Towards effective digital transformation strategies: exploring Mexico's National Digital Strategy.

Master Thesis

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Abbreviations

DTS	Digital Transformation Strategy
DRP	Digital Regulation Platform
IADB	InterAmerican Development Bank
ICTs	Information and Communications Technologies
ITU	International Telecommunications Union
KBC	Knowledge-Based Capital
KPIs	Key Performance Indicators
NDP	National Development Plan
NDS	National Digital Strategy
OECD	Organisation for Economic Co-operation and Development
SMEs	Small and Medium Enterprises
TOE	Technology-Organization-Environment Framework
WB	World Bank

1 Introduction

1.1 Research motivation

In the current digital era, society appears more interconnected than ever; however, technology has not succeeded in bridging societal divides. As of 2023, approximately 67% of the population, equating to 5.4 billion individuals, has an Internet connection (ITU, 2023b). This connectivity varies significantly by economic status: in high-income countries, about 93% of the population is connected, whereas in low-income countries, only 27% of individuals have Internet access (ITU, 2023b). Additionally, gender disparities persist, with approximately 70% of men online compared to 65% of women. According to the International Telecommunications Union (ITU), gender parity is achieved when the *parity score* ranges between 0.98 and 1.02. As of 2023, the worldwide score is 0.92. In high-income countries, gender parity in Internet access has been attained, but low-income countries are lagging. Furthermore, a disparity exists between urban and rural areas: urban areas having 81% connectivity, whereas rural areas have only 50% (ITU, 2023b).

The concept of digital transformation is believed by some experts to have originated in the mid-1950s with the invention of microchips and semiconductors, which enabled the conversion of manual processes into digital technologies (Casalino et al., 2021). The introduction of the Internet in the early 1990s transformed isolated systems into interconnected networks (Needham, 2013). Initially ideated by the private sector, this trend soon permeated the public sector, with the earliest electronic services emerging in the late 1980s (Aguilar, 2021). The implementation of new technologies has revolutionized interactions between individuals and governments, access to goods and services, and production methods (Priharsari et al., 2023).

Within the public sector, Ebert & Duarte (2018) outlined the objectives of digital transformation in two key sections: social and economic. In the social realm, digital transformation aims to foster a more innovative and collaborative culture within industries. It also seeks to reform the education system to equip society with new skills essential for thriving in a digital world. The creation and maintenance of digital communication infrastructure is crucial for delivering high-quality services (Ebert & Duarte, 2018). In the economic realm, the goals include implementing new business models and enhancing the regulatory framework and technical standards. These advancements are anticipated to boost productivity and income generation (Ebert & Duarte, 2018).

Within the international agenda, digital transformation is considered a priority, with the United Nations recognizing it as foundational for achieving the Sustainable Development Goals (Department of Economic and Social Affairs, 2015). To ensure a comprehensive and integrated plan for effective digital transformation, governments develop and work around a national digital strategy. These strategies are designed to establish objectives, guide policy implementation and outline the digital transformation path for a country (Gierten & Lesher, 2022; Priharsari et al., 2023). According to the ITU, as of 2023 over half of the countries worldwide have integrated digital strategies (Digital Regulation Platform, 2023). Furthermore, among the 38 member countries of the OECD, 34 had adopted a digital strategy by 2020 (OECD, 2020b).

Several international organizations have developed guides to facilitate the adaptation to digital technologies. These guidelines help countries in creating their national digital strategies. The World Bank (WB), the United Nations (UN), the Organisation for Economic Co-operation and Development (OECD), and the Inter-American Bank of Development (IADB), are some of the organizations that have published these guidelines. While these guides provide a general framework for government, they are not one-size-fits-all documents. Governments must consider the specific contexts they face before adopting these tools. Furthermore, countries of the Global South face additional challenges, as much of the research has been conducted with a Eurocentric perspective.

1.2 Research problem

In this context, countries must have a comprehensive digital strategy to maximize the benefits of digital technologies. The focus should extend beyond merely adopting new technologies to include the development of skills, institutions, and regulations (WB, 2016). Furthermore, the policies adopted by countries should develop at the same pace as digital transformation in a country is done (WB, 2018). While all countries strive towards digital transformation, it is essential to consider cultural, social, and economic contexts when analysing and implementing a digital strategy (Casalino & Zuchowski, 2019; Tham, 2018).

As previously states, numerous guidelines for digital transformation have been developed by various entities, including governments, international organizations, consulting agencies, and private companies. This research will focus on the guidelines formulated by international organizations aimed at developing digital strategies at the national level. These guidelines are particularly valuable due to their broad applicability, allowing for adaptation to the specific needs of different governments. Among the international organizations that have produced such guidelines, three stand out for their emphasis on national-level strategies: the Organisation for Economic Co-operation and Development

(OECD), the Digital Regulation Platform (DRP) (a joint effort between the World Bank (WB) and the International Telecommunication Union (ITU)), and the Inter-American Development Bank (IADB). These guidelines offer comprehensive frameworks aimed at fostering national digital strategies, distinguishing them from those that are more locally focused.

Within the global context of digital transformation and its nuanced implementation, understanding the unique cultural, social, political, and economic context becomes essential. These considerations are particularly crucial for a country like Mexico, which, with a population of over 126 million, represents the second-largest economy in the Latin America region and the 12th worldwide (IMF, 2023). In the international sphere, Mexico is a member of several international organizations such as the UN, OECD, WB, IADB, APEC, and WTO, just to mention some.

The political background of the country influences the development of government strategies. Federal administrations serve six-year terms without the option for re-election, which often leads to the design of strategies intended to span solely the duration of a single presidential term. This absence of a long-term perspective and a vision beyond political parties hinders the development of a comprehensive digital transformation strategy. The year 2024 represents a pivotal moment for the country as the current government completes its six-year term. In terms of digital transformation, this implies that the National Digital Strategy initiated in 2021 will conclude (Coordinación de Estrategia Digital Nacional, 2021). Mexico offers a unique case study for understanding and identifying key areas in the development and implementation of a national digital strategy.

1.2.1 Research questions

This research will aim to answer the following **research question:** How are technological, organizational, and environmental factors addressed in national digital strategy guidelines developed by international organizations?

SRQ 1: How do the national digital strategy guidelines of the IADB, OECD, and DRP differ in their approaches, priorities, and recommendations?

SRQ 2: Which guideline exhibits the highest alignment with the Mexican National Digital Strategy?

SRQ 3: What specific technological initiatives or investments are prioritized within the Mexican National Digital Strategy, and how do they align with the recommendations of the IADB, OECD, and WB guidelines?

The scope of this research includes:

- Objectives of Digital Transformation: Reviewing social and economic goals within the public sector.
- International Guidelines: Analysing the guidelines provided by the IADB, OECD, and DRP for developing national digital strategies.
- Case Study – Mexico: Evaluating the 2021-2024 Mexican National Digital Strategy using the TOE framework.
- Comparative Analysis: Identifying differences in approaches, priorities, and recommendations among the guidelines.
- Assessment of the Mexican Strategy: Evaluating the alignment of the Mexican National Digital Strategy with international guidelines.

1.2.2 Research objectives

This research aims to make two primary contributions to the field. Firstly, it will provide a comprehensive analysis and comparison of three guidelines using the Technology-Organization-Environment (TOE) framework. Secondly, the Mexican National Digital Strategy will undergo an evaluation using the same evaluating parameters as the guidelines. This assessment aims to determine the extent to which the strategy addresses various aspects and to identify its closest alignment with one of the three guidelines.

These two principal outcomes will provide practical utility to the field. The conceptual matrix provides a systematic approach for future researchers engaged in the comparative analysis of diverse guidelines, creating a cohesive analytical framework. Furthermore, applying this matrix to an existing national strategy, exemplified by the Mexican National Digital Strategy, demonstrates its efficacy in practical contexts.

While there is research on digital transformation and digital strategies, limited studies (Benz et al., 2017; Meuleman, 2021; Ward, 2011) evaluate the implementation and impact of national digital strategies aligned with frameworks from an international organization. This research will provide a concrete example of how these guidelines either facilitate or hinder the implementation of national digital strategies.

1.2.3 Structure of the research

The structure of this research is as follows: Chapter 2 is composed of a review of literature about digital transformation in the public sector, followed by an analysis of the selected guidelines and explain the main concepts and recommendations provided. Chapter 3 will explain the theoretical framework upon which this research is built by providing a detailed

explanation of the Technology-Organization-Environment (TOE) framework. Chapter 4 will describe the research design and the methods used to analyse the guidelines, including data collection methods and data analysis techniques, limitations, and explain how the results will be presented. Chapter 5 presents the results of the analysis of the guidelines and the Mexican National Digital Strategy, following the TOE framework. Additionally, this section explains the grading received in each category, followed by the discussion in Chapter 6. Chapter 7 concludes the research with a summary of findings and suggestions for future research.

2 Literature Review

This section will first provide a deep analysis regarding digital transformation in the public sector. As this research aims to identify specific characteristics present in the literature, a comprehensive analysis on each of the selected guidelines is conducted. Numerous international organizations, governments, private companies, and non-governmental organizations have published their own guidelines. Nevertheless, considering the research's emphasis on understanding the development of digital transformation strategy at the national level, the scope of available guidelines is constrained. Despite the broad array of available guidelines, this research prioritizes those provided by international organizations due to their comprehensive and globally relevant perspectives on digital development.

As mentioned by Miles & Huberman (1994) a conceptual framework allows a researcher to explain the concepts to be used in the research and specify the connection between these. Therefore, the selected papers were identified following the next keywords: "e-government", "national digital strategy", "digital transformation", in combination with "public sector", "public administration", and "guidelines".

2.1 Digital transformation

The term digital transformation, first ideated by the private sector, is related to the use of new technologies to maintain a competitive role in the Internet age (Mergel et al., 2019). The transformation of online services is perceived as a technique to improve customization by standardizing things (Andal-Ancion et al., 2003). Berman (2012) defines digital transformation as a way to rethink business models using new technologies. Due to the increase of technologies being created, citizens are starting to increase their expectations of the public sector's delivery of services (Mergel et al., 2019).

Thanks to the development of new agreements in digital technologies, governments are evolving the delivery of services. The use of information technologies (ICTs) in the public sector has been defined in literature as e-government (Aguilar, 2021). Bounabat (2017) describes that e-government is the use of ICTs to ensure government access and delivery of services, promote efficiency within the government with these services, cover a large scale of services, and ultimately transform governments. Furthermore, the United Nations defined e-government as "*the use of ICTs to deliver government services more effectively and efficiently to citizens and businesses. It is the application of ICTS in government operations, achieving public ends by digital means*." (United Nations, 2020, para.1). According to Gartner's Four Phases of e-government model (2000) the transformation that an administration should follow must be gradual.

The four stages presented by Gartner are:

Presence: This first stage is the most basic, where a government creates a webpage, and some information is made available online. As the data information is provided online without altering existing processes, there is no need for a redesign, as it is only a process of digitizing data (Aguilar, 2021; Al-Hashmi & Darem, 2008).

Interaction: During this second stage, services are provided, enabling interactions between the government and the citizen (G2C), government to business (G2B), or between government institutions (G2G) (Al-Hashmi & Darem, 2008).

Transaction: In this third stage, interaction between the government and its citizens becomes available. Online transactions in real time with two-way communication are possible (Bounabat, 2017).

Transformation: This final stage, which is most aligned with the concept of governance, allows for a deeper connection between the government and its citizens. This stage involves a holistic restructuration of the way functions within the government are perceived and carried out (Al-Hashmi & Darem, 2008).

For this research, the last stage of transformation will be explored in greater detail.

2.2 Digital transformation in the public sector

In research on the public sector, the term "digital transformation" has been studied in relation to how services are being delivered (Kitsios et al., 2023). Several definitions regarding the digital transformation of the public sector have been proposed. Some authors highlight the use of new technologies to enhance the accessibility of information for citizens (Roots et al., 2017). Other authors argue that new technologies should be used to create new services for citizens (Kontogeorgis & Varotsis, 2021). Additionally, some authors emphasize the interaction between citizens and the government via ICTs (Chung & Kim, 2019).

Karpenko et al. (2023) define digital governments as the use of ICTs technologies to help state functions, services, and citizen participation in socio-economic development, processes, and quality of life. Due to the increase of digitalization in the public sector, it is necessary to reanalyse policies, processes, and services so that communication for citizens and workers is simplified (Mergel, 2021). Mergel et al. (2019) argue that digital transformation is a continuous process where procedures, amenities, and commodities should adapt to external demands. This process results in better relations between institutions and stakeholders, as well as citizens' satisfaction. Similarly to Mergel's

argument, Alenezi, (2022) attests that a government's digital transformation strengthens relationships, increases citizen engagement, accelerates the economy, enhances policy implementation, and overall has a positive impact. For the public sector, digital transformation represents new means of collaboration with stakeholders, contemporary frameworks of service delivery, and creating new interconnections (European Commission, 2016). The digital transformation process should be seen as "*a social reinvention and cultural change that affects procedures, uses and customs of people and organizations*"(Cubo et al., 2022, p.215).

2.3 National Digital Strategy

As defined by Gierten & Lesher (2022), a National Digital Strategy (NDS) is a government's blueprint for all digital policy across the areas influenced by digital transformation. To fully exploit all the benefits from digital technologies, a country should not solely focus on the development of new technologies, but also develop regulations, skills and regulatory institutions (WB, 2016). The creation of regulations helps develop skills that, in turn, foster opportunities in the digital world and make institutions more accountable (Priharsari et al., 2023). The WB (2018) mentions that the creation of all policies related to digital technologies should revolve around digital transformation. Hanna (2004) argues that a national digital strategy is necessary for development in the new techno-economic digital era. While there are various aspects that should be included in a NDS, authors agree that it is not possible to agree on a universal conceptual framework for how a NDS should be interpreted and adopted (Alizadeh & Sipe, 2015).

2.4 Government Digital Transformation Guide

The Inter-American Development Bank (IADB) was established in 1959 with the drafting of the "Articles of Agreement" by the Organization of American States (OAS) (*OAS*, 1959). The IADB is the largest multilateral financing source for Latin America and the Caribbean region and is owned by 48 states, of which 26 are borrowing countries (*IADB*, n.d.). Non-borrowing countries include Canada, Germany, Israel, Japan, the People's Republic of China, South Korea, Spain, United States, among others. The bank provides loans to the governments of the borrowing countries at standard rates and preferred credit status. This arrangement ensures that borrowing countries prioritize repayment to the bank before other lenders, such as commercial banks. Unlike other financial entities, borrowing countries hold the majority of shares and have control of the decision-making. The voting power within the bank is determined by the shareholding of each member country (*IADB*, n.d.).

Government Digital Transformation Guide

Published in 2022 by the Inter-American Development Bank (IADB), the Government Digital Transformation Guide is a comprehensive document that serves "*as an encyclopaedia of digital government"* (Cubo et al., 2022). The guide can be analysed and applied as a whole, or by focusing solely on one of its sections. The five axes of analysis are Governance and Institutional Framework; Legal and Regulatory Framework; Digital Talent and Change Management; Infrastructure and Technological Tools; and New Digital Processes and Digital Services (Cubo et al., 2022). The guide works around the principles of transversality, comprehensiveness, technological neutrality, and practicality.

2.4.1 Governance and Institutional Framework

For digital transformation to be correctly implemented, governance must be established at the highest level to ensure coordination of all actions across the government. An independent body can achieve co-responsibility and a legal framework must be established to regulate its functions, responsibilities, interactions with other government entities, and end goals. Successful digital transformation requires active participation from all stakeholders to ensure multidimensional communication and coordination. As the ultimate recipients of government goods and services, citizens should also play an active role.

Digital transformation strategy: A national digital transformation strategy coordinates government digitalization (Cubo et al., 2022), involving input from government, citizens, the private sector, and academia. It aligns the digital agenda and technology strategy with political and economic plans and includes a communications plan for informing audiences and managing institutional relations. A cybersecurity strategy is essential due to the handling of sensitive information, and a contingency plan addresses potential challenges. Effective monitoring and evaluation are crucial, with institutions defining coverage levels and relevant metrics.

Lead institution: A successful digital transformation requires defining the relationship between the government, citizens, and companies within the governance framework. A lead institution should oversee the entire process, draft ICTs regulations, govern digital transformation, and provide ICTs services. This institution must have a clear mandate, defined powers, specialists from various backgrounds, a budget, operational capacity, and coordination capability.

Governance mechanisms: Large digital transformation processes involve numerous actors and stakeholders, necessitating formal mechanisms for binding decisions at the

central government level. Due to the horizontal impact of projects, a steering committee is essential for proper coordination. These committees ensure coherence, monitoring, and accountability.

Operational management: Operational management involves the actions required to implement the strategy. Given the numerous operations and requests from different interlocutors, it is necessary to prioritize requests and have a single point of approval, prioritization, and verification. As actions are often addressed in parallel, team capabilities, technological infrastructure, and processes must be well-governed.

Sectorial digital transformation strategies: Common services with sector-specific goals should have their own digital transformation strategies, coordinated with the national strategy to achieve better results for citizens.

2.4.2 Legal And Regulatory Framework

Given their interaction with citizens and companies, public administration needs a clear set of rules for all situations. Traditional regulatory frameworks are often ill-suited to the challenges and opportunities presented by new technologies, necessitating flexible adaptations with a long-term vision.

Administrative simplification: Regulations can impose requirements that create access barriers and additional costs for citizens and businesses. Digital transformation aims to streamline processes for both authorities and citizens, focusing on generating the greatest value by reducing transactional costs.

Transparency and open government: An open government fosters a relationship between the state and its citizens by creating legitimate and accountable institutions. Strategies for openness should include transparency, integrity, collaboration, and citizen participation. Laws and regulations should promote these principles and build institutional capacity to enforce them.

Accessibility and usability: Digital transformation has social and cultural effects, requiring a flexible approach to accommodate these changes. Information systems need simplification to ensure easy adoption and use by all citizens. Systems must be accessible to everyone, regardless of condition, location, or disability.

Data protection: The processing of personal data in cyberspace increases privacy risks. New processes must balance protecting citizens' rights with fostering innovation. A robust regulatory framework is essential to ensure personal data is protected through strict enforcement.

Interoperability: Digital transformation requires standards for how actors are involved and how products and services integrate. A regulatory framework ensures that information systems from all sectors can exchange information and use similar operating techniques.

Data: A coordinated, holistic strategy and a regulatory framework for data governance are necessary for all public and private entities handling data. This strategy includes both legal and semantic regulations to homogenize data treatment.

2.4.3 Digital Talent and Change Management

Human talent is essential for the successful development of a digital transformation process. The new tasks required for the transformation demand a variety of hard and soft skills. As ICTs now play a key role in strategy development, new leadership positions need to be created, along with the training of public employees to handle these new tasks.

Key roles for a digital government: In the evolving economic context, agility and innovation promotion are crucial. Creating C-level positions is a key pillar for transformation in any institution. Important roles to establish include Chief Information Officer, Chief Data Officer, Chief Information Security Officer, Chief Digital Information Officer, Chief Technology Officer, and Sponsors or Agents of Change.

Training of public employees: Digital transformation can change employees' tasks, potentially leading to resistance. A strategy is needed to address this resistance and provide opportunities for new tasks. Training should focus on performance and productivity, enhancing skills, providing greater autonomy, developing new competencies, and ensuring overall job satisfaction.

Organizational change management: The transformation process requires a paradigm shift in government and the relationship between institutions and citizens. While changes will benefit the collective, individuals may face some constraints. Human talent is the backbone of the transformation process, so a strategy for reinforcement and continuous support is essential.

Relationship with citizens in a digital context: It is important to have a strategy to reduce existing societal gaps through digital transformation. Proper planning can help technology bridge these gaps. Additionally, citizens need training in new digital skills to benefit from digital solutions.

Public-private collaboration: Highly qualified resources, often found in the private sector, are needed for the transformation process. Mechanisms promoting public-private

collaboration are necessary as the public sector alone cannot address all challenges. Collaboration with all stakeholders from both sectors is essential.

2.4.4 Infrastructure and Technological Tools

In the digital era, technology directly influences society and its members, impacting both economic processes and almost all aspects of human life. Implementing technologies in the public sphere has led to improvements and the creation of new services for citizens. The digital transformation process must encompass the adoption of technology itself, not just the end benefits.

Infrastructure: Given the volume of data handled by organizations, necessary tools must be available to manage it quickly and securely. As citizens demand a more transparent and efficient government, there is a need for greater processing and storage capacity in the cloud or data centres. Additionally, adequate technological services and digital workstations are required.

Data: Data alone does not provide value without analysis. Information emerges when data is organized with specific rules and intelligence is applied. A country's data policy must specify several dimensions to be accessible to all institutions while remaining flexible enough for each institution to adapt through minimum standardization. This standardization ensures proper interoperability between institutions and compatibility for analysing data from different sources.

Cybersecurity: Given the information handled by public administration, cybersecurity must be a pillar for all organizations. Key aspects of the cybersecurity framework should include threat analysis, vulnerability detection, ethical hacking, a cyber emergency response team, and an operation centre, among others.

Disruptive technologies: The digital era advances rapidly, making new technologies available for governments and citizens. However, many of these technologies are not yet mature enough for large-scale implementation in the public sector. Public institutions must channel and promote studies to analyse the feasibility of these technologies. Emerging technologies for public service innovation include big data, artificial intelligence, robotic process automation, the Internet of Things, and blockchain.

2.4.5 New Digital Processes and Digital Services

Digital technologies have transformed the way society lives, works, and interacts. These technologies offer potential benefits for economic and social development by adapting

services to citizens' needs. Digital transformation goes beyond a web page; it involves restructuring processes and training new skills.

Administration perspective: Digital transformation refers to the electronic processing of activities and administrative procedures. Homogenized data allows for effective monitoring of public services and analysis of results, facilitating government decision-making.

Citizen access to digital services: For citizens, this transformation changes their relationship with the public sector as the public services by making public services more accessible. However, it is crucial that these services are user-friendly to encourage their adoption over traditional options.

2.5 Going Digital Integrated Policy Framework

The OECD is an international organization established in 1961 to promote economic progress and world trade. Its predecessor, the Organisation for European Economic Co-operation (OEEC), was founded in April 1948 to help administer the Marshall Plan. By the late 1950s, several member countries believed the OEEC had fulfilled its purpose and should be adapted for a more global perspective (*OECD*, n.d.). Following the Rome Treaties of 1957, the OECD was founded with 20 members, including 18 European countries and 2 from the Americas. Currently, the OECD has 38 member countries and several participating partners, including the European Union (*OECD*, n.d.).

Going Digital Integrated Policy Framework

As part of the OECD Going Digital project, the OECD published in 2020 its 292nd volume of the Digital Economy Papers (OECD, 2020a). The Going Digital Integrated Policy Frameworks provides a roadmap for governments, individuals, and stakeholders to create policies for a thriving digital future (Gierten & Lesher, 2022). The framework involves a cross-cutting analysis of vectors across several policy domains and includes seven policy dimensions: access, use, innovation, jobs, social prosperity, trust, and open market openness (Figure 2). Each dimension explores multiple policy domains that must be considered together to promote coordination and eliminate policy silos.

(OECD, 2020a)

Figure 1. Going Digital Integrated Policy Framework OECD

2.5.1 Access dimension

Communications infrastructures and services form the foundation for interactions between people, organizations, and machines, enabling an interconnected flow of information. Efficient digital transformation requires access to robust communication networks. As data becomes crucial economically, its availability and accessibility are vital.

Investment: Promoting investment in communications infrastructure is essential for enhancing access. In OECD countries, most investment comes from the private sector. Governments should identify and remove investment barriers and promote a competitive environment. The OECD's Recommendations on Broadband Development (2004) and International Mobile Roaming Services (2012) offer guidance.

Communications infrastructure and services: Investment barriers often relate to traditional infrastructure policies. Ensuring the development, access, and use of IXPs without hindering interregional networks is crucial. Spectrum, a scarce resource for data transmission, should be equitably distributed (OECD, 2014a). With IPv4 addresses becoming scarce, policy measures are needed for deploying infrastructure and services (Ayoub et al., 2018; OECD, 2014b).

Competition: Governments should promote competition in the communications market to attract private investment and support emerging technologies (OECD, 2019f). Competition improves broadband quality and speed, aiding underserved populations. Policies should ensure a variety of network and service providers and guarantee access to infrastructure deployed by other entities (OECD, 2014c).

Regional development: Innovation and competition help address digital divides, especially in rural and remote areas where market entry barriers are higher. Most OECD countries have national broadband plans with provisions for public investment in rural areas, prioritizing speed and coverage (OECD, 2018a). Encouraging private investment through incentives like tax exemptions and reduced spectrum fees can support universal connectivity(OECD, 2018a). The availability of data can result in economic and social benefits (OECD, 2019a).

2.5.2 Use dimension.

To harness the full potential of digital technologies, understanding their correct usage is essential. This entails recognizing the benefits they offer and fostering trust and knowledge among users. While the usage of the Internet is widespread across OECD countries, the adoption of advanced tools declines with the demand for higher skills (OECD, 2017a).

Digital government: In recent times, many countries are migrating towards a more holistic approach to e-government, known as digital government. This approach emphasizes a user-driven approach to design, develop, deliver, and monitor policies and services (Attrey, 2018). Digital technologies offer an opportunity to reconsider government processes, procedures, and services by integrating digital elements and addressing citizens' needs. Digital government strategies enable a more systematic approach towards digital transformation. In this regard, the OECD Recommendation of the Council on Digital Government Strategies (2014) and the G20/OECD High-Level Principles on SME Financing (2015) can provide further insights into the topic.

Investment: The spread of digital technologies relies on infrastructure investments. Investment in high-speed broadband infrastructure facilitates the adoption of technology. (Andrews et al., 2018). The effective use of technologies should be complemented with KBC. Financial support for the investment of ICTs equipment, as well as non-financial support such as training, is essential for successful implementation (OECD, 2019d).

Business dynamism: Technology diffusion is closely linked to business dynamism, which influences resource allocation. While some firms can successfully adopt digital tools, others must scale down or exit the market (Andrews & Criscuolo, 2013). This dynamism has been declining in many OECD countries in the past years (Criscuolo et al., 2014), especially in deep digital sectors (Calvino & Criscuolo, 2019).

Small and medium enterprises: The use of digital tools is essential for SMEs seeking to improve their processes, drive innovation, and achieve growth. However, many SMEs

lag in the adoption of digital technologies due to barriers such as limited awareness, investment constraints, and capability gaps. Governments must support SMEs through improved policy frameworks, awareness campaigns, and skill development of initiatives.

Skills: The success of firms do not depend solely on the workers' abilities in problem-solving, literacy, numeracy, and general ICTs skills. Increasingly, ICTs and data specialists are being needed, particularly in significant digital sectors where the need for specific skills and competencies is rising. To ensure firms keep pace with the digital transformation process, training for workers is essential.

Digital security and privacy: Trust in digital technologies is essential for digital interactions. Addressing concerns about security and privacy requires managing digital risks and understanding technology workings (OECD, 2019c).

2.5.3 Innovation dimension

Digital innovation drives the digital transformation, revolutionizing interactions, production, and consumption. It fosters new business models and enhances efficiency in the public sector. The efficient use of digital technologies not only promotes digital innovation but also leads to improved performances across the economy (Guellec & Paunov, 2018).

Entrepreneurship: Structural factors promoting new ventures are crucial for fostering innovative businesses (McGowan et al., 2017). Investing in KBC boosts complementary skills and benefits new business models.

Small and medium enterprises: Young firms play a crucial role in the digital innovation landscape, underscoring the necessity of policies that promote their creation and growth. These smaller firms often have limited resources to pursue digitally driven business models or incorporate digital technologies. By implementing innovative tools such as crowdfunding, SMEs can access new financing mechanisms (OECD, 2019b).

Competition: In a digitalized economy, market concentration can represent a barrier to innovation. While young firms often act as a source of competition for similar actors, larger firms may exert influence over economy-wide innovation. Regulatory frameworks should allow flexibility to adapt to evolving business models, ensuring fair competition and innovation promotion (OECD, 2018c).

Science and technology: As digital innovation relies on a constant contribution to the knowledge base, research in science and technology becomes essential. In this regard, support for universities and research institutions is crucial (OECD, 2015b). Given the

uncertainty of the outcomes, the private sector often exhibits hesitation in investing. Therefore, it falls upon the public sector to invest in research. Public sector investments, partnerships with universities and industry, and initiatives such as public-private partnerships (PPPs) and open science all serve to promote innovation and data-driven initiatives.

Digital government: Digital government strategies, particularly those involving open government data, foster innovation and enhance efficiency in the public sector. Digital technologies can become more efficient and eliminate waste. OECD publications like the "OECD Innovation Strategy (2015)" provide guidance on innovation.

Sectoral policies and regulations: The momentum of digital transformation varies across sectors. The OECD's taxonomy maps out to which length different industries have gone digital. While digital technology is ubiquitous across industries to some degree, certain sectors are becoming more deeply integrated with digital technology than others.

2.5.4 Jobs dimension

Digital transformation is reshaping organizations and markets, raising questions about shifts in the job market and necessary skill sets. Creative destruction, where some jobs vanish while others emerge, is a notable effect of this transformation, with 42% of new jobs created between 2006 and 2016 in OECD countries attributed to digital sectors. Projections suggest that 14% of jobs could be automated and 32% could undergo significant changes within the next two decades (Nedelkoska & Quintini, 2018). To inform policy, the OECD offers guidance through publications like the "OECD Jobs Strategy (2018)" and the "OECD Skills Strategy (2019)".

Labour markets: Policies should facilitate worker transitions across businesses, industries, and regions, promoting mobility and skills transfer. Regulations need updating to remain relevant amid digital transformation, addressing issues like employment protection and working time regulations (OECD, 2019e). Flexibility is crucial to accommodate new forms of work and ensure regulatory neutrality.

Skills: A diverse skill set is required for the evolving demands of digital transformation, encompassing literacy, problem-solving, ICTs, and soft skills like creativity and communication. In newly developed jobs, deep ICTs specialization and data skills are needed, and demand is higher than supply in most OECD countries (OECD, 2017a). Training programs should span from early education to lifelong learning, with incentives for investment in transferable skills and collaboration with the private sector.

Social protection: Effective systems are needed to protect workers during transitions, offering both passive and active programs and constant retraining opportunities. Challenges include providing social protection for non-conventional work arrangements and informal workers.

Tax and benefits: Tax and benefit systems must adapt to provide minimum protection and ensure the portability of social security across different job contexts. Governments should promote non-contributory systems for universal access to social protection regardless of their contract status.

Regional development: The effects of digital transformation vary by location, sometimes exacerbating regional inequalities as jobs are created and lost in different areas (Sorbe et al., 2018). Regions with lower automation potential often have higher levels of tertiary education and urbanization (OECD, 2018b). To assist displaced workers subsidies could be provided to lower relocation costs, and housing policies could support mobility to regions with more job opportunities (Andrews et al., 2011; OECD, 2015a).

2.5.5 Society dimension

Digital transformation's societal impacts are complex, affecting how individuals, firms, and governments interact. While it can enhance access to information, improve healthcare, and promote education, it also exacerbates work-life imbalances, isolation, negative mental health outcomes, and digital disparities.

Social policies: Social policies must address digital gaps, including geographic and gender divisions, by ensuring equal access and opportunities for all Berger, 2009; Moretti, 2012; OECD, 2018). Governments can leverage digital technologies like big data to implement targeted social policies and enhance overall well-being.

Skills: Skill development throughout the life cycle is crucial to ensure everyone benefits from digital transformation and to minimize existing gaps. This includes foundational competencies like literacy and problem-solving skills, as well as soft skills essential for success in the digital age.

Tax and benefits: Evolving societies require redistribution policies to ensure inclusivity, particularly as work dynamics change in the digital age. While income support and personal income taxes have declined (Causa & Hermansen, 2017), increased spending on social policies is necessary to address emerging challenges (Causa et al., 2018).

Environment: Digital technologies offer opportunities for environmental improvement by reducing the footprint of the ICTS sector, enhancing efficiencies, and modifying social

and cultural behaviour. However, their rapid diffusion can also increase resource and energy demands, necessitating better recycling and disposal practices. E-commerce can affect recycling regimes and producer responsibility principles (Hilton et al., 2019), while changes in global value chains may impact environmental footprints across countries (Backer et al., 2018).

Health care: Digital technologies offer both opportunities and challenges in healthcare. They enable the digitization of health records, utilization of new surgical equipment, and adoption of telemedicine, enhancing care and cost-effectiveness. Moreover, big data can facilitate personalized care and advance understanding of health status. However, concerns about data protection, privacy, security, transparency, accountability, and quality and safety standards also emerge.

Digital government: Governments are increasingly embracing digital government strategies to enhance citizen engagement (OECD, 2017b). This shift prioritizes user needs and involves stakeholders more deeply in policy delivery. By adopting a citizen-driven approach, governments promote greater openness and public engagement throughout the policy cycle.

2.5.6 Trust dimension

Embracing digital transformation requires trust among individuals, firms, and governments to ensure its social and economic benefits outweigh the challenges (Mayer et al., 1995). Trust is crucial in navigating the uncertainties and interdependencies inherent in the digital sphere. Balancing potential benefits with risks is essential, recognizing that uncertainties cannot be eliminated.

Digital risk management: Managing digital risks requires a common reference for all stakeholders, spanning various sectors. Policies should integrate digital risk management to foster trust among individuals and organizations. Depending on policy objectives, risk management activities may differ, necessitating policies to address interrelated risk levels. Transparency is crucial to ensure trust in the risk management capabilities of all actors involved.

Small and medium enterprises: SMEs and start-ups encounter distinct risk management challenges compared to larger firms, with potential impacts being more significant. Security incidents could lead to trust loss, reputation damage, and economic setbacks. Moreover, these enterprises often lack a robust risk management strategy. Increased awareness of digital risks could present additional partnership opportunities.

Privacy: Personal data protection plays a vital role in digital transformation as the volume of processed data increases daily, amplifying associated risks. These risks extend beyond individuals to the principles underpinning privacy protection. Privacy is not just a value to uphold but also a prerequisite for economic and social prosperity (OECD, 2016). Despite positive developments, a strategic approach to privacy remains crucial.

Digital security: In the realm of digital security, economic, social, and national security aspects are considered. While digital security risks are seen as technical issues economically, the evolving nature of digital transformations requires cultural shifts in government strategies. Achieving a completely secure digital environment is unattainable, so understanding risk management is vital for organizations and individuals. Collaboration among stakeholders is crucial for effective risk management and public policies play a key role in creating an environment for secure technology frameworks and responsible digital use.

Consumer protection: With emerging technologies like IoT, consumer protection is paramount for building trust. Addressing consumer concerns about digital risks and clarifying responsibilities in the digital market is essential for fostering trust. As digital technologies blur traditional roles and rights between consumers and businesses, individuals require new skills to navigate these complexities and understand associated risks.

2.5.7 Market openness deminsion

Digital technologies are reshaping the landscape for businesses, fostering an environment where both local and international firms can compete on equal footing due to market openness. However, this digital transformation brings about both challenges and opportunities, necessitating a re-evaluation of traditional market factors.

Trade: Digital technologies blur trade boundaries, reducing costs and connecting businesses globally. This opens new trade opportunities and introduces new players and business models. However, regulatory hurdles increase costs for service providers, especially SMEs, resulting in unequal benefits and additional trade barriers.

