Universidade do Minho
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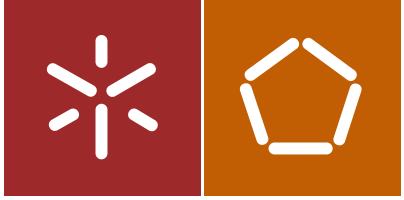

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A method for the formulation of E-Governance strategies taking into account international rankings

PhD thesis
Doctoral Program in Information Systems and Technology

Thesis performed under the supervision of
Professor João Álvaro Carvalho
Professor Delfina de Sá Soares

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This Thesis is dedicated to my wife and daughters Cinara, Janaína and Cora. My three "girls". My life is so-much-super-ultra-yabba-dabba-doo-fine-superior-and-better with them. Develop this thesis would be more difficult without them by my side during the journey.

DECLARATION OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

ABSTRACT

A method for the formulation of

E-Governance strategies taking into account international rankings

Today, 151 of the 193 Member States of the United Nations have a digital strategy. This research resulted in **a method for the formulation of EGOV strategies taking into account international rankings**. The acronym EGOV is used to refer to e-Governance, the public sector's use of Information Technology to improve information and service delivery, encourage citizen participation in the decision-making process, and make governments more accountable, transparent, and effective. The method has been developed to be effective, flexible, easy to use, instructive, co-creative, comprehensive, and coherent. The development occurred through a research design inspired by the Design Science Research Methodology – DSRM and Action Design Research – ADR. Along with the development, the method has been improved in multiple development-and-evaluation loops. Some of these loops occurred with more than a single evaluation after its application or demonstration. It was considered an application the use of a method in the formulation of the Sao Tome and Principe EGOV strategy, the Cabo Verde EGOV strategy, and the Guinea Bissau EGOV Roadmap. The use of the method in capacity-building programs destinated for public officials, which involved a simulated application with participants playing EGOV strategists, was also considered an application. This situation occurred twice and involved Egyptian high-level public officials. Another scenario, considered a demonstration, i.e., the method's presentation in a focus group with EGOV experts in an international conference, complemented set of evaluations of the development process. All scenarios were valid to evaluate method versions, totalising six opportunities in five iterations. The final version resulted in a method with five stages: Diagnosis and Context Analysis; Definition of Strategic Objectives, Vision, and Principles; Definition of Intervention Areas; Definition of Strategic Initiatives; and Identification of Enablers. Each stage presents guidelines that are supported by techniques and instruments available in the method.

Keywords: Electronic Governance Strategy, EGOV Strategy, EGOV Strategy Formulation, EGOV International Rankings

RESUMO

Um método para formulação de estratégias de Governação Eletrônica tendo em conta os rankings internacionais

Hoje, 151 de 193 Estados-Membros das Nações Unidas tem uma estratégia digital. Esta pesquisa apresentou como resultado um método para formulação de estratégias de Governação Eletrônica tendo em conta os rankings internacionais. O acrônico EGOV é utilizado em referência à Governação Eletrônica, o uso pelo setor público da Tecnologia da Informação para aprimorar a prestação de serviços e informações, encorajar a participação de cidadãos no processo de tomada de decisão, e tornar governos mais responsáveis, transparentes e eficazes. O método foi desenvolvido para ser eficaz, flexível, fácil de utilizar, instrutivo, co criativo, completo e coerente. O método foi desenvolvido sob um *research design* envolvendo o *Design Science Research Methodology – DSRM* e *Action Design Research – ADR*. Ao longo do desenvolvimento, o método foi aprimorado em múltiplos ciclos de desenvolvimento-e-avaliação. Alguns desses ciclos ocorreram utilizando mais de uma simples avaliação após sua aplicação ou demonstração. Foi considerada uma aplicaçao o uso do método na formulação da Estratégia de Governação Digital de São Tomé e Príncipe, da Estratégia de Governação Digital de Cabo Verde, e do Roteiro de Governação Digital de Guiné-Bissau. O uso do método em programas de capacitação destinado a funcionários públicos, os quais envolveram simular sua aplicação com alunos no papel de estrategistas de EGOV, também foram consideradas aplicações do método. Tal situação ocorreu duas vezes envolvendo funcionários de alto escalão do Egito. Um outro cenário, considerado uma demonstração, a apresentação do método em um grupo focal com especialistas em EGOV em uma conferência internacional, complementou o conjunto de avaliações do processo de desenvolvimento. Todos os cenários foram válidos para avaliar versões do método, em um total de seis oportunidades em cinco iterações. O resultado final é um método em cinco estágios: Diagnóstico e Análise de Contexto; Definição de Objetivos, Visão e Princípios Estratégicos; Definição das Áreas de Intervenção; Definição das Iniciativas Estratégicas, e Identificação dos Habilitadores. Cada um dos estágios apresenta diretrizes, que são apoiadas por técnicas e instrumentos disponíveis no método.

Palavras-chave: Estratégia de Governação Eletrônica, Estratégia de EGOV, Formulação de Estratégias de EGOV, Rankings Internacionais de EGOV.

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LIST OF ABBREVIATIONS/ACRONYMS

AC	Anticipated Consequence
ADI	Área de Intervenção Acesso e Disponibilização de Informação (*Intervention Area of Access and Availability of Information*)
ADR	Action Design Research
CNED	Comissão Nacional da Estratégia Digital (*National Commission for Digital Strategy*)
COVID-19	Coronavirus Decease, caused by the SARS-CoV-2 virus
DNMA	Direcção Nacional de Modernização Administrativa (*National Administrative Modernisation Directorate*)
DP	Design Principle
DSP	Área de Intervenção Digitalização e Simplificação de Processos Administrativos (*Intervention Area of Digitalization and Simplification of Administrative Procedures*)
DSRM	Design Science Research Methodology
EDB	Edelman Trust Barometer
EGD-CV	Estratégia de Governação Digital de Cabo Verde (*E-Governance Strategy of Cabo Verde*)
EGOV	Electronic Governance
EGOV-CeDEM-ePart	Conference on Electronic Government, Electronic Participation, E-Democracy and Open Government of the International Federation for Information Processing
EST-ADM	Estruturante Administrativo (*Administrative Structuring Pillar)*
EST-LEG	Estruturante Legislativo *(Legislative Structuring Pillar)*
EST-TEC	Estruturante Tecnológico (*Technological Structuring Pillar*)
EU	European Union
EU/DESI	European Commission Digital Economy and Society Index
GOV	Área de Intervenção Governança (*Governance Intervention Area*)
ICT	Information and Communication Technology
ID	Identity
IEI	Área de Intervenção Integração e Interoperabilidade (*Integration and Interoperability Intervention Area*)
IES	Área de Intervenção Infraestrutura e Segurança (*Infrastructure and Security Intervention Area*)

