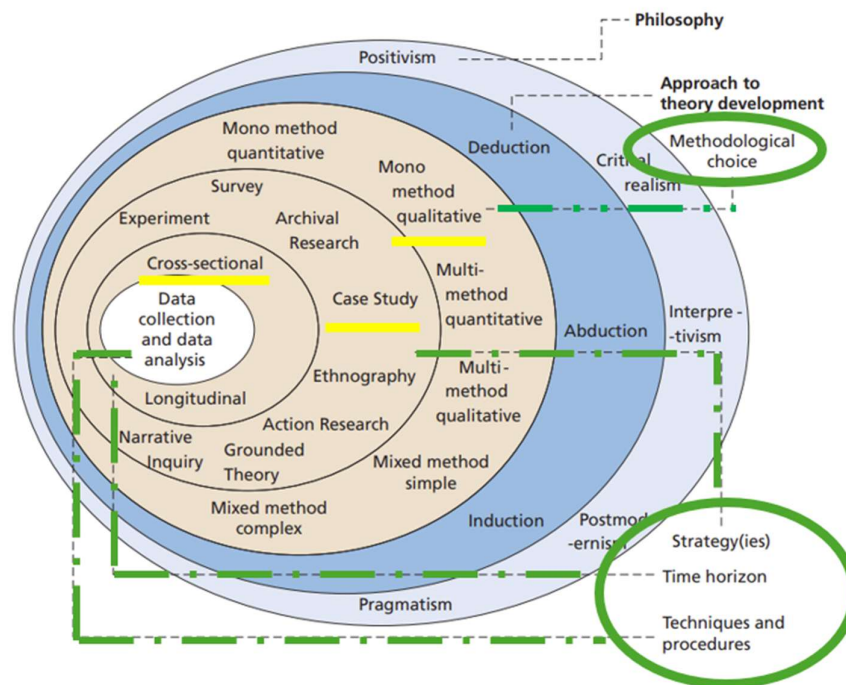
Table 2 Framework used for barrier identification Adapted from Sellitto and Pavleska.(2024)

Barrier type	Barrier explanation
Legal	Regulatory constraints, fragmented legal frameworks, and unclear mandates that hinder data sharing, automation, and the lawful design of inclusive digital services.
Technical	Limitations in infrastructure, interoperability, and data systems that constrain the technical feasibility of delivering seamless, proactive, and user-centred digital services.
Organizational	Internal structural, procedural, and coordination challenges within and across public bodies that impede effective implementation and scaling of digital transformation efforts.
Business	Misaligned incentives, rigid procurement models, and limited integration with private sector innovation that delay service modernization and reduce responsiveness.
Political	Lack of sustained political commitment, competing policy agendas, and insufficient leadership that weaken governance continuity and digital transformation momentum.
Human	Skill gaps, low digital literacy, cultural resistance, and limited user involvement that obstruct adoption and equitable access to digital public services.

3 Research Design

This chapter describes the methodology adopted to answer the research question. The research question aimed to identify barriers to proactivity and inclusion in digital public services within the context of the Single Digital Gateway and further to summarize how these barriers could be evaluated and addressed.

To structure and organize this chapter, some layers from Saunders' Research Onion framework were applied (see Fig 9). Layers that were not relevant to the scope of this study were excluded. In terms of methodological choice, a mono-method qualitative design was selected. The research strategy follows a single case-study approach, focusing on the Single Digital Gateway. The study adopts a cross-sectional time horizon. The data collection process and how the gathered data were analysed will be discussed in this chapter.



cf. (Saunders et al., 2020)

Figure 9 Research Onion developed by Saunders

3.1 Case-study

In this research, the Single Digital Gateway (SDG) was chosen as a case-study. According to Platt (2007), the case-study method enables researchers to access personal meanings by allowing the collection of data across multiple factors for each case and situating the data within a rich and contextualized environment (Platt, 2007). Similar perspective is developed by Thomas (2011). In Thomas (2011) framework, the selected case is not viewed as a sample or as representative of a wider population. Instead, the strength of a case-study lies in its ability to provide a rich and insightful understanding of a specific phenomenon. Based on the nature of proactivity and inclusion in digital public services, which are considered socio-technical and multi-layered phenomena, it became evident that a case-study was an appropriate choice for this research. It provides the necessary depth and contextual grounding to examine how these two dimensions interact in practice.

Moreover, Thomas (2011) identifies three main ways for selecting a case: based on local knowledge, as a key case of a phenomenon, as an outlier (Thomas, 2011). The concept of local knowledge fits more with the case of SDG. The researcher had prior familiarity with the SDG context and direct access to relevant stakeholders and resources. Therefore, the selection of SDG in this research aligns with the principle of local knowledge.

3.2 Data collection

The data for this research were collected through two approaches: primary and secondary data collection. Primary data were gathered through semi-structured expert interviews, designed to obtain in-depth insights from the experts regarding barriers to proactivity and inclusion in digital public services within the context of the Single Digital Gateway.

Secondary data were collected through a review of existing literature as desk research, which provided essential background information and contextual understanding for this study.

3.2.1 Semi-structured interviews

To access the first-hand source of data for this research, the semi-structured interview method employed. There are various definitions for data collection strategy; however, one of the closest is that a semi-structured interview is a qualitative research method in

which the researcher asks informants a series of predetermined but open-ended questions. According to Lioness Ayres (2008), for employing semi-structured interviews typically developing a written interview guide in advance is needed. Regarding this approach, before each interview, several notes were provided as follows: Proactivity of digital public services, design of proactivity, barriers related to proactivity, inclusiveness of digital public services, barriers to inclusion, related frameworks and recommendations.

The interviewer may either strictly follow the guide, asking questions in the given order, or flexibly move between topics based on the informant's responses. In either case, the content of the interview guide is closely aligned with the research questions and the tentative conceptual model underlying the study(Ayres 2008).

The interview questions were designed to investigate the barriers to proactivity and inclusion in digital public services, as well as to collect participants' recommendations for addressing these challenges. To ensure their validity and alignment with the research objectives, the interview questions were reviewed and validated by an expert prior to data collection. Probing techniques were employed during the interviews to further explore participants' responses to alternative suggestions. At the beginning of each interview, participants were familiarized with the concepts of proactivity to establish a shared understanding. A detailed overview of the interview structure, along with the full list of interview questions, is provided in the appendix.

The target group consisted of two categories, strategists and practitioners involved within a specific public service, the interview guide was tailored to their respective areas of expertise.

The process of reaching participants, e.g. sampling criteria for selecting participants, were based on purposive sampling strategies. Several purposive sampling methods exist, including convenience sampling (selecting the first volunteers who meet eligibility criteria), snowball sampling (recruiting participants through referrals from initial informants), homogeneous sampling (selecting individuals with similar characteristics), and maximum variation sampling (capturing a wide range of perspectives within the domain) (McIntosh & Morse, 2015).

For current research, snowball sampling was applied. A full overview of the reached participants is presented below (see Table 3).

Table 3List of interviewees

Participant	Role	Duration	Means	Country
Interviewee1	SDG program coordinator	50 min	Teams Microsoft	Belgium
Interviewee2	Project Manager, DG Digital Transformation	50 min	Teams Microsoft	Belgium
Interviewee 3	Researcher in the field of proactivity	50 min	Teams Microsoft	Germany
Interviewee4	Local coordinator for SDG	50 min	Teams Microsoft	Belgium
Interviewee5	Service designer AMMA	45 min	Teams Microsoft	Portugal
Interviewee6	Service communications	45 min	Teams Microsoft	Belgium
Interviewee7	Researcher in digital services and inclusion	45 min	Teams Microsoft	Belgium
Interviewee8	Head of digital enabling services	50 min	Teams Microsoft	Malta
Interviewee9	Digital transformation expert in public sector	35 min	WHATSAPP call	France
Interviewee 10	Digital inclusion expert	50 min	Teams Microsoft	Belgium

To conclude, the targeted group of interviewees included both individuals directly involved in service delivery and recognized experts in the field. The full interview transcripts are provided in the *Annex*.

3.3 Data analysis

Thematic analysis (TA) utilized as the method of data analysis in this research. According to (Clarke & Braun, 2017) TA is a flexible and widely applicable approach suitable for both small and large datasets. For instance, it has been used in case-studies with only 1–2 participants (Cedarville & Åberg, 2010) as well as in large-scale interview studies involving over 60 participants (Mooney-Somers, Perz, & Ussher, 2008). TA is also appropriate for analysing both homogeneous and heterogeneous samples.

In the present study, participants represented two distinct groups, public service practitioners and academic researchers, who were from different European countries. In this context, heterogeneity refers to variation within the sample, such as differences in professional backgrounds, experiences, and perspectives. This diversity is methodologically significant. As noted by (Kouam Arthur William, 2024) applying heterogeneity in social science research helps avoid oversimplified interpretations and supports the generation of more nuanced and generalizable findings

The approach utilized for TA was based on the guidelines proposed by (Braun & Clarke, 2006) in six stages (see Fig. 10).



Figure 10 Braun & Clarke 6 stage analysis

The first stage in Braun and Clarke's (2006) framework is familiarization with the data. In this study, the familiarization process began during data collection and continued throughout the transferring transcriptions into NVivo. During this phase, the transcripts were read multiple times to gain a comprehensive understanding of the content and to develop a deep engagement with the data. This immersion stage, gave the opportunity to get familiar with patterns, meanings, and potential areas of interest, laying the foundation for subsequent phases of analysis.

In the second stage, the interview transcripts were systematically analysed, and initial coding was conducted with reference to the research questions. This phase involved identifying and labelling meaningful data segments relevant to the aims of the study. Particular attention was given to recognizing similarities, differences, and recurring patterns across the dataset (Braun & Clarke, 2006).

In the third stage, potential themes were developed by clustering related codes into broader categories that encapsulated shared meanings across the data. The fourth stage focused on reviewing and refining these preliminary themes to ensure they accurately reflected the underlying data. This iterative process involved assessing the internal coherence of each theme and confirming their distinctiveness in relation to one another.