Investment: Positioning digital transformation as a growth driver attracts foreign direct investment, particularly in communication infrastructures and technologies. Removing investment barriers can enhance the scope of digital transformation. Moreover, investments in knowledge-based capital (KBC) and skills encourage enterprise expansion across borders, fostering growth, productivity, and innovation (OECD, 2013)

Financial markets: Stable and transparent financial markets incentivize investment in digital transformation, enhancing competitiveness for domestic firms against foreign counterparts. The emergence of new external funding avenues through digital technologies broadens financing options for a larger investor base. Consequently, regulatory frameworks must adapt to ensure the safety of digital spaces amid the shifts in traditional markets.

Competition: In the digital age, promoting competition benefits consumers through lower prices and increased product variety. Competition also drives digital transformation by fostering innovation, business dynamism, and productivity. As geographic barriers diminish, suppliers and retailers can enter markets without physical presence, expanding competition. However, the rise of digital technologies presents challenges for traditional regulations. OECD guidance on this topic includes "The OECD Market Openness Principles (2011)" and "The OECD Competition Assessment Toolkit (2015)".

Taxation: The tax system plays a crucial role in investment decisions, impacting competition and resource allocation. Digital transformation has broadened this influence on tax policy and administration both domestically and internationally. Current international tax laws face challenges in adapting to the global business landscape, considering factors like data collection, new business models, and evolving roles (Calvino et al., 2016).

2.5.8 Creating a strategy

Establish a governance approach that supports effective coordination: Digital transformation policies require coordination among all involved stakeholders, including governmental and non-governmental entities, as well as international partners. This governance approach should adapt to national institutions, administrative structures, and cultural contexts. In OECD countries, governance strategies typically fall into two categories.

Centralized coordination: In some countries, the responsibility lies above the ministerial level, with the head of government leading strategy development in collaboration with ministries and stakeholders. Operational coordination is managed by focal points within each ministry, reporting to the main office for evaluation.

Ministry-led coordination: Other countries assign a lead ministry to oversee strategy development and implementation, engaging stakeholders through a ministerial council. Operational coordination is decentralized, with implementation responsibility distributed across ministries.

Articulate a strategic vision and ensure coherence: In this phase, a strategic vision for digital transformation must be developed to tackle the country's challenges. This strategy should harmonize with other national, regional, and international agendas. The Digital Transformation Strategy (DTS) needs to align with national strategies while identifying synergies and avoiding conflicting approaches. Sub-national strategies should complement the overarching goals of the DTS.

Assess key digital trends, related policies, and regulations: To assess a country's digital development, thorough monitoring and analysis of trends and policies are essential. The DTS aims to enhance the quality, legitimacy, and effectiveness of policies and expenditures (OECD, 2015c). Insights from this analysis inform decisions on prioritization, policy measures, and resource allocation.

Enable inclusive strategy development: For effective coordination, a coherent strategic vision, and informed analysis, the DTS should involve all relevant stakeholders. This includes government officials, international partners, and non-governmental stakeholders. Adopting a multi-stakeholder model is considered a best practice for developing the DTS.

Implement the strategy successfully: The success of a DTS hinges on effective implementation. Challenges such as unrealistic objectives, existing policy frameworks, and societal preferences may emerge during this phase (OECD, 2015c). To overcome these challenges, clear communication, negotiation, and stakeholder support are crucial. An action plan with specific policy measures and funding sources must be defined to achieve strategic objectives. Additionally, the skills and capacities of key actors and coordinating institutions play a vital role in implementation. A clear timeframe with target Key Performance Indicators (KPIs) is essential, and progress should be monitored accordingly. After completing the implementation cycle, a comprehensive assessment and evaluation should be conducted to update or create a new strategy as needed.

2.6 National Digital Transformation Strategy – Mapping the Digital Journey

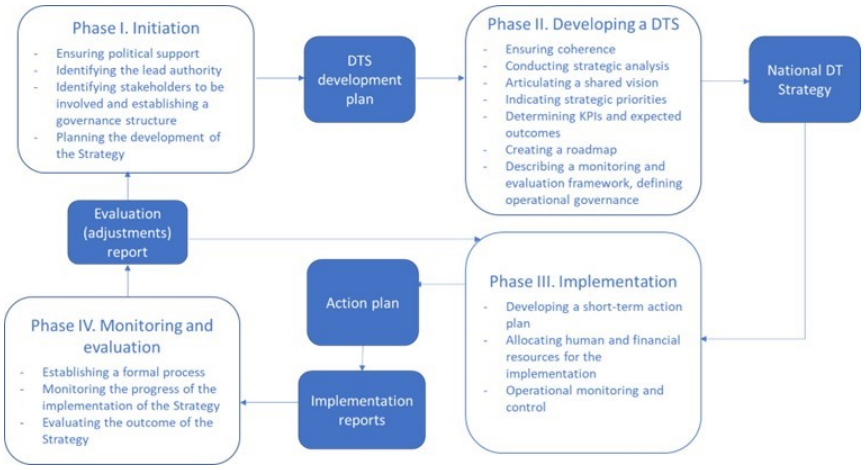
The Digital Regulation Platform (DRP) emerged in 2000 through a collaborative effort between the World Bank and the International Telecommunication Union (ITU). The platform aims to provide practical guidance for policymakers, experts, providers, and the general public information on regulation best practices, and benefits of the digital economy (WB & ITU, n.d.). The platform serves as a centralized hub for up-to-date ICTS regulation pertinent to digital transformation, along with accessible tools and evolving ICTS controllers' perspectives. The Platform provides detailed guidance, case studies, and best practices on digital economy, aspects that can be found in the 2020 Digital

Regulation Handbook (formerly known as the Telecommunication Regulation Handbook).

National digital transformation strategy – mapping the digital journey.

To facilitate governments in achieving a seamless digital transformation, the Digital Regulation Platform has released numerous reports and guidelines for government officials to reference. Among these resources, one noteworthy tool is the article titled "National digital transformation strategy – mapping the digital journey" published in July 2023. The article serves as a comprehensible guide for governments embarking on digital transformation strategies as it delineates the essential steps and elements required for developing a national digital strategy. Structured into four phases, the guide highlights the key pillars crucial for successful digital transformation: infrastructure; skills and education; cybersecurity and trust; research and innovations, policy, and regulations (Digital Regulation Platform, 2023).

The creation of a digital transformation strategy must be created based on the country´s specific political, economic, and social context, and consider the culture, stakeholders, and complexity if the system. A DTS should be a combination of resources, tools, and projects. The buildout of a DTS tends to follow a cyclical manner, this cycle can be observed in Figure 2.



(Digital Regulation Platform, 2023)

Figure 2. Creation of a DTS - DRP

2.6.1 Phase I. Preparation and initiation

The first phase should be used to create a common ground among stakeholders, decision-makers, and all other key actors, regarding the actions needed to be taken.

Political will and support: During the initial stage of the digital transformation, it is crucial to secure political will and support. Political will involves prioritizing digital transformation at the highest levels of government, allocating resources, removing structural barriers, and fostering cultural and organizational changes. Meanwhile, political support entails creating public awareness, gather consensus among political parties, and demonstrating the necessity of digital transformation. This step ensures that the benefits of digital transformation are recognized and embraced as essential for progress.

Strategic governance: For the successful creation of a national DTS, intra-governmental and inter-sectoral coordination and collaboration are essential, with clearly defined processes, roles, and responsibilities. This requires establishing a strategic governance framework designed to guide the creation of the DTS. Leading the digital transformation implementation, a competent authority with political support must be designated, and equipped with the necessary financial resources and human capabilities. Defined guidance ensures cross-sectoral coordination and integration.

Additionally, appointing a neutral lead institution can prevent inherent biases and avoid internal competition for resources. As a good practice, the instance in charge of the creation of the DTS should differ from the one overseeing the implementation.

A third consideration in this stage is fostering collaborative governance with the stakeholders to encourage ownership and partnership. This can range from informal systems, such as advisory groups, to formal structures, such as steering committees.

To identify the main stakeholders two approaches can be followed:

- Whole-of-government (WGA): joint efforts of ministries, administrations, and public agencies to implement a unified DTS.
- Whole-of-society (WSA): expands on the WGA approach by placing emphasis on the involvement of the private sector, academia, civil society, and politicians.

The selected list of stakeholders depends on the country's structure and, depending on the approach chosen, can be exhaustive. Additionally, consultative groups may be considered to review the documents. The external evaluators can be from academia, consultants, financing partners, or international organizations.

Plan for DTS formulation: In the final stage of the initiation phase, the leading institution prepares an action plan. This plan should outline the main steps, timelines, and required human and financial resources. Additionally, it delineates the actions and

involvement of stakeholders in the development process. Following its creation, the plan undergoes approval by a steering committee and/or government. If a consultation process is planned, the extent of involvement should be defined at this stage.

2.6.2 Phase II. Strategy formulation

Map the existing documents to ensure coherence: To ensure consistency, the development of a national DTS should consider existing strategies and policies related to digital transformation. Due to the potential novelty of a DTS, adjustments or new documents may be necessary to ensure alignment with the new strategy. Additionally, the DTS should align with overarching national frameworks (e.g., the National Development Plan) and supra-national strategies (e.g., the 2030 Agenda for Sustainable Development). Furthermore, the DTS should maintain coherence with existing or upcoming documents in areas such as research and development, education, and innovation, to prevent duplication of efforts. Any documents associated with the DTS should clearly position it within the legislative framework.

Strategic analysis – digital maturity and digital landscape evaluation: A strategic analysis helps identify opportunities and challenges within the digital ecosystem, both inside and outside of the country. In this regard, a digital landscape and digital maturity analysis must be conducted. The first refers to the analysis of external factors that could impact the digital transformation process. The second refers on an evaluation of the current state of the digital capabilities and readiness. A multi-dimensional approach should be adopted, where social, environmental, and political aspects are considered. In addition, a gap and SWOT analysis can help identify priorities and create a roadmap. Furthermore, having an international perspective can countries gain insights into future developments. Regional development and digital transformation trends, as well as their impact on the country, must be considered when conducting the strategic analysis. Frameworks by international organizations can also help countries evaluate the country's current digital maturity.

Articulate a clear, ambitious, but feasible vision: To have a proper roadmap for development, a vision should be clear, meaningful, and tangible. The vision should consider how the country will look in the future, and how this can be accomplished. It should be broad enough to encompass strategic objectives and be meaningful for citizens and stakeholders.

Set clear priorities and strategic objectives: Based on the political, social, economic, and environmental context, strategic priorities are identified to advance the overarching vision. It is advised to formulate the objectives using the SMART approach: Specific,

Measurable, Achievable, Relevant, and Time-bound. The DTS should be crafted to prioritize areas with the highest digital potential rather than attempting to cover everything simultaneously. The initial step involves identifying digital enablers that facilitate transformation across economic and social spheres. Subsequently, specific areas are selected based on their potential for significant social and economic gains through digitalization. Some countries adopt an approach of establishing guiding principles and values as criteria for decision-making. Prioritization should consider the availability of financial resources and estimate the necessary investments relative to the available or planned resources.

Strategic metrics (KPIs) and expected outcomes: To monitor the progress of the objectives over time, key performance indicators (KPIs) should be selected. Strategic KPIs refer to the monitoring progress, while operational KPIs relate to the performance of tasks and activities, both should be reviewed on a regular basis. When selecting the KPIs it is important to consider that the indicators are aligned to the strategic objectives. These should focus on a limited set of insightful metrics with accurate and regularly collected data. The KPIs can be established for the full strategy and/or per strategic area. Additionally, the indicators should align with regional and international recommended indexes.

Create a roadmap: A roadmap helps to ensure that the strategy can be achieved in actionable steps with a detailed plan for achieving the strategic objectives. It breaks down the objectives into manageable tasks. Usually, milestones, timelines, tasks, and necessary resources are included.

Strategic monitoring and evaluation: Implementing a monitoring and evaluation framework is essential to establish guidelines for how, when, and by whom the implementation of the DTS will be monitored and reviewed. Furthermore, to facilitate a seamless transition from planning to implementation, it is crucial to consider a governance model for the strategy's execution. This governance model enables clear identification of the entity responsible for coordinating the implementation of the DTS.

2.6.3 Phase III. Ensuring implementation - making the strategy implementable

Translate strategy into operational reality: Once the strategy is created, a short-term implementation plan should be developed. When the roadmap of the strategy is to accomplish milestones related to an aspirational situation, then the short-term activities allow for the management of the implementation. This short-term implementation is conducted via sub-actions during a specific period and is linked to departmental or individual goals. Developing the action plan simultaneously with the DTS allows for a

better implementation as there are no time lags between the design of a strategy and its implementation.

Ensure proper funding, secure commitments, and create incentives: For an effective implementation, resources, both financial and human, must be made available. This allocation of resources can be done during a funding period (i.e., annually, biannually, or rolling budget for multiple years), or by assuring that institutions in charge of the implementation of the DTS receive proper funding. Nevertheless, it is necessary to include other stakeholders, primarily the private sector, as most of the connectivity investments come from it. Some resources like state aid, venture capital, and co-financing mechanisms, among others, can be used to obtain resources for the DTS implementation.

Train, educate, and build capacities: Digital skills within the government are needed to drive the process for the correct implementation of a DTS. Digital Academies are used by several countries to train leadership as well as tech and soft skills.

Communicate: After the development of the DTS, it is imperative to ensure effective communication to convey its purpose and significance accurately. This communication can be achieved through various channels such as official documents, websites, publicity meetings, and others. Engaging in two-way communication events like roundtable discussions, conferences, and workshops enhances the understanding of the DTS and allows stakeholders to provide input and feedback. Providing opportunities for feedback fosters stakeholder engagement and commitment to the strategy.

2.6.4 Phase IV. Monitoring and evaluation.

As mentioned above, it is necessary to have formal monitoring and evaluation mechanisms. During this phase the relevance of the strategy will be analysed and, if needed, adjusted. In most countries, this phase is lagging as only one-third of the regulatory agencies conduct these reviews (ITU, 2023a). When creating the monitoring and evaluation mechanisms, countries must define the indicators to be monitored and how often, as well as assign responsibility for the data provision and data consolidation. Additionally, the evaluation results must be included within the planning cycle.

While every country is adopting its own approach towards digital transformation, following a comprehensive DTS makes the process easier. Any DTS should include a clear strategic vision, clear objectives and priorities, measurable targets, financial and human resources and monitoring and evaluating mechanisms. Digital solutions should be created with a sustainable perspective, and they can help encourage environmental and social development.

3 Theoretical framework

This section provides a comprehensive exploration of the Technological, Organizational, and Environmental (TOE) framework, providing detailed insights into each dimension. Additionally, outlines cases where this selected framework has been employed in previous research, leading to an analysis of its potential effectiveness in assessing digital transformation guidelines within the public sector.

3.1 Technology-Organization-Environment (TOE) framework

As technology continues to influence and transform the way governments are built and organised, scholars have delved into what factors influence this innovation (Bounabat, 2017). Authors (Gangwar et al., 2014; Gounaris & Koritos, 2008) argue that the increase in research on innovation and technology adoption has served as a "pusher" for the creation of conceptual models and frameworks in order to understand the relations. Within the IS studies, authors tend to focus on a rational and techno-economic perspective; (Al-Natour, 2009; H. O. Awa, Baridam, et al., 2015; H. O. Awa, Ojiabo, et al., 2015; Eze et al., 2013); while others (Barrett et al., 2006; Jacobsson & Linderoth, 2010; Kim & Ammeter, 2014) highlight the impact that imitation and social pressure have on the adoption of technologies. The rational models are arraigned focusing solely on traditional models and technological determinism (Aboelmaged, 2014; Benbasat & Barki, 2007). Authors like Venkatesh et al. (2007) argue that the decision to adopt a technology is in the innovation itself, and not on the individuals.

The adoption of any new technology is defined as the voluntary decision of individuals and/or organisations to accept and use it in its operations regularly (Khasawneh, 2008; Musawa & Wahab, 2012). To explain the adoption of technology, several authors have proposed frameworks to explain and predict this implementation. Some of the most widely used frameworks include the Technology Acceptance Model by Davis (1989), the Technology Readiness Index by (Parasuraman, 2000), the Innovation Diffusion Theory by Rogers (2010), and the Unified Theory of Acceptance and Use of Technology by Venkatesh et al. (2003). Nevertheless, as Oliveira & Martins, (2011) point out, these frameworks focus mainly on the individual aspect of technology adoption. To shift the focus of the models, H. O. Awa et al. (2017) explain that T-O-E (Tornatzky et al., 1990) and the decision maker-technology-organization-environment (D-T-O-E, Thong, 1999) highlight the factors that have an influence on an organization-level.

While the TAM framework includes a perceived usefulness (PU) as well as the perceived ease of use (PEOU), the social and psychological factors are almost non-existent (Venkatesh & Bala, 2008). The IDT framework presents the relative advantage, the

complexity (or ease of use), triability (how is an innovation experimented on a limited basis), observability (how visible the results are), and compatibility (how consistent it is with existing value, experiences, and adopters) (Rogers, 2010). On its part, TRI accentuates that the correlation of contributors (optimism and innovativeness) with inhibitors (discomfort and insecurity) is the determinant for technological readiness (Parasuraman, 2000).

First published by Louis G. Tornatzky and Mitchell Fleischer in 1990 (Tornatzky et al., 1990) the Technology-Organization-Environment (TOE) framework explains how technology is embraced within organizations and how this adoption and implementation of technological innovation is influenced by the technological, organisational, and environmental aspects. This framework focuses on higher-level attributes, rather than individuals. The TOE is an adaptive framework that helps explain the innovations within the business processes of an organization (Ramdani et al., 2009). Tornatzky and Fleischer's framework (1990) is based on Fiedler's contingency theory (1964) to propose a generic framework for technology adoption (H. O. Awa et al., 2017). The framework englobes several components for the technology's development: business and organisational conditions and reconfiguration, and industry environment (Aboelmaged, 2014; Chatterjee et al., 2002; Tornatzky et al., 1990).

The three core aspects of the TOE framework will be further discussed below.

3.1.1 Technology

Within this framework, technology encompasses all types of technologies relevant to the firm or company. This includes both the technologies already in use within the organization and those available externally but not yet utilized.

Referring to the existing technologies, these play a key role, as these limit the scope and pace of the technological transformation that an organization can correctly undergo (Collins et al., 1988). Referring to the second type, technologies available in the market but not yet implemented, these carry an important weight as well, as these define the limits of what is technologically possible.

Additionally, these help to understand how technology can evolve. Within the technologies outside of the company, Anderson & Tushman, 1986 defined three groups of innovations: incremental, synthetic, or discontinuous changes. Incremental changes refer to the introduction of new features or versions of existing technologies (H. O. Awa et al., 2016, p.14). These types of changes are considered the least risky and have the least

change required for the organization. An example of this change would be an upgrade from the software of Microsoft 10 to a newer version.

For the synthetic change created by innovations, represents a moderate change, where already existing technologies and ideas are combined and presented in a newer version. Massive Open Online Courses (MOOCs) could serve as an example, as already existing knowledge is combined with existing technology, and is delivered in a novel way.

The last group, discontinuous change, also referred as radical innovations (Ettlie et al., 1984), represents a significant change from existing technologies and processes. An example of this would be the use of cloud storage for organizations from the early 2000s (Marston et al., 2011).

Planned behaviour is understood as the perceived behavioural control (user's ability and agility, understanding the know-how) and the support resources (Internet infrastructure, time to use) needed to correctly use a proposed system (H. O. Awa, Baridam, et al., 2015; Eze et al., 2013; Zhu & Kraemer, 2002). Furthermore, Awa et al. (2017) propose that perceived simplicity, perceived compatibility, and perceived values, have an impact on the technology aspect.

3.1.2 Organisation

The organization term refers to all the characteristics and resources an organization has, including how these relate to each other. Additionally, the links between employees, internal communication, processes, and resources, just to mention some examples, are included. Various cases where the context affects the adoption and implementation processes can be identified. Firstly, the internal relations within subunits in the organization can promote innovation (Anderson & Tushman, 1986; Galbraith, 1973). These informal connecting agents tend to promote the adoption of technologies. This can be exemplified by understanding that teams and employees have formal and informal connections to other departments within the organization or outside of it. As Burns & Stalker, 1994; Daft & Becker, 1978) point out, the more organic and decentralized the structure within an organization is, the easier the adoption of novel technologies. This can be explained as the organizations that have a more horizontal approach tend to have a more fluidity of responsibilities for employees and promote communication outside of official reporting lines. Zaltman et al., 1973 mention that while this decentralised structure could be helpful during the adoption phase, during the implementation phase should be more mechanic. This research emphasizes that formal reporting relationships, centralized processes and defined roles allow for a swifter process.

Another aspect that has an influence on innovation within an organization, is how communication works. Tushman & Nadler, 1986 argue that it is the responsibility of top management to create within the organization a space that welcomes change and supports innovation following the mission and vision. The communication processes include describing how innovation can help the organization's objectives, rewarding innovation formally and informally, understanding and sharing how change has helped the organization, and most importantly motivating and building a skilled team that understand and works towards the organization's firm.

Within the aspects that affect innovation in an organization context, the most researched are slack and size. Authors March & Simon (1958); Rogers (2010) have argued that slack allows a better adoption. Nevertheless, (Tornatzky & Eveland, 1986) explains that slack may not necessarily lead to innovation and it does not need to be used for innovation to exist. (Tornatzky et al., 1990). The second aspect, size, has an inconclusive link with its effect on innovation. While bigger organizations tend to easily adopt innovations (Cyert & March, 1963; Kamien & Schwartz, 1982; Scherer, 1980), it needs to be further analysed as the availability of certain resources could explain the adoption (Kimberly, 1976).

The idea of organisational factors focuses on the availability and proficiency of internal resources (Wymer & Regan, 2005), social dynamics (Ajzen, 1991; Rogers, 2010; Venkatesh et al., 2003), the mission of the organisation (H. Awa et al., 2010), and the facilitating conditions (Tornatzky et al., 1990; Triandis, 1980). Other scholars propose that factors such as the cultural and structural aspects (Chau & Tam, 1997), human resources, degree of centralization (Scupola, 2009), and information sources and channels of communication (Kannabiran & Dharmalingam, 2012), size of the organisation (Wang et al., 2010) should be considered.

3.1.3 Environment

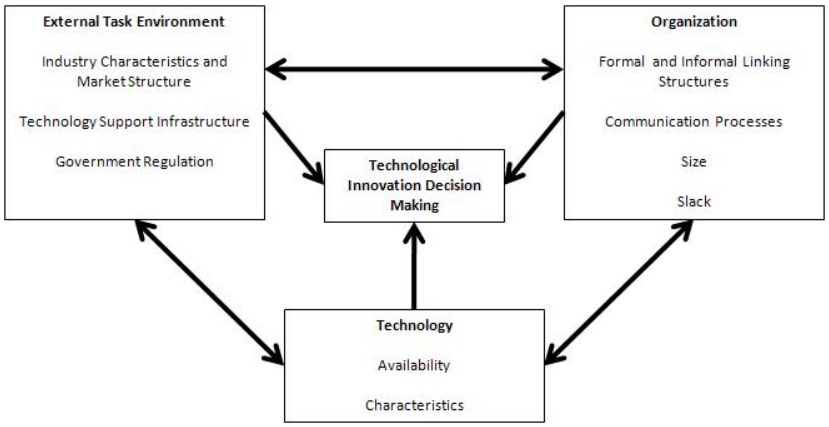
The environmental aspect pertains to the external context in which the organisation exists. This includes aspects such as the structure of the industry (Prais, 1968), the presence or absence of technology providers (Globerman, 1975), regulatory requirements, social and cultural norms (Baker, 2011), and any other aspect that could potentially have an effect. As exemplified by Mansfield (1968, 1977) intense competition in the sector, can lead to an increase adoption of innovation. Kamath & Liker, (1995) add that the presence of bigger firms within a value chain can have an impact on other companies and their need to innovate. This aspect has been deeply analysed by Porter's five force model in the microenvironment that can drive competition and affect the profit of a firm (Bruijl, 2018). Porter describes five forces as contributors: 1) competition among existing competitors;

2) threat of potential new entrants; 3) bargaining power of suppliers; 4) bargaining power of customers; and 5) threat of substitute products or services (Porter, 2008).

An important factor to consider is the infrastructure needed for the adoption of technology. These refer not only to the physical technologies needed to adopt innovation but also to the skilled workers. This aspect, studied by Globerman (1975); and Levin et al. (1987) highlight that if firms invest in paying higher wages for skilled workers, then these as a result end up innovating through time and work-saving innovations. The availability of skilled workers and experts, as well as a broader range of technology services, creates a space that further pushes innovation (Rees et al., 1984).

One final factor that the environment aspect studies is the influence the government have both internally and externally, as this actor could have a beneficial or detrimental effect on innovation. Any additional factor capable of influencing the implementation is considered within this aspect. In the realm of the public sector, situations such as crises, socio-political aspects, and international conditions are taken into account (H. O. Awa et al., 2016). This influence can be seen when the government imposes new constraints on a certain industry, then innovation is required by the companies within that sector to continue working. Perhaps the most recent example of this influence could be the introduction of artificial intelligence (AI) in almost all sectors. Not only has AI pushed for governments to innovate within themselves, but it led to the introduction of legislation for governmental agencies, as well as companies within the country and outside of it.

The following figure showcases the connections between the 3 aspects within the organisation's context.



(Tornatzky et al., 1990)

Figure 3. Technology-Organisation-Environment Framework

3.2 TOE framework in research and application

Due to its flexible principle, the TOE framework has been used in a variety of industries and contexts. Within the IS field, this framework has been earning support both empirical and theoretical (Henriksen, 2006; Yoon & George, 2013; Zheng et al., 2011). Some authors (Barrett et al., 2006; Jacobsson & Linderoth, 2010) argue that this increasing adoption is a result of the framework incorporation of the socio-economic aspects.

As mentioned above, to understand how technology is adopted several frameworks such as the UTAT, DOI, TAM, etc., have been developed. Nevertheless, in the context of a large organization, there are external factors that these frameworks do not include, or do not allow for the needed flexibility. As (Gangwar et al., 2014) explain, one of the main benefits of the TOE framework in a dominant and specific enterprise context is that, due to the generic factors, it can better-understood users‘ perspectives about certain systems and technologies in a more comprehensive, multi-layer perspective (Al-Natour, 2009; Benbasat & Barki, 2007). It is worth mentioning that due to this flexibility, researchers have criticized the framework for not being a specific model, but rather as a tool to categorize aspects into the study context (Ven & Verelst, 2011). In order to find more meaningful results and to identify underlying relationships, scholars (Alatawi et al., 2013; H. O. Awa, Baridam, et al., 2015; Premkumar, 2003) have suggested that the TOE framework should incorporate other adoption theories based on the specific aspect being examined.

Due to the flexibility of the TOE framework, it has been studied and implemented in several industries such as enterprise systems (Ramdani et al., 2009), health care (Lee & Shim, 2007), financial systems (Zhu, Shutao, et al., 2006), just to mention some examples. Within a larger scale, this framework has been tested in European, American, and Asian contexts (Zhu et al., 2003; Zhu & Kraemer, 2005). Throughout several studies, the three elements of the framework have shown an important role in the creation, implementation, and adoption process of new technologies (H. O. Awa et al., 2017). Throughout these studies, researchers have selected different aspects to analyse, which confirm Tornatzky et al., (1990) argument that the three aspects can benefit or slow the adoption of new technologies.

In summary, the comprehensive examination of the TOE framework, along with its application in previous research, highlights its potential effectiveness in assessing digital transformation guidelines within the public sector. The adaptable nature of the TOE framework helps understand the complex interplay between technology adoption, organizational dynamics, and environmental influences.

4 Methodology

The following section will delineate the research design and the methods used to answer the research questions delineated on Chapter 1. This section encompasses, data collection methods, data analysis techniques, case study, and explains how the results will be presented.

4.1 Research approach

4.1.1 Qualitative Methodological Approach

Qualitative research is the empirical collection of narrative data that produces a deep knowledge of a subject of interest (Moser & Korstjens, 2017). This type of research, in the context of public administration, has been significantly done more than quantitative research (Miller & Jaja, 2005). Charles Ragin (1989) distinguishes between both approaches, "*quantitative researchers work with few variables and many cases, while qualitative researchers work with few cases and many variables*". Collier et al., (2004) provide a more detailed definition as there is a distinction of four aspects in which qualitative research digress from quantitative: level of measurement, size of the N, statistical tests, and thick vs. thin. Qualitative research involves smaller sample sizes, detailed knowledge, nominal-level data, and verbal analysis, in contrast to the larger sample sizes and statistical analyses common in quantitative research (Collier et al., 2004, p.301-2). As highlighted by Guba (1981), quantitative and qualitative research can be seen as different ways of addressing a similar criterion. Lowery & Evans (2004) argue that, in the aspect of public administration, qualitative research is beneficial as the approaches are suitable for communicating normative and ontological prerogatives; encourage listening skills and reflection; and align with the perspective of the public administrator as a facilitator rather than an expert. Another aspect that qualitative research highlights the promotion of theoretical aspects in this type of research (Luton, 2015). In its action theory paradigm, Harmon (1981) outlines that the meanings of actions done by actors, as well as the relationships between researchers and the subjects in the research setting must be analysed as well.

One aspect that differentiates qualitative from quantitative research is that researchers aim to get an insider's perspective from a particular case rather than general ideas. The goal of this research is to understand specific situations in a particular context, which could transfer to other situations (Luton, 2015). Qualitative research recognizes the importance of the context and insights, an aspect that, due to its goal of homogeneity, quantitative research dismisses the relevance of the distinguished contexts (Collier et al.,

2004). McNabb (2015) explains that case studies qualitative research is compelling at introducing conceptual aspects, and interactions between individuals and institutions, as well as understating the structure.

Another characteristic in which qualitative research differentiates from quantitative research is the deep understanding of complexity and context through thick description (Luton, 2015). Through detailed descriptions via observation, notation, and interpretation, readers can be brought into the context described (Erlandson et al., 1993). Detailed description is one of the means by which qualitative research addresses causality. Causal explanations are then understood as ideographic and emergent, due to the interconnectivity of actions (Brower et al., 2000). Due to the different professional goals of scholars and practitioners, it is often complicated to find a connection between what practitioners expect and what researchers can deliver (Bolton & Stolcis, 2003). For this aspect, qualitative research can bridge this gap so that research will address topics in ways that are relevant to practitioners (Luton, 2015).

4.2 Research strategy

4.2.1 Case Study

To dive deeper into how a national digital strategy is developed and to analyse how countries adopt and follow the guidelines provided by international organizations, a case study will be followed. A case study is a term for the research of an individual, a group or a phenomenon (Sturman, 1997). Mesec (1998) defines it as a "*descriptive and analytical exploration of a specific matter or case, aimed at identifying variables, structures, and interaction patterns among participants*" (p.383). In addition, Sagadin (1991) specifies that a case study is adopted when there is an analysis and description of a person individually, a group of people, individual institutions or a problem, processes, etc., in detail. A case study can be considered a descriptive method if analysed solely on a descriptive level, but it can also be considered as a causal-experimental method if it is analysed on a causal level (Sagadin, 1991). Additionally, a case study emphasizes the development factors, which means that the cases evolve usually as a series of interconnected events (Rebolj, 2013). Furthermore, a case study analyses the environment in which it occurs (Sagadin, 1991). Simons (2009) provides an encompassing definition, portraying a case study as "*an in-depth exploration from multiple perspectives of the complexity and uniqueness of a real-life project, policy, institution, program, or system*" (p. 21). It's important to note that a case study serves as a design framework incorporating various methods, rather than being a method in itself (Simons, 2009).

4.2.2 Research integration matrix

A matrix is a “set of numbers or terms arranged in rows and columns, from which something originates, takes form, or develops” (Agnes, 2000, p.887) Within qualitative research, a matrix analysis is the crossing of two or more dimensions to understand how they interact (Miles & Huberman, 1994, p.239). These matrices can describe existing situations (descriptive), related to consequences and their results (outcome-oriented), or focus on how dynamics work (process-oriented) (Averill, 2002) Additionally, matrices can serve to examine how categories are related to specific theoretical concepts. As this research aims to understand the existing relations, a descriptive matrix will be created. In the case of descriptive matrices, the researcher can display data in individual cells to analyse and understand how it reacts to other data (Averill, 2002). The data inserted in each of the cells can come from paraphrased information, data collection, or any other relevant data source. Matrices serve to streamline the process of identifying similarities, differences, and connections from a group of interviewees (LeCompte & Schensul, 1999; Marsh, 1990; Miles & Huberman, 1994).

The matrix analysis is a versatile method for cross-sectional, qualitative analysis used in business, commercial and applied research (Groenland, 2014). Groenland (2014) developed the Matrix Method (2021) based on Gordon & Langmaid's (1988) qualitative market research. This method is based on the coding and analysis of transcripts from interviews or focus groups. As a result of the coding, a set of categories is created following a specific set of steps (Groenland, 2014). The researcher can then come up with interpretations from the interviewees, which can then lead to conclusions. Groenland (2014) states that the goal of research is achieved when the research question is answered. In other words, the mixed methods approach validates the structure based on academic knowledge.

For the creation of the categories in the matrix, two approaches can be followed. The first one is an *eclectic approach*. This approach is done without the guidance of an academic theory. Therefore, the answers of the interviewees may be based on common sense or previous knowledge. In this approach, some categorizations could be done in terms of advantages versus disadvantages. One of the risks of this approach is that due to the lack of theoretical foundation, the results could be achieved coincidentally. The second approach is the *theoretical approach.* This approach refers to the theoretical concepts defined in the research and aims to understand their structures and significance. In this case, the researcher tests the category structures specified and places the responses of the interviewees within the category structures. If some data does not fit into the designated

categories, new categories may be added, or the researcher analyses the ways questions were asked within the discussion section.

4.3 Data collection

4.3.1 Documentary analysis

Document analysis is an underused approach in qualitative research (Merriam & Tisdell, 2016). Fischer (2006) defines this research method as a systematic procedure for evaluating printed and electronic documents. The analysis of documents, such as books and journals, is favourable because data in this format is stable and unaffected (Merriam & Tisdell, 2016; Morgan, 2022). One risk of relying solely on interviews for data collection is that researchers may not gain a complete understanding of the researched topic (Bailey & Bailey, 2017).

It is important to note that document analysis is not without its challenges. One example is when organizations allow outsiders to analyse internal documents; access may be restricted to selected documents that do not fully reflect the reality of the organization (Morgan, 2022). Another potential bias occurs when analysing public records and personal documents, as the information provided may not always be accurate (Merriam & Tisdell, 2016). A third challenge for document analysis arises when data on a certain topic is not available, leading researchers to potentially modify their research question based on existing data (Blackstone, 2019).

Despite these disadvantages, document analysis remains beneficial. This research approach allows researchers to access data that would otherwise require a significant amount of time and effort to collect (Merriam & Tisdell, 2016).

Several research methods can be further enhanced by document analysis. For instance, a positivist approach focuses on affirming or discarding a hypothesis by seeking factual evidence (Denzin, 2017). The thematic analysis aims to recognize patterns within the data, with themes becoming categories for analysis (Fereday & Muir-Cochrane, 2006). Grounded theory represents another approach for document analysis, using data to describe the reasons behind the occurrence of certain situations.