INIC	Instituto de Informação e Conhecimento (*Institute of Information and Knowledge)*
IMD	Institute for Management Development
IMD/WDC	Institute for Management Development World Digital Competitiveness
INT	Interviewee
IS	Information System
IT	Information Technology
ITU	International Telecommunication Union
ITU/GCI	International Telecommunication Union Global Cybersecurity Index
LEG	Área de Intervenção Legislação (*Legislation Intervention Area*)
LIT	Área de Intervenção Literacia (*Human Resources Literacy Intervention Area*)
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
PALOPS	Portuguese Speaking African Countries
PDEX	Plataforma de Integração e Interoperabilidade de Cabo Verde (*Network Interoperability Platform of Cabo Verde*)
PEDS	Plano Estratégico de Desenvolvimento Sustentável (*Strategic Plan for Sustainable Development*)
SPD	Área de Intervenção Serviços Públicos Digitais (*Digital Public Services Intervention Area*)
SWOT	Strengths, Weaknesses, Opportunities and Threats
TEC	Área de Intervenção Tecnologia (*Technology Intervention Area*)
UC	Unanticipated Consequence
UN	United Nations
UN/EGDI	United Nations E-Government Development Index
UN/EPI	United Nations E-Participation Index
UNU-EGOV	United Nations University Operating Unit on Policy-Driven Electronic Governance
URL	Uniform Resource Locator
WB	The World Bank
WB/DB	World Bank Ease of Doing Business Report
WB/GTMI	World Bank GovTech Maturity Index
WB/WGI	World Bank Worldwide Governance Indicators
WEF	World Economic Forum

WEF/GCI	World Economic Forum Global Competitiveness Index
WEF/NRI	World Economic Forum Network Readiness Index

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1. INTRODUCTION

This research intends to develop **a method for the formulation of EGOV strategies taking into account international rankings**. This chapter contextualises the scenario in which the research idea emerged, its relevance, and its motivation. It is followed by presenting the research objective, presenting a glimpse of the research approach, and detailing the structure of the thesis.

1.1. Contextualisation

The past two decades have seen the widespread practice of placing the letter 'e' in front of words such as government, democracy, commerce, business, politics, warfare, education, and others. Regarding e-government, its roots lie in the late 20th century, and since then, new information technologies have been swiftly applied to all levels of government (Acharya et al., 2008; Rabaiah & Vandijck, 2009). The application of Information Technology (IT) in "all levels of government" created a range of similar terms such as e-government, electronic government, e-governance, electronic governance, and EGOV, which is a short term indistinctly used for all previous ones. Digital government and digital governance are also usual, but most of the time, the word "digital" plays the same role as "electronic", with rare exceptions. The acronym EGOV is used in this thesis to refer to e-Governance, the public sector's use of IT to improve information and service delivery, encourage citizen participation in the decision-making process, and make governments more accountable, transparent, and effective (United Nations Educational Scientific and Cultural Organization, 2019). It is a comprehensive concept that encompasses, but goes beyond, what is often named "e-government" (Bannister & Connolly, 2012a), focused on the use of IT to more effectively and efficiently deliver government services to citizens and businesses (United Nations, 2019). FIGURE 1 represents e-Governance (EGOV) as a broader concept than e-government.

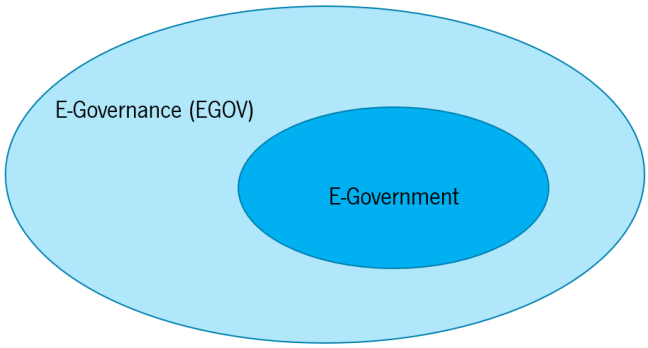


Figure 1: E-Governance: a broader concept than e-government (Bannister & Connolly, 2012a).

The association of IT with government and governance is not a simple task. The complexity of promoting accountable, effective, inclusive, transparent, and trustworthy public services that deliver people-centric outcomes is growing (United Nations, 2018). The modern world has brought new opportunities and challenges to many personal and business areas; for the government, it is no different. It is unclear how the core government functions, such as public services and infrastructure providing or formulating and implementing public policies, should be performed in the physical and digital worlds (Janowski, 2015).

A strategic approach seems necessary, which reminds the traditional strategic alignment between IT and correspondent organisational business (Henderson & Venkatraman, 1999). Indeed, "if IT is heavily involved in reform, it too must be planned strategically (Heeks, 2006a, p.43)", remarking that the growing contribution of EGOV to public sector reform processes represents a strategic change. To formulate these strategies, public officials typically use benchmarking studies and use them to shape their investments (Heeks, 2006b). Indeed, international rankings are an important tool for policy definition, program prioritisation, and strategy formulation. They help review past digital government efforts and update national e-governance policies, regulations, and manuals by following the latest standards and best practices (Soares et al., 2018). They are also valuable because governments need to assess their programs to monitor the achievement of objectives, categorise strengths and weaknesses, define new strategic orientations, and benchmark e-governance organisations (Ostasius & Laukaitis, 2015).

The role of producing benchmarking reports, surveys, and rankings between countries is usually performed by international institutions such as the United Nations, the Organization for the Economic Cooperation and Development, and the World Bank. These organisations regularly undertake significant studies to evaluate countries on a wide range of features, including information technology (Rorissa et al., 2011). These rankings are used to compare States for purposes as varied as deciding how to allocate foreign aid or investment and determining whether States have complied with their treaty obligations

(Davis et al., 2012). Examples of such studies include the United Nations E-Government Development Index – UN/EGDI (United Nations Department of Economic and Social Affairs, 2020), the World Economic Forum Global Competitiveness Index – WEF/GCI (World Economic Forum, 2020), the European Commission Digital Economy and Society Index – EU/DESI (European Commission, 2020), and the recently-launched World Bank GovTech Maturity Index – WB/GTMI (Dener et al., 2021), amongst others. A method that systematises EGOV strategy formulation by taking international rankings into account is still absent. It would benefit public officials in supporting their duties as EGOV strategists and scholars acting in the research field. This research intends to fill that gap.

1.2. Relevance and Motivation

Today, 151 of the 193 Member States of the United Nations have a digital strategy (United Nations Department of Economic and Social Affairs, 2020). This number includes strategies fully dedicated to the public sector, EGOV strategies, and national digital strategies that only dedicate specific chapters or sections to the subject. Strategies are top-level plans that address directions, goals, components, principles, and implementation guidelines (Rabaiah & Vandijck, 2009). These plans support the management of investments while turning possible an evaluation process through a set of indicators (Heeks, 2006a) along with their implementation. The strategy evaluation processes have proven to be important (Ogutu & Irungu, 2013) but complex due to the various perspectives involved, including the difficulty of quantifying objectives and the respective contexts.

In these circumstances, resorting to the international rankings and their indicators is not a rare action (Soares et al., 2018). However, their use must be accompanied by a systematic study and reflection on the implications, possibilities, and pitfalls of such practices. Many of them are built using a mix of indicators, with substantial decision power available to the compiler in choosing what specific indicators to include, selecting weightings, and smoothing over data unavailability (Davis et al., 2012). Even ranking producers recognise limitations and alert countries to decide the level and extent of their ranking use, balancing this practice with national development priorities (United Nations, 2018).