In the fifth stage, the finalized themes were clearly defined and named, with each one representing a specific dimension of the research focus. Finally, in the sixth stage, a comprehensive analytical report was produced. This report presents the key findings of the analysis, supported by illustrative data excerpts, and is explicitly linked to the research questions and relevant scholarly literature.(Terry et al., 2017)

3.3.1 Reliability and validity

In this study, a codebook reflexive thematic analysis used, which represents a midpoint between coding reliability approaches and the reflexive approach to qualitative analysis(Brooks & King, 2017; Smith & Firth, 2011). Even though a structured codebook supports consistency in the coding process, the current analysis is still interpretive. It is grounded in a qualitative approach that acknowledges the researcher's active role in constructing meaning from the data (Braun & Clarke, 2019).

In reflexive thematic analysis, reliability is not achieved through inter-coder agreement, using metrics such as Cohen's Kappa, but rather through transparency, reflexivity, and analytical depth. Codes are not treated as objective labels; instead, they represent the researcher's evolving interpretations of patterns within the data. Themes emerge inductively through iterative engagement with the material, shaped by the researcher's situated perspective.(Braun & Clarke, 2019).

In order to have the validity of the findings, a data triangulation strategy applied. This method achieved through comparing interview data with policy documents, report and secondary sources. Additionally, expert guidance was sought and incorporated to strengthen the robustness of the analysis.

4 Findings and results

This chapter presents the findings derived from the conducted expert interviews and addresses the core research question in two parts. The first part explores the barriers to proactivity and inclusion in digital public services, with a particular focus on the European Single Digital Gateway (SDG). The second part addresses how these barriers can be evaluated and effectively addressed.

4.1 Barriers to proactivity

In response to the research question concerning the barriers to proactivity, this section presents the key barriers identified through expert interviews. A codebook table (see Table 4) is provided to summarize the main categories and corresponding codes related to proactivity barriers, offering a structured overview of the thematic analysis.

Table 4 Codebook related to proactivity

Theme	Sub-theme	codes	References
Organizational inertia	Structural rigidities	Hierarchical nature of decision-making Cultural organizational barriers	Interview2 Interview 4
Political misalignment hinders digital proactivity		Competing priorities inside of government Different government cycles Technological hypes and society demand	Interview 3 Interview 7 Interview 4
Infrastructure and system-level barriers		Technical and architectural complexity Technical challenges seem manageable	Interview 3 Interview 6 Interview 8 Interview4 Interview 5 Interview 2
Fragmented data integration	Semantics and interoperability	Differences in data formats Unresolved data issues at the national level, Language differences Not using and having uniform formats	Interview 7 Interview6 Interview9 Interview 1 Interview3 Interview8
	Lack of data governance		Interview 7
Legal barriers		Legal limitations on data mining Limitations on data sharing across different levels and stakeholders Explicit request as a limitation	Interview 8 Interview 5 interview 6 Interview3 Interview 1 Interview7
Trigger mechanisms		Citizen-initiated vs. System-initiated Models	Interview 5 Interview 6 Interview 1
		User confirmation and consent Requirements	Interview 5

Theme	Sub-theme	codes	References
Nuances of trust in the context of SDG			Interview 7 Interview3 Interview 6

4.1.1 Organizational inertia

#count (2/10) One of the themes identified through the interviews was related to organizational resistance and blockers. Mainly the codes were about the structural challenges that act as a hinderance for proactivity.

Structural Rigidities

Interview findings indicated that structural blockers significantly impede the implementation of proactivity and were explicitly acknowledged as a key barrier. This can be seen in hierarchical nature of decision-making, which limits the ability of institutions to anticipate and respond effectively to citizen's needs. One interviewee pointed it out as follows:

... a very strong barrier... it is a pyramid style... you have a chain of command, of course...If the head [decision makers] is disconnected from the bottom, not much is going to happen. So, this is a strong barrier, and then all the consequences are... legal, technical, resources.

(Interview 2, 2025)

Another aspect of structural rigidity identified in the interviews relates to the siloed nature of entities and organizations, which is related to organizational culture. Beyond the resistance to change, findings highlighted the persistence of legacy thinking as a fundamental obstacle. One interviewee explained:

...we have to make a shift between what we were doing and the way we were doing it, and what is proposed and asked, asked for ... So, there is a shift to be done there too.

(Interview 7, 2025)

To conclude, resistance to change, silo working driven by organizational culture (rather than solely performance structures), and hierarchical decision-making were all identified as barriers to proactivity. As one interviewee noted, what is needed is not merely more technology, but rather significant improvements in underlying processes.

I would say right now in the services we have the legacy. It means that changing the whole, it is not only about technical, but also the processes matter ... We have to do the processing improvement.

(Interview7, 2025)

4.1.2 Political misalignment hinders digital proactivity

#count (4/10) This theme revealed that political movements and government agendas play a significant role in prioritizing proactivity. Contextual factors, such as national defence, the COVID-19 pandemic, or even the hype surrounding emerging technologies, can divert attention and resources away from proactive service development, thereby slowing its progress and deprioritize it.

Competing priorities inside of government

Interview findings indicated that contextual shifts within government can significantly influence its willingness to pursue digital transformation initiatives, particularly those related to proactivity. These shifts are shaped by broader strategic priorities and emergency at the political level, such as defence, public health responses during the COVID-19 pandemic. When such high-level priorities dominate the agenda, proactivity might be deprioritized. This prioritization noted out in an interview, as:

...if you have different priorities, then that is always difficult...If I focus on economic advancements ...military development or whatever the social aspects, then of course I focus on these things and digitalization needs to take a step back, right. So, digitalization of the public sector is not that popular that you can win a lot of elections with that.

(Interview 3, 2025)

Different government cycles

Interview findings revealed that political movements and policy cycles play a significant role in creating support for proactivity. At certain times, government ideology dwell on proactivity and larger scale digitalization, while at other times, proactivity receives considerably less attention. This fluctuation is also reflected at the EU level, as noted by interviewee who emphasized how political direction and institutional focus can shift over time, impacting the continuity and strength of support for proactive digital services. It is argued as follows:

...now in ... we had this one year a very supportive government on the digital services. And so, we implemented important laws for having a single, a single point of contact in which all the services are Federated...But now we are going to elections. So, these efforts of this government will slow us down a little bit. So then multiply this context factors across Europe and you have a multiply of small interferences on the way we are going. And this doesn't permit us to have a straight linear movement forward with constant evolution and because there are so many different contexts and variables that each team in each country has to face.

(Interview 7, 2025)

Technological hypes and society demand

Findings indicated that technological hype and emerging digital trends play an important role on shaping societal demands. Subsequently, these evolving demand influence how governments position itself toward the demand of the society. As one interviewee discussed, public expectations driven by technological innovation can pressure governments to adopt more proactive approaches, even when institutional readiness may lag.

... they have the feeling that everyone has to do now some AI stuff, and it is always a question of how you can sell certain things? What does society now push forward as a topic? And it is always also a question of what kind of pressure is there...

(Interview 3, 2025)

4.1.3 Infrastructure and system-level barriers

#count (6/10) This theme encompasses two distinct perspectives on how technology functions as a barrier to proactivity. The first group of findings viewed technological aspects, particularly those related to service requirements, as a significant barrier. In contrast, the second group viewed technological capabilities manageable, but emphasized that the real challenges lay in the supporting conditions necessary for implementation, such as securing funding and ensuring regulatory compliance.

Technical and architectural complexity

#count (4/10) To enable proactivity within the context of SDG, the required technical and architectural design was undeveloped. To exemplify that, the data integration at the backend of the SDG would require centralized or interoperable database to support proactive service delivery. However, the implementation of such systems involves various complexities, including issues related to sensitivity and information security. One interviewee elaborated on this challenge as follows:

... you can have either a single database, ... physically and then all government agencies would access the data in this one single database... that is not..really realistic...You would not do it ... because of IT security aspect. So, keeping all the data in one, one single database that's not realistic...for various reasons

(Interview 3, 2025)

Another important aspect relates to backend complexities. One interview example illustrated how a life event within the SDG, such as studying abroad, could be affected by these issues. In such cases, the integration between different technical components is

essential but it is often missing or inadequate. The complexity of multi-layered systems and backend processes was also mentioned as a significant challenge. Given that a Maltese student wants to apply to the university of Ljubljana (see Fig. 11). The process has several systems working together behind the scenes to exchange necessary documents. The student first logs in through a secure identity system (eIDAS), then previews the required data, usually stored at the University of Malta. The data is retrieved, prepared, and securely sent to Slovenia using the SDG infrastructure.

As explained by the interviewee:

This is a process that has at least 50 steps. From a technical perspective, it is complex. And what I think ... where as much as possible we want to see simple clicks, simple interfaces.

(Interview 5, 2025)

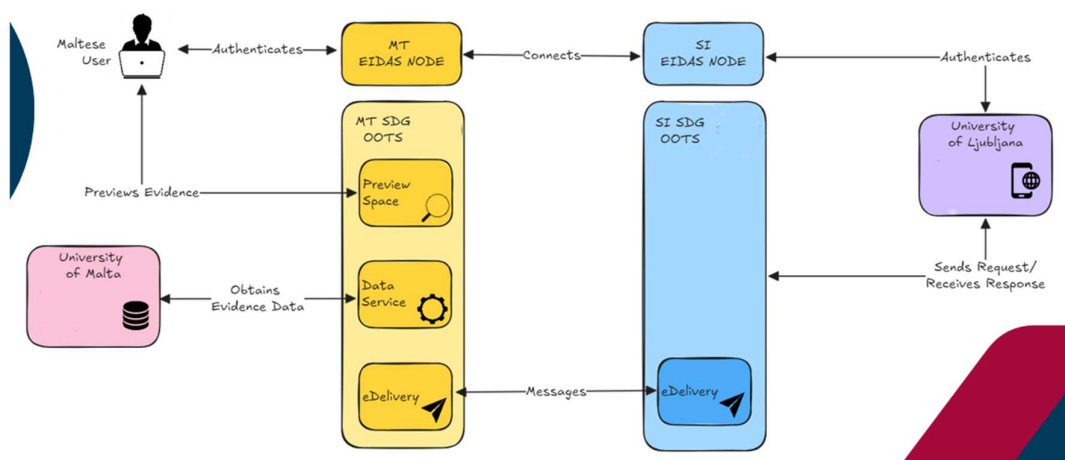


Figure 11 Back-end architecture for cross-border study event

Technical challenges seem manageable

#count (4/10) Within this category, another perspective emerged from the interviews. While the complexity of technology was acknowledged, it was generally viewed as manageable. For these findings, the more burdensome challenges were not related merely technical in nature, but rather related to supporting conditions, such as financing and compliance with regulatory frameworks. For example, one interviewee highlighted the disproportionate weight placed on budgeting, using the metaphor of a Lego set to describe the architectural and financial demands of implementing new features:

a whole new Lego set next to it, because it's difficult to make all the connections to all the features... takes programming architecture and technically it's always possible to change things, but changing things costs money and the budget for this IT tool is always stepped beforehand.

