BRINGING THE DIGITAL GOVERNMENT REVOLUTION TO SMALL MUNICIPALITIES IN LATIN AMERICA

SIPA WORKSHOP IN DEVELOPMENT PRACTICE 2020

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EXECUTIVE SUMMARY

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Introduction

During a period in which many governments around the world are embracing online services, it is clear that switching from face-to-face to online interactions can have a substantially positive effect on citizens' quality of life. Online interactions are, on average, 74 percent faster, much cheaper (between 1.5 and 5 percent of the cost), and less vulnerable to corruption.

Nonetheless, many subnational administrations, which are the face of government in day-to-day life, are far behind on digital transformation. This is the case even though they are often responsible for more transactions than the central government.

While studies about the obstacles and possible solutions for making these transitions at the national level exist, notably the *Wait No More* publication by the IDB, not enough has been written about the difficulties and possible solutions that are specific to the subnational level context. The specific issues surrounding how to reach subnational governments, which often are not endowed with the necessary resources to make new investments, remain a major yet different issue than that for central governments and major cities.

This research project was carried out for and in collaboration with IDB with the purpose of providing insights that governments may use to address the specific challenges associated with switching to digital government at the subnational level.

Methodology

To identify the most appropriate case studies, the first stage of research focused on identifying countries i) where governments have had general success in their transition to digital government, ii) where subnational governments have some autonomy in decision-making (based on the Fiscal Decentralization Index, for example), iii) where subnational governments have made advances in their transition to digital government. Relevance to the Latin American context was also taken into consideration. This desk review led to the selection of five countries, in consultation with IDB where the team would carry out in-person interviews: Argentina, Canada, Netherlands, Spain, and the United Kingdom (UK). Additionally, selective research would also be carried out for the cases of South Korea and the state of California in the United States (US).

The COVID-19 emergency introduced new challenges as the team was unable to travel and contacts in each of those countries had to cancel even virtual interviews, due to the emergency in their own countries.

Nevertheless, the team conducted 33 virtual interviews with experts and officials in Argentina, Canada, Netherlands, South Korea, Spain, the UK, and the US. The interviewees represented various levels of government in those countries, as well as the private sector and non-profit actors.

During the analysis phase of the research, the team wrote profiles for each country which included the highlights and upshot of the insights provided by the country interviews. It then carried out workshops on each "tool", where all team members participated in drawing conclusions from the research so as to lay out best practices that would be useful for governments that wished to carry out this same process in their countries.

Research Findings

The interviews showed that governments faced common difficulties when working to promote digital government at the subnational level, which tended to fall in one of three main groups: i) lack of resources ii) technical know-how and iii) change management. When deriving insights, it was clear that the tools that governments used for responding to these difficulties could fit into five broad categories: i) governance, ii) financial, iii) regulatory, iv) technology, and v) others (which includes several, smaller tools). Key findings for each tool are detailed below.

Throughout this research, it was evident that subnational digital government transformation requires a developed and strengthened national digital government agenda. As a result, it should be noted that in some cases the tools presented may have an indirect, rather than direct, effect on the subnational level of government.

Governance

Governance tools include any structure, model, group, or mechanism that facilitates coordination between the many bodies that contribute to the decision-making process at the subnational level. The following best practices were identified:

The establishment of government coordination bodies on digital government: These institutions act as focal points for promoting digital government development. They allow for representation of local authorities in the decision-making process regarding the digital process, and allow for cooperation between different entities in public administration, thereby removing the delays caused by coordination challenges that arise when coordination is carried out strictly from the central level. They also allow for ownership from the local governments and facilitate compatibility and interoperability of systems. The report focuses on the case study of the Electronic Administration Sectoral

Commission (Comisión Sectorial de Administración Electrónica**)** in Spain as a best practice.

The creation of local government strategies, charters and plans: The existence of these types of tools allows the coordinating institutions and bodies to be able to focus their energies, create synergy, minimize complexity, and maximize impact allowing for a better plan. To be useful, these need to be written in a way which clearly defines the problem, considers the needs of all stakeholders and is clear and coherent in its vision and mission. However, it should be noted that they are usually not enforceable since they are generally non-binding. The report focuses on the case study of the United Kingdom's Local Digital Declaration as a best practice.

Capability development and knowledge sharing efforts: Practitioners of the digital transition strategy, including officials at subnational governments, must have the required skills to implement the initiative. This implies supporting the professionalization of their digital career paths and creating a civil service culture that uses digital technologies to engage with users. These include capacity-building and awareness initiatives through seminars or online blogs. The report focuses on the case study of nationwide capability development efforts in the United Kingdom as a best practice.

Financial

Financial tools can range from budgetary specifications for digital transformations to special funds dedicated to enable digital government collaboration and services. The following best practice was identified:

Funding for digital government initiatives: Grants have been used to fund digital skills training and projects that address common local service challenges. Collaboration among various ministries facilitate this process. The report focuses on the case study of the Local Digital Fund in the United Kingdom.

Regulatory

Legal and regulatory tools can reduce costs, provide access to municipalities with less capacity, and ensure interoperability of systems. The following best practices were identified:

Mandating transitions to digital government: In some countries, governments have mandated the transition to digital government. By legally binding digital government strategies, governments signal a strong commitment towards the goal of digitizing

government, serving as support to the political will of subnational level public servants in their push to change public administration at the local level, while ensuring the necessary financing. In some cases, these mandates also stimulate private sector action by signaling that there will soon be a demand for new service solutions, which helps with resource planning and prioritization. While many countries globally have developed digital government strategies, few have made these legally binding either at a subnational or central government level. The report focuses on the case study of Spain's Laws 39/2015 and 40/2015 and the interoperability regulation.

The establishment of compatibility regulations: This type of framework is based on the principle that, to provide its citizens with access to online services, public administration units, whether among ministry-level or between national and subnational, must be able to cooperate and fluidly exchange data with each other. Therefore, such regulations ensure that different levels of government can benefit from the information and tools that are stored within other administrative units, which are essential to providing the service. The report focuses on the case study of the National Interoperability Framework in Spain.

Technology

Technology tools were found to bring cost efficiencies in service delivery for governments and to make overall service quicker and more convenient for citizens. The following best practices were identified:

National platforms and co-development strategies: Applications or portals developed by central governments for use by citizens directly as well as for further services that can be built off of these platforms by subnational governments were found to be one of the most effective technology tools for sprouting of local digital transformation efforts.

Platforms or spaces that allowed local technology development teams to share knowledge and work together to share resources and build complimentary digital services were also found to be very effective. These allowed for promotion and development of common terminology, cost efficiencies for all departments involved, greater collaboration and creative problem-solving to help digital transformations at the subnational level to be owned by the local governments involved. The report focuses on the case study of the UK and the Netherlands' national portals and co-development platforms as best practices.

Digital standards: Digital standards were also found to be a crucial tool in enabling a robust digital transformation process at the subnational level. These were responsible for

enabling the interoperability of different local and national systems that could collect and analyze data through standardization of formats or templates. Digital services were also found to be effective if they were put through quality and standard checks to enable similar access for all parts of the population. The report focuses on the case study of the UK, Canada and Netherlands as best practices.

Shared technology practices: Some other important tools found were shared service agreements such as group or bundled procurement contracts which went a long way in enabling use of a particular technology at the local level where resources are even more limited and individual local procurement is often done by the same person who is managing all digital efforts and does not have cost and time resources to create these efficiencies. The report focuses on the case study of Canada, Spain, UK and Netherlands as best practices.

Others

These are additional tools that do not fall into the previously described categories. The following best practices were identified:

Monitoring and evaluation: This includes mechanisms used by different stakeholders to evaluate and benchmark the quality of digital government services provided at the subnational level. The report focuses on the case study of Spain's Electronic Administration and Digital Transformation Observatory.

Digital literacy education: A key aspect of promoting digitization at the subnational level includes promoting digital literacy at the user level, including citizens and public administrators, to encourage the adoption of technology and public service. This report focuses on the case study of Argentina's National Plan for Digital Inclusion.

INTRODUCTION & METHODOLOGY

INTRODUCTION

The Need for Digital Government Transformation of Subnational Governments

The technology revolution has enabled greater connectivity with the potential for increased efficiencies in everyday life, greater transparency of information, and greater accessibility of services. On average, online interactions are 74 percent faster, much cheaper (costing between 1.5 and 5 percent of the cost of face-to-face transactions), and less vulnerable to corruption[1]. This has increased the demand both in government to increase time and cost efficiencies and with digitally-enabled citizens for better and faster services from governments, leading to the rise of digital government. This refers to the use of technology to deliver online public services and the use of Information and Communication Technologies (ICT) to gather, maintain, publish and utilize public records, and improve governance processes with increased efficiency, accessibility, and transparency. Digital government tools can be used to promote digitalization in the following ways:

a. G2G: government to government services
b. G2C: government to citizen services
c. G2B: government to business services

The Digital Government Transformation Challenges at the Subnational Level

Recognizing these technological developments, many national governments around the world are rethinking the way they deliver public services. They have started, or are in planning stages, of their digital government transformation which examines digital technology's ability to fundamentally transform the way the public sector operates and deliver services to customers and offers strategies for government leaders to accelerate the rate of their progress.[2] However, many national digital government transformations largely exclude, or rather, do not prioritize, consistent digital development across the country. This results in inconsistent implementation and development across levels of governments and further widens the service delivery gap across the country. Subnational governments face the biggest brunt of this challenge as they try to build a strong digital ecosystem that is resilient to political change. As subnational governments are often the face of government to citizens on a day-to-day basis, it is crucial that efforts are ramped up to ensure consistent service delivery by the government.

The responsibility of digital government transformation will vary depending on the system of government. It will also depend on the specific legislative and decentralization powers

[1] Inter-American Development Bank (2018). P.13
[2] Deloitte (2015a)

that the country has. For example, Canada is a parliamentary democracy[3] with powers strongly devolved to provincial governments. This makes provincial governments entirely responsible for matters related to frontline service delivery of transportation, health, education, and other municipal functions. Hence, digital government transformation for each province falls within the provincial government's purview. In contrast Argentina is a federal republic with many more of the decisions being made centrally.

While some subnational governments may have autonomy and responsibility to implement digital government transformations, it is important to note that many subnational governments face overarching challenges that include:

Lack of Resources

- **Budgetary resources:** Limited funding at the subnational level to implement their own digital solutions
- **Human resources and capacity:** Insufficient resources and a lack of technical staff to lead local digital government transition, to carry out trainings, and to lead communication strategies with the public
- **Economies of scale:** Finding solutions to lower costs by coordinating with other subnational governments, or from tools provided by national governments

Technical Know-How

- **Interoperability:** Difficulty in ensuring that digital solutions can benefit and connect with other available tools across subnational governments and at the national level
- **Accessibility and equity:** Ensuring all sections of population including vulnerable populations have access to digital services

Change Management

- **Local public-servant support:** Ensuring cooperation and buy-in from local public administrators, especially where transformation may be challenging
- **Citizen participation and support:** Securing citizen participation and interest to adopt new practices

[3] House of Commons Canada (2000)

PROJECT OVERVIEW

Client Agency

The Inter-American Development Bank (IDB) is the largest source of multilateral financing in Latin America and the Caribbean (LAC). Established in 1959, the IDB aims to improve lives in the region by providing solutions and supporting economic and social development, and regional integration by assisting national governments, provinces, municipalities, and NGOs. The IDB partners with 48-member countries in LAC to also provide them with cutting-edge research about relevant development issues, policy advice to inform their decisions, and technical assistance to improve the planning and execution of projects.

The IDB's current focus areas include three development challenges –social inclusion and equality, productivity and innovation, and economic integration– and three cross-cutting issues –gender equality and diversity, climate change and environmental sustainability, and institutional capacity and the rule of law.

In 2018, the IDB's approved lending amounted to US$13.5 billion with Brazil, Argentina, Mexico, Colombia, and Ecuador being the main beneficiaries particularly in the areas of reform/modernization of the state, energy, transport, and social investment[4]. Currently, including the projects approved in previous years, there are 600 projects financed by the IDB, in 26 borrowing countries[5].

Specifically, for this project, the team worked with the Innovation in Citizen Services Division (ICS) at the IDB. ICS focuses on reform and modernization of the state and supports governments in LAC in their digital transformation efforts. This includes the redesign of government procedures, the incorporation of digital technologies in government interactions with citizens, and building institutional capacity to coordinate digital reforms across government institution[6].

Our project builds on the work of ICS and aims to take it forward by exploring the tools used by central governments to promote digital governments at the local/municipal level that are of relevance for LAC.

[4] Inter-American Development Bank (2019a)
[5] Inter-American Development Bank (2019a)
[6] Inter-American Development Bank (2019b)

Project Rationale

In implementing digital government, national government institutions tend to be the most advanced. However, it is subnational administrations that are the face of government in day-to-day life of citizens and business, providing a wide range of core services. Despite this, municipal governments, with some notable exceptions, are far behind on the digital transformation of their services as well as administrative processes. Government transactions in the region are difficult, slow, and prone to corruption with many still carried out in person and on paper.[7] This leads to inefficiencies, leakages and loss of productivity for citizens, businesses, and governments alike.

Subnational governments face various challenges and obstacles in implementing digital government, which can include broad autonomy, the political situation, limited budgets, personnel and skills base, limited awareness of industry trends and standards, and limited basic connectivity. For these reasons national governments have an important role to play in promoting subnational digital government transformation. Moreover, studies have been undertaken about the obstacles and possible solutions of making these improvements at the national level, such as the Wait No More publication. However, not enough has been written about the difficulties and possible solutions that are specific to the subnational level context, which, in many countries, are responsible for even more government transactions than the central government[8]. In this context, the IDB requested the assistance of a SIPA EPD Workshop team to conduct a global review of mechanisms used by national government institutions and policymakers to promote the digital transformation of subnational governments, categorize the tools available, assess their degree of success, and evaluate their potential applicability to Latin American contexts.

Use of this Digital Government Toolkit by National Governments

This toolkit was primarily derived through interviews conducted with digital government practitioners both in the public and private sectors, and across all levels of government. The information collected from interviews was then supplemented with additional desk research. (The constraints of the COVID-19 pandemic impinged on both the quality and quantity of interviews, nonetheless we were able to obtain sufficient information to provide fairly robust findings).

This toolkit highlights key insights from these interviews and includes relevant learnings that digital government practitioners can use to advance their own digital government transformation. Its purpose is to serve as a guide for central digital officials to help them

[7] Inter-American Development Bank (2018)
[8] Inter-American Development Bank (2018). P.10

prioritize efforts and take into account important considerations while promoting digital transformations in local governments.

METHODOLOGY

Phase 1: Desk Research and Shortlisting Countries

The team developed a rationale for country selection which was based on the criteria below. The following criteria supported the team in identifying how a country stands out in terms of promotion of digital government at the subnational level.

Decentralization

Utilizing the International Monetary Fund (IMF) *Fiscal Decentralization Index*[9] to measure the decentralization of resources within countries. The Fiscal Decentralization Index provides a measure of the extent to which the expenditure and revenue assignments of the central governments have been transferred to subnational governments.

Success of government digitalization

Leveraging the United Nations (UN) *E-Government Development Index (EGDI)* to measure the success of digitalization within countries. The EGDI ranges from 0 to 1, and "measures countries' use of information and communications technologies to deliver public services. The index captures the scope and quality of online services, status of telecommunication infrastructure, and existing human capacity".[10]

Range of digital government and digital services

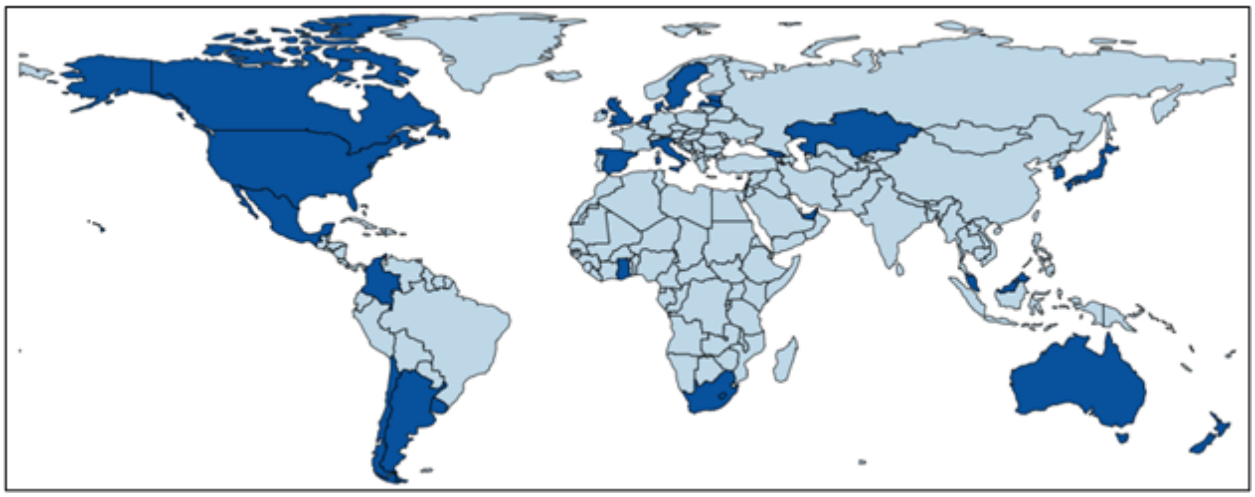
Based on the volume and quality of digital services in the scanned countries, the tools used by national governments to encourage digital government transformation at the subnational level were prioritized.

Relevance to Latin America

Identifying common problems solved by digital transformations in the best practice countries.

With this criterion in mind, the team carried out an exhaustive global review that looked at the experiences of national governments in the implementation and promotion of digital government at the subnational level. The team also carried out interviews with global experts to understand key levers for successful digital government transformations.

[9] International Monetary Fund (2019)
[10] United Nations (2018)



Illustrative map of countries researched in phase one. Dark blue indicates countries researched.

Based on the global country scan and expert interviews, the team shortlisted eight countries in consultation with IDB, to benchmark as digital government leaders. The shortlisted countries were: Argentina, Australia, Canada, Denmark, Netherlands, South Korea, Spain, the United Kingdom (UK) and the United States (California only).

However, due to the COVID-19 pandemic, the team was forced to cancel travel plans, conduct all interviews virtually, and shift focus primarily on **Argentina, Canada, Netherlands, Spain** and **UK** with a more selective examination of South Korea and the state of California in the US.

Phase 2: Interviews and Country Profiles

The team conducted 33 interviews in Argentina, Canada, Netherlands, South Korea, Spain, the UK, the US, and with additional global experts. The interviewees were across sectors and levels of government and a list can be found in Appendix 2. These interviews focused on understanding the level of digitalization achieved at each level of government and the tools that had a significant impact on making the transformation journey a success.

The team developed comprehensive case studies mapping the successes and challenges these countries faced in their digital transformation. It is important to note that insights and recommendations of this toolkit are based primarily on the interviews conducted, supplemented by secondary desk research. The level of access the team was able to achieve in gaining insights from practitioners of digital government transformation,

notwithstanding the aforementioned constraints, sets our research apart and provides practical insights for policymakers looking to achieve success in their own transformation journey.

Phase 3: Toolkit Development and Recommendations

Deriving insights from country case studies, the team identified five toolkit categories: 1) governance, 2) financial, 3) legal and regulatory, 4) technology and 5) other.

To develop meaningful insights, the team conducted toolkit workshops (tool specific discussions within the team across different interviewers by country) which helped the team identify best practices across the board that would be practical and useful for national government.

The key findings and recommendations are presented below. They are organized by tool category and summarize examples of best practices within each category, with each section including the following: (1) description of the tool; (2) rationale for its usefulness for subnational governments; (3) implementation, (4) challenges, risks, and mitigation.

TOOL CATEGORIES

GOVERNANCE

Governance tools include **any structure, model, group, or mechanism that** facilitates coordination between the many bodies that contribute to the decision-making process at the subnational level.

TOOL TYPE:	Coordination Bodies, Institutions & Agencies
TOOL NAME:	Electronic Administration Sectoral Commission
COUNTRY WITH BEST PRACTICE:	Spain

Coordination Bodies, Institutions & Agencies

Tool Description

Spain: Electronic Administration Sectoral Commission

The Electronic Administration Sectoral Commission (EASC) (*Comisión Sectorial de Administración Electrónica*) is a technical arm of the national government and oversees cooperation between the many public administration agencies nationwide, including at the national level, that of autonomous communities (1st subnational level in Spain), provinces (2nd subnational level) and municipalities (3rd subnational level).

The EASC is chaired by the Secretary General of Digital Administration of the Ministry of Economics and Digital Transformation. The Secretary General facilitates the cooperation of the administration of the autonomous communities and entities that make up the local administration in the field of electronic administration.[11]

The EASC's main functions are to (1) ensure compatibility and interoperability of systems and applications used by public administrations, (2) promote the development of electronic administration, and (3) ensure cooperation between public administrations to provide clear, updated, and unambiguous administrative information. The commission is divided into 13 ad hoc working groups.[12]

An important actor from the municipality's point of view is the Spanish Federation of Municipalities and Provinces, which is represented in the Commission.

[11] Portal de Administracion Electronica (2015a)
[12] Agencia Estatal Boletin Oficial del Estado (2015a)

Rationale for Usefulness at the Subnational Level

A designated institution dedicated to the completion of the move towards digitalization would allow for the facilitation of the following tasks (given below) to be carried out seamlessly. This would reduce bureaucratic lags to achieve the desired goal of digitalization provided that all the preconditions are met. In the case of the EASC, the institution serves as an advisory body, where the decisions are non-binding. The decision-making mechanism entails majority voting on proposals that are often proposed by the representatives from the General Secretariat of Administration-Digital (SGAD) but which can also be by any other member of the group. The members of the commission currently meet virtually or in person on a need basis.

The tasks to be carried out by this institution are:

- Serve as a liaison between stakeholders to ensure coordination on policies and allow for subnational stakeholders to benefit from the leverage of national agencies. These leverages include but are not limited to group procurement to reduce the cost of digital initiatives.[13]
- Advocate for and implement compliance with actionable guidelines to avoid undue lags.
- Estimate costs and lobby for the generation of finances associated with improving efficiency of the Information and Communication Technologies (ICT).
- Facilitate the development and dissemination of strategies and plans nationwide to increase awareness about the importance of the move towards digitalization.
- Foster the usage of interoperability technology across nations and avoid duplication.

Implementation of the Tool

For the seamless implementation of the digitization process the following preconditions need to be in place:

- Political will in understanding the urgency and importance of digitalization.
- Financial resources for the running of the institutions and their programs and the capacity building of their employees.
- Roles and responsibilities of representatives of institutions, bodies & agencies need to be clearly defined so each representative is held accountable for their actions.
- Well-coordinated and objective monitoring and evaluation team needs to be present to be able to audit the working of the institutions.

[13] ISA (2016)

- Designated leaders/representatives of the organization are empowered and their decisions are based on standard best practices.
- A coherent and clear vision of the desired outcomes for the successful implementation of the digitization process.
- Decentralization within the institution is necessary so as to fasten the process of the move towards digitalization.

The implementing body is the Commission which comprises representatives from the Directorates-General of the Autonomous Communities and Cities which hold considerable authority in the realm of Electronic Administration. Additionally, with regards to the General State Administration the authority is held with the General-Secretariat for Digital Administration. While the working of the local administration is under the jurisdiction of the Spanish Federation of Municipalities and Provinces and the Conference of Rectors of Spanish Universities (CRUE). [14]

The Commission also has 13 ad hoc working groups formed on a need basis which collaborate on projects by sharing experiences and good practices. These working groups are dissolved once they have met their objective and presented their conclusions. The current working groups mentioned on the website are as follows:

- Group of digital identity and electronic signature
- Brokering group and services.
- Interoperability group
- Integrated telecommunications group
- Observatory group, indicators and measures
- Security group
- Reuse group of applications and services
- Common Repositories group
- Document group, file and electronic file
- Officers group and electronic record of Hijacking
- Group of functional support to the implementation of laws 39 and 40/2015
- Identifier group European legislation - ELI
- Group of electronic invoice

The coordination body fosters multi-stakeholder partnerships. This is not limited to only within government, but also with the private sector and civil society, which enable the digital government implementation.

[14] Portal de Administracion Electronica (2015)

Challenges, Risks and Mitigation

Two risks that countries seeking to establish a similar body may want to consider are the differences due to power dynamics between stakeholders and bureaucratic delays in the implementation of strategies. Both these challenges would eventually lead to the slowing down of the decision-making process within the body and hinder the process of digitization.

Moreover, since this coordinating body would require allocation of financial resources, monitoring and evaluation and stakeholder accountability would be a major challenge, this problem is amplified in countries with weak systems of government where corruption is rampant.

Successful compliance with the preconditions could help mitigate the challenge mentioned above. Key among these would be the clear and coherent vision and similar roles and responsibilities of the representatives of the coordinating bodies. Understanding the channels of authority and communication allows for the mitigation of many challenges.

There are a number of benefits of establishing a coordination body as a focal point for promoting digital government development.

Firstly, a body of this nature allows for representation of local authorities in the decision-making process with regards to the digital process. It removes the delays caused due to coordination challenges which is otherwise the case in a top down approach.

Secondly, it allows for the promotion and acceptance of the frameworks and standards to facilitate interoperability and efficiency across government agencies. For instance, policy frameworks for the use of technology, business policies, outline principles governing the acquisition of technology standards.

Lastly, a diverse inter-agency collaboration periodically sharing information and good practices would allow for any government to constantly evolve and adjust to the dynamic sector of digitalization. The sharing of information in this case could include but not be limited to repositories of digital government projects, publications, and websites on good practices.

TOOL TYPE:	Local Government Strategies, Charters & Plans
TOOL NAME:	Local Digital Declaration
COUNTRY WITH BEST PRACTICE:	UK

Local Government Strategies, Charters & Plans

Tool Description

The Local Digital Declaration is a statement of intent. It commits the local authorities and sector bodies from across the UK who sign up to make services easier to use and more efficient. The main themes of the declaration are using technology to redesign services to meet the needs of the people using them, and the development of open and collaborative cultures. It is a joint initiative from Government Digital Service (GDS) and the Ministry of Housing, Communities and Local Government (MHCLG), and a collection of local authorities and sector bodies from across the UK. It affirms the UK government's collective ambition regarding the future of local public services and their commitments to realizing it. The commitment is to work on a new scale to i) design services that best meet the needs of citizens, ii) challenge the technology market to offer the flexible tools and services needed, iii) protect citizens' privacy and security, and iv) deliver better value for money.

The ambition is to co-create the conditions for the next generation of local public services, where technology is an enabler rather than a barrier to service improvements, and services are a delight for citizens and officials to use. By developing common building blocks local authorities will be able to build services more quickly, flexibly and effectively.

Drawn together around the Local Digital Declaration, all signatories will work together with a shared vision to deliver more user-centric, cost-effective local public services through open, collaborative and reusable work. In the beginning, the Local Digital Declaration was co-authored by 45 public sector organizations including GDS, MHCLG, and local authorities. As of February 2020, there are over 200 signatories.

Benefit to Signatories

All Declaration signatories are eligible for the opportunity to apply for funding (as part of Local Digital Fund[15]) on a collaborative project(s). Staff of local authorities that have signed the Local Digital Declaration are eligible to apply for free digital skills training[16] provided by GDS Academy, as part of the Local Digital Fund. Besides that, signatories will receive support provided by GDS. In particular:

- GDS will make messaging and payment platforms - GOV.UK Notify and GOV.UK Pay - available for local authorities to use.
- GDS will offer training in best practice procurement and showcase the Digital Marketplace[17] (online service for public sector organizations to find people and technology for digital projects).
- GDS will consult on and rework the Digital Service Standard to be applicable to local authorities.
- GDS will make access to Open Standards[18] easier. Open Standards are technical specifications developed outside of government for designing and building the service.

With the benefit attached to the declaration, signing the declaration comes with the commitment and responsibilities, that the signatories need to agree to apply the declaration principles[19], and they have to submit a commitment to a digital project (then it will be called the declaration project) that they are going to carry out within the next 12 months. The declaration projects proposed by local authorities must be in line with the declaration principles[20]:

- Redesign the services around the needs of the people using them.
- Break the dependence on inflexible and expensive technology that does not join up effectively in favor of modular common components and open data standards.
- Design safe, secure and useful ways of sharing information to build trust among partners and citizens.
- Demonstrate digital leadership, creating the conditions for genuine organizational transformation.
- Embed an open culture that values, incentivizes and expects working in the open wherever we can, sharing our plans and experience, working collaboratively with other organizations, and reusing good practice.