The idea of developing such a method emerged from the author's experience in government functions as a public officer. The author has been a Brazilian public official since 1994 and, from 2014 onwards, has taken leading roles related to the use and impact of information technologies in government, including the role of Director of Digital Government from 2016 to 2017 at the Ministry of Planning, Development

and Administration of Brazil. The author was part of the team that formulated two strategies for Brazilian Digital Governance. In 2018, he spent three months as Government Fellow at the United Nations University Operating Unit on Policy-Driven Electronic Governance – UNU-EGOV, in which a review of the current Brazilian EGOV strategy occurred. There, he was challenged to explore the idea of a method for formulating EGOV strategies in the context of a doctoral degree. The publication of an article discussing EGOV policy measurement, assessment, and monitoring (Soares et al., 2018) collaborated to refine the idea of a doctoral thesis involving the international rankings thematic.

The beneficiaries of such a method include public officials involved in EGOV strategy formulation processes. Researchers acting in the field are also expected to benefit from this research.

1.3. Objective of the Research

The objective of this research is **to develop a method for formulating EGOV strategies by taking into account international rankings.** This research objective has a limited scope that guides the development of the method, such as:

- It is a method that guides strategists in formulating and delivering a strategy.
- The scope is the public sector. It does not offer prescriptions for strategy formulation in the private sector.
- It is restricted to the formulation phase of strategic planning. Strategy execution, for example, is out of the scope.
- The method takes into account international rankings but should not be limited to them. It means that the method considers relevant aspects related to the rankings but is not fully based on them and is flexible enough to respect the country's context.

The objective is derived from a problem found in practical situations involving the development of EGOV strategies considering international rankings. Generally, this process is done without systematisation or rigour when using the rankings as a source of information. This problem, **the absence of a method for formulating EGOV strategies by taking into account international rankings,** detailed in Chapter 4, was used to define the research objective. The production of such a method will fill the gap of a method to support EGOV strategists to systematically use international rankings components along with the strategy formulating process.

1.4. Research Approach

The research is based on the design science paradigm (Hevner et al., 2004) as it involves the development of an artefact. According to the classification of theories in Information Systems – IS, the expected outcome of the research, to develop a method for formulating EGOV strategies by taking into account international rankings, can be classified as a "Design and Action" (Gregor, 2006) theory. The method can be considered an IT-related artefact. It aims to produce an EGOV strategy, an IS artefact of its own, due to its important role in dealing with the impact of IT on the government. Regarding the IS taxonomy of theories, there is space for this kind of method, as detailed in Chapter 3, which is dedicated to the Research Design. Like other methods in IS, it prescribes and provides a "recipe" about "how to do" the development of an IS artefact.

The research approach follows a development process based on development-and-evaluate loops to improve the artefact in multiple iterations. There are five iterations until a stop-point is reached, as detailed in Chapters 4 to 8. Due to the author's involvement in strategy formulation processes, the research approach is also influenced by Action Design Research – ADR (Sein et al., 2011), which offered crucial support in the evaluation phases.

The research also comprehended an exploratory study to establish evidence on the use of international rankings in formulating EGOV strategies. This study was also valuable in determining the desired features for the method.

1.5. Structure of the Thesis

The thesis is structured into ten chapters. After this introduction in Chapter 1, the remaining document is organised as shown in TABLE 1.

Table 1: Structure of the thesis.

Chapter	Title
1	Introduction
2	Literature Review
3	Research Design
4	From the Exploratory Study to Version 1
5	From the Application of Version 1 to the Development of Version 2
6	From the Application of Version 2 to the Development of Version 3
7	From the Application and Demonstration of Version 3 to the Development of Version 4
8	From the Application of Version 4 to the Development of Version 5
9	Discussion About the Journey
10	Conclusion

Chapter 2 presents the Literature Review, covering themes such as EGOV, public policies, strategies in the public sector, international rankings, methods, and frameworks on EGOV. Chapter 3 presents the Research Design, explaining the development track to reach the method for formulating EGOV strategies by taking into account international rankings. The research design considers principles and guidelines inspired by the Design Science Research Methodology – DSRM and Action Design Research – ADR. An exploratory study that ratified the theme's relevance and established the desired features for the method is presented in Chapter 4, which describes the development of the Method – Version 1. Chapter 5 describes the application of this version in the formulation of the São Tomé and Príncipe EGOV Strategy, followed by the evaluation of this application used to develop the Method – Version 2.

Chapter 6 presents the method applied to develop the Cabo Verde EGOV strategy, the respective evaluation, and the development of the Method – Version 3. Chapter 7 demonstrates the method in a focus group enabling an evaluation. The same version is used in a simulated application in a capacity-building programme involving Egyptian public officials. The Method – Version 4 is produced by taking into account these situations. Chapter 8 describes the 2nd Egyptian capacity-building programme and the formulation of the Guinea-Bissau EGOV roadmap. The evaluation of these applications supported the development of the Method – Version 5, which concludes the development. In Chapter 9, a discussion about the journey is presented. Chapter 10 presents the PhD research conclusions.

2. Literature Review

This Chapter presents a review of literature relevant to provide a theoretical background for the research and development of the method. It is relevant to learn the breadth of research on a topic of interest or answer practical questions by understanding what existing theory has to say on the subject (Okoli & Schabram, 2010).

2.1. Introduction

The development of a method for formulating EGOV strategies by taking into account international rankings cannot be executed without a review of definitions and concepts that lay down the conceptual basis of the research. Fundamental concepts like e-Government and e-Governance (EGOV), as well as the concepts of Government and Governance, should be clearly stated. As Governments usually formulate strategies to execute public policies, these subjects are also discussed to introduce the EGOV strategies subject subsequently. Frameworks on EGOV strategies are covered, followed by the presentation of the differences between the strategy formulation process and the strategy content. Finally, measurement and benchmarking are approached, concluding with presenting international rankings related to EGOV.

2.2. E-Government and E-Governance (EGOV)

E-Government and e-Governance (EGOV) are easily understandable, and their potential is better visualised after comprehending the functions and processes involved in the concepts of government and governance. The functions refer to all legal, political, and administrative organisations and stakeholders that control a State (Sandoval-Almazán et al., 2017) and comprise the Executive, Legislative, and Judiciary branches in typical democracies.

The President leads the Executive branch. While the Legislative branch is composed of the members of the parliament, the Judiciary is formed by judges and other professionals that are part of the justice system. Public officials support all these authorities in the execution of their functions. This list of government actors admits some variations, depending on the country's organisation. It is a dynamic mixture of goals, structures, and functions to maintain many government functions, for instance, collective security, the administration of justice, the provision of the institutional infrastructure of the economy and

society, and ensuring maintenance or improvements in health, education, and communities lives (Center for Technology in Government & University at Albany, 1999).