As document analysis retrieves information from the data, it is crucial to select the right documents. Public records, as highlighted by (Bowen, 2009), are useful for understanding an organization's activities. However, documents should be critically analysed and carefully used in research. Stake (1995) argues that researchers must evaluate if the

selected documents fit the conceptual framework of the research and determine their credibility, accuracy, authenticity, and representativeness (Patton, 1990)

4.3.2 Semi-Structured Interviews

For qualitative research, one of the most used tools to gather information is through interviews. For quantitative research, the data is often collected through lengthy methodological development. In the case of qualitative research, research about interviews is restrained to the number of interviews and to the types of research (semi-structures, focused, open-ended) (Hammer & Wildavsky, 1993; Merton et al., 1990). Qualitative interviews as a research method raises questions about the epistemological and ontological aspects of the method and its suitability to the theoretical approach (Zittoun, 2021). A qualitative interview is a social interaction that influences the results obtained (Bourdieu, 1999). Therefore, due to its social aspect, multiple distortions exist within the structure of the interview (Zittoun, 2021). An interview is a conversation where the questions are presented in the cultural environment of the interviewee, indicating how they understand their world and connections to others (Kerlinger, 2007). As defined by Cannell & Kahn (1968), an interview is a "*conversation initiated by the interviewer for the specific purpose of obtaining research-relevant information*" (p.527). This interaction is direct and includes verbal and non-verbal language (Cheron et al., 2022).

According to Cheron et al. (2022), using interviews as a data collection tool can serve three purposes: 1) test or formulate hypotheses that address the research problem, this includes applying concepts, identifying variables, and relating the variables. 2) Compose a complex research design to achieve the intended objectives. This aspect includes exploring unexpected results, validating other methodologies, and getting a deeper understanding of the answers. 3) Access information directly related to the research topic, including data, values, behaviours, and attitudes. An interview comes as a result of the research objectives and is created within the theoretical framework (Cheron et al., 2022). The research objectives come from a theoretical perspective and act as the link between the theory and the methodology. The selection of the structuring of questions, and the subsequent interview protocol, depend on the purposes for which the interviews are intended (Cheron et al., 2022).

In line with the research objective of comprehensively understanding how national digital strategy guidelines from various international organizations address technological, organizational, and environmental factors, interviews will be conducted using a semi-structured format.

Table 1. Interviews conducted.

Interviewee #	Organization/Agency	Role/Position
1	InterAmerican Development Bank	Author of the guideline / Data and Digital Government Unit
2	InterAmerican Development Bank	Author of the guideline / Senior Specialist in Modernization
3	International Telecommunications Union	Senior Program Officer ITU/BDT
4	World Bank	Senior ICT Policy Specialist
5	Organisation for Economic Co-operation and Development	Junior Analyst Science and Technology Directorate
6	Organisation for Economic Co-operation and Development	Author of the guideline / Senior Analyst Environment Directorate
7	Centro México Digital	General director / Digital transformation expert

This research aims to identify how certain technological, organizational, and environmental factors are represented in each of the analysed guidelines. While the main analysis will be directed within the guidelines themselves, a series of interviews are conducted to gather more information.

Starting with the Inter-American Development Bank, experts with extensive experience in digitalization, particularly in digital government, are interviewed. They play pivotal roles in coordinating the creation of the guideline and are actively involved in digital transformation initiatives across Latin American governments.

For the Digital Regulatory Platform, interviews are conducted with experts from both the International Telecommunication Union and the World Bank. These experts possess deep knowledge in digital transformation and collaborate closely with governments worldwide to develop digital solutions.

Regarding the Organisation for Economic Co-operation and Development, experts from various directorates, including the Environment and Science and Technology, are interviewed. One of the interviewees is an author of the guideline and has published extensively on digital transformation in the public sector.

In the case of the Mexican National Digital Strategy, officials from the National Digital Coordination Office were contacted to gain insights into the development of the current strategy. However, after several unsuccessful attempts to reach various members of the government agency, the general director replied that "*the closing of the year's activities keeps complicated agendas for the public servants who work in this Technical Support Unit*" (appendix J). It is important to note that on June 2nd, Mexico had federal elections, therefore, all government projects and programs had to be finalized before. To gain a perspective on how the digital transformation process in Mexico is done, an interview is

conducted with a member of “Centro México Digital,” a non-governmental think-tank promoting digitalization in Mexico. This interviewee, with over 30 years of experience in the public sector and collaborations with international organizations and national governments, provides valuable insights on the digital transformation process in Mexico.

4.4 Data Analysis

4.4.1 Content analysis

Data analysis in qualitative research varies in comparison to how quantitative research is conducted. In quantitative research, the data is organized in a machine-readable form for statistical analysis. In qualitative research, the raw data is organized into categories and themes or concepts (Djamba & Neuman, 2002). The codes, also identified as tags or labels, are used to give meaning to the descriptive information used during research. These codes are attached to stacks of information varying in size (can include words, phrases, sentences, or whole paragraphs) (Miles & Huberman, 1994, p. 56).

When choosing which coding method(s) to choose several perspectives arise. Some authors argue that the coding should be introduced and followed by a detailed continuous analysis of the data. As this action of subconscious analysis develops connections that provide insights, not only the coding system (Musante (DeWalt) & DeWalt, 2010). Other authors explain that more than one coding method and at least two analytical approaches must be considered in each research to have deeper and more comprehensive results (Coffey & Atkinson, 1996; Leech & Onwuegbuzie, 2007; Mello, 2002). In some research methods, a coding scheme might not be necessary as they rely mostly on detailed transcriptions and analytic memos (Gee & Green, 1998). Some authors even argue that coding is futile and purposeless (Dey, 1999) and are a closed system in post-structural research approaches (Jackson & Mazzei, 2017). A more centred perspective on coding is that there is a need for coding for selective qualitative research, yet it is necessary to have an open perspective during the data collection before determining which method to use (Saldaña, 2021).

As this research analyse interviews as well as official reports and guidelines, several coding mechanisms are used. One of the coding methods used is the magnitude coding. This method consists of assigning an alphanumeric or symbolic code to an existing category (Saldaña, 2021). Having code ratings can supplement qualitative research to provide a numeric dimension for the quality, strength, depth, perceived importance, sentiment, salience, beauty, and value (Salmona et al., 2019, p. 77-122). A magnitude coding as a qualitative notation system is useful for sentiment/opinion analysis as it analyses the positive, negative, and neutral perspectives (Liu, 2015). Magnitude coding

can serve as a way to analyse qualitative data in a quantitative format (Saldaña, 2021). This method of coding can help to generate selected statistics from the codes. By assigning weights to a certain segment of text or a code itself, a new measure of magnitude is available for analysis (Saldaña, 2021). Miles et al. (2020) propose several forms of quantifying qualitative evaluations by using rubric-based codes that can be applied to quantitative data. Some aspects to quantify can be by quantities (minor, moderate major/ nil, uncertain, low, high), evaluative qualities (poor, moderate, good/ missing, weak, adequate, strong), change (dropped, revised, added/ not pertinent, pertinent but not important in current situation, important factor in current situation), and effects (negative effects, positive effects/ not important, somewhat important, quite important, very important). Magnitude coding serves as a way to quantify a phenomenon's intensity, frequency, direction, presence, or evaluative content (Tashakkori & Teddlie, 1998).

The second coding mechanism that used is descriptive coding. This method summarizes in a word or a short phrase a topic of a passage for qualitative data (Saldaña, 2021). Tesch (1990) specifies that "the codes are identifications of the topic, not abbreviations of the content. The topic is what is talked or written about. The content is the substance of the message" (p.119). This method is useful for indexing topics and subtopics with keywords for a cross-reference in a later stage of the research (Saldaña, 2021). Descriptive coding aims to have a categorized inventory, tabular account, or index of the data's content, which is necessary for further analysis and interpretation (Wolcott, 1994, p.55). Field notes have an important role in the interpretation of symbolic meanings of the environment in which the research is being conducted (Berger, 2009; Clarke et al., 2018; Hammersley & Atkinson, 2019).

4.4.2 Comparative analysis

This research adopts a theoretical approach, employing the TOE framework as the foundation for constructing the matrix. The matrix is segmented into three primary categories: Technology, Organization, and Environment, with each category concentrating on five core aspects. These selected aspects are determined based on the characteristics of the TOE framework and the requisites for formulating a national digital strategy, which will be elaborated on subsequently.

Key concepts and keywords pertinent to each category are identified within the guidelines, accompanied by corresponding page references for easy retrieval. Subsequently, each aspect undergoes grading based on the evaluation criteria outlined in Annex A and receives a low, medium, or high value. To facilitate clearer comparison, all results are presented in a table format, enabling a comprehensive assessment of each guideline.

In the analysis of the Mexican National Digital Strategy, questions are slightly adjusted to ensure a more comprehensive review, following the same methodology as applied to the guidelines.

Core aspects examined within each category:

Technology: Assessing relevance ensures that the technological recommendations address current needs and challenges, making them practical and timely. It helps in determining if the technology will effectively solve the existing problems (Pousttchi et al., 2019). *Compatibility* is crucial for seamless integration with existing infrastructure and systems. Evaluating this aspect ensures that the new technologies can work harmoniously with the current technological environment (Zhu, Shutao, et al., 2006). *Scalability* ensures that the technological solutions can grow and adapt to future needs. This is important for long-term planning and investment, allowing organizations to accommodate growth and changes without having to modify their systems (Zhu, Kraemer, et al., 2006). Addressing *accessibility* ensures that the technology is inclusive and available to all, including marginalized or disadvantaged groups. This promotes equity and ensures that the benefits of technological advancements are widespread (Botelho, 2021). Robust *security measures* are essential to protect against cyber threats and data breaches. Evaluating security ensures that the technology is safe to use and that sensitive information remains protected, fostering trust and compliance with legal and regulatory requirements (Möller, 2023).

Technology	*Relevance:* How relevant are the technological recommendations in the guideline to the current needs and challenges?
	Compatibility: How compatible are the suggested technologies with existing infrastructure and systems?
	Scalability: Are the technological solutions scalable to accommodate future growth and changes?
	Accessibility: Does the guideline address issues of accessibility to technology, especially for marginalized or disadvantaged groups?
	Security: How robust are the security measures suggested to protect against cyber threats and data breaches?

Organization: A clear definition of *roles and* responsibilities ensures that all stakeholders understand their tasks and accountability. This helps in the smooth execution of the guidelines and reduces the risk of confusion and overlap of duties (Martínez-Peláez et al., 2023). Effective *governance mechanisms* are vital for structured decision-making and oversight. They ensure that the implementation of guidelines is monitored and controlled, leading to better outcomes and adherence to standards (Jewer & Van Der Meulen, 2022). Encouraging *stakeholder engagement* promotes collaboration and buy-in from various parties. It ensures that different perspectives are considered, leading to more

comprehensive and accepted solutions (Martínez-Peláez et al., 2023). Provisions for capacity building ensure that the organization has the necessary skills and knowledge to implement the guidelines effectively. This is important for sustainability and ongoing improvement (González-Varona et al., 2021). Guidance on managing *organizational change* processes helps in navigating the transitions associated with adopting new guidelines. It reduces resistance to change and helps in smooth implementation (Pacolli, 2022).

Organization	*Clarity of Roles:* Are the roles and responsibilities of different stakeholders clearly defined?
	Governance Mechanisms: Does the guideline provide effective governance mechanisms for decision-making and oversight?
	Stakeholder Engagement: How well does the guideline encourage engagement and collaboration among various stakeholders?
	Capacity Building: Are there provisions for capacity building to ensure organizations have the necessary skills to implement the guideline?
	Change Management: Is there guidance on managing organizational change processes associated with adopting the guideline?

Environment: Ensuring *alignment* with national, regional, or sectoral development priorities ensures that the guidelines support broader strategic goals. This increases the likelihood of receiving support and funding from various stakeholders (Jonathan & Kuika Watat, 2020). Considering *cultural factors* ensures that the implementation is sensitive to and respectful of local values and practices. This increases the acceptance and effectiveness of the guidelines in different cultural contexts (Ifenthaler & Egloffstein, 2020). Fostering an *environment* that encourages innovation is crucial for continuous improvement and staying competitive. It ensures that the guidelines support and stimulate technological advancements and creative solutions (Ionescu et al., 2022; Jacobsson & Linderoth, 2010). Assessing economic feasibility and sustainability ensures that the recommendations are *economically viable* and practical. This prevents resource wastage and ensures that the benefits outweigh the costs (Bican & Brem, 2020). Evaluating the potential *social impact* ensures that the guidelines contribute positively to society, particularly for vulnerable or marginalized groups. This promotes social equity and enhances the overall societal benefits of technological adoption (Komarčević et al., 2017; Larsson & Teigland, 2019; Sestino et al., 2023).

Environment	*Alignment with Priorities:* To what extent does the guideline address the alignment with national, regional, or sectoral development priorities?
	Cultural Considerations: Does the guideline consider cultural factors that may influence implementation success?
	Innovation facilitation: Does the guideline foster an environment that encourages innovation and technological advancements?
	Economic Viability: Does the recommendations consider the economic feasibility and sustainability of implementation?
	Social Impact: What is the potential social impact of implementing the guideline, particularly on vulnerable or marginalized groups?

As mentioned above, the creation of the matrix will be based on the interviews conducted with experts on the topic of national digital strategies with some of them being the authors of the guidelines. Based on the information provided by the interviewees as well as official documents, the guidelines will be evaluated following a magnitude coding to get a classification for each aspect.

4.4.3 Limitations of the Research

This research presents several limitations that must be considered. Firstly, the data collected via interviews relies on information provided by experts from international organizations, many of whom are contributors to one of the analysed guidelines. Consequently, the responses may carry biases, and the accuracy of the information is dependent on the knowledge and transparency of the interviewees. As previously mentioned, government officials were contacted but declined the invitation for an interview, the response received can be found on Annex L. As a result, the analysis of the Mexican National Digital Strategy was conducted solely based on official documents, which may not fully reflect internal processes.

Secondly, there is limited research on the evaluation of national digital strategies using guidelines from international organizations. Consequently, part of the research relies on non-country-specific metrics provided by the guidelines. While the alignment of the guidelines through the TOE framework highlighted common aspects identified in all three documents, there may be country-specific characteristics not included. Additionally, considering other categories within each of the TOE dimensions might yield different results.

Thirdly, this research analysed solely the Mexican National Digital Strategy for the 2021–2024 period. Consequently, the results and observations are specific to this strategy and are not necessarily replicable to other countries or future strategies. Furthermore, if other guidelines were considered for analysis, the alignment of the Mexican strategy might vary.

Finally, the research relied on analysing the guidelines as well as the Mexican NDS following the dimensions presented in the TOE framework. This framework was selected due to its flexibility and its focus on analysing not only the technological aspect but also the organizational and environmental dimensions. If a different framework were selected for the analysis, the results might differ.

4.5 Digital Transformation in Mexico

The United Mexican States (Mexico) is a country geographically located in the south of North America. Bordering the United States to the north, the Pacific Ocean to the west and south, Guatemala and Belize to the southeast, and the Gulf of Mexico and the Caribbean Sea to the east (SRE, n.d.). The country has a continental area of 1'960,189 square kilometres, with an exclusive economic zone of 3'149,190 km2 (SRE, 2017). It has a territory of 3,000 km from northwest to southwest and a width that varies from 217 km in the south to 1,900 km in the north (Britannica, n.d.). The most recent census was conducted by the National Institute of Statistics and Geography in March 2020, this census reported that the total population amounts to 126,014,024 (INEGI, 2020).

Mexico is a federal republic divided into three powers: Executive. Legislative, and Judicial Power. The country is divided into 32 federal states, with Mexico City being the capital of the country and where the three powers reside. The president is the head of state and government, elected for a period of six years with no option for re-election. The Legislative Power consist of a chamber of senators with 128 seats, and a chamber of deputies with 500 legislators (Gobierno de México, n.d.-b). The Judicial Power is represented by the Supreme Court of Justice consisting of 11 ministers (SCJN, 2005).

According to the latest data from the World Bank, the country has a GDP of 1,466 trillion USD, with an annual growth of 3,9 (World Bank, 2022). On the Human Capital Index, Mexico scores 0,6 on the 0 to 1 scale (World Bank, 2020). In the international sphere, Mexico is a member of several international organizations such as the United Nations, Organisation for Economic Co-operation and Development, World Bank, Inter-American Development Bank, Asia-Pacific Economic Cooperation, and World Trade Organization, just to mention some. Mexico represents the second-largest economy in the Latin America region and the 12th worldwide (IMF, 2023). In the 2023 edition of the OECD Digital Government Index, Mexico occupied the 25th place of digital development out of all OECD members (OECD, 2023a).

4.5.1 National Digital Strategy (NDS)

As an active effort to promote and expand digitalization in Mexico, in 2013 the Federal Government introduced the National Digital Strategy "México Digital". The goal of establishing the strategy was "*to increase the digitalization of Mexico, to maximize its economic, social and political impact to benefit the quality of life of the people*" (Gobierno de México, 2013). During the 2012-2018 administration, the National Digital Strategy worked towards 5 goals: government transformation, digital economy, educational transformation, universal and effective health, and civic innovation and citizen participation.

Published in September of 2021, the National Digital Strategy 2021-2024 serves as a guideline for all institutions from the Public Federal Administration, deriving from the National Development Plan 2019-2024 (NDP). The NDS work along two main lines of action: 1) Digital policy in the Public Federal Administration (PFA), and 2) Digital Social Policy to guarantee access to information and communication technologies. Technologies are means upon which government and society should use to increase welfare (Secretaría de Gobernación, 2021). Following this line of action, one of the priority projects in the NDP, in the section "Economy", is nationwide Internet access in public spaces, highways, hospitals, schools, and community spaces.

The NDS works around five principles that guide the actions followed by the technological policy. These are followed in all initiatives and ICTS projects in the government. The principles have a humanistic basis with a focus on people, security, transparency, use of reliable technologies, and focus on vulnerable groups. The five principles are:

1. Austerity: related to achieving high-quality services with the maximum use of resources and reduction of expenses.

2. Fight against corruption: put an end to unfair, unjust, unfair, unfair, and perverse practices that benefit private interests to the detriment of the State or its members.

3. Efficiency in digital processes: operational simplification and focused attention to government procedures.

4. Information security: stability, protection and certainty of the information generated or stored in digital systems or platforms. The development of such platforms and systems must also provide stability and certainty of their operation.

5. Technological sovereignty: unique attribution of the nation to make decisions without external interference on what policies and strategies to follow in the digital and technological field.

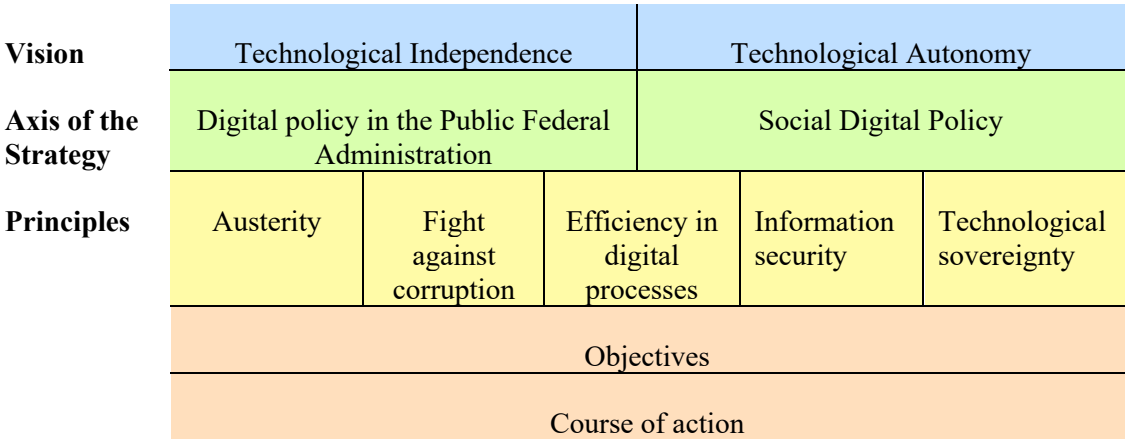


Figure 4. Structure of the National Digital Strategy

As mentioned above, the NDS works along two main lines of action, upon which specific goals and courses of action are created. On the axis of Digital Policy in the Public Federal Administration, all the actions related to the adoption of public policy technologically are encompassed. This top-to-bottom approach coordinates all the measures related to digital government, information security and technological autonomy. The specific goals and respective action plan for each policy axis can be found in Annexes B and C.

The National Digital Strategy is based on article 6 of the Mexican Constitution and is compliant with the Federal Law of Republican Austerity and the related principles in several federal laws. Additionally, it derives from the National Development Plan 2019-2024 and the programs emanating from it. A figure representing the laws and programs upon which the strategy is built can be found in Annex D.

5 Results

This chapter presents the findings derived from the analysis of the guidelines and the Mexican National Digital Strategy, following the Technology-Organization-Environment framework. Additionally, this section explains the grading received in each category.

5.1 Results with the TOE matrix

Technology

Relevance: How relevant are the technological recommendations in the guideline to the current needs and challenges?

IADB - Government Digital Transformation Guide

High – The evaluation for up-to-date and relevant technology recommendations is rated as high, indicating the guideline provides current and pertinent guidance on technological solutions for digital transformation. The text consistently emphasizes the importance of technological solutions as the cornerstone of the transformation process. It underscores the principle that technology is most effective when tailored to meet specific needs (p.6), highlighting a forward-thinking approach that prioritizes relevance and applicability. Additionally, the section focusing on "Infrastructure and technological tools" delves into how technologies can benefit society, further demonstrating a commitment to providing relevant recommendations that address contemporary challenges and opportunities. By emphasizing the adoption of technology within the digital transformation process and not solely focusing on overarching benefits (p.437), the guideline ensures that its recommendations remain up-to-date and aligned with the evolving landscape of digital innovation.

OECD - Assessing National Digital Strategies and their Governance.

High – The framework highlights technology, data, and business models as driving forces underlying digital transformation (p.4). Access to efficient, reliable, and accessible infrastructure can set the technical foundation needed for an interconnected Internet network that facilitates digital transformation (p.6). Some barriers to digital transformation are due to the traditional infrastructure and services. Creating interconnected infrastructures and services can foster an increased agile and efficient infrastructure (p.7).

High – The evaluation for up-to-date and relevant technology recommendations is rated as high, indicating that the framework provides current and pertinent guidance on

technology, data, and business models driving digital transformation. The text underscores technology, data, and business models as key drivers of digital transformation, aligning with contemporary trends and best practices in the field (p.4). Furthermore, it emphasizes the importance of efficient, reliable, and accessible infrastructure as a technical foundation for an interconnected Internet network, highlighting the relevance of infrastructure considerations in facilitating digital transformation (p.6). By acknowledging that some barriers to digital transformation stem from traditional infrastructure and services, the framework demonstrates an awareness of current challenges and the need for innovative solutions (p.6). Moreover, the emphasis on creating interconnected infrastructures and services to foster increased agility and efficiency reflects a forward-thinking approach to addressing infrastructure-related barriers to digital transformation (p.7).

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for up-to-date and relevant technology recommendations is rated as high, indicating that the text provides current and pertinent insights into digital technologies and their impact on various domains (p.1). The text acknowledges the accelerating adoption of digital technologies in daily life, highlighting their amplified impact across individual, organizational, and governmental levels (p.1). Furthermore, acknowledgment that the creation of new technologies may require advanced digital abilities that do not currently exist (p.25) demonstrates an understanding of emerging technological challenges and opportunities. Additionally, the text emphasizes the transformative benefits of digital technologies for countries' participation in organizations, associations, and policy groups (p.25), illustrating the broad-reaching implications of digital transformation. The mention of digital enablers such as infrastructure further reinforces the relevance of infrastructure considerations in facilitating digital transformation across various domains (p.24).

Compatibility: How compatible are the suggested technologies with existing infrastructure and systems?

IADB - Government Digital Transformation Guide

High – The evaluation for compatibility with existing infrastructure is rated as high, reflecting seamless compatibility with existing systems and processes evident in the text. The implementation of new technologies is described as a redesign of processes, indicating an integration of capabilities from both new and mature technologies (p.439). This approach suggests a seamless transition and compatibility with existing infrastructure, as new technologies are incorporated without disrupting the functionality

of existing systems. Furthermore, the text emphasizes the importance of analysing each country's current situation to understand what is feasible to implement, recognizing the need for tailored solutions that are compatible with existing infrastructure (p.440).

OECD - Assessing National Digital Strategies and their Governance.

High – The evaluation for compatibility with existing infrastructure is rated as high, indicating seamless compatibility and consideration for existing systems and regulations evident in the text. Digital technologies are depicted as catalysts for the development of new goods, services, and business models, highlighting the importance of frameworks that ensure correct implementation while considering existing infrastructure and regulations (p.18). This approach suggests a proactive stance towards compatibility, where the integration of new technologies considers the existing technological landscape and regulatory frameworks, ensuring a smooth transition and minimal disruption to existing systems. Moreover, the text emphasizes cooperation with other actors to promote the deployment of new technologies using existing public infrastructure, thereby reducing costs for infrastructure and service providers while enhancing access to new technologies for users (p.8). The recognition of the significant potential of digital innovation in cities, coupled with the importance of high-quality infrastructure (p.21), further underscores the commitment to compatibility and integration of new technologies within existing infrastructure.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for compatibility with existing infrastructure is rated as high, indicating seamless compatibility and consideration for existing systems evident in the text. The formulation of the strategy is depicted as a comprehensive process that includes analysing the digital ecosystem both within and outside the country, emphasizing the importance of understanding the existing landscape and potential challenges and opportunities (p.15). Moreover, the mention of a digital landscape analysis provides further insights into external factors that may affect compatibility and integration with existing infrastructure. Additionally, the inclusion of a digital maturity assessment highlights a focus on understanding the current state of internal digital capabilities, ensuring alignment and compatibility with existing infrastructure and resources (p.16).

Scalability: Are the technological solutions scalable to accommodate future growth and changes?

IADB - Government Digital Transformation Guide

High – The evaluation for scalability is rated as high due to the comprehensive provisions for expansion and adaptability outlined in the text. The text emphasizes the necessity of flexibility within the national digital strategy to accommodate the constantly changing landscape of digital transformation. It advocates for periodic updates to the National Cybersecurity Strategy to address evolving cyber threats (p.89), indicating a proactive approach to scalability in response to changing needs. Furthermore, the inclusion of architecture management (p.136-147) considerations underscores a robust framework for anticipating and addressing potential scalability challenges before they arise (p.149).

OECD - Assessing National Digital Strategies and their Governance.

Medium - The evaluation for scalability is rated as medium, indicating moderate scalability with some provisions for expansion, as reflected in the text. While the text acknowledges the potential of digital technologies to facilitate the adoption and implementation of future technologies (p.4), it does not explicitly emphasize robust provisions for scalability or adaptability. Instead, it suggests that competition in communications infrastructure and services can contribute to increased speed and capacity for future technologies (p.7), implying a moderate level of scalability driven by market dynamics. Additionally, the text mentions investment in communications infrastructures, technologies, and knowledge-based capital as means to create and implement new technologies that promote growth (p.45), suggesting some level of scalability but without explicit emphasis on scalability or adaptability to changing needs.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High - The evaluation for scalability is rated as high, reflecting robust provisions for expansion and adaptability evident in the text. The inclusion of a vision within the digital transformation strategy to guide development and envision the country's future (p.19) demonstrates a proactive approach to scalability, emphasizing long-term planning and adaptability to evolving needs. Moreover, incorporating an international perspective into the strategy not only allows for benchmarking against other countries but also provides valuable insights into future developments (p.16), indicating a comprehensive approach to scalability that considers global trends and potential expansion opportunities. Additionally, acknowledgment of the need for faster, more agile, and future-oriented policymaking and regulation in the context of digitalization (p.26) underscores a proactive stance towards scalability and adaptability to changing needs.

Accessibility: Does the guideline address issues of accessibility to technology, especially for marginalized or disadvantaged groups?

IADB - Government Digital Transformation Guide

High – The evaluation for comprehensive accessibility features, ensuring inclusivity, is rated as high, reflecting a strong emphasis on incorporating the needs of different user groups to ensure accessibility for all users. The text highlights one of the primary goals of the digital transformation process as benefiting how services are provided to citizens, emphasizing the importance of inclusivity in system design. It advocates for the inclusion of usability as a priority for information systems, recognizing the inherent complexity of these systems and the potential barriers they pose to certain user groups (p.215). By adopting a usability perspective, the text suggests a proactive approach to addressing accessibility challenges and ensuring comprehensive accessibility features. Additionally, the mention of diagnosing the environment to identify gaps and ideate palliative measures further underscores a commitment to inclusivity and accessibility, ensuring that all user groups are considered in the digital transformation process (p.411).

OECD - Assessing National Digital Strategies and their Governance.

Medium – The evaluation for accessibility features is rated as medium, indicating basic accessibility features with room for improvement, as reflected in the text. While the text acknowledges the importance of access to technologies, especially in underserved areas (p.9), it primarily focuses on enhancing access through investments in high-speed backbones or backhaul infrastructure. While this approach may improve access for some users, it may not comprehensively address the needs of all marginalized groups, suggesting room for improvement in inclusivity. Additionally, the text mentions the government's role in encouraging private investment in digital technologies through incentives (p.9). Although the correct assessment of approaches and technologies is mentioned to enhance access to disadvantaged groups, specific strategies for achieving comprehensive accessibility are not outlined, indicating a need for further development in this area.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

Medium – The evaluation for accessibility features is rated as medium, indicating basic accessibility features with room for improvement, as reflected in the text. The text emphasizes the importance of a holistic perspective in developing the National Digital Strategy (NDS), highlighting the need for inclusivity, empowerment, and a human-centred approach (p.9). Additionally, the mention of the correct implementation of the Digital Transformation Strategy (DTS) depending on the collective willingness of society, while emphasizing principles of openness, transparency, and inclusiveness, does not directly address the accessibility needs of specific user groups (p.9). While these

principles are important for creating an environment conducive to accessibility, they do not necessarily ensure comprehensive accessibility features are incorporated into digital technologies.

Security: How robust are the security measures suggested to protect against cyber threats and data breaches?

IADB - Government Digital Transformation Guide

High – The evaluation for strong security measures, protecting against potential threats comprehensively, is rated as high, reflecting a robust cybersecurity strategy outlined in the text. The text emphasizes the critical importance of safeguarding sensitive government information through a comprehensive cybersecurity strategy. It underscores the necessity of having a national authority responsible for managing and implementing the strategy, as well as ensuring cooperation with other authorities at local and international levels to develop a joint strategy (p.79). Furthermore, the text highlights the use of various tools within the cybersecurity strategy, such as prevention mechanisms, intrusion detection, threat analysis, and monitoring, demonstrating a multi-layered approach to protecting against potential breaches (p.616).

OECD - Assessing National Digital Strategies and their Governance.

Medium – The evaluation for security measures is rated as medium, indicating adequate security measures but not fully comprehensive, as reflected in the text. The text acknowledges the inherent risks associated with digital technologies, recognizing that the digital environment cannot be entirely safe and secure (p.38). While it emphasizes the importance of managing risks to ensure they do not impede the benefits and opportunities of digital transformation (p.39), specific strategies or measures for comprehensive risk management are not outlined. Additionally, the mention of public policies enabling firms to create secure technologies and individuals to understand digital risks and use digital services more responsibly suggests a proactive approach to addressing security concerns (p.40).

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

Medium – The evaluation for security measures is rated as medium, indicating adequate security measures but not fully comprehensive, as reflected in the text. While the text acknowledges the importance of trust in digital technologies and platforms and highlights the development of cybersecurity strategies by governments to ensure safety in the digital world (p.25), specific measures or frameworks for comprehensive security are not outlined. The mention of high-quality networks, accessibility to secure Internet

connections, and safe navigation enabling digital transformation to benefit society suggests an awareness of the importance of security infrastructure (p.25). However, the guideline does not provide detailed mechanisms or strategies for ensuring comprehensive security features across digital platforms and technologies. Although the mention of incorporating cybersecurity strategy within the Digital Transformation Strategy (DTS) within the overall legislative structure is noted (p.14), specific details on how this integration will ensure comprehensive security measures are not provided.

Organization

Clarity of Roles: Are the roles and responsibilities of different stakeholders clearly defined?

IADB - Government Digital Transformation Guide

High - The implementation of a digital strategy needs the collaboration between existing roles and the creation of new responsibilities. It is necessary to highlight the need for collaboration between the "leadership positions from the coordinating office of the digital transformation process and the leaders of the vertical sectors" (p.369). As a result of the dependency on IT, new positions must be created, and depending on the state of each organization, the configuration of these roles will be defined (p.379).

High – The evaluation for clear and well-defined roles and responsibilities is rated as high, reflecting a strong emphasis on collaboration and delineation of roles in the implementation of the digital strategy outlined in the text. The text emphasizes the necessity of collaboration between leadership positions from the coordinating office of the digital transformation process and leaders of vertical sectors (p.369), highlighting a clear understanding of the roles and responsibilities of key stakeholders. Additionally, the mention of creating new positions depending on the state of each organization further underscores a proactive approach to defining roles and responsibilities to support digital transformation initiatives (p.379).

OECD - Assessing National Digital Strategies and their Governance.

Medium – The evaluation for clarity in roles and responsibilities is rated as medium, indicating some clarity in roles and responsibilities but room for improvement, as reflected in the guideline. While stakeholders are identified and their relevance is highlighted for the digital transformation process, specific responsibilities are not clearly specified. The guideline acknowledges the importance of involving stakeholders in the development of the digital strategy (p.33) but does not provide a detailed delineation of their roles or responsibilities. Although the adoption of a digital government represents a

transition involving a range of stakeholders, the text does not elaborate on their specific roles in improving the delivery of policies and services, leaving room for ambiguity. Furthermore, while stakeholders are included in the development of the strategy through a ministerial council, chaired by the head of government (p.51), the specific responsibilities of stakeholders within this framework are not clearly outlined.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for clear and well-defined roles and responsibilities is rated as high, reflecting a strong emphasis on delineating roles and responsibilities for stakeholders in the digital transformation process outlined in the text. The text acknowledges the complexity of digital transformation, involving multiple stakeholders with interests across various domains (p.2). It emphasizes the inclusion of relevant stakeholders from different levels of government, non-governmental stakeholders, and civil society in the creation of the digital transformation strategy (p.3), indicating a clear understanding of the importance of stakeholder engagement. Furthermore, the mention of financial mechanisms such as venture capital and public-private co-financing mechanisms to incentivize stakeholder participation demonstrates a commitment to facilitating active involvement in the digital transformation process (p.41).

Governance Mechanisms: Does the guideline provide effective governance mechanisms for decision-making and oversight?

IADB - Government Digital Transformation Guide

High – The evaluation for effective governance mechanisms, facilitating smooth decision-making, is rated as high, reflecting a strong emphasis on formal instances to coordinate decisions and ICTS steering committees outlined in the text. The text acknowledges the collaborative nature of the digital transformation process, involving multiple stakeholders, adoption of new technologies, changes in management and culture, and overall restructuring (p.125). It emphasizes the need for formal instances to coordinate decisions, indicating a clear understanding of the importance of effective governance mechanisms in facilitating smooth decision-making (p.125). Additionally, the mention of ICTS steering committees highlights a specific mechanism aimed at identifying and reducing challenges during the implementation of the strategy (p.126-128), further underscoring a proactive approach to governance.