[15] See also Local Digital Fund as a Financial tool. Please refer to the Financial section of this toolkit for more details
[16] Ministry of Housing, Communities and Local Government (2018a)
[17] GOV.UK Digital Marketplace (2020)
[18] GOV.UK Service Manual (2020)
[19] See the commitments and principles in Ministry of Housing, Communities and Local Government (2018b)
[20] Ministry of Housing, Communities and Local Government (2018c)

Rationale for Usefulness at the Subnational Level

The GDS has shown how the application of digital culture, practice and technologies to central government can make government work better for users. This has often involved close collaboration with local authorities who share many of the same organizational and delivery challenges. It motivated GDS to co-publish the Local Digital Declaration, that comprises a set of guiding principles that will help support local authorities of all sizes or capabilities to deliver digital services and platforms that meet the needs of citizens.

In 2017, the GDS National, International and Research team ran a discovery project in the regions outside of London. This looked into what public services around the country wanted and needed in terms of digital support. While some local authorities are leading the way with forward-thinking digital transformation programs, others are more isolated and have had less access to trusted guidance and support to match their digital ambitions. Therefore, GDS, working in partnership with MHCLG, developed the Local Digital Declaration in 2018 to encourage more local authorities to implement digital transformation.

In the beginning, the Local Digital Declaration was co-authored by 45 public sector organizations including GDS, MHCLG, and local authorities. Six months later, there were close to the 150-signatory mark including nearly a third of all principal British local authorities. As of February 2020, there are over 200 signatories.[21]

This initiative highlights the importance of digital use at the subnational level. The declaration projects have already begun to report savings in operational costs, improved citizen services as well as higher collaboration between councils to improve the citizen engagement with the local governments. Since a lot of the projects were initiated only in the last year, it is too early to assess their full impact.

Implementation of the Tool

The main themes of the declaration are using technology to redesign services to meet the needs of the people using them, and the development of open and collaborative cultures. It sets the Government Service Standard[22] as the benchmark local services need to meet. As part of the initiative, the Local Digital website[23] includes case studies, best practice, templates and practical tools for local authorities to access. For example, during the current COVID-19 epidemic, the MHCLG team is collecting helpful links and

[21] Cozens, S. (2020)
[22] GOV.UK Service Manual (2019)
[23] Ministry of Housing, Communities and Local Government (2018d)

resources in the shared drive to support councils' response to COVID-19. Some local councils are also sharing the reusable products such as website code.

Reusable products

Directory of services - Royal Borough of Kingston upon Thames	
Link	https://www.connectedkingston.uk/
Code	https://github.com/RoyalBoroughKingston?utf8=%E2%9C%93&q=ck-&type=&language=
Agency	Ayup

Directory of Services - Buckinghamshire	
Link	https://directory.buckinghamshire.gov.uk/
Code	https://github.com/wearefuturegov/bucks-service-directory
Agency	Futuregov

Figure 1: Reusable products shared openly by councils in the Local Digital website

The website also publishes all declaration projects[24], from each organization that has signed the Local Digital Declaration, for the community to benefit from, creating opportunities to collaborate and share knowledge. Some of the listed projects under the declaration have included setting data standards for local community-based services in two local councils in England, digitizing customer service to increase customer engagement and experience, implementing GOV.UK Pay, developing projects to implement local maps, and launching multiple council projects to improve local government business processes and service improvements.[25]

[24] All declaration projects are published in Ministry of Housing, Communities and Local Government (2018e)
[25] Ministry of Housing, Communities and Local Government (2018e)

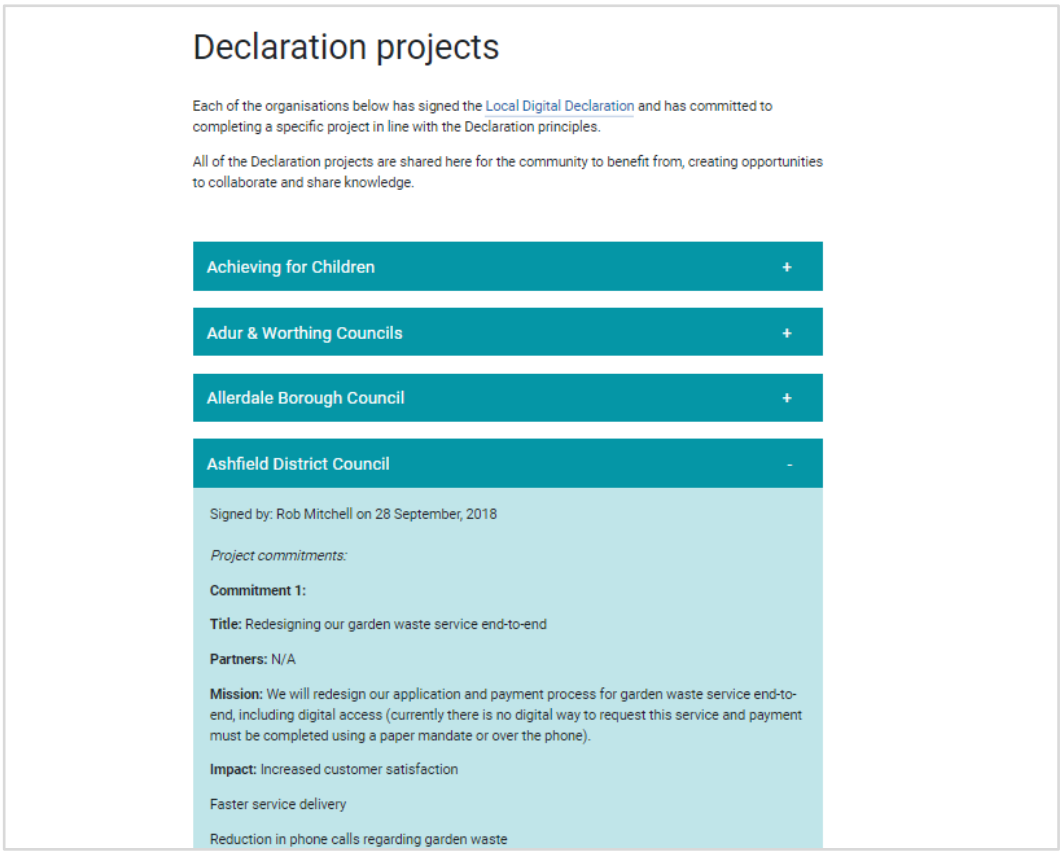


Figure 2: Declaration projects published publicly[26]

Some aspects can be covered prior to implementing this tool and may serve as pre-conditions.

Identifying the goal and a roadmap for the coordinating institution to achieve the goal can be used to include developing the mission and vision statements, along with a list of specific actions that need to be achieved to get to the goal with a focus on intricacies. Forecasting the potential changes within 5 and 10 year should be considered because the digital space is very dynamic and getting all stakeholders on the same page would be very difficult if potential dynamic changes are not considered in advance. Lastly, development and utilization of different metrics can be used to understand the needs of all stakeholders involved.

[26] All declaration projects are published in Ministry of Housing, Communities and Local Government (2018e)

Process of Implementation

- Developing the declaration: The Local Digital Declaration has been developed within the local government community, in partnership between central and local government and stems from research carried out at GDS. A number of workshops took place all over the UK over six months and several drafts of the declaration were circulated, commented on and then revised.
- When an organization signs the declaration, first they agree to apply the principles, and second, they have to submit a commitment to a digital project that helps to realize the Declaration's ambition (then it will be designated a declaration project[27]) that they're going to carry out within the next 12 months. The declaration projects should be a way for an organization to experience the Declaration in action. These commitments are published so that organizations can lead by example, see what each other were up to and scope out opportunities for learning and collaboration.
- There is guidance on completing the sign-up form provided by GDS and MHCLG. The Declaration sign up form has 4 fields to explain what the commitment entails:
    - Title: This should summarize in a few words, the problem you're trying to solve, or the project you're developing, so that an outsider quickly understands what they might learn from it.
    - Partners: List the organizations you'll work with to deliver your project. You should only list collaborators who have already agreed to work with you, rather than those you hope to work with in the future.
    - Mission: This should summarize what you hope to have delivered within a year of signing the Declaration, and indicate how you plan to do it.
    - Impact: Explain to your peers how you think specific users will benefit from your project.
- The Local Digital Declaration program didn't stop after launching. Six months post launching, the Local Digital Collaboration Unit (LDCU) at MHCLG convened 10 local authority Chief Digital Officer (CDO) level leaders from across the UK to better understand their needs and how they could support them.[28] During the meeting, they identified what responsibilities and powers make a local authority CDO effective, understood their common challenges and opportunities, identified opportunities for some of these challenges to be overcome more easily together, and identified the network's needs of the convening organizations.

To implement the Local Digital Declaration, the GDS have also recruited two new regional relationship managers, one based in Leeds and one in Bristol. They are responsible for building relationships in their regions and providing a route to digitalization based on

[27] All declaration projects are published in Ministry of Housing, Communities and Local Government (2018e)
[28] O'Halloran & Reidy (2019)

public service sector needs. They will also listen to wants and needs and then link local authorities to the relevant teams in London, or send the teams out where needed. The implementation also included the involvement of multiple local authorities before launching the declaration. A number of workshops took place all over the UK over six months and several drafts of the declaration were circulated, commented on and then revised by representatives of local authorities.

Challenges, Risks and Mitigation

The challenges with this declaration are two-fold:

(1) The implementation of the policy by the signatories is not binding.

(2) There are still gaps in the awareness of the policy among local government bodies in the UK.

Target subnational governments that are generally considered “market leaders”. Convince them to adopt the charter/plan/declaration with the eventual goal of herd mentality allowing for a domino effect after a substantial number of subnational governments adopt the charter/plan/declaration.

A strategy, charter or declaration would allow the coordinating institutions/bodies to be able to focus their energies to scan the environment and understand the limitations and gaps with regards to the availability of resources. Knowing this would allow coordinating institutions to create synergy, minimize complexity, and maximize impact allowing for a better plan for the future.

The only drawback of these strategies/plans/charters is the enforceability aspect. Since most of them are non-binding and are tools used to share best practices or experiences, defining clear targets or projections, for the future with regards to the move towards digitalization, is going to be more subjective and would depend on the willingness of the subnational governments to adopt the strategies.

The strategy needs to be such that it clearly defines the problem, considers the needs of all the stakeholder and is clear and coherent in its vision and mission. Additionally, those developing the strategy need to understand that the sector is dynamic and needs to have at least some forecasting for the distant future so that the strategy doesn’t have to be amended every few months. The problem with amendments is that they cause delays and interrupt the impact of the process.

TOOL TYPE:	Capability Development and Knowledge Sharing
TOOL NAME:	Nationwide capability development
COUNTRY WITH BEST PRACTICE:	UK

Capability Development and Knowledge Sharing

Tool Description

Capability development is a broad and comprehensive approach to growing and developing digital and data-related skills in the public sector, creating profiles and career paths based on forecasted needs. It encompasses the traditional scope of professional development (skills-based training, knowledge-based education, and experience), but also incorporates other aspects including in-person and online knowledge sharing.

In the UK, the GDS Academy teaches public sector professionals the digital skills they need to transform public services. GDS Academy pursues one of the UK Government Transformation Strategy's ambitions of having one of the most digitally skilled groups of public servants in the world by 2020.[29] GDS Academy is open to civil servants, local government employees, devolved administrations, and other public servants. As of March 2020, it offers twelve different courses focused on digital and agile delivery, a subset of practitioner courses, and a course in agile for more senior leaders. The courses are as follows:

- Agile for teams
- Digital and agile awareness
- Digital and agile awareness for policy makers
- Digital and agile foundation
- Digital leadership
- Hands on agile for leaders
- Introduction to artificial intelligence in government
- Introduction to user-centered design in government
- Service owner
- Working level for business analysts
- Working level for delivery managers
- Working level for product managers

[29] Cunnington, K. (2019)

To increase outreach, alongside its four permanent locations (London, Leeds, Manchester and Newcastle), there have been pop-up academies in Birmingham and Newport. Another strategy to increase the number of local authority students is that the Local Digital Declaration team worked closely with GDS Academy to provide training to Declaration signatories. Any civil servants who are interested in attending the training can enroll through GDS Academy website and are required to pay the course costs, which can be paid by his/her organization. Also, The Local Digital Fund[30] provides committed funding for more than 1,000 local authority staff to attend training.

GDS Academy is an integral part of the Digital, Data and Technology (DDaT) Profession[31], which represents around 17,000 professionals across government. The Digital, Data and Technology (DdaT) Profession Capability Framework is a guideline to create and grow cross-government communities of DdaT professionals, map out career paths, identify skill gaps, and develop the training delivered through the GDS Academy.[32] GDS Academy's aspirations are to better support career transition by helping civil servants develop the skills they need to take on digital, data and technology roles, and career progression for digital, data and technology professionals, by helping the professionals increase their skills and progress their career within government. The GDS Academy has helped 10,000 people to embrace digital ways of working and puts users at the heart of their work, by 2019.[33]

Additionally, through the use for blogging and nationwide events, GDS and local governments disseminate information, news and updates on the digitalization process in the UK to raise awareness about the process so as to invite more local governments to join the process. Since the Local Digital Declaration is a guiding principle and not law it allows for a medium to share experiences and encourage the speeding up of the process at a local level. One of the examples of a nationwide event is GDS's flagship event, Sprint, which brings together people working across government to learn more about how digital transformation is improving people's lives. It aims to showcase GDS expertise in transformation, highlighting the work going on across government, including central and subnational, to build a government that works for everyone.[34] It is a day-long event integrating workshops, keynotes, ministerial announcements, and panel sessions, creative content including blog posts, videos and animations, press briefing, and event design.

[30] See also Local Digital Fund as a Financial tool. Please refer to the Financial section of this toolkit for more details
[31] GOV.UK (2020a)
[32] Digital People (2019)
[33] Cunnington, K. (2019a)
[34] Government Digital Service (2019)

Rationale for Usefulness at the Subnational Level

Public servants at the subnational government can get the most appropriate learning and development training. Governments need to ensure they have the skill sets needed to use new digital tools, work collaboratively, and engage with citizens and businesses. This will require, among others, consistent capability development and regular knowledge sharing.

According to the former Director General of the GDS, GDS Academy has been one of GDS' most successful ways of building technical capability across the public sector and it continues to grow.[35] Emerging technologies also feature in the courses, such as Artificial Intelligence and GDS Academy Masterclass, where world-leading academics and industry experts share their expertise on how new technologies are impacting public services. GDS Academy, with strong communities of practice and opportunities for learning and development, supports attraction, recruitment, and retention of DdaT specialists.

Implementation of the Tool

The Capacity Building Programs will only be successful if the following is met:

- Political will to encourage and advocate for Knowledge Sharing platforms.
- A well-defined system of coordination, coherence and monitoring and evaluation within the coordinating institutions to allow for the smooth running of the capacity building initiatives.
- Financial resources for the running of the institutions and their programs and the capacity building of their employees.
- Clearly identified problem.
- The demand, for the specific task force needed to facilitate the capacity building initiatives, meets the supply.

Process of Implementation

- GDS Academy is built based on the role description and skills described in the Digital, Data and Technology (DdaT) Capability Framework that is used across the nation. It defines the roles in the DdaT Profession and describes the skills needed for each role level. The Civil Service Board commissioned the Digital, Data and Technology Profession to lead on a number of cross-government actions identified to support The Government Transformation Strategy. These actions will help departments attract, recruit, and retain the people they need to build the best public services.

[35] Cunnington, K. (2019b)

- The Capability Framework enables strategic initiatives for building cross-government DdaT capability by providing a common language and a coherent structure. Example initiatives include:
    - Running cross-government recruitment campaigns, rather than individual ones for each organization, based on common job descriptions.
    - Capturing consistent and meaningful data across the profession to measure progress against The Government Transformation Strategy and support workforce planning.

To implement any capacity development tool at the subnational level, local government leaders should encourage their teams to participate in the capability development program and knowledge sharing sessions. They should also develop partnerships with academic institutions and private sectors to improve the quality of capability development programs. Online learning tools and knowledge sharing platforms are some required infrastructure for implementing such programs.

It is recommended to offer both in-person and online training, and be flexible in training delivery. For example, not only GDS Academy runs the training in their offices/training centers and some pop-up academies (such as in Birmingham and Newport), but also GDS Academy can send a trainer to come to a local authorities' office if the participants can't travel to the training centers. For that, the local authorities will need to pay for the trainer's travel, and accommodation.

Challenges, Risks and Mitigation

- Attendance to these capacity building programs are not mandatory, so initially getting a substantial amount of participation would be a challenge.
- The finances to continue these programs might pose a problem**.**
- The content of events like talks, and seminars among others should be such that it raises awareness and advocates for subnational governments to adopt the digitization process.
- Lobby for and designate funds when the finances are being decided for the digitalization process.

All three components of the governance tool are connected. If the practitioners of the strategy do not have the required skills to implement the initiative or there isn't enough awareness about the importance of the digitalization process through initiatives like blogging the efficacy of the move towards digitalization would be compromised.
Governments need to invest in creating the right environment for public sectors that can operate in the digital age. This implies supporting the professionalization of digital career

paths across public sectors and the development of an advanced civil service culture that uses digital technologies to engage with users and place their needs at the center of its activities.

One of the strategies to increase the number of local authority students is that the Local Digital Declaration team worked closely with GDS Academy to provide training to Declaration signatories and the training commitment is an inseparable part of the declaration itself. Having right skills or expertise and continuous learning are part of the declaration's commitment, as well as one of Local Digital Fund Assessment Criteria[36]. Another important aspect is that, for an effective move towards digitalization, funds need to be allocated by the central government for capacity building and awareness initiatives that would include, but are not limited to, blogging and hosting seminars etc.

[36] Ministry of Housing, Communities and Local Government (2020)

FINANCIAL

Financial tools can range from budgetary specifications for digital transformations to special funds dedicated to enable digital government collaboration and services.

TOOL TYPE:	Funding for Digital Government Initiatives
TOOL NAME:	Local Digital Fund
COUNTRY WITH BEST PRACTICE:	UK

Funding for Digital Government Initiatives

Tool Description

Based on research conducted by the Organization for Economic Cooperation and Development (OECD), funding activities are a major component for the improvement of a nation's digital government strategies. They can typically be funded through "a) an institution or institutions responsible for the implementation of the project, b) a central earmarked government fund for financing or co-financing strategic projects or promising pilots or prototypes, c) external funding (i.e. international organizations), or d) a mix of the above."[37]

Furthermore, many countries studied have highlighted the importance of having "centralized ICT funds to co-finance strategic projects and create incentives that foster compliance with existing norms, guidelines and digital government objectives established by the strategy."[38]

Within the UK, various central body ministries exist to provide funds at the local level to support digital initiatives. This can involve an application procedure akin to applying for a government-issued grant. The local digital fund initiated by the UK Ministry for Housing, Communities and Local Government (MHCLG), the Government Digital Service (GDS), and a collection of local authorities and sector bodies from across the UK, aims to help local authorities implement the Local Digital Declaration by funding digital skills training

[37] OECD (2019). *Digital Government in Chile – A Strategy to Enable Digital Transformation*. OECD Digital Government Studies, OECD Publishing
[38] OECD (2019). *Digital Government in Chile – A Strategy to Enable Digital Transformation*. OECD Digital Government Studies, OECD Publishing

and projects that address common local service challenges in common, reusable ways. The Fund was set to invest up to a total of £7.5 million during financial years 2018/19 and 2019/20 and fosters cross boundary collaboration, given that a criteria for application is that councils must work together. Sixteen projects were awarded grants of up to £100,000 in the first round of funding in December 2018, and there have been three rounds of funding so far, the last one being in October 2019.[39] The projects were tested using the digital service standards and were listed in phase alpha or beta depending on the progress they have made.

Rationale for Usefulness at the Subnational Level

Within the UK, between 50 and 60 projects have been initiated through support from the Local Digital Declaration[40] and the Local Digital Fund, spurring collaboration at the council level.

Implementation of the Tool

Given that the fund is overseen by a body of established ministries, MHCLG and GDS, the replicating country would need to ensure that similar ministries exist. Furthermore, this tool assumes that there are existing local authorities that would be eligible to receive the fund through a set of specific criteria. In this case for example, the application has outlined the following set of eligibility criteria:

1. Solve common problems
2. Focus on and involvement of users
3. The right team and an approach to work collaboratively
4. The plan
5. Share learnings and outputs
6. The potential level of savings for the sector[41]

The UK has a set of established ministries that oversee the Local Digital Fund. In particular they are the MHCLG and the GDS. These bodies act in coordination with local authorities within the UK to oversee the fund's efforts. As an independent entity, the MHCLG is responsible "to create great places to live and work, and to give more power to local people to shape what happens in their area."[42] The GDS functions to "help governments work better for everyone by leading digital transformation."[43]

[39] https://localdigital.gov.uk/funded-projects/
[40] Please refer to the toolkit section on Governance for more details.
[41] Ministry of Housing, Communities and Local Government (2020)
[42] GOV.UK (2020b)
[43] GOV.UK (2020c)

With support from these ministries, the fund has a detailed application process in place, outlined in an accessible document on their website[44]. The application documents several key aspects of the application procedure including: an introduction and overarching objectives about the fund, eligibility criteria, and application timelines. Applicants are asked to follow this procedure.

Within the MHCLG, the Local Digital Collaboration Unit team, then oversees selecting the applicants through a workshop. In the first round of selection, an expert panel joined the team to review the projects which were shortlisted for the Local Digital Fund's awards. The team, which received 77 applications in total, focused on 27 shortlisted bids which were reviewed through a 4-hour workshop consisting of three phases as follows[45]:

1. Ground Rules: The team sets the tone of the agenda by describing the selection process, the published selection criteria, and the goals of the fund. It also highlighted the importance of prioritizing projects that (i) would benefit many councils, (ii) didn't give preference to specific proprietary software projects, and (iii) would support the local government to deliver on the goals set by the Local Digital Declaration.
2. Project round-up and reflection: The team then presented more detail on each of the 27 applicants. The panel and the team spent an hour on quiet reflection, reading the bids in detail and making written notes on the projects with 'hopes', 'fears', and 'notes', taking specific consideration of the projects whose works they were familiar with. This part of the review consisted of 5 Collaboration Unit members for each panelist to answer questions.
3. Prioritization mapping exercise: The next phase consisted of a few hours where the reviewees plotted the 27 bids on an x-y axis. After discussion on the best way compare and prioritize projects, the team decided to put 'how much interoperability and reuse the project could unlock (while doing no evil)' on the x-axis and 'amount of human energy (or pain) it could spare and money it could save' on the y-axis.

From this first round of selection and after careful consideration and discussion, the team decided to award funding for 16 projects.

This fund requires **partnerships** between the implementing agencies (MHCLG and GDS) and the local authorities that are potential applicants of the fund. Local authorities include those that are involved with providing public services such as collecting waste and recycling, cleaning the streets, supporting the most vulnerable.[46]

[44] GOV.UK (2020d)
[45] MHCLG Digital (2019)
[46] GOV.UK (2020d)

Challenges, Risks and Mitigation

One of the major challenges with the fund is the overwhelming amount of applications they get. Many local council digital offices that applied for the grants did not receive funding due to the high volume of applications. This is a clear indicator of demand for funds for local government digital projects. This poses an opportunity to bridge the gap between accurate marketing and awareness, thus enabling more projects to be supported in some way through the local fund. The fund is open for applications from any local authority that has a digital initiative, however given that this fund is still relatively new and small, there remain challenges in following through with the application process. Another key consideration is that this specific fund allocates funding based on which phase a particular project is on. For example, projects can either be in the discovery, alpha, or beta stages of development and as such the application delineates specific criteria they might look for in an application and the amount of potential funding.

This example highlights the importance of having centralized government bodies which are able to oversee and implement a fund of this nature. As such, a country looking to replicate this model would need to first ensure that they provide necessary oversight through ministries such as MHCLG and GDS. Furthermore, governments need to lobby for and designate funds when the finances are being decided for the digitization process.

LEGAL AND REGULATORY

Legal and regulatory tools can reduce costs, provide access to municipalities with less capacity, and ensure interoperability of systems.

TOOL TYPE	Mandating Transitions to Digital Government
TOOL NAME:	Digital Government Mandate
COUNTRY WITH BEST PRACTICE:	Spain

Mandating Transitions to Digital Government

Tool Description

Spain: Law 39[47]/2015 and Law 40/2015[48]

In Spain, Laws 39 and 40 of 2015 (as well as Law 11 of 2007) set the foundation for digital government by ensuring the ability to interact with government digitally as a citizens' right. This premise set the foundation for regulations that would come after, solidifying Spain's commitment to digital government. While this right was first mentioned in Law 11 of 2007, the Laws of 2015 were responsible for the granularity of detail and strengthened regulations. Interviewees considered that the transition to digital government was a central government priority with the Laws of 2015 which mandated the transformation. The mandate made it clear to all public administrations, both at the national and subnational level, that they must create or acquire the possibility of providing all public services online, while retaining the option of providing them in person services, for citizens who preferred the existing method.

As detailed by interviewees, the mandate provided political backing and support to local efforts that were already underway. The mandate helped facilitate the job of local officials which made the work of subnational governments easier. Other interviewees also shared that the mandate had a considerable effect on the private sector, which, given a new high demand for services, acted quickly to compete in the creation of solutions that would respond to this new demand for technology solutions in government. The high demand affected prices as new solutions provided by the private sector could achieve economies

[47] Agencia Estatal Boletin Oficial del Estado (2015b)
[48] Agencia Estatal Boletin Oficial del Estado (2015a)

of scale, increasing the affordability of solutions.

That said, mandated digital government transformation was also met with strong resistance from public employees and citizens, providing considerable obstacles to implementation. In some cases, public sector employees initially chose not to use the digital solutions, perceiving it as a greater burden. In other cases, citizens could not understand the new systems that were being mandated and instead chose to continue using in-person services. This was eventually overcome through strong accompaniment work for public employees, and strong public information campaigns, supported by notable public officials. This experience showed that mandates should be implemented only after considerable consultation with the affected units and segments of communities, to understand possible negative repercussions. Mandates should also come with a roadmap to effectively manage the softer component of changing mindsets of both public administrators and citizens at all levels of government.

Rationale for Usefulness at the Subnational Level

Digital government strategy and initiatives are becoming commonplace in countries around the world. But, while many countries globally have developed digital government strategies, few have made these legally binding either as laws or regulatory frameworks at both the national and subnational level of government. We have found that translating these strategies and initiatives into legally binding frameworks helps governments signal a strong commitment towards the goal of digitalizing government at all levels in the country. It can serve as a support to the political will of subnational level public servants in their efforts to transform public administration at the local level, while ensuring the necessary financing. By legally binding frameworks, itl also helps governments at all levels with resource planning and prioritization.

Also, mandating digital government strategies ensures that governments are held responsible and accountable to implement their digital government agenda. This also creates a framework for governments, agencies and private sector technology providers to interact on digital government topics.

In short, a digital government mandate helps subnational governments with prioritization, resource planning and direction to implement digital government transformation. A mandate also lends political support for subnational governments to pursue their digital government transformation agenda.

Implementation of the Tool

Interviewees in Spain note that one explanation for the success of these laws in promoting a successful transition was its design process, given that they were written jointly by legal and technology experts, ensuring that they would be understandable to both and easy to implement and enforce. Input from sub-national officials, while considered to be somewhat limited during the design, was also considered.

Governments should first have a comprehensive digital government strategy that includes attributes, accountability and responsibility to ministries, agencies and subnational governments. In the process to make these strategies legally binding, governments should appoint a coordinating ministry or body, such as those outlined in the governance tools, that is responsible for the nation-wide digital government transformation agenda. The responsible coordinating ministry or body may consider conducting town halls across the country to better understand priorities, challenges, financing and technological needs. These town halls should be multidisciplinary, diverse and inclusive to ensure broad and comprehensive perspectives. This would also include private sector technology implementers who can help with feasibility of technologies in discussion. For example, the government of Canada conducted a multidisciplinary approach as it crafted its digital strategy.