The concept of government usually comes around with another important concept, governance. Governance englobes decision-making and how decisions are implemented, involving stakeholders and organisations, formal and informal constituted, to set in place the decisions. If the governance process runs well, it is usually referred to as "good governance", having significant characteristics of being participatory, consensus-oriented, accountable, transparent, responsive, effective, efficient, equitable and inclusive, and following the rule of law (United Nations Economic and Social Commission for Asia and the Pacific, 2000). The concept of governance can be separated into two components: structural and normative.

Structural governance "encompasses things such as processes, structures, lines of authority, laws, regulations, stakeholders, forms of communication and responsibilities – the mechanisms by which power is exercised, decisions made, a policy is created or changed, and its implementation achieved (Bannister & Connolly, 2012a, p.7)". It is about how the government executes its functions and public policies. Normative governance consists of "the set of value-related features of structural governance including transparency, accountability, integrity, honesty, impartiality, efficiency (p.7)". As international rankings evaluate both structural and normative aspects of governance, understanding these two components is important.

Institutions and academic authors have proposed many definitions for e-Government and e-Governance (EGOV). The Organization for Economic Cooperation and Development (OECD) defines e-Government as using information and communications technologies, particularly the Internet, to achieve better government (Organization for Economic Co-operation and Development, 2003). The World Bank refers to e-Government as government agencies' use of information technologies, such as wide area networks, the Internet, and mobile computing, that can transform relations with citizens, businesses, and other arms of government (World Bank, 2016). These two definitions are broad but only allow the conclusion that e-Government is about the application of Information Technology within the government. The United Nations goes beyond this; according to the United Nations Department of Economic and Social Affairs – UNDESA, e-Government is the use and application of information technologies in public administration to streamline and integrate workflows and processes, manage data and information effectively, enhance public service delivery, as well as expand communication channels for engagement and empowerment

of people (United Nations, 2014). This definition is ample and includes aspects related to the governance process, namely e-Governance (EGOV).

The acronym EGOV is used in this thesis to refer to e-Governance, the public sector's use of IT to improve information and service delivery, encourage citizen participation in the decision-making process, and make governments more accountable, transparent, and effective (United Nations Educational Scientific and Cultural Organization, 2019). It is a comprehensive concept that encompasses but goes beyond what is often named e-Government (Bannister & Connolly, 2012a). It is "the use of IT to support the execution of States' multiple governance activities in its different aspects – Politics, Administration and Society (Alarabiat et al., 2018, p.120)", including the use of IT to support public services, government administration, democratic processes, and relationships among citizens, civil society, the private sector, and the state (Dawes, 2008). It is the application of technology by the government to transform itself and its interactions with customers to create an impact on society (Estevez & Janowski, 2013). EGOV purposes, therefore, can be considered the application of IT to a) make the government more efficient, b) improve public service delivery, c) make the government more accountable, and d) improve the relationship between citizens and businesses within the public sector. (Alarabiat et al., 2018; Mkude & Wimmer, 2013; Ojo & Janowski, 2011; United Nations Educational Scientific and Cultural Organization, 2019).

The list of EGOV purposes is compatible with good governance values, which qualify the structural governance. Structural governance is how government executes its functions and public policies. Under this context, analysing how public policies and EGOV are connected is convenient.

2.3. Public Policies

As governments have accepted information technology as a facilitator to reform, transform and modernise the governance activity (Carvalho & Soares, 2018), it is reasonable to link them to the policy lifecycle (United Nations Educational Scientific and Cultural Organization, 2019). The policy lifecycle is a particular sequence that government stakeholders can use to comprehend and implement the policy task (Bridgman & Davis, 2003). Its goal is to simplify the complexity of public policy-making by identifying both its fundamental processual and cyclical nature (Howlett, 2018).

As FIGURE 2 illustrates, the first stage in policy-making refers to identifying a public problem, which requires the state to intervene. Those public problems that are chosen by the decision-makers constitute

the policy agenda. In the second stage of the policy cycle, policy formulation deals with elaborating alternatives of action. It involves the definition, discussion, acceptance, or rejection of feasible courses of action for coping with policy problems. The third phase is policy adoption, which refers to the formal assumption of a policy (Knill & Tosun, 2008). Generally, policy formulation is strongly related to policy adoption, and a clear-cut distinction between them is often impossible.

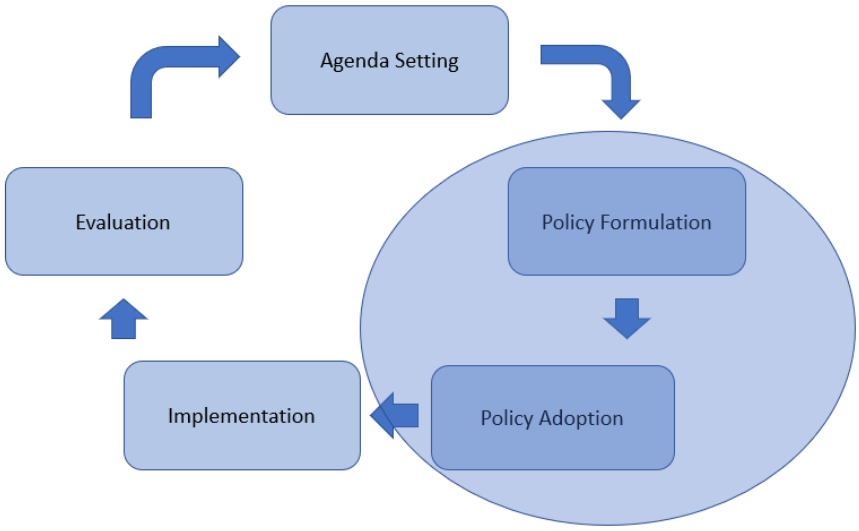


Figure 2: The policy cycle. Adapted from (Knill & Tosun, 2008)

The implementation stage represents the conversion of public policy into practice through strategies, programs, and projects. Without proper implementation, the policy has neither substance nor significance; thus, policy success depends on how well administrative structures implement government decisions. After a policy has been implemented, it becomes the subject of evaluation, providing a feedback loop that enables decision-makers to draw lessons from each policy in operation. Strategies are essential to the government's actions (Johanson, 2019).

Even when a public policy is proposed in the form of programs and projects, it is usual to have a plan for its implementation. If this plan is constructed with typical strategy components, such as a diagnosis, clear objectives, and a vision, it can be considered a strategy. Indeed, strategic management is an interesting crossing point between politics and public administration (Johanson, 2019).

There are real EGOV cases that have already passed all phases: from agenda setting and problem definition to policy preparation, policy-making, policy implementation, and policy evaluation (Janssen et al., 2018). The association between EGOV and the public policy cycle is not new. There are success stories about the relationship between EGOV and policy agenda setting, as well as good examples of

practices and alternatives from the support of policy formulation to the offering of comparative data to support policy evaluation, improving future policy-making (Alarabiat et al., 2018). EGOV initiatives have policy goals such as the search for efficiency and savings, benefiting the government; for effectiveness and quality services, benefiting the constituents; and for good governance, contributing to generating benefits for society (De Angelis et al., 2010).