(Interview 4, 2025)

Another finding emphasized the legal and regulatory frameworks pose a challenge than technical infrastructure:

It's more like the legal aspect, and I don't think that there are so much technical difficulties. It's not that easy, but I think we always have the opportunity to set up a technical environment to share data. But then there is the legal aspect, and the possibility to legally, legally have these data.

(Interview 8, 2025)

4.1.4 Fragmented data integration limits proactivity

#count (6/10) This theme addressed one of main barriers to the implementation of proactivity, which is related to data fragmentation. The results suggested that there are two distinct levels. The first level concerns the domain of data itself, including discrepancies in data formats and structures. The second level operates at a higher scale and relates to a broader issue for instance data governance. Considering these factors, they could be as a barrier for data exchange and sharing.

Misalignment of data standards and structures

#count (6/10) Interview findings revealed that a major challenge for implementing proactivity in the context of Single Digital Gateway lies in the lack of uniformity in data standards and similarities across EU member states. Several participants emphasized that while data may be technically available, differences in data formats, unresolved data issues at the national level, language variations and the absence of standard formats significantly hinder the data integration and exchange.

Based on the findings, the large number of languages used across the EU and their structural differences could complicate on the data exchange process. One interviewee illustrated that there is excessive and unnecessary data in documents such as birth certificates and similar ones and explained it as follows:

...for instance, the birth certificates. Birth certificates have a lot of information to be shared... if the data is not structured in an appropriate way, we will not be able to share only the needed information.

(Interview 7, 2025)

Or other interviewee mentioned that the difference like this:

Well, that's one in the smaller details. Even the way people write their first and last name is not the same in all over Europe.

(Interview 6, 2025)

Lack of data governance

#count (1/10) Another barrier related to data, as identified in the findings, concerned the lack of robust data structure mechanism at higher institutional level such as data governance. finding exposed that there is a strong need for a shared vision and a common approach to data governance across Europe. This need is perceived foundational, rather than purely technical. Its absence is particularly evident in unresolved data ownership mechanisms. To clarify, the interviewee explained it as the way that public entities consider themselves as data owners for what they generate, that makes data sharing across institutions and borders challenging. While the current regulations provide assurance to security and authentication like SDGR, or GDPR, they fall short in addressing issues of ownership, access rights, and related governance dimensions. As one interviewee expressed:

"It doesn't matter ... is dealt with by the tax authority in Portugal and by the justice ministry in Spain... If the data is well organized and well structured, and if we have the right governance of data, then this becomes more important than political or organizational governance. Data is a layer beneath organizations—it is public data, and it can serve as the foundation for building new services, regardless of whether they originate from social security, tax authorities, or municipalities."

(Interview 7, 2025)

4.1.5 Legal barriers

#count (4/10) Legal barriers emerged as the most recognized barriers in the context proactivity and SDG. Two specific aspects were directly identified as legal barriers: first, legal constraints related to data sharing between institutions, and second, legal limitations on the use of data mining to proactively identify eligible users.

Legal constraints on data sharing across different levels and stakeholders

The study finding indicate d that access permission, across multiple levels, often restrict the potential for data exchange in digital public services. To clarify, it can occur both within a single country among different public or private entities, and even between

countries. Even in services which regarded as proactive, it can happen. However, it is not data limitation; it is a legal issue. This interviewee explicitly clarified it as

The possibility to share data, to have shared data from other countries or other administrations, even in ... or private organizations like banks... it's more legal. You have to set up the possibility to have this shared data."

(Interview 8, 2025)

Legal Limitations on data mining

Interview findings suggested that legal legislations effect on the actions related to proactivity and limits them. To be more specific, data mining and related activities that can help to reach personal data for determination of eligibility is restricted after the GDPR. A concrete example was provided in the context of study grant eligibility checks. Prior to GDPR, public authorities at both regional and federal levels allowed to access and process the personal data to identify the eligible ones. However, this action limited due to current legal limitations.

4.1.6 Explicit request as a limitation

#count (1/10) One of the key legal limitations associated with the Single Digital Gateway is called explicit request from the user. Any automated exchange of evidence takes place under that. In other words, not only the initiation but also influence on the continuation of the service throughout the process is dependent on citizen. In fact, this requirement often viewed as a cornerstone of how service must operate within the SDG framework. As one interviewee demonstrated:

... There has to be a specific user direction to do anything...

(Interviewe5, 2025)

4.1.7 Trigger Mechanisms

This theme explored the role of triggering in the context of Single Digital Gateway, the rules and mechanism that may act as a barrier to proactivity. The findings suggest that, in most cases, the SDG relies on triggers from citizens to initiate service and in some cases life event could act. Mostly in the context of SDG the system needs triggers from the citizens and in some cases might be life event helps.

Citizen-Initiated vs. System-Initiated models

The interview findings indicated that, in the context of Single Digital Gateway, both the initiation and continuation of service are largely dependent on the triggers from citizen.

Typically, a citizen sends a request and the process begins. however, this is not always the case. In some instances, the nature of service is closely entangled with life events and system can recognize the life event. To clarify, in the case of study grants, sometimes the system may be able to detect a life event and identify the eligible citizen. Yet, even in such cases, the level of proactivity is inconsistent and context dependent. #count (3/10)

One interviewee highlighted that in Belgium, for instance, the trigger mechanism may vary depending on the region. For example, if you live in Flanders service detection could be based on the life event, but you live in Wallonia citizen must apply for that. Ultimately, the findings revealed that the current system does not yet support seamless, proactive delivery at full potential. As one interviewee clearly explained.

...we as a government cannot decide when you want to move to another or have to move to another country. We cannot do anything. The first signal should be a citizen telling us that he wants to move. in that way it's not possible to act in a proactive way.

(Interview 1, 2025)

User Confirmation and Consent Requirements

The findings also indicated that beyond the initial trigger, the continuation of the service still require explicit action from the citizen. In other words, even if the system is able to detect a relevant life event or initiate a service autonomously, it cannot proceed without user confirmation. One interviewee explained this limitation by referring to the concept of a “preview space,” which highlights the current dependency on user consent for the system to move forward:

... what is called a preview space comes up first. And the preview space is a safe place where the user is, is kind of allowed to accept or decline. Now if the user declines, you know, the, the, the transaction stops there. And that requirement is absolutely needed. It is not possible to say, for example, I would store my instruction somewhere and the system will take it as good. But that is not possible at the moment with the single digital gateway...

(Interview 5, 2025)

In the context of Single Digital Gateway, user acceptance and dependence on user action are often perceived as burden placed on the citizen. As discussed, the initial triggers typically come from the citizen’s side. However, there is ongoing critique about the continued reliance on user involvement across multiple steps of the process which is also reliant on the user. As interviewee explicitly describe the process as

...to have a potential scenario, maybe we could adjust it that the universe, the ...citizen sends a push notification to the multiuser. The multiuser ... clicks on that notification, push notification, it brings up a prefilled screen. And then there is some you know, the process kicks in again... You have to ask the user to confirm that they can use the calculation that is happening on the other side. There is no other way of doing it except this.

(Interview 5, 2025)

4.1.8 Trust in the context of Single Digital Gateway

#count (3/10) The concept of trust emerged as one of the most nuanced themes in this research. However, its meaning and significance are highly context-dependent, particularly when comparing trust within national-level proactive digital services and within cross-border frameworks such as the Single Digital Gateway (SDG). The findings put emphasis on that trust concept varies depending on its function and direction. For instance, in cases involving data integration, such as the automatic calculation of study grants, citizens must trust the government enough to allow the use and exchange of their personal data. Without this foundational trust, the automation of services becomes technically and politically unfeasible.

Furthermore, one interviewee referred to the “Big Brother effect,” illustrating a paradox in the relationship between data-driven proactivity and public trust. While proactive services require extensive access to personal data to function effectively, the accumulation and use of such data may trigger feelings of surveillance and loss of control. This is especially pronounced when fiscal administrations are perceived as “knowing everything about everyone.” As the findings show, although greater access to data may technically enhance the capacity for proactivity, it may also erode public trust in digital government. This creates a critical dilemma: proactivity depends on data, but inclusion depends on trust.

4.2 Barriers related to inclusion

In this part, all the findings related to the inclusion and codebook table for the inclusion is provide as follows (see Table 5).