Canada: Digital Charter: The Ministry of Innovation, Science and Economic Development is responsible for Canada's Digital Charter. The Charter, with the aim to make Canada a data-driven, digital global economy, was launched in 2019 and was developed through a collaborative process. This included the National Digital and Data Consultations, which were held between June and October 2018 and included 30 roundtable discussions hosted by six Digital Innovation Leaders across Canada, engaging with more than 550 Canadians. The six Digital Innovation Leaders, appointed by the Minister, reached out to a broad cross-section of society including business leaders, innovators and entrepreneurs, academia, women, youth, indigenous people, provincial and territorial governments, and all Canadians.[49] Additionally, Canadians shared more than 1,900 ideas through their website and online platforms.[50]

Figure 3: Example of Canada's Digital Charter, which highlights the country's efforts to convene thought-leaders from various sectors to improve digital governance.

This diversity will ensure that the legal and regulatory binding framework is feasible to enforce and implement so multi-stakeholder perspectives are crucial. It is equally important to keep interoperability in mind as outlined in the tool above to guarantee consistent and implementable regulation at all levels of government. It is important to

[49] Government of Canada (2019)
[50] Government of Canada (2020)

recognize however that the legislative process will undeniably vary depending on the political system and the legislative structure of a country. Heavily decentralized political systems may also want to include additional frameworks to safeguard the adoption of the law at all levels of government and avoid pockets of the country from falling behind in their digital government transformation.

Lastly, partnerships are a crucial element to ensure the success of digital government mandates. Similar to the development of legally binding frameworks, partnerships should have a multidisciplinary approach. For example, national government partnerships with provincial and/or municipal governments; provincial government partnerships for group procurement and implementation and municipal governments with academic institutions for digital government technology development. Partnerships can help governments with cost-savings and synergies which will increase efficiency and productivity across both national and subnational government.

Challenges, Risks and Mitigation

The biggest challenge with implementing digital government mandates is the legislative process that is dependent on government structure. For example, heavily decentralized countries such as Argentina, have limited nation-wide legislative structure. So, laws approved at the federal-level must be adopted by individual municipal governments to be taken into effect. If a municipality disagrees with the federal law, or rather, do not see it as a priority, they have no obligation to adopt the law in their own jurisdiction. This may create an uneven digital government transformation across the country. This underscores a political will challenge and representatives at each level of government will need to coordinate closely to ensure the adoption of any legal and regulatory framework. However, another challenge is that it is extremely time intensive to develop a multi-stakeholder view towards legislation but it would mitigate the risk of neglecting local buy-in and perspectives on digital government. Enforcement will also prove to be challenging, especially for subnational governments that are smaller or that are far removed from national governments. A way to mitigate this could be to delegate enforcement of the digital government agenda to subnational governments at the provincial level, which will both reduce national government burden while ensuring that all levels of government are following the law.

The risk associated with digital government mandates is that the regulatory framework could be too broad for implementation efforts at the subnational level. Conversely, it could also be too specific that subnational governments find it impossible to implement.

Countries with specific legal and regulatory frameworks on the development and implementation of digital government have been more successful in mobilizing a whole-of-government approach. It creates a cohesive and coherent agenda which helps governments at all levels prioritize, plan, and allocate sufficient human and financial resources towards the digital government agenda. This specificity also ensures accountability and responsibility in the implementation process and provides subnational governments autonomy to implement digital government transformation efforts. The success of this type of legal and regulatory framework will require political will and buy-in or at the very least a consensus to prioritize the digital government agenda. To facilitate this as well as mitigate the risks of failure, a multi-stakeholder approach towards developing this regulation should be considered to ensure its success.

High-level of collaboration among subnational government administrators is needed to facilitate accountability and responsibility. Digital government mandates are largely **dependent on governance tools**, specifically those related to coordination bodies/institutions, and those related to local government strategies or charters.

Challenges also include that of enforcement. As with any legal framework, enforcing legislation will be challenging especially for small municipalities that are far removed from central government. In countries where provinces or municipalities must choose to adopt central government regulations, it will be even more challenging to convince them to do so.

TOOL TYPE:	Establishment of Compatibility Regulations
TOOL NAME:	Compatibility Regulation
COUNTRY WITH BEST PRACTICE:	Spain

Establishment of Compatibility Regulations

Tool Description

In the countries studied, subnational governments were often given much liberty when it came to defining their own process toward transformation to digital government, which depended on their own technical and financial capacities. In this context, various interviewees at the subnational level in Spain have identified compatibility regulations, which include those related to systems interoperability and security, among the most

important things that can be done at the central government level to facilitate the work at the subnational level. This was first regulated in detail in Royal Decree 4/2010[51] (equivalent to a presidential decree in presidential systems) and then incorporated into Laws 39 and 40 of 2015[52], which mandated public administration nationwide to respect the newly created National Interoperability Framework. This framework was created based on the principle that, to provide its citizens with access to online services, public administration units, whether at the ministry-level or between national and subnational, must be able to cooperate and fluidly exchange data with each other. This need made standards for compatibility between their software a necessity.[53]

Law 39 establishes that even if subnational governments develop their own software, every administrative unit must adhere to the requirements established in the National Interoperability Framework (as well as the National Security Framework) and related technical norms, to ensure that all requests and communication and platforms at the subnational level is compatible with the national system (see "Disposición adicional segunda" in the law). This includes information such as that related to powers of attorney (Article 6), administrative records and registries (Articles 27 and 70).

Furthermore, Article 3 of Law 40/2015 includes interoperability among the key principles of public administrations, with a focus on the protection of personal data, and to facilitate the joint provision of services to citizens. It also reiterates the interoperability and compatibility requirement throughout various portions of the law.

Rationale for Usefulness at the Subnational Level

The liberty that was given to subnational governments, as mentioned earlier, naturally creates space for innovation, as subnational governments can commission or create new digital solutions. However, it can also present many challenges, since public administration often requires interacting fluidly with other sectors of governments to provide citizens with services, a task that can prove much more difficult and expensive to address if the digital solutions did not adhere to the same guidelines initially.

This issue was also mentioned in other countries. In Canada, for example, interviewees pointed out that, while subnational governments are capable of advancing their own digital government agendas, the lack of national level compatibility norms mean that there

[51] Agencia Estatal Boletin Oficial del Estado (2010)
[52] See Law 39 of 2015: Agencia Estatal Boletin Oficial del Estado (2015b)
[53] Portal de Administracion Electronica (2015b)

are obstacles to use of data that is stored in national-level databases to provide services at the subnational level.

Using laws, rather than internal government mandates, has proven to be much more useful in Spain. As was mentioned in the previous tool, administrators at the subnational level point out the striking difference in the effectiveness between law 11/2007 and 39 and 40 in 2015, where the legal requirement for interoperability and security included the latter laws, thus providing the necessary backing for them to finally be respected at the local level.

Implementation of the Tool

The law enshrines the importance of certain key documents on 'systems interoperability', which are updated by technical teams. Ensuring that the critical "how to" aspects in external documents exist guarantees that as technology improves, updates can be made to the technical norms without going through the legislative process.

Of these documents, the most important is the National Interoperability Framework and the Technical Standards document. [54] Among its primary contributions, the National Interoperability Framework contains guidance on topics such as i) ensuring interoperability through technical standards for all digital solutions, ii) establishing common definitions and vocabulary, iii) regulations around the use of common software (interoperability nodes) that are provided by the national government, iv) norms in terms of licensing the software, and v) standards for the use of e-signatures and identity certifications.[55]

The Technical Norms for Interoperability, which are updated regularly, act as a single deposit of specific details and examples for how digital government must be implemented in every administrative unit. Given that the requirement is set about in the law, this set of norms serves as the set of documents that explain specifically how each subnational level can comply with the norms established.[56]

The application of these norms, as well as the transition to digital government in general, is a particular challenge for small municipalities. While a transition to e-government is mandated for all public administration units, specific norms exist to support this process in smaller municipalities. Article 36 of **Law 7 of 1985** on local government stipulates that provinces (1 level up from municipality) are responsible for ensuring that all public services reach all small municipalities, under the principle of equity, particularly by

[54] Portal de Administracion Electronica (2018a)
[55] Portal de Administracion Electronica (2015b)
[56] Please see the Technical Norms website here: Portal de Administracion Electronica (2017)

providing the technical and economic cooperation necessary to municipalities with lower economic and management capacity. In the case of the transition to e-government, this has led to the practice that provinces take on the responsibility of arranging for the provision of digital government to municipalities with a population of under 20,000 people. For example, in the province of Castellón, in Spain, it was the provincial government that carried out one software purchase that would serve 120 municipalities. Multiple interviewees confirm that this law was essential to guiding strategy for ensuring that all municipalities reach their intended levels of digital government.

Challenges, Risks and Mitigation

The main challenge associated with using regulations based on laws is that the legislative process required is long and can take several years.

Furthermore, compatibility requirements will have a likely effect on costs and the ease of finding private sector actors that can respond to these stricter needs. These stricter requirements may mean that solutions are outside of the public administrative unit's budgetary constraints, since simpler software solutions that solve immediate problems may be available, but aren't capable of interacting with other databases.

Oversight for this kind of issue during implementation can be a challenge. In Spain, there are cases in which local level governments acquired digital solutions which were not in line with the most recent norms. It is important that the appropriate expertise be available to support local governments revise the options being presented by the private sector, to ensure compliance with the norm.

Compatibility regulations have a large added value in the implementation of digital government at the subnational level by ensuring that different levels of government can benefit from the information and tools that are stored within other administrative units, which are often essential to providing the service.

In the case of Spain, including these types of regulations within legislation was essential to make sure they were respected, even if this meant going through the legislative process. Given the speed with which technological standards change, the law should refer to the necessary technical documents, which can be updated more often.

The risks mentioned point to the fact that requirement compatibility might attract rejection from local level governments, who may also have difficulty in ensuring that the norms are respected. Well-designed communication campaigns should be implemented to explain

the importance of these regulations, and proper human resources should be made available to help local governments ensure compliance with the regulations.

TECHNOLOGY

Technology tools bring cost efficiencies in service delivery for governments and make overall service quicker and more convenient for citizens.

TOOL TYPE:	Enabling Products and Services - Applications
TOOL NAME:	National Digital Portals and Co-development strategies
COUNTRIES WITH BEST PRACTICE:	UK, Netherlands

Enabling Products and Services - Applications

Tool Description

National Digital Portals provide citizens and businesses with a one-stop-shop entry for government products and services. As observed in the UK and the Netherlands, centralized digital portals are often the gateway for national governments to promote digital government transformations at subnational levels. The portals contribute to improving transparency in public administration thereby improving citizen participation in digital governments.

GOV. UK is a digital portal that consolidates all central government information services and application programming interfaces (APIs). Since GOV.UK was launched, one of the central government's main focus has been digital by default, meaning digital services which are straightforward and convenient that all those who can use digital services will choose to do so, while those who can't are not excluded. The term **'digital by default'** has a clear service delivery focus and is the goal for public services with over 100,000 transactions per year.

Similarly, Netherlands currently operates three national portals to address the distinct needs of the constituents they serve.

1. **Overheid.nl**: Government portal - Serves as the central access point for all information relating to government organizations. The portal provides information about services for persons and businesses by themes, life events and location. It provides consolidated national legislation, official publications, local and regional legislation and about internet consultations. The portal links to EU legislation, the

open data portal data (overheid.nl) and to the common website of the ministries, with documents and publications, news items on all domains.

2. **Ondernemersplein.kvk.nl**: Business portal - Serves as the point of contact for businesses and entrepreneurs in areas such as legislation, subsidies and permits. The information provided covers all levels of government and focuses on the issues and needs of the business community. The website *business.gov.nl* was launched and improved to assist English speaking entrepreneurs in the Netherlands and abroad.
3. **Mijnoverheid.nl**: Portal for personal services - Serves as the portal on which citizens can access personalized information and digital messages from the government, after having logged in with their digital id (DigiD). Citizens can access registries, and view their personal data registered by the government. Citizens can receive messages from different government organizations in their secure message box. And citizens can follow the workflow, after having applied for services with participating municipalities.

Rationale for Usefulness at the Subnational Level

National digital portals serve as outlets for subnational/local governments to:

- **Connecting local governments with national digital initiatives:** While national governments prioritize technology transformation initiatives, these initiatives are often implemented in partnership with local/municipal governments. In the Netherlands, passport, driver's license, registration of birth/marriage/death, property registration falls under the purview of national ministries but are delivered by municipal governments. So, the national digital platform rijksoverheid.nl supports the local government with guidelines and the infrastructure to deliver their services. Such digital government initiatives promoted by national governments result in cost savings for local governments. Message box app was launched to enable citizens to easily read mail from the government on a smartphone or tablet.

- **Access resources for building local digital initiatives:** Although GOV.UK is not mandated for local governments, but GOV.UK and other platforms as a service together allow for the development of services on the internet in the shortest possible time. The national portal builds in many ways on the work that councils have been doing for years – a combination of appropriate channel choice and good design that not only reduces cost by 'shifting' services on to cheaper channels, but also improves the customer experience by allowing swifter and more convenient self-service interactions at any time and from any place.

- **Develop public services efficiently:** Using Mijnoverheid.nl, citizens can follow the workflow, after having applied for services with participating municipalities. A total of 21 organizations were connected to the workflow functionality at the end of 2018. Such efficiencies which improve service delivery and public participation at subnational level can be realized through national digital platforms.

Implementation of the Tool

The national digital portals work by integrating services across ministries, institutions and functionalities. Services are added, both from local and regional authorities and private parties.

GOV.UK has built the underlying architecture that allows for common functionality to be developed and reused by citizens, businesses, and governments – local and national.

GOV.UK Verified is an easy, secure and fast way of verifying the identity of a citizen to avoid identity theft and secure sensitive personal information.

GOV.UK Registers for structured data sets on crime geography, education, government, health and life circumstances to help aid the building of services on high-quality secure data infrastructure. Currently there are 18 government organizations with an average range of 1-2 registers with a few having 6 or 10 registers each. Each Government body keeps their registers up to date through subject experts in those relevant government organizations. Since the data is kept up-to-date by subject experts from the government organization the data populated in the registers is from that organization.

Gov.UK Pay is a service that is compliant of the payment card industry, allowing for a secure management of payments. It can be directly used by instantly setting up a payment page on GOV.UK or integrating with our API and generating custom payment pages for a service. Over 290[57] national and local services are already using this platform and it now also allows users to pay via Apple or Google Pay which further enhances trust and security.

Gov.UK Notify allows bodies across government to keep the citizenry updated by the use of emails and text messages among other mediums of communication. Real time progress on the sending of the email can be seen via the Dashboard on GOV.UK Notify, which will notify the user or government representative if anything needs to be done and if all the information provided is correct.

[57] GOV.UK Pay platform performance indicators, https://www.gov.uk/performance/govuk-pay

In the case of the Netherlands, DigiD enables individuals to identify themselves for digital services. In 2018, the platform was connected to 945 web-services provided by 647 public institutions. DigiD is available at three levels - basic (username and password: DigiD), middle (DigiD + sms-authentication or using the DigiD app) which both represent a stork QAA level 2, and substantial (the DigiD app upgraded with an ID verification), stork QAA level 3. Although not mandatory by law yet, DigiD has become the main authentication system for citizens, thus allowing them to connect with their national and local services through the same ID. This provides a ready-made platform for local governments to synchronize their services on. Civil certificates (births and marriage) requests are handled by the local authorities. Most municipalities provide civil certificate request applications and supporting documents as downloads via DigiD.

DigiD Authorise enables users of a digital service to authorize someone to act on their behalf. eRecognition (eHerkenning) is the e-Identity Trust Framework that enables authentication for government agencies and businesses. With an eHerkenning authentication token, users can log in to online services offered by government agencies and businesses. Authentication tokens are technology neutral; therefore, a range of options are available for users (e.g., SMS, OTP, certificate, user name or password). Public Key Infrastructure (PKI) for the government (PKIoverheid in Dutch) facilitates reliable digital communication inside and with the Dutch government. PKIoverheid is a very high-grade, safe infrastructure, based on digital certificates. Dutch open data portal provides an overview of all available datasets provided by governmental organizations in the Netherlands. Over 150 Dutch government organizations list their available data in over 12,000 datasets. The data portal is updated daily by harvesting-processes, API-updates and individual users. The DCAT standard for data exchange is used and has been extended for use in the Netherlands (DCAT-AP-NL). The data registry is based on the CKAN software platform and Drupal 8.

The platform functionality is expanded with a demand-driven approach, based on the needs of citizens, entrepreneurs and local governments. The new features are tested in an online pilot environment before being merged into the main portal. Regular ‘customer journeys’ mapping exercises allow for identifying the missing components of the portal for developing additional functionality.

Challenges, Risks and Mitigation

National digital portals come into existence because of priorities made by central governments. As a result, the preliminary versions of the portals might not reflect the needs and priorities of local government priorities. However, building technology products

that are centered on the needs of the citizens and the priorities of local governments is key to adoption and usage. Knowledge-sharing between different digital development teams across local governments and central governments can result in robust portal functionality that addresses the citizen interaction with digital government interface.

Data ownership, and privacy loss/leakages remain a concern for local government integration into national portals. Local governments not only want to be users of local citizen data but also owners of it. The development of national portals at locations away from their regions and a lack of full picture of the development process often causes trust and autonomy concerns. By involving the local governments from an early stage in development, the ownership and trust concerns can be addressed.

Digital readiness of a country is equally important in the adoption and usage of a national digital portal. A minimum level of digital literacy of citizens is needed to achieve sustainable adoption of portals. Development of national portals should occur in conjunction with digital literacy programs and set up of digital connectivity infrastructure.

TOOL TYPE:	Best Technology Practices
TOOL NAME:	Digital Standards
COUNTRIES WITH BEST PRACTICE:	UK, Canada, Netherlands

Digital Standards

Tool Description

The UK, Netherlands and Canada use these below mentioned best practices in setting digital government standards. These cover the key digital standard types for ensuring a relatively uniform digital service delivery experience for the citizens in different parts of a country.

UK's **Digital Service Standard**[58] is a set of 14 criteria to help governments create and run good digital services. It requires service developers to understand user needs, do ongoing user research, have a multidisciplinary team, use agile methods, iterate and improve frequently, using open data standards, evaluate tools and systems, collect data

[58] GOV.UK Service Manual (2019)

and test their service with a user-base and many other aspects which enable the launched public service to be at par with industry standards for digital services.

Government of Canada's **Open standards** are a set of rules designed to do a specific job in technology and include both, the use of open data standards and open source software (OSS). Open standards refer to file formats, protocols and application interfaces that can be implemented by everyone (in open source and proprietary software alike) since the specifications are available at no cost, and since their development and standardization is open and transparent. This standardization work is done by specialized agencies that are usually either government agencies or organizations created by professionals from a given industry sector.

Netherlands' **Application Programming Interface (API) Standard** began with a National API strategy which was developed by a national alliance setup for the same. It was then carried out further through the API platform created in collaboration with the National Standards Bureau and other relevant ministries. Given the development towards a digital society where many digital services must be able to work together easily, the Dutch government benefits from Knowledge Platform APIs which jointly looks at strategic and tactical issues related to the development and use of APIs outside and within the government.

Rationale for Usefulness at the Subnational Level

In delivering thousands of services and digitalized business processes of multiple government departments that need to interact with each other at some level, standards play a key role.

In interactions with digital development experts and implementers, digital service standards, API standards, open code and data standards, frequently came up as best practices enabling them to create and deliver uniform value to the citizens. These technical and service standards are also extremely crucial to scaling digital services and processes across the large number of local and municipal governments within countries.

It has also been found that open data standards and interoperability standards have been important in determining the long-term durability of national GOV platforms in promoting digital government at the local level.

The COVID-19 global crisis also revealed the importance of using the latest best practices in open source code for development so that developers can quickly move data and applications to newer technology platforms to accommodate larger and quicker systems

within ministries and agencies in case of emergencies. Closed code migrations in an emergency or crisis would delay and reduce service delivery to citizens as experienced by the employment service of the United States in responding to the COVID relief benefits very recently.

Implementation of the Tool

Development and implementation of national digital standards must begin with developing a national level Digital Government strategy that provides guidelines for building and implementing digital government applications. This can be a guideline or a mandate for subnational governments based on the system of governance. This standardization work is done by specialized agencies that are usually either government agencies or organizations created by professionals from a given industry sector. Local administrators across districts as well as agencies need interoperability at a technical, language or semantics, legal as well as overall governance level. Digital standards provide this interoperability across the different parts of the system.

Another key example of standards at the development stage can also be terms and conditions that state technology co-development by cities/municipalities as a requirement for accessing government innovation grants/budgets. To promote and implement these standards technology Conferences, city level meet-ups, learning sessions and open civil society conversations can be platforms to educate and promote digital government best practices such as open source and open data protocols. Making best practices available online for use by local governments is another best practice to ensure the development of a robust digital administration from the beginning. Evaluating impact and taking feedback to promote the most useful practices through feedback loops can be very useful in ensuring if the standards set are effective in achieving their goals.

One example of assessment of standards is from the UK. Local governments can opt for the ready-to-use 'digital service assessment tests' developed for local governments, which requires the developer team to conduct two levels of assessment - alpha and beta - which involves more research and data collection, *stories of success* stage and a *live demo* stage. If teams do not pass their assessments, they have to take appointments again and redo the assessment center. This ensures that all digital services released to the citizens are equally accessible to all sections of the population and meet quality standards. The **Empathy Lab**[59] attached to the digital service standards aims to ensure that vulnerable populations and disabled people can also access these services. This allows for maintaining equity and access while using strong technical standards in the

[59] Henke, A. (2019)

final digital service created, and while this is not a mandatory assessment, it can be a very useful tool to maintain compliance with accessibility laws for services.

In order to define open data and source code standards, the following tasks are needed:

- **Defining principles for selecting open standards** that ensure that the selected standards will enable software to interoperate through open protocols and data exchange to occur between software and data stores
- **Identifying open standards for use through** an interoperability framework that lists mandatory and recommended open standards with possible alignment and collaboration with other governments successfully implementing similar standards.
- **Training and Support** around the migration to and adoption of open standards.
- **Format conversion** requires a significant effort to ensure that closed files and data formats can be converted to open standards keeping in mind that digitization can become a labor-intensive task for any complex documents.

Challenges, Risks and Mitigation

Autonomy of local governments can be a challenge in total time taken for adoption. Insufficient buy-in from local authorities must be understood, since the challenges could be specific. For example, design flexibility and autonomy for interfaces can be a key to maintaining standards while allowing local development teams to deliver digital services appropriately to citizens under their governance.

Another important consideration can be that local governments might have dissimilar data collection formats and templates and also small amounts of data thus creating challenges for re-usability and accessibility. Additionally, cooperation could be restricted due to regulations, different priorities and timelines, financial impact.

Standards are created to answer specific needs and the proliferation of competing standards may increase the required time spent selecting the right one to reduce the issues in the long-term management of data, information and applications. Co-creation of standards may take time and the emergence of new ones when an agreement cannot be reached amongst stakeholders may increase the risk of settling for another standard as the broader market may take a different direction.

Above risks and challenges can be mitigated through use of revenue generating business cases to gain local buy-in and by ensuring transparency and clarity in data usage and sharing agreements.

TOOL TYPE:	Best Technology Practices
TOOL NAME:	Shared Technology Practices
COUNTRIES WITH BEST PRACTICE:	Canada, Spain, UK, Netherlands

Shared Technology Practices

Tool Description

Co-development strategies and collaboration tools:

1. In the UK, CivTech is the Scottish Government's multi-award-winning **innovation conference** where public sector organizations, including councils and government agencies, set challenges and invite proposals with the aim of attracting new ideas from tech companies. Agencies sponsor challenges, and startups compete to be the best at solving that challenge, potentially winning hundreds of thousands of pounds and a reference customer. CivTech's approach of bringing multiple stakeholders of a community together, is already helping transform public sector engagement with tech and innovation, delivering significant benefits to public services, and producing genuine uplifts for the Scottish economy.
2. In the Netherlands, **Common Ground** is a modern, agile way of designing, building and managing ICT systems. Common Ground, inspired by the X-road system of Estonia, is based on the idea of a **shared data landscape** and enables municipalities to innovate faster and save costs, by creating a information exchange system which includes both data sharing platforms as well as coworking and collaborative spaces for municipal developers to meet. Common Ground's purpose is to build a new, modern ICT infrastructure next to the existing municipal ICT infrastructure for the exchange of data within and between municipalities. With Common Ground, municipalities can drastically renew their services and operations from the ground up. In the Common ground approach, bigger municipalities (100,000+ population) are in the lead with the re-design and digital transformation of the back-offices. Smaller municipalities have adapted more quickly at the front-office. For back end operations, the smaller municipalities collaborate with a bigger municipality or with a group of other smaller municipalities.

Procurement platforms and practices:

1. Spain's **Electronic Procurement System (Plataforma de Contratación del Estado)**[60] is an e-procurement platform used to manage interactions between public and private companies during procurement, from initial request for proposals to invoice payment. The system also connects the company and the municipal accounting systems so that information on the advancement of payments is known immediately.
2. Shared Service Canada (SSC) has initiated a **cloud service contract** for adopting cloud computing is set to help the Government of Canada (GC) maintain IT service excellence during a period of increasing demand for digital services and timely access to emerging technologies. For example, in 2011, data centers, networks and email were consolidated under the management of SSC. In 2012, the Report on the State of Aging IT Across the Government of Canada emphasized the need to plan for the investment that would be needed to eventually replace legacy applications. In addition to leveraging internal IT capacity and capabilities, CIOs must also leverage cloud services to bring about further transformations.[61]

Rationale for Usefulness at the Subnational Level

Shared technology practices include effective business practices to improve the resource utilization of government funds, as well as initiatives that promote collaboration at local levels. The case of collaborative environments such as technology platforms and conferences that connect local policymakers and technology specialists and small firms or local start-ups has been successful across countries such as Spain, the UK, the Netherlands and Canada where backed by local funds, partnerships with private service providers as well as civil society organizations, people have come together to solve local problems innovatively.

In the example of Spain's electronic procurement platform, multiple interviewees from Spain involved in the digital government transformation hailed it as the most impactful service from the central government, as did members of the private sector since it facilitates contract management, reduces transaction costs and adds transparency to the process.

In case of Canada's cloud contract, one of the main savings in operational costs due to cloud are due to the ability of governments to scale usage up or down as per traffic and requirement, leading to lower costs of pay as you scale. Another efficiency comes from

[60] Ministerio de Hacienda (2020)
[61] Government of Canada (2018)

freeing up personnel in local government budgets that are required to maintain and update local legacy IT applications, and by using giant group contracts that lower costs for individual departments by relieving them of the hassle of out-bidding procurement departments from other local governments.

Implementation of the Tool

Robust shared technology platforms can be built with the following in mind:

- Building technology products that are centered on the needs of the citizens and the priorities of local governments is key to adoption and usage.
- Well-connected back-end systems with interoperability mechanisms and centrally accessible databases allow for easy development and customization of frontend applications at municipal/local level.
- Local stakeholder participation and their buy-in is essential for gathering inputs for the business requirements and technical specifications.
- National Digital Transformation strategies with guidelines, milestones, and best practices help smaller municipalities to develop their own applications roadmap.

In the case of the electronic procurement platform in Spain, The Ministry of Finance and Public Administrations[62] is in charge of national public procurement policy through two main bodies. The first is the Directorate General for State Assets, which is responsible for the general regulatory framework on public procurement, setting the national strategy for e-procurement and operating the national e-procurement platform. The second, the Directorate General for Rationalization and Centralization of Procurement, focuses on the harmonization and centralization of national public procurement, operates as the central purchasing body for the State administration and State-related entities, and has developed a centralized procurement catalogue to be used in conjunction with the tool.

To enable quicker adoption of a large national platform, there needs to be the prerequisite of standards in place so that different systems across local governments can integrate a national platform in a useful way to their system.

In the case of Canada, the streamlined procurement process supports the Government of Canada's National cloud strategy along with the open government standards. The National Cloud adoption strategy charts out the types of cloud networks and defines the technical standards for use of cloud services. Training and support along with a feedback loop can be effective ways of managing the challenges with its implementation.