As implementing a public policy through the formulation of a strategy is a common practice, and public policies related to the EGOV theme are a reality in the government, it is necessary to study how strategic management occurs in the public sector scenario.

2.4. Strategies in the Public Sector

A strategy is a clear plan developed consciously and purposefully, made in advance of the specific decisions it applies to (Mintzberg, 1978). This plan is also characterised by analytical, formal, and logical processes through which organisations scan the internal and external environment and develop policy options that differ from the *status quo* (Andrews et al., 2009). Two concepts are involved in this definition: strategy process and strategy content, concepts that are different but complementary. While the strategy process reflects how alternatives and actions are selected (Hart, 1992), strategy content is the outcome of this process (Johanson, 2019).

Strategic planning, part of strategic management, has become an increasingly widespread reality in governments and public agencies (Janowski, 2015). Developing strategies to transform public policies into action is expected in any country. The challenges of defining clear, uniform goals or accurate performance metrics for government activities are complex (Johanson, 2019) and generally demand specialised skills in strategic management by politicians and public officials. It is a practice of making strategies, thinking about prospects, combining available resources in a novel fashion, and establishing links to others in the external environment (J. Bryson & Edwards, 2017).

These authors systematised which features characterise the public-sector strategic planning. The list of features is presented in the following bullets. They have been adapted to guidelines due to the objective of the research:

- Pay attention to the context, including the decision-making context.
- Analyse the requirements, purposes, and goals related to political, legal, administrative, ethical, and environmental scenarios.

- Focus on a broad agenda first, moving to specific themes in the sequence.
- Adopt a systematic observation to understand the dynamics of the overall scenario to be planned.
- Listen to as many government stakeholders as possible, including elected, appointed, and public officials.
- Involve multiple sectors of society in the process of strategy formulation.
- Focus on strengths, weaknesses, opportunities, threats, competitive and collaborative capabilities, and advantages.
- Analyse how the impact of strategies will influence the future.
- Pay attention to the challenges possibly involved in the strategy implementation phase.

These guidelines contain suggestions related to the formulation phase of strategic management. However, the list also contains implications about strategy implementation, a distinct phase of strategic management. Indeed, there is no strategy without its implementation or execution, in which the plan is put into practice to achieve the specified aims most efficiently (Olivier & Schwella, 2018).

Like public policies, there is a phase dedicated to evaluating the strategy execution. By understanding progress, or the lack of progress through proper evaluation, it is possible to appropriately respond and learn from successes and failures (Olivier & Schwella, 2018). It is a fact that something that cannot be measured cannot be managed and improved (Walrad & Moss, 1993). Measurements and benchmarking are essential to show advances in public policies and strategy execution.

Strategic management comprises different and complementary phases, formulation and implementation (J. M. Bryson et al., 2018). These processes are different in scope. This differentiation is important to define the scope of a method related to strategic management. Usually, there are different methods and frameworks for each phase, which also applies to EGOV strategies.

2.5. EGOV Strategies

The broad scope of the EGOV concept suggests that transforming the related public policies into practice is not a simple task. It reflects the traditional pressures governments are exposed to but potentialised by the digital world context. In this scenario, the "landscape is continuously changing to reflect how governments are trying to find innovative digital solutions to social, economic, political and other pressures" (Janowski, 2015). Governments develop strategies to face the challenge (Rabaiah & Vandijck, 2009) (Boyne & Walker, 2004).

The construction of these strategies is a reality for both developed and developing countries since they embarked on e-Government initiatives in their modernisation activities (Mkude & Wimmer, 2013). Indeed, international institutions seem to encourage the strategic approach, as occurred in the World Summit on the Information Society, an event promoted by the United Nations, which motivated governments to develop national digital strategies (Sandoval-Almazán et al., 2017). Today, 151 of the 193 United Nations Member States have a digital strategy (United Nations Department of Economic and Social Affairs, 2020). EGOV strategies are plans for government systems and their supporting infrastructure, which maximises the ability of management to achieve organisational objectives (Heeks, 2006b). It is a top-level document that addresses strategic directions, goals, components, principles, and implementation guidelines (Rabaiah & Vandijck, 2009). The content of a strategy may change, but several components are common, such as a vision, programs, projects, and an evaluation process (Mkude & Wimmer, 2013). Although these authors use the term e-Government to refer to the strategies, their scope to refer to e-Government is compatible with the concept of EGOV used in this thesis.

An EGOV strategy can be formulated guided by questions such as "Where are we now?", "Where do we want to get to?", and "How do we get there?" (Heeks, 2006a), as FIGURE 3 illustrates.

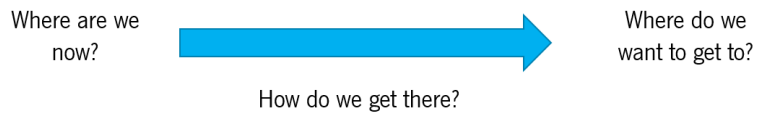


Figure 3: Questions that guide the formulation of an EGOV strategy. Adapted from Heeks (2006a)

To answer these questions, the EGOV strategists should bear in mind the country context but also the EGOV purposes previously stated in this chapter: a) to make the government more efficient; b) improve the public service delivery; c) make the government more accountable; and d) improving the relationship between citizens and businesses within the public sector. This list presents many perspectives, which brings a wide range of objectives to pursue.

A strategy should support the management of investments and allow an adequate evaluation through performance indicators. The assessment of EGOV has proven to be an important but complex aspect due to the various perspectives involved, the difficulty of quantifying its objectives, and the variety of contexts of its application (Ogutu & Irungu, 2013). Public officials typically rely on benchmarking studies to monitor

the implementation and shape investments (Heeks, 2006b), and to facilitate the process, they usually turn to international rankings and their indicators.

Several authors have proposed frameworks and methodologies involving EGOV strategies, development, and implementation. Chen summarised the differences between developed and developing countries, identifying key factors for a successful e-Government implementation and proposing an implementation framework (Chen, 2006). Rabaiah and Vandijck designed a generic strategic framework for e-Government, describing the essential elements and components after reviewing a series of papers and government strategies (Rabaiah & Vandijck, 2009). Mkude and Wimmer compared nine guidelines, resulting in a new comprehensive strategic framework for the successful design of e-Government in developing countries (Mkude & Wimmer, 2013). Janowski (2015) presented a four-stage Digital Government Evolution Model comprising Digitisation, Transformation, Engagement and Contextualisation stages (Janowski, 2015).

Two frameworks are particularly important for this research as they are used along with the method development iterations, one by Rabaiah and Vandijck and another by Mkude and Wimmer. They will be detailed in the next section.

2.5.1. The Strategic Framework by Rabaiah and Vandijck

Rabaiah and Vandijck (2009) designed a generic strategic framework that serves as a generic abstraction of an e-Government strategy. Although the authors use the term e-Government, it is flexible enough to address EGOV purposes as well, as there are no limitations on the kind of objectives addressed through the framework.