OECD - Assessing National Digital Strategies and their Governance.

Medium – The evaluation for governance mechanisms is rated as medium, indicating adequate governance mechanisms, but occasional inefficiencies, as reflected in the

guideline. While the text acknowledges the importance of adopting a governance approach for the formulation of digital transformation policies, it also recognizes that this approach can vary depending on national institutions and culture (p.50), suggesting occasional inefficiencies or inconsistencies. Although the text advocates for a governance approach that supports coordination, and a coherent strategic vision and gains insights from monitoring and evaluation (p.53), it does not provide specific details on how these aspects will be achieved or maintained, leaving room for occasional inefficiencies.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for effective governance mechanisms, facilitating smooth decision-making, is rated as high, reflecting a strong emphasis on intra-governmental and inter-sectoral cooperation and clearly defined roles and responsibilities outlined in the text. The text emphasizes the importance of ensuring cooperation between various governmental entities and sectors to have a correctly designed digital transformation strategy (p.4), indicating a clear understanding of the significance of effective governance mechanisms. It highlights the governance framework to define processes, roles, and responsibilities of all parties involved in the implementation of the national DTS. Additionally, the mention of identifying main governance entities, such as the steering committee, lead institution, planning team, and other relevant stakeholders (p.5), further underscores a clear delineation of roles and responsibilities, contributing to effective governance.

Stakeholder Engagement: How well does the guideline encourage engagement and collaboration among various stakeholders?

IADB - Government Digital Transformation Guide

High – The evaluation for extensive stakeholder engagement, ensuring broad support, is rated as high, reflecting a strong emphasis on including stakeholders from both the public and private sectors and actively involving them throughout the digital transformation process outlined in the text. The text emphasizes the importance of including all stakeholders and professionals to ensure alignment with the process (p.22). It highlights the benefits of collaboration with all involved actors in understanding sector needs and improving efficiency (p.140), further underscoring the significance of broad stakeholder engagement. Additionally, the mention of managing stakeholders' expectations by including them in the design phases and implementing feedback and changes proposed demonstrates a commitment to addressing stakeholder concerns and ensuring their involvement throughout the transformation process (p.365).

OECD - Assessing National Digital Strategies and their Governance.

High – The involvement of stakeholders is vital for the strategy as they can “identify and/or design appropriate policy measures and develop an action plan for successful strategy implementation” (p.53). Governments and stakeholders must work together to “create a future where the benefits of digital transformation can improve the lives of all people” (p.2). For this purpose, the guideline proposes the “multi-stakeholder model”. This approach includes all stakeholders from the early stages of the strategy development.

High – The evaluation for extensive stakeholder engagement, ensuring broad support, is rated as high, reflecting a strong emphasis on involving stakeholders throughout the strategy development process outlined in the text. The text emphasizes the vital role of stakeholders in identifying and designing appropriate policy measures and developing action plans for successful strategy implementation (p.53), indicating a proactive approach to stakeholder engagement. It highlights the importance of collaboration between governments and stakeholders in creating a future where the benefits of digital transformation can improve the lives of all people (p.2). Additionally, the mention of the "multi-stakeholder model" proposed by the guideline (p.53), which includes all stakeholders from the early stages of strategy development, demonstrates a commitment to inclusive decision-making and ensuring diverse perspectives are considered.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High - The evaluation for extensive stakeholder engagement, ensuring broad support, is rated as high, reflecting a strong emphasis on collaborative governance involving multiple stakeholders in the implementation of the digital transformation process outlined in the text. The text underscores the importance of stakeholders engaging in some form of collaborative governance to support, guide, and advise the lead institution in the development of a digital transformation strategy (p.9), indicating a proactive approach to stakeholder engagement. It highlights the flexibility in the collaboration process, suggesting that it can take the form of informal meetings or more formal structures such as task forces or advisory boards, catering to the diverse needs and preferences of stakeholders. Additionally, the acknowledgement that stakeholder involvement may vary depending on the approach chosen for the development of the strategy (p.10) demonstrates an understanding of the dynamic nature of stakeholder engagement and the importance of tailoring approaches to ensure effective participation.

Capacity Building: Are there provisions for capacity building to ensure organizations have the necessary skills to implement the guideline?

IADB - Government Digital Transformation Guide

High – The evaluation for comprehensive capacity-building provisions, addressing all relevant skills, is rated as high, reflecting a strong emphasis on training, and preparing professionals for the implementation of the transformation process outlined in the text. The text underscores the importance of training professionals as the key to correctly implementing the transformation process (p.38). Additionally, the mention of conducting internal assessments to determine required skills and establishing plans for skill enhancement through internal training or hiring (p.155). Moreover, the recognition of the need for a strategy to respond to challenges posed by digital transformation and facilitate the updating of knowledge and functions for public employees underscores a proactive approach to capacity-building (p.382).

OECD - Assessing National Digital Strategies and their Governance.

Medium – The evaluation for capacity-building provisions is rated as medium, indicating basic capacity-building provisions but with some skills gaps remaining, as reflected in the text. While the text acknowledges the importance of training for investment in skills, it also highlights the need for incentives for both firms and workers to offer and take more training (p.15). Additionally, although coordination with the industry and partners is mentioned to better prepare workers for future skill requirements, specific strategies, or mechanisms for ensuring comprehensive skill development are not outlined. Furthermore, while digital technologies such as MOOCs are mentioned as providing flexibility in training and complementing traditional skills (p.15), the text does not provide details on how these technologies will address specific skills gaps. Although the mention of the OECD Skills Strategy presents an integrated framework for identifying weaknesses and developing policies for better skills (p.25), the text does not elaborate on specific policies or initiatives to address skills gaps comprehensively.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

Medium – The evaluation for capacity-building provisions is rated as medium, indicating basic capacity-building provisions, but with some skills gaps remaining, as reflected in the text. The text acknowledges the importance of considering digitally skills and education as a key pillar of the digital transformation strategy, it also highlights challenges such as the shortage of digitally skilled workers and the ageing public sector workforce (p.21). The mention of promoting education and training to address these challenges indicates a recognition of the need for skill development; however, specific strategies or mechanisms for comprehensive skill development are not outlined. Additionally, while the text emphasizes the importance of fostering leadership and soft

skills alongside technological skills to support cultural change (p.22), specific details on how these skills will be developed are not provided.

Change Management: Is there guidance on managing organizational change processes associated with adopting the guideline?

IADB - Government Digital Transformation Guide

High – The evaluation for well-managed change processes, fostering adaptability and acceptance, is rated as high, reflecting a strong emphasis on structured actions and the involvement of users in the digital transformation process outlined in the text. The text emphasizes the importance of analysing actions on both micro and macro levels for effective implementation of the transformation process (p.36). It highlights human and change management as crucial areas of action (p.134). Additionally, the mention of identifying roles and responsibilities within the organization and defining necessary skills for each level (p.173) demonstrates a structured approach to managing change processes. Moreover, ensuring users feel involved and are considered the main actors in the digital transformation process (p365, 396-405) further emphasizes the importance of fostering adaptability and acceptance.

OECD - Assessing National Digital Strategies and their Governance.

Medium - The evaluation for managed change processes, but with occasional challenges, is rated as medium, reflecting recognition of strategies for addressing the impact of digital transformation on jobs and skills, but with some gaps in detailed change management outlined in the text. The text acknowledges the creation of new jobs and the disappearance of others as part of the adoption of new technologies in the digital transformation process, indicating awareness of the need to address changes in the workforce. However, the existing strategies from the OECD focus primarily on the analysis and restructuring of existing jobs and skills, without addressing detailed change management processes. While the Jobs Strategy (2018) provides policy recommendations for creating more and better jobs with a whole-of-government approach, the text suggests that these strategies may lack detailed guidance. Similarly, while the Skills Strategy (2019) aims to identify weaknesses and create better policies for transforming skills, specific mechanisms for managing change processes are not outlined.

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

Medium – The evaluation for managed change processes, but with occasional challenges, is rated as medium, reflecting a recognition of the importance of coordination and training for users in the digital transformation process. The guide acknowledges the importance

of providing necessary training for users and workers to adapt to new technologies and processes (p.40). However, while the WB & ITU guideline highlights this importance, specific recommendations regarding how organizational change should be managed are not provided, suggesting a potential gap in addressing detailed change management processes. While the appropriate allocation of financial and human resources is mentioned as crucial for correct implementation (p.40), specific strategies for managing change are not outlined, leaving room for challenges in detailed change management. Additionally, while training digital skills to support cultural change is emphasized for the implementation of an NDS (p.43), specific mechanisms for managing change processes are not elaborated upon.

Environment

Alignment with Priorities: To what extent does the guideline address the alignment with national, regional, or sectoral development priorities?

IADB - Government Digital Transformation Guide

Medium – The evaluation for alignment with national or regional priorities is rated as medium, reflecting partial alignment with priorities. While the guideline focuses primarily on a national level, it acknowledges the importance of aligning with priorities at both national and regional levels (p.125). Although it mentions good practices such as including external relations to ensure cooperation with other public institutions and reinforcing international relations (p.120), specific mechanisms for aligning with regional priorities are not elaborated upon. Additionally, while governance mechanisms are mentioned as allowing for the development of strategies aligned with subnational governments (p.23), detailed strategies for achieving alignment with regional priorities are not provided.

OECD - Assessing National Digital Strategies and their Governance.

High – The evaluation for alignment with national or regional priorities is rated as high, reflecting strong alignment with national priorities and coherence with international agendas outlined in the guideline. The document emphasizes the importance of having a strategic vision for the direction of the national transformation process (p.51). It highlights the need for strategic priorities that facilitate coherence with other national and/or international agendas, underscoring a commitment to aligning with broader agendas. The reference to the "Going Digital Toolkit" allowing countries to self-assess and benchmark domestic trends internationally with key indicators suggests a proactive approach to aligning with international standards and benchmarks (p.52).

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for alignment with national or regional priorities is rated as high, reflecting strong alignment with higher-level visions and supra-national strategies outlined in the text. The text emphasizes the importance of aligning the development of a digital transformation strategy with a higher-level vision, such as a national development plan, and supra-national strategies like the 2030 Agenda for Sustainable Development (p.12). It highlights the significance of implementing an international perspective for comparing the standing of the DTS and having a forecasting perspective that considers regional and global trends (p.17-18). Additionally, the mention of cooperation and collaboration in areas such as standardization, harmonization, and cybersecurity emphasize the necessity of aligning with international standards and engaging in global initiatives (p.26).

Cultural Considerations: Does the guideline consider cultural factors that may influence implementation success?

IADB - Government Digital Transformation Guide

Medium – The evaluation for consideration of cultural factors is rated as medium, reflecting some acknowledgement of cultural factors but with a focus primarily on organizational culture and implementation strategies outlined in the text. While the guideline mentions the influence of cultural aspects on the implementation of the strategy, it primarily focuses on organizational culture and ensuring correct implementation. Additionally, while the text acknowledges that the digital transformation process will have positive results for all groups involved (p.396), it also mentions the potential for individual resistance to change (p.397).

OECD - Assessing National Digital Strategies and their Governance.

High – The evaluation for consideration of cultural factors is rated as high, reflecting a strong emphasis on acknowledging the influence of cultural factors and ensuring comprehensive consideration of these factors in the digital transformation strategy outlined in the text. It highlights the influence of cultural factors on the policy environment, recognizing that strategies may vary from country to country based on cultural considerations (p.2). Additionally, the mention of the governance approach chosen for the digital transformation process and its potential differentiation based on national institutions, culture, and other factors further demonstrates efforts to consider cultural nuances comprehensively (p.50). Moreover, the acknowledgment that new technologies influence how a city is built and change social and cultural behaviour

underscores a proactive approach to understanding the cultural implications of technological advancements (p.30).

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

Medium – The evaluation for consideration of cultural factors is rated as medium, reflecting some acknowledgment of the impact of culture on digital transformation but with limitations. While the guideline acknowledges that digital transformation has an impact on culture and emphasizes the importance of training to foster necessary skills to support the process (p.42), it does not delve into specific cultural factors that could influence the design and implementation of the digital transformation strategy. Additionally, while the text recognizes the need to adapt each strategy to the specificities of each country, including political, social, and economic contexts, leadership, and overall ecosystem complexity (p.2), specific inquiry into cultural factors is not mentioned, suggesting a gap in comprehensive consideration of cultural nuances.

Innovation facilitation: Does the guideline foster an environment that encourages innovation and technological advancements?

IADB - Government Digital Transformation Guide

High – The evaluation for support for the development of new technologies is rated as high, reflecting extensive support for research and development outlined in the text. The text emphasizes the importance of a well-defined governance model that promotes public-private cooperation, enabling the participation of the private sector and leveraging its innovation knowledge (p.21). This collaboration facilitates investment in new technologies and systems for the benefit of the public sector, indicating strong support for the development of new technologies (p.366).

OECD - Assessing National Digital Strategies and their Governance.

High – The evaluation for support for the development of new technologies is rated as high, reflecting extensive support for research and development outlined in the guideline. The text emphasizes the importance of enhancing the knowledge base through research on science and technology (p.18). It highlights the role of the public sector as a catalyst for promoting investment and support for research, particularly in large innovation projects where the private sector may be hesitant. Additionally, the mention of cooperation between universities, industry, and government to provide funding and knowledge to start-ups (p.18) further highlights support for innovation and technological advancement. Moreover, public-private partnerships are highlighted as promoting innovation by sharing risks and rewards (p.19).

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for support for the development of new technologies is rated as high, reflecting extensive support for research and development outlined in the guideline. The text emphasizes the importance of ensuring consistency between a digital transformation strategy and existing national strategies in key areas such as research and development (R&D), skills, education, and innovation (p.14). It highlights science and research as crucial aspects for the sustainability of the digital world, emphasizing the role of investment in digital R&D, fostering frameworks for digital innovations, and providing incentives to promote interest and investment in new technologies (p.25).

Economic Viability: Does the guideline consider the economic feasibility and sustainability of implementation?

IADB - Government Digital Transformation Guide

High – The evaluation for economic viability is rated as high, reflecting strong economic viability with sustainable recommendations outlined in the text. The text emphasizes the use of technology as a dynamic tool within a digital agenda to ensure sustainable economic and social benefits (p.37). It highlights the importance of considering the management of service delivery with an agile and economical perspective, aiming to optimize resource utilization and minimize unnecessary expenses (p.141). Additionally, the mention of solutions developed by the strategy focusing on efficiency, effectiveness, quality, and better use of economic resources for public administration (p.462) further underscores the emphasis on economic viability.

OECD - Assessing National Digital Strategies and their Governance.

High – The evaluation for economic viability is rated as high, reflecting strong economic viability with sustainable recommendations outlined in the text. The text emphasizes the role of young firms in promoting digital innovation within the digital transformation environment, indicating a focus on fostering innovation as a driver of economic growth (p.17). Additionally, the mention of accessibility to data through existing infrastructure enabling effective and innovative use and reuse further underscores the potential for economic and social benefits (p.9). Furthermore, initiatives that promote innovation are highlighted as leading to new knowledge and technologies that drive social and economic development (p.19)

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for economic viability is rated as high, reflecting strong economic viability with sustainable recommendations outlined in the text. The text emphasizes the variability of digital transformation efforts across countries due to differences in economic, political, and social contexts, as well as digital connectivity, skills, and regulations (p.1). It highlights the importance of a comprehensive approach during the formulation of the strategy, considering multiple dimensions of digital impact, including political, economic, social, and environmental factors, to ensure economic viability (p.17). Additionally, the mention of defining the vision of the strategy to be achievable within the selected timeframe (p.19) and following the SMART approach (Specific, Measurable, Achievable, Relevant, and Time-bound) for setting objectives further underscores the focus on sustainable and economically viable recommendations (p.23).

Social Impact: What is the potential social impact of implementing the guideline, particularly on vulnerable or marginalized groups?

IADB - Government Digital Transformation Guide

High – The evaluation for consideration of social impact is rated as high, reflecting extensive consideration of social impact with targeted efforts to support vulnerable groups outlined in the text. The text emphasizes the transversality principle, indicating that any service or technology created must be replicable (p.6). It highlights the importance of including subnational governments in the digital transformation strategy to ensure marginalized groups can benefit from the solutions (p.12). Additionally, the mention of designing the strategy with an inclusive perspective from the beginning to avoid enlarging societal gaps further underscores the commitment to addressing social impact and supporting vulnerable groups (p.12).

OECD - Assessing National Digital Strategies and their Governance.

High – The evaluation for consideration of social impact is rated as high, reflecting extensive consideration of social impact with targeted efforts to support vulnerable groups outlined in the text. The guideline emphasizes the complexity and interconnectedness of the effects of digital technologies on society, indicating a nuanced understanding of the social implications of digital transformation (p.29). It highlights the role of policies in addressing different digital divides, including geographic divisions and social disparities. Moreover, the mention of correctly targeted policies benefiting groups with lower access to technologies, such as the elderly, people with lower education, and women, further addresses the social impact and supporting vulnerable populations (p.20).

WB & ITU - National Digital Transformation Strategy – Mapping the Digital Journey

High – The evaluation for consideration of social impact is rated as high, reflecting extensive consideration of social impact with targeted efforts to support vulnerable groups outlined in the text. The guideline emphasizes the potential of a national digital strategy to improve the provision of health and education services, facilitate social inclusion and communication, and improve well-being (p.2). Additionally, the mention of digital tools and technologies serving as catalysts for advancing the implementation of Sustainable Development Goals underscores the strategy's broader societal implications and commitment to sustainability (p.3). Moreover, the emphasis on digital transformation strategies aiming at the digitalization of businesses, societies, and governments to facilitate the transition towards a more sustainable society (p.45-46) further demonstrates a commitment to addressing social impact and promoting sustainability.

The next table provides a visual representation of the results for each of the guidelines and the respective categories for each of the TOE factors.

Table 2. Results of the TOE evaluation for the international guidelines

Factor	Category	IADB	OECD	WB & ITU
Technology	Relevance	High	High	High
	Compatibility	High	High	High
	Scalability	High	Medium	High
	Accessibility	High	Medium	Medium
	Security	High	Medium	Medium
Organization	Clarity of roles	High	Medium	High
	Governance mechanisms	High	Medium	High
	Stakeholder engagement	High	High	High
	Capacity building	High	Medium	Medium
	Change management	High	Medium	Medium
Environment	Alignment with priorities	Medium	High	High
	Cultural considerations	Medium	High	Medium
	Innovation facilitation	High	High	High
	Economic viability	High	High	High
	Social impact	High	High	High

5.2 Mexican National Digital Strategy

Technology

Relevance: How relevant are the technological recommendations in the strategy to the current needs and challenges?

Medium - The evaluation for up-to-date and relevant technology recommendations is rated as medium. The national digital strategy emphasizes the role of digitalization in enhancing government services by simplifying procedures, administrative processes, and increasing transparency and accountability tools. It highlights the importance of access to ICTS as a means for governments and societies to enhance relationships and activities to

improve welfare (p.3), indicating a recognition of the relevance of digital technologies in modern governance. Nevertheless, as the national digital strategy focuses mainly on the "Internet para todos" program, all efforts are directed toward this project.

Compatibility: How compatible are the suggested technologies with existing infrastructure and systems?

High – The compatibility is rated as high, as there is a seamless adaptation with the existing infrastructure. The Mexican National Digital Strategy, under the Digital Policy of the Public Federal Administration axis, highlights the importance of re-using technologies and the existing infrastructure (p.6). One of the priority projects of the National Development Plan is the "Internet para todos" initiative which aims to provide Internet connectivity for all of the country through the existing infrastructure (p.3). Furthermore, all the planned projects must promote a culture of collaboration, cooperation, and use of existing resources.

Scalability: Are the technological solutions scalable to accommodate future growth and changes?

Medium – As there is moderate scalability, with limited provisions for expansion, this category is rated as medium. The national strategy was created under the National Development Plan 2019-2024, meaning the programs and projects created have a defined timeframe. The priority projects of the strategy aim to create a digital environment, which can be observed with the strategy focusing on the development and deployment of infrastructure. While the solutions presented do not mention or specify the inclusion of future technologies, the base of a digital environment could, technically, accommodate new solutions.

Accessibility: Does the strategy address issues of accessibility to technology, especially for marginalized or disadvantaged groups?

High – The strategy highlights several aspects that align with the parameter of comprehensive accessibility features, ensuring inclusivity. The National Development Plan's core principle of promoting societal participation to create an inclusive modern state (p.1), the focus on providing nationwide Internet connectivity to marginalized groups and remote areas (p.3), and the humanistic perspective of the national digital strategy that prioritizes vulnerable groups (p.4) all demonstrate a strong commitment to comprehensive accessibility and inclusivity. These elements collectively ensure that the digital strategy is designed to be inclusive and accessible to all, particularly the most vulnerable and marginalized populations.

Security: How robust are the security measures suggested to protect against cyber threats and data breaches?

Medium – The strategy offers adequate measures, but not fully comprehensive, this gives the category a medium rating. The text mentions fostering an information security culture and implementing several policies to ensure trust among users, indicating a proactive approach to security (p.7). It also highlights the role of the National Cyber Incident Response Centre in coordinating the cybersecurity strategy and promoting cooperation and collaboration. However, the strategy does not provide enough detail to suggest that the security measures are fully comprehensive and capable of protecting against all potential threats comprehensively.

Organization

Clarity of Roles: Are the roles and responsibilities of different stakeholders clearly defined?

Medium – In the digital strategy some stakeholders are identified, but the specific roles and responsibilities for each of them will have, are not defined. While the strategy does mention the importance of collaboration with other institutions, their participation is not included. It is worth highlighting that the priority program "Internet para todos" does specify the collaboration of the federal government with private companies and businesses to ensure nation-wide connectivity, indicating some level of clarity and defined roles in this specific area.

Governance Mechanisms: Does the strategy provide effective governance mechanisms for decision-making and oversight?

Medium – The strategy provides some governance mechanisms, but these are not comprehensive. A subsequent agreement published by the Federal Government provides policies and regulations for the correct implementation of the National Digital Strategy, specifying mechanisms for decision-making and some regulations for monitoring the implementation (p.6). This suggests that there are adequate governance mechanisms in place. However, the strategy does not indicate that these mechanisms are comprehensive or without inefficiencies, which implies that some inefficiencies might still be present.

Stakeholder Engagement: How well does the strategy encourage engagement and collaboration among various stakeholders?

Medium – The National Digital Strategy emphasizes cooperation with other institutions and local governments under both axes of analysis (p.6). Furthermore, the subsequent

agreement states that cooperation between institutions and the private sector is necessary to maximize the use of technologies and minimize expenditure in new systems (p.5). However, the text does not provide detailed information on how comprehensive this cooperation is.

Capacity Building: Are there provisions for capacity building to ensure organizations have the necessary skills to implement the strategy?

Low – The strategy does not specify any provision of skills training for the development of the skills needed for the adoption of the National Digital Strategy.

Change Management: Is there guidance on managing organizational change processes associated with adopting the strategy?

Low - The strategy does not specify any guidance on how the manage the changes that come with the adoption of the guide.

Environment

Alignment with Priorities: To what extent does the strategy align with national, regional, or sectoral development priorities?

High – The Mexican National Digital Strategy demonstrates strong alignment with national priorities as it derives from the National Development Plan. This Plan encompasses the objectives and strategic priorities for the federal administration during its six-year term (Gobierno de México, n.d.-a). Additionally, the "Internet para todos" program is designated as a priority with specific legislations and projects dedicated to its completion.

Cultural Considerations: Does the strategy consider cultural factors that may influence implementation success?

Low – The strategy does not consider any cultural factors that could influence the implementation.

Innovation facilitation: Does the strategy foster an environment that encourages innovation and technological advancements?

Medium - The strategy aims to promote the access and responsible use of ICTS and foster the promotion of high-quality technologies and innovation (p.1). Additionally, the strategy has in its mission to "promote and encourage citizens to enjoy and benefit from access to information and communication technologies, as well as broadband and Internet

services and their transformative potential" (p.4). However, the strategy does not detail what actions the government will take to do so.

Economic Viability: Do the recommendations consider the economic feasibility and sustainability of implementation?

Medium – The strategy highlights moderate economic viability, but as no specific recommendations are provided, this could lead to potential challenges. Following the Digital Policy in the Federal Public Administration axis, one of the objectives aims to harmonize the regulatory framework to achieve technical and economic efficiency. Additionally, a central technical and economic instance is proposed. This instance will oversee analysing the technological projects based on their operational relevance (p.6).

Social Impact: What is the potential social impact of implementing the strategy, particularly on vulnerable or marginalized groups?

High – The Mexican National Digital Strategy depicts an extensive consideration of the social impact, with specific efforts targeted towards vulnerable groups. The strategy aims to bridge the digital divide by providing Internet access to marginalized and underserved communities, which can lead to enhanced opportunities in education, healthcare, and economic empowerment. Additionally, by promoting the responsible use of ICTs, the strategy seeks to reduce inequality and improve government services, ensuring that benefits reach those most vulnerable (p.1).

The following table shows the results of the assessment for each of the factors and its respective categories.

Table 3. Results of the TOE evaluation for the Mexican National Digital Strategy

Factor	Category	Mexican NDS
Technology	Relevance	Medium
	Compatibility	High
	Scalability	Medium
	Accessibility	High
	Security	Medium
Organization	Clarity of roles	Medium
	Governance mechanisms	Medium
	Stakeholder engagement	Medium
	Capacity building	Low
	Change management	Low
Environment	Alignment with priorities	High
	Cultural considerations	Low
	Innovation facilitation	Medium
	Economic viability	Medium
	Social impact	High

6 Discussion

This chapter presents an analysis of the results presented above. As mentioned above, this research aims to understand how international organizations tackle technological, organizational, and environmental aspects in the guidelines targeted for governments. Due to the importance and influence international organizations have in the policy creation and serving as some sort of consultants to governments. The guidelines provided tend to have specific goals in mind. This research aims to identify how are governments providing recommendations to countries, whether these can be replicable, and how detailed these are. This section will discuss the findings presented above and whether these guidelines serve as guidance documents. Additionally, this section will delve into how the guidelines agree or disgrace with the Mexican National Digital Strategy.

6.1 Government Digital Transformation Guide

The IADB guideline is a detailed document that provides a clear roadmap for the analysis, design, implementation, and monitoring of a national digital strategy. The guideline, divided into five main sections, is structured around the use, implementation, legislation, and human connection with technology in the public sector. Interviewee #1 mentions that *"a national digital strategy should be related to the country's strategy with the vision of the leaders, the country at the moment".*

As mentioned above, the guideline has technological solutions as a core factor for a digital transformation process. The guideline provides relevant and up-to-date technological recommendations that can be integrated with existing systems. In terms of technology, the guideline provides a comprehensive assessment of digital maturity and the digital landscape. This assessment helps to identify gaps and opportunities. Moreover, the guideline highlights the importance of aligning the digital transformation strategy with national and supra-national strategies, such as national development plans and the 2030 Agenda for Sustainable Development. Interviewee #1 highlights that *"a strategy should make some mention of the fact that legislative frameworks may need to be reformed".* Furthermore, it underscores using international frameworks to benchmark the country's digital maturity against global standards.

However, specific technological innovations or tools to be used or developed are not thoroughly discussed. The document focuses heavily on strategic planning without clearly mentioning the technological solutions or platforms intended for implementation. Furthermore, the potential over-reliance on existing documents for coherence might hinder innovation, as it may lead to excessive dependence on current policies and strategies without fostering disruptive technological advancements.

From an organizational perspective, the guideline mentions that a national digital strategy benefits from establishing a strategic governance framework with clearly defined roles, responsibilities, and processes, which supports effective collaboration and coordination across various sectors. The emphasis on securing political will and support at the highest levels ensures that the digital transformation process receives the necessary backing and resources. Interviewee #1 notes the significance of governance, stating that *"creating governance mechanisms, helping the relevant actors to participate and not being guided by a specific group (...) helps to provide continuity".* Additionally, articulating a clear, ambitious, but feasible vision, along with SMART objectives, provides a structured and systematic approach to achieving the digital transformation goals. Interviewee #2 agrees that *"every strategy needs principles that support it and a broad vision of where we want to work towards"*. They also point out that *"Political will is crucial, but coordination is also essential".*

Nonetheless, the creation of multiple governance bodies, such as steering committees and advisory groups, may introduce bureaucratic delays and inefficiencies, complicating the implementation process. Another organizational weakness is the insufficient detail on addressing potential shortages in skilled personnel required for the digital transformation, despite the mentioning the need for building digital skills.

The guideline demonstrates strength in its inclusive whole-of-society approach, engaging a wide range of stakeholders, including the private sector, academia, civil society, and political actors, fostering a comprehensive and inclusive digital transformation process. Collaborative governance with stakeholders helps build a sense of ownership and partnership, crucial for the strategy's success. Additionally, regular strategic monitoring and evaluation mechanisms ensure the DTS remains relevant and effective, with the ability to adjust based on performance data. Interviewee #1 underscores the importance of engagement, stating that *"the private sector, academia, civil society cooperation helps to provide continuity".*

However, there are weaknesses in the environmental aspect, particularly in resource allocation and funding. Although proper funding and resource allocation are emphasized, there is a risk of insufficient financial commitments and over-reliance on private sector investments, which may not always align with public interests. Furthermore, the text does not address the potential environmental impact of digital transformation in detail, such as managing e-waste, or the carbon footprint associated with increased digital infrastructure.

Overall, the IADB's guideline is an encompassing document that takes most of the TOE aspects into consideration. While the focus of the guideline is still on mostly internal changes, the perspective is quite detailed with a possibility of implementation.

Interviewee #1 comments on the adaptability of the guideline, stating, *"I do not believe that there are recipes that can be applied uniformly to all countries (...) the important thing is that a country advances and that the benefits of digitalization reach its people".* It is worth mentioning that while every country builds its own strategy based on its needs and objectives, a document such as this guideline does provide the necessary description for countries to adopt new technologies and implement a digital transformation process. Another beneficial aspect is that the guideline provides a control sheet for the documentation of digital transformation actions. The potential implementation of the guideline can be global, as the challenges countries face during the digital transformation process are worldwide. Interviewee #1 concludes, *"The important thing is that they do it [the digital transformation process], the guide helps to provide continuity to the digital policy".*

Interviewee #2 also emphasizes the importance of the guide's universal applicability, stating, "*It is not possible to have a national government digital transformation initiative without addressing each of the 5 (pillars) to some extent*". He further elaborates on the goal of the guide, *"to convey that almost philosophical concept" and to "democratize access to knowledge".* Despite the challenges, interviewee #2 highlights that "*the philosophy that is within the guide is to make the digital agenda serve to deliver on public policy priorities",* ensuring its durability and adaptability across different political contexts.

6.2 Assessing National Digital Strategies and their Governance.

The OECD's guideline serves as a comprehensive framework, encompassing various recommendations and methodologies the organization has published over the years. Divided into seven transversal factors, this guideline provides a cross-sectoral analysis of elements essential for implementing a digital transformation process.

In terms of technology, the guideline demonstrates several strengths. Firstly, it emphasizes the importance of robust communication networks, highlighting reliable broadband infrastructure and complementary enablers. Such emphasis ensures the foundation for effective digital transformation. Secondly, the framework promotes the adoption of digital government strategies, which streamline processes and enhance citizen engagement. Lastly, the framework supports innovation by encouraging investments in knowledge-based capital (KBC) and fostering entrepreneurship and SMEs, thereby driving technological advancements.

Nevertheless, there are some weaknesses in this area. Despite the focus on robust networks, challenges in infrastructure development, particularly in rural and remote areas,

persist. Addressing digital security and privacy concerns remains a significant challenge, potentially hindering trust, and widespread technology adoption. Additionally, limited adoption of advanced digital tools due to skill demands can slow down overall technological progress. Interviewee #5 points out that "*there are countries that definitely won't do that [digital transformation process] and that's obviously their prerogative".* Interviewee #6 further elaborates that, through the guideline "*we are placing digital government as a topic of policy area (...) enabling actors in the government themselves to use digital technologies and data to improve processes*".

The organizational dimension of the guideline presents a cross-cutting analysis across various policy domains helps break down silos and promotes coordinated efforts among stakeholders. Additionally, the inclusive strategy development process involving all relevant stakeholders ensures diverse perspectives are considered, leading to comprehensive policies. Lastly, the establishment of a clear governance approach for coordination among stakeholders ensures effective policy implementation and adaptation.

However, some challenges in this dimension arise. Firstly, coordinating among various stakeholders, especially in decentralized systems, can be challenging and lead to delays. Secondly, the success of implementation heavily relies on the skills and capacities of key actors, which may be insufficient in some regions or organizations. Moreover, unclear communication and unrealistic objectives can pose significant barriers during the implementation phase, affecting the overall success of the strategy. Interviewee #6 mentions that one of the challenges for the guideline within the organizational dimension is that "*we [the OECD] propose a very comprehensive guideline (...) when implementing the guideline, they [the countries] may have very specific challenges and initiatives to deal with priorities on the national domestic side".*

In terms of the environment, the guideline promotes market openness, allowing both local and international firms to compete, thereby driving innovation and economic growth. Secondly, the framework addresses social policies, ensuring that the benefits of digital transformation are widely shared across society. Lastly, leveraging digital technologies for environmental improvements can enhance sustainability and reduce the ecological footprint of the ICT sector.

Nonetheless, there are some weaknesses in this dimension, particularly adapting regulatory frameworks to the evolving digital landscape can be complex and create obstacles for seamless digital transformation. Moreover, digital transformation may exacerbate regional inequalities, requiring targeted interventions. Additionally, managing the societal impacts of digital transformation, such as cultural and societal norms, requires

careful attention to avoid negative outcomes. Interviewee #5 notes that *"the policies may not be great. It's just like how comprehensively you address these issues or not".*

The OECD's guideline is an encompassing document that offers a series of recommendations across several sectors. While the guideline does offer guidance on how to do the implementation of certain aspects, the document relies mostly on previously presented policy recommendations in specific areas. It is important to notice that the guideline is part of a larger effort from the organization to provide support in terms of digital transformation. Furthermore, as the guideline is aimed at member countries, certain considerations for low-income countries are not included, which could limit the adoption of the guideline in other regions of the world. Overall, the guideline does offer broad recommendations that countries can replicate when developing their own strategy. Case examples included in the document help elucidate specific aspects needed for the creation of a national digital strategy, as well as the digital transformation. However, deeper explanations for certain aspects would be beneficial to prevent the formation of incomplete national strategies.

In conclusion, the OECD's guideline is "*meant to be there as a tool"* (interviewee #5). The practical use of the guideline must consider local contexts, regulatory environments, and the specific challenges faced by the countries. Interviewee #6 points out that the guideline *"represents sort of an ideal picture, based on OECD consensus of the policy domains that should be covered in a national strategy".*

6.3 National Digital Transformation Strategy – Mapping the Digital Journey

The WB and the ITU, through the Digital Regulation Platform, published its guideline to offer recommendations for all country members. The guideline serves as a comprehensive resource, detailing best practices and strategic actions to implement and manage digital transformation initiatives at a national level.