[62] European Commission (2016)

In interviews across Canadian subnational ministries, there was a local adoption of best practices through collaboration and mirroring of the success of other regions. Subnational local governments were looking up to other governments who have adopted a certain practice before implementing anything themselves. They have also been sharing successes and failures at local levels through learning platforms for local digital leaders and champions.

Challenges, Risks and Mitigation

To enable the optimal usage of procurement contracts of newer technology, CIOs must understand the changing environment, undertake the necessary workforce planning, and invest in their workforce by providing their IT professionals with the necessary learning and developmental opportunities. CIOs are encouraged to appoint a cloud leader to direct a core team to address the organizational changes brought on by cloud. For the adoption of cloud to succeed, the GC must build a cloud ecosystem that has both skilled employees and experienced private-sector professional services.

For collaboration tools, for example, the CivTech program also faced its own procurement challenge around finding a home, eventually signing a lease for its first batch less than an hour before launch. But the program has grown rapidly since its inception. It had just 6 projects during its first batch, but has had 10 projects in the second round, from a diverse set of agencies, including Scotland's health service and illicit trade agencies, which was achieved through local partnerships and increased marketing and strategic awareness of the program. The program has been able to thus boost the local start-up scene and create new jobs.

OTHER

There are additional tools that do not fall into the categories previously described. They consist of mechanisms used by different stakeholders to evaluate and benchmark the quality of digital government services provided at the subnational level, promote the citizens' digital literacy, and facilitate the communication between digital government stakeholders. Below are some best practice examples to illustrate these tools.

TOOL TYPE:	Monitoring and Evaluation
TOOL NAME:	Electronic Administration and Digital Transformation Observatory
COUNTRY WITH BEST PRACTICE:	Spain

Monitoring and Evaluation

Tool Description

Every two years, the Spanish Central Government publishes their assessment of Digital Transformation plans of their national and local governments, covering all their subnational levels, also measuring "information on technological, human, economic and contracting resources related to information technologies.[63]" With this tool, the Spanish Government monitors the use of ICT in local governments gathering indicators of this topic and its evolution.

Rationale for Usefulness at the Subnational Level

This tool provides a systematic platform, monitored by the Spanish Central Government, for tracking the implementation of the Digital Government at the Local Level. The Electronic Administration and Digital Transformation Observatory publishes detailed reports, where aggregates data obtained in different territories under a common methodology, providing an evaluation of performance of Digital Transformation in each, as well as the resources used in it. In this way, it favored the creation of a general framework of action to guide future planning and acquisition decisions.

[63] Portal de Administracion Electronica (2018b)

Implementation of the Tool

Under the context of the Digital Transformation in Spain —where laws 39 and 40 in 2015 made digital government mandatory at the national and subnational levels of public administration and provided specifications as to how that would be carried out, the Central Government established a regulation (Real Decreto 806/2014[64]) where different responsibilities were defined for the Central Government involvement in this transformation process.

One of them was the creation of the Electronic Administration and Digital Transformation Observatory assigned to the Secretary of State for Digitization and Artificial Intelligence and the General Secretariat for Digital Administration. The purpose of this observatory is to monitor and evaluate the progress of Digital Government Transformation on national and local governments, complementing these results with an analysis of the ICT resources used in this process[65].

Specifically, the assessment of Local Governments is published every two years in the report "IRIA[66]", constructed with information obtained from a representative sample of all the Local Governments with more than 500 inhabitants. The IRIA questionnaire was constructed with the participation of subnational governments and following the general objectives of the European eGovernment Action Plan 2016-2020[67].

An important precondition for the implementation of this tool was the collaboration of local governments in all this process, not only designing it but also collecting the information required.

The concepts evaluated are[68]:

1. Existence and progress of the plans of digital transformation
2. Availability and usage of digital government services, G2C and G2B
3. Availability and usage of G2G digital government services
4. Open Government
5. ITC, Financial and Human Resources used in this process

[64] Agencia Estatal Boletin Oficial del Estado (2014)
[65] Portal de Administracion Electronica (2018b)
[66] Secretaría General de Administración Digital (2018)
[67] European Commission (2019a)
[68] Secretaría General de Administración Digital (2018)

TOOL TYPE:	Digital Literacy Education
TOOL NAME:	National Plan for Digital Inclusion
COUNTRIES WITH BEST PRACTICE:	Argentina

Digital Literacy Education

Tool Description

The National Plan for Digital Inclusion trains citizens for using the Internet for their personal and professional development, through courses of digital literacy taught by university students.[69]

Rationale for Usefulness at the Subnational Level

An important precondition for any digital government plan is to have digitally literate citizens. In Argentina, this requirement presents the lowest level among our shortlisted countries, with only 74.3% of its population using the Internet in 2017[70]. Moreover, disparities arise when this statistic is presented by educational attainment. Table 1 shows the rates for home-based internet, computer, and mobile-phone usage by households with people aged 4 years old or more. Here, indeed, can be seen the significant variability in accessibility across these groups.

[69] Argentina.gob.ar (2019)
[70] The World Bank (2019)

Internet, computer and mobile-phone usage by education level			
% of households with population aged 4 years old or more (2018, 4th quarter)			
Education level	**Internet**	**Computer**	**Mobile phone**
No education	53.0	18.2	34.0
Basic education (incomplete)	63.9	32.6	54.8
Basic education (complete)	51.2	11.1	76.2
Secondary education (incomplete)	82.5	41.0	90.9
Secondary education (complete)	83.6	40.2	93.7
Tertiary education (incomplete)	95.7	72.6	98.5
Tertiary education (complete)	94.3	71.1	97.0
TOTAL	77.7	42.6	83.5

Figure 4: Internet, computer and mobile-phone usage by education level
Source: National Statistics Office in Argentina (Instituto Nacional de Estadística y Censos, INDEC[71])

Having this gap in mind, the Argentinian central government established in 2017 its digital literacy program, training citizens in internet use, which includes how to access information, complete transactions, and find a job.

Implementation of the Tool

First, here there is a Central government entity (the Undersecretary of Digital Country) who works with local governments (the first and second subnational levels: Provinces and Municipalities) through this tool implementation, which starts with a **diagnosis** of the

[71] INDEC (2019)

infrastructure and digital literacy of each territory. Then, the biggest gaps are identified as **priority zones** of intervention.

In parallel to the infrastructure and technology improvements needed for the digital government implementation, there were established 582 **Digital Hubs**, public spaces with free public WiFi, and facilities suitable for digital training and cultural activities. Those spaces, in conjunction with public universities, are the locations for the digital literacy training programs[72]. Initially, this program taught citizens in **Internet use**, which includes how to access information, complete transactions, and find a job; but then additional contents were added for adapting to the local needs, like digital marketing and how to prevent cyberbullying[73]. As part of this program, for example, the elderly also received tablets and were trained in its use[74].

All these courses were **taught by students** from public universities, specially trained for this purpose[75], who received scholarships as compensation.

As of December 2019, this plan has trained 370,000 citizens in 170 cities[76]

Challenges, Risks and Mitigation

One crucial aspect to consider when implementing the digital literacy program is the existing IT infrastructure that supports how successful a program such as this can be. Specifically, in the case of Argentina, the central government has instituted what is known as the “Connectivity national plan”. The plan projected a significant increase in optical fiber coverage, where ARSAT (the telecommunications public firm) carried out this work. The impact of this plan was an increase from 5,000 to 28,000 km of optical fiber across the country, raising the average speed from 5 to 20 MB/per second (in 2015-2019). Talking about the risks related with this tool, for a successful and last-longing technological adoption, the subnational government also needs to establish stable teams in charge (or teams that make a successful knowledge transfer to their successors), that solve the problems that could arise in the future with these systems. Besides, these teams need the political support for changing the current services configuration. Then, trial and measure all these changes, modifying them according to the citizen's needs. This is an important precondition to enable a digital literacy program.

[72] Direccion de Gobierno Abierto (2019)
[73] Argentina.gob.ar (2018)
[74] Argentina.gob.ar (2017b)
[75] Argentina.gob.ar (2017a)
[76] Argentina.gob.ar (2019)

CONCLUDING REMARKS

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Challenges Meet Solutions[77]

The toolkit was created on a set of guiding principles to serve as an integral part of the government ecosystem digitalization process to improve the generation, exchange, analysis, collection and presentation of digital content, for the best use of information and communication technologies (ICTs) for public value.

These guiding principles included but were not limited to data openness, transparency and inclusiveness with a key focus on data privacy and security. The process delved into the engagement and participation of a diversity of stakeholders in policy making and service delivery circles; whose leadership and political commitment played a pivotal role in the creation of a data driven culture in the delivery of the public sector's coherent use of digital technology across the policy spectrum. This enabled an effective and organized governance coordination framework for countries in the process of implementing their digitalization agenda.

The team aimed at developing a collection of case examples with a citizen driven focus for the sharing of experiences between countries to strengthen international cooperation with other governments on the digitization process.

These cases focused on solutions for three overarching challenges faced by the subnational governments. These were as follows: (1) lack of resources, (2) technical know-how, and (3) change management. Within these, it is important for countries to first understand the extent to which these challenges exist and second, determine how different tools and resources can be implemented and utilized to successfully improve public service delivery through digital government at the subnational level.

The above selected best practice examples highlight the tools, challenges, pre-considerations, and other key insights which governments, recognized as global leaders in their digital transformation efforts, have considered when improving the efficiency and effectiveness of ICT at the subnational levels within their respective countries. The insights gained from this research have allowed us to determine how these tools have been used to overcome the aforementioned challenges and the lessons for other countries.

The **lack of resources** ranges from *budgetary limitations*, *limitations of human resources and capability*, and the ability for these resources to foster *economies of scale*. Within the

[77] OECD (2014)

UK, the Local Digital Fund is a prime example of how centrally earmarked-funds can support digital projects at the local level, further demonstrating accessibility for local government entities to apply for and access funding. Within Argentina, the National Plan for Digital Inclusion demonstrates how to foster capacity building by involving and training everyday citizens.

Technical know-how considers interoperability and accessibility/equity. Specifically, as is the case with Spain, Netherlands, and the UK, governments have improved the gap between technology and government through various web-based service platforms such as the e-Procurement Platform, gov.UK platform, and other co-development strategies in each of these countries, respectively.

Change management considers the vital importance of cooperation from both local level public administrators and citizens in adopting new practices. This can be demonstrated through examples namely the Electronic Administration Sectoral Commission in Spain, the Local Digital Declaration in the UK, and the Open Standards in Canada.

Recommendations to Central Governments[78]

With the move towards digitalization in an integrated government ecosystem there needs to be a change in the way the government in implementing countries works so as to ensure they have the required skills to use new digital tools, to be able to work in a collaborative manner and engage with different stakeholders. This will entail updating and where necessary creating relevant legal, regulatory and governance structures and frameworks.

The recommendations will delve into the effective implementation of the five tools provided in the toolkit.

Governance

Governments in implementing countries should develop a governance framework which supports the creation of interoperable and resilient digital government infrastructure with a key focus on digital development roles, offices, and ministries at all levels of the government. These ministries and offices need to be designed such that they have a clear mandate which allows for coordination and collaboration and facilitates engagement within relevant agencies to pursue the digital agenda. Additionally, systems need to be instituted that encourage an environment that avoids power dynamics and provides resources and a system to monitor the working, allowing for accountability within the system.

[78] OECD (2014)

Financial
Implementing governments should invest in the development of digital enablers through designated centrally earmarked-funds to support and improve ICT development at the local level providing incentives for the concurrent use by concerned stakeholders across the different sectors.

Regulatory
Governments in implementing countries should facilitate the development of digital government legislation to enable technology adoption. This legislation should indicate a clear vision, purpose, and strategy with expected outcomes, outputs and impacts that are transparent, open and inclusive of government processes. The legislation should be developed in consultation to stakeholders from both the private and public domain and take steps to address digital divides and digital exclusions.

With cyber security becoming an important concern, regulatory frameworks need to safeguard the security and privacy of their citizens by updating current citizen digital rights laws in line with best case examples. This would allow for increased trust between implementing stakeholders and those that are on the receiving end.

Technology
Implementing governments need to ensure and establish open government data strategies that clearly define metrics and technical standards and engage in public-private partnerships with clear outcomes and outputs to manage the digitalization value chain effectively to enable value creation.

Additionally, governments moving towards the digitization process need to both assess their existing assets and procure technologies that best serve the modernization agenda, specifically investing efforts to develop IT infrastructure and platforms that are compatible and interoperable with existing systems in the environment.

Other
In addition to the above, governments can go the extra mile in public service delivery by planning for digital literacy and by engaging in a citizen-approach to government. In particular, governments should institute a culture of sharing, testing and evaluating prototypes and pilots in collaboration with relevant stakeholders with a primary focus on expected end-users to allow for the adjustment and scaling of projects. This would allow for the incentivization of public engagement in policy making, data value creation, design

and delivery. Additionally, governments should support human capacity by implementing digital literacy programs for citizens and public administrators.

One of the fundamental takeaways from the research is to underscore the importance of governments shifting towards a **citizen-driven approach** rather than a citizen-centric approach. In other words, governments should shift gears by encouraging citizens and businesses to work in partnership with them to identify their own needs and solutions rather than determine their own.

REFERENCES

REFERENCES

- Agencia Estatal Boletin Oficial del Estado (2010). Real Decreto 4/2010, de 8 de enero, por el que se regula el Esquema Nacional de Interoperabilidad en el ámbito de la Administración Electrónica. *Gobierno de Espana - Agencia Estatal Boletín Oficial del Estado*. Retrieved from: https://www.boe.es/buscar/doc.php?id=BOE-A-2010-1331
- Agencia Estatal Boletin Oficial del Estado (2014). Real Decreto 806/2014, de 19 de septiembre, sobre organización e instrumentos operativos de las tecnologías de la información y las comunicaciones en la Administración General del Estado y sus Organismos Públicos. *Gobierno de Espana - Agencia Estatal Boletín Oficial del Estado*. Retrieved from: https://www.boe.es/eli/es/rd/2014/09/19/806
- Agencia Estatal Boletin Oficial del Estado (2015a). Ley 40/2015, de 1 de octubre, de Régimen Jurídico del Sector Público. *Gobierno de Espana - Agencia Estatal Boletín Oficial del Estado*. Retrieved from: https://www.boe.es/buscar/act.php?id=BOE-A-2015-10566
- Agencia Estatal Boletin Oficial del Estado (2015b). Ley 39/2015, de 1 de octubre, del Procedimiento Administrativo Común de las Administraciones Públicas. *Gobierno de Espana - Agencia Estatal Boletín Oficial del Estado*. Retrieved from: https://www.boe.es/buscar/act.php?id=BOE-A-2015-10565
- Argentina.gob.ar (2017a). Chicos de todo el país se capacitaron para ser alfabetizadores digitales. *Argentina.gob.ar, March 22th 2017*. Retrieved from: https://www.argentina.gob.ar/noticias/chicos-de-todo-el-pais-se-capacitaron-para-ser-alfabetizadores-digitales
- Argentina.gob.ar (2017b). Estamos capacitando a los adultos mayores que reciben sus tablets +SIMPLE. *Argentina.gob.ar, December 4th 2017*. Retrieved from: https://www.argentina.gob.ar/node/183596/noticias
- Argentina.gob.ar (2018). Noticias Plan Nacional de Inclusión Digital 2015-2019. *Argentina.gob.ar*. Retrieved from: https://www.argentina.gob.ar/node/183596/noticias
- Argentina.gob.ar (2019). Plan Nacional de Inclusión Digital. *Argentina.gob.ar*. Retrieved from: https://www.argentina.gob.ar/jefatura/innovacion-publica/inclusiondigital
- Association of Netherlands Municipalities (2018). Local Government in the Netherlands. Retrieved from: https://www.publieksdiensten.nl/wp-content/uploads/2018/04/DENMARK-4-Local-Government-in-the-Netherlands.pdf
- Business.gov.nl (2020). Standard Business Reporting (SBR). *Business.gov.nl*. Retrieved from: https://business.gov.nl/regulation/standard-business-reporting/

- Capgemini (2019). eGovernment Benchmark 2019. *Capgemini, October 21st 2019*. Retrieved from: https://www.capgemini.com/us-en/resources/egovernment-benchmark-2019/
- Central Intelligence Agency (2020). The World Factbook 2020. Washington, DC: Central
- Intelligence Agency. Retrieved from: https://www.cia.gov/library/publications/the-world-factbook/geos/uk.html
- Clark, D. (2019). United Kingdom (UK) population in 2018, by age group. *Statista, September 26th, 2019*. Retrieved from: https://www.statista.com/statistics/281174/uk-population-by-age/
- Commonwealth Local Government Forum (2018). *The Local Government System in Canada*. Commonwealth Local Government Forum. Retrieved from: http://www.clgf.org.uk/default/assets/File/Country_profiles/Canada.pdf
- Cozens, S. (2020). Adopting the Local Digital Declaration. *LocalGov, February 5th, 2020*. Retrieved from: https://www.localgov.co.uk/Adopting-the-Local-Digital-Declaration/49945
- Cunnington, K. (2018). The Government Transformation Strategy - one year on. *Government Digital Service, February 8th 2018*. Retrieved from: https://gds.blog.gov.uk/2019/02/20/gds-academy-turns-5-and-celebrates-training-10000-students/
- Cunnington, K. (2019a). GDS Academy turns 5 and celebrates training 10,000 students. *Government Digital Service, February 20th 2019*. Retrieved from: https://gds.blog.gov.uk/2019/02/20/gds-academy-turns-5-and-celebrates-training-10000-students/
- Cunnington, K. (2019b). How GDS is transforming services and building digital capability across the public sector. *Open Access Government, August 27th 2019*. Retrieved from: https://www.openaccessgovernment.org/gds-digital-capability-public-sector/67123/
- Deloitte (2015a). *Digital Government Transformation: The Journey to Government's Digital Transformation*. Deloitte Digital. Retrieved from: https://www2.deloitte.com/global/en/pages/public-sector/articles/digital-government-transformation.html
- Deloitte (2015b). *Digital Government Transformation: Canada Survey Data Analysis Public Sector Research Group*. Deloitte Digital. Retrieved from: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/gx-deloitte-digital-government-transformation-canada.pdf
- Department for Digital, Culture, Media & Sport (2015). 2010 to 2015 government policy: broadband investment. *Department for Digital, Culture, Media & Sport, May 8th 2015*. Retrieved from: https://www.gov.uk/government/publications/2010-

to-2015-government-policy-broadband-investment/2010-to-2015-government-policy-broadband-investment

- Digidentity (2020). Learn more about us. *Digidentity*. Retrieved from: https://www.digidentity.eu/en/home/#about
- Digital Government (2018a). *Digital inclusion: Everyone must be able to participate*. Retrieved from: https://www.nldigitalgovernment.nl/wp-content/uploads/sites/11/2019/02/digital-inclusion-everyone-must-be-able-to-participate.pdf
- Digital Government (2018b). *Base registers and system standards. Digital Government*. Retrieved from: https://www.nldigitalgovernment.nl/wp-content/uploads/sites/11/2019/02/digital-inclusion-everyone-must-be-able-to-participate.pdf
- Digital Government (2019a). Data Agenda Government. *Digital Government, April 12th 2019*. Retrieved from: https://www.nldigitalgovernment.nl/document/data-agenda-government/
- Digital Government (2019b). NL Digibeter 2019. *Digital Government*. Retrieved from: https://www.digitaleoverheid.nl/nl-digibeter2019/
- Digital Government (2020a). Home. *Digital Government*. Retrieved from: https://www.digitaleoverheid.nl/
- Digital Government (2020b). DigiD. *Digital Government*. Retrieved from: https://www.nldigitalgovernment.nl/dossiers/digid/
- Digital Government (2020c). Legislation. *Digital Government*. Retrieved from: https://www.nldigitalgovernment.nl/dossiers/legislation/
- Digital Office (2020). Digital Services. *Scottish Local Government - Digital Office*. Retrieved from: https://telecare.digitaloffice.scot/?slug=digital-telecare
- Digital People (2019). Making the Digital, Data and Technology Capability Framework more user friendly. *Digital People, October 24th 2019*. Retrieved from: https://digitalpeople.blog.gov.uk/2019/10/24/making-the-digital-data-and-technology-capability-framework-more-user-friendly/
- Digital Telecare (2020). Welcome to the Digital Telecare Playbook. *Scottish Local Government - Digital Telecare*. Retrieved from: https://telecare.digitaloffice.scot/?slug=digital-telecare
- Direccion de Gobierno Abierto (2019). *Argentina Abierta: Mapa federal de políticas públicas sobre Gobierno Abierto*. Retrieved from: https://www.argentina.gob.ar/sites/default/files/argentina_abierta_-_edicion_digital.pdf
- Duggin, A. (2018). Creating the UK government's accessibility empathy lab. *Government Digital Service, June 20th 2018*. Retrieved from:

https://gds.blog.gov.uk/2018/06/20/creating-the-uk-governments-accessibility-empathy-lab/

- EIP-SCC (2020). Rotterdam's Digital Twin Redefines Our Physical, Digital, & Social Worlds. *EIP-SCC, January 16th 2019*. Retrieved from: https://eu-smartcities.eu/news/rotterdams-digital-twin-redefines-our-physical-digital-social-worlds
- ESPRESSO (2020). systEmic Standardisation apPRoach to Empower Smart citieS and cOmmunities. *ESPRESSO*. Retrieved from: http://espresso-project.eu/
- European Commission (2016). *Public procurement – Study on administrative capacity in the EU Spain: Country Profile*. Retrieved from: https://ec.europa.eu/regional_policy/sources/policy/how/improving-investment/public-procurement/study/country_profile/es.pdf
- European Commission (2016). Innovation Union. *European Commission*. Retrieved from: https://ec.europa.eu/info/research-and-innovation/strategy/goals-research-and-innovation-policy/innovation-union_en
- European Commission (2019a). European eGovernment Action Plan 2016-2020. *European Commission, August 20th 2019*. Retrieved from: https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020
- European Commission (2019b). *eGovernment Benchmark 2019*. Retrieved from: https://www.capgemini.com/us-en/wp-content/uploads/sites/4/2019/10/The-European-Commission-eGovernment-Benchmark-2019.pdf
- European Commission (2019c). Internal Market, Industry, Entrepreneurship and SMEs. *European Commission*. Retrieved from: https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en
- European Commission (2020a). Horizon 2020. *European Commission - Funding programmes*. Retrieved from: https://ec.europa.eu/programmes/horizon2020/en
- European Commission (2020b). Horizon Europe - the next research and innovation framework programme. *European Commission*. Retrieved from: https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en
- European Commission (2020c). Spain. Population: Demographic Situation, Languages and Religions. *European Commission, March 9th 2020*. Retrieved from: https://eacea.ec.europa.eu/national-policies/eurydice/content/population-demographic-situation-languages-and-religions-79_en
- European Union (2020). Spain: Overview. *European Union*. Retrieved from: https://europa.eu/european-union/about-eu/countries/member-countries/spain_en

- Experian (2020). Home. *Experian*. Retrieved from: https://www.experian.co.uk/identity-and-fraud/govuk-verify/
- Federacion Espanola de Municipios y Provincias (2009). Quienes somos. *Federacion Espanola de Municipios y Provincias*. Retrieved from: http://femp.femp.es/Portal/Front/ContenidoDetalle/_y3BL5bs6mAoqwWxabKxMrfIKwkoKhB7s
- Federation of Canadian Municipalities (2020). About FCM. *Federation of Canadian Municipalities*. Retrieved from: https://fcm.ca/en/about-fcm
- Galbraith, K. & Dubois, P. (2020). How we implemented Notify on Canada.ca. *Canadian Digital Service, March 5th 2020*. Retrieved from: https://digital.canada.ca/2020/03/05/how-we-implemented-notify-on-canada-ca/
- GOV.UK (2017). Government Transformation Strategy 2017 to 2020. *GOV.UK, February 9th 2017*. Retrieved from: https://www.gov.uk/government/publications/government-transformation-strategy-2017-to-2020
- GOV.UK (2019). National Cyber Security Strategy 2016 to 2021: progress so far. *GOV.UK, May 31th 2019*. Retrieved from: https://www.gov.uk/government/publications/national-cyber-security-strategy-2016-to-2021-progress-so-far
- GOV.UK (2020a). Digital, Data and Technology Profession. *GOV.UK*. Retrieved from: https://www.gov.uk/government/organisations/digital-data-and-technology-profession
- GOV.UK (2020b). Ministry of Housing, Communities & Local Government. *GOV.UK*. Retrieved from: https://www.gov.uk/government/organisations/ministry-of-housing-communities-and-local-government
- GOV.UK (2020c). Government Digital Service. *GOV.UK*. Retrieved from: https://www.gov.uk/government/organisations/government-digital-service
- GOV.UK (2020d). Local Digital Fund: prospectus 2019 to 2020. *GOV.UK*. Retrieved from: https://www.gov.uk/government/publications/local-digital-fund-prospectus-2019-to-2020
- GOV.UK (2020e). How government works. *GOV.UK*. Retrieved from: https://www.gov.uk/government/how-government-works
- GOV.UK Digital Marketplace (2020). Digital Marketplace. *GOV.UK Digital Marketplace*. Retrieved from: https://www.digitalmarketplace.service.gov.uk/
- GOV.UK Notify (2020a). Send emails, text messages and letters to your users. *GOV.UK - Notify*. Retrieved from: https://www.notifications.service.gov.uk/
- GOV.UK Notify (2020b). Emails. *GOV.UK - Notify*. Retrieved from: https://www.notifications.service.gov.uk/features/email

- GOV.UK Notify (2020c). Text messages. *GOV.UK - Notify*. Retrieved from: https://www.notifications.service.gov.uk/features/sms
- GOV.UK Notify (2020d). Letters. *GOV.UK - Notify*. Retrieved from: https://www.notifications.service.gov.uk/features/letters
- GOV.UK Pay (2020). Take online payments from your users. *GOV.UK - Pay*. Retrieved from: https://www.payments.service.gov.uk/
- GOV.UK Platform as a Service (2020). Build your government service with data you can trust. *GOV.UK - Platform as a Service*. Retrieved from: https://www.cloud.service.gov.uk/
- GOV.UK Registers (2020a). Build your government service with data you can trust. *GOV.UK - Registers*. Retrieved from: https://www.registers.service.gov.uk/
- GOV.UK Registers (2020b). Government registers collection. *GOV.UK - Registers*. Retrieved from: https://www.registers.service.gov.uk/registers?show_by=organisation
- GOV.UK Service Manual (2019). Service Standard. *GOV.UK Service Manual*. Retrieved from: https://www.gov.uk/service-manual/service-standard
- GOV.UK Service Manual (2020). Working with open standards. *GOV.UK Service Manual*. Retrieved from:https://www.gov.uk/service-manual/technology/working-with-open-standards
- Government Digital Service (2019). *Communications Strategy 2018/19*. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/742686/GDS_communications_strategy_2018_to_2019.pdf
- Government Digital Service (2020). GOV.UK Verify overview. *GOV.UK, March 25th 2020.* Retrieved from: https://www.gov.uk/government/publications/introducing-govuk-verify/introducing-govuk-verify
- Government of Alberta (2020). Notices, court filings and appeals. *Government of Alberta - Legal procedures and assistance*. Retrieved from: https://www.alberta.ca/notices-court-filings-appeals.aspx
- Government of British Columbia (2018). BC Services Card. *Government of British Columbia - Government ID*. Retrieved from: https://www2.gov.bc.ca/gov/content/governments/government-id/bc-services-card
- Government of British Columbia (2019). Local Government Grants & Transfers. *Government of British Columbia - Local Governments*. Retrieved from: https://www2.gov.bc.ca/gov/content/governments/local-governments/grants-transfers

- Government of Canada (2017). Government. *Government of Canada*. Retrieved from: https://www.canada.ca/en/immigration-refugees-citizenship/services/new-immigrants/learn-about-canada/governement.html
- Government of Canada (2018). Government of Canada Cloud Adoption Strategy: 2018 update. *Government of Canada - Treasury Board of Canada Secretariat*. Retrieved from: https://www.canada.ca/en/government/system/digital-government/modern-emerging-technologies/cloud-services/government-canada-cloud-adoption-strategy.html
- Government of Canada (2019). Canada's Digital Charter in Action: A Plan by Canadians, for Canadians. *Government of Canada - Ministry of Innovation, Science and Economic Development*. Retrieved from: https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00109.html
- Government of Canada (2020). National Digital and Data Consultations - Results. *Government of Canada - Ministry of Innovation, Science and Economic Development*. Retrieved from: https://www.ic.gc.ca/eic/site/084.nsf/eng/h_00043.html
- Government of Ontario (2019). Contributing to the standard. *Government of Ontario - Digital Service Standard*. Retrieved from: https://www.ontario.ca/page/digital-service-standard#section-16
- Government of Ontario (2020). Ontario's Open Data Directive, 2019. *Government of Ontario*. Retrieved from: https://www.ontario.ca/page/ontarios-open-data-directive
- Henke, A. (2019). Using persona profiles to test accessibility. *Accessibility in government, February 11th 2019.* Retrieved from: https://accessibility.blog.gov.uk/2019/02/11/using-persona-profiles-to-test-accessibility/
- House of Commons Canada (2000). The Canadian System of Government. *House of Commons Canada*. Retrieved from: https://www.ourcommons.ca/marleaumontpetit/DocumentViewer.aspx?Sec=Ch01&Seq=2
- INDEC (2019). *Acceso y uso de tecnologías de la información y la comunicación. EPH: Cuarto trimestre de 2018*. Buenos Aires: Instituto Nacional de Estadística y Censos. Retrieved from: https://www.indec.gob.ar/uploads/informesdeprensa/mautic_05_19CF6C49F37A.pdf
- Index Mundi (2018). *Netherlands - Urban population (indicator)*. Retrieved from: https://www.indexmundi.com/facts/netherlands/indicator/SP.URB.TOTL.IN.ZS
- International Monetary Fund (2019). *IMF's Fiscal Decentralization Dataset, 2019*. Washington D.C.: International Monetary Fund.