The framework comes from a comprehensive study of 20 strategies produced by 20 countries and the European Union. It describes a strategy's basic elements and components and their relationships, as shown in FIGURE 4. They alert that these components are found in all strategies and should be basic constructs in a framework proposal.

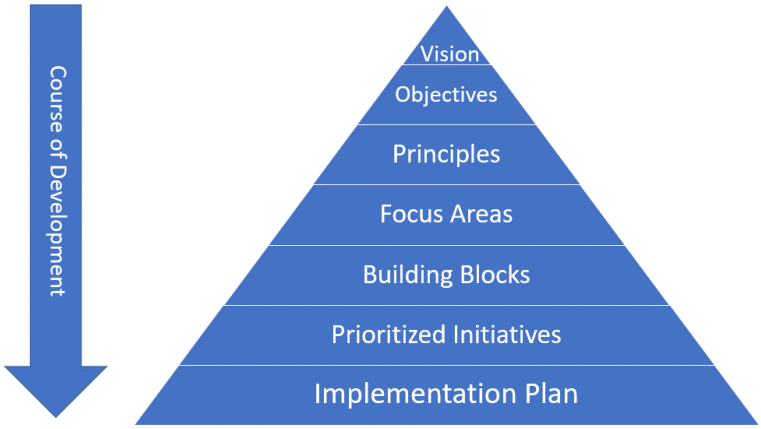


Figure 4: Adaptation of the Strategic Framework by Rabaiah & Vandijck (2009).

According to these authors:

- "The vision is important because it reflects the government's policy. From this vision, the e-government strategists are held accountable for laying out the mission statement (Heeks, 2006a, p.247)". It helps reflect on government efforts, sets the basis for the whole plan, and will always be referred to during the implementation phase. It represents the political will indispensable to launch a project of this kind.
- The strategic objectives are important to the development of the entire strategy as they provide a complete package for what the government will achieve, in some way not totally unrelated or completely disconnected. These objectives are important to justify the resources dedicated to public policy. They show a long-term and high-impact intent, guiding crucial investments. They include but are not limited to user-centric operation, enhancing public sector and services, networked government, operational and cost-efficiency, enhanced accessibility, simplifying procedures, and increasing citizen participation.
- Strategic principles delimit the possible constraints, providing focus and control over the strategy formulation. They will also impact the strategy implementation. The principles define general themes and trends that show where the government is heading in their program, suggesting qualities that can be expected. Strategic principles include participatory governments, universal accessibility, citizen-centric orientation, open-source standards, shared services, sustainability, and privacy. It means that compatibility with these principles should be previously checked for every item addressed in the strategy document.
- Focus areas are key areas targeted by the government in the strategy. They should contribute to reaching the strategic vision and represent the areas that will cluster the initiatives. Focus areas

can be service delivery, internal efficiency, infrastructure development, accessibility, legislation, simplifying procedures, and human resources development. Authors alert that intensities of effort in these focus areas are not equal, depending on the country's context. In addition, they vary over the years according to the development of the field in a given country. In the past, infrastructure was a major concern for several countries. As governments achieve maturity in this area, the focus changes.

- Building blocks show how governments visualise the basic elements of their programs. Authors propose groups of blocks related to infrastructure and organisational aspects. In addition, standards, norms, and regulations are grouped into a building block that can be understood as containing legislation aspects. Examples of these three types of building blocks are organisational framework, interoperability tools, and legal standards.
- Prioritised initiatives are derived from strategic objectives and are formulated to reach them.
- The implementation plan establishes a timeline for their execution during the strategy-defined period.

2.5.2. The Strategic Framework by Mkude and Wimmer

Mkude and Wimmer (2013) developed a comprehensive framework that enables countries to design e-Government systems whilst generating public value. The authors' understanding of e-Government is compatible with the EGOV concept used in this thesis. The scope of the research included "enhanced quality of public services, transparency and accountability, cost-effective service provision and government operation, reduced corruption, citizen engagement in public matters, optimisation of public policies for better outcomes and integrated government processes (Mkude & Wimmer, 2013, p.149)", similar to the list of EGOV purposes proposed. The authors mention the enforcing of "good governance" principles, listing items such as legitimacy, the rule of law, transparency, accountability, integrity, effectiveness, coherence, adaptability, participation, and consultation.

The authors screened nine frameworks, methods, and guidelines to develop a comprehensive strategic framework for successfully designing e-Government systems. The framework is destined for policy-makers and public officials involved in formulating strategies in which investments generate public value. The context involved developed and developing countries and included frameworks, methods, and guidelines produced by international institutions, such as United Nations Educational, Scientific and Cultural

Organization; countries, such as Republic of Korea; and academic authors, including Rabaiah and Vandijck. From the comparison of guidelines, they found a cluster of activities, consolidating them in the proposal of a new framework. FIGURE 5 presents this framework.

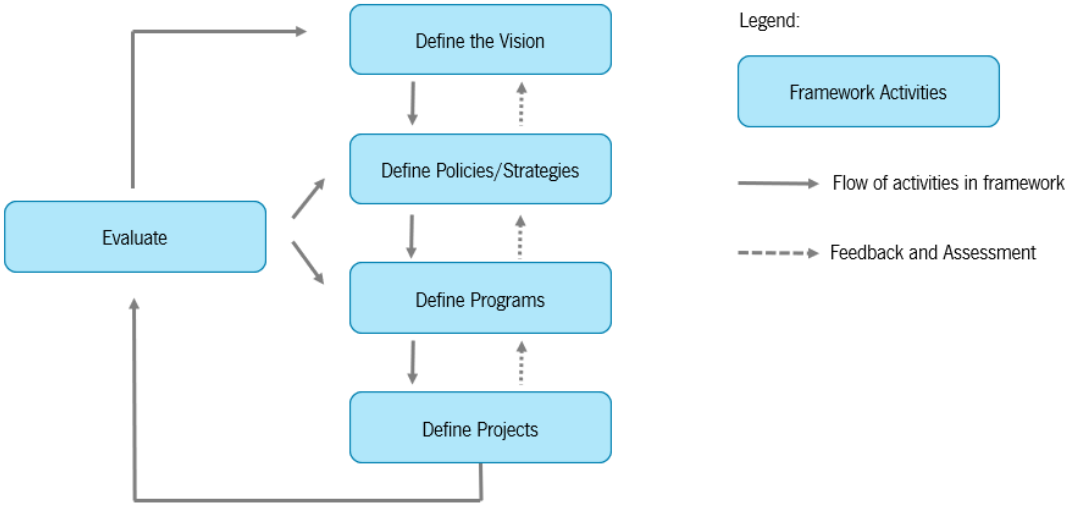


Figure 5: Adaptation of the Strategic Framework by Mkude & Wimmer (2013).