Starting with the technology factor, the WB & ITU's guideline provide detailed recommendations. Firstly, the strategic analysis outlined in the guideline demonstrates a significant strength by incorporating tools such as gap analysis and SWOT analysis. This thorough examination of the digital landscape and maturity allows for the identification of opportunities and challenges, ensuring that the strategy is well-informed and targeted. Additionally, the method of mapping existing documents related to digital transformation fosters coherence by aligning the DTS with national and international strategies. This alignment is crucial for maintaining consistency and avoiding redundancy. Furthermore, the articulation of a clear, ambitious yet feasible vision, along with setting SMART

(Specific, Measurable, Achievable, Relevant, Time-bound) objectives, ensures that the DTS is both goal-oriented and pragmatic.

Interviewee #4 emphasizes the importance of creating digital transformation strategies through participatory processes. The process "*which delivers the strategy is often more important than the strategy itself, because it's the process (...) which is fully participatory, fully transparent, fully inclusive*". This highlights the necessity of engaging all stakeholders throughout the strategy development process to ensure that the resulting strategy is well-supported and reflective of the needs and goals of the entire population.

However, there are weaknesses within this factor. The necessity to align the DTS with a wide range of existing documents and strategies can introduce complexity, potentially slowing down the implementation process. Moreover, the guideline's reliance on the current state of digital capabilities and readiness, which can vary significantly across different regions, poses challenges, particularly in less developed areas. Interviewee #4 highlights that telecommunication infrastructure tends "*to grow first in cities and only spread later to rural areas".* This variability may impede the uniform application of the strategy and require additional resources to address disparities in technological readiness. As noted by interviewee #3 *"economic constraints, political biases, and changes in government priorities can all be significant barriers"* to implementation.

The organizational aspect of the guideline highlights several strengths, particularly in the establishment of strategic governance frameworks that support effective collaboration across government sectors and stakeholders. By defining roles and responsibilities clearly, this guideline ensures a coordinated approach to digital transformation. Additionally, the emphasis on both whole-of-government and whole-of-society approaches promotes comprehensive stakeholder engagement, fostering a sense of ownership and partnership among all involved parties. The detailed monitoring and evaluation framework is another strength, as it ensures ongoing assessment and adjustment of the DTS, maintaining its relevance and effectiveness over time.

Nonetheless, the organizational context also presents some weaknesses. The success of the DTS is heavily dependent on securing political will and support at the highest levels, which can be challenging to sustain over the long term. The process of securing proper funding and commitments from various stakeholders, particularly the private sector, can be difficult, potentially hindering the implementation process. Additionally, the need for extensive training and capacity building within the government and public sector may slow down the initial phases of implementation, as these efforts require significant time and resources to develop the necessary internal digital skills. Interviewee #3 emphasizes that *"implementation hinges on having skilled staff who can develop and execute the*

strategy, as well as the capacity to monitor progress and sufficient financial resources". Interviewee #4 highlights the importance of private sector participation, stating, *"Experience has shown the private sector tends to be more efficient, tends to be more customer-oriented than the public sector,"* stressing the need for balanced and effective engagement with private entities to drive digital transformation forward.

The environmental context of the guideline offers strengths in its alignment with broader national development plans and international agendas, such as the 2030 Agenda for Sustainable Development. This alignment ensures that the DTS contributes to overarching goals and supports national and international commitments. Emphasizing the creation of digital solutions with a sustainable perspective is another strength, as it supports environmental and social development, making the strategy future-proof and ethically sound.

However, there are notable weaknesses in the environmental context. Adapting regulatory frameworks to the rapidly evolving digital landscape can be complex, creating obstacles for seamless digital transformation. Additionally, the digital transformation process may exacerbate regional inequalities, necessitating specific programs to ensure that benefits are equitably distributed across different regions. Managing the societal impacts of digital transformation, including adherence to social and cultural norms, requires careful attention to avoid resistance and ensure smooth adoption. Interviewee #4 notes the challenges of maintaining an inclusive approach, stating that digital strategies *"have to be inclusive (...) to reach out to rural areas and have access to urban areas, it has to cut across ethnic groups within society."* These challenges highlight the need for a balanced approach that considers the diverse environmental factors influencing the digital transformation process. Interviewee #3 highlights the importance of foresight and adaptability, stating, *"It is about having a foresight division, or as they call it in French, a 'division de prospective technologique,' to stay informed and engaged".*

Overall, the WB & ITU's guideline offers a detailed plan for the design, implementation and monitoring of a national digital strategy. The guideline provides considerations and offers methodologies that can be used for the creation of a strategy in any region of the world. The guideline offers examples of real national strategies and explains how certain aspects are present in these. While there are certain aspects in which the guideline could offer more detailing, in general, it can be easily replicable and adapted to each country's specific characteristics and needs.

Interviewee #3 points out that "*These guidelines are not binding; they're simply recommendations put forward".* Furthermore, "*it is ultimately up to individual countries to adapt them and determine how to address their unique challenges".* Additionally,

interviewee #4 highlights the non-binding nature of the guidelines, stating *"these guidelines are not binding; they're simply recommendations put forward...it's ultimately up to individual countries to adapt them and determine how to address their unique challenges*". In conclusion, while the WB & ITU's guideline provide a robust framework, the real challenge lies in the effective implementation and adaptation of these guidelines to fit the unique contexts of different countries.

6.4 Mexican National Digital Strategy

The Mexican National Digital Strategy provides a comprehensive overview of the projects aimed at facilitating the country's digital transformation. The previous section highlighted that the primary focus of the Mexican strategy is on establishing the necessary infrastructure to ensure nationwide Internet connectivity. As shown in the results section, within the three components of the TOE framework, the organizational factor received the lowest ratings. Unclear roles can lead to incomplete and incorrect implementation of the strategy, especially given the emphasis on efficiency in the current administration.

For successful implementation of the strategy, it is essential to have skilled and trained workers capable of adapting the proposed technologies and systems. The Mexican strategy does not specify the necessary skills required for implementation, nor does it outline how these skills should be developed and integrated into program design. Interviewee #7 points out that for the implementation of a national digital strategy workers "*need not only technical training but also training in public policy and a broad vision. It is essential to be able to articulate ideas and implement them in the government ministries".*

Another crucial aspect of the organizational factor that the strategy fails to address is the management of the processes related to the strategy's implementation. Not including recommendations for these processes can delay the strategy's success, as it should not be assumed that the strategy can be adopted without any organizational changes. *"Digital transformation is a change of culture, it is a change of even if I can change my business model, it is a change, it is a different way of visualizing your organization, be it public or private or whatever*" (interviewee #7).

Under the environmental factor, the cultural considerations category received a low rating. Although the strategy emphasizes the need for an inclusive perspective and the involvement of all societal groups, particularly vulnerable ones, it fails to provide specific recommendations. Mexico is a country with more than 70 indigenous communities (Secretaría de Cultura, n.d.); therefore, cultural considerations must be highlighted when designing national policies and projects. The omission of these cultural considerations

reflects poorly on the development of the strategy. "*The problem with the [Mexican National Digital Strategy] strategy is that it does not analyse the general context of a digital Mexico, it focuses only on the ICTs areas, not even the needs of the whole country"* (interviewee #7).

The technology factor received the highest ratings among the three areas of analysis. Nevertheless, the factor did not receive high marks across all respective categories. For example, the scalability category evaluates how well the strategy addresses the technologies' abilities to accommodate future growth and changes. Interviewee #7 mentioned that after the current administration started its mandate, most of the efforts in terms of digital transformation disappeared as under the austerity principle *"all projects were reduced, and new operations were minimal. Then all the projects were simply cancelled".* Since the Mexican strategy is designed with a specific timeline, the proposed solutions are limited to that timeframe. *"The problem (...) is that there is no planning, there is no national digital strategy, there is no strategy to transform because what little there was remained in 2018".* Nevertheless, as the strategy focuses on achieving nationwide Internet connectivity, the ICTS infrastructure deployed during this period can support future technological advancements.

A thorough analysis of the data released by the government through official channels indicates that the National Digital Coordination Office aims to serve as a guiding entity. As stated in both the National Development Plan and the National Digital Strategy, the current administration primarily concentrates on the priority program "Internet para todos." Interviewee #7 stated that "*the goal was to connect the entire population to the Internet. However, there was no clear directive from the top as to how to operate".* Despite being a federal entity under the president's office, there appears to be a lack of collaboration from the National Digital Strategy Coordination with other federal and local entities and offices responsible for digital transformation. *"Furthermore, there appears to be a lack of collaboration with the private sector or civil society organizations."*

Comparing the current strategy with that of the previous administration reveals a more limited strategy with broader priorities. Although various mechanisms for improved implementation and digital skills training may exist internally, the available official information does not support this assumption. The government's reluctance to provide more detailed information hinders the research into how the strategy is developed, implemented, and monitored. The tenure of the current administration will officially conclude on September 30th, 2024. Due to the broad impact of digital transformation in all societal areas, it will be upon the incoming government to create a new strategy that effectively drives the digital transformation process within the country.

7 Conclusion

This research aimed to understand how international organizations develop their government digital transformation guidelines considering specific technological, organizational, and environmental aspects. Furthermore, this research aimed to identify the same principle in the Mexican National Digital Strategy. Below the research questions are analysed and answered.

Main RQ: How are technological, organizational, and environmental factors addressed in national digital strategy guidelines developed by international organizations?

Starting with the Inter-American Development Bank (IADB), the guideline emphasizes the role technology plays in the digital transformation process. Technology changes how society communicates and how services are delivered. Given that each country faces different challenges and needs, the approaches towards technology will vary, and the technologies used will differ accordingly. To support the inevitable changes brought about by digital transformation, the organization responsible for these changes must have the necessary protocols and training to ensure proper implementation. The guideline highlights that the government is responsible for ensuring employees and society are aware of the changes and possess the necessary skills to adapt. Finally, it is crucial to create an innovative and inclusive environment that ensures a comprehensive strategy.

The Organisation for Economic Co-operation and Development (OECD) guideline focus on the recommendations previously presented by the organization. The guidelines highlight the impact digital technologies and data have on interactions between people, businesses, and governments. Technologies change the traditional ways in which organizations operate. Due to the interconnection inherent in a digital transformation process, all areas of society need to be included and trained to maximize the benefits of technology. For a strategy to be correctly developed, external factors must be considered, as proper planning fosters inclusivity and economic sustainability.

The World Bank (WB) and International Telecommunication Union (ITU)'s guideline provides guidance on all stages of a digital transformation strategy. Digital technologies can serve as a catalyst for society if implemented correctly. It is necessary to identify the needs and current state of the country to ensure that technologies are utilized to their fullest potential. For the strategy to be implemented correctly, society and those responsible for providing services must have the capacity to do so. The strategy must consider the development of skills within the organization to cope with the presented changes. A digital transformation process needs to be designed within a context that

supports and encourages the inevitable changes. All external factors that could influence the transformation process must be analysed and addressed from the design phase.

SRQ 1: How do the national digital strategy guidelines of the IADB, OECD, and WB differ in their approaches, priorities, and recommendations?

As discussed above, the three guidelines address the topic of national digital strategy from different perspectives. On one hand, the IADB guideline serves as an encyclopaedic resource due to its comprehensive detailing of terms. This guideline not only defines several key terms essential for the digital transformation process but also presents case studies for these terms, allowing for further in-depth analysis. Additionally, the guide introduces four characters who illustrate how they are affected by their respective positions in society. This interactive tool facilitates the comprehension of concepts and is available in both English and Spanish.

On the other, the OECD guideline is a more formal document primarily aimed at government officials. It provides detailed policy recommendations based on the seven strategic areas around which the guideline is structured. These recommendations are crafted with an economic perspective, offering guidance for social development within this economic framework. As part of a broader initiative focused on digital transformation, this guideline suggests that reviewing related reports within the initiative could provide a more comprehensive understanding.

Finally, the WB & ITU guideline offers a straightforward approach by highlighting the essential elements and steps required for a digital transformation process. It elaborates on these necessary elements and explores their significance. Furthermore, the guideline presents strategies from various countries to exemplify the adoption of concepts and the promotion of best practices. It also includes visual aids that illustrate the relationships between concepts, actors, and institutions, enhancing the overall clarity and utility of the guideline.

SRQ2: Which guideline exhibits the highest alignment with the Mexican National Digital Strategy?

The Mexican National Digital Strategy exhibits the highest alignment with the guidelines of the OECD (Organisation for Economic Co-operation and Development). Firstly, the strategy’s push for the digitalization of government services to enhance efficiency and accessibility closely aligns with OECD recommendations. Furthermore, the Mexican strategy highlights the importance of using existing resources to promote technological development and innovation, this reflects the OECD's promotion of an active digital

economy and innovation ecosystem. The holistic approach of the Mexican strategy, ensuring that digital technologies benefit society, also aligns well with the OECD's comprehensive perspective on digital transformation. While there are overlaps with the IADB and WB guidelines, the OECD's focus areas show the highest alignment with Mexico's strategic priorities.

SRQ3: What specific technological initiatives or investments are prioritized within the Mexican National Digital Strategy, and how do they align with the recommendations of the IADB, OECD, and WB guidelines?

The Mexican National Digital Strategy prioritizes the development of ICTS and telecommunication infrastructure. The strategy emphasizes several specific technological initiatives and investments, such as expanding broadband infrastructure to enhance connectivity nationwide, particularly in underserved rural and remote areas. This commitment is exemplified by the prioritization of the “Internet para todos” program in the National Development Plan and the NDS. In this regard, the IADB guideline has a chapter focused solely on infrastructure and technological tools, emphasizing the importance of wide infrastructure deployment. Furthermore, the guideline mentions that for digital services to be available to society, access to the respective technology is essential.

Additionally, the strategy points out the development of efficient digital processes and technological autonomy. These priorities align closely with the guidelines from the IADB, OECD, and WB, which stress the importance of developing accessible technologies that can serve all societal groups. By focusing on technological autonomy, the strategy aims to reduce dependence on external technologies and enhance national capabilities. Although the guidelines do not specifically address technological autonomy, they do mention that governments should create technologies tailored to their specific needs.

By exploring how different international organizations perceive key aspects of a digital transformation strategy, this research highlights the comprehensive guidance these organizations provide. Utilizing the TOE (Technological, Organizational, and Environmental) framework as a common ground for analysis enabled the identification of specific connections between various aspects and phases detailed in the guidelines. Additionally, an in-depth analysis of a specific national digital strategy facilitated an understanding of how a Digital Transformation Strategy (DTS) is structured and identified characteristics developed by international organizations.

7.1 Contributions to the field

This research aimed to provide practical utility to the field, which has been achieved in several ways. Firstly, the creation of a comparative matrix allows for the observation of similarities and differences in approaches to government digital transformation. This matrix serves as a valuable tool for policymakers and researchers, offering a clear visual representation of how different organizations prioritize and address technological, organizational, and environmental factors in their guidelines. It enables stakeholders to identify best practices, common challenges, and unique strategies tailored to specific contexts.

Secondly, by focusing on specific areas of analysis, this research thoroughly explored the recommendations and guidance provided by international organizations, revealing their practical implications. This detailed analysis highlights the thoroughness and specificity with which international organizations address various aspects of digital transformation, offering concrete examples and actionable recommendations that can be directly applied by governments seeking to develop or refine their digital strategies.

Thirdly, by analysing a specific national digital strategy—namely, the Mexican National Digital Strategy—using the same parameters as those set out in the international guidelines, it was possible to observe how a government translates these recommendations into practice. This comparative analysis not only demonstrated the alignment and divergence between national and international approaches but also shed light on the practical challenges and successes experienced by a government in the process of digital transformation.

By applying the TOE framework to both international guidelines and a national strategy, this research provided a meticulous understanding of how theoretical recommendations are implemented on the ground, thereby bridging the gap between theory and practice. By comparing the guidelines from international organizations with the specific national strategy of Mexico, this research highlights the adaptability and flexibility required for successful digital transformation.

Furthermore, this study helps close the research gap concerning the analysis of digital transformation guidelines from the perspective of international organizations. Most previous research has been conducted at a local or state level, often focusing on single-case studies. This limited scope has left a significant gap in understanding the broader, international landscape of digital transformation strategies. By offering a broader comparative perspective, this research enriches the understanding of digital

transformation strategies on an international scale, providing valuable insights into best practices, common challenges, and innovative solutions.

7.2 Future research

This study focused on analysing guidelines provided by specific international organizations, chosen for their emphasis on national-level considerations. Analysing guidelines tailored to state and municipal levels could offer further insights into how international organizations approach digital transformation on a smaller scale. Additionally, while this research concentrated on guidelines from international organizations, it's noteworthy that various consultancies, private sector entities, and civil society organizations have also developed their guidelines. Examining how approaches differ across these different entities could highlight the priority areas each considers essential for digital transformation.

The study was structured around the Technology-Organization-Environment (TOE) framework to analyse and compare the selected guidelines. While TOE provided a robust foundation for understanding the multifaceted nature of digital transformation, incorporating additional theoretical frameworks could enhance the analysis further. By conducting a joint analysis using diverse theoretical lenses, such as the Institutional Theory (Powell, 1983; Powell & DiMaggio, 1991), the Technology Enactment framework (Fountain, 2001), or the Adaptive Structuration Theory (DeSanctis & Poole, 1994), it would be possible to explore different dimensions and perspectives of digital transformation in greater depth. This approach could reveal intricate insights into the interaction between technological advancements, organizational structures, environmental influences, and institutional contexts, thus offering a more comprehensive understanding of the dynamics involved in the process of digital transformation.

International organizations play a crucial role in guiding governments through the key aspects of digital transformation. While the guidelines they offer are not binding, governments should take into consideration the recommendations provided, as these could lead to better common digital progress. Although there is no one-size-fits-all solution for digital transformation, analysing these guidelines enables countries to identify and incorporate essential elements tailored to their unique contexts. By doing so, they can effectively navigate the complexities of digital transformation, utilizing global insights to foster sustainable progress and innovation.

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Appendix

A Grading for each aspect of the matrix

Factor	Low	Medium	High
Technology	Outdated or irrelevant technology recommendations.	Some relevant technology recommendations, but not comprehensive.	Up-to-date and relevant technology recommendations.
	Lack of consideration for compatibility with existing infrastructure.	Partial compatibility with existing infrastructure, requiring some adjustments.	Seamless compatibility with existing infrastructure.
	Limited scalability or adaptability to changing needs.	Moderate scalability, with some provisions for expansion.	High scalability, with robust provisions for expansion.
	Poor accessibility features, excluding certain user groups.	Basic accessibility features, but room for improvement.	Comprehensive accessibility features, ensuring inclusivity.
	Inadequate security measures, leaving systems vulnerable to breaches.	Adequate security measures, but not fully comprehensive.	Strong security measures, protecting against potential threats comprehensively.
Organization	Unclear or ambiguous roles and responsibilities.	Some clarity in roles and responsibilities, but room for improvement.	Clear and well-defined roles and responsibilities.
	Weak governance mechanisms, leading to decision-making bottlenecks.	Adequate governance mechanisms, but occasional inefficiencies.	Effective governance mechanisms, facilitating smooth decision-making.
	Limited stakeholder engagement.	Moderate stakeholder engagement, with some gaps.	Extensive stakeholder engagement, ensuring broad support.
	Inadequate capacity-building provisions, hindering implementation.	Basic capacity-building provisions, but some skills gaps remain.	Comprehensive capacity-building provisions, addressing all relevant skills.
	Poorly managed change processes, leading to resistance or confusion.	Managed change processes, but with occasional challenges.	Well-managed change processes, fostering adaptability and acceptance.
Environment	Lack of alignment with national or regional priorities.	Partial alignment with priorities, but some mismatches.	Strong alignment with national, international priorities.
	Insufficient consideration of cultural factors.	Some consideration of cultural factors, but not comprehensive.	Comprehensive consideration of cultural factors.
	Lack of support for innovation and technological advancement.	Partial support for research and development of technologies.	Extensive support for the development of new technologies
	Limited economic viability, with unsustainable recommendations.	Moderate economic viability, but potential challenges.	Strong economic viability, with sustainable recommendations.
	Minimal consideration of social impact, neglecting vulnerable groups.	Some consideration of social impact, but gaps in addressing vulnerable groups.	Extensive consideration of social impact, with targeted efforts to support vulnerable groups.

B Digital Policy in the Public Federal Administration

Specific goal	Action Plan
Improve the regulatory framework through a simplified articulation of the technological guidelines for the country	Create technological policies that promote a change in management and contracting of government ICTs.
	Define key technical and regulatory elements for the contracting of technological solutions.
	Define a central authority of technical and economic analysis of technological projects.
Standardize ICT procurement through transparent actions	Develop, along with the Ministry of Finance and Public Credit, actions to ensure standardizes parameter for procurement.
	Transparency in ICT procurement.
	Define technical standards for ICT projects acquired or developed with institutional resources.
Promote technological autonomy and independence	Encourage the development of private and open access information systems among institutions.
	Prioritize use of free software.
	Promote the sharing of resources and technological infrastructure among institutions.
	Create an inventory of the PFA's ICT goods and services.
	Facilitate the reuse of programming code of government applications.
	Encourage migration towards free software that allows more flexibility in ICT projects.
	Promote the exchange of technical knowledge among institutions.
	Encourage the training of new ICT experts.
Maximize the use of computer applications and infrastructure through technological collaboration	Promote the exchange of information for the simplification of procedures and services.
	Encourage digitalization of previously simplifies procedures.
	Promote development of user-friendly platforms, infrastructure, technical standards, systems, and interfaces that are interoperable with other technical elements.
	Guide the implementation of open and harmonized standards that facilitate government procedures and services.
	Promote the use of the "advanced electronic signatures", as an authenticator for procedures and services.

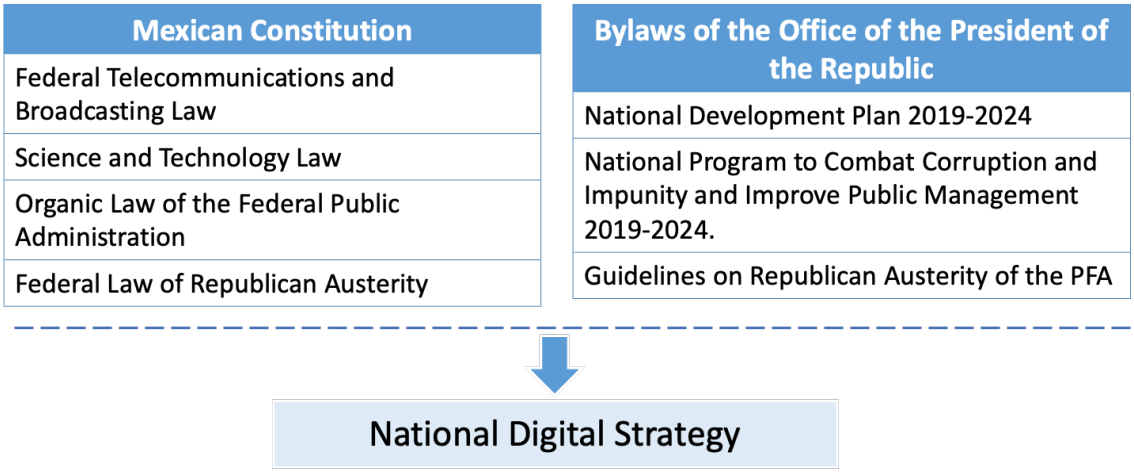
	Coordinate the development and implementation of technological projects among the institutions.
Foster an information security culture that provides certainty and trust among users.	Promote a general information security policy that preserves confidentiality, availability, and integrity of information.
	Encourage the implementation of a Standardized Protocol for the Management of cyber incidents.
	Coordinate security evaluations within the institutions to detect threats and improve risk management.
	Strengthen coordination between authorities to improve prevention processes and attention to threats.
	Promote good practices for promotion and reaction with the National Cyber Incident Response Center.
	Propose the adoption of key action to strengthen information security mechanisms to prevent risks.
Support continuity and improvement of projects and programs through integration of structured information.	Encourage the adoption of institutional databases that consolidate information from governmental systems.
	Promote the use of institutional databases.

C Social Digital Policy

Specific goal	Action plan
Promote the integration of fiber optics to reduce the digital division in the country	Encourage collaborative actions with the Federal Electricity Commission (CFE).
	Promote the maximization use of institutional communications networks to expand governmental capacities and coverage.
	Encourage the interconnection of the federal government.
	Foster free internet connectivity in public spaces, hospital, schools, and community spaces.
Foster the roll-out of internet to areas without coverage, to achieve universal connectivity.	Coordinate agreements and connectivity actions with the private sectors and communities.
	Harmonize collaboration mechanisms to promote the use of shared networks.
	Promote coordination with local governments to maximize the use of ICT infrastructure.

	Encourage interconnection of federal institutions via the National Fiber Optic Network.
Improve the quality of social programs aimed at the welfare through technologies	Promote the development and implementation of technological mechanisms that enhance transparency.
	Encourage action to improve information management.
	Promote the use of ICT infrastructure to facilitate government services.
	Provide technological support and guidance for the definition and implementation of the welfare programs.

D Regulatory Framework of the Mexican NDS



E Interview #1

Interviewer:
And now, you were telling me, X, if you could tell me a little bit about your experience, how you ended up, where, where you are now?

Expert #1:
All right, look, I, well, I studied in Europe, and I am Spanish. I studied economics and business at the University of Oviedo in Spain, and I started working soon after university in international cooperation, first at the Spanish Agency for International Cooperation and Development in El Cid. Then I was at the UNDP for several years as well. This happened in Uruguay, after Uruguay. I came to the United States, and I came to do a master's degree. I did an MBA at Thunderbird in Arizona.
After finishing my master's degree, I started working in the technology sector, focused on governments in a digital government company. From there I went to the OAS, to the Organization of American States in 2002, a little more than 20 years ago, to set up the

OAS Digital Government program at that time, because the Internet was already growing and it was already clear that it was going to be strong and that there was potential to use it in the public sector and the OAS was interested in getting involved in this issue.
Then I set up the program, I spent 10 years at the OAS, 11 in fact, in 2013 I came to the bank, to the Bid to do the same, to work in digital governance, but with a perspective, the OAS is more of a policy organization, no. Of policy, of spherical political conversation in the bank with a perspective more of projects, more of financing, large investment projects in digital transformation. And then I coordinate the digital government team, the cluster is called data and digital government, a team of specialists in here, in the bank, in a division called innovation to serve the citizen.
That's who I am.

Interviewer:
And thank you very much, very, very interesting, definitely. Thank you and well, I don't know if you can comment, maybe it's a very general question, but how would you define digital transformation in the public sector?

Expert #1:
I would define it as a change in the way of relating between the Government and the citizens, that takes advantage, when I say citizens, I mean citizens and companies that take advantage of digital technologies and above all, for two things, 1, to increase efficiency. To make it faster, to make it less costly for the Government, to manage the relationship with the citizen.

And two, to increase the ease for the citizen to relate with the Government, to make it simple and agile, to make it also efficient, to make it not cost much effort and I would define the digital transformation of the public sector, I do not know if you want to focus on the public sector, it is the use of digital technologies to make the relationship between government and citizens and companies more efficient, more agile, simpler.

Interviewer:
OK perfect, thank you very much. As I told you, I'm focusing on the part of national digital strategies. So, what do you consider essential features that should be included in a national strategy?

Expert #1:
I think it is important for a national digital strategy to be related to the country's strategy with the vision of the leaders, the country at the moment. The isolated digital world does not make sense, it makes sense connected with what is important for the country or if it is important for the country to protect itself from natural disasters. The digital agenda has to have an emphasis on that, then connect the national digital agenda with the priorities

of the country. It must also include the vision of the citizens. They have to have a way to participate and contribute to that agenda. From my point of view, it has to have clear objectives. It has to have some definition of roles and responsibilities, what we could call governance in some way, and also the institutional framework. Who is going to be in charge of what? It has to have some definition of what is going to be invested, because otherwise it is going to be just literature. And where are the resources going to come from? In other words, how much is going to be invested in this digital agenda? And then I believe that it has to have, in some way it has to address what we in the Government's digital transformation guide consider to be the 4 main blocks, right.

I have already mentioned institutional governance. When I said well, we must distribute roles and responsibilities, we must see who is going to be in charge of what and be sure that they have the capacity. In other words, I can say that all citizens will have a digital identity, or a digital wallet, but if whoever provides the identity does not have the capacity, it will not happen. Well, if it has the institutional governance defined.

It has to have some mention of what is going to be done with the regulatory framework. It cannot be that the implementation of this agenda of this strategy requires some regulatory reform, not of Chile is a notable example of Chile's digital transformation law was an important push to the digital agenda because it established the necessary regulation to manage in digital format all that functioning of the public sector. So a strategy should possibly make some mention of the fact that legislative frameworks may need to be reformed, or at a reading level, at a lower level, not decrees or regulations that talk about form 359, which may need to be eliminated and all those things.

You will have to talk about digital talent in some way, that is, the digital agenda requires a professional profile in the public sector. Some of them exist, others need to be incorporated, others need to renew their knowledge. You have to talk about the human aspect of digital talent.

And then you will also have to talk about infrastructure and applications, that is, about the digital part per se, not about whether the government's routines are all connected or not, or whether you have to invest in fiber optics to connect them, or whether they are connected with sufficient capacity for today's world, where everything comes from the cloud. And it was not like before, that I had there, looking to feel the ministry itself with my servers and well, then I think that those are elements that I think are important in a digital agenda.

Interviewer:

Continuing along these lines, what are the main challenges that governments now face in creating and implementing these strategies?

Expert #1:
I think that at least in our region, I speak a lot from the perspective of Latin America and the Caribbean. I do not know if it is the European Union, I know a little, but I know less about Asia and Africa. The great challenges are 1) human talent, people with the capacity to design projects and to execute them.
And it is not that it exists in the region, but that it is mainly in the private sector. The public sector cannot afford it. And 2) availability of financial resources. Our region still invests little in digital issues. When one sees the figures in the European Union, Estonia in Spain or any country, the figures that the government has to invest in digital agenda, that is, the country invests as 15 Latin America and the Caribbean.
So, for me these two big challenges, availability of human talent and scarcity of financial resources to invest in the digital agenda.

Interviewer:
Moving a little bit more from the part of the guides, what do you think is maybe not the reason, but from the part of the international organizations to push for the creation of these digital transformation guides?

Expert #1:
I would say, at least in the case of Latin America and the Caribbean, because there is a lack of knowledge generated in the region. We are very importers of documents, guides, road maps, studies that come from anywhere, Japan, Korea, Estonia, welcome. I think we have to study them but without taking them as a reference, but in a region like Latin America and the Caribbean, with 32 OAS member countries, with 600 million people, with lots of universities and with the GDP it has, you can generate material in the region. So others in the bank thought it was important to make a guide made with the region based on the knowledge of the region, on the quality of the region, which is full of references from all over the world. But it is made with Latin America in mind.

Two, there is a need for continuity in these policies and these documents.
These guides serve to maintain continuity in the work because people change, no, you know it well, you know the region. The government changes, the party changes, there is not yet a very stable civil service body that remains there when the government changes, and even less so in the digital area. So, when there is a guide that marks a roadmap easier than the one that arrives, take the guide and the water, there is no need to implement the interoperability platform, with these standards, well, let's go with the topic.

And then, because it also fulfills a third element, is that it fulfills the role of helping to alleviate the problem of availability of digital talent, which is in fact I may lead the digital issue in country X and not know everything, but if I grab the government's digital transformation guide that you are using, it serves me a bit like when you are in school, no, and you use the encyclopedia.
I look and I say, Ah, this digital identity thing is put together like this, it has these legal implications. They did it well in this country I'm going to study this reference. So, those guides serve as having a manual in my library to consult when I have doubts, let's say they don't cover little gaps of knowledge, if you want to call it that.

Interviewer:
Can you tell me a little more about what was the process from the bank to create this guide, which is quite good worldwide, it is the most extensive that exists so far.

Expert #1:
Sure, look the process was a result of requests from the governments we work with about us telling them how to implement an interoperability platform, who implemented a PKIY system well, which countries have good data protection legislation? Many countries were asking us for information and the same information on these key topics and we thought it made a lot of sense to sort it out and make it available for everyone to use. While we made the effort, well just once, and if I could for the whole region, that all the information was together that showed a comprehensive view of all the pieces that are necessary to move forward in the digital transformation.
So it was a demand-driven process, as is almost always the case, at least in the Inter-American Development Bank, where the countries are the ones that set the guidelines. And it was, it was a vocation or a desire on the side of the IDB to put in order all those concepts that were scattered and also to help everyone, at least in our region, to understand the same thing when we talk about, well, a cyber emergency center or when we talk about an interoperability node, or when we talk about digital identity, it will start to have a little more uniformity in the concepts and this guide helps that, not only in terms of the concepts, but also in terms of the concepts that are necessary to move forward in the digital transformation.

Interviewer:
I definitely think that one of the biggest challenges that exist in the region, well, not only in the region, but in digital issues is that information is in the so-called silos, right?

Expert #1:
Sure

Interviewer:

So, following on from this, you mentioned earlier that one of the challenges is that a government ends and the strategies come to an end and practically the next government arrives and it is in a certain way starting from scratch, right? So, do you consider that these guidelines not only allow the process to be faster, but also that governments generate strategies beyond let's call it 4 or 6 years?

Expert #1:
Of course, I think so, I think it helps and ah before a little bit more about why the guide that I forgot to tell you that if you notice when you look at it we also wanted it to be a didactic and friendly document or easy to handle for someone who is not a techie. That's why we tried to illustrate each concept with a story. That's why there are 4 characters so that someone who is not particularly interested in understanding what I know, what interoperability is, can understand why it is relevant, but not by reading the story of one of the characters. In other words, it's also about being accessible. Readable by those who make big decisions so big decisions is very important here what we are going. The policy makers, minister, responsible for the Treasury or digital theme, we do not read a document difficult to digest. Let's take a look at it and say Ah, yes, I read the story of the entrepreneur and understand why interoperability is important so that you are not asked 3 times for the same thing when you are going to create the company. And that was also still a little bit the vocation.
So now I do believe that it is useful for the issue of continuity. I do believe, because it is one of the things emphasized in the guide, in the issue of creating governance mechanisms, helping the relevant actors to participate and not being guided by a specific group, a minister or president. But in their governance spaces. The private sector, academia, civil society, for example, are almost defined, so this will help to provide continuity.
The guide also insists on the importance of the communication function around the digital world and that also helps to provide continuity, that is, if I communicate the value of the digital agenda for I do not know why all children are registered at birth or so that entrepreneurs can export. If I communicate it, society knows it, legislators know it, and it is much easier for someone to say that it is great.
The agenda is important, it cannot be broken, it cannot be altered, that is, it can be reoriented according to the priorities of the moment, but this is important, so I believe that the guide with these elements does help to give continuity to the digital policy.

Interviewer:
Thank you very much, it is just one of these challenges that I imagine, and that is how can we have a balance between creating a universal framework that is easy to adapt and

that the countries at the same time, based on their specifications, can have a way to download it so that they can implement it depending on their characteristics?

Expert #1:
Of course, look, I think that the Frameworks and this guide are also what they have to be, a reference, a reference that the user can either follow it 100%. Or take the parts that are useful to him. I do not believe that there are recipes that can be applied uniformly to all countries in the world, not even in the region. I believe that countries like, well, as in everything, use their sovereignty for the good of their people, what they consider political leaders, which is the good of their people, so I believe, we must respect the criteria of each country to say, look, I believe that the interoperability model proposed in the guide is not the one I want to implement and I will implement another one and the guide also talks about reusing components, not about the whole IPR agenda, about digital public infrastructure that the United Nations pushes a lot and ITU and even the OECD framework also mentions it, no, Reusability.
Very good, but well, these have limitations. There are countries that, for whatever reasons, because they say that the adaptation effort is greater than the effort of making the new one or buying it or because the dependence on the one who made the component is very large and I do not know if it will be available.