- Inter-American Development Bank (2018). *Wait No More: Citizens, Red Tape, and Digital Government. Washington, D.C.*: Inter-American Development Bank.
- Inter-American Development Bank (2019a). Key facts. *Inter-American Development Bank, December 15th 2019*. Retrieved from https://www.iadb.org/en/about-us/key-facts
- Inter-American Development Bank (2019b). Institutions for the Development Sector. *Inter-American Development Bank, December 15th 2019*. Retrieved from https://www.iadb.org/en/about-us/departments/ifd
- Inter-American Development Bank (2019c). Gobernarte. *Inter-American Development Bank*. Retrieved from: https://www.iadb.org/es/concursogobernarte
- ISA (2016). *eGovernment in Spain*. Brussels: European Union. Retrieved from: https://joinup.ec.europa.eu/sites/default/files/inline-files/eGovernment%20in%20Spain%20-%20February%202016%20-%2018_0_4_00.pdf
- ISA (2019). *Digital Government Factsheet 2019: Spain*. Brussels: European Union. Retrieved from: https://administracionelectronica.gob.es/pae_Home/dam/jcr:06d9f785-a317-4bef-999d-7b71a0ae8bcd/Digital_Government_Factsheets_Spain_2019_1.pdf
- Jimenez, J. (2017). The Modernisation of Argentina's Public Administration. *Centre for Public Impact, September 5th 2017.* Retrieved from: https://www.centreforpublicimpact.org/case-study/modernisation-argentinas-public-administration/
- Johnson, J. (2020a). Internet usage in the United Kingdom (UK) - Statistics & Facts. *Statista, February 10th, 2020*. Retrieved from: https://www.statista.com/topics/3246/internet-usage-in-the-uk/
- Johnson, J. (2020b). UK: active social media users 2020. *Statista, March 3rd, 2020*. Retrieved from: https://www.statista.com/statistics/507405/uk-active-social-media-and-mobile-social-media-users/
- Kemp, S. (2020). Digital 2020: The Netherlands. *DataReportal, February 18th 2020*. Retrieved from: https://datareportal.com/reports/digital-2020-the-netherlands
- Local Government Association (2014). *Transforming local public services using technology and digital tools and approaches*. Retrieved from: https://www.local.gov.uk/sites/default/files/documents/transforming-public-servi-80e.pdf
- Local Government Association (2020). *Case studies*. Retrieved from: https://www.local.gov.uk/case-studies
- Logius (2010). English: About Logius. *Logius*. Retrieved from: https://www.logius.nl/english

- MHCLG Digital (2019). Selecting the first Local Digital Fund projects. *MHCLG Digital, December 7th 2018.* Retrieved from: https://mhclgdigital.blog.gov.uk/2018/12/07/selecting-the-first-local-digital-fund-projects/
- Ministerio de Hacienda (2020). Plataforma de contratacion del sector publico. *Gobierno de Espana - Ministerio de Hacienda*. Retrieved from: https://contrataciondelestado.es/wps/portal/plataforma
- Ministry of Housing, Communities and Local Government (2018a). Local Digital Fund training offer. *UK Ministry of Housing, Communities and Local Government (MHCLG)*. Retrieved from: https://localdigital.gov.uk/training-offer-for-local-digital-fund/
- Ministry of Housing, Communities and Local Government (2018b). The Local Digital Declaration: A common aspiration for the future of local public service. *UK Ministry of Housing, Communities and Local Government (MHCLG)*. Retrieved from: https://localdigital.gov.uk/wp-content/uploads/2019/05/Local-Digital-Declaration-July-2018.pdf
- Ministry of Housing, Communities and Local Government (2018c). What is the Declaration? *UK Ministry of Housing, Communities and Local Government (MHCLG)*. Retrieved from: https://localdigital.gov.uk/what-is-the-declaration/
- Ministry of Housing, Communities and Local Government (2018d). Local Digital. *UK Ministry of Housing, Communities and Local Government (MHCLG)*. Retrieved from: https://localdigital.gov.uk/
- Ministry of Housing, Communities and Local Government (2018e). Declaration projects. *UK Ministry of Housing, Communities and Local Government (MHCLG)*. Retrieved from: https://localdigital.gov.uk/commitments/
- Ministry of Housing, Communities and Local Government (2020). Local Digital Fund Prospectus - 2019/20. *UK Ministry of Housing, Communities and Local Government (MHCLG)*. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/860775/Round_4_prospectus_-__Local_Digital_Fund.pdf
- National Literacy Trust (2012). Adult literacy. *National Literacy Trust*. Retrieved from: https://literacytrust.org.uk/parents-and-families/adult-literacy/
- Nederland Digitaal (2018). Dutch Digitalisation Strategy 2.0 published. *Nederland Digitaal*. Retrieved from: https://www.nederlanddigitaal.nl/english/dutch-digitalisation-strategy-2.0
- NORA (2020). NORA online. *NORA*. Retrieved from: https://www.noraonline.nl/wiki/NORA_online
- O'Dea, S. (2019). Active mobile subscribers in the United Kingdom (UK) 2007-2018. *Statista, October 17th, 2019*. Retrieved from:

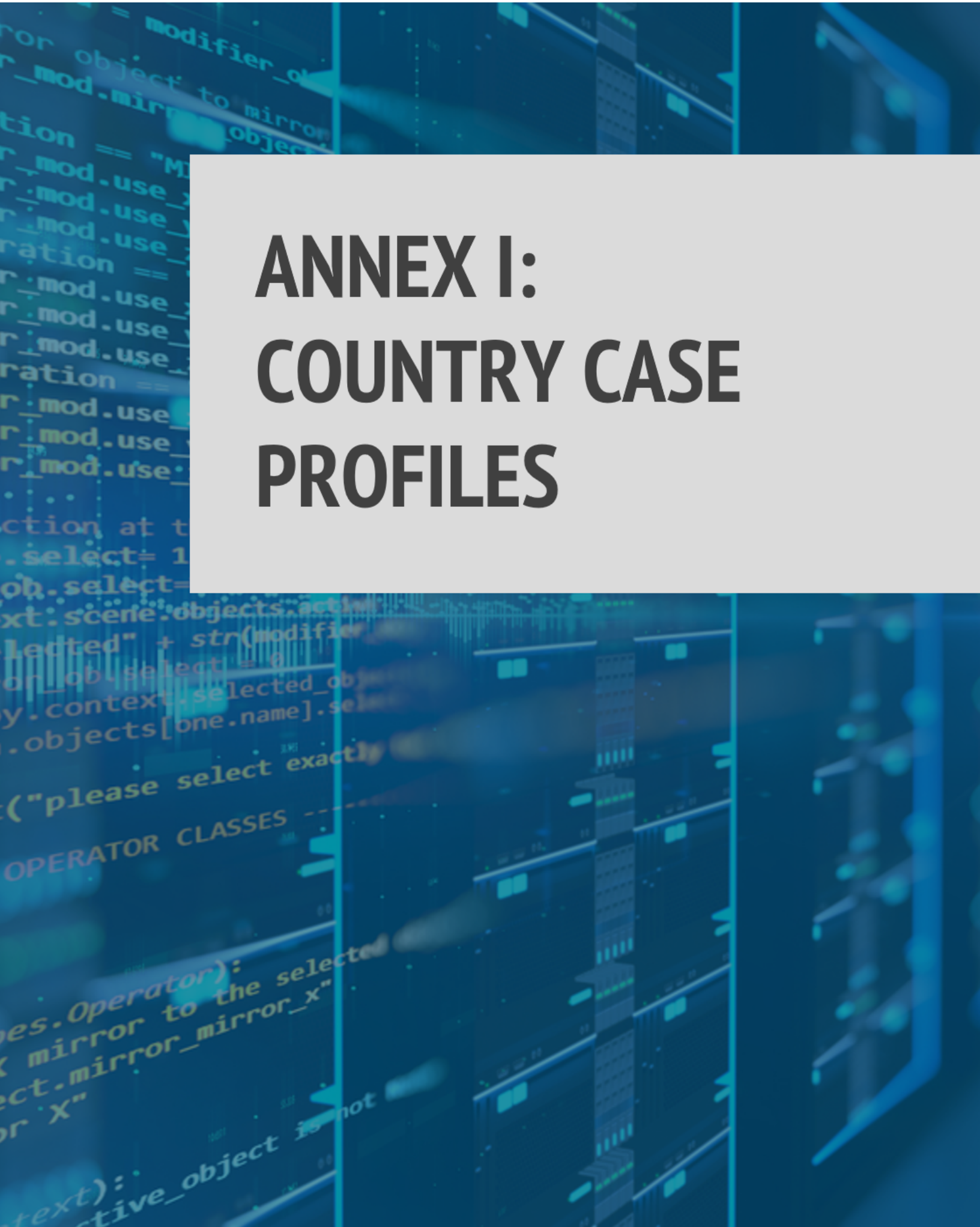
https://www.statista.com/statistics/271586/active-mobile-subscribers-in-the-united-kingdom-uk/

- O'Dea, S. (2020). Forecast of smartphone user numbers in the United Kingdom (UK) 2018-2024. *Statista, April 1st, 2020*. Retrieved from: https://www.statista.com/statistics/553464/predicted-number-of-smartphone-users-in-the-united-kingdom-uk/
- O'Halloran, L. & Reidy, J. (2019). Helping local government Chief Digital Officers make the most of the Local Digital Declaration. *MHCLG Digital, March 19th 2019.* Retrieved from: https://mhclgdigital.blog.gov.uk/2019/03/19/helping-local-government-chief-digital-officers-make-the-most-of-the-local-digital-declaration/
- OECD (2014). *Recommendation of the Council on Digital Government Strategies*. Paris: OECD Publishing. Retrieved from: https://www.oecd.org/gov/digital-government/Recommendation-digital-government-strategies.pdf
- OECD (2016). *Argentina: Federal Country*. Paris: OECD Publishing. Retrieved from: https://www.oecd.org/regional/regional-policy/profile-Argentina.pdf
- OECD (2019). *Digital Government Review of Argentina: Accelerating the Digitalization of the Public Sector*. Paris: OECD Publishing.
- OECD (2020). *Income inequality (indicator)*. Paris: OECD Publishing. Retrieved from: doi.org/10.1787/459aa7f1-en
- Ofcom (2014). *The European Broadband Scorecard*. Retrieved from: https://www.ofcom.org.uk/__data/assets/pdf_file/0022/77062/european_broadband_scorecard_2014.pdf
- Parliament of Canada (2016). Powers of the National and Provincial Governments. *Parliament of Canada*. Retrieved from: https://lop.parl.ca/about/parliament/senatoreugeneforsey/book/chapter_3-e.html
- Post Office (2020). *Home*. Post Office. Retrieved from: https://www.postoffice.co.uk/
- Portal Argentino (2010). República Argentina: Provincias y Municipios. *Portal Argentino*. Retrieved from https://web.archive.org/web/20060813185002/http://portalargentino.net/municipios.htm
- Portal de Administracion Electronica (2015a). Sectoral commission E-government. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/pae_Home/en/pae_Organizacion/ambito-nacional/comision-sectorial.html?urlMagnolia=/pae_Home/pae_Organizacion/ambito-nacional/comite-sectorial.html=0=eu&idioma=en

- Portal de Administracion Electronica (2015b). Esquema Nacional de Interoperabilidad - ENI. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/pae_Home/pae_Estrategias/pae_Interoperabilidad_Inicio/pae_Esquema_Nacional_de_Interoperabilidad.html#.XpMeaJkpA2w
- Portal de Administracion Electronica (2017). Normas Tecnicas de Interoperabilidad. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/pae_Home/pae_Estrategias/pae_Interoperabilidad_Inicio/pae_Normas_tecnicas_de_interoperabilidad.html#.XqCCAJkpA2w
- Portal de Administracion Electronica (2018a). Interoperabilidad. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/pae_Home/pae_Estrategias/pae_Interoperabilidad_Inicio.html#.XqBb9ZkpA2w
- Portal de Administracion Electronica (2018b). Informe IRIA. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/pae_Home/pae_OBSAE/pae_Informes/pae_InformeIRIA/pae_InfDescripcion.html
- Portal de Administracion Electronica (2018c). Servicio de Verificación y Consulta de Datos: Plataforma de Intermediacion. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/ctt/svd
- Portal de Administracion Electronica (2018d). Red SARA. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/ctt/redsara#.XpMqQZkpA2w
- Portal de Administracion Electronica (2020a). Home. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/pae_Home
- Portal de Administracion Electronica (2020b). Identidad y firma electronica. *Gobierno de Espana - Portal de Administracion Electronica*. Retrieved from: https://administracionelectronica.gob.es/pae_Home/pae_Estrategias/pae_Identidad_y_firmaelectronica.htm
- Presidencia de Gobierno (2020). Spanish Institutions. *Gobierno de Espana - Presidencia de Gobierno*. Retrieved from: https://www.lamoncloa.gob.es/lang/en/espana/spanishinstitutions/Paginas/index.aspx

- Prime Minister's Strategy Unit (2005). *Connecting the UK: The Digital Strategy*. Retrieved from: https://core.ac.uk/reader/4155440
- RUGGEDISED (2020). Home. RUGGEDISED. Retrieved from: https://ruggedised.eu/home/
- Scotish Government (2019). Social security: benefit take-up strategy. *Scotish Government, October 21th 2019*. Retrieved from: https://www.gov.scot/publications/social-security-scotland-act-2019-benefit-take-up-strategy-october-2019/pages/2/
- Secretaría General de Administración Digital (2018). *Las tecnologías de la información y las comunicaciones en la administración local: informe IRIA 2018*. Retrieved from: https://administracionelectronica.gob.es/pae_Home/dam/jcr:4397c4e4-69a9-4e39-b9fa-78313e2632fe/Informe_IRIA_2018_acc.pdf
- SecureIdentity (2020). Home. *SecureIdentity*. Retrieved from: https://help.secureidentity.co.uk/hc/en-gb
- SEDIPUALB@ (2020). Home. SEDIPUALB@. Retrieved from: https://www.sedipualba.es/
- Simeon, R. (2002). *Federalism and Decentralization in Canada*. Paper presented at the Second International Conference on Decentralization, Manila. Retrieved from: http://www.forumfed.org/libdocs/Misc/20031213-ca-RichardSimeon.pdf
- Standard Business Reporting (2017). SBR International: Standard for digital exchange of business reports. *Standard Business Reporting*. Retrieved from: https://www.sbr-nl.nl/sbr-international
- Startup in Residence (2020). Startup in Residence: Bringing startups and governments Together. *Startup in Residence*. Retrieved from: https://startupinresidence.com/
- Statistics Canada (2017). Municipalities in Canada with the largest and fastest-growing populations between 2011 and 2016. *Statistics Canada - Analytical products, 2016 Census*. Retrieved from: https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016001/98-200-x2016001-eng.cfm
- Statistics Canada (2019).Census Profile, 2016 Census. *Statistics Canada - Census Program*. Retrieved from: https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016001/98-200-x2016001-eng.cfm
- The World Bank (2019). *World Development Indicators, December 2019*. Washington D.C.: The World Bank
- United Nations (2014). *Country classification*. World Economic Situation and Prospects - Statistical Annex. Retrieved from: https://www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf

- United Nations (2016). *United Nations E-Government Survey 2016*. New York: United Nations.
- United Nations (2018). *United Nations E-Government Survey 2018*. New York: United Nations.
- We Are Social (2020a). Digital 2020: Canada. *We are social*. Retrieved from: https://wearesocial.com/ca/digital-2020-canada/
- We Are Social (2020b). Digital 2020: Espana. *We are social*. Retrieved from: https://wearesocial.com/es/digital-2020-espana



ANNEX I: COUNTRY CASE PROFILES

I. ARGENTINA

Table of Rankings for Global Benchmarking:

Fiscal Decentralization: Percentage of the General Government Expenditure executed by Subnational Government (OECD, 2018)[79]	44.7
E-Government Development Index (EGDI)* (UN, 2018)[80]	0.73

*The EGDI, which ranges from 0 to 1, "measures countries' use of information and communications technologies to deliver public services. The Index captures the scope and quality of online services, status of telecommunication infrastructure and existing human capacity."[81]

Political, Economic, Social Landscape:

I. Political:
Argentina is a federal republic, where its President —whose term lasts for four years, with the possibility of an immediate reelection for one more term— is head of state and head of government of the country. The administrative division of Argentina includes 3 levels:

- Central, called the "Federal Government", composed of three branches: Executive, Judicial, and Legislative.

- Twenty-three "Provincias" and one autonomous city, Buenos Aires: regional autonomous entities in the administrations responsible for all the subjects that they chose not to delegate to the federal government. They cannot contradict the Argentinian constitution, but each of the provinces has its own constitution, laws, legislature, and form of government, managing their own resources.

- Municipalities: autonomous local levels of the administration. According to the 2010 Census, there are 2,171 municipalities, with an average population of 17,173 inhabitants. They are run by elected mayors[82].

[79] OECD (2016)
[80] United Nations (2018)
[81] United Nations (2018)
[82] Portal Argentino (2010)

II. Socio-economic:

- Population Total (2018): 44.5 million[83]
- Population by age group (2018, % of Total population)
    - 0 to 14 years: 24.8%
    - 15 to 64 years: 64.1%
    - 65 years and above: 11.1%
- Urban population as a share of total population (in 2018): 91.9%
- GDP per capita, PPP (constant 2011 international $) (in 2018): 18,288
- GDP growth (annual % in constant local currency) (in 2018): -2.5%
- GDP per capita growth (annual % in constant local currency) (in 2018): -3.5%
- School enrollment, secondary (% net) (in 2017): 90.8%
- Unemployment, total (% of total labor force) (modeled ILO estimate) (in 2019): 10%
- Literacy rate, adult total (% of people ages 15 and above) (in 2018): 99%
- Literacy rate, adult female (% of females ages 15 and above) (in 2018): 99.1%
- Literacy rate, adult male (% of males ages 15 and above) (in 2018): 98.9%
- Account ownership at a financial institution (in 2018): 48.7%
- Income distribution, GINI Index (in 2017): 41.2
- Poverty headcount ratio at $5.50 a day (2011 PPP) (% of population in 2017): 7.7%

III. Adoption of ICT/Digital Readiness:

- Fixed broadband subscriptions (per 100 people, in 2018): 19.1%
- Access to electricity (% of population) (in 2017): 100%
- Individuals using the Internet (% of population, in 2017): 74.3%

IV. Country Analysis:

According to the previous characterization of Argentina, this country presents development indicators above the Latinamerican average: for example, in GDP per capita constant PPP[84] and in EGDI[85]. From these features could be implied a high readiness for the local government digital government in Argentina.

However, there are some nuances that should be also considered. First, Argentina has a significant level of income inequality[86], which is also reflected in the level of development across local governments. There are municipalities with a high level of technology applied to its citizen services —like Buenos Aires, Cordoba, and Santa Fe, while others do not have internet connection and offer all of its services in an analogous way. Specifically, in

[83] The World Bank (2019). *World Development Indicators, December 2019*. Washington D.C.: The World Bank. Please note that all mentioned statistics in this section (II. Socio-economic) and the subsequent section (III. Adoption of ICT/Digital readiness) come from this source.
[84] Where the GDP per capita, in constant PPP, was 14428 for Latin-American and the Caribbean in 2018.
[85] Where Argentina is the country with the third highest E-Governance Development in Latin-American and the Caribbean, in 2018.
[86] Where its GINI coefficient and poverty rate are the highest among our shortlisted countries, as well as the percentage of Fixed broadband subscriptions is the lowest.

2016, of the 717 municipalities with more than 5,000 inhabitants, 36% did not have a website[87].

This inequality also manifests in the different citizen's digital literacy levels observed across the country[88]. Moreover, the cost savings that the digital government could bring to Argentina are highly needed because of the last long-time economic crisis of this country, where its GDP per capita decreased in five of their last 10 years[89].

On the other hand, the political system of Argentina offers advantages and challenges for the digital government implementation at the local level. First, since the autonomy of provinces and municipalities allows their public policies to adapt to their own reality and their citizen needs. But, at the same time, this feature is a challenge for nationwide policies, since central government projects and laws should be ratified by the provinces —according to their own laws and authorities— before being applied there.

Digital Government Development:

I. Digital Transformation Strategy:

Government efforts to support digital government have been a relatively recent trend in Argentina. According to international organizations' assessments, prior to 2015, "central administrations did little to construct the necessary structures and systems to support the digital transformation[90]". However, President Mauricio Macri's administration (2015-2019) made digital transformation of the public sector a major priority. Specifically, this was done through the creation of the agency Ministry of Modernization (MoM) in 2015 which had a digital Jimenez, J. (2017)service team and the innovation lab known as the Government Lab of Argentina (LABGobAr)[91]. Under this agency, the administration mobilized the MoM to support digital transformation efforts through technologies and government-wide policies[92]. For example, within the MoM, a main objective was the modernization of processes for every department of the state through technology, digitization, and shift to a paperless system. This entailed the implementation of features such as electronic files and e-signatures, with the aim of facilitating administrative processes[93]. The president also established an Under-secretariat of Digital Government while the then MoM

[87] Direccion de Gobierno Abierto (2019)
[88] INDEC (2019)
[89] The World Bank (2019)
[90] OECD (2019), page 15.
[91] OECD (2019)
[92] OECD (2019)
[93] Jimenez, J. (2017)

continued to work in a central coordination role for the national government modernization framework[94].

Within the MoM and other areas of the federal government, the President recruited a team of experts across areas in digital policy, service design and implementation, public sector innovation and open data to push digital government efforts in Argentina particularly in the city of Buenos Aires[95]. The team of experts have been able to drive the digitization of public services, government operations, and a paperless government, allowing the completion and delivery of public service initiatives to be done in a short-time period[96]. In September 2018, the MoM was reorganized under the direction of the President. Consequently, it was renamed to the Government Secretariat of Modernization (Secretaria de Gobierno de Modernización, SGM) and moved to the Cabinet Office, an office at the center of the government led by the President's Chief of Staff.[97] Prior to this shift, the MoM was in a challenging situation given its responsibility for government-wide policy making, despite it operating in a non-central ministry. Once the SGM moved to the center of government, the agency was able to better achieve its mission and sustainability in their digital efforts[98]. This shift also allowed the new SGM to send a strong political message, driving the importance of digital transformation in the public sector.

II. Local/Municipal Transformations Present:

Subnational governments in Argentina generally have their own autonomy to develop and implement their own ICT policies and services[99]. However, given the different levels of government and varying agencies within these levels, there are differences in technologies and approaches which presents its own challenges such as limits in information sharing, cross-collaboration, and overall, in a structured, centralized system to achieve shared goals[100].

The SGM is able to coordinate with Argentina's 24 provinces by way of the Federal Council on Modernization and Innovation for the Public Administration (COFEMOD)[101]. This agency is the only coordination mechanism that exists between national and subnational governments however, any decisions made by the group are non-binding.

[94] OECD (2019)
[95] OECD (2019)
[96] OECD (2019)
[97] OECD (2019)
[98] OECD (2019)
[99] OECD (2019)
[100] OECD (2019)
[101] OECD (2019)

One example of an initiative enacted by the COFEMOD was the "Federal Commitment to Modernization"[102]. This commitment sought to oversee coordination between different levels of government for ICT and other objectives of the SGM. The commitment, signed in 2017 by 19 provinces and the city of Buenos Aires, delineates a set of agreed objectives surrounding how to modernize provinces including administrative modernization, open government and innovation, and technological infrastructure[103].

III. Development and Implementation of Tools:

As the 2015-2019 presidential administration focused efforts and priorities on digital government, the administration wanted to promote long term sustainability and provide clear policy goals through **Argentina's Digital Agenda[104],** a government-drafted document outlining guidance and priorities to accelerate the nation's digital agenda. This initiative, led by the Secretary of Digital Government and Innovation Technology within the then MoM, continues under the efforts of the SGM[105]. Furthermore, the agenda has been allocated to a steering committee, the Ministerial Council for Planning and Monitoring of the Digital Agenda Argentina. This committee brings together secretaries and other key officials from various ministries to ensure implementation of the agenda[106].

The objectives behind the agenda are to outline centralized government-wide guidance to push digital transformation efforts in Argentina, namely:

1. **The promotion of an open, transparent, citizen-centered government;** this includes "ensuring free and unrestricted access to information and knowledge and de-bureaucratization of the public sector with the goal to reduce costs and simplify processes."[107]
2. **"Transition to a data-driven public sector for decision making"[108]**
3. **Cybersecurity skills; "**build trust in digital environments, and collaborate across sectors to protect cyberspace"[109]
4. **Promoting Argentina's lead role in the digital world[110]**

Tools:

[102] OECD (2019)
[103] OECD (2019)
[104] OECD (2019)
[105] OECD (2019)
[106] OECD (2019)
[107] OECD (2019)
[108] OECD (2019)
[109] OECD (2019)
[110] OECD (2019)

Regulatory

TOOL 1: Presidential decrees established the "Digital country" plan

Argentina dictated, in 2016, a Presidential decree establishing the "Modernization of the State" and "Digital country" plans. Then, in 2018, another Presidential decree established the government organization for these Digital Government initiatives. These Presidential decrees involved the risk of not having a law status, which gives it lower stability, because it can be changed for a decree of the following president. Additionally, the presidential decree does not involve the consensus of the entire political spectrum, provinces, municipalities and the private sector. For this reason, there was no definition about issues like: use of the digital driver license database by the police in local governments, legal responsibility for public employees in document management, rules for government transition, resolution of environmental conflicts, among others.

TOOL 2: Cordoba Province: Administration Modernization law

The Cordoba Province dictated, in 2019, the Administration Modernization law which simplified public administration, regulated digitalization, digital identity, digital notification, interoperability, and electronic public hearings. This law involved the risk of not having the Political will of the Municipalities, since public policies and laws coming from higher levels of the Argentinian administrative division should be confirmed by provinces and municipalities.

Technology

TOOL 1: Central government’s "Digital Country" plan

Argentina’s central government "Digital Country" plan aimed to bring digital government services to the local governments; including, for example, the Electronic Documents Management System (GDE). This tool had the challenge of coordinating with all the local governments, and being able to understand and adapt to the different needs of their citizens. Also, these services still need to be transferred to the local governments; since they are using platforms and financial resources of the central government.

TOOL 2: Cordoba Province’s “Digital Citizen” platform

The Cordoba Province implemented the “Digital Citizen” platform that centralizes all the digital interactions between the citizen and the government. This tool involved the risk of rejection from public sector employees, who feared that their jobs were going to be replaced and the use of the shared information.