According to these authors:

- The vision defines where the country wants to be and guides all formulation and execution. It will be an important source for all the subsequent stages. For this reason, it must be defined clearly before starting any effort. It is a long-term view that provides the basis for achieving the objectives (Mkude & Wimmer, 2013). It depends on the country's context; therefore, each country should reflect its national priorities in the strategic vision. In addition, its definition should involve as many stakeholders as possible, including government officials, citizens, and businesses.
- "Policies/strategies" are overall "goals and objectives for implementation which reflect the overall vision (p.157)". It should include items related to political, economic, social, cultural, and legal aspects, considered "prerequisites" to reach the strategic vision. Implementation objectives, such as "change management, public-private partnerships, organisational and business architecture", are also defined as general objectives. Using the terms "Policies / Strategies" by the authors brings some confusion, but in short, their function is to set strategic objectives that guide the whole strategy.
- Programs and projects materialise the objectives and goals into actions. They have three purposes: first, to offer the possibility to prioritise the implementation; second, to prepare the

opportunity for careful planning of resources; and third, to offer traceability between the vision and strategic objectives and programs and projects. "The management becomes more viable compared to scattered implementation projects working towards diverse objectives and goals (p. 157)."

- Evaluation is related to the post-formulation phase in strategy management. It assesses the status of implementation of the strategy and evidence of the progress of the policy execution. It offers results reports to stakeholders, including public officials, citizens, and businesses.

2.6. EGOV Strategy Process

The frameworks proposed by Rabaiah and Vandijck, and Mkude and Wimmer, include both an EGOV strategy formulation process and EGOV Strategy Content. However, the authors do not explicitly differentiate these concepts, as stated in Section 2.5. Indeed, the research on strategic management is divided into two categories: content research and process research (Elbanna, 2006).

The EGOV strategy formulation process corresponds to **answering** the questions proposed by Heeks: "Where are we now?", "Where do we want to get to?", and "How do we get there? (Heeks, 2006a). It is about selecting alternatives and actions (Hart, 1992), while the strategy content results from this process (Johanson, 2019).

The strategy process involves two models, procedural rationality planning and logical political-incrementalism planning (Elbanna, 2006). These two models have their origins in different perspectives in the management literature. According to rationalists, organisations are oriented to pursuing relatively specific goals and exhibit relatively highly formalised social structures (Scott & Davis, 2015). Therefore, rational planning is an analytical, formal, and logical process. In those processes, there is a scanning of the national and international context, in the case of countries, and the development of policy options differs from the current *status quo*. It operates within a bounded rationality framework because of decision-makers cognitive limits and the iterative way they move between the various planning phases (Elbanna 2006). Despite limitations in the rational planning processes, they can provide a valuable framework for formulating objectives and actions.

According to the management literature, a different approach is logical political incrementalism, which emphasises the importance of setting broader goals. It understands organisations have participants pursuing multiple interests, both disparate and ordinary, but who recognise the value of perpetuating the

organisation as an important resource (Scott & Davis, 2015). It suggests that strategy formulation is a political process in which organisational actors may have conflicting views on the most appropriate ways to meet organisational goals. This conciliation and subsequent reconciliations are reflected in the strategy-formulation process. (Elbanna 2006).

The analysis of these different approaches is relevant to design the expected outcome of this research project, a method to be used by those involved in formulating national digital strategies, and a strategy formulation process. It should address a common problem common to technical policy-making, supporting public officers involved in the EGOV strategies formulation process by taking into account international rankings alongside this process. International rankings will be used as input to generate the strategy content, a topic that is covered in the next section.

2.7. EGOV Strategy Content

The strategy content corresponds to the **answers** to the questions "Where are we now?", "Where do we want to get to?", and "How do we get there? (Heeks, 2006a). Along with answering the questions, there is a process in which some alternatives are selected, and others are discarded. As already discussed, this decision about what the country will do and will not do is a complex negotiation process involving multiple stakeholders from inside and outside the government.

The analysis of the frameworks presented in Section 2.6 allowed identifying the strategy content's components. The framework proposed by Rabaiah and Vandijck identified the following components: strategic vision, principles, focus areas, building blocks, initiatives, and implementation plan. From the other framework, by Mkude and Wimmer: vision; goals and objectives, policies and strategies, programs, projects. FIGURE 6 uses the work of these two authors as examples to illustrate the relationship between strategy process and strategy content.

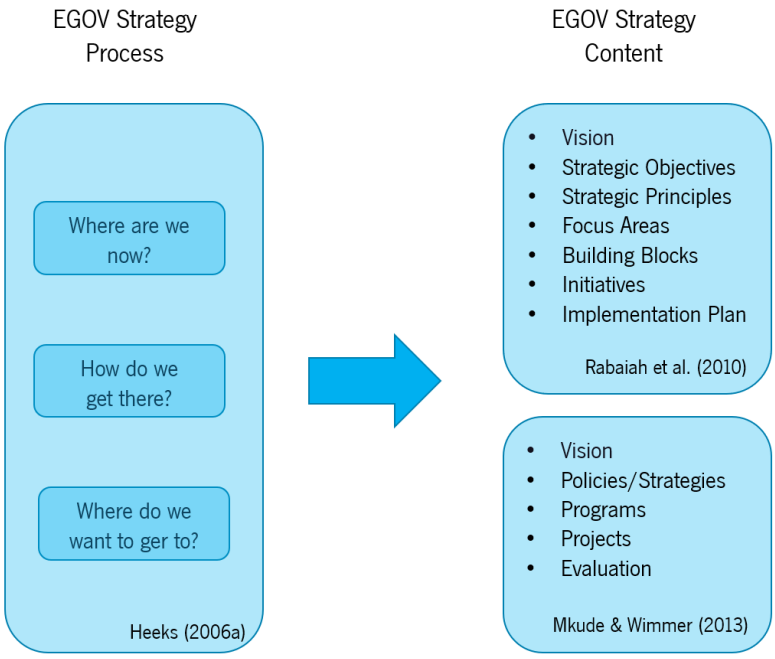


Figure 6: The relationship between Strategy Process and Strategy Content. Developed by the author.

Based on the descriptions, it is possible to identify similarities in both frameworks, for instance, the strategic vision. It answers the question, "Where do we want to get to?". Other components seem to address the strategy content related to the question, "How do we get there?", i.e., how to reach the strategic vision. It involves goals, objectives, initiatives, programs, and projects. According to the description proposed by the author, these items can be grouped into focus areas.

A list of focus areas was identified in the work of Rabaiah and Vandijck as the most presented in the strategies these authors analysed. They have the objective of clustering the strategic initiatives with similar purposes. The list presented in their work can be the object of a matching exercise with evaluation areas, or dimensions, of relevant international rankings on EGOV, as detailed in section 2.9. TABLE 2 shows examples of these strategic focus areas, and the description the strategic initiatives:

Table 2: Examples of EGOV Focus Areas and Strategic Initiatives. Adapted from Rabaiah and Vandijck (2009).