For me, in short, things that you may have heard, because the reality is that most countries, not only in Latin America, but also in Europe, each one uses its own solutions adapted to its local reality. I believe that conceptually the DPI, digital public infrastructure, usability, is a welcome concept, valued and accepted by all, it is difficult to oppose, it makes a lot of sense. The reality is that each country wants to adapt all issues, not only digital. To their reality, to their agenda, so this universality that you say, and this guide of universal application sounds very good, but I think we have to be realistic.
It seems to me that the most important thing is that a country advances and that the benefits of digitalization reach its people. If they do it following the IDB guide or the United Nations guide or no guide at all, welcome. The important thing is that they do it.

Interviewer:
Just continuing with the guide, well, the guide was published in 2022. Are there any plans so far to publish a new edition or make modifications, updates? I don't know if it is in your plans.

Expert #1:
Of course, a very good question, yes, and besides, you will almost be able to give it a scoop.
Yes, there are two plans that go in line with that.

We are going to have a completely digital online version, with a tool with a modern interface that will allow us to receive suggestions for modifications and updates from the people, from the Community.
In other words, you are going to arrive and say, hey, what you are saying here about digital entities does not take into account that now the European Union has approved eIDAS 2, which talks about wallets with I don't know what, I think you have to update it and we are going to be able to update it. So it's going to be interactive and we're going to be able to get input from everybody to keep it updated. That should be out very soon before your thesis, so in a month or so, it's almost there.
And two what we are doing, already. About to come out the first one are what we call the daughters of the mother guide. The daughters are the sectorial government digital transformation guides. We already have the digital justice guide ready. In other words, how to land this path in a specific sector of the public sector, which is justice. We are starting to work on one for transportation and another one for migrations, so it is a kind of like daughters of the mother guide for specific sectors.

Interviewer:
Yes, it sounds quite interesting. Definitely, because, well, it is just this part, no, that all the time new topics are being developed, new technologies, all the time. I think it is mentioned in the guide, that precisely because of the pandemic, the need to have this connection accelerated worldwide, right?

So let's hope that another situation that needs this push does not happen, but it happened for a reason and it is good that in this case it allowed us to show this need. And I do not know if you have any success story of any government that has implemented the guide so far, it is still very recent.

Expert #1:
Look, well, to tell you the truth, it is very difficult for us to know who is using it every day. If it was useful, it was not useful because we do not have a specific study on the matter. We would have to go out and ask, do a study, as the scholars of the subject do, with a defined statistical procedure to ask, did you use it, did it work for you, we do not ask. Our fundamental measure of success is that people keep downloading it. I believe that it is already going, I don't know if it is going for 100,000 downloads, close to 100 million downloads.
We are being asked by universities to be able to use it and now an important organization in Washington we are signing an agreement with them because they want to make a version for municipalities, to use it all over the world. It is a large foundation that operates all over the world and so these are a bit like indicators of success and I am sure that many countries in the region have it, they have it at hand, and they look at something, but I have

no evidence to tell you in writing, thanks to the guide, in Peru they did this. No, I have no idea.

Interviewer:
Yes, thank you very much. Anyway, and just to conclude, I do not know if you have any recommendation, I mean anyway, you are more dedicated to what you do.
Any recommendation for the governments that want to improve all this part of not only implementing the national strategies, but how.
Well, you mentioned that here in Latin America we do not have this budget mainly, but as I said, pushing towards the federal government, or towards decision makers, the need to invest more in the whole issue of digital transformation.

Expert #1:
Look, I, my advice would be that the key word there is to invest, that is to say, to make the resources appear. Finally, investment in the public sector is going to come from the Minister of Finance, no, the Minister of Finance. And well, in our experience in a ministry, what they want are business cases, of course, why do I have to invest in this issue? If I have a lot of issues on the table of roads, agricultural development, hospitals and schools, EH? So, you have to make the business case very well and to make the business case is to tell you how much you save every dollar you invest in digitization. When we save every time we remove form we are saving a lot of money to the people and to the government?

Then, communicating the results as well, something works well. I don't know, if a woman does not have to go to the civil registry to register her child, because the doctor has already done it at the hospital. Well, you have to communicate that to society and to the Minister and say, look, there are 500,000 mothers or fathers who did not have to waste a morning going to the civil registry and that is thanks to digitalization. So it is business cases, communicate the value, the achievements, communicate it. And then raise in the cabinets of ministers and the Minister of Finance himself that digitization is not an agenda of engineers, programmers of digital ones. Digitalization is so that the health system can do telemedicine, doctors can see x-rays with artificial intelligence support to diagnose more accurately. Digitalization is so that airports who control security do not let criminals escape and sneak in. And digitalization is for entrepreneurs to be able to export, that is, it is an agenda for the whole country.

In other words, it is not the work of the crazy engineers who took the digital agenda to the ministers' plane. It is not this, investing in digital is investing in education, investing in health, investing in citizen security, no. Those would be my arguments.

Interviewer:
Thank you very much, thank you very much, well, those are all the questions, maybe just as a last question, maybe if you have any other person from the Bank who could give me some perspective on the digitization issue, I would be very grateful. If you have any contact, it would be very welcome, and I don't know if you have any questions.

Expert #1:
More than questions, I am very happy that you are doing this work, it seems to me that this subject needs young people like you, who study and research, who publish. I think it is very good that you are disseminating this type of documents, which are guides for public officials, who hopefully read your thesis, to say I am going to look at these guides. So I congratulate you, I am very happy that you are more there, learning from countries. I was in Estonia and I know everything that was done there it's a fantastic place to learn about these things.
And so no, I congratulate you and thank you very much for spreading the guide. It is a huge effort, I mean, it is two years of work of many people. And what we want is that everybody knows it and uses it. I think it is useful for Latin America and the Caribbean, but through your thesis I hope people from Mozambique or Vietnam, people from wherever, will use it because it is in English as well.

Interviewer:
Yes, thank you very much again for the time and for your answers that will definitely support me a lot in this research.

Expert #1:
Gladly and if you have any doubts, later, when I review the notes or such, just write me. There you have my email and much success with the good work you are doing.

Interviewer:
Yes, thank you very much, see you later.

Expert #1:
Chao.

F Interview #2

Interviewer:
I don't know if before I start with the questions you can tell me a little bit about yourself and your experience, how you got to the bank and everything.

Expert #2:

Yes, of course. Well, I'm originally from the United States, from Seattle. Born and raised, I was educated on the East Coast of the United States, first at Tufts in Boston for my undergraduate studies in International Relations, and then at Columbia University, where I pursued a master's degree in Economic Development. In between, I worked for a bit in legal services for migrants with health problems in New York City. After completing my master's degree, I spent two years at the World Bank as a junior professional. Following that, I worked for a year with an IT consulting firm in strategy consulting. Then, through a competitive process, I joined the Inter-American Development Bank (IDB) as a young professional.

In 2014, I spent a year in the IDB's Evaluation Office, and the following year, I moved to the division where I am now. Initially focused on institutional capacity of the state, the division later changed its name to Innovation to Serve the Citizen. For about five years, I coordinated our agenda for Digital Government and Data, and two years ago, I took on an additional role coordinating the entire division's agenda, which, in addition to digital issues, includes public management, transparency, and citizen security in Jamaica. I am currently based in Kingston, Jamaica.
To be transparent with you, when I started working on government knowledge issues, I knew absolutely nothing about the subject. It was a great privilege because, as a knowledge producer, I was paid to study. It has been a continuous learning journey over the years, and I still learn with every study, every meeting, and every experience. But in that sense, you are way ahead of where I started. Well, I hope that serves as an introduction.

Interviewer:
Yes, thank you very much. Well, just to get started, how would you define digital transformation in the public sector?

Expert #2:
Now, in the Government's digital transformation guide, we have a definition that was quite elaborate, so I'll try to recall it. It's something like leveraging information and communication technologies to provide citizens with more efficient, secure, and transparent services. That's the gist of it.

Interviewer:
OK, perfect. Now, to delve a bit deeper into the topic of transformation guidelines, what characteristics would you consider necessary in a digital transformation strategy?

Expert #2:
What characteristics are necessary in a strategy? Well, to me, characteristics are synonymous with the content sections of the strategy, because every strategy needs principles that support it and a broad vision of where we want to work towards. That broad vision is like the tip of a target pyramid, with various actions depending on how broad the strategy is. But if we're specifically talking about digital government, it's not just about digital skills, connectivity, or digital times. Those are all important pillars, but once you decide on the starting point, which is the vision, you have the components of the pillars or whatever you want to call them. Each one can have a more specific vision, a future state that you want to achieve. And after that future state, there can be initiatives that are groupings of projects, for example. Having a future vision could mean envisioning a society in which most people and companies access public services through digital means. So, what does it take to accomplish that? Well, it requires the availability of services, usability of services, and competence. This part related to users could be the pillars, and within the pillars, you can have a series of tangible projects, well-defined with a start and an end, indicators, responsible parties, and budget. For me, those are the necessary elements of a digital transformation governance strategy.

Interviewer:
OK, thank you very much. What are the areas in which governments usually encounter difficulties when they want to implement these strategies? Is it one specific area, or are there many smaller challenges?

Expert #2:
There's always some challenge, but it varies greatly from place to place. Where does it stem from? Some experiences, eh? Right now, you can think of it in terms of the ingredients you need to accomplish a strategy, and there are many, but the basics are political will, budget, personnel, and coordination. Political will is crucial, but coordination is also essential. And then, one can encounter difficulties in any of those areas.

No, if you have budget and staff, some things you can do, let's say, in-house. If you're the governing body of the state government, you can do quite a bit without political support and coordination capacity. But there's going to come a point where you have to pass a regulatory change and that requires political support. Or you have to digitize services that belong to other entities. There you need coordination capacity.

In other cases, you have all the political will in the world, or the President talks about digitization all the time, but you have no one to do anything. I would say that's even more problematic, because it's easy for a politician to say what he or she wants, but it's harder to get the necessary resources allocated. Resources for a digital governance officer come in different forms: staff and budget, but also concrete tools for action, such as mechanisms to force other entities to follow your guidelines. For example, you will know that there are

There are unique government domains in Mexico and other countries. And how do you get to that uniqueness? They force people to turn off their web pages. And how are they forced? Through a rule that says that one entity can manage the only government web page, and by that date all other entities must turn off their pages and migrate their contents to this one. That power carries a political cost.

Political will can have different levels of depth. I can talk very nicely about digital transformation, but if I don't back it up with money, people and power, we're not going to get anywhere. Often, that's the shortcoming I see most often: a disconnect between the interest at the political level and the resources that go into it.

On a more nuanced level, I would say that it is common to lose sight of the need for non-financial resources, such as positions to hire people or the powers that allow you to move other public sector entities.

Interviewer:
OK. Yes, thank you very much. Well, moving on a little bit to the IDB guide, could you share what was the objective or the idea behind the bank in creating this very comprehensive guide?

Expert #2:
Basically, the ideas were twofold. One, to put forward a concept, a vision. Because although the document is about 720 pages long, you can reduce the content to the table of contents. With just that, you've gone a long way. Any initiative, whether at the national, subnational, or even sectoral level of digital transformation in government, must include elements such as narrative, personal, institutional, and so on. That is the goal: to convey that almost philosophical concept.

Second, democratize access to knowledge. It looks like an encyclopedia because there is nowhere else a level of detail like this. For example, how to make an interoperability

platform, what are its generic characteristics, or the aspects to take into account when creating a regulatory framework for administrative simplification. That is not written anywhere.

And while that knowledge will deteriorate over time, as with any changing subject, it is written in such a way that it does not quickly become obsolete. I give it about five years before it is completely out of date. That was it.

Interviewer:
OK, perfect. Moving on to that part of how governments use the guide or should use the guide, how do you strike a balance between having a universal framework and at the same time allowing governments to be able to tailor it to their specific needs?

Expert #2:
Yes

Interviewer:
You mentioned a little bit that it is a kind of encyclopedia, can you tell me a little more about this part.

Expert #2:
You say as a balance between how to adhere to certain international standards and customize?

Interviewer:
Yes, exactly.

Expert #2:
I believe that from the 5 pillars that are in the guide, there is no escape. It is not possible to have a national government digital transformation initiative without addressing each of the 5 to some extent.

Now, where is the emphasis placed? It depends entirely on the context, what you have at hand, what is desired and what the background is. Whether you have a majority in Parliament, budget, people, it all depends.

I'll give you some examples. In the UK, starting in 2011, their emphasis was 80% on the new services part for the citizenry. The focus was almost exclusively on what the citizen

sees, because that was their mandate. So they were born, not out of a discovery that the state's web presence was a shambles and citizens couldn't easily interact with the government online. So, they put the emphasis on that and paid very little attention to the other elements. For the first few years, the institutional element was driven by citizen-facing projects, and today, with all the elements taken care of, the locomotive of change is the single domain.
On the other hand, in Uruguay, which started more or less at the same time, it was not born that way. It was born out of a calmer observation, so to speak, that in order to modernize the state they had to invest in technology. So they founded an institution that worked behind the scenes without making major changes in what the citizen saw. For a long time, they built regulatory, institutional and technological buildings for 5 years, making small changes, digitizing a service here and there. It was a much more gradual development because of their context and patience.

Then, they put the emphasis on governance, narrative and technological infrastructure, and it wasn't until within 5 or 6 years that they started to focus more on citizen services.

As I tell you, UK here, Uruguay here, many countries that have had some degree of this, have some of the 5 pillars, it's inescapable.

Interviewer:
Well, the guide is intended to be something more general, something that governments can take. But what is actually observed is that many times countries create their strategies only during the time they have the government. It is logical.

Do you think that the guide, or well, not only the IDB guide, but the recommendations of international organizations, can allow governments to perhaps create more long-term strategies or projects, that go beyond the governments? Or is it something that only governments can maintain for 4 or 6 years?

Expert #2:
Excellent question. Our guide and others like it typically do not take political cycles into account. However, politicians are a reality, stronger in some countries than in others. For example, in Mexico, each change of government challenges the existence of institutions founded in previous administrations, such as the National Digital Strategy and Strategy Coordination. In contrast, in Uruguay, during 12 years, there were several changes of political party, but the strategy did not change, suggesting that the politicization of the

digital agenda is more related to the institutional context than to the approach of the strategy itself.

Our paper is not going to tell you how to interact with your political context. However, it is a conversation I have with my counterparts here. The philosophy that is within the guide, albeit in a somewhat underhanded way, is to make the digital agenda serve to deliver on public policy priorities. In this way, you can integrate the lead institution and the digital agenda as an indispensable part of any government.

Because 80-90% of what you do in your digital agenda can serve any purpose. For example, if today your focus is health, fine, it will serve you. But tomorrow, if your focus is on supporting small and medium-sized enterprises, it will also serve you. All the same between security prevention, digital identity, etc. Everything will be useful in the platform, in the single portal.

This way of approaching the agenda makes it more durable. It has a durable component, apolitical in nature, and a flexible component that can be adapted to the priorities of the administration of the day.

Interviewer:
OK, Yes, thank you very much. You mentioned earlier that there are terms that probably in 5 years will no longer be updated, or that there will already be new terms and technologies. Are there any plans at some point to update the guide, to keep it updated periodically and to add new situations? So far there is no information on this matter.

Expert #2:
Well, we have talked about it and we would love to. We don't have a budget and we don't have a concrete plan because of how our institution works. At this point, the only thing that exists is an acknowledgement that some things will need to be updated, some things will need to be added, and some things will need to be removed altogether. However, we don't have any kind of firm commitment.

Interviewer:
OK, okay, thank you very much. do you have any success stories or know of any governments that have used the guide in its entirety or certain specific sections and have had success with it? Or is it more of a more generalized use?

Expert #2:

That is a very good question. I live in Jamaica and I am a promoter of the document. I have used it in my dialogues with the Government and it has also informed the construction of Jamaica's first digital government strategy. I know because I'm here, I'm involved with my Jamaican counterparts. All I can say is that it's had about 70,000 downloads. So, somebody has definitely used it.

Interviewer:
Right. Well, in wrapping up, do you have any recommendations for governments, whether local or national, on how they can improve the implementation of digital transformation initiatives?

Expert #2:
It is difficult to give a generic recommendation. But if I had to give one, I would say that one should start with the 5 axes of the guide. Although the specific contents are more directed to national governments, the principles behind them are universal. You cannot say “I want to make municipality X digital” without considering the regulatory part, governance, core technologies and process reengineering. The service part is equally important. So, that's the recommendation: apply the magnifying glass of the 5 pillar concepts and ask to what extent we have seriously considered this.

Interviewer:
OK, all right, thank you very much. So that would be it as far as the questions I have, do you have any more questions, maybe I can answer you?

Expert #2:
No, no further questions at this time. I would just like to request something: I would love to know how your research is going. I'll be waiting for an advanced draft. As someone who is immersed in this stuff every day, I find it very interesting that someone can step back and give it some serious thought.

Interviewer:
Yes, of course, as soon as I finish it, I have the draft due in May. I will gladly share it with you.

Expert #2:
OK, great

Interviewer:

Yes, well, that would be all again. Thank you very much for your time and for all this knowledge. It will definitely be very helpful to me.

Expert #2:
I'm glad, well, nice to meet you, Aranza.

G Interview #3

Expert #3:
At the International Telecommunication Union, we are engaged in various sectors, including radio communication and standardization. In the Standardization Bureau, we provide recommendations for industry standards that countries, including our Member States, can choose to implement or follow. These recommendations are not binding, unlike the radio regulations, which are binding and cover everything related to spectrum. I work in the Development Bureau, where our focus is on providing assistance to our Member States, particularly developing countries, to achieve universal, meaningful connectivity and sustainable digital transformation, ensuring that no one is left behind. Our work is broad and high-level.
We organize our work into different streams, including study groups where our membership, which consists of administrations such as governments, agencies, ministries, regulators, and private sector entities dealing with ICTs, collaborate. These groups produce reports every four years, containing recommendations and guidelines based on good practices that Member States and others can refer to in advancing their national agendas.
Additionally, we develop best practice guidelines as part of the Global Symposium for Regulators (GSR), which we organize annually. Through consultations on specific topics, we gather contributions from regulators and the private sector. Based on these contributions, we prepare and publish the GSR best practice guidelines, which are available on our website.

Interviewer:
Yes.
Expert #3:
Draft guidelines are developed through a process led by the chair of the Global Symposium for Regulators (GSR), typically the head of a regulatory entity. These guidelines are then shared with regulators for adoption at the GSR. It's important to note that these guidelines are non-binding and primarily serve policymakers and regulators as a reference when reforming or advancing digital transformation strategies. Regulators can

then bring these guidelines back to their respective ministries or government cabinets to showcase best practices from other countries and the regulatory community.

At the national level, we also track and monitor the regulatory maturity of countries through initiatives such as the ICT Regulatory Tracker and the G5 Benchmark. These tools help assess and compare the regulatory environments of different countries in their journey towards digital transformation.

Interviewer:
I think I have seen the tracker only.

Expert #3:
Yeah, OK. So the tracker and the benchmark, the G5 benchmark specifically, is more focused on assessing the digital transformation process, including collaborative approaches and various indicators we gather. The benchmarks within the G5 benchmark are based on good practices we've observed. For instance, if collaboration is a good practice, countries will score higher if they demonstrate strong collaboration efforts or have established competition policies.

These guidelines serve as a reference for countries, regulators, and policymakers when advancing their agendas or developing new policies and regulatory frameworks. They provide insight into best practices. While we don't always receive direct feedback from countries on their use of these guidelines, some may inform us that they have utilized them. Additionally, regional entities, such as CRASA, may use these guidelines as a reference when developing their own regional guidelines for their members to follow at the national level.

I hope this answers your question and provides the information you were seeking.

Interviewer:
Yeah, no, definitely. It's more or less what I'm working on. So, as you mentioned, what we typically do is create these guidelines and then, let's say, on a regional level, they are adopted and then disseminated to countries within the region. Like you mentioned, the example of Africa.

But do you have any way to measure how much these guidelines are being used or what changes can be made to these guidelines? Or is it just that you provide the guidelines and then they're free to interpret and implement them as they see fit?

Expert #3:
So, they are free to use them as they see fit, because these guidelines are not binding; they're simply recommendations put forward. We do receive some feedback when we measure the evolution of countries' regulatory frameworks. For instance, if we notice changes in legislation related to topics we've provided guidance on, like infrastructure sharing or Open Access, it indicates that countries may have adopted some of our recommendations. Additionally, we gather feedback when conducting country reviews or case studies on collaborative regulation. However, it's not automatic feedback; we rely on countries to report back to us through various mechanisms.

For example, in study group reports, regulators may indicate which guidelines they have adopted. This is a useful way to see how they are disseminating these good practices further. We also track metrics such as publications, downloads, and social media engagement, like sharing on LinkedIn, to gauge the impact and reach of our guidelines.

Interviewer:
Yes.

Expert #3:
Yeah, that kind of feedback is useful, but to monitor it more effectively, getting direct feedback from countries is something we've been working on figuring out.

Interviewer:
Yeah.

Expert #3:
We're looking for more concrete feedback, and this is something we might want to add to our survey. Currently, we send out a survey every [period] to collect data for the tracker and the G5 benchmark. These benchmarks rely on data gathered every two years from national regulators or ministries. However, we don't currently have a specific question in the survey asking how they are using the guidelines. It might be worthwhile to include such a question, although it would depend on who responds to the survey. I'll need to check with my colleague Hugo about this.

Interviewer:
So, what would you say are some of the biggest challenges that countries face when adopting these guidelines and creating their own national digital strategy?

Expert #3:
So, I think one of the common challenges countries face is the need to base their decisions on evidence, particularly data and benchmarks. They need to look at what other countries are doing and how their strategies relate to those of others. Additionally, if a government or entity is hesitant to introduce a new digital transformation strategy, they may need to consider having an independent entity responsible for ICT or telecom regulation. For example, if a country lacks competition policies, they could recognize the importance of implementing them to ensure competition in the market and lower prices. This approach can be quite effective in guiding their decisions.

Interviewer:
OK.

Expert #3:
And developing that, yeah.

Interviewer:
So, what would be some of the biggest barriers that countries face? Would they be cultural barriers, economic barriers, or something else?

Expert #3:
Certainly, economic constraints, political biases, and changes in government priorities can all be significant barriers. For example, if there's a change in government, the new administration might not prioritize the previously drafted digital transformation strategy or might want to overhaul it completely. Implementation hinges on having skilled staff who can develop and execute the strategy, as well as the capacity to monitor progress and sufficient financial resources. Collaboration among institutions and regulators is critical to avoid duplication and ensure a coordinated approach. However, challenges also arise from limited human and financial resources, as well as resistance to change in some countries and entities hesitant to embrace digital transformation.

Interviewer:
Yeah.

Expert #3:
This feedback aligns with what I heard in a meeting last week. Some entities expressed concerns about resistance to fully embracing a digital environment.

Interviewer:
Okay, as you mentioned, governments typically create strategies to last, let's say, 4-6-8 years maximum.

Expert #3:
Mm.

Interviewer:
Is there any way these guidelines could help governments create longer-term solutions that extend beyond the current administration? Or is it a situation where each government has to start from scratch?

Expert #3:
That's a good question. I think each country has its own specific context, so it really depends on the country. However, there are some guiding principles. For example, you need to plan for your strategy to be implementable over 5 to 8 years, but then you need to have different phases, like reviewing and monitoring regularly, and establishing a feedback loop. This could be a good practice. It's up to governments to decide how to incorporate these important phases into their processes and to use feedback for reviewing and adapting the strategy. For instance, what was a priority today may not be as crucial once implementation starts. It's also about knowledge sharing and exchanging information to see what works and what doesn't in different countries. But, of course, each country is unique, so different factors come into play when implementing and reviewing a strategy.

Interviewer:
Alright, let's delve into the realm of international organizations and their guidelines.

Expert #3:
Mm hmm.

Interviewer:
Is it feasible for organizations like the ITU or others to develop guidelines that are universally applicable, yet flexible enough for individual countries to easily adopt? Essentially, can these guidelines be both standardized and adaptable to diverse national contexts? Or is achieving this balance not realistically achievable?

Expert #3:
Every four years, we host the World Telecommunication Development Conference, along with our Plenipotentiary Conference, during which we outline a plan of action and identify key issues for consideration. While we can provide guidelines offering concrete advice on specific topics or aspects, it's ultimately up to individual countries to adapt them and determine how to address their unique challenges. These guidelines are typically high-level, requiring customization to fit each country's specific circumstances. Our aim, through events like workshops and training sessions, is to disseminate these best practices using various channels, such as capacity-building initiatives and the development of new studies and reports. By showcasing examples of successful implementation and explaining why certain strategies have worked, we hope to provide countries with the tools they need to implement effective solutions tailored to their contexts.

Interviewer:
Alright, so these guidelines typically stress the importance of taking a user-centric approach. The question then becomes: how can governments effectively involve citizens and guarantee that their requirements are addressed throughout the digital transformation process?

Expert #3:
That's an excellent point, and we're currently developing a module focused on collaborative approaches to regulation and policymaking. There are various methods for governments to engage citizens. They could organize workshops or conduct public consultations online by posting draft policies on ministry or regulator websites, inviting feedback and comments. Responses to comments could then be reviewed and posted. Roadshows are another option, held at both national and sub-regional levels to explain ongoing initiatives and organize workshops involving all stakeholders interested in contributing to specific policy development. Additionally, intergovernmental discussions and coordination are essential for alignment among agencies. External coordination involves drawing attention to discussions and events through meetings and publications on websites, then feeding the feedback received back into national-level workshops, events, or publications.

Interviewer:
OK.

Expert #3:
And get that yeah feedback loop.

Interviewer:
Perfect. So, continuing along this line, how can governments foster collaboration with the private sector, non-governmental organizations, and any other stakeholders? This collaboration could greatly aid in these digital transformation efforts.

Expert #3:
So, it's about sharing what they're doing, explaining the development of a consultation process. This involves consulting with them, either online or through meetings, organizing workshops and meetings to gather feedback and keep them informed of the process. Engaging them at every step of the development process is crucial. Additionally, maintaining engagement during implementation and monitoring is important, as the private sector may offer insights from a technical perspective. Public consultation can be conducted online, through events, or workshops. That's how we envision it being done.

Interviewer:
OK. And also yeah, as we saw with the COVID-19, basically it stop and in a way it pushed for a lot of governments to start or increase or detail transformation journey as hopefully we will need another push like that.

Expert #3:
Yes

Interviewer:
But how can Government's create strategies around these unexpected situation or new technologies that are emerging all the time. Is there any way that they can, not predict, but maybe be aware of any new things that could happen in four or five, six years?

Expert #3:
Hmm, that's a valid point. It's really about having a foresight division, or as they call it in French, a "division de prospective technologique," to stay informed and engaged. This means participating in various discussions and events, sharing insights with other agencies or ministries about ongoing work streams and developments. It's about learning and being prepared, anticipating future needs, and having contingency plans in place for emergencies or specific situations, like another COVID outbreak.

For emerging technologies, it's crucial to stay informed by attending events, such as those hosted by the World Bank, and contributing to study groups exploring these technologies.

We recently published an article on digital transformation strategies for policymakers, which provides concrete guidance on how to approach this. It emphasizes the importance of consultation with the private sector and other stakeholders. Some organizations also establish innovation or foresight divisions to stay ahead of the curve.

Interviewer:
OK, perfect. And yeah, like now maybe going so that we can start closing.
What emerging trends do you foresee in government detailed transformation and how could these align or diverge from the current international guidelines?

Expert #3:
There are numerous emerging trends related to AI and transformative technologies, as you may have noticed. These topics are being addressed and discussed in various forums, such as the AI for Good Summit, which provides a platform for stakeholders to discuss governance issues and necessary regulations. It's through consultations, collaborations, and coordination between agencies, both nationally and internationally, that we can address these challenges.

While international guidance sets a foundation, new guidelines are often needed based on evolving best practices and experiences in different sectors. These guidelines need to adapt to changes in markets, regulations, and policymaking. It's essential to continuously review and update guidelines to stay abreast of the latest developments and prepare for future innovations.

Interviewer:
OK, perfect.

Expert #3:
I don't know if I this answers your yes.

Interviewer:
Yeah, it does.

Expert #3:
OK, great.

Interviewer:
So yeah, those are or those were all my questions.

Thank you for the time again and your like expertise like I really appreciate it, especially the topic that I'm doing, not a lot of people really know about the guidelines. So it was really good and I don't know if you have any questions to me.

Expert #3:
No, I've put you in the chat like 2 the article I was referring to a digital transformation strategies. Uh, so and then also the collaborative Reg digital regulation country reviews that we've done in in countries looking at helping them based on some of the good practises to see where they they are they have some gaps where they can improve so that could give you also some indication.
On what we're doing and how these pract good practises are being like then conveyed to the countries.
In addition to just publishing them and discussing them at our meetings, and also if you have any questions or follow up questions or if there's any anything else you need like information, please don't hesitate to contact me. Yeah, be pleased to to help you. And if you want to share after one point, once you've finished your report, your thesis time would be really interested.

Interviewer:
Yeah. Yeah. Thank you so much.
Yeah. Thank you so much. And just before we leave, I don't know if you have any contacts within the ITU that other experts that I could interview on the topic.

Expert #3:
Yeah.
Sure, I can provide you with my I can ask my I'm sorry. I'm gonna have to jump on a call. I'll send you by e-mail the contact of my colleague (X) who's doing the benchmark and the tracker. So maybe she could help you. She could provide you some guidance and maybe from colleagues from the study groups. Yeah.

Interviewer:
Oh yeah, that would be amazing.

Expert #3:
Great. Sorry. I have to jump.

Interviewer:
So yeah, thank you so much. Yeah. No, no, no worries. Thank you so much.

Expert #3:
Have a nice day. Bye bye.

Interviewer:
Thanks. You too. Bye bye.

H Interview #4

Interviewer:
Okay, so first, just like to start, could you give me a brief overview of your background?

Expert #4:
Yeah. So, I'm [expert]. I'm a Lead Digital Development Specialist with the World Bank, based in Nairobi. Although in recent years, I've also worked in Ethiopia and Washington, DC, and have been based in or worked in Somalia recently as well. I've been at the World Bank since 2008. Previously, I worked at the International Telecommunication Union in Geneva, and before that, with the OECD in Paris. I've done a tour of international organizations.

In terms of what I've covered historically in my career, I did quite a lot of analytical work and wrote big thick books. But after a while, I realized nobody was reading the big thick books. So, I moved to the operational side of the World Bank, and I now give away money, which is a much more popular profession, as you can imagine.

The countries where I manage projects include Kenya, where we have the Kenya Digital Economy Acceleration Project, which is $390 million in its first phase. I manage that and also the Digital Foundations and Regional Digital Integration projects in Ethiopia, which are just over $300 million. I manage projects in Madagascar, Malawi, and a couple of other countries as well.
Interviewer:
Okay, thank you so much. Yeah. Sounds like a really interesting career.

Expert #4
You have a lot of friends when you give away money.

Interviewer:

Yeah. Yeah, I can imagine. So yeah, I think like, like, first general question would be How would you describe or define digital transformation in the public sector?

Expert #4
Yeah, um, let me reference something that you may have seen: the 2016 World Development Report, which I was one of the co-authors of. The World Bank produces a World Development Report every year, and the 2016 edition looked specifically at what we call digital dividends. In that report, we developed a framework of a sort of three-stage approach to the impact of digital technologies on the economy.

The first phase is what we call Digital Foundations. That involves investments in digital public infrastructure, particularly networks—first mile, last mile, and middle mile networks. It also includes creating a legal and regulatory framework. Most of the projects that I'm managing in Africa, such as those in Malawi, Ethiopia, and Madagascar, I would regard as foundational.

The second phase is Acceleration, where a country really begins to benefit from those investments and starts to see productive use of ICTs growing. This phase might include the introduction of foundational digital ID systems or foundational e-government systems. As the name suggests, Acceleration involves a general speeding up of processes.

The third phase, and this answers your question directly, comes after Digital Foundations and Digital Acceleration. The third phase is Digital Transformation. This is where analog processes are completely re-engineered for a digital world. True benefits of digitization begin to be seen in this phase in terms of job creation, wealth creation, reduction of transaction costs, and broad-scale participation by the general population in digital technologies. This includes both usage and creation of content, as well as other benefits like reduced transaction costs, which can lead to lower prices or greater efficiencies, and speeding up of services.

Digital Transformation, therefore, is the third stage within a three-phase process. With Digital Foundations, you're basically putting a digital stamp on analog processes. For instance, you might take a particular ministry and give it a website, or you might take a specific transaction that already exists in government and automate some parts of it. But Digital Transformation really means rewriting the underlying analog processes.

I'm trying to think of a good example of that. For instance, consider paying fines. If you're a motorist and you get caught speeding, you pay fines. The analog version of that would

be that the policeman stops you, gives you a bill, and you pay it. The Acceleration version of that would be that you have the ability to pay it online. But the Transformation part of that is that the actual speeding is captured on camera, the billing is automatic, and the payment is maybe automatic as well. So the whole process is digitized. From the analog version of the policeman stopping you on the road to the digital transformation version, you can see the transaction costs have reduced, the speed of the process has increased, and hopefully the transparency of the process has improved.

In Kenya, pretty much all the speeding fines go to the financial benefit of those who stop you. Whereas with the latter example that I've given, hopefully, it's a more transparent and open process in which bribery and corruption are reduced.
Yeah, so you didn't ask for an example, but I gave you one. I'm not a driver, so I don't have any speeding fines.

Interviewer:
No, but it's a good example to like to see especially these three stages that that you mentioned, so it's really helpful to exemplify it. So as I mentioned, I'm working on the national digital strategies. So what would you say are some key characteristics that every like digital transformation strategy should have

Expert #4
The characteristics of a digital transformation strategy that need to be emphasized are participatory processes. Stakeholder consultation is crucial and, in many ways, often more important than the strategy itself. The process that delivers the strategy is often more critical because the strategy can become outdated as soon as it's written. However, the stakeholder process, the inclusive process by which it is written, should be fully participatory, transparent, and inclusive.

So, that would be one characteristic. Building on that, perhaps saying the same thing in different words, it has to be inclusive. It must include all segments of the population: women, older people, younger people, fully abled people, disabled people. It has to reach out to rural areas as well as urban areas, cut across ethnic groups within society, and be available to minorities within society. This inclusivity builds on the participatory process by which a strategy is developed.

Thirdly, I would say it needs to be technology neutral. There are plenty of examples of countries that have adopted strategies aimed at promoting their national incumbent operator and have missed out on technological change. A classic example is in the early

days of the Internet when France continued to promote its own Videotex system, Minitel, considered state-of-the-art in the 1980s and early 1990s. As a result, France was a late adopter of the Internet because it had promoted its own incumbent system. The advantage of technology neutrality is that when a new technology emerges, such as low Earth orbit satellites, a country can adapt its regulatory structure to utilize these new technologies without being tied to existing investments or preferences for state-owned operators.