Infrastructure

TOOL 1: Central government's "Connectivity national plan"

Argentina's central government "Connectivity national plan" projected a significant increase in optical fiber coverage, where ARSAT (the telecommunications public firm) carried out this work. The impact of this plan was an increase from 5,000 to 28,000 km of optical fiber across the country, raising the average speed from 5 to 20 MB/per second (in 2015-2019). Talking about the risks related with this tool, for a successful and last-longing technological adoption, the subnational government also needs to establish stable teams in charge (or teams that make a successful knowledge transfer to their successors), that solve the problems that could arise in the future with these systems. Besides, these teams need the political support for changing the current services configuration. Then, trial and measure all these changes, modifying them according to the citizen's needs.

Governance

TOOL 1: The Federal Council on Modernization and Innovation for the Public Administration (COFEMOD)

The Federal Council on Modernization and Innovation for the Public Administration (COFEMOD), established in 2016, comes from the Federal Council of Public Function (COFEFUP) founded in 1992. This council aims to foster administrative simplification by digitizing internal and external administrative procedures to facilitate the government's relations with citizens, subnational governments and businesses. This council includes the Government Secretary of Modernization (SGM) and representatives of the provinces and the city of Buenos Aires. This tool involved the risk of inapplicability of their agreements, since their members come from the technical side of their governments, not having enough authority for executing the COFEMOD recommendations.

Reputational

TOOL 1: Non-monetary incentives

Non-monetary incentives could be important for positioning the digital government relevance, and also its advocates. The IDB contest "Gobernarte: el arte del buen gobierno

– Premio Eduardo Campos" was won by the Cordoba province government and its platform "Ciudadano Digital."[111]

Other

TOOL 1: Central government's "National Plan for Digital Inclusion"

The "National Plan for Digital Inclusion" trained citizens for using the Internet for their personal and professional development, through courses of digital literacy taught by university students. The elderly, for example, also received tablets and were trained in its use. The impact of this plan was its training reach: 370,000 citizens in 170 cities.

TOOL 2: Communication across sectors

The NGO Gov<code>School is trying to connect, for technological matters, the subnational governments with the private sector. This tool has the challenge of initiating the communication, currently absent, between these sectors in Argentina; which is important for technological and digital government initiatives.

[111] Inter-American Development Bank (2019c)

II. CANADA

Table of Rankings for Global Benchmarking:

Fiscal Decentralization: Percentage of the General Government Expenditure executed by Subnational Government (OECD, 2018)[112]	68
E-Government Development Index (EGDI)* (UN, 2018)[113]	0.8258

*The EGDI, which ranges from 0 to 1, "measures countries' use of information and communications technologies to deliver public services. The Index captures the scope and quality of online services, status of telecommunication infrastructure and existing human capacity."[114]

Political, Economic, Social Landscape:

I. Political:

Canada follows the British pattern of parliamentary democracy and a federal system that recognizes and accommodates linguistic, regional and cultural differences; and the development and implementation of public policy.

Canada has three levels of government - federal, provincial or territorial, and municipality (city).[115] The federal government deals with national and international matters. The provincial and territorial governments lead each province and territory with the power to change their laws and manage their own public lands; they are in charge of education, healthcare and road regulations. The municipal government is led by mayors who run cities, towns or districts and are responsible for community services, local law enforcement and public transportation among others.

At the federal and provincial governments, Canada follows a decentralized system but municipal governments follow a more centralized approach. This means that provincial governments have more autonomy as opposed to municipal governments which do not carry the same influence in shaping public policy[116].

Provincial governments have high 'political capacity' - strong citizen loyalties and identity; high jurisdictional capacity; high fiscal capacity; and high bureaucratic capacity to design

[112] International Monetary Fund (2019)
[113] United Nations (2018)
[114] United Nations (2018)
[115] Government of Canada (2017)
[116] Simeon, R. (2002)

and deliver public services. Local governments however are dependent on provincial governments for development, implementation and funding of public policy and service delivery. This system creates high levels of cooperation in specific areas of the public sector with considerable competition among local governments for political strength and public support.[117]

Canada has 5,162 municipalities according to the 2016 Census geographic boundaries. The three largest municipalities are Toronto, Montreal and Calgary, representing 7.8%, 4.8% and 3.5% respectively of the population. The 15 largest municipalities were the home of almost two in five Canadians. The majority of these municipalities are central municipalities of a census metropolitan area (CMA). A central municipality is defined as the municipality that lends its name to the corresponding CMA or census agglomeration (CA). All other municipalities within a CMA or a CA, except the central municipality, are called peripheral municipalities. For example, the second-largest municipality in Canada, Montréal, is the central municipality of the Montréal CMA. Other municipalities located within the Montréal CMA, such as Laval, are peripheral municipalities. Distinguishing central and peripheral municipalities is useful to assess some phenomena such as the urban spread.[118] The Federation of Canadian Municipalities (FCM) brings together more than 2,000 municipalities of all sizes, representing 90% of all Canadians, in an effort to increase coordination.[119]

II. Socio-economic:

- Population Total: 37.06 Million[120] / 81% urbanization[121]
- Population by age group[122]:
    - 0 to 14 years: 5, 839, 565
    - 15 to 64 years: 23, 376, 530
    - 65 years and over: 5, 935, 630
    - Note: Population aged 16 to 64: 65% / 24.5 million[123]
- Urban population as a share of total population: 81%[124]
- GDP per capita, PPP (constant 2011 international $): 44, 078[125]
- GDP growth (annual %): 1.9[126]

[117] Simeon, R. (2002)
[118] Statistics Canada (2017)
[119] Federation of Canadian Municipalities (2020)
[120] The World Bank (2019)
[121] We Are Social (2020a)
[122] Statistics Canada (2019)
[123] We Are Social (2020a)
[124] We Are Social (2020a)
[125] The World Bank (2019)
[126] The World Bank (2019)

- Median total income of households in 2015 (pre-tax): 70, 336[127]
- School enrollment, secondary (% net): 100[128]
- Unemployment, total (% of total labor force) (modeled ILO estimate): 6.1%[129]
- Literacy rate - adult male: 99%, adult female: 99%[130]
- Account ownership at a financial institution or with a mobile-money-service provider, secondary education or more (% of population ages 15+):99.87[131]
- Income distribution, GINI Coefficient: 31[132]

III. Adoption of ICT/Digital Readiness:

- Fixed broadband subscriptions (per100 people): 38.96[133]
- Access to electricity (% of population): 100[134]
- Number of mobile connections:[135] 36.23 million / 96% of total population
- Active Social media users: 25 million / 67% penetration[136]
- Internet Users: 35.32 million / 94% penetration[137]
- Internet users as a percentage of total population: 94%[138]
- Mobile network infrastructure: 80.43[139]

IV. Country Analysis:

Canada's federal system is fairly unique as power is devolved to the provincial or territorial government. At this level, power is often centralized for municipalities within these provinces or territories. This can create an unequal digitalization agenda. Moreover, as provinces and territories encompass vast geographic scopes, this can create inequalities within these regions as internet and service access may not be streamlined, potentially leaving pockets of communities, especially vulnerable populations, without services.

Canada is a developed economy[140] with high literacy and internet usage. This indicates a society that is both familiar with digital tools and has access to these digital technologies. Comfort-level of citizens plays an important role in the design of public service delivery as it also reflects the ability of civil servants to use these tools. As such,

[127] Statistics Canada (2019)
[128] The World Bank (2019)
[129] The World Bank (2019)
[130] We Are Social (2020a)
[131] The World Bank (2019)
[132] OECD (2020)
[133] The World Bank (2019)
[134] The World Bank (2019)
[135] We Are Social (2020a)
[136] We Are Social (2020a)
[137] We Are Social (2020a)
[138] We Are Social (2020a)
[139] We Are Social (2020a)
[140] United Nations (2014)

digitalization of government may be approached with more ease than if society was not digitally ready. That said, it is important to recognize that this ease with digital tools may not be universal as vulnerable populations and isolated communities may not be able to benefit from these developments.

Canada's digital strategy objective is primarily to improve citizen experience, engagement and transparency and to increase efficiency.[141] Many agencies also find procurement of digital services challenging indicating a gap that could be filled by the federal government.[142]

Digital Government Development:

I. Digital Transformation Strategy:

The Canadian Treasury Board has been moving services online since as early as 1998 with the launch of its Service Improvement Initiative. But it was post the year 2000 that digital service policies and frameworks were officially implemented in Canada. During 2001 to 2014, the Canadian government iteratively carried out revision of digital service policies namely through Service Canada, the Treasury Board Policy Framework for Service Improvement, and Treasury Board Policy on Service. The latest is a Digital Operations Strategic Plan in action from 2017 until 2021.

The 4-year digital strategy lists multiple principles for making digital government work, for delivering services across agencies and departments to cover all Canadians, and certain themes that form the core of the service delivery strategy for Canada including:

- A service-oriented government with a user-centric approach
- An open, collaborative and accessible government
- A digital-first and digitally enabled government
- Modern technology and modern information practices
- A digitally enabled public service
- Good digital governance

The Policy on Service and Digital and supporting instruments serve as an integrated set of rules that articulate how organizations within the Government of Canada can manage service delivery, information and data, information technology, and cyber security in the digital era. In addition to the digital policy directive, the Canadian Digital Service (CDS) of the Treasury Board serves to enable more digital services across government agencies at federal level and subsequently at the provincial level as well.

[141] Deloitte (2015b)
[142] Deloitte (2015b)

II. Local/Municipal Transformations:

Canada is a federal bicameral parliamentary democracy and a constitutional monarchy with a highly varied local government system[143]. Legislation for local government is unique to each province and territory. Canada's constitution divides powers between the federal government and the ten provincial governments, but municipalities are not recognized as a separate order of government. Provinces and territories have a number of legislative acts that govern local government within their jurisdiction.

Provincial and territorial ministers with local government responsibilities oversee local government legislation, including the digital government agenda. Under the ten provincial and three territorial governments are two supra-regional authorities (in Québec), 143 regional authorities and over 3,600 local governments. Property taxes are the main source of revenue for local governments, with individual municipalities determining their own property tax rate.

Provincial and territorial governments set their own government agenda which includes digital government initiatives. For example - privacy laws. Canada has two federal privacy laws. The Privacy Act covers how the federal government handles personal information while the Personal Information Protection and Electronic Documents Act (PIPEDA) covers how businesses handle personal information. The Privacy Act applies to only the federal government institutions listed in the Privacy Act Schedule of Institutions. PIPEDA on the other hand generally applies to private sector organizations that are not federally-regulated and conduct business in selected provinces.

In addition to federal privacy laws, every province and territory has its own laws that apply to provincial government agencies and their handling of personal information. As Canadian data collection is done mostly by provinces using different methods and definitions, provinces may also have industry-specific laws such as for health-related, employment-related and sector-specific privacy laws. Where the law is deemed 'substantially similar' to PIPEDA, provincial law takes precedence. As a result, provinces are either left to drive their own privacy laws or wait for the federal government to update existing laws. Either way, these laws do not allow data sharing across government functions and across levels of government.

Thus, due to legislative restrictions on data sharing, there is limited coordination with the federal government. At the provincial level, there are some information sharing mechanisms between provincial governments such as a network of all Chief Information Officers and Chief Digital Officers which includes knowledge sharing but not necessarily

[143] Commonwealth Local Government Forum (2018)

technology sharing. Some digital government councils also include counterparts in the federal governments. Most provincial governments have a Chief Digital Officer and/or a dedicated agency set up with the sole purpose of improving digital government services. For example, the Government of British Columbia appointed a Chief Digital Officer, whereas the governments of Ontario and Alberta set up a dedicated digital services team tasked with advancing the digital government agenda in their respective provinces. Regardless of role, provincial government leaders are tasked with working with city and local governments to implement public service initiatives.

From a regulatory perspective, provincial and territorial governments have specific legislative power which includes property and civil rights laws.[144] However, similar to the federal government, legislative changes are subject to political will and the uncertainties of change of governments. As a result, legislative changes are cumbersome and difficult to implement, and very localized to the particular province.

III. Development and Implementation of Tools:
Some examples of provincial and municipal digital government services are:

- Ontario Digital Service Standards[145]: The Digital Service Standard is a government-to-business(G2B) service provided at the provincial level, and sets out 14 points to help public sector internal teams or third-party vendors build and deliver excellent government services. This Digital Service Standard was developed for the Ontario government to use as they design online information and transactional services for the people of Ontario. The purpose of the Digital Service Standard is to help the Ontario government deliver consistently good services online. The service undergoes a test or demo from beginning to end with the responsible minister before it goes live. It is assisted by a service design playbook for developers and lists the multiple laws and regulations that assist it, for example the 'Freedom of Information and Protection of Privacy Act', which protects data and regulates the sharing and integration of data on platforms used to build the services, and Ontario's Open Data Directive, 2019[146].
- British Columbia (BC) Services Card[147]: The BC Services Card provides access to government services such as publicly funded health services for residents of British Columbia. The card links the identity of each resident through a Digital ID and provides access to driver's license, health care, banking and accessing

[144] Parliament of Canada (2016)
[145] Government of Ontario (2019)
[146] Government of Ontario (2020)
[147] Government of British Columbia (2018)

government services online. This is a G2C service that directly encompasses many major citizen services in one.

- British Columbia Local Grants and Transfers[148]: British Columbia provides some direct grants to local municipal bodies for climate action, community projects, infrastructure, etc. which can be applied for and processed online through the state government website. This is a G2G feature that provides a state level government provides the local governments.
- E-filing of court appeals in Alberta[149]: The justice system in many states across Canada, taking an example of Alberta, offers many G2C services to all residents state by state. The Alberta government allows residents to submit an e-appeal to the Court of Appeal of Alberta through their public portal. This service is currently partially online as it requires filing and then verification of the appeal, but you can order a courtroom transcript online too.

Tools:

GOVERNANCE

TOOL 1: Federal-level governance structure

At the federal-level, the Government of Canada has established numerous agencies and individuals responsible for pushing forward the national digital agenda for the government. This includes creating the position of Chief Information Officer (CIO), Chief Technology Officer (CTO), which sits within the Treasury Board, and a Minister of Digital Government.

The Minister of Digital Government provides oversight and leads Digital Governments work to increase trust in the Government's digital capabilities. The Minister is tasked with governing in a positive, open and collaborative way. The Minister also leads the digital strategy and programming at the Treasury Board Secretariat and Shared Services Canada (SSC). The Minister is also responsible for overseeing the work of the CIO, the Canadian Digital Service, and the SSC; and supporting various ministers including the Minister of Innovation, Science and Industry; and the Minister of Families, Children and Social Development.

[148] Government of British Columbia (2019)
[149] Government of Alberta (2020)

At the federal-level, the Government of Canada founded the Canadian Digital Service (CDS) in 2017 to work with federal departments and agencies to make services easier for governments to deliver. Essentially, they are tasked with developing solutions that can ease government service delivery including tools such to access disability benefits and a service to allow for cybercrime reporting.

The impact of these federal-level governance structures is that it allows for i) increased collaboration; ii) directive on digital government initiatives; and iii) streamlined solutions at the federal level. This impact can be evidenced by the increased uptake of services provided at the federal level. For example, SSC's web experience toolkit is used by 27 agencies and 77 departments at the federal level. The savings cited from this initiative, including the group procurement of solutions such as Amazon Web Services, Adobe Analytics and cybersecurity efforts, is high, however the numbers are confidential.

The biggest challenge of this governance structure is that it currently exists at the federal-level with little to no coordination or cooperation with provincial governments. This creates silos and a loss of efficiency as there is no comprehensive timeline on when provincial support will begin largely due to regulatory challenges that limit data sharing between levels of government.

TOOL 2: Establishment of provincial digital and innovation offices and roles

At the provincial-level, provincial governments have established innovation and digital offices to facilitate the digitalization of government agenda. Examples include, Alberta Digital Innovation Office, Ontario Digital Service and the role of Chief Digital Officer in the Government of British Columbia and the Government of Quebec.

The impact of these provincial-level governance structures is that it i) creates a central coordinating body at the provincial level, ii) establishes accountability and responsibility for the digital government agenda; and iii) sets the strategic view and coordination for municipalities within the provinces. However, in Canada, these provincial-level agencies are still in their strategic development stages and have yet to provide development and implementation support.

The challenges that provincial governments face are primarily around regulation. For example, there is no specific data sharing legislation that allows for data sharing between governments at different stages. This has been cited as a huge barrier in the implementation of service delivery.

REGULATORY

TOOL 1: Policy on Service and Digital

The Policy on Service and Digital defines clear rules that articulate how Government of Canada organizations manage service delivery, information and data, information technology, and cyber security in the digital era. Other requirements, including but not limited to, requirements for privacy, official languages and accessibility, also apply to the management of service delivery, information and data, information management and cyber security. The Policy on Service and Digital focuses on the client, ensuring proactive consideration at the design stage of key requirements of these functions in the development of operations and services. It establishes an enterprise-wide, integrated approach to governance, planning and management. Overall, the Policy on Service and Digital advances the delivery of services and the effectiveness of government operations through the strategic management of government information and data and leveraging of information technology. The management of these functions is guided by a commitment to the guiding principles and best practices of the Government of Canada Digital Standards: design with users; iterate and improve frequently; work in the open by default; use open standards and solutions; address security and privacy risks; build in accessible from the start; empower staff to deliver better services; be good data stewards; design ethical services; collaborate widely.

While there is no defined metric for measurement, the Policy's impact is that it clearly defines rules of engagement.

The biggest challenge of the policy is that it is applicable only at the federal-level of government, thus there is no legal imperative for provincial governments to adhere to it. The enforcement of the policy will also be challenging and requires strict guidelines on penalties to ensure adherence to the policy.

TECHNOLOGY

TOOL 1: Web-experience toolkit

Web Experience Toolkit (WET) includes reusable components for building and maintaining innovative websites that are accessible, usable, and interoperable. These reusable components are open source software and free for use by departments and external Web communities. WET is led by the Treasury Board of Canada Secretariat and

has been collaboratively developed and maintained by Government of Canada departments and external Web communities.

WET eases compliance with the *Standard on Web Accessibility*, the *Standard on Web Usability* and the *Standard on Web Interoperability.* It is highly recommended for use on Government of Canada websites.

One of the major impacts of making such tools available under the Open Government initiative at the federal level has been the accessibility for people who have barriers and disabilities. For example, open source web service toolkit automatically creates text fields for people to use across different access groups, making it easier for developers to create more accessible web applications.

TOOL 2: Content management system

Notify is a service developed by the Canadian Digital Service (CDS) platform team, that allows government departments to send emails and text messages to people who use their services, at low costs and in just a few simple steps. Notify can be used to help services save resources - including call centers looking to reduce the volume of inquiries made by phone, or Access to Information and Privacy (ATIP) offices trying to cut down on long application wait times. With no customization and a $70 USD a month server, Notify was able to send 10,000 emails in 15 minutes - that translates to one million emails a day, and 29.5 million emails a month.[150]

As part of the Open Government initiative of the Canadian government, this content management system serves more than 27 departments that have migrated to it across Canadian national agencies, and also ensures that the cybersecurity for the system remains in their control.

A key challenge with uptake of these systems was that initially the national agencies bought the common platforms and configured them making it overly customized. This was eventually reduced to allow individual agencies and local governments to customize and be creative with their applications.

[150] Galbraith & Dubois (2020)

III. THE NETHERLANDS

Table of Rankings for Global Benchmarking:

Fiscal Decentralization: Percentage of the General Government Expenditure executed by Subnational Government[151]	31%
E-Government Development Index (EGDI)* (UN 2018)[152]	0.8757

*The EGDI, which ranges from 0 to 1, "measures countries' use of information and communications technologies to deliver public services. The Index captures the scope and quality of online services, status of telecommunication infrastructure and existing human capacity."[153]

Political, Economic, and Social Landscape:

I. Political:

The Netherlands is a constitutional monarchy with a decentralized democratic and unitary entity. In this entity, the European Union (EU), the Central Government, the 12 provincial, 380 municipal governments and 22 regional water authorities[154] work to provide services to the citizens of the country.[155]

The Central Government deals with national and international matters with the different tasks divided in the 11 ministries. These tasks include but are not limited to foreign and European policies, education, national social security, health, roads and railways and media. [156]

The Provincial Governments / Councils under the Provincial act 1994 deal with environmental issues, conservation, roads and public transport, regional development and local taxation. [157]

While the water authorities' deal with water safety, maintenance and water collection and treatment is a responsibility of others. [158] Municipalities deal with public order and safety,

[151] International Monetary Fund (2019)
[152] United Nations (2018)
[153] United Nations (2018)
[154] Since most of the country is surrounded by water, an authority needs to be responsible to guard the approxiimately 18,000 km of dikes, 225,000 km of waterways, 3,700 pumping stations and 360 wastewater treatment plants
[155] Association of Netherlands Municipalities (2018)
[156] Association of Netherlands Municipalities (2018)
[157] Association of Netherlands Municipalities (2018)
[158] Association of Netherlands Municipalities (2018)

spatial planning, urban planning, education, health, transport, social security provision, tourism culture and taxation among others. [159]

The Netherlands has an Association of Netherlands Municipalities (VNG), a major component of the governing of municipalities, allowing for the building of a forum for the advocacy and exchange of good practices on developments within municipalities. More specifically, it deals with the building of a voice and channel of communication between the Local Government and the Central Government. Some specific examples of cooperation include, the "Big 4" comprising the 4 largest cities[160] allow for the development of a channel of communication between the central government and local governments on specific urban problems. On similar lines to the G32, municipalities with inhabitants of over 100,000 and P10, the largest 10 rural municipalities cooperate with each other so as to better serve the citizens in an efficient manner. One of the biggest achievements of the VNG has been the Municipal 2020 Strategy of 2014 which advocates for a transformation of society with optimal cooperation and reforms within the local financial sector and the removal of national and international legal constraints on municipal autonomy. [161]

II. Socio-economic:

- Population Total: 17,231,017[162]
- Population by age group
    - 0 to 14 years: 2,775,600 [163]
    - 5 to 64 years: 11,147,718[164]
    - 65 years and above: 3, 307,699[165]
- Urban population as a share of total population: 91.49 %[166]
- GDP per capita, PPP (constant 2011 international $) : $49, 787.073 [167]
- GDP growth (annual %, as of 2018): 2.597 % [168]
- School enrollment, secondary (% net) : 93.164 %[169]
- Unemployment (as of 2019), total (% of total labor force) (modeled ILO estimate): 3.761 %[170]

[159] Association of Netherlands Municipalities (2018)
[160] Amsterdam, Rotterdam, The Hague and Utrecht
[161] Association of Netherlands Municipalities (2018)
[162] The World Bank (2019)
[163] As of 2018; The World Bank (2019)
[164] As of 2018; The World Bank (2019)
[165] As of 2018; The World Bank (2019)
[166] As of 2018; Index Mundi (2018)
[167] As of 2018; The World Bank (2019)
[168] As of 2018; The World Bank (2019)
[169] As of 2017; The World Bank (2019)
[170] As of 2019; The World Bank (2019)

- Literacy rate (adult male, adult female) (99%, 99%)[171]
- GINI Index: 28.5 [172]

III. Adoption of ICT/Digital readiness:

- Fixed broadband subscriptions (per 100 people): 43.417 [173]
- Access to electricity (% of population): 100 % [174]
- Total Unique Mobile users: 17.01 million[175]
- Active Social media users: 11.00 million[176]
- Internet Users: 16.26 million[177]
- Unique mobile users as a percentage of total population: 99 %[178]
- Internet users as a percentage of total population: 95%[179]
- Mobile network infrastructure: 82.70/100[180]

IV. Country Analysis:

The Netherlands, the sixth largest economy in the European Union with its dual system of a constitutional monarchy and a decentralized democratic and unitary entity that has performed well with regards to socio economic indicators. Economic growth has been fairly impressive and the country has also done exceptionally well on socio economic indicators like literacy and unemployment.

With a strong economy, it has been no surprise that the digital preparedness of the country shows that 90 % of the population has access to internet services and are mobile users. The only anomaly for the Netherlands is that the country's fixed subscription to high speed access public internet is 43 people per 100 persons.

Digital Government Development:

The Netherlands' approach to digital government is deeply tied to the country's democratic principles of participatory government. The autonomy with which city,

[171] As of 2020; Kemp (2020)
[172] As of 2017; The World Bank (2019)
[173] As of 2018; The World Bank (2019)
[174] As of 2017; The World Bank (2019)
[175] As of 2020; Kemp (2020)
[176] As of 2020; Kemp (2020)
[177] As of 2020; Kemp (2020)
[178] As of 2020; Kemp (2020)
[179] As of 2020; Kemp (2020)
[180] As of 2020; Kemp (2020)

municipal, and other forms of local governing bodies function in the Netherlands is reflected in the digital government practices as well.

Governments (central, provincial, city-level, municipal), citizens, and private organizations are considered as the three participatory groups that need to come together to build an accountable, empowering, accessible and transparent digital government.

As identified by the representatives from the Municipality of Rotterdam, the Dutch Digital government transformation is supported by three distinct communities.

- Community of Knowledge - This group includes knowledge institutes - domestic and international, government representatives, city CIO/CTO, subject matter experts. Focused research questions on digital governments are discussed, and debated, and possible solutions/alternatives are identified by this community.
- Community of Practice - This group includes digital government practitioners, technologists, entrepreneurs, private businesses and government representatives. They focus on building the platforms, testing the applications, tinkering with user design, and conducting quality assurance.
- Community of Inspiration - This involves direct citizen participation. Feedback portals, dashboards, surveys allow for citizens to share their ideas and opinions on current services and possible new services. Not only citizens but municipalities and cities which have successfully implemented a digital program become part of the community of inspiration for other cities who would like to learn from them and emulate their projects.

Digital Government Policy History:

- 1998: First Electronic Government Programme
    - Government to become online (25% of total government operations)
    - One portal, service catalogue
    - Introduction of the concept of reuse
- 2003: Modernizing Government's programme
    - Introduction of the concept of burden reduction for citizens
    - Electronic government pillar
        - Introduction of infrastructure (authentication, system of base registers)
- 2008: NUP Action programme
    - Joint agenda / shared vision on one digital government
    - Focus on development
- 2011: Programme i-NUP

    - Focus on implementation
- 2013: Programme Digital 2017
    - Legislation
    - Monitoring
    - High level study group ‘Make it happen’
- 2020: NL DIGIbeter
- Through the years of digital government development, a common thread that remained are:
    - User centric approach: easy and secure, better services, less administrative burdens, no wrong door, once only, transparency
    - Infrastructure approach: user centric approach requires common infrastructure, e.g. authentication, base registries

Netherlands Benchmark Statistics

eGovernment EU benchmark 2019 report	Netherlands
Online provision of public services	92%
Transparency	71%
online availability of public services	76%
Key enablers	80%

In the Netherlands, the Digital government is understood to be a two-way street. It is seen as an extension of the democratic process that empowers citizens to organize and participate in government functioning. Whistleblower platforms, voting apps, online participatory budgets, and discussion boards are understood to be part of a vibrant digital government, improving the transparency of the government and increasing direct citizen participation.

Tools:

1. **Ministry of the Interior: A Central Government Perspective**

- **Governance:**
  - NL DIGITAAL: Data Agenda Government [181] -
    - This agenda outlines the government's vision on improving data sharing between individual government agencies and data sharing between the government and commercial parties.
    - It sets out how data can be used better to improve policy-making and resolve social issues.
    - It includes an innovation budget aimed at stimulating innovative government services.
    - This agenda sets the guidelines for responsible (re)use of data
    - The government has formulated three key pillars to this end:
      - The government must raise its data governance standards (getting all data in order)
      - Achieving greater yields from available data (data-driven working methods)
      - Safe and trustworthy data sharing between government agencies, businesses and citizens (data sharing, open data).
  - NL DIGIbeter - Agenda Digital Government [182] -
    - This agenda is about utilizing, protecting rights of the society, and how to make government contact with citizens and entrepreneurs to be smart, accessible, understandable and inclusive.
    - NL DIGIbeter is an agenda for all layers of government. All tiers of government and numerous executive organizations are currently implementing measures to make the Dutch digital government more accessible, personalized and easy to understand.
    - Pillars NL DIGI better
      - Innovation
      - Data
      - Inclusion (everyone should be able to participate)
      - Digital identity
      - Control of data
  - Dutch Digitalization Strategy 2.0 [183] - It offers a brief overview of the results achieved over the past year and looks ahead to the future.