Strategic Focus Area	Description of Strategic Initiatives
Service delivery	Initiatives related to digital public services
Internal efficiency	Initiatives related to back-office structures to offer digital public services
Government networking	Initiatives related to physical, organisational, logical, and semantic interoperability
Infrastructure	Initiatives related development to ICT infrastructure.
Accessibility	Initiatives related to broaden access to digital services and information to all, including the elderly, youth, children, and minorities.
Legislation	Initiatives related to the regulatory framework.
Human resources	Initiatives related development to human capacity development.
Simplifying procedures	Initiatives related to modify the organisational process to a subsequent digital transformation

It is worth noting that other focus areas can emerge, depending on a country's context or the subject's importance for the EGOV field. An example is IT governance. This complex structure called the government is an object of a transformation process associated with the introduction of IT (Sandoval-Almazán et al., 2017), and it is "valuable to understand the extent to which IT is aligned with the objectives of different government agencies (Campbell et al., 2009, p.14)". It collaborates with the EGOV initiative's success, especially in promoting long-term solutions and supporting its effectiveness (Luciano et al., 2016). EGOV strategists can use the same arguments to include new focus areas along with the strategy formulation process, generating the corresponding EGOV strategy content.

2.8. EGOV Measurement, Benchmarking and Comparison

Performance measurement and benchmarking are two well-known tools for policy evaluation and feedback (Janssen et al., 2018). Indeed, it is important to monitor and determine the strategy development level of EGOV (Bogdanoska Jovanovska, 2016). Measuring EGOV is not, however, a simple task (Carvalho & Soares, 2018). Although performance measurement is an object of the strategy evaluation, a subsequent phase of strategy management, the formulation phase, can be used to facilitate it producing a strategy content that facilitated the measurement process in the future.

Bogdanoska Jovanovska (2016) defines measurement as a systematic assignment of numerical quantitative values and qualitative descriptions of the characteristics of the development of EGOV. Berntzen & Olsen (2009) defines benchmarking as a technique for comparing performance in EGOV and is generally based on a set of indicators used to calculate the performance index. The performance index can rank different governments or government agencies against each other. These benchmarking

processes have the potential to be used not only to compare different "photos" of a specific country in different moments but also comparisons between countries, over time or not.

If systematically collected data from many countries is available, it will also make it possible to create rankings between them. Rankings are based on comparing countries, resulting from the availability of measurement results, and benchmarking process. In fact, if you measure it, they will score (Janssen et al., 2018).

It is a situation that demands bringing the comparison theory from psychology to the literature review. It is necessary once it can bring essential elements to understand why benchmarking, or comparison, are necessary for people and groups. In psychology, the theory of social comparison originates in the seminal work of Leon Festinger. The theory was revised over time, including social comparison within groups (Goethals & Darley, 1987), which seems adequate to analyse the comparison between countries. Individuals evaluate their abilities by comparing them with the abilities of others, and to do this, individuals choose similar others with whom to compare. It occurs because individuals have the drive to evaluate their abilities and a "generalised desire, need, wish, or want to know" (p.24) how good they are at various ability-linked tasks (Goethals & Darley, 1987).

Regarding comparisons across groups, Tajfel and Turner's social identity theory seems adequate. Social identity theory concerns how individuals maintain high self-esteem compared to other groups, usually known as outgroups. In brief, if comparison with outgroups is untoward, the person will attempt to improve the group, which causes engagement in competition with other groups. (Goethals & Darley, 1987).

In this context, it is possible to make a comparison between groups and countries. Ranking countries according to specific features can promote competition, engaging citizens and businesses through representatives and leaders to work toward a better country's performance in several comparison criteria. There are several possibilities, such as health, education, GDP, and others. It is in this scenario that international rankings on EGOV are produced.

2.9. International Rankings and EGOV

Rankings are used to compare States for purposes as diverse as deciding how to allocate foreign aid or investment and determining whether states have complied with their treaty obligations (Davis et al., 2012). The use of ranking components in the EGOV strategy formulation is not rare. There is evidence of the use of international rankings in formulating National EGOV Strategies. In the Digital Government

Strategy 2016 (Brazil, 2016), Brazil used the United Nations E-Government Development Index – UN/EGDI and United Nations Electronic Participation Index – UN/EPI. In the Digital Roadmap 2018 (Austria, 2016), Austria used the European Union Digital Economy and Society Index – EU/DESI and the World Economic Forum Network Readiness Index – WEF/NRI. Argentina, in its Digital Agenda 2018 (Presidencia de la Nación Argentina, 2018), used the World Economic Forum Global Competitiveness Index – WEF/GCI and the Institute for Management Development Digital Competitiveness Index – IMD/DCI.

Institutions that produce rankings do not name them uniformly. Usually, an official report is published that uses data on countries, subsequently ordered as a ranking. Nevertheless, the social communication around the publication indistinctly admits reports, indexes, barometers, or rankings. This particularity can be observed in the following list of relevant rankings for the formulation of EGOV strategies:

- The United Nations E-Government Survey, which produces the E-Government Development Index – UN/EGDI (United Nations Department of Economic and Social Affairs, 2020), has been published since 2001 and is considered "the only global report that assesses the e-government development status of all Member States of the United Nations" (United Nations, 2018). Every two years, all 193 countries are ranked through a systematic assessment of the use of IT to transform the way government works. The survey questionnaire assesses several features related to online service delivery, including whole-of-government approaches, open government data, e-participation, multi-channel service delivery, mobile services, usage uptake, digital divide, and innovative partnerships. Dimensions of the UN/EGDI are: Online Services Index – OSI; Human Development Index – HDI; and Telecommunication Infrastructure Index – TII.
- The United Nations E-Participation Index – UN/EPI (United Nations Department of Economic and Social Affairs, 2020) is a supplementary index to the United Nations E-Government Survey. It has been published since 2001. It evaluates all Member States in dimensions such as providing information, citizen consultation, and citizen involvement in decision-making. The report is published as an additional report of the United Nations E-Government Development Index – UN/EGDI, therefore, every two years regularly.
- The European Commission Digital Economy and Society Index – EU/DESI (Europäische Kommission, 2021) reports Member States' digital progress and has been published annually since 2014. Each year, the reports include country profiles of all Member States and identify areas for priority action, analysing the key areas of the digital public policy. It comprises four

dimensions: human capital, connectivity, integration of digital technology, and digital public services. The dimension of digital public services is directly related to EGOV, although the remaining dimensions evaluate items that are considered enablers for the execution of policies related to EGOV.

- World Economic Forum Network Readiness Index – WEF/NRI (Tabar et al., 2021) reflects how technology and people need to be integrated within an effective governance structure to have the right impact on our economy, society and the environment. The report was published by the World Economic Forum between 2002 and 2019. Since 2020, it has been published by the Portulans Institute. It ranks 130 economies based on their performance across 60 variables. The primary level consists of four pillars that comprise the fundamental dimensions of network readiness: technology, people, governance, and impact. These four pillars are divided into several sub-pillars: trust, regulation, inclusion, and others.
- The World Bank GovTech Maturity Index – WB/GTMI (Dener et al., 2021) measures the key aspects of four focus areas, supporting core government systems, enhancing service delivery, mainstreaming citizen engagement, and fostering enablers. It was published in 2019 and evaluated 198 countries (or "economies"). The WB/GTMI is a composite index based on 48 key indicators defined to collect data from 198 economies in four categories: the Core Government Systems Index (CGSI), based on 15 indicators; the Public Service Delivery Index (PSDI), based on six composite indicators; the Citizen Engagement