So, to summarize what I've said so far: a participatory process, inclusivity, and a technology-neutral approach.

I would add a fourth aspect: the definite advantages of private sector involvement. On the whole, experience has shown that the private sector tends to be more efficient and customer-oriented than the public sector. While there may be examples of services better delivered by the public sector, overall, private sector participation is beneficial. If you compare telecoms or digital services with an industry like energy, the level of private sector participation is much higher, and we as consumers benefit from that.

I should have five aspects, and maybe I'll think of a fifth one later, but those are the first four. If another point comes to mind as we discuss, I'll add it to the list.

Interviewer:
Yeah, perfect. Continuing on this line, what would you say are the biggest challenges in a digital transformation strategy?

Expert #4
Yeah, well, all of those characteristics have challenges. I would say the challenge to participation is avoiding vested interests and ensuring that the process is open and transparent. Vested interests are significant in telecoms; any incumbent or set of market entrants that have already invested in infrastructure have an interest in limiting further market entry and promoting their own services. So, ensuring that vested interests are kept under control in the participation process is crucial.

Probably the biggest challenge is inclusivity. Telecom networks tend to grow first in cities and only spread later to rural areas. They tend to grow in mainland economies and only spread later to outlying islands. They tend to be adopted by the young and only later by the elderly. So, there are built-in structural tendencies within digitalization that almost inherently promote inequalities. Challenging and countering those inequalities requires significant efforts from both the public and private sectors.

In terms of technology neutrality, it is very hard to implement in practice. Technology is always changing, and regulators tend to be a generation behind with their approaches. To give you an example, the country of Mauritius, where I do a lot of work, has a policy of not allowing satellite communications for one-to-one communications. The reason for this is to track drug dealers and criminal calls, particularly related to drug dealing. However, new phones, like the iPhone 14, have the built-in ability to connect to satellites. So, Mauritius finds itself in a situation where its legal structure would logically ban the very latest technology, like iPhones, for a very good reason. Wanting to track offenders on an island like Mauritius is a noble ambition. However, the lack of technology neutrality means they have created a problematic situation. If you ban satellite communications, why not ban the internet? Why not ban other forms of communication? Because the regulation was not technology neutral, they have created this particular issue.

I mentioned private sector involvement as the fourth aspect. Ensuring private sector-led development is essential. Pretty much every country in the world, including Mexico, had a public sector monopoly in telecoms. There are a few examples that go in a different direction, like the Philippines, but almost every country had a public sector monopoly, and it has taken decades to untangle the influence of those monopolies. However, you then have the counter-danger of private sector monopolies developing. In Mexico, the example of Carlos Slim's outfit is close to being a private sector monopoly—not a monopoly in law, but a monopoly in fact. Ensuring private sector participation means moving towards a level, regulated playing field, facilitating market entry and exit, and regulating anti-competitive practices.

So, my fifth characteristic of a sound digital transformation strategy would be equitable regulation—sound regulation.

Interviewer:
Yeah. Thank you so much. Continuing on this line, how should governments create their international strategies, considering external factors such as economic and political conditions, especially nowadays? As we've seen, in one day, you can have a situation that will affect the next four years.
Expert #4:
Can you hear me now?
Interviewer:
Yes, I can hear you now.
Expert #4

Yeah, okay. We lost each other briefly. Building on those five principles I gave you earlier, I would say it's crucial to ensure that the process by which the strategy is developed is fully participatory. I'll come back to a point I made earlier: the process by which a strategy is developed, whether it be a broadband strategy or a digital ID strategy, if it's fully participatory, is more important than the strategy itself. The strategy itself will probably never get read, will probably sit on a shelf, and will be out of date from the day it's published. So, the strategy itself is a lesser document.

The process is about achieving common consensus among the different stakeholders—users, suppliers, governments, and different sectoral line ministries—on what the common goals and targets are. This consensus-building process is more critical than the strategy document itself because it ensures that all stakeholders are aligned and committed to the strategy's objectives.
Interviewer:
Okay, perfect. So now, perhaps focusing more on the part of international organizations? What role should international organization have in helping governments developing their national strategies?

Expert #4
I think probably the easiest and most effective thing we can do is what you might call benchmarking. So, saying, well, Country A did it this way, Country B did it this way, Country C did it this way, and you can learn from all of those experiences. Benchmarking includes producing international statistics that are comparable, such as prices, spectrum allocation, market licensing, etc. That would be the first role I would say for international organizations.

The other side of benchmarking is what you might call naming and shaming. So, if a country has a particularly high level of price for data, you name and shame that country. Secondly, we can help financially. For the poorest countries in the world, we can assist by bringing in international expertise and peer reviewers to help review their policy strategies. The OECD, in particular, has a very good model of peer review, whereby when a country requests assistance, it can bring in three or four experts from peer countries to review and offer comments. This is a good way in which international organizations can provide support.

For the World Bank, in particular, because we have funds available, we can help with the implementation of policies. As I said earlier, many strategies are developed with the best of intentions but are never implemented because there is no cash at the end of the day.

We can provide the necessary funds for implementation. Through our technical assistance, we can guide countries in their implementation of digital transformations, such as the projects that I work on personally.

Interviewer:
Thank you so much. Like as you mentioned before, these strategies should be user centric. Do you have any specific examples where Like International, like national strategies have focused mainly on user centric and have had positive outcomes.

Expert #4
Yeah, I think so. In the case of Somalia, for instance, we helped the government of Somalia together with the ITU as part of a joint ITU and World Bank project to develop a national digital strategy for Somalia. At the end of the day, the customer, who is the most vulnerable, stands to benefit the most from a well-implemented strategy.

Some of the aspects we looked at included the lack of regulation in the telecom sector. When we started working in telecoms in Somalia, there was effectively no regulator, and there was no appeal against fraud by operators. The mobile money system in use at the time was very fragile and could easily collapse, which would have resulted in thousands of dollars of consumer money being lost. Users were very dependent on mobile money in Somalia, but there was no legal protection.

So, the strategy focused on consumer users, aiming to regulate or rein in the power of the operators. At that time, the operators paid no tax, and there was no recourse for users to claim lost money in a transaction. By focusing on individual consumers, we were able to develop a strategy that the government could then implement with support from the World Bank. This strategy aimed at empowering users, creating a regulator, introducing taxation into the system, and providing consumer protection in areas like mobile money.

Interviewer:
Okay, thank you. And perhaps we can start concluding. In your experience, what would you say are some emerging trends that will come for the digital transformation of governments and how international organizations can help governments adapt to these new technologies?

Expert #4
Yeah, well, probably the biggest one is artificial intelligence. We are certainly now getting a lot of requests for how we can support governments in reacting to AI, avoiding

a situation in which jobs are destroyed, and creating a situation in which value moves to countries with high investment in AI. We also need to look at the climate implications, as AI consumes huge amounts of electricity. There are regulatory concerns about the power output from the data centers necessary to keep AI running. Additionally, there are policy concerns that AI might reinforce existing biases within society or underlying assumptions about the abilities of different people to participate in the digital economy. So, that would be one critical challenge.

A second critical challenge is what we might call last-mile connectivity—ensuring that the most remote, rural, and neglected populations are served and have equality of opportunity to access digital resources.

Thirdly, digital skills are crucial. Ensuring that people have the ability to participate effectively in the digital economy means having a basic level of digital literacy. Beyond that basic level, it includes having the awareness to understand things like data protection breaches, cybersecurity hacks, and online fraud. It's about building a certain level of resilience within the population to counter the dangers of the information supply.
Interviewer:
Okay, thank you so much. So yeah, those are all my questions. I don't know if you have any questions.

Expert #4
Anything you disagree with, from what I've said or would you add a sixth characteristic to my Fiverr for instance?

Interviewer:
No, I think I mean, so far like on the research that I've done, I think it's most of the characteristics that you mentioned are also like the common knowledge. So yeah, definitely. I completely agree with you. So thank you very much for your time.

Expert #4
You're welcome. Even though obviously, you're limiting your study to the international organizations, I would encourage you to look at the 10 Digital principles that are developed, developed by dial digital impact Alliance. So if you search for that, because I think that is also contains some some good thinking as well.

Interviewer:

Okay. Yeah, yeah, I will definitely check it out. So like, thank you very much for your time and for your insights. And yeah, have a good weekend. Thanks, you too. Bye. Bye.

I Interview #5

Interviewer:
So, yeah, I'm analyzing of course the OECD, I'm also working with a World Bank and with the Inter-American Development Bank. So yeah, that's how I came across the paper that I told you. But I don't know if you want to start like maybe with an overview or what you do. And then from there, we can go.

Expert #5:
Yeah, so my name is (expert). I work in the Digital Economy Policy Division in the STI Directorate at the OECD. I'm quite new to the OECD, having started in September last year, so I'm still getting used to everything. Before that, I used to work for the British government on various tech policy areas. I've worked on digital infrastructure, broadband, but also worked with the minister in charge of all digital matters. So, I've been involved in a variety of different things.

Since I started at the OECD, I've been working on a chapter for the digital economy outlook, a significant publication. There are a couple of versions online already that you can see, but there's a new one coming out next year. I've been doing a lot of comparative work on different countries and their digital policies. Additionally, I've been working on a project with the Norwegian government, assisting them with a new strategy they have in the pipeline. And now, we're about to revise something you might have noticed from the paper you read, called the Going Digital Integrated Policy Framework. That's (name), my boss, who you emailed; it's her significant project. Much of our work stems from that framework, and we're looking at how to operationalize it and assess how well countries are utilizing it. It's been really interesting so far.

Interviewer:
Yeah, exactly. What you mentioned, whether governments use it or not, is more or less what I want to see. I'm focusing on a case study, and since I'm from Mexico, I'm particularly interested in studying Mexico, especially now, as the current government's term is ending, and I'm hoping they will respond to all my emails. So, that's the overall idea. I have some questions regarding the framework because I believe it was published in 2020. The second paper, the one I mentioned earlier, is relatively new. My understanding was that it aimed to evaluate how countries have progressed according to

the framework that the OECD published, about two or three years after its release. But I'm not entirely sure if I'm correct or not.

Expert #5:
It's sort of like that, but it's a bit less precise. Instead of basically having a framework with seven different policy dimensions and 38 domains in total, what the MDSC, which is the paper you mentioned, the National Digital Strategy Comprehensiveness Indicator, is trying to convey is a bit complicated. I remember before I started, I was reading it, and I was like, "Whoa," and it took me a lot of reads through to understand it. But it's actually quite simple.

The idea is that we have this policy framework that we think, from an OECD perspective, is the way all countries should think about digital policies for growth and well-being. It looks holistically across all these different aspects. One important element of your overall digital policy is your national digital strategy because that should be the central coordinating document that builds everything else out.

So, what the MDSC does is assess how comprehensively a country's national digital strategy covers the policy framework. It's not necessarily an assessment of how well it does it, but rather how much of the framework is covered by the NDS.

I go through each country's document, part of the chapter I mentioned, and assess how comprehensively they address the issues outlined in the framework. I wouldn't necessarily read through the document and evaluate how well it captures the framework. Instead, I use a big table and check if they have a policy for each aspect. The policies may not be great, but it's about how comprehensively they address these issues.

Interviewer:
Okay, yeah, perfect. That makes more sense. Also, you wanted to know if there are any similar barriers or challenges that governments usually face when they try to implement these strategies, right?

Expert #5:
When governments implement their own strategies, a lot depends on national contexts. Having worked in both a national government and now for the OECD, I can see the differences. In national governments, decisions are heavily influenced by factors like upcoming elections, internal politics, past actions, and even considerations like how to garner positive press coverage for a strategy.

However, from the perspective of the OECD, the framework is meant to be a tool. For instance, if the British government is formulating a new national digital strategy, they could use the framework to ensure they consider all relevant aspects. In reality, though, policies aren't always developed this way.

Currently, we're working on a project with the Norwegian government, which is more akin to what you mentioned regarding the NDSC, where we conduct a detailed assessment to identify strengths and weaknesses. We use indicators from the Going Digital Toolkit, which translates into framework dimensions. For example, if Norway doesn't perform well in innovation indicators, we analyze their innovation policies and provide recommendations for improvement in their next NDS. It's a qualitative assessment of what's working well and what isn't, rather than just counting numbers.

However, not all countries engage in this level of detail. Some may not prioritize it, which is their prerogative. Additionally, there are other frameworks like the EU's Digital Decade, which countries may need to align with for certain funding opportunities. So, navigating the process can be complex for countries, as they consider how to organize and approach it.
Interviewer:
Yeah, okay. Those are some of the questions I have because typically, governments create strategies for about six years, from what I've seen. I'm wondering if there are any recommendations or tools that the OECD or international organizations, in general, can offer to governments to create more long-term strategies. We know that technologies don't just become obsolete after six years. So, I'm curious if there's anything that can be done to encourage the development of longer-term strategies.

Expert #5:
Yeah, I understand your point. The framework is meant to serve as a comprehensive guide for countries seeking to develop long-term digital strategies. It provides a blueprint based on international best practices. However, whether countries choose to adopt these recommendations is ultimately up to them. Some governments may feel they already have strong policies in place or may prefer to rely on their own expertise rather than international guidance.

As an international organization, our role is to provide guidance and support. While we can offer recommendations and tools like the framework, it's ultimately up to the

countries to decide how much they want to engage with them. We can't impose our guidance on countries, but we can offer assistance and expertise for those who seek it.

There's also the question of how countries interpret and implement these recommendations. For example, a country may score low on certain indicators not because their policies are inadequate, but because they haven't aligned them with the OECD framework. This underscores the need for flexibility and understanding that each country's context is unique.

In summary, while we can provide guidance and tools, the extent to which countries utilize them varies depending on their specific needs, priorities, and political considerations.

Interviewer:
Okay, yeah. So, in terms of gathering feedback from countries, it's a continuous process for organizations like STI and the OECD. We don't just dictate our opinions; rather, we engage in a constant cycle of feedback with member countries. For instance, you mentioned the case of Denmark. It's not solely about the OECD saying, "This is how you should do it." Instead, it involves ongoing dialogue and collaboration. We gather input from member countries about their experiences, challenges, and successes in implementing digital strategies. This feedback loop helps us refine our guidance and tools to better meet the diverse needs of countries around the world.

Expert #5:
Regarding the feedback from Denmark, everything we produce and publish at the OECD goes through a declassification process. Representatives from all member countries are involved in that process. So, when they see the scores we assign, they have the opportunity to provide feedback through the comment process. This is how we engage with them.

Another example that aligns with what you're talking about is New Zealand. We went through the process and used the latest version of their policies available online. However, New Zealand delegates informed us that there had been an election since these policies were created, and the new government is departing from the policies of the previous administration. Therefore, we added a note to clarify that these policies were from a previous administration.

There are situations like this where things don't always neatly align. Ideally, the delegates on the committee should be well-informed about national developments and our work as the Secretariat for the relevant committee. They should be thinking about how new policies impact their engagement with us.

Sometimes, delegates inform us about new policies outside of the formal process, which is helpful for ongoing dialogue. However, this doesn't always happen, and delegates aren't always well-informed due to differences in representation and resources among countries. With the vast amount of publications, it's unrealistic to expect everyone to read everything. Therefore, there are some challenges in this process.

However, given the nature of the OECD's role in providing comparative analysis and guidance, it's not about imposing strict rules but rather offering support to member countries. So, in that sense, it's manageable. Okay?

Interviewer:
Yeah, also, maybe delve more into how countries should develop them. Like, yeah, I usually, by the OECD, or like, almost all the international organizations, say that the national strategy should have a user-centric approach. But how can the governments actually engage citizens and ensure that their needs are being met in this process of digital transformation where you have to deal with a number of stakeholders but still having the citizens at the core?

Expert #5:
So I think there's a couple of things that come to mind. I think having a citizen-centric approach to policymaking is one thing, which is about policy design. And then within digital transformation, specifically the issue of digital government, there's this idea of user-centric digital government services, which is slightly to do with the way it comes from software design.

For instance, the UK Government was one of the early pioneers of having this like GDS (Government Digital Service) process where they dedicated an organization to delivering a platform for the whole government's digital services. They have this idea of the user need, and that's something that is a principle within software development in general. So if you go to an app developer, they'll talk about what's the user need and what's the user journey.

Sometimes, some of that is used a bit interchangeably when you see digital government stuff. So on the one hand, there's that principle about if you're developing digital government services, you should do a lot of feedback, you should always be willing to iterate on the service, and have ways to collect feedback from your users to ensure that the service is working correctly. That's like a design consideration that is embedded into stuff.

And then there's how do you create citizen-centric policy, which is also used in the short term, but that's a bit harder. But with digital technology, it can make it a lot easier. So you can collect feedback from people through websites and platforms and stuff like that. I think it's also like just doing engagement exercises.

So in ways, you do like a public consultation, which might be a formal thing, where you send out a document and you have six weeks for people to send in their responses, and you analyze them, and you publish a follow-up. But it might also just be as simple as asking a certain number of people, doing some polling or whatever, and checking that things are working. Also, there's actually getting feedback, which is the ideal thing.

And then there's also just when you're designing the policy, thinking about the citizen, particularly with services, think about the user journey. When I'm this person, and I try to claim this benefit, what do I have to do? Do I go into the center? Do I ring up? What if I'm disabled? What if I'm blind? It's like a way of thinking to ensure that you're considering all of these different ideas, and everything is about what's going to be the citizen-level impact of this, rather than just focusing on the policy in isolation.

With digital policies, particularly when they're new and emerging, and there are new technologies, there's a risk that you might just copy and paste from other countries without considering if it will work for the citizens and contexts you have in your country. That's where having a mindset of thinking about the person and how this affects their daily lives, and what the broad effects on society are, becomes crucial.

Interviewer:
Okay, and also, how, yeah, usually, governments create these strategies for, let's say, 4 to 6 years. But as we've seen, there are technologies basically coming up every single day. So how can governments actually create these strategies? Like being flexible enough to allow new technologies, but also, I mean, they do need specific actions to be taken. So how to create this balance?

Expert #5:
Yeah, so I think the framework deals with this quite well. It tries to be kind of principles-based rather than technology-based. The idea is that, like, you might think about your main national digital strategy that's in the center of everything. Think about that in terms of not like this technology, that technology, but think about it in terms of okay, jobs, society use access. And within that, you may have other sub-strategies. So within access, you might say, well, we've also got this national broadband plan, but then I don't know, 6G comes along, and you want to do a 6G strategy, but you've not spoken about that in your NDS.

But then at the start of your 6G Strategy, you say, well, this falls within the access dimension within our national digital strategy, and you refer back and everything is linked. Having actually gone through the NDC process, a lot of the stuff is about how well is everything linked back to keep this coherent vision so that it doesn't move over here, move over there, move over there. That kind of allows for coordinated strategies that might be technology-specific within the broader picture, which is more values-based. You are going to update it every few years, but the general direction is still the same.

And you're still thinking about the general, again, this is like where it goes back to the citizen linking is like, I'm not thinking about this specific technology or that specific technology, but like, which bit of someone's life does this affect? And how does it affect them? I think if that's done well, that can work really well. Obviously, it's not always done well. And often you get, you know, there's this over here, this over here, this over there. Some of that is because policy is not done well, but also it's often because, I don't know, something happens in the press, and so a national government has to react.

It's also like, you know, you have this department, that department, that department, and this one was not talking to that one, and there's not, but you know, everyone, this person's trying to make a name for themselves. So they want to publish a strategy so they just do it, no reason, and, you know, there's all these kind of messy things that can create confusion. But ideally, if you're saying like, these are the broad thematic areas that we care about that make sense to a normal person, and then within that, there's a lot more specialist stuff, then you just have a section that says okay, but this is linked to that because this is relevant in this regard. But these are the following very technical aims. Okay, yeah.

Interviewer:

As a last question, yeah. Additionally, the other are basically silos everywhere, which is like a big problem, especially in this term, like the digital transformation that you have, you need the cooperation between several actors. So what are how can it be, like in a way promoted to have? Because I mean, of course, you need not only to have like a strong strategy or to have a really motivated president, prime minister, but it's way more complex network. So how can like a neat digital strategy help or like, yeah, basically held connect these silos?

Expert #5:
Yeah, I think it's some of it's to do with, it's not just the strategy, but it's like the governance arrangements that go with it. So like we've seen, some of the things we've seen is there's been this really big trend towards having a dedicated digital ministry, which is obviously a good thing, because then it's like, even though every ministry should be doing a bit digital development, if you have like the people who are in charge of developing that overall strategy that helps.

But then it's like, do you have the right levels of accountability that Okay, so if someone wants to publish something that's digital related? Do they have to speak to that department to check that it fits with the strategy, and that department might look through and say, Okay, this document's good, but you know, you haven't referred to this or haven't spoken to this person. And some of that's just to do with how you run a government, there's obviously different ways.

You know, and you might do, some countries will have like a digitization Council. And so then everything from the different departments flows up to that for approval, those kinds of things can just help like having a central place that looks over everything. Of course, you still want individual departments and bits of government where they have their own specialist knowledge, to feel empowered to do their own thing. You know, if you don't have a health department that's thinking, how can we have digital healthcare or redesign, but that's not good.

You need them to be doing that. But then you just need someone in the digital department to know that that's happening and think about how that tallies in with the overall strategy. Okay.
Interviewer:
Perfect. So those were all the questions I had. Thank you so much for your time. I'm not sure if you have any questions for me, but if you do, I'll do my best to answer them.

Expert #5:
But yeah, I don't really have. I mean, just always happy to chat about this stuff. But yeah, no, no questions.

Interviewer:
Thank you so much, again, for the time and for these answers.

Expert #5:
No problem. And yeah, if you have any other questions, you know, just don't hesitate. Send me an email.

Interviewer:
Perfect. Thank you so much and have a nice rest of the day. Thanks. Bye.

J Interview #6

Expert #6:
I'm happy to share anything I know that might be relevant to you. One aspect I noticed is your focus on the digital transformation of organizations, whether they are international, private sector, or governmental. However, I want to clarify that our division's work on digital economy policy and for the Digital Policy Committee is primarily centered on national digital strategies. These strategies are aimed at the transformation of economies and societies by governments, which differs from digital government strategies focused on transforming the government as an organization. I think this distinction is important to note upfront. While you may find some relevant information in our paper, there may also be additional insights from colleagues in the governance directorate. Have you reached out to them as well?

Interviewer:
Yes, I have two weeks ago a meeting. Not with (name), but with someone from her department. And I reached to someone from Indigo. I think it's a division within governance.

Expert #6:
That doesn't ring a bell sorry.

Interviewer:
In the diagram it like it appears that as Indigo. Okay,

Expert #6:
Is it innovation in the public sector? Is that what it used to be called? Because right now there are divisions like innovation, digital, and open government, as well as government innovation, digital government, and data. I think the unit with these people here would probably be most relevant to what you're doing, in addition to what I can share. So, do you still have access to the system organizational chart?

Interviewer:
No.

Expert #6:
But what I can quickly share with you here is, Oh, yes, let me pull it up and then show you the context I'm talking about because I think it'd be worth you reaching out to them as well. So, trying to make this big and whatever it is, it's sort of going away. Okay, so I think the unit that is most pertinent, working on the topic that you're working on, is this digital government data unit.
So it's really (unintelligible) so this is not digital economy or digital society, which is what we are doing, (name) is doing. We, meaning STI digital, this is digital government. Right. And so they are really looking (unintelligible) they have done a lot of work on (unintelligible) there is testing the council recommendation on digital government strategies. This is public, if you haven't seen this, you know, it'd be useful to get. And there's quite a lot of work that comes out of that unit, including, you know, country reviews, digital government reviews for countries, but also thematic work and indicators and so on. That all look at how governments themselves become more digital and data-driven. Which I think is, you know, a key thing you're probably looking at or for.

Sorry, I just want to start off with making sure you (unintelligible) I think, yeah, this will provide you that, say, the most valuable source of information, their publications, and maybe then people that you may contact here from that unit. I don't know if you just send off a screenshot or something for the names and yes. Or write them down. And then you could, you know, maybe you see, reach out to one, one of the colleagues down the unit. And, you know, you could (unintelligible) I mean, I know maybe not to Barbara, she's probably going to be too busy, but somebody else there in the team, you know, maybe Jakob Arturo or somebody below.

So let me just real quick, before I say something more, tell me if you have specific questions, that paper, or questions that you were hoping that I could answer to you. And then I'm happy to just say anything else that I can think of."

Interviewer:
Yeah, so far, I have some questions, but they are not specific to the paper. They're a bit more general into like digital transformation strategies. But yeah, I think like in the paper, some of these are mentioned, but I don't know if you want me to start with them, or if you want to start talking about the paper, and then..

Expert #6:
No, I think Go ahead, let's go because I think I want to make sure you, you get your questions answered. And then if there's additional things, I'm happy to talk about them. Okay,

Interviewer:
Perfect. So yeah, the first one is Yeah, I mean, in the paper, you mentioned seven aspects about digital transformation, but what is like, what are some characteristics that you will think I'll reconsider necessary for government for governments who want to develop a digital strategy?

Expert #6:
So, this is, you mean, if you say digital strategy is you mean a strategy for digital transformation of the government? Yeah,

Interviewer:
exactly.

Expert #6:
Okay. So, this is one second, I just want to bring up the recent recommendation. So, as well, let me share this again. So, we don't really look at strategies for the digital transformation of government. So, I can say a few things from the point of view that we develop, which is that we are placing digital government as a topic of a policy area, if you wish, in that large framework that we use when we are to assess digital transformation strategy, so overcoming in society and the three areas in which we place this government with regards to using digital technologies.

So that's a key condition, if you like, the usage of data technologies and data and digital government and digital governance strategies. You know, what probably have an important focus on enabling actors in the government themselves people that work in the government to make it concrete to actively extensively where it's useful, use digital technologies and data to improve processes to digitalize you know, manual paper-based processes to streamline and so on. And if I said it really, it also always applies data-driven a lot of this is more and more release of very data intensive.

Then the second area where we place different government in this framework, Chelsea understand is under society and sorry, not there's a third, let me go to the second actually in the order is under jobs and skills. So, where basically, we look at the implications for or you know, think of the implications for government in terms of skills. So, you know, using technologies is important and, you know, having them in place is important to be able to use them, but then for people, government employees to be effective in using them a key thing other skills right to, to empower them to use that.

And then the third aspect of mentioned is where we mentioned that your Government and the society is that Digital Government strategies. That's not not a condition for, you know, another criteria, but it's sort of an objective more of digital government standards, I guess, to enable civic participation and make the government itself a more open open organization, if you wish. accessible and inclusive of, of, of any type of stakeholders, citizens, businesses, wherever groups and that have, you know, that are useful to involve in policymaking processes be, you know, in, in review of draft legislation in, in all sorts of things where digitalization can help a lot with making that happen.

So these are just three aspects of that, I think a couple of more. And, you know, I'm just at a, do you see this my screen here? Yes. So this is crucial, I think, you know, have a look at the OCD recommendation on digital government strategies. That's high level, but it's all I think, very much, you know, targeted to what you're looking for. And you agree, I think a lot of this and some answers to your question here. You know, you know, these are basically sort of high level points that you want to you want to go and more specifically the recommendation. And then look, again, at more detailed publications. That's sort of maybe a high level starting point.
Interviewer:

Okay. Perfect. So yeah, maybe yeah, focusing more on the document that you authored. So when I talked with the people from STI, they mentioned that this document was part of, I think, is like the four phases of the digital transformation like the digital toolkit,

something like nothing mentioned. So it was this paper. And then I think, a year after it was published the monitoring document of the way they have this specific name here. So yeah, it's from the going detail integrated policy framework. And then it was published the assessing national digital strategies and the recovery net.

So I don't know if Yeah, because like I was checking the second document that assessing national digital strategies. And from what I saw, like, not all the not all the OECD countries were evaluated in this monitoring. So I don't know, like, maybe it was because of the voluntary contributions, or what was it? Like not all the countries were evaluated and altered? How was the process of evaluating the countries?

Expert #6:
It's simply because we didn't. So this is, the paper started with a data collection, in which not all countries were invited to participate, but not all countries responded. So we didn't have the information for all countries. Therefore, we included in the assessment only the countries of which we had information. That's as simple as that.

Interviewer:
Okay. What would we like some challenges that the countries usually have following these recommendations by international organizations?

Expert #6:
That's, I think, a very general question. I'm not sure I'm able to answer. But it really depends on what your recommendations you mean.

Interviewer:
Yeah. So, for example, if a country wants to adopt the framework by the OECD, I'm curious if you have had some feedback on the biggest challenges countries face when trying to incorporate this guidance into creating their own strategy?

Expert #6:
Just to confirm that this is applicable (unintelligible) It seems like you're focused on strategies for the transformation of the government, right? Because the paper we're discussing doesn't cover such strategies.

Interviweer:
Yeah

Expert #6:
Alright. This event focuses on entirely different strategies. In fact, it could be about anything, really. It just happens to have 'digital' in the title. It's similar to how an event about National Fisheries strategies would be just as different from what you're looking at as the national digital strategy.
One of the challenges is that we propose a very comprehensive framework. It has been developed with input from all member countries over an elaborate process involving almost all OECD committees. This framework represents an ideal picture, based on OECD consensus, of the policy domains that should be covered in a national strategy. However, when countries adapt this framework to their domestic context, they may not need to cover the entire spectrum. While it would be beneficial in most cases, they may have specific challenges and initiatives that prioritize certain areas over others, resulting in a more focused national strategy.

So, the challenge arises when a country attempts to align its strategy with the OECD framework but realizes that certain areas may overstretch its current capacity or require more focused attention. However, even in such cases, this framework serves as a valuable guide. It ensures that countries, when developing or revising their national strategy, do not overlook key areas that should at least be considered.

Interviewer:
Okay, perfect. Yeah, I think, as you mentioned, my focus is more on the government aspect. So the guidelines may not be specific to that. Maybe, if you could, also be more general. What are some emerging trends that you can see coming up in government digital transformation?

Expert #6:
Yeah, I think I would really defer to my colleagues. They can provide a much more informed and competent answer than me. My colleagues, not from SDI, but from the governance or public governance directorate, because they really focus on exactly that. They have a history of digital transformation of government and could give you a good indication of where we are coming from, where we stand today, and where we are going in that respect.

I mean, the only thing I can say, I think, is that I've worked with a couple of countries and have seen a lot of heterogeneity. Countries are at very different stages in this process, and they face different types of challenges. Some are common, for sure. But it depends a lot on how the government is structured.

To give you one example, Germany, being a federal country, has a lot of important responsibilities at the sub-national level. When you think about the digital transformation of the government, it's not just the national government involved. There are also sub-national, regional, city-level, and even communal-level governments that play a crucial role. Some very important public services are delivered at the sub-national level. So, the transformation that has to happen is not just in Berlin but in all the 14 states and many more cities. The way this is being done creates very different challenges compared to, say, a country like France, where much of the government is centralized in Paris and nationally, and it's more top-down driven.

So, it will be very different processes depending on the type of country and governance structure you have, and where you come from in terms of digitalization or digital transformation, as well as the level of uptake by the government. It will really differ a lot.

Interviewer:
Perfect. So, yeah, I think those were all the questions I had related to you. Thank you very much for your time and for providing the contacts. I'll definitely reach out to the people in governance to get their perspective on this. So, yeah, thank you very much for your time. Do you have any questions?

Expert #6:
Thank you. I'm really glad you're diving into this topic, which is truly exciting. Since you've delved into the paper and the broader work on national digital strategies, besides digital government strategies, I think it's important to maintain a clear distinction. However, it's also useful to keep in mind the relationship between them.

While you're focused on digital government strategies, it's worth considering how they relate to the transformation of government itself and national digital strategies, which may include aspects of digital transformation of the government. This interplay between the two types of strategies is quite interesting.

Typically, they need to be well coordinated, but often they involve different stakeholders. For instance, in Germany, the government strategy is led by the interior ministry, while the digital transformation strategy is led by the Ministry of Economy and the Chancellery. These differences in leadership can shape the strategies differently.

So, as you explore strategies for the transformation of government, it might be worthwhile, at some point, to link your findings to these broader national digital strategies. You could consider the implications for the relationship between the two types of strategies, which could provide valuable insights.

I think it's an interesting question to keep in mind alongside your current focus. Okay."

Interviewer:
yeah, no, thank you. I will definitely take it into consideration. So yeah, thank you very much. And yeah, have a nice rest of the day in Paris.

Expert #6:
Thank you so much. You too in Estonia. But yes, it's a beautiful country. I haven't visited yet, but I'm familiar with some of the other Baltic countries.

I think Estonia is probably one of the nicest there. So yeah, thank you. Good luck with your thesis, and don't hesitate to reach out to your colleagues and look at their work. It seems quite relevant to what you're studying and hopefully helpful. And again, if you have any other questions, feel free to reach out.

Interviewer:
Okay. Perfect. Thank you very much. And yeah, have a nice day. Thanks. Bye.

K Interview #7

Interviewer:
Super! Ah, yes, so first of all, could you tell me a little bit about your background: how did you end up where you are and what is your relationship with the subject?

Expert #7:
Right, well, I studied computer engineering at UNAM and did a master's degree in telecommunications. The reason I did the master's degree in telecommunications was because I realized, during my computer engineering career, that I had a passion for computer networks. At that time, around 1985, when computer networks started to be interconnected, I had the opportunity to work on that project and I was fascinated by telecommunications.

Later on, I was assigned the task of building the UNAM telecommunications network. Although I completed the design and contracting, I decided to pursue a master's degree because I felt I needed a specialization in telecommunications.

After completing my master's degree, I returned and came across a program in Boulder at the University of Colorado that was very interesting. It was not only focused on telecommunications as technology or engineering, but it was called the Interdisciplinary Program of Telecom. This program provided a foundation in telecommunications policy, regulation, finance and economics, plus 60% of the credits were engineering oriented, creating a very comprehensive plan.

When I returned to Mexico, I had planned to rejoin UNAM, as I had a scholarship from the university. However, a friend who worked in the government told me that they needed someone with my profile, a technician with a broader vision of public policy and regulation. So I joined the Ministry of Communications and Transportation as an advisor in new technologies. There began my public career, in which I have worked almost all the time as a public official, first designing plans in Mexico to open telecommunications to competition.

Mexico, following a worldwide trend, opened its telecommunications to competition in 1990, and I arrived at the Ministry of Communications and Transportation in 1992 to work on this process.

There was a plan to modernize and open up to competition, and I had to work on that plan. The interesting thing is that I had to interact with all areas of the Secretariat, which helped me to understand how the Secretariat of Communications worked.

After advising, I was in charge of introducing new technologies, analyzing and implementing them. I also coordinated the indicators of the communications sector.

The last undersecretary I worked with at the Undersecretariat asked me to attend to certain international issues. That was the beginning of my international work, and I have always believed in the importance of continuous training. For this reason, I frequented the Secretariat of Foreign Affairs and the Secretariat of Economy a lot, since there were two important trends: international negotiation criteria and free trade agreements and economic cooperation organizations. I had to understand both visions in order to work on telecommunications issues.

Thus, I began to work with groups to position Mexico. The Federal Telecommunications Commission was created and most of us in the Undersecretary's Office moved there. The undersecretary, who became president, asked me to head the international area, and I spent almost eight years in that position. Those were fabulous years, I loved negotiating both bilaterally and multilaterally.