[181] Digital Government (2019a)
[182] Digital Government (2019b)
[183] Nederland Digitaal (2018)

- The Dutch Digitalization Strategy is built on the principles of:
  - privacy protection
  - cybersecurity
  - digital skills
  - fair competition
- Netherlands is further expanding its role as a living lab by launching field labs and workplaces for entrepreneurs to innovate and experiment with digital technologies.

Source: Dutch Digitalization Strategy 2.0

- Standard Business Reporting (SBR) [184] -
  - National standard for the digital exchange of business reports. SBR allows Dutch businesses and their intermediaries to reduce reporting and administration work in the exchange of business information to local authorities and banks.
  - SBR enables information in company records to be captured once only in a standard way. Information can then be easily reused for various reports to government agencies and a number of banks.
  - SBR applies international open standards, including XBRL and web services in a way that enables a high degree of automation within the business reporting processes; from data gathering and transfer to validation and processing. It makes the reporting chain more efficient and effective and delivers substantial benefits to all participants in the reporting chain.
- Logius [185]: An agency for the management of the infrastructure services
  - Logius is the digital government service of the Netherlands Ministry of the Interior and Kingdom Relations (BZK).
  - It maintains government-wide ICT solutions and common standards that simplify the communication between authorities, citizens and businesses.
  - Logius supplies products relating to access, data exchange, standardization and information security.
- Startup in Residence [186]
  - The Startup in Residence programme links social issues to innovative solutions. Five winning start-ups will be further developing

[184] Standard Business Reporting (2017) and Business.gov.nl (2020)
[185] Logius (2010)
[186] Startup in Residence (2020)

their ideas with the help of a financial incentive from the Ministry of the Interior and Kingdom Relations.

- Digital Inclusion Action Plan [187]
  - This action plan addresses both the opportunities and (general and social) challenges of a digital society. Amongst other aspects, this will involve ensuring the accessibility of government services and information and organizing assistance for those with less digital skills.
  - The 'Words Count' (Tel mee met Taal) programme focuses on improving the digital skills of functionally illiterate citizens. Digital government information points will be opened at libraries around the country.
  - Current initiatives as a part of the Action Plan also include the Digital Society Alliance. The Alliance is developing concrete measures on 4 specific themes: care environment, online commerce, employees and the social environment. Collaboration will serve to increase the measures' effectiveness and social impact.

- **Technology:**
  - 5G in practice - The 5G network is already being tested at various locations throughout the Netherlands. [188]
  - Spatial data center strategy [189]
    - The Spatial data center strategy outlines a range of measures aimed at facilitating the development of new data centers and improving our business climate.
    - Data centers play a crucial role in the development of digital economy and society
  - Common Infrastructure:
    - Base Registers [190] - The system of base registers consist of 10 separate fundamental, interconnected registers. To realize this connectivity, system standards have been agreed upon.
      - Base registers have been officially instituted by the government as the mandatory data registration sources for all governmental institutions when executing their public duties.
      - What is registered is stipulated by law and follow Standards/services for data exchange

[187] Digital Government (2018a)
[188] Nederland Digitaal (2018)
[189] Nederland Digitaal (2018)
[190] Digital Government (2018b)/

- Their application varies: from the turning out of emergency response services, and the efficient determination of a claim on benefits, to the appraisal of a license application.
- The citizen's privacy is guaranteed when these data are used.

- Service delivery
  - Portals
  - Personalized environments: mijn.overheid.nl, secure message box,
  - Standardized messages: e-invoicing, Standard Business Reporting.

- Knowledge sharing
  - For policy makers[191]: sharing the goals and ambitions, as well as policies and projects (high level building blocks).
  - For (IT) architects[192]: sharing decisions, the design of generic services and views of the current state and future state of our digital Governmental services.
- DigiD [193] - enables individuals to identify themselves for digital services.
  - Using DigiD, the Citizen Service Number (BSN) of the person logging in is disclosed. This makes it possible to check the information already on file for that individual, and offer personalized services.

- **Regulation:**
  - Digital Government Act [194] - Contains a legal basis for appointing mandatory open standards. Currently under parliamentary scrutiny.
  - New Laws:
    - "Open Government, Open Data, Open Source"
    - "Digital Government" (contains guidelines for Dutch Digital Infrastructure)
  - EU Legislation - GDPR, eIDAS, PSI, SDG, WAD

2. Municipality of Rotterdam: A City Government Perspective

- **Innovation Financing & Grant Funding: Horizon 2020 [195]**

[191] Digital Government (2020a)
[192] NORA (2020)
[193] Digital Government (2020b)
[194] Digital Government (2020c)
[195] European Commission (2020a)

- The City of Rotterdam was a beneficiary of a Horizon 2020 grant. Rotterdam was a pilot city to develop user cases for the ESPRESSO project.
- The City of Rotterdam's ESPRESSO project was budgeted at ~ €1,000,000 over three years.
- EU funded projects follow a 50-50 model where the EU funds 50% of the budget and the city/municipal government are required to match the remaining 50% of the project budget.
- The City of Rotterdam received ~€500,000 as a Horizon 2020 grant. City of Rotterdam municipality matched the remaining project budget.

- **Standardization: Espresso** [196] **(**syst**E**mic **S**tandardisation ap**PR**oach to **E**mpower **S**mart citie**S** and c**O**mmunities) - For ESPRESSO project Rotterdam developed two user cases
  - User Case 1: Parking Space - Smart automatic parking control system. In this use case, the aim is to enlarge the scale of the pilot smart automatic parking control system to an entire district where there is a lot of parking nuisance. The information gathered is not only applicable for the inhabitants to be able to find parking spots, but also as input for the municipality to adjust their policy on parking in the city (i.e. Smart Governance).
  - Use Case 2: Ground Water Level - The pilot will help ESPRESSO to identify gaps in the interoperability arrangements and validate the reference architecture to support the urban platform.
  - Houses in Rotterdam are built on wooden poles and these need to be kept wet, to avoid their rotting. Groundwater levels are measured at regular intervals using both sensors (currently 3) and human readings (approximately 2000 wells in the city manually measured). More sensors are planned so that more accurate, frequent, flexible measurements, less manual labor. These sensor readings are sent and stored in the Data Lake for retrieval and analysis. Sensor readings are read from the Data Lake using Sensor Things API (or SOS) and visualized in the existing CityGML based 3D model of the city.

- **Technology tools/best practices: 'Grand Design'**
  - **MIM**: **Minimum Interoperability Mechanisms** - This approach focuses on developing the minimum building blocks of technology needed to get a project off the ground. Because of the interoperability nature of the approach, additional functionalities can be developed and added in a modular fashion.

[196] ESPRESSO (2020)

- **PPI: Pivotal Points of Interoperability - Open data Standards** - Data should always be collected, encoded, saved, and made available in Open language/format. This allows for smooth data flow/sharing through the entire ecosystem. And every department in the municipality will know upfront about the language/format in which they will receive the data.
  - **Open Data Standards** - Every credible entity (after verification) that is interested in contributing to Rotterdam's smart city initiatives should have access to data.
  - Open Data Standards are made part of procurement rules/contracts that are signed with private companies. As a result municipalities remain the owners of data, not just users of data.
- **Network approach** - Network approach is centered on transparency in development. Even when departments continue building tools and applications within their silos, if their technology operations and data structures remain transparent, then other departments will still be able to access any cross functional data. New technology blocks will not hinder the access to data outside the silo.
- **Digital Twin4vg** - Now, Rotterdam is going one step further by creating a "digital twin" for the city, which will act as a platform for a new era of digital city applications. A digital twin is a smart 3D model of the city that accurately represents the streets, buildings, public spaces, and so on, of the physical city. Sensors and data-streams around the city feed into the model meaning many digital elements are updated in real-time, such as the movement of people or vehicles, which can be incorporated into the system. The digital twin can also provide real-time visibility of power and water flow, maintenance work, or monitor the location of emergency services to better respond to emergencies. All data that describes the current reality of the city can be a part of the Digital Twin.[197]

- **Governance:**
  - Knowledge Sessions: Held 4-5 times a year, where municipal officials, research institutions, experts share, learn, network, build partnerships for better digital governance.
  - Initiating development - Municipalities believe that their autonomy is better protected when they take the lead in the early stages of digital government

[197] EIP-SCC (2020)

projects during which they can set the rules and limitations. Construction and operational phase might be done by a consortium that includes the municipal governments, citizen groups, legal institutions, and private technology businesses. Consortium would be responsible for the daily operations.

- Negotiations & Agreements - Adoption of data standards and technology best practices by various departments within the municipality can be achieved through agreements and not by-passing rules/laws.
- City governments move to digital platforms to save costs and raise revenues. A business case to commercialize, generate revenue is an incentive to transition to digital platforms.
- Citizen Journey Mapping - To build comprehensive and end to end digital government platforms, a citizen journey mapping exercise must be undertaken for every service that is being designed. This exercise allows municipalities to identify the various departments and different data sources that need to be integrated for a smooth experience with the platforms.
- City governments with visionary leadership and well-funded budgets are aggressively pursuing their own digital government strategies. The challenge they face is how to remain autonomous when partnering with private enterprises or central governments to establish their digital government services. A potential takeover of services, public data, revenue streams by private companies (Google, Huawei, Amazon, Microsoft) or by central governments (Estonia, Singapore, China) is a threat they worry about.
    - Gaining the trust of the municipal government and the buy-in of the leadership/stakeholders is the first step to getting them onboard with the national digital strategy.

3. **Civil Society Organizations: A Citizen Centric Digital Democracy Vision Perspective**

- **Governance:**
    - Civil Society Organizations, by virtue of their work with local communities, often build strong relationships with local governments and their leadership. These relationships can be leveraged by the central governments to bridge the information gap that impedes local and municipal governments to transition to digital operations.
    - Association of Municipalities (VNG) plays an important role in connecting municipalities with each other. VNG in partnership with civil society

organizations and the central government can support the subnational digital government transition.

- **Technology:**
  - DECODE Project: Based on promoting data ownership by governments - disconnected from citizen participation tools and is more focused on local governments to create better policies to protect public data (that is gathered by PPP) - ensure that data gathered in public space is owned by public governments. Standardized format that everyone is adhering to
  - DESCENT: Open source solutions throughout Europe and collectively enhancing & experimenting with these tools → want to bring this into Dutch municipalities and Europe-wise
  - Participatory budgeting is the most common process to be part of digital democracy
  - Open source tools - municipalities could choose one of these tools and start experimenting with them. If collective issues arise or they wanted certain parts of technologies, then the Ministry of Interior would step in.
  - Smarticipate platform. The intention of the platform is to enable the co-creation of new public services. The real-time feedback mechanism is one of the core features of the platform and is also an interesting feature to organize feedback from the bottom up to policy-makers.
  - **NEXT_public services co-creation/co-development** NEXT_public services is about taking the jump in implementation & upscaling of ICT-enabled co-creation in our cities. It's an idea initiated by partners from four leading European consortia: OpenBudgets, Ozwillo, Spacehive and Smarticipate. Through the European Commission called SwafS-13-2017 'Integrating Society in Science and Innovation - An approach to co-creation', we are poised to make the jump together.
  - **Urban Stories -** Key characteristics of this method include: stories are from the user perspective, focus on the New Public Service being co-created (not on the data or digital tool being created), and follow the user process from idea inception to implementation while integrating offline expertise & participation. Storytelling approach is essential to make the process accessible & relatable to a wide audience, regardless of their technical proficiency, while also providing the context & feedback that technicians needed to program the platform & apps

- **Legal:**
    - Governments and Markets Law (NL) - governments cannot compete with the markets. So a lot of local governments in NL are very much used to outsourcing their technology to the markets and their IT services → also outsourcing citizen participation process which is problematic

Role of Intergovernmental Organizations:
In countries with strong autonomous federal states, where political power is decentralized, it will remain a challenge to enforce a central government devised digital strategy. In such governance structures, inter-governmental organizations (e.g. World Bank, Inter-American Development Bank, United Nations) can play the role of an effective third party to design agreeable guidelines for digital governments, finance digital government projects, and encourage and nudge state and local governments to participate in digital governments.

The European Union (EU) has designed policies, disseminated information, created grants and funding mechanisms, and shared technology resources that resulted in central governments, provincial governments, city governments and municipalities of member countries to increase their digital government activities.

It should be noted that policy measures and projects developed by inter-governmental agencies may focus solely on digital governments or on broader themes such as innovation, economic growth, ICT research, and democratic processes that facilitate a faster transition to digital governments.

Below is a list of incentives, projects and policies that the EU has implemented to promote ICT, innovation and digital government. IDB should consider emulating these ideas to foster digital government transition in LATAM countries.

Policy: Innovation Union- The Innovation Union was a past research and innovation policy. The plan contained over 30 action points and aimed to do 3 things:

- Make Europe into a world-class science performer
- Remove obstacles to innovation like expensive patenting, market fragmentation, slow standard-setting and skills shortages

- Revolutionize the way public and private sectors work together, notably through Innovation Partnerships between the European institutions, national and regional authorities and business.[198]

Innovation Financing & Grant Funding: Horizon 2020 - Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.

- Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract.
- Horizon 2020 grants put research at the heart of the EU's blueprint for smart, sustainable and inclusive growth and jobs. By coupling research and innovation, Horizon 2020 is helping to achieve this with its emphasis on excellent science, industrial leadership and tackling societal challenges.
- The goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation.
- Horizon 2020 is open to everyone, with a simple structure that reduces red tape and time so participants can focus on what is really important. This approach makes sure new projects get off the ground quickly – and achieve results faster.[199]

Innovation Financing & Grant Funding; Horizon Europe - EU Commission's proposal for Horizon Europe is an ambitious €100 billion research and innovation programme to succeed Horizon 2020.

- Horizon Europe will support European partnerships with EU countries, the private sector, foundations and other stakeholders. The aim is to deliver on global challenges and industrial modernization through concerted research and innovation efforts.
- The Horizon Europe proposal lays down the conditions and principles for establishing European Partnerships. 3 types are proposed.
    - **Co-programmed European Partnerships -** Between the Commission and private and/or public partners. Based on memoranda of understanding and/or contractual arrangements
    - **Co-funded European Partnerships using a programme co-fund action -** Partnerships involving EU countries, with research funders and other public authorities at the core of the consortium.

[198] European Commission (2016)
[199] EIP-SCC (2020)

- **Institutionalized European Partnerships -** These are partnerships where the EU participates in research and innovation funding programmes that are undertaken by a number of EU countries. These can also be public-private partnerships, such as joint undertakings or EIT Knowledge and Innovation Communities. These partnerships will only be implemented where other parts of the Horizon Europe programme would not achieve the objectives desired or expected impacts.[200]

- **Standardization: Espresso (**syst**E**mic **S**tandardisation ap**PR**oach to **E**mpower **S**mart citie**S** and c**O**mmunities) **-** Key objectives of ESPRESSO is to identify a collection of open standards that work well together. Such an approach promotes the greatest possible reuse of existing open standards to accelerate Smart City deployment.
  - ESPRESSO focuses on the development of a **conceptual Smart City Information Framework based on open standards**. This framework will consist of a **Smart City platform** (the "Smart City enterprise application") and a number of data provision and processing services to integrate relevant data, workflows, and processes.
  - Based on a detailed requirements-engineering campaign executed in close cooperation with cities, standardization organizations, administrative bodies, and private industry, the project will identify open standards matching the elicited requirements and will establish a baseline for interoperability between the various sectoral data sources and the Smart City enterprise application platform.
  - In a comprehensive set of coordination, support and networking activities, the project will engage a very large number of stakeholders, such as Smart Cities (both existing and those with aspirations), European Standardization Organizations (**ESO**s), National Standardization Bodies (**NSB**s), Standards Development Organizations (**SDO**s), public administrations, industries, SMEs, and other institutions.
  - ESPRESSO's approach emphasizes cost reduction and will foster an open market for many actors, **avoiding lock-in** to proprietary solutions. European Smart City solutions that adopt these prescripts will be raised to the forefront worldwide.

- **Lighthouse Cities - Fellow Cities (Co-Development model): Ruggedised**[201]

[200] European Commission (2020b)
[201] RUGGEDISED (2020)

- RUGGEDISED is a smart city project funded under the European Union's Horizon 2020 research and innovation programme. It brings together three lighthouse cities: Rotterdam, Glasgow and Umeå and three fellow cities: Brno, Gdansk and Parma to test, implement and accelerate the smart city model across Europe.
- Working in partnership with businesses and research centers these six cities will demonstrate how to combine ICT, e-mobility and energy solutions to design smart, resilient cities for all.
- The goals include improving the quality of life of citizens, reducing the environmental impact of activities and creating a stimulating environment for sustainable economic development.

Reputational:

- **Annual eGovernment Benchmark report:**[202]
  - The annual study, led by Capgemini[203] and jointly carried out with its subsidiary Sogeti and consortium partners, IDC and Politecnico di Milano for the European Commission evaluates how EU countries are progressing with the priority areas of the EU's eGovernment Action Plan 2016-2020.
  - The assessment of services covers the priority areas of the EU eGovernment Action Plan 2016-2020.
  - Top-level benchmarks:
    - **User centricity**: indicates the extent to which a service is provided online, its mobile friendliness and its usability (in terms of available online support and feedback mechanisms).
    - **Transparency**: indicates the extent to which governments are transparent about the process of service delivery, the responsibilities and performance of public organizations and the personal data processed in public services.
    - **Cross-border mobility**: indicates the extent to which users of public services from another European country can use the online services.
    - **Key enablers**: indicates the extent to which technical and organizational pre-conditions for eGovernment service provision are in place, such as electronic identification and authentic sources.

[202] European Commission (2019b)
[203] Capgemini (2019) and European Commission (2019b)

- **European Innovation Scoreboard:**
  - The European innovation scoreboard[204] provides a comparative analysis of innovation performance in EU countries, other European countries, and regional neighbors. It assesses relative strengths and weaknesses of national innovation systems and helps countries identify areas they need to address.
  - The regional innovation scoreboard[205] is a regional extension of the European innovation scoreboard. It provides a more detailed breakdown of performance groups with contextual data that can be used to analyze and compare structural economic, business and socio-demographic structure differences between regions.

[204] European Commission (2019c)
[205] European Commission (2019c)

IV. SPAIN

Table of Rankings for Global Benchmarking:

Fiscal Decentralization: Percentage of the General Government Expenditure executed by Subnational Government [206]	43%
E-Government Development Index (EGDI) (UN 2018)[207]	0.8415

*The EGDI, which ranges from 0 to 1, "measures countries' use of information and communications technologies to deliver public services. The Index captures the scope and quality of online services, status of telecommunication infrastructure and existing human capacity."[208]

Political, Economic, Social Landscape:

I. Political:[209 210 211]

Spain is a parliamentary democracy and constitutional monarchy with a head of government - the prime minister - and a head of state - the monarch. A council of ministers is the executive branch and is presided over by the prime minister. Under its constitution, Spain adheres to two principles - unity and autonomy. Spain is a unitary state, composed of 17 autonomous communities and 2 autonomous cities with varying degrees of autonomy. The redistribution of political and administrative power between central and autonomous authorities has made Spain one of the most decentralized countries in Europe. Spain has been a member of the European Union (EU) since 1 January 1986 and contributed 1.02% of its GDP to the EU in 2018.

Spain has a unitary form of government meaning that all powers are vested in the central government. That said, some powers are delegated by it to lower levels of government. In Spain, there are three different levels of government - central government, autonomous communities' governments and provincial and municipal governments. The distribution of powers between the State and the Autonomous Communities is based on the distinction between the exclusive powers of the State and the Autonomous Communities, the powers shared between the State and the Autonomous Communities and concurrent powers, in which both the State and Autonomous Communities may intervene. The exclusive powers

[206] International Monetary Fund (2019)
[207] United Nations (2018)
[208] United Nations (2018)
[209] European Union (2020)
[210] Presidencia de Gobierno (2020)
[211] Federacion Espanola de Municipios y Provincias (2009)

include legislative power and implementing capacity, while shared powers may lead to a different distribution of legislative and regulatory power between the State and Autonomous Communities, which usually hold the implementing capacity in these cases. In terms of organization, the institutions of government and administration of the municipalities are councils (ayuntamientos), those of the provinces are provincial councils (diputaciones provinciales) and those of the islands the island councils or Cabildos and Consejos Insulares in the Canary Islands and the Balearics, respectively. The Spanish local government is considered the tier closest to citizens.

In Spain today there are 50 provinces and 8,117 municipalities that, due to the number of inhabitants, are very unevenly distributed in terms of size. Thus, in accordance with the official figures from the review of the municipal register at 1 January 2011, 4,855 municipalities (59.82%) have a population not exceeding 1,000 inhabitants and 6,797 (83.74%) are municipalities whose population does not exceed 5,000 inhabitants. Only 145 municipalities (1.78%) have a population of over 50,000 inhabitants.[212]

In an effort to enable cooperation, the Spanish Federation of Municipalities and Provinces (FEMP) was established in 1985. FEMP is the most widely implemented state Association of Local Authorities, bringing together a total of 7,324 Town Councils, Provincial Councils and Island Councils, accounting for over 90% of Spanish Local Governments. The FEMP is the Spanish Section of the Council of European Municipalities and Regions (CEMR) and the official headquarters of the Latin American Inter-Municipal Cooperation Organization (OICI). The foundational and statutory purposes of the FEMP are: promotion and defense of the autonomy of local authorities; representation and defense of the general interests of local authorities before other public authorities; development and consolidation of the European spirit at the local level, based on autonomy and solidarity between local authorities; promotion and encouragement of friendly relations and cooperation with local authorities and their organizations, particularly in Europe, Latin America and Arab countries; provision, directly or through companies or entities, of all kinds of services to local corporations or authorities depending on them and any other purpose that directly or indirectly affects the associates of the Federation.

II. Socio-economic:

- Population Total: 46,723,749[213]
- Population by age group[214]
    - 0 to 14 years: 14.6%
    - 15 to 59 years: 59.8%

[212] United Nations (2018)
[213] The World Bank (2019)
[214] European Commission (2020c)

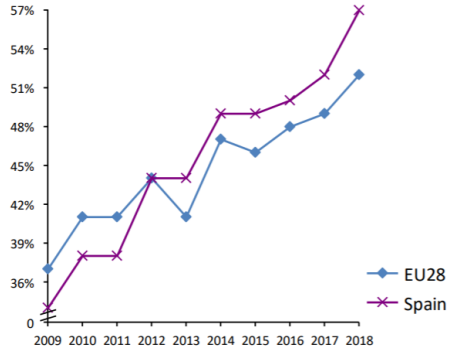
    - 60 years and above: 25.6%
- Urban population as a share of total population: 80%[215]
- GDP per capita, PPP (constant 2011 international $): 34, 831[216]
- GDP growth (annual %): 2.4%[217]
- School enrollment, secondary (% net): 97[218]
- Unemployment, total (% of total labor force) (modeled ILO estimate): 14.7[219]
- Literacy rate (adult male: 99%; adult female): 98%[220]
- Account ownership at a financial institution or with a mobile-money-service provider, secondary education or more (% of population ages 15+): 95.84[221]
- Income distribution, GINI Index: 34.7[222]

III. Adoption of ICT/Digital Readiness:

- Fixed broadband subscriptions (per 100 people): 32.50[223]
- Access to electricity (% of population): 100[224]
- Number of mobile connections: 54.11 million[225]
- Active Social media users: 29 Million / 62%[226]
- Internet Users: 42.40 Million[227]
- Mobile connections as a percentage of total population: 116% [228]
- Internet users as a percentage of total population: 91%[229]
- Mobile network infrastructure: 75.63[230]

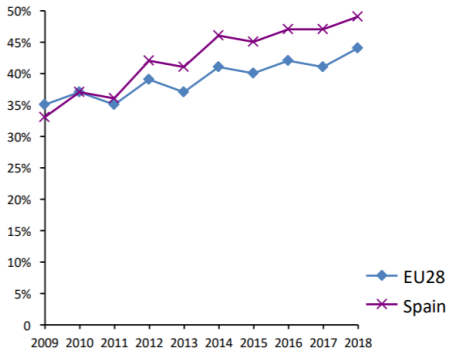
[215] We Are Social (2020b)
[216] The World Bank (2019)
[217] The World Bank (2019)
[218] The World Bank (2019)
[219] The World Bank (2019)
[220] The World Bank (2019)
[221] The World Bank (2019)
[222] The World Bank (2019)
[223] The World Bank (2019)
[224] The World Bank (2019)
[225] We Are Social (2020b)
[226] We Are Social (2020b)
[227] We Are Social (2020b)
[228] We Are Social (2020b)
[229] We Are Social (2020b)
[230] We Are Social (2020b)

Percentage of individuals using the internet for interacting with public authorities in Spain



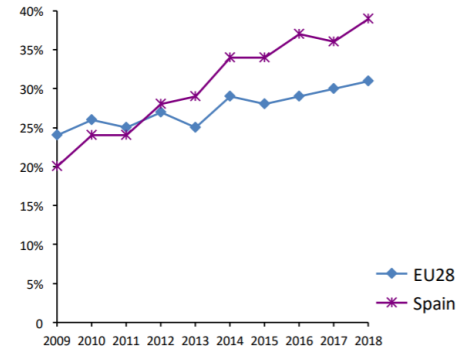
Source: Eurostat Information Society Indicators

Percentage of individuals using the internet for obtaining information from public authorities in Spain

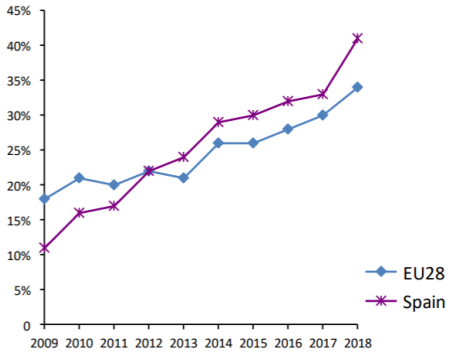


Source: Eurostat Information Society Indicators

Percentage of individuals using the internet for downloading official forms from public authorities in Spain



Percentage of individuals using the internet for sending filled forms to public authorities in Spain



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IV. Country Analysis:

Spain's parliamentary democracy system is unique in that it enables autonomy with cooperation. Due to its heavily decentralized structure, local governments have the power to implement, enact and drive their own agenda. This is beneficial as local governments are able to tailor the digital government agenda to their own needs. That said, this decentralization can also create unequal digitalization as municipalities with larger financial and human resources are able to implement digital government initiatives with more ease compared to smaller municipalities. These inequalities imply that access to digital services might be inconsistent, and can result in excluding the most vulnerable populations. They will also cause interoperability challenges.

[231] ISA (2019)

Spain is a developed economy with high literacy rates and high Internet users. This indicates a digitally literate society that is familiar with using the Internet to access services. Digital government development in Spain has had a strong focus on taking the actions necessary to enable automation of service delivery to better satisfy users. The Spanish digital economy is taking off because Spain invested heavily in its digital infrastructure, providing almost universal access to the Internet to households and businesses. This access has become faster with the expansion of broadband, which is now more affordable.

Digital Government Development:

I. Overview of the Digital Transformation in Spain:

The transition toward digital government at the subnational level in Spain has been facilitated by several key events, such as the passage of Law 11/2007, which stipulates that citizens have a right to access their public services online. It was also heavily influenced by the 2008 financial crisis. This event, which deeply affected Spanish society, forced the Spanish state to find new ways to increase efficiency and transparency in the use of a much-reduced fiscal base during times of great need, and it opted to use opportunities that were presented by information technology. This led to various attempts at the transition, some successful and others less so, which culminated in a set of laws, laws 39 and 40 in 2015, which made digital government mandatory at the national and subnational levels of public administration, and provided specifications as to how that would be carried out. The following section will provide details on that experience and the main lessons learned, as told by public employees responsible for implementing e-government at the local levels and the national level, as well as perspectives from private sector actors.

The basic tenets of the Spanish model to promote digital government at the subnational level

- The national government provides regulation and tools from which subnational governments can benefit to support their own processes.
- Local governments (provinces and municipalities) implement digital government solutions that meet requirements set by government regulation, these solutions (software) can be created in-house, taken from other municipal governments, or purchased through contracts with private sector firms. In the case of small municipalities (population of under 20,000), solutions must be provided by their respective province.
- Private sector firms compete against each other (and against public sector options developed by municipalities) to provide solutions to local governments.

Considerations regarding the Spanish government model for technological transfer:

Benefits: local governments can create or acquire software that responds to their specific legal needs, which can differ from one local government to another, and also differ from what might be needed at the central level.