Table 5 Codebook related to the inclusion

Theme	Sub-theme	codes	References
Digital divide	Digital skills	Statistics of digital literacy, Identification of group, digital literacy as a barrier	Interview 2 Interview 6 Interview 10 Interview 4

Theme	Sub-theme	codes	References
	Lack of access	Physical access Connectivity Socio-economic related access Outreach challenges	Interview 10 Interview 2 Interview 4 Interview 9 Interview 6
Complexity of service		Administrative burden Procedural burden Digital allergic	Interview 2 Interview 10 Interview 8 Interview 1
Policy-strategy Misalignment		Willingness of leaders Inclusion best practices Disconnection between government and citizen	Interview 2 Interview 4 Interview 7
Language and context barrier	Language barrier	Language as part of digital divide Language in the context of cross border Language barrier in the context of in person support	Interview 9 Interview 10 Interview 6 Interview 7
Language and context barrier	Context and textual	Contextual complexity Simplification vs oversimplification	Interview 4 Interview 10
Design failure		Design limitations Importance of inclusive design Lack of non-technical stakeholders knowing about IT Path- dependency of design Systematic blind spots Needs override Designer bias	Interview 2 Interview 4 Interview 10 Interview 9
Eligibility exclusion		Single digital gateway and cross border services	Interview 3 Interview 7

4.2.1 Excluded by digital divide

#count (4/10) In the context of this research, the digital divide exists as a wicked problem in the domain of digital public services. This theme included digital literacy, lack of access, language barriers which is explained as follows:

Digital skills

#count (4/10) Digital literacy and skills emerged as a recurring theme throughout the interviews. One key finding emphasized that if digitalization becomes fully implemented, a significant number of users will be excluded due to lack of digital literacy. However, the concern is supported by national data on digital literacy in Belgium, approximately 35% of population lacks adequate digital literacy. Apart from statistics, one interviewee provided a nuanced view, by identifying three specific categories in Belgium that are

particularly vulnerable to digital literacy as people with low education, with low income and elderly populations.

Physical and Socio-economic access

#count (5/10) Lack of access emerged as one of the core themes in this research, as indicated by the interview findings. This theme is primarily reflected in the absence of physical access to smartphones, digital devices, and reliable internet connectivity, factors that remain significant barriers in several of the countries represented by interviewees and related to the services examined in the study.

In the case of fully digital services, exclusion tends to worsen, as one interviewee argued.

... there's a lot of barriers because the services are thought of as a fully digital process. But a lot of citizens... they don't have access to the internet...

(Interview10, 2025)

Several findings highlight the impact of socio-economic conditions on access to digital public services. As one interviewee pointed out, even in major urban areas such as Brussels, there are neighbourhoods where people still lack access to devices or reliable internet connectivity. In other words, barriers to access persist at multiple levels and are often concentrated among groups affected by socio-economic disadvantage. As one explicitly described:

First of all, access. You need internet and you need a laptop or a smartphone. And if you go to a school, a random school in Brussels, you will already see that not every family there has a functioning smartphone that has access to the internet. The Internet is still something we must pay for. It's not like it's free for all. So perhaps rather controversial, but if we could give every family a basic amount of Internet, like Internet in the whole country that you know, at a very slow Speed.

(Interview 4, 2025)

Another interviewee referred to statistical evidence on connectivity in Belgium, noting that 5 % of Belgian population does not have the proper connectivity. This observation reinforces earlier findings on the access-related barriers, even in well-connected countries.

While this barrier is critical, the findings indicate that it lies outside the control of service providers. As a result, designers, policymakers, and service implementers face significant challenges in effectively reaching marginalized groups. This disconnect highlights the limitations of institutional capacity when structural or socio-economic

factors, such as lack of access or digital literacy, fall beyond the direct influence of public service actors.

4.2.2 Complexity minimization dilemma

#count (4/10) This finding corresponds to the complications and complexity involved in user interactions with public services. These individuals often struggle using digital public services due to complexity of administrative procedures. One interviewee highlighted that users often struggle with the technical jargon used in digital service interfaces, which can make even basic interactions overwhelming.

A concrete example was provided by an interviewee referencing the procedure to apply for a school fee discount. The first barrier was simply knowing the service existed. From there, users needed to understand which administrative body to contact, a particularly confusing task in Belgium's multi-level governance system. Even when users were aware of the benefit, further difficulties emerged around the application process itself. These challenges are intensifying for vulnerable groups.

The experience gets more difficult for certain groups who do not consider digital delivery as an option, but rather as an added layer of difficulty. As described by one of interviewees as

...there will always be people who struggle to do things, even if it's not digital, because our domain[service] is complex... But there will be always a part of citizens who are allergic to ...digital services.

(Interview 8, 2025)

4.2.3 Policy-strategy misalignment

#count (3/10) The level of inclusive practices is closely tied to the degree of leadership support and alignment between policy and strategy. One of the key findings highlights that the existence and advancement of inclusive measures depend on the political will at higher levels of governance.

Another important aspect is the perceived disconnect between citizen and government. As the interviewee argued the gap through the metaphor of “living on 7th floor “, suggesting that there is a disconnection and distance between government and citizens, that's current practices cannot lie citizen at the center.

4.2.4 Context and Language barrier

#count (5/10) Language is considered as a barrier not only in the context of this study, where it poses a challenge to inclusion in the Single Digital Gateway. However, the findings indicate that the context to which language acts as a barrier depends on the complexity of the service and the user individual circumstances, for instance their socio-economic status or level of education.

In the case of the study grant, language differences among European countries were not considered as a barrier. Interviewee explicitly explained it as:

... students at least have a certain level of knowledge, even the and the language where they are in that university they're studying... not all every student study fluent Dutch...

(Interview 6, 2025)

However, the perception changes in the case of students with a refugee background. Taken together, the findings indicated that, in the case of vulnerable individuals, language consistently acts as a barrier.

Another finding revealed that, in the context of Single Digital Gateway, even offline and in-person services can also be affected by language barriers. As interviewee clarified as

... you can use teams or phone to have help, then there is the language barrier, because we have three[language] in Belgium, but we cannot speak English, even if we try to speak English, will the ... citizen also understand English? And can he speak English? So, there will always be about the barrier of the language...

(Interview 7, 2025)

However, at times, it is not the language itself but rather the style and context in which it is used that creates an additional layer of complexity. As one of the interviewees explained it as

The language that they use is very complicated. So, the threshold to actually do these things is very high, especially for certain.

(Interview 10, 2025)

For instance, some digital services are presented in English, but the language is symbolic rather than functional, making it impractical for users. Thus, in this case, it is the context that matters more than the language itself.

4.2.5 Challenges of design for inclusion

#count (4/10) The interview findings indicated that the foundation of current design practices is not inclusive enough. However, the findings revealed that one of the key reasons for the failure of inclusive design was the lack of meaningful participation by vulnerable groups in co-design sessions. The exclusion occurred either due to systemic data gaps or limited outreach capacity for identifying vulnerable group, because members of vulnerable groups were unable to attend design activities as their basic needs' overrides.

This suggested the presence of a bias in how inclusion is approached within the design process. As one interviewee explicitly expressed:

...services or digital products are designed by designers who think they're designing for themselves or for the people in their network...it's very important ... involve a very diverse group of users from the start before you start designing, when you have a first design, when you want to test the first product... I think there's really a lack in user involvement or diverse user involvement.

(Interview10, 2025)

The findings also demonstrated that inclusive design often fails in practice due to a clear disconnect between service providers and users. Rather than involving end users, design processes are largely shaped by civil servants. As one finding revealed, users often lack both the channels, and the voice needed to participate effectively in shaping digital public services.

Another finding dealt with the fact that the design session with target groups and vulnerable individuals is not inclusive enough. One argued that for many vulnerable people, participation in co-design activities is simply not a priority, as they are preoccupied with meeting basic needs. In addition, the findings showed that digital enhancements and service improvements can unintentionally undermine inclusion. This is largely because user experience (UX) data and feedback are gathered from users who are already engaged and willing to participate, rather than from a representative cross-section of all users or vulnerable groups.

Finally, another important perspective related to path dependency in the design process. From the beginning, there has been a lack of knowledge exchange between civil servants and professionals such as IT staff. As a result, technical requirements were not clearly communicated early on, which led to design flaws that are now costly and time-consuming to reform.

4.2.6 Cross-border nature of Single digital gateway

#count (2/10) In the context of Single digital gateway, there are cross border limitations that affect inclusion.

One key factor was the need for data and data availability to define the concept of “typical citizen” as defined by interviewee

...you can define eligibility criteria, but everyone who meets these eligibility criteria will then get the service right... right then you have to define certain criteria of a typical citizen and everyone who falls out of these criteria then needs to approach the government in a reactive manner.

(Interview3, 2025)

As outlined in the finding, the exclusion is constructed after the conceptualization and implementation of *typical citizen*. However, additional layers of complexity emerge due to governance and fiscal constraints. As financial limitation exist and it is explicitly defined by interviewee as

...They've considered that only 80 - 90% of the people will ask for [study grant]. Subsidies and if suddenly 100% is getting it, then you must increase the budget and well... we've always got, we've got not money...

(Interview6, 2025)

To reach full proactivity, where benefits are automatically delivered to eligible people, it would really need substantial increases in public expenditure. In cross border scenarios this challenge is further compounded, beyond technical and data limitations, the underlying governance structures and budgeting models serve as key impediments to inclusive service delivery.

4.3 Conclusion to barriers

Based on the expert interview data, the table above presents a structured overview of the key barriers to achieving inclusive and proactive digital public services. The barriers are organized across six conceptual categories, user-related, service design, political, organizational, technical, and legal and are mapped according to their relevance to the dimensions of inclusion and proactivity. The final column indicates the ratio of interviewees who identified each barrier, offering insight into the breadth and prominence of each issue.

The analysis reveals that inclusion-related barriers were more frequently cited and represented a wider conceptual variety. High-frequency issues included lack of digital skills, limited access, service complexity, and language barriers. In contrast, proactivity-related challenges were more concentrated in technical and legal domains, such as architectural complexity, lack of data governance, and absence of monitoring mechanisms. Certain barriers, such as trust and eligibility exclusion, were found to impact both inclusion and proactivity dimensions simultaneously.

This categorization and ratio-based synthesis serve as a foundation for the subsequent analysis. It supports evidence-based recommendations for improving the design and implementation of inclusive, and proactive services in the context of the EU's Single Digital Gateway.