At first, I was upset because I thought it would take me away from engineering, but I soon realized how much engineering is needed to negotiate frequencies and everything related to telecommunications. In 1997, convergence began, raising issues about how to deal with information technology, telecommunications and broadcasting.

Interviewer:
Yes

Expert #7:
When I built the UNAM telecommunications network, NEC, a Japanese company, won the bidding. NEC is still a Japanese company and I had the opportunity to go to Japan for training in the use of their switches. Back in 1990, they were very clear about the concept of “Computer and Communications” and they were pushing it very hard. For me, if you want to know about the technological future, Japan is the country to watch. Although they may disagree on many issues, in technology they are at the forefront.

Expert #7:
In many areas, the United States, China, South Korea and European countries are currently competing in technological development. However, Japan is still the cradle of technological development. For me, it was very important to have lived there for a while, absorbing all that knowledge.
My participation in APEC in the Asia-Pacific region was also enriching, because there they practice what they call “multi-stakeholder”. In the discussions and negotiations, you saw people from industry, academia, civil society and government.
Regarding technological convergence, in 1998 the International Telecommunication Union issued a political declaration on the Internet issue, because it was seeing that the situation was getting out of ICANN's hands. This generated a strong clash between governmental and non-governmental organizations.
In fact, we had to push for a government group to be incorporated into ICANN, so that they would not act unilaterally.

Interviewer:
Mhm.

Expert #7:
Which is what is happening to artificial intelligence right now.

Interviewer:
Yes

Expert #7:
Yes, so that period was very good. I led several groups at the international level, and my last involvement was with the International Telecommunications Union, where I was in charge of the evaluation of the Constitution and the bylaws. This was to consider the possibility of transferring elements between the Constitution and the bylaws, and vice versa, to make the system much more agile. That was my last experience in international forums.

After my work in the international area, I resigned from Cofetel in 2006 due to the publication of the Televisa law, with which I disagreed. I considered that the law favored Televisa and other monopolies, granting them the use of the radio spectrum, which is a public good.

I was a commissioner for three years in the area of engineering and technology, and the new law prevented commissioners from continuing in their positions. Although I could have sued, I had neither the money nor the desire to do so, so I decided to resign.

Then, I got involved in a civil association created by universities and research centers. This association is dedicated to deploying telecommunications networks to interconnect all research centers and universities. This is important because at that time the concept of the National Research and Education Network started to develop in Europe, where every country has one.

I don't know if you got to see this while you were in Belgium, Germany and now Estonia.

Interviewer:
Yes

Expert #7:

I do not remember the names of the networks in those countries, but their function is to interconnect research centers. When the Internet became commercialized, academics were left without their own network for their activities without having to pay third parties. So they created what is known as Internet 2, a high-speed academic network.

Projects such as CERN, which has high-energy physics researchers at its facilities, but also 85,000 physicists around the world collaborating on various tasks, began to emerge. These tasks needed to be transported to CERN through the National Education and Research Network, interconnecting all countries on a very high-speed private network that they could use.

This concept is fundamental in the academic world. However, around 2010, the commercial networks managed to match the bandwidth with the academic networks, thus losing their advantage.

I joined the National Education and Research Network in Mexico, which is part of CLARA, the Latin American regional network. I had the international responsibility of training researchers in novel technological topics. The cloud did not yet exist when we started, but we saw its development, as well as the evolution of artificial intelligence, blockchain and other advances. I was in charge of facilitating the work of researchers from a technical point of view and teaching groups from other sectors how to use technology to do collaborative science.

So, the truth is that it was a very enriching period, I was there from 2006 to 2018. In 2018, the new government, the current one, contacted me. (name), who was going to be (position), asked me if I wanted to be the (job title). I told him that I needed to think about it, since I have a 16-year-old daughter and I need to be close to her in this period.

Then he told me that I would have total freedom of schedule, as long as I responded to my responsibilities. I told him that was perfect. Throughout my career, I always put my daughter first. I would tell them at work, “I'm going to bring my daughter. As long as she doesn't walk, I will close my door and no one should bother me." After that, I took her to daycare. I had very understanding bosses, but I also think it's crucial that you sign up and say, “I'm going to do this.”

Expert #7:
But as long as you produce.

Interviewer:
Yes, you answer them.

Expert #7:
So, yes, you get my point. I was there for 16 years, then I was Undersecretary. I accepted to be (positions) and I was there for a year and a half, but due to republican austerity, the Undersecretary of Communications disappeared. I gravely told them: “If you want, I will leave, but do not merge transportation with infrastructure, since communications require a lot of work in public policy”.

At that time, I was already working on issues of artificial intelligence, cybersecurity and so on, because I believed it was necessary to address them in a cross-cutting manner. So, I decided to get out. I thought that the disappearance of the Undersecretariat would be chaos, so I asked myself, “What can we do?”.

We decided to create a think tank with two other partners to analyze digital development. We have been publishing a state digital development index for four years. We are producing content for the general population, such as infographics and blogs on cutting-edge topics. We are also measuring, making sure our measurements are accurate and come from reliable sources.

We have been very successful. Currently, I am getting calls from several states, such as Michoacán, asking why they are in last place. We explain and they understand the situation.

Interviewer:
Mhm.
Yes

Expert #7:
We have a lot of things to work on, don't we? The novelty of this index is that we did it at the subnational level, something that has not been done before. I think only Europe has something similar at the subnational level. WIPO has certain aspects at the subnational level, but no country in Latin America did until we shared our knowledge with a similar organization in Argentina.

Their index will be called the “Provincial Digital Development Index.” It will not include all the elements that we have, as they do not have access to as much information as INEGI

generates here. Also, they do not put as much emphasis on doing it at the subnational level or segmenting it by gender, age, socioeconomic aspects and so many other valuable aspects that we consider essential for the analysis.

Well, that's a summary of my background so far. Currently, I am mainly dedicated to organizing forums. Ah, I have to tell you! Last year I entered the competition for the National Engineering Award and I was awarded it in March.

Interviewer:
Oh, congratulations!

Expert #7:
Right? I am going through different stages, building this fabulous moment. Besides, as I am a computer and telecommunications engineer, the convergence of both areas has been very easy for me, don't you think?

Interviewer:
Yes

Expert #7:
So, the truth is that I am happy with the current state of the world, although there are things that worry me, especially the fact that children and young people are increasingly immersed in electronic devices. For example, in small populations, many no longer read properly because they spend their time watching only videos or memes. This affects their comprehension and attention span, making it difficult to perform more complex tasks. That part worries me much more than anything else.

Interviewer:
Yes, exactly. I don't think it's the wisest thing to assume that artificial intelligence is going to take over the world. Rather, we should worry about what is already happening without the intervention of artificial intelligence before we start imagining science fiction scenarios like “The Matrix.” It's still a long way off, if we ever get to that point.

Expert #7:
Exactly. I always tell them that there are three myths about artificial intelligence. First, the myth that it is “intelligence,” when in fact it is only a partial imitation of the human being. The second myth is that it's going to take your jobs. All industrial revolutions have

taken away jobs, but you reinvent yourself as a human being. We will destroy each other before artificial intelligence takes us away.

Interviewer:
Yes, exactly. Well, I just wanted to tell you a little bit about my thesis in the post. What I am evaluating is digital transformation in governments, especially from the perspective of international organizations. I have been looking at the support provided by entities such as the Inter-American Development Bank and the United Nations, as they have published guides in this regard. My goal is to determine to what extent these guides are beneficial and whether or not governments are using them. I am also reviewing the national digital strategy. I have tried to contact them, but I seem to be blacklisted, as I have not received a response despite my attempts. Perhaps you have more information on the strategy?

Expert #7:
Yes

Interviewer:
How did the process compare the 2012 strategy to the 2018 strategy?

Expert #7:
Sure, look, actually, when a digital strategy started to be developed in the country was during Peña Nieto's term. At that time, the Office of the National Digital Strategy was created in the Presidency. There was an intense debate about whether it should be under the Secretariat of Communications or in the Office of the Presidency. Personally, I think it was right to leave it in the Office of the Presidency, since its function should be to advise the President and not to execute actions directly.

The problem is that telecommunications and information technologies are so exciting that one wants to be involved in everything. However, at the governmental level, the structure is different. If you have an advisory body in the Presidency, it must establish the strategic lines, but the execution must be carried out by the ministries of state or independent agencies. In this sense, it was a success in terms of planning and organization of the structure, although there were tensions between the Secretariat of Communications and the National Digital Strategy.

One of the positive things of that time was the way in which industry, government, civil society and all stakeholders were articulated around the strategy. In addition, the planning document was quite solid and established many important issues. For example, the

General Directorate of Electronic Government was created in the Ministry of Public Administration, in charge of coordinating information technologies throughout the government.

However, in the new six-year term, there was a change in the vision of technologies, especially the Internet. Originally, President López Obrador considered that all the functions of the National Digital Strategy should be transferred to the Undersecretary of Communications. But when I took office, that changed. He decided he wanted to have the strategy close to him.

The profile of the people currently involved in the National Digital Strategy is more technical, they are programmers. In my opinion, to fill those positions you need not only technical training, but also training in public policy and a broad vision. It is essential to be able to articulate ideas and implement them in the State Secretariats. As for the National Development Plan, I have had the opportunity to contrast it with the plan proposed by the Secretary of the Treasury before.

I do not remember this (name).

Well, I don't remember very well, but there was a National Development Plan that addressed the problem from a planning perspective. However, that plan was not to the liking of López Obrador, who opted to elaborate his own plan, which had a more philosophical and ideological approach.

Interviewer:
I know what you mean.

Expert #7:
Yes, his sole vision and main focus in the field of communications and the Internet was “Internet for All”. That is, his goal was to connect the entire population to the Internet. However, there was no clear directive from the top on how to proceed.

Interviewer:
Yes

Expert #7:
I drew on my experience of many years working in the area. I used as a reference what we had provided for the other national development plan. Then, I developed a whole

strategy for the next six years, defining how we would approach the subject according to the functions established by the Federal Telecommunications and Broadcasting Law and the National Digital Strategy.

Since we did not have an allocated budget, I asked myself: Where can I get it from? I decided to incorporate e-government within the structure of the National Digital Strategy, removing it from the Public Function. This generated some controversy, but we were also entrusted with leading the "Internet for all" project. This project had already arisen previously, but had been withdrawn from the Federal Electricity Commission (CFE) because it was not their priority.

Unfortunately, there was a lack of strategic planning to properly distribute responsibilities. This resulted in the creation of documents such as the National Digital Strategy, which, while ideologically focused, lacked details on the investment needed to develop proprietary technology.

Interviewer:
Yes

Expert #7:
So, what is happening is that they, as programmers, which is their specialty, are programming things and then handing them over to third parties to use, without worrying too much about the protection of all these systems and the backup that is needed when buying licenses, which guarantee maintenance and updates.

Perhaps it would be a good idea to implement it, but with a solid strategy that includes a large investment. For example, we could establish a high-level technological design and development center, like an improved version of INFOTEP. Also, we should have a very clear strategy on what we want to achieve. I think they modified Mathys and now it is called something else. What they did was to make sure that the development of free software is promoted and that whoever develops it shares it with others.

Another problem is that purchases of information and communications technologies are now made through direct awards, without comparatives. This means that we do not know what the government is buying and whether these decisions will be sustainable or whether they will be a waste in the future.

In that sense, I believe that the National Digital Strategy is not really oriented to what it should be at the national level. It looks more like an e-government or digital government office, and furthermore, it does not involve all the relevant stakeholders.

Interviewer:
Yes

Expert #7:
Don't worry about the lack of response, they didn't pay attention to us either. I was telling Emiliano, the incumbent there, that although he could do whatever he wanted, the law stated that I had to resolve those issues on the day we were called to account to (unintelligible), not him. So I needed him to inform me about what they were connecting, you understand?

Interviewer:
Yes

Expert #7:
With respect to the national digital strategy and the Internet for all framework, there is a clear public policy established by the Federal Telecommunications and Broadcasting Law. This law divides the regulatory functions, leaving such functions to the Federal Telecommunications Institute, but assigns the specific issue of universal coverage to the Ministry of Communications and Transportation. An important chapter of this law is Chapter 10, from Article 200 to 215, which details what must be done to achieve universal coverage.

Since I could not work in coordination with the national digital strategy to obtain a line of action, I relied on the law. This law, in its Article 210, establishes that the Secretariat must publish the social coverage program. So I designed a social coverage program that I have been publishing since 2019. This program has important criteria to focus efforts only where there is no coverage and avoid unnecessary public policies in areas already covered.

We also created the public site connectivity program, which covers schools, hospitals and now includes wellness sites. We conducted a detailed analysis and were able to publish this program in 2019. With these programs, we were able to map where we should start working with companies such as CFE Telecomunicaciones to bring Internet to everyone. However, we did not act arbitrarily. We established and followed a detailed plan in terms

of public policy. In addition, we had another project called meaningful connectivity, which originated during the Peña Nieto administration and focused on providing connectivity with value for the population and for the government.

Interviewer:
Yes

Expert #7:

Then, during the Peña Nieto era, the Mexico Connected Points were created, which I later transformed into Digital Inclusion Centers. There was one of these centers in each state. What I did was to reduce their budget by 47%, but I managed to get the community to take ownership of them. Instead of offering isolated courses, we focused on providing comprehensive training, following a map of basic and advanced skills. We wanted to help people discover their vocations and develop them.

This initiative lasted as long as I was in office, about a year and a half. After that time, they decided to eliminate the trusts that funded these activities. I received 70,000 México Conectado sites, operating in offices and schools. The decision to close everything came from above.

I suggested to them that we let all the contracts run until 2022, so we could let them expire naturally. We didn't want to default on public-private contracts. But they did not listen to me. I proposed to the President to let the contracts be completed and then design the Internet strategy for everyone. He asked those two individuals to assess the situation. What happened the following year was that they didn't assess anything and they blamed me, saying I didn't follow the instruction.

Interviewer:
Yes

Expert #7:
I had no instructions from the President to close the projects until an evaluation was done. Therefore, I continued with or Even so, we had 70,000 projects in place. Suddenly, they canceled all those projects. I received letters of complaint from all sides, but they didn't care. They also closed the trust, which had another purpose: to work with the national education and research networks. I managed to negotiate with the operators not to take away their infrastructure, but to provide them with broadband capacity. Until the end of

2020, that was the only thing I was able to salvage. In reality, all the public policies that were established both in the Federal Telecommunications Law and in the program created during the Peña Nieto era were lost. All this was reduced to an ideological policy of the national digital strategy that led nowhere.

Interviewer:
Mhm.

Expert #7:
The negotiation for social coverage through satellites, a delicate issue involving national security, was not pursued. I tried to change the exclusivity of Mexican satellites for the armed forces, proposing their opening to provide services to other countries in Central America and Colombia. This could have generated income to maintain our system. However, there is a lack of continuity and strategic planning between the six-year terms of Calderón and Peña Nieto on this issue.

The satellite issue is a complex problem, especially in terms of national security. The Treasury has an important role in this, because if it accepted in Calderón's era that this use be given, Peña Nieto's government did not solve it adequately. Currently, the only ones who pay for their satellite terminals are, at least, those of the Navy, since they have no other option for their communication. It is worrying that in such a sensitive issue there is no adequate transition to protect these projects and ensure their continuity. The proprietary technology designed by the Mexican government was valuable, with proprietary inscriptions and software to ensure its security. In addition, the terminals were similar to iPhones, which allowed for greater flexibility in their use.

Interviewer:
Ajá.

Expert #7:
So, what you had was a dual system.
I tried to recover the project and to promote viable actions to continue, but I found obstacles in those who had the last word. They showed no interest or concern for the future. I am not aware of the current status of the satellite issue, but it is something that the government should take up again. It is crucial to think about the renewal of satellites and how they will be used strategically. This part of the digital domain, which includes satellites and other infrastructure, lacks proper articulation and planning.

Interviewer:
Yes

Expert #7:
In other words, they thought very small and only about doing government formalities, no (unintelligible) things like that.

Interviewer:
Yes

Expert #7:
And the telecommunications and information technology sector is much broader than that, isn't it?

Interviewer:
Yes, just that generated a lot of doubts when I reviewed the strategy developed during the Peña Nieto administration and compared to see which projects were continued. To begin with, I was surprised that the previous strategy consisted of approximately 40-50 pages. In contrast, the current one barely reaches 9 pages. But yes, I am reviewing from the perspective of the agencies to see what they propose.

Expert #7:
Exactly.

Interviewer:
So you are looking to see what the World Bank recommends to have in a national strategy? Just yesterday I was talking to my colleagues here, and we were mentioning that there doesn't seem to be a clear way to align the objectives of Mexico's strategy with what the OECD or the World Bank proposes. It is as if, when you review it, you say: “No, this does not fit at all”.

Expert #7:
No.

Interviewer:
It is crucial not only to establish austerity and anti-corruption principles, but also to ask how they will actually be implemented. For example, when we talk about “Internet for all,” it's all well and good to have that vision, but how will it be implemented in practice?

How much will be invested in cybersecurity? I've been researching this topic for a year, and I found that cybersecurity goes beyond simply putting passwords on government emails. It's about protecting the entire infrastructure and educating those who operate those systems about the risks. From sending an email to handling sensitive data, every step must be protected to prevent potential attacks or leaks. I have yet to find out more details on how this challenge is planned to be addressed.

Expert #7:
Right.

Interviewer:
Currently, the government is measuring all the performance indicators, right? What I fail to understand is how exactly the strategy is addressing this. What is the criteria for mentioning that the priority program is “Internet for all”? Are they focusing only on achieving universal coverage, or are there other aspects that they are considering? Also, how do you plan to measure the success of this program - is it enough to simply get everyone access to the Internet, or are there other factors that you should take into account?

Expert #7:
They claimed that in two years they would be able to cover the whole country. However, every time I heard that, it seemed unrealistic. How could they achieve it without a huge investment? Even with $3.3 billion, the task seemed too ambitious to complete in a single six-year term.

Interviewer:
Yes

Expert #7:
Look, I think the problem with this strategy is that it does not analyze the general context of a digital Mexico, it focuses only on the areas, what are called the UTIs, the information and communications technology units of the federal public administration. Not even of the country.

Interviewer:
Yes

Expert #7:

And there are no indicators, they talk about austerity and eliminating corruption. They removed the two elements that could help, which is transparency and accountability in the purchase of all that has to do with equipment or software developments.
This and the issue of Internet for all.
I do not know if IFETEL, because as it is a concession it has to be accountable to IFETEL, I do not know if IFETEL is evaluating.

How well are they complying now? It is even more complex because they originally as CFE, telecommunications and Internet for all. Originally they were the ones that were going to develop this network that was going to cover the areas that were not covered because their original title said that they had to cover the areas where there was no operator. Then, if they used the social coverage program, they had to go to those places, they realized that it was very expensive and difficult to do it with any technology.

Interviewer:
Yes

Expert #7:
So what they did is.
Spoil the Shared network project. Because the Shared network project had a purpose and it was accepted or authorized by the Government through a bidding process. Having won through a competition, the obligations were exclusive to the private company. To succeed because they had set their goals, right?
At the moment when we entered, the Government they decide for some crazy reason, this Government decides “no, we have to move them to the rural areas to cover them faster”.

And I told them, although it was not my responsibility to sign, I told them, no, that is crazy. Remember that as a Government, if we authorize them through a bidding process and we get involved, we become judge and party, so my suggestion is not to get involved in anything, , and let the company assume its responsibility and we will rescue it and whatever (…) everything will be fine.

Interviewer:
Mhm.

Expert #7:
Y el empresario con mi jodidísimo dijo de aquí soy, de aquí me Safo porque lo las metas que tenía eran inalcanzables.

And the businessman said perfect, I can get out, because the goals I had were unattainable.

Interviewer:
Yes

Expert #7:
Totally because they had not really done a study of what it was like to penetrate Mexico because Mexico has a very concentrated urban population. And the rural population is very scattered, with very few east, as they are called, with very few people in each zone.

I am going to show you a graph that was made during Peña Nieto's term, where the dispersion is and you can see that there are hundreds of hundreds, that is, 100,000 or more dispersed populations against I don't know about 8040 and concentrated populations. Obviously, from the economic point of view, if I can take advantage of that area, why should I go to the others, no, I mean, it is going to cost me a lot of money and everything.

Interviewer:
Yes, sure.

Expert #7:
And also, since it is a competitive market, they have every reason to ask for their return on investment and social coverage, since they already had to do it with a social coverage program, they remove that social coverage program.
They decide to create this company, they do not comply in giving you the social coverage and, nevertheless, they decide that Altán networks because they had a very big confusion. Again, their vision was that of a programmer, they said that Altán belongs to the Government and I do not, Altán does not belong to the Government, Altán has a loan from the development bank, which is a totally different thing and has commitments to make, so did they make those changes, did they modify Altán? obviously, this businessman said from here I am, he did everything he had to do, he charged very expensive salaries.
He did his golden parachute, the company was rescued, but to date I feel that it is a bottomless barrel, it is one of all the big projects that have had another one that has more expenses than benefits.
Interviewer:
Yes

Expert #7:

But in addition, the Altán model was that the technological partners, which were Nokia and Huawei, in other words, were the ones who had to inject money and, depending on the profits, they were paid or reinstated. Then they were paid or reinstated. No, they were not paid, they were heavily indebted. Today they no longer create their own infrastructure, but rent the infrastructure.
So it is even worse because the day it thunders again, half of the infrastructure disappears because it was rented. And they are surviving on that basis.
Mobile virtual operators that call them and give them the opportunity to provide services. And, through CFE, Telecommunications and Internet, it is for everyone, to the end user, that is to say, they modified Altan's concession title and modified the concession title.

Interviewer:
Mhm.

Expert #7:
In other words, the only thing the national development plan says is Internet for all.

Interviewer:
Yes

Expert #7:
I think it is very serious because the truth is that they are creating a monster that the Government and the development banks have to maintain because I told them (the government), they (Altán redes) made you inject more money. This is for a project that is not even subject to development bank financing, today, why? Because it is not viable.
The problem that you have, Aranza in front of your eyes, is that there is no planning, there is no national digital strategy, there is no strategy to transform because the little that there was and the elements that remained if you if you go to the databases everything is in 2018 all the data remained in 2018 then there is no collection of information there is no here this.

Interviewer:
Yes
Expert #7:
What are the KPIs called?
Well, there are no performance KPIs and they made sure that there are none so that there is no accountability. So they don't even respect their national digital strategy, which says there should be austerity, no corruption and there is no accountability, there is neither

transparency nor accountability, not in any of the senses that you want to see it when you ask them about artificial intelligence, no, that's not going to happen this stuff.

So you say, hey, we should already have principles or an artificial intelligence strategy, a cybersecurity strategy on the cybersecurity issue. I had to participate in a group called CESI (Coordination of Information Security), it was not yet called cybersecurity security, where several agencies meet to identify the most common attacks and threats.

For information security there is a certain link to a certain leadership of the cybersecurity issue in the National Guard, in the scientific police, but what you are going to see in Mexico is a disarticulation of several initiatives, some very good, some very bad, which are where the country is trying to overcome a transition to a digital transformation.

So, what happened when I started to measure?
I am realizing that, and you will see it in the index, that the States are taking ownership of the absence of a national digital strategy and then they are trying to make their national, digital agendas and also putting infrastructure in place. They are implementing planning exercises that were not done at the national level and the municipalities, some of them are also doing that work as well. So, perhaps due to the lack of this national planning, the States and the municipalities positioned themselves to be able to survive, especially because there was a pandemic in the middle of the pandemic and in the pandemic they paid less attention to the issue.

I am going to tell you that there are many private initiatives, many initiatives of federal, state and municipal governments and of the civil society, there is also a lot of work, especially on the subject of appropriation of the digital elements, of all the digital concepts. And we are doing it, with the support of embassies from other countries, with the support of the government itself, donations from companies and everything so that at least it can be seen that something is being done.

But yes, the next government will have to come and land a national digital strategy with a functional structure that will allow it to articulate the part that is in the Presidency to all the agencies.
I, my perception is that there must be an ICT secretariat by force, that is, we can no longer ignore it. The regulatory body plays an important role, but it is regulatory, it has nothing to do with public policy.

Interviewer:

Yes.
Well, yes, that is exactly what the next question is, what can we expect from the government, whichever one it is, that arrives?
In addition to the challenges it faces, yes, digitalization, cybersecurity, coordinating these state efforts, a year ago I was talking to the Government of Mexico City and Hidalgo about their efforts. And it was my surprise to see that there is so much effort at the state level and at the national level, well, luckily they have their blessing and that's it. So, what would be the challenges and what should the new government do from the digital point of view?
Expert #7:
They would need to have, notice that I have just been in a meeting with Caneti who wants him, that is to say, he presented a proposal to all the candidates.
I have one, I do not know if you have seen it 24 for the 24th.

Interviewer:
Yes

Expert #7:
Well, that's my proposal, but I didn't want to put together the strategy, I told them, you have to take all these elements into the strategy.
Canetti's team made 3 main topics.
What actions should be taken in telecommunications?
What are the actions to be taken in information technologies?
And what actions need to be taken in electronics, which is the semiconductor issue?

So I think the dialogue at that meeting was very good because it was also with (candidate) team, because now I am going to tell you what is happening with (candidate) team.
They are aware that they necessarily have to make a national digital strategy urgently and that they have to do it in the first 100 days because there has to be a roadmap. What is going to happen in the next 6 years? No, because apart from the problem, the advantage of digitalization is that it already permeates in any sector.

Interviewer:
Yes

Expert #7:
So I should not do it exclusively for the communications sector, I have to do it for all sectors, right? And also, they have to articulate to follow the bases of the strategy, even

if there are particularities in each sector, but I believe that these particularities have to be associated to this secretariat of communications or secretariat of Tech. They were calling it the secretariat of digital transformation, science and technology and innovation. I don't know how much you can associate it because science, technology and innovation have other themes.

Maybe another articulation of digital transformation is science, technology and innovation. I am not so much in favor of linking the two themes because. Because you could fail to see critical issues of science and technology.
Regardless of what this one is called, it should be the articulator of all the others, regardless of whether the approach is sectorial or national, the approach is not, and it also has to have a very important qualification with the States, because telecommunications do not have this geography, so you need to work very hard there, that is what I think.

What is happening with (candidate) government?
I mean with the strategy that at least the one she has let us see is to give continuity to what today is Internet for all, which is, well, I think it is very serious. Because they are not realizing what is happening in Altán redes and what is happening in CFE, telecommunications and Internet for all, when there is also a very strong electricity problem, and also telecommunications is a competitive market. You cannot be giving benefits to a state-owned company over the telecommunications market, so they are distorting everything. So, if you say that you are going to give continuity, it is dangerous, is it not?
Interviewer:
Yes

Expert #7:
But in addition to what he is presenting to us, because he has already been in three of their presentations, he is presenting the same thing he did in (city), which is to create a large agency for paperwork. To pass it to the federal government, so it is a little bit more of the same, but more structured of the same that the national digital strategy sees today. It is not bad, but it is not the only issue to work on, so I am saying, well, it is going to fall short in its vision because there are many issues.

She has an idea that we are going to make satellite policy, because she already said that they were going to build another satellite and I do not remember what else she said. But there is nothing planned or serious in this proposal.

(candidate) does not have a specific person and they have appointed Senator (name), I think her last name is (last name), I do not remember, she is the one who heads the Digital Rights Commission. They have clear ideas, but there is not something structured about what they want to do, I am not going to go over a link where they presented the 3 at the Ibero so that you can see there I give an introduction of, well, where the thing is going and where the problems are, they simply raised the problem of the community radios and nin.

And curiously, those of (political party), they did touch on that issue because I believe that she personally had a problem with community radio stations, but the other two had not even passed this way, right?

Interviewer:
Yes

Expert #7:
But well, and another very serious issue in the sector is the radioelectric spectrum, which is very expensive and it is not understood by the Treasury that having it so expensive inhibits you from reaching and promoting universal coverage and also promoting that people have the affordability to pay for this service, which is a fundamental right. So, the truth is that the future looks better in the case of our sector, in the case of (candidate), but everyone needs to make a strategy to be ready in the first 100 days, right?

Interviewer:
Yes, just reviewing the strategy, there is this lack of focus. It is believed that digital transformation is the Internet and digital transformation is everything.
Expert #7:
Everything, everything and also you have to articulate it is not only health, it is health, with environment, with this education, with everything else, no.
And, in addition, to create prevention, people confuse digitalization with digital transformation. I am always telling my partner, don't put digitalization, because digitalization is to convert from non-automated to automated, with digital tools. Digital transformation is a change of culture, it is a change of even changing my business model, it is a change, it is a different way of visualizing your organization, whether it is public or private or whatever.
No, so, the truth is yes. Put a lot of emphasis on that because people think that digitalization is digital transformation.

And, for example, this national digital strategy has to bring the concept of digital transformation because it is a change of vision, I even tell you of turn, it could be or of the way in which the government can present things, right?

Interviewer:
I know that, at least from my perspective, people need to understand that digitization is not only about having new technologies, artificial intelligence, blockchain. It is this change of mentality, this change of mentality, this switch that is needed and also, not only from the ones that now say that it is not only the young people who have to make this change, but I feel that it is everything, that is to say, it is not teaching everybody.

Expert #7:
Of course. It is everyone and something very important, for example, what do you say now, they never teach us to know, even ask Google.
Many people don't know how to use, I remember when I was looking for my master's degree, I went to the center for research in sciences and humanities of the UNAMS and there they had a thing called Alexis Nexus, which still exists, it is a database, the most powerful one in the field of, I think it was legal or something like that, but there you could look up a lot of things.

And there were some librarians who taught me how to extract information, how to ask questions and all that. In ChatGpt, it is very important how you structure the questions and how you tell them that you did this, now I need you to do this, this and this. If people do not know how to use ChatGpt they will do very bad things. It is very useful if they know how to use it, if you know how to squeeze everything you have to squeeze, but even so it is still a summary of information, because it is not an intelligence, it is a tool. A system that speeds you up or reads you faster or summarizes you faster, but it has no intelligence. So, there, for example, it is very important that your touch is with your intelligence, not with the intelligence of the technological tool.

Interviewer:
Yes

Expert #7:
So, that is what many people have not understood. I am going to send you some things, I teach a class on digital transformation at the Ibero, in the graduate program, in the postgraduate program, and notice that I do not use the typical books, but I use a structure

that I am also going to send you, which is very interesting on how you get involved and what steps you have to take to really make it happen in an organization.

Interviewer:
Yes

Expert #7:
Digital transformation, and a lot of it, has to do with human relations.
It has a lot to do with the dynamics that you achieve with your teams and that you select the right people to make that digital transformation.

Interviewer:
Yes

Expert #7:
And the last department involved in this transformation is the information technology department. Few people understand digital transformation as such, they think it's truly digitization and no, no it's not digitization,
But well, it's, I don't know if there's anything else you want me to tell you, do you have any other questions?

Interviewer:
Can you comment on how digital transformation affects sustainability?
Expert #7:
It is very important because you as a country are not isolated, you are not an island and you do not send yourself alone, but you have decided to work in coordination in some organizations through linkages and in other organizations through cooperation.

No, so, in reality, this issue of the SDGs is very important because they are commitments that I made as a country and you have to link them, there is a road map.
The problem is that, I don't know if you have heard of Gema Santana who was a girl who was working in the presidency on the SDGs, and she was the one who was in control of everything, but she left the government and it seems that there is no one to follow up on them anymore, but here the important thing is that we always try to associate these sustainable development goals, how much impact are we having on them or not?
The problem we have in Mexico is that some people do it and other institutions do not, so you are going to find this discrepancy because there is no articulation that is watching

and monitoring that they do it. According to the SDGs, we are going to reach 2030 with very serious concerns that we are not complying with many things.

Interviewer:
Yes

Expert #7:
Let me see if I can find any document or more recent ones. I remember that when I was looking for how much they were using them, I found a document that had half updates, but it had remained, I think it was around 2020 2022 or something like that, that is, they did not give it continuity, let me look for it and I will tell you, but it is an office that existed in the Presidency, it is no longer there. Because (name) left and no one else took it over, the team left.
I am telling you that there is no strategic planning, neither in our international commitments nor in our national commitments and national policy or strategy. And there is no one measuring the data, maybe INEGI has the SDGs. I have never consulted INEGI, but it could be a good search, not to see if INEGI has anything on the SDGs. But if not, Google how Mexico is doing with the SDGs, because it will surely come up.

Interviewer:
Yes, I think I remember reading, I think just United Nations did like where we are at or how we are going in, but I don't remember well if it was updated.

Expert #7:
Yes

Interviewer:
Or I think it was pre-pandemic

Expert #7:
Yes, I think the pandemic came to distort many things, but well, what I do work on is the acceleration of the digital transformation of many things, but well, this has its pros and cons.

Interviewer:
Yes

Expert #7:

If not, let me see what else I can find you of or of is because there are some studies that. The industry trend that impact on this topic with with with with with no of times yes I think I have seen them, yes, I let me you, I will look for you and send you information that is useful to you and what you want by chat.

Interviewer:
Ah OK, Super yes that would be perfect.

Expert #7:
Then go ahead
I don't have a problem.

Interviewer:
I had several interviews with the United Nations, the World Bank, the OECD, the Inter-American Bank. But I wanted to leave Mexico to the last to see if by any chance, the closer we got to the elections, some extra news would come out, but nothing did.

Expert #7:
No, and it will not come out and when the report arrives I don't know what they are going to report, to tell you the truth.

Interviewer:
Well yes, thank you very much, once again for all this, and likewise, and we will be in touch.

Expert #7:
Yes, nice to meet you.
Of course, be well, see you.

L Government response for an interview after contacting the whole unit

Estimada Aranza Sierra

Saludándole de forma respetuosa, y en respuesta al interés que tiene por conocer sobre el desarrollo de la Estrategia Digital Nacional, en virtud de lo cual ha dirigido correos electrónicos hacia el personal que laboramos en la Coordinación de Estrategia Digital Nacional, le informo que actualmente, las actividades de cierre de gestión, mantienen agendas complicadas para las personas servidoras públicas que laboramos en esta Unidad de Apoyo Técnico; no obstante, es posible encontrar vasta información relacionada con la EDN en las siguientes referencias:

* https://www.gob.mx/cedn
*
https://dof.gob.mx/nota_detalle.php?codigo=5628886&fecha=06/09/2021#gsc.tab=0
*
https://www.dof.gob.mx/nota_detalle.php?codigo=5628885&fecha=06/09/2021#gsc.tab=0

Asimismo, esta CEDN ha participado en diversos ejercicios promovidos por organizaciones internacionales y que están relacionados con las políticas públicas implementadas en materia tecnológica, entre ellos. Cabe mencionar que en estos ejercicios se han atendido procesos complejos de aportación de datos, evaluación y discusión con entes externos, de conformidad con sus metodologías de desarrollo aplicadas a todos los países participantes.

https://www.oecd.org/governance/2023-oecd-digital-government-index-1a89ed5e-en.htm
https://www.worldbank.org/en/programs/govtech/gtmi

De la misma forma, se ha dado a conocer información relacionada con el desarrollo de la Estrategia Digital Nacional a través de las Conferencias matutinas disponibles en:

https://www.youtube.com/playlist?list=PLRnlRGar-_296KTsVL0R6MEbpwJzD8ppA

Agradeciendo su interés, reciba el reconocimiento de esta Coordinación por sus labores de invetsigación.

(name)
(position)