Risks: This model places a heavy burden on local governments in terms of time and financial means to acquire these solutions.

Considerations for a model in which local governments hire directly from the private sector

Having individual contracts can provide opportunity to access expert technical support from firms, which can provide close accompaniment to civil servants during their transition process that could otherwise be too large a burden for the central government (if it had to serve all municipalities nationwide).

On the other hand, the procurement process for the private sector can be long and bureaucratic (lasting up to several months), as can be the design and implementation process (contracts normally lasting 4-6 years). This solution would also likely be costlier. Also, some municipal governments report having negative experiences with some private sector firms, where the firms implement solutions without taking into account the local legal and regulatory framework (which in many cases in Spain can differ between regions), focusing on more general improvements in the efficiency of processes. In other cases, the systems provided by the firms did not meet the security and interoperability guidelines required by law.

Considerations for cases in which local governments build technological solutions in-house

In the case of local governments that choose to create their own solutions in-house, some provincial governments, such as that of the Province of Albacete with the SEDIPUALBA[232] system, have been successful on this front. Their solution was created by programmers in the province´s public administration unit and then shared with municipalities within the province and in other provinces. Several municipalities that were interviewed have opted for this solution report being satisfied with the software.

[232] SEDIPUALB@ (2020)

The case of SEDIPUALBA: A few reasons that have been noted for this experience´s success are: a) the province uses the system for its own internal processes (not just a service provider to other administrations) and so quickly corrects any issues when necessary b) Albacete has easy access to computer programming talent, which reflects the presence of a university in the town with a strong computer science program.

Considerations on the Spanish model´s focus on decentralization

There are varying perspectives on the efficacy of the model used by the Spanish government. Considering that attempts to implement pre-made software solutions from the central government to the municipalities were unsuccessful (and costly), some users express high levels of satisfaction with the current model. Meanwhile, others consider that the complexity and time required to create or purchase solutions locally are high, and that the possibility of purchasing software at the central level that serves the needs of all municipalities should also be considered. If that option were chosen, the most important aspect to keep in mind to avoid errors is to ensure that solutions are designed jointly with municipal governments and tailored to their specific needs (which are very different from the needs of a central government administrative unit).

Other considerations for a transition to digital government at the subnational level:

Adoption by the population

According to municipal administrators, the most difficult aspect of this transition process has been the “change management” component both with public sector employees and with the residents.

For example, in cases even when the technology works, there are problems where the population may not know that online services exist given the lack of promotion by local administrators. Otherwise, segments of the population, such as the older populations, are not comfortable with the new systems. In Spain, the possibility of carrying out the service in person always remains as an option for residents who are not comfortable with doing it online. In the case of firms, they have to use the online process. Another point that was mentioned is that as people having good experiences in one municipality, this can have a positive impact on the populations in other municipalities.

To address this, the following have been mentioned as most important:

1. Political leadership that promotes the process.

2. Public campaigns that can educate the population on the benefits of this process in terms of efficiency and improvements in the quality in public service.

Adoption by local level public servants

Organizational change management at local-level offices can be a challenge as there is sometimes resistance to carrying out processes in a new way, which often feels like additional work for public employees. It has been the experience in some cases that resistance from the public servants has meant that at the local level they do not promote the e-services.

Tools:

TECHNOLOGY

Examples of services provided by the central government:

TOOL 1 - The Electronic Administration Portal[233]

It is a knowledge sharing platform for all public administration units in the country. Its objective is to bring and centralize all solutions, reports, indicators, news, etc. managed by different agencies in the field of Electronic Administration and that facilitate both the development and implementation of electronic administration and to know the current status of its implementation. The system includes:

- Electronic Administration Observatory - OBSAE: publishes reports/studies on the progress of Electronic Administration with the collaboration of the different public administrations
- Technology Transfer Center (CTT in Spanish): the CTT publishes a general directory of applications or / and solutions whose objective is to favor the reuse of solutions by all Public Administrations.

TOOL 2 - Profile Management System

- Central government makes a list of people that work for the state.
- Local admin decides who should be given different permissions.

TOOL 3 - Interoperability Nodes

The national government provides key services at the central level, referred to as ¨interoperability nodes¨ which municipalities use to create their own services. This

[233] Portal de Administracion Electronica (2020a)

software enables, among others, i) secure management of digital signatures[234] ii) secure management of digital certifications for online processes[235] as well as iii) digital platforms for public administrations units to share data securely[236].

REGULATORY

TOOL 1: Laws that ensures e-government reaches small municipalities

While a transition to e-government is mandated to all public administration units, specific norms work to support this process in smaller municipalities. Article 36 of **Law 7 of 1985** on local government stipulates that Provinces (1 level up from municipality) are responsible for ensuring that all public services reach all small municipalities, under the principle of equity, particularly by providing the technical and economic cooperation necessary to municipalities with lower economic and management capacity. In the case of the transition to e-government, this has led to the practice that Provinces take on the responsibility of arranging for the provision of digital government to municipalities with a population of under 20,000 people. For example, in the province of Castellón, it was the provincial government that carried out one software purchase that would serve 120 municipalities. Multiple interviewees confirm that this law was essential to guiding strategy for ensuring that all municipalities reach their intended levels of digital government.

- Risks involved: Municipal employees mentioned that current laws often seemed to be written with national level government administration in mind, which sometimes made implementation at the municipal level more difficult.

OTHER

MONITORING AND EVALUATION

TOOL 1 - Electronic Administration and Digital Transformation Observatory

Every two years, the Spanish Central Government publishes their assessment of Digital Transformation plans of their national and local governments, covering all their subnational levels, also measuring “information on technological, human, economic and contracting resources related to information technologies”.[237]With this tool, the Spanish Government monitors the use of ICT in local governments gathering indicators of this topic and its evolution.

[234] Portal de Administracion Electronica (2020b)
[235] Portal de Administracion Electronica (2018c)
[236] Portal de Administracion Electronica (2018d)
[237] Portal de Administracion Electronica (2018b)

V. UNITED KINGDOM (UK)

Table of Rankings for Global Benchmarking:

Fiscal Decentralization: Percentage of the General Government Expenditure executed by Subnational Government [238]	24%
E-Government Development Index (EGDI)* (UN, 2018)[239]	0.899

*The EGDI, which ranges from 0 to 1, "measures countries' use of information and communications technologies to deliver public services. The Index captures the scope and quality of online services, status of telecommunication infrastructure and existing human capacity."[240]

Political, Economic, Social Landscape:

I. Political:

The United Kingdom (UK) is a sovereign country made up of England, Wales, Scotland, and Northern Ireland. England consists of 26 two-tier counties, 32 London boroughs and 1 City of London or Greater London, 36 metropolitan districts, and 56 unitary authorities. Northern Ireland consists of 5 borough councils, 4 district councils, and 2 city councils. Scotland has 32 council areas, and Wales 22 unitary authorities. Of the total of 67 million people living in the UK, 84% live in England, 8% in, Scotland, 5% in, Wales and 3% in Northern Ireland.

The UK is a parliamentary democracy with a constitutional monarch. The UK has a unitary system of government,[241] with power held at the centre in Westminster, although some powers have been devolved to Scotland, Wales and Northern Ireland, where devolved administrations are responsible for many domestic issues, and their Parliaments/Assemblies have law-making powers for those areas. Councils make and carry out decisions on local services across the UK. Many parts of England have 2 tiers of local government: county councils and district, borough or city councils. Areas of the Scottish and, Welsh Governments, and the Northern Ireland Executive are responsible for the decentralized services such as many aspects of culture and the environment.

[238] International Monetary Fund (2019)
[239] United Nations (2018)
[240] United Nations (2018)
[241] GOV.UK (2020e)

The UK has been an active member of the European Union (EU) since its accession in 1973, but in a referendum on 23 June 2016 narrowly voted to leave the EU. Negotiations on the future EU-UK economic and security relationship will continue throughout 2020 and probably beyond.[242] This can potentially affect new digital initiatives owing to changes in laws, regulations, tax rates and business processes for private firms that interact with the public sector as well as citizens.

II. Socio-economic:

- Population: 66,488,991[243]
- Population by age group[244]
    - 0 to 14 years: 11.91 million
    - 15 to 64 years: 42.34 million
    - 65 years and above: 12.16 million
- Urban population as a share of total population: 83%[245]
- GDP per capita, PPP (constant 2011 international $): 40,522[246]
- GDP growth 2018-19 (annual %): 1.4%[247]
- School enrollment, secondary (% net): 97%[248]
- Unemployment, total (% of total labor force) (ILO estimate):3.8%[249]
- Literacy rate (adult male, adult female): Overall reported rate is over 99%, however the National Literacy Trust in UK reports that 16.4% of adults in England, or 7.1 million people[250] have very poor literacy skills.

III. Adoption of ICT/Digital Readiness:

- Fixed broadband subscriptions (per 100 people): 39.6[251]
- Access to electricity (% of population): 100%[252]
- Total Mobile subscriptions: 92 million[253]
- Total Smartphone users: 51.8 million[254]
- Active Social media users: 45 million[255]
- Internet Users: 54.2 million[256]

[242] Central Intelligence Agency (2020)
[243] The World Bank (2019)
[244] Clark (2019)
[245] The World Bank (2019)
[246] The World Bank (2019)
[247] The World Bank (2019)
[248] The World Bank (2019)
[249] The World Bank (2019)
[250] National Literacy Trust (2012)
[251] The World Bank (2019)
[252] The World Bank (2019)
[253] O'Dea (2019)
[254] O'Dea (2020)
[255] Johnson (2020b)
[256] Johnson (2020a)

- Internet users as a percentage of total population: 82.61%[257]

IV. Country Analysis:
The UK is a developed economy with a high adult literacy rate. In terms of digital readiness, looking at infrastructure access first, we see that broadband access is not very high, but overall internet penetration exceeds 80% of the population with over 51 million active smartphone users. The UK government is one of the most digitally-enabled countries, consistently ranking in the top 3 on EDGI.

The UK has also been deploying something called the Accessibility Empathy Lab[258] to enable access of digital public services and products to people with disabilities and to vulnerable populations across the country.

As elsewhere, the wide range of age groups presents certain challenges in bringing digital government to all citizens, as mindset shifts are required to change the status quo, however local council digital officers have been empathetic and have also collaborated with civil society organizations to include the elderly and other fringe populations in local digital services through partnerships.

There are multiple local councils and sub-regions that are taking ownership of providing a Digital First UK in their areas, using open data principles, inter-operable platforms, investment in broadband infrastructure and many other best practices. This is indicative of a strong foundation along with other metrics such as economic and political stability that will determine how well it is able to uptake it's Digital Strategy 2017-20.

Digital Government Development:

I. Digital Transformation Strategy:
Since 2003, the UK government has become one of the most digitally advanced countries in the world.[259] The UK digital transformation efforts from 2000 until recently show that the UK started with facilitating innovation in government organizations, developing common infrastructures (such as broadband), addressing digital divide, and continued with common services centralization efforts across the country. For example, the citizen and business portals Directgov.uk and Businesslink.gov.uk were created in 2004. Strategically, the UK recognized the importance of ensuring a whole-of-government

[257] Johnson (2020a)
[258] Duggin (2018)
[259] The United Kingdom has been among top 10 World E-Government Leaders for seven editions of United Nations E-Government Survey from year 2003 to 2016. Specifically, the UK is ranked 1st in 2016 World E-government Rankings by the United Nations E-Government Survey (United Nations, 2016).

approach (shared platforms and components across government agencies) in public service delivery. Since 2005, the UK has started the effort of digitalization of local government, as outlined in 2005 UK digital strategy.[260] A central body helping with the digitization process enables local governments to move the digitalization effort forward.

In 2010, another wave of government service delivery enhancement followed. A consolidation of all central government information services and application programming interfaces (APIs) under the GOV.UK[261] The website was launched in 2012. The Government Digital Service (GDS) was created in 2011 as a digital center of excellence for government[262], to oversee all of the online government presence, and a central team responsible for overall user experience in all digital channels and cross-departmental digital reforms.

By the end of 2014 GOV.UK had replaced the majority of department and agency websites. Departments created numerous digital services across government. GOV.UK Verify was developed as a way for users to prove their identity online securely. Two additional reusable components have been launched that make the job of delivering services across government easier and the user experience more consistent: GOV.UK Pay (a free and secure online payment service for government and public sector organizations) and Notify (a tool to send emails, text messages and letters to the users/citizens).

Enhanced collaboration across organizational boundaries by joining-up across central and local administration

The most recent national digital initiatives are the UK Digital Strategy 2017 and the Government Transformation Strategy 2017-2020, that were released in 2017. The national strategy focused on strengthening the UK's digital economy and turning it more resilient to changes associated with the exit from the EU. The Government Transformation Strategy concluded that the UK delivers increasingly sophisticated digital services and recognizes that many departments have reached the limits of transformation without changing how the organization works.

The strategic focus of the new digital government agenda was on enhanced collaboration across organizational boundaries by joining-up across central and local administration and third parties. The examples of the effort are Communities of interest (transformation together network experts), Transformation Peer Group (senior leaders), Components and

[260] Prime Minister's Strategy Unit (2005)
[261] GOV.UK is a single website that brings government information and services together
[262] GOV.UK (2017)

business capabilities, GOV.UK Verify, Notify, Pay, API standards, Customer-centric procurement guidelines.

The UK pursues a conceptual whole-of-government approach (shared platforms and components across government agencies). It is outlined in the UK's Digital Transformation strategy, which recognizes the need for design and delivery of joined-up services and sets specific tasks to establish cross-government mechanisms, language, tools and techniques, and frameworks to approach and deliver major transformations across government, which also includes local authorities. The strategy also outlines a preliminary list of services areas and user-journeys to be improved.

In summary, the objectives of 2017-2020 UK Digital Transformation are:

- continuing the development of world class digital services / business transformation
- enhancing the right skills and culture
- building better workplace tools processes and governance for civil servant
- making better use of data
- creating shared platforms to speed up transformation

II. Local/Municipal Transformations:

Municipal governments in the UK have autonomy to prioritize their digital initiatives. In the effort of national digital transformation, the local governments benefit from the centralization efforts of the central government. It enables local governments to move the digitalization effort forward in their respective areas. GDS firmly placed the concept of government as a platform at the core of its 2012 strategy to reorganize online service provision. Common horizontal services, such as identification, payments and data storage, are centralized without affecting user experience, and software components can be easily reused by different local government services.

According to a report in 2018 by former GDS Director General Kevin Cunnington[263], there are now more than 175 services across the government that use one of the common components they operate. Local authorities are also taking advantage of these components. For example, Bath and North East Somerset Council use Notify to let residents know about bin collection days, while both GOV.UK Pay and GOV.UK Verify are also available to local authorities. In terms of making better use of data (to use data as an enabler of public services), local authorities have benefited from open data platforms[264].

[263] Cunnington, K. (2018)
[264] Data.gov.uk and GOV.UK Registers

III. Development and Implementation of Tools:

Since GOV.UK was launched, one of the central government's main focus is digital by default, meaning digital services which are straightforward and convenient can be used by all those who can choose to do so, while those who can't use digital services are not excluded. The term **'digital by default'** has a clear service delivery focus and is the goal for public services with over 100,000 transactions per year.[265] Although not mandated for local governments, the approach builds in many ways on the work that councils have been doing for years – a combination of appropriate channel choice and good design that not only reduces cost by 'shifting' services on to cheaper channels, but also improves the customer experience by allowing swifter and more convenient self-service interactions at any time and from any place.

Infrastructure Challenges

Despite the UK having the highest take-up and coverage of superfast broadband,[266] lack of adequate broadband coverage continues to pose real problems especially in rural parts of the country and is a significant contributory factor to both digital exclusion and people's failure to access government services through digital channels.[267] Therefore in 2013, the Department of Culture, Media and Sport (DCMS) announced the investment of £530 million to bring high-speed broadband to rural communities, reaching 90 per cent of homes and businesses, £250 million to extend superfast broadband to 95 per cent of the UK, and a further £150 million in 'super-connected cities'.[268] These investments were match-funded by councils, who worked closely with suppliers to implement broadband initiatives locally.[269]

Examples of Local Government Digital Initiatives

There are some examples where councils have used technology and digital tools and approaches in ways that demonstrate an impact both in terms of improved outcomes for citizens and financial savings.

East Riding of Yorkshire Council, a county of about 330,000 people, combined technology with effective customer insight and service redesign to deliver tangible savings while improving the customer experience.[270] They developed self-service kiosks to provide a range of council services, such as reporting a missed bin, booking a bulky waste collection, reporting a housing repair and making payments of council tax. Self-service

[265] Local Government Association (2014)
[266] Ofcom (2014)
[267] Local Government Association (2014)
[268] Department for Digital, Culture, Media & Sport (2015)
[269] Local Government Association (2014)
[270] Local Government Association (2014)

kiosks have been successfully installed with geo-mapping technology that helps users to easily report enquiries. As more customers self-serve, fewer staff are required to work within the Community Hubs[271] and more staff are able to deal with more complex enquiries centered on the council's most vulnerable users. The savings over a three-year period in terms of a reduction in full time equivalent staff. Amounted to £91,500[272].

Bristol City Council, a city of 500,000 people, uses mobile technology to increase the efficiency of its mobile neighborhood based staff, reducing office-based hours and increasing reporting of local issues.[273] The council equips their mobile officers with a "MyCouncil" app and a range of other standard software solutions enabling each officer to complete their daily tasks without having to visit an office to report some local issues. Between June 2013 and May 2014, 565 reports were submitted, resulting in a cost saving of £2,356 and an increased level of reporting from staff.[274] Office hours were reduced for a quarter of the staff, part of a larger programme of facilities reduction which is due to save the council an estimated £10 million over three years.[275]

A further emerging trend is for public bodies to invest in 'open source' systems that allow the organization itself to make changes to the software, rather than having to rely on the original developers. Local government has made extensive use of G-Cloud and open source[276]: Wiltshire Council procured, implemented, and trained staff in a new legal case management system in six months. Shropshire Council's Project WIP website service saved £204,000 over an initial five-year period; and Solihull MBC, using Red Hat Linux for over a decade, saved more than £1 million.

Tools:

REGULATORY AND STRATEGY

TOOL 1: Government Transformation Strategy 2017-2020

The strategy aims to transform citizens-facing services in a flexible way to improve efficiency of public sector provision. Additionally, to advocate for an internal government transformation to allow for a better collaboration and delivered enablement of change.

[271] The face-to-face Community Hubs provide integrated customer service, library, and leisure facilities.
[272] Local Government Association (2014)
[273] Local Government Association (2020)
[274] Local Government Association (2014)
[275] Local Government Association (2014)
[276] Local Government Association (2014)

TOOL 2: National Cyber Security Strategy 2016-2021

A strategy by the UK government to make Britain a secure cyberspace. Progress Report publicly published to monitor progress in its implementation[277] However, there is no defined portion of how this Strategy relates to the Local government. Also, the Local Digital Declaration states the following: *"Champion the continuous improvement of cyber security practice to support the security, resilience and integrity of our digital services and systems."* There is no clear mention of how it's related to the NCSS.

GOVERNANCE

TOOL 1: Local Government Association

A politically led cross party organization with a core membership of 335 out of 338 local councils in England aims to strengthen the communication channels between the Local and Central Government. It supports the work of council in moving toward digital transformation and allows for the development of local solutions to national problems. This process has facilitated the provision of funding and design for digital tools to allow councils to improve and redesign their services.

Impact: The impact of the association on the community is documented in case studies and through alumni challenge (project) records/documents identifying not only the positives with regard to the implemented projects but also the areas where the future challenge (Projects) contenders can improve.

TOOL 2: Scotland Local Government Digital Office

The office was developed after the passing of the Digital Transformation Strategy for Local Governments in 2015-2016 allowing for the 30 councils in Scotland to join forces to drive the digitization process.

The aim of the office is to turn the transformation strategy 2017 into a set of measurable and actionable goals to be used as guiding principles for the long-term digital process. Mainly to use a portfolio of collaborative initiatives to advocate for and promote citizen centered digital technologies that are cost effective and efficient so that they are favored by the citizens as opposed to commercial services. Additionally, it aims to promote and

[277] GOV.UK (2019)

collaborate with partnering firms to develop and deliver services in a dynamic world.

A key aspect of the Digital Office is the four-part digital frame work which is used to aid the move towards digitalization. This framework includes Digital Maturity, Digital Leadership elected members, Data Skills Development and Digital Transformation Capabilities.

Impact: Using the "discover, develop and implement" strategy the office has through programs like the technology enabled care (TEC)[278] program focused on developing and delivering services in the realm of digital classroom and education and health and social care. [279]

The impact of the digitization process is evaluated by looking at Maturity Leadership Framework.

TECHNOLOGY

TOOL 1: Social Security Scotland- Digital and Technology Strategy 2018-2021

A citizen centered policy whereby 11 services have been transferred to a digital forum following the Digital First Standards. The aim is to focus on poverty and inequality while preserving the dignity of the citizens, Building on the Agile Discovery engagement the strategy aims to design a high level architectural solution such that the 11 devolved benefits to the citizens of Scotland are transferred from the UK Department for Work and Pension such that they are accessible, safe and secure by design and meet the needs of the citizens. The aim of the strategy is to provide components that can be interchangeable so that they are able to adjust in a dynamic space allowing for a reduction in vendor control which can pose a restrictive platform.

Impact Measurement: The SSSD's success is measured through the Charter Measurement Framework. The aim of the framework is to evaluate how the services are being delivered and to improve their provision.[1]
Additionally, annual audits are done to evaluate the success of the service.[2]

Challenges: One of the major challenges of the implementation of the strategy and most other strategies adopted on a local level have been the constraints with regards to capital both human and financial. Other challenges have included, the lack of trust in the

[278] Digital Telecare (2020)
[279] Digital Office (2020)

institutions providing the services, and lack of awareness about the benefit, eligibility and application process.[280]

TOOL 2: Technology Code of Practice

A cross-government spend control process as part of the Transfer Strategy 2017 allows for the Government to develop and buy technology such that it meets the needs of the citizens and is easier to share, while less dependent on single third-part suppliers and providing a value for money.

The impact of the Gov.UK services are done through a performance platform dashboard, measuring how the services performed with respect to cost per transaction, user satisfaction, completion rate, and digital take-up. A feedback loop has also been developed where citizens are allowed to voice their concerns on the performance of the application and how it can be improved. The statistics are publicly available to see if the applications are meeting the expectation of the citizens.

TOOL 3: GOV.UK Services
(These are used by National and Local Bodies and the citizens)

Gov.UK. Verified[281]
An easy, secure and fast way of verifying the identity of a citizen so as avoid identity theft and secure sensitive personal information. The program utilizes the services of a select few government approved identity provider companies which after asking specific questions from the users sift through the data, they have on them to verify the identity of the persons. These companies specialize in identity verification services. They are also known as certified companies and include Barclays (Bank), Digidentity (Authentication Specialist Company)[282], Experian[283](Company using data analytics to help businesses understand their target customer's needs, additionally they specialize in identity protection of their account holders), Post Office (UK Post Office)[284] , SecureIdentity(Authentication Specialist Company)[285] The verification of citizens/users to use government services will only be done once in a matter of 5-15 minutes after the first time of verification each time you sign in it will only take a few moments to avoid

[280] Scotish Government (2019)
[281] Government Digital Service (2020)
[282] Digidentity (2020)
[283] Experian (2020)
[284] Post Office (2020)
[285] SecureIdentity (2020)

undue inconvenience to the user to make the process smooth and seamless and the process of verification does not affect the credit score of citizens.

GOV. UK Platforms as a service[286]
The platform as a service tool allows for the development of services on the internet in the shortest possible time with the avoidance of web loops so as to use the developers time efficiently and use finances efficiently. The platform aims to develop new applications at a fast pace, scale up the existing applications and invest in the promotion of backing up services like PostgreSQL and Redis databases.

GOV. UK Registers[287]
The service allows for structured data sets of government information on crime, geography, education, government, health and life circumstances among others[288] to help aid the building of services on high-quality secure data infrastructure. Currently there are 18[289] government organizations with an average range of 1-2 registers with a few having 6 or 10 registers each. Each Government body keeps their registers up to date through subject experts in those relevant government organizations. Since the data is kept up-to-date by subject experts from the government organization the data populated in the registers is from that organization.

GOV.UK Pay[290]
A service that is compliant of the payment card industry, allows for a secure management of payments.

GOV.UK Notify[291]
A service built by the Government Digital Service (GDS)[292], allowing bodies across government to keep the citizenry updated by the use of emails,[293] text messages[294] and letters[295] .

When the bodies across government sign in to this service (GOV.UK Notify) they can see on their dashboard which emails, text messages or letters their organization is sending the citizenry, files the organization has uploaded to Gov.UK Notify and how much of the

[286] GOV.UK Platform as a Service (2020)
[287] GOV.UK Registers (2020a)
[288] GOV.UK Registers (2020b)
[289] GOV.UK Registers (2020b)
[290] GOV.UK Pay (2020)
[291] GOV.UK Notify (2020a)
[292] GOV.UK Notify (2020a)
[293] GOV.UK Notify (2020b)
[294] GOV.UK Notify (2020c)
[295] GOV.UK Notify (2020d)

free allowance of text and emails their organization has used up. Each organization can set up templates for their emails, text messages or letters, these can be personalised using place holders like name, number etc. Once the templates have been set up there are two ways the services can be sent to the citizenry. Either the government body can integrate part of their service with GOV.UK Notify and use the API system of the GOV.UK Notify or by manually uploading files for small jobs.

When sending emails or text messages, using the manual uploading of files for small jobs the representative from the government body selects a template and uploads a file with all the contact information of the target audience. After the representative is satisfied with the text of the email or text message and verifies the information of the uploaded file, it is sent to the target audience. Real time progress on the sending of the email can be seen via the Dashboard on GOV.UK Notify, which will notify the user or government representative if anything needs to be done and if all the information provided is correct. The procedure for letters[296] is the same as for the emails and text message it's just that they are printed on e.g. Monday and dispatched on the following working day. These letters are sent via first (one day delivery) or second class (two day delivery) post. Though there is a free allowance for emails and text messages there are no free allowances for letters. The service is like all other services mentioned in this section, user friendly and accessibility with tutorials and guides to make the process more seamless.

Measurement of the Impact: The impact of the Gov.UK services are done through a performance platform dashboard, measuring how the services performed with respect to cost per transaction, user satisfaction, completion rate, and digital take-up.[297] A feedback loop has also been developed where citizens are allowed to voice their concerns on the performance of the application and how it can be improved. The statistics are publicly available to see if the applications are meeting the expectation of the citizens.

OTHER

MONITORING AND EVALUATION

TOOL 1: National Performance Framework

A tool used to collaborate the efforts of multiple stakeholders including the national and local governments, businesses, voluntary organizations and the citizens to meet a

[296] GOV.UK Notify (2020d)
[297] GOV.UK (2020f)

collective set of common national outcomes. These national outcomes include but are not limited to the provision of services with particular focus on environment, education, human rights, health and poverty. The framework acts like a tracking tool to monitor the performance of the Scottish Government to understand its progress towards digitalization. It provides a matrix showing the breakdown of equality data. Through this matrix it identifies and compares the progress of the citizens with protected characteristics as opposed to the general citizens. This is done through listening to citizens who use public services and working in the public private realm focusing on the provision of services in a way such that problems are prevented before they start in the most efficient way. A key aspect of this process is the improvement of the procurement practices, focusing on sustainable procurement.

Measuring success:
Interactive data Matrix dashboards, national indicator performances models and general performance overviews are used to measure the impact of the framework.

Impact: The framework's success towards the achievement of the national outcomes has been monitored by senior analysts in the Scottish Government. The process has looked at 81 indicators and whether Scotland has improved, maintained or worsened based on the last two points. As of late Scotland has predominantly maintained its performance[298]

COMMUNICATION

TOOL 1: Blogging and Nationwide events of Local Government Digitalization

Through the use for blogging GDS and local governments disseminate information, news and updates on the digitalization process in the UK to raise awareness about the process so as to invite more local governments to join the process. Since the Local Digital Declaration is a guiding principle and not law it allows for a medium to share experiences and encourage the speeding up of the process at a local level.

Impact: An increase in Local Governments sharing their experience through the use of blogs and attending events organized by GDS.

[298] Scottish Government (2020)