Table 6 Barriers to inclusion and proactivity

Barrier Title	Conceptual Category	Inclusion	Proactivity	Ratio
Digital skills	User related	✓	—	0.4
Lack of access	User related	✓	—	0.5
Complexity of service	Service design	✓	—	0.4
Policy-strategy misalignment	Political	✓	—	0.3
Language barrier	User related	✓	—	0.4

Barrier Title	Conceptual Category	Inclusion	Proactivity	Ratio
Context and textual	Service design	✓	—	0.2
Inclusive design	Service design	✓	—	0.4
Structural inflexibilities	Organizational	—	✓	0.2
Political misalignment	Political	—	✓	0.3
Technical and architectural complexity	Technical	—	✓	0.6
Semantics and interoperability	Technical	—	✓	0.6
Lack of data governance	Legal	—	✓	0.1
Legal limitation related to data	Legal	—	✓	0.6
Trigger Mechanisms	Service design	—	✓	0.3
Explicit request	Technical -Legal	—	✓	0.1
Trust	User related	✓	✓	0.3
Eligibility exclusion	Service design	✓	✓	0.2

4.4 Evaluation and addressing barriers

To address the research question, particularly regarding how to overcome the identified barriers, several key findings were uncovered. This section provides a detailed explanation of the proposed solutions.

4.4.1 Standardization and governance at EU-level

The findings indicate that the establishment of an EU-level standard framework is crucial for achieving proactive services. The requested standardization had a wide range from framework to KPIs for evaluation. A shared European standard, with common definitions particularly in areas such as semantic interoperability and legal baselines was one of the requested suggestions. In this context, digitally mature countries such as Estonia and Portugal can play a critical role as pilot implementers. These early movers are well-positioned to test and refine SDG-related frameworks and to provide valuable roadmaps

and support mechanisms for countries still in the earlier stages of digital development. As the interview described the need for that as

at some point we have to decide and establish a standard and then and then start to work through that standard. And even if some countries are below, we are going to have more detailed road map for them to achieve that standard.

(Interview 7, 2025)

However, not all respondents supported the concept of a unified framework. Instead, many emphasized the importance of standards at more detailed levels, such as semantics, interoperability, and European KPIs. Particularly in case of KPIs and evaluation on of the interview explicitly explain the need as:

... it's also something that's really difficult to evaluate. And sometimes you, you are going to say, okay, for me, I think it's proactive and user centric. But is it really as proactive and user centric as another country? Of are we more Pro user centric than another country? So we don't have standards that can say, Okay, we have a measure. We have standards, and we know our level of proactivity in the European Union

(interview 8, 2025)

4.4.2 Mindset shift as a measure to proactivity

#count (4/10) At the government level, a shift in both political mindset and political will is essential to drive inclusive and proactive public service delivery. In several countries, the political conditions do not adequately prioritize inclusiveness, with a lack of political commitment identified as a significant barrier. Interviewees emphasized the need for a shift in government priorities to foster a culture of proactivity and citizen-centredness, citing best practices from GCC countries as examples of how political will can facilitate a more inclusive approach. Similarly, at the implementation level, changing the mindset could also be effective. One interviewee noted that shifting from traditional implementation methods to quick-win, goal-driven strategies could strengthen proactivity within the SDG context. As one interviewee explicitly stated:

In the context of quick-win approach Piloting impactful services first would help citizens see tangible benefits, increase engagement, and reduce scepticism about the value of digital transformation.

(Interview 9, 2025).

4.4.3 Omnichannel strategies

#count (5/10) The findings indicate clearly indicate the need for omnichannel strategies in public services. Findings acknowledged that while removing certain structural access issues lies beyond the responsibility of individual practitioners, one way to improve accessibility is through the design and implementation of omnichannel services.

Findings demonstrate that reaching to digital public services cannot be achieved solely through digital means such as websites or mobile applications. For services to be truly accessible, especially to vulnerable populations, offline alternatives must also be made available. Within the context of the Single Digital Gateway (SDG), such offline support structures could be absent or underdeveloped as it indicated through findings. In this regard omnichannel approaches can help overcome barriers associated with digital-only or “digital by default” service models. As one of the interviews put emphasis on omnichannel thinking and consider it to address citizen needs as follows,

Whereas if you think in citizen experience, then... we have digital, but we have also physical, and we have phone, and we have email, and we have an omnichannel way of thinking, which makes it different, but it needs structural reform to reach that point, that stage, that level of citizen, citizen experience, but there is no vision on that yet.

(Interview 10, 2025)

Other findings suggest that omnichannel strategies can serve as a backup for accessing public services, helping to address even contextual exclusions. One interviewee provided an example from Portugal, where public service design continues to support parallel physical and digital channels. This model allows citizens to choose their preferred mode of interaction and ensures inclusivity by offering flexible access pathways. The interviewee viewed omnichannel strategies as a valuable solution to current exclusion challenges, with another interviewee noting their potential to address contextual exclusions as well.

4.4.4 Community-based and in-person assistance (3/10)

#count (3/10) To address digital skills gaps, particularly those related to administrative and service-related issues, several approaches were identified through the findings. One interviewee highlighted promising example of physical support points that can help bridge these gaps. For instance, Digipunten in Belgium and Informatiepunten Digitale Overheid (IDOs) in the Netherlands represent physical support points where citizens can receive in-person assistance with digital public services. Another interviewee referred to the coordination with social organizations and community-based assistants. While the service itself is proactive, he emphasized the importance of community support. As he explained:

that's something that can happen. What we try to do is to have other organization that can help citizen, for example, OCM ways, CBAS so social assistance, there are organization that can be the intermediary between citizen and administration to help them fulfil their obligation, or what we have set up is the possibility for a citizen to make the tax declaration for another citizen. (interview 8 ,2025)

4.4.5 Design guidelines for inclusion

#count (2/10) Utilizing guiding design principles is a key approach to enhance inclusion in public service design. However, the effectiveness of these principles depends significantly on the mechanisms in place to support their practical implementation. Without clear structures for application, even well-developed guidelines risk becoming symbolic rather than transformative.

As the findings indicate, several guiding principles were introduced in the context of this study. In Portugal, a set of design principles in a human rights-based approach has been implemented to guide the public sector. One interviewee described the design guidelines as follows:

entities must be prepared when they redesign the services ... That's why in Portugal we have developed 9 guiding principles for designing public services based on human rights... a toolbox that helps public entities when redesigning their services to make sure that these principles ... services and human rights-based service design if they are going to be addressed...

(interview 7 ,2025)

Similarly, some guidelines exist at the flanders and developed as In Belgium, similar guidelines have been established under the Digital Services Strategy (Digitale Dienstverleningsstrategie), led by the Digital Flanders (Digitaal Vlaanderen) initiative. However, findings from the current study suggest that awareness and implementation of these guidelines remain limited and inconsistent. While the guidelines exist, their operationalization in everyday service design and delivery is still unclear.

4.4.6 Engage with excluded and hard-to- reach users

#count (4/10) One of the key barriers identified in this study is the design bias toward vulnerable groups. Although there is often an assumption that diverse communities are included in the design process, in practice, this inclusion rarely occurs. A significant blind spot remains for individuals who face foundational access barriers, often referred to as hard-to-reach populations. To address this issue, it is recommended that designers broaden their inclusion strategies, particularly by diversifying communication channels and outreach efforts.

As interviewee expressed:

You could go for a day as a designer to a centre for homeless people and to a design workshop in the centre. Like I think it's very difficult to get those excluded

groups to do some user testing office in some fancy building that will, it's very unlikely to happen.

(Interview 10 ,2025)

More concretely, engaging in field-based design, conducting in-situ workshops, and collaborating with organizations that already work with excluded groups, such as undocumented individuals, homeless people, and persons with disabilities, are essential strategies. Partnering with local actors and community organizations that maintain continuous contact with these populations helps reduce design bias and counteracts the systemic neglect that often shapes digital service design from the outset. Furthermore, creating comfortable, familiar, and non-institutional environments for engagement is crucial to fostering participation. This is particularly important given that many individuals in these groups are preoccupied with fulfilling basic needs and may be unable or unwilling to participate in formal office or lab settings.

4.4.7 A mechanism for recorded consent

#count (1/10) To enable proactive service delivery under the Single Digital Gateway Regulation (SDGR), a legal and technical framework should be introduced to support persistent user consent. One of the identified barriers is the need for explicit user consent at every stage of a transaction. The findings of this study suggest that an ideal solution could be a consent management dashboard, allowing users to manage and revoke consent as needed. This dashboard would function similarly to features like "Remember Me," where users can indicate their preferences for future interactions.

... maybe what is needed is more of a dashboard, where the user sees everything that is happening and maybe some form of, you know, advanced consent management...

(Interview 5, 2025)

4.4.8 Data minimization initiatives

As findings demonstrated, there are several solutions for reducing administrative burden and one of them is redesigning forms, according to the findings interview demonstrated that there are several ways to do the data minimization, it can be achieved through redesigning forms, and reorganizing processes in the context of services. As interviewee expressed that as:

we encourage public administration entities to look to their forms ... what are you asking to the people name and address? ... You have that, that information when

people authenticate with the digital mobile key that we have, you have already access to that information. So, you can cut this from the form and then you ask for their parents' names, ... We have this on ... in the Institute for Agencies and Notary.

(interview 7, 2025)

4.4.9 Knowledge sharing mechanisms for decision-makers

Based on the findings, some suggestions were provided for better decisions and design in the context of public services, particularly for civil servants. The findings indicate that there is a need for enhancing technical awareness and sharing among service decision makers to be effective.

Regarding IT knowledge sharing, the findings demonstrate the need for both managers and public servants to be familiar with IT concepts. Such knowledge can help minimize design challenges from the outset and prove effective in addressing legacy issues. As one interviewee expressed:

If you could start with teaching the basics of programming like in a, in a few minute presentation, but just teaching civil servants at high levels like this is where programming is... everything has to go out the window to inform civil servants what is an easy change to make in software architecture and what is an impossible change to make in software architecture... Like if you are the boss of an IT tool, please take one day of your life of a course that will teach you the basic, basic, very basic of IT. So you at least you know 50% of what you're dealing with...

(interview5,2025)

On the other hand, one finding suggests that there is an interactive triangle between civil servants, citizens, and public managers. Any design-related issue must be considered within this triangle to ensure effectiveness, as one interviewee explicitly stated:

If you combine the three [political objectives, user needs, and worker expertise] normally, you should be able to make the thing work.

(Interview2, 2025)

This triangle represents the balancing act needed when designing or implementing a service or system. To be effective, a solution must strike a balance between these three perspectives, ensuring that the system meets the objectives of the political or managerial goals while being responsive to user needs and workable from a practical standpoint.

4.4.10 From European KPI to innovation matrix

Given that most of the services examined were identified as reactive rather than proactive, a key recommendation emerging from the interviews is the need to establish a clear set of Key Performance Indicators (KPIs). Such indicators would enable service providers to systematically evaluate the level of proactivity in their service delivery and clarify what should be measured. Examples of proposed KPIs include: The number of users actively

requesting a service, The volume of inquiries received regarding a specific service, Metrics related to fraud detection and eligibility validation.

Beyond these practical indicators, participants also referred to the need for more strategic evaluation tools. This includes the development of a matrix for measuring innovation in public services and frameworks for monitoring and assessing service quality and responsiveness. A related suggestion was to create a transversal evaluation framework that would apply across service types and administrative levels. This framework would define common indicators aligned with a conformity model, ensuring consistency and comparability.

Finally, respondents emphasized the importance of making use of existing data sources by integrating them into dashboards for continuous monitoring and performance feedback. Such dashboards would support real-time analysis and evidence-based decision-making, contributing to a more accountable and adaptive public service ecosystem.

5 Discussion and recommendations

This chapter draws upon the findings presented in the preceding sections. Synthesizing key insights to address the research questions posed at the outset of this study. In the context of the Single Digital Gateway (SDG) initiative, the barriers to proactivity and inclusion in digital public services have been thoroughly examined, highlighting political, technical, legal, organizational, service design and user related factors. Building on these insights, this chapter offers a series of targeted recommendations aimed at enriching the insights to current research question.

Evaluation ambiguity of proactivity, Framework limitations were one of the aspects discussed in the study, particularly regarding the evaluation of proactivity in the context of digital services. Participants were asked how proactivity is assessed, and the findings showed that even for current digital services, there is no existing framework or key performance indicators (KPIs) in place to measure it. Apart from some indices, the utilized method was from tracing the service to simple feedback from users, no other complementary method was used. The findings were aligned with the challenges that exist in the context of evaluation of public services.

This gap is aligned with insights from Tassabehji et al. (2016), who examined the transition from e-government to digital governance and the interplay of actors in this transformation. In their study, the application of Technology Enactment Framework (TEF) highlights that digital technologies are not deployed in a vacuum but are shaped by specific institutional, cultural, and political contexts.

To understand the current condition of the service, which was also reflected in the finding's, limited indices are available (see Fig. 12). According to Lynn et al. (2022) , there is a wide range of e-government measurement models. However, when it comes to digital services, the indices are limited.

To conclude, to evaluate the status of services and their transition to another evolutionary model, the first step should be to define an overall framework. The goals should be clearly stated, and based on that, there should be a rationale for analysis and evaluation (Ronchi, 2019).

Framework	Description	Source
Digital Economy & Society Index (DESI)	Measures performance across five dimensions: 1. Connectivity 2. Digital Skills 3. Use of Internet 4. Integration of Digital Technology 5. Digital Public Services	Digital Economy and Skills Unit (2018, 2020, 2021)
Digital Capital Index	Measures digital capital based on two dimensions: 1. Digital competencies • information and data literacy • communication and collaboration • digital content creation, • safety • problem solving. and 2. Digital access • access to digital equipment, • connectivity (quality and place) • historical time spent online • support and training	Ragnedda et al. (2020)
Digital Planet—Digital Evolution Index	The competitiveness of a country's digital economy is a function of two factors: 1. its current state of digitisation based on four drivers (99-170 indicators): • supply conditions • demand conditions • institutional environment • innovation and change and 2. its pace of digitisation (momentum) over time measured by the growth rate of a country's digitisation score over a ten-year period	Chakravorti et al. (2015)
Digital Ecosystem Development Index	64 indicators organised in to 8 pillars: 1. Institutional and regulatory 2. Connectivity 3. Infrastructure 4. Factors of production 5. Household digitisation 6. Competition 7. Digitisation of production 8. Digital industry	Katz et al. (2014), Katz and Callorda (2018)
G20 Toolkit for Measuring the Digital Economy	Over 30 key indicators organised in 4 themes: 1. Infrastructure 2. Empowering society 3. Innovation and technology adoption 4. Jobs and growth	G20 Digital Economy Task Force (DETF) (2018)
ICT Development Index ^a	Comprises three sub-indices and 11 indicators: 1. ICT Access 2. ICT Use 3. ICT Skills	ITU (2018)
I-DESI Partnership on Measuring ICT for Development	International of DESI (see above) Core list of 50 indicators in 5 themes: 1. ICT infrastructure and access 2. ICT access and use by households and individuals 3. ICT access and use by enterprises 4. ICT sector and trade in ICT goods 5. ICT in education 6. ICT in government A supplemental list of 26 indicators for adequately assessing specific targets of the UN Sustainable Development Goals were proposed in 2020.	Foley et al. (2018) ITU (2021)

Source: (Lynn et al., 2022)

Figure 12 Selected international measurement frameworks

Organizational barriers were one of the aspects considered as a barrier in the study. In the context of the current study, factors such as siloed working structures, hierarchical decision-making processes were consistently identified by respondents as impediments to change. The identified barriers were, to some extent, aligned with the framework of barriers identified by Sellitto & Pavleska (2024) . However, in their model, some aspects recognized at the national level for instance, insufficient communication between government departments, the intricacy of altering organizational structures, work practices, and cultures, and the substantial costs associated with implementation. Similarly, the findings are aligned with the study by Scholta et al. (2019a) , as in his works, process optimisation and management were among enablers. By focusing on one aspect (organizational silo) as a barrier, the study that carried out by Bertrand & McQueen (2021) indicates that breaking down the silo can lead to reform in public services. As such, overcoming institutional inertia and fostering interdepartmental collaboration are critical prerequisites for the effective implementation of proactive digital public services.

The political aspect was one of the factors recognized as a barrier to both proactivity and inclusion. Regarding proactivity, different factors may act as barriers, such as political agendas, policy cycles, technological hypes, and accordingly citizen demands. The findings from this study differed from those in studies focused specifically on the political barriers of the SDG. The political aspect for instance, in the study by Sellitto & Pavleska (2024), factors like the number of civil servants, fluctuation of IT skills were introduced which is totally different.

However, the findings were aligned with the study by Scholta et al. (2019a) . Findings from Estonia and Austria demonstrate that top management and political support serve as key enablers for advancing e-government service delivery. Similarly, in a study carried out by Idzi & Gomes (2022) , a systematic literature review was conducted to explore the influence of DEG on public policy design. It was noted that certain stages of the policy process, such as agenda formation, act as barriers, particularly in the domain of digital governance. These findings reveal how shifting political priorities can disrupt continuity and limit the implementation of proactive digital services.

The findings related to inclusion are aligned with the concept identified by Sellitto & Pavleska (2024), who found that the absence of a digital strategy for public inclusion in digital transformation acts as a barrier. However, the results of this study do not fall within the categories of inclusion defined by Lindgren & Jansson (2013), even the study findings by Pérez-Escolar & Canet (2023b).

In the case of inclusion, it can be said that, according to the literature, the gap is longstanding and exists in every phase of digital service transformation. According to the Tate et al. (2018) , disconnect between citizens and government is a fundamental and still unresolved barrier in public service delivery.

Regarding to technical aspects, the identified findings such as, complexity of infrastructure, suggest that challenges have existed for a long time in the context of new public services, not necessarily in proactive services. Technical barriers are similar to those in any online platform or market, where performance depends on the exchange of information, resources, and artefacts (Janssen et al., 2012; Tate et al., 2018). Nonetheless, the technical setup in the context of the SDG is distinct, as it includes several technical enablers such as OOTS, eIDAS, and the Once-Only Principle (OOP). Despite these structural distinctions, the findings remain aligned.

Conversely, the technical part in the context of SDG, remains controversial. According to Krimmer et al. (2021) ,*“The phrasing of the law strongly suggests a federated or at least strongly decentralized model [...] in which each Member State retains a clear degree of control over their national administrative activities, with the Commission operating a smaller central component of the system that will be responsible for interconnecting the national nodes.”* This contradicts the findings of the current research, which emphasize the need for moving toward proactivity under the SDG. In this regard, the SDGR is against the given assumptions required for proactivity, as it explicitly states that no centralised storage of evidence is permissible under the SDGR(Krimmer et al., 2021). Another technical barrier was the presence of multilayered processes behind the back end. This barrier can be considered an inherent characteristic of the SDG. It is reflected in

situations where evidence needs to be collected or created upon request, and procedures are thereafter halted temporarily or even potentially for hours or days (Krimmer et al., 2021) . While the technical barrier described by Krimmer et al. (2021) , focuses on operational delays due to multilayered backend processes, Article 14.11 of the SDGR sheds light on the underlying governance structure that contributes to such complexity. The split responsibility between the Commission and Member States may hinder coherent system integration, thereby exacerbating the very delays and inefficiencies noted in practical service delivery. These findings are also aligned with the technical difficulties identified by Scholta et al. (2019b) in Australian context. In his work it is mentioned that fragmentation and inadequate structures are the barriers to proactivity.

Regarding legal aspect, this category relates to two main issues: data and regulatory frameworks. Specifically, it includes the lack of data governance mechanisms and challenges related to data semantics, interoperability, and uniformity, as well as the availability and completeness of data.

Interoperability is considered as an enabler in the work by (RORANDELLI, 2021; Scholta et al., 2019b) which supports exchange of information across IT systems and various agencies, in his findings interoperability was considered as one of the enablers that were used in Estonian X-Road.

Meanwhile, there is consensus on the importance of interoperability. In contrast, specific limitations are evident within the context of the SDG, particularly due to regulatory constraints. As notes by Bielowski (2022), European harmonization will not be completed for all relevant datasets within the targeted timeframe ($t = 3$) for the proposed architecture. Therefore, even if the goal should be to exchange progressively more and more standardized structured data, this cannot be achieved in a few years.

Concerning semantic, the concept is recognized as a challenge by Scholta et al. (2019a) , who describe the alignment of different data models and data semantics, along with the integration of legacy systems into new architectures, as particularly difficult. This issue is frequently discussed in the technical literature related to the SDG, where it is identified as a barrier to implementing the OOP (Leosk et al., 2021). Moreover, concerns have been raised regarding the practical application of semantic. These include the lack of canonical data models, divergent national legal form requirements, the failure to ensure accurate translations and semantic equivalence, and the absence of mechanisms to relate differing national documents across systems (Bielowski, 2022). Despite their relevance, such technical issues are often not adequately addressed in the broader context of SDG implementation.

Another barrier identified is the lack of data governance and clear data ownership structures. This challenge is intensified by low readiness for change and limited willingness to share data across public and private entities, including with citizens. It is further shaped by variations in national laws and uneven progress in implementing EU-level regulatory guidelines, as discussed by Sellitto & Pavleska (2024).

There is a significantly different interpretation of the concept. According to Wimmer (2021), it is considered an enabler of the Once-Only Principle (OOP) and is linked to socio-cultural aspects. These are reflected in traditions of data sharing among governments, perceptions of data ownership, and the balance between citizens' obligations and their freedom to decide when and how to provide data to public authorities.

Regarding legal-technical barriers, the requirement for *explicit user* requests was identified as a key barrier. According to Bielowski (2022), the explicit request is explained as “a competent authority needs to inform the user of the voluntary nature of the exchange and collect their explicit and specific request to start the exchange,” indicating that the citizen maintains control over each stage of the process. Krimmer et al. (2021) also consider this regulation a user-centric approach to the Once-Only Principle.

This perception of explicit requests contradicts the role of citizens in proactive services. As Scholta & Lindgren (2023a) explicitly state, current laws that require explicit client consent for service delivery hinder proactivity, and the regulations should be adapted accordingly.

Regarding service design and triggers, the triggers from the citizens were recognized as a barrier to the fully proactive services. However, this reflects a nuance in the underlying logic of system design. According to Erlenheim et al. (2020a), proactivity exists on a spectrum, within its model, *Stage 5 of Life-event-triggered (expression of will be required)* representing a high level where services are activated by life-events but still require users to express intent. Within the Single Digital Gateway (SDG) context, this model faces structural limits. Although a *user-triggered push pattern* has been piloted, the SDG architecture excludes *authority-triggered push mechanisms* in the mid-term due to legal and technical complexities (Bielowski, 2022). This aligns with findings by Scholl (2020), who describe current service journeys as reactive: users must recognize their needs, understand the required data, and initiate the process themselves. While this reflects the present reality, Scholl et al. also envision scenarios that could move toward more proactive service models. To conclude, citizen-triggered services can be considered

a full barrier to proactivity. In contrast, life-event triggers do not pose a barrier if implemented, but they also do not achieve full proactivity.

Regarding the nuance of trust in the context of SDG, although trust can influence the implementation of proactive services, the findings show that its definition and application vary within the context of this study. In the proactivity literature, particularly in discussions around the "no-stop shop" concept, the focus is on how to access data while meeting users' trust requirements under existing privacy and data regulations (Scholta et al., 2019b).

In contrast, the SDGR literature emphasizes trust at the individual level through system-embedded mechanisms, for example, giving users direct control over their data and full transparency at each stage of data exchange. By requiring user-initiated requests and allowing a "preview" of evidence before transmission, the Regulation ensures no authority can access personal information without explicit consent, thereby reinforcing trust in privacy protections (Krimmer et al., 2021; Scholl et al., 2021).

To conclude, while trust is a significant barrier in general, it has not emerged as a major issue in the context of the current Single Digital Gateway, since its present implementation does not yet support a fully proactive approach.

Regarding user-related barriers several factors identified.

Considering inclusion, referred to user-related barriers in this study, several challenges were identified. *Various aspects of the digital divide emerged as key barriers*, particularly in terms of access, connectivity, and digital skills.

Regarding lack of access, in this study, it includes a range of factors, such as limited physical infrastructure, poor connectivity, socio-economic barriers, and outreach challenges. These findings align with a wide range of literature. For instance, Reisdorf & Rhinesmith (2020) describe three levels of inclusion: physical and material access to technology; skills and usage; and the benefits or outcomes derived from digital engagement. The study also put emphasis on the fact that digital disparities persist even in countries with widespread internet access, which supports the relevance of these inclusion-related findings (e.g., van Deursen, Helsper, Eynon, & van Dijk, 2017). All the findings correspond with the barriers observed in this study.

For example, Morte-Nadal & Esteban-Navarro (2022), in their study on digital inclusion in European digital services, highlight a range of factors influencing access and use, including sociodemographic characteristics like age, education level, and geographic

location. Vulnerable groups, especially older adults, often face repeated cycles of exclusion, something also observed in our study.

Regarding to service complexity, some barriers were identified, such as administrative burden, the complexity of service and digital characteristic of services. These findings align with the work of Park & Humphry (2019), who explore how social, digital, and data exclusions intersect through their work. The main implication for the study relates to the part that digital technologies intended to support citizen interaction with service providers can themselves become sources of inequality. This is reflected in the study, where interviews revealed that technical jargon, fragmented administrative responsibilities, and a general lack of awareness about how to use digital services posed challenges not only for vulnerable groups, but also for average users.

These findings can be seen at the critique of bureaucratic systems by Peeters & Widlak (2018), who argue that digitalization does not necessarily make public services more responsive; instead, it can reproduce traditional forms of exclusion through complexity and rigidity. Similarly, Madsen et al. (2022) found that users often feel excluded not because of a lack of digital skills, but due to the time and cognitive effort required to understand how a service works, determine eligibility, and learn how to access it. However, the current findings are aligned with this, highlighting that digital service design itself can be a barrier to inclusion.

Regarding language and contextual barriers, emerged as significant obstacles to the inclusive use of digital public services, especially in the context of the Single Digital Gateway (SDG). While these challenges are often grouped under the broader concept of the digital divide in existing literature on inclusion, this study treats them as distinct section because of its importance. There were several literatures that the findings of current study aligned with them. According to Madsen et al. (2022), frustration with the language and terminology used in digital public services was a key barrier identified by users. Their study, conducted in the context of European digital public services, revealed that language accessibility is perceived as one of the most significant obstacles. Meanwhile, one of the objections was the lack of clarity and complexity of language which is used. Similarly, Morte-Nadal & Esteban-Navarro (2022) found that the vocabulary and bureaucratic tone used by public administrations contribute to confusion and exclusion.

5.1 Recommendations

Considering the findings and discussions in the current study, several recommendations were formulated as follows:

5.1.1 Co-design a maturity roadmap for current services

Based on the interview findings and the literature, it became clear that there is a significant conceptual discrepancy among practitioners when it comes to defining proactivity.

The interviews revealed a wide range of perceptions, suggesting the absence of a shared understanding or a clear roadmap for implementing proactive digital services. This issue is not new; one of the motivations behind Pawlowski and Scholta's (2023) effort to develop a taxonomy of proactivity was the existing conceptual vagueness surrounding the definition. A similar stance is taken by Gil-Garcia et al. (2018) in their work on the conceptual ambiguity of digital government. They argue that the lack of clarity creates practical challenges for coherent implementation and effective policy alignment.

To address this issue, it is recommended to develop a structured maturity model or roadmap that reflects the current state of digital services. Ideally, this model should be built using a bottom-up approach, allowing insights to be gathered directly from civil servants and other frontline practitioners. Additionally, the model should be flexible enough to support personalization and contextual adaptation. For instance, in case the model is developed in Belgium, the maturity level between Wallonia and Flanders are different, it should consider these differences.

Raising awareness among practitioners across different domains is also crucial. The findings reveal a noticeable disconnect between service designers, IT specialists, and, in an ideal scenario, inclusion experts. Bridging this knowledge gap early in the service development process can help ensure that the necessary targets for inclusivity and effectiveness are met.

5.1.2 Mitigating bias in collecting feedback

In the context of the Single Digital Gateway (SDG), several online channels developed to collect user feedback. Based on the literature, these tools are primarily online and embedded within webpages, and it is provided in different languages (European Commission, 2023).

While feedback mechanisms are essential for improving service quality, they can inadvertently introduce bias. According to Matthews et al. (2023), user activity and reporting in most online services is created by a small number of the total users, 10% of users generate over 60% of all reports in most digital platforms (parsons, 2019). This statistical concentration suggests that there is a bias in creating feedback exist.

Moreover, policy documents related to the SDG currently place limited emphasis on inclusive feedback strategies. To address this gap, it is recommended that a diverse set of feedback collection tools be designed and implemented, particularly those that can reach underrepresented groups. Ensuring a more representative feedback process is essential for the development of truly inclusive digital public services under the SDG framework.

5.1.3 Reaching to cross-agency life events at the national level

Due to persistent legal and technical barriers, most public services remain somewhere along the spectrum between reactive and proactive delivery. However, best practices, such as pre-filled tax forms, demonstrate that proactive service delivery is feasible, particularly when supported by robust intra-agency structures.

To expand these efforts beyond individual agencies, it is recommended to strengthen cross-agency coordination frameworks at the national level.

Based on findings, there is potential to implement interoperability mechanisms and structured data exchange at the national level, which could serve as a critical foundation for more proactive public service delivery to cross-agency life events.

5.1.4 Using AI and new technologies to address current barriers

This study identified a range of persistent barriers in digital public service delivery, many of which have remained unresolved despite previous efforts particularly, those technical legal problems like consent of citizens.

To address these challenges, it is recommended that policymakers and regulatory bodies explore the use of emerging technologies, such as artificial intelligence (AI) and tools like the European Digital Identity Wallet as enablers of proactive service delivery. These technologies can support functions such as automated eligibility matching.

6 Conclusion

This study focus was to answer the following questions:

What are the barriers to proactivity and inclusion in digital public services in the context of single digital gateway, and how can they be evaluated and addressed?

To answer the research question, findings were obtained through semi-structured interviews. The sampling method followed a snowball approach, and the data were analysed using thematic analysis.

To answer, “*What are the barriers to proactivity and inclusion in digital public services in the context of single digital gateway*”, The identified barriers were categorized into different aspects (see Table 7).

Table 7 Identified barriers in the context of current study

Barrier	Explanation
User related	This category includes barriers related to access, lack of digital skills, language barriers, and nuances of trust.
Design / service design	This category includes complexity of services, contextual and textual barriers, trigger mechanisms, and eligibility-related exclusion.
Legal	This category includes barriers related to data governance and legal regulations.
Technical -legal	Explicit request
Technical	This category includes barriers related to technical and architectural complexity, as well as issues of semantics and interoperability.
Political	This category includes policy–strategy misalignment concerning inclusion, and political barriers to proactivity such as lack of commitment, shifting political cycles, and changing agendas.
Organizational	This category includes structural inflexibilities within public sector organizations and public governance.

The categorization of identified barriers was based on the framework adopted by Sellitto & Pavleska (2024) , to address the Single Digital Gateway. However, the model was modified in this study, as the original framework did not consider service design or the concept of inclusion as distinct themes. In this regard, service design was treated as a separate category, given its relevance across multiple domains.

Barriers related to inclusion were placed under the category of user-related barriers. Since inclusion was not explicitly addressed in the original framework, this study incorporated it within the user-related dimension to ensure it was examined as a distinct theme.

Based on the findings presented in (Table 7), some barrier categories emerged more frequently and showed greater consensus among participants. Technical and legal aspects, as well as access-related barriers under the user-related category.

The second part of the research question focused on how these barriers are addressed and evaluated, as shown (see Table 8).

Table 8 Addressing barriers through interview findings

Solution	Barrier aspect
Standardization and governance at EU-level	Technical, Legal, Service design
Mindset shift as a measure to proactivity	Organizational, Political
Omnichannel strategies	User- related
Community-based and in-person assistance	User- related
Design guidelines for inclusion	User- related, Service design
Engage with excluded and hard-to-reach users	User -related, Service design
Mechanism for recorded consent	Technical -legal
Data minimization initiatives	User- related
Knowledge sharing mechanisms for decision-makers	Service design, Organizational

As the second part of the research question involves evaluation, several suggestions emerged from the interview findings. These included the number of users actively requesting a service, the volume of inquiries related to a specific service, and metrics concerning fraud detection and eligibility validation.

To conclude, achieving proactive and inclusive services remains a challenge. The findings suggest that, particularly in proactivity, there significant gaps to overcome. Some barriers have persisted since the early days of e-government and consequently e-services. Some barriers have persisted since the early stages of e-government and continue to affect digital services. These are often rooted in legal and technical constraints. As technologies evolve, older systems become legacy systems, this creates a form of path-dependency that makes reform more difficult. In the context of current study, technical change considered manageable provided that adequate support mechanisms are in place. However, the main limitations were found to be legal in nature, as technical aspects must comply with them. This interaction can create challenges and hinder the progress of digital service delivery.

Regarding inclusion, there is extensive literature covering its various dimensions. However, due to systemic issues for instance socio-economic aspect, hard-to reach individuals, some barriers continue to be viewed as “wicked problems”. Apart from the nature of the barriers, there are innovative solutions to address them in the domain, for instance, CBAS, in-person assistance, and omnichannel strategies were among them.

In the end, since the current state of services, particularly in the context of the Single Digital Gateway, remains reactive and proactivity has not yet been achieved, the connection between the two dimensions could not be established. The current study has several limitations, which are addressed in the following section.

6.1 Limitations

The current study investigated proactivity and inclusion in digital public sector, in the context of the Single Digital Gateway. There are several limitations that should be acknowledged, as outlined below.

Regarding the dimensions of research, this research dealt with three complex and evolving dimensions: proactivity, digital services and the Single Digital Gateway (SDG). Each of these presents its own challenges and is still evolving. The SDG mainly plays an informational role and encompasses various services, each with different levels of maturity. Exploring each service in depth was beyond the scope of this study. Proactivity also presents difficulties. Although several taxonomies exist to define levels of

proactivity, applying these models remains largely theoretical. This is because many current digital services still lag behind the broader goals of digitalization, creating a gap between the theoretical ideal and practical implementation.

In the context of the Single Digital Gateway (SDG), multi-level governance and institutional complexity make it difficult to trace a single, coherent citizen journey across one agency or organization. This challenge is especially highlighted in countries with complex governance structures, where searching between entities can be overwhelming for researchers. Such fragmentation limited the possibility of conducting a focused case-study that could comprehensively illustrate the full user experience.

Regarding the methodology, the study relied on thematic analysis to explore qualitative data. While this approach was appropriate for capturing the nuanced experiences and institutional perspectives of experts, the limited timeframe of the research made it impossible to pursue a mixed-methods design. The use of quantitative techniques, such as factor analysis, could have strengthened the findings and improved the study's overall generalizability.

Another challenge arose from the specialized knowledge of the interview participants. Most experts were deeply involved in either proactivity or inclusion, but not both. As a result, the research had to synthesize fragmented insights rather than draw on integrated, cross-disciplinary perspectives. This may have limited the depth of analysis on how inclusion and proactivity intersect in practice.

Furthermore, despite the conceptual harmonization of the SDG regulations across the EU, the maturity and implementation of digital services still differ significantly between countries. These disparities introduced certain biases into the data, especially regarding how services are perceived, managed, and evaluated. Therefore, cross-country comparisons should be interpreted with caution.

Finally, since the study was conducted within a specific institutional and geographical context and relied on qualitative methods, the findings should be viewed as interpretive guidance rather than universally generalizable conclusions. The recommendations and insights are valuable within the scope of the cases examined but may not be directly transferable to all contexts.

6.2 Future recommendations

It is recommended to explore the current level of automation and digitalization within the Single Digital Gateway in the context of a single country. Since the maturity of services varies across member states, a more focused national study could provide clearer insights.

In some countries, implementation is significantly delayed, and timelines are behind schedule.

During the interviews, several guidelines were mentioned, such as the design guidelines developed in Digital Flanders and the Guiding Principles for a Human Rights-Based Approach. It is recommended to further explore how effective these guidelines are in practice, particularly from the perspective of civil servants and service designers.

In the research, particularly in relation to inclusion initiatives aimed at reducing administrative burden and addressing digital skill gaps, some mechanisms were introduced, such as intermediaries and CBAS. It is recommended to study these mechanisms further to understand their effectiveness and impact.

To explore the implications of proactivity, based on the existing taxonomy models, it is recommended to carry out a study within the context of a demand-driven service, particularly those that have comparable counterparts in the private sector. This could help highlight differences in user expectations, service delivery, and automation levels.

According to the current study, there is a nuanced difference between trust in the Single Digital Gateway and trust in public services at the national level. It is recommended to explore how technical enablers influence the trust, and how it can change regarding different regulations.

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Appendix

A Interview questions

Main questions and probe questions- Question set1

1. Can you briefly describe the digital public service you are working on and your role in its development or implementation?

- Probe Questions:

What are the main steps a user needs to go through to receive the service?

2. Would you consider this service proactive? Why or why not?

- Probe Questions:

Does the service take any action before the citizen makes a request?

Where is effort mainly placed — on eligibility or delivery?

3. How is the proactive part of the service designed in terms of timing, communication method, and whether it's opt-in or opt-out?

- Probe Questions:

Why were these design choices made?

Do they impact how accessible or inclusive the service is?

4. What barriers have you faced when trying to implement or improve the proactivity of this service?

- Probe Questions

Are the challenges more technical, legal, organizational, or human-related?

How do internal coordination or data-sharing limitations play a role?

Do you think attitudes, risk-aversion, or leadership priorities influence how proactive your service can be?

5. Do you consider this service inclusive for all users? Why or why not?

Probe Questions:

Are there groups who are left out or face difficulties (e.g., digital skills, access to technology, language)?

How do you try to reach users with different needs?

Do you think the service is equally effective for everyone, or do some groups struggle to complete it even if they start it?

6. Is there any existing process or framework to evaluate how proactive or inclusive this service is?

Probe Questions:

- Do you use data, user feedback, or service monitoring to measure success?

- Do you distinguish between evaluating eligibility steps and delivery steps separately, or do you look at the user journey as a whole?

7. What improvements would you suggest to make the service more proactive and more inclusive?

Probe Questions:

- If you had no constraints, how would you redesign it?
- What changes would have the most immediate impact?
- Would these improvements require changes in technology, policy, or organizational processes?

Main questions and probe questions- Question set2

How do interviewees define and interpret proactivity, especially across EU and national levels?

1. How proactive are SDG-related services in reality? What does the interviewee observe across countries or sectors?
2. What design choices (e.g., timing, consent, communication) influence how proactivity is built into services?
3. What systemic (technical, legal, organizational, etc.) barriers hinder proactive service implementation under the SDG?
4. How inclusive are proactive digital services under the SDG framework, and who risks being excluded?
5. How should proactivity and inclusion be measured or evaluated, and what frameworks or KPIs are used or needed?
6. What concrete actions or systemic changes would improve proactivity and inclusion in SDG implementation?

B Transcripts

[Click here to open the PDF](#)

C Declaration of Authorship

I hereby declare that, to the best of my knowledge and belief, this Master Thesis titled “ Enhancing proactivity and inclusion in digital public services: In the context of EU Single Digital Gateway ” is my own work. I confirm that each significant contribution to and quotation in this thesis that originates from the work or works of others is indicated by proper use of citation and references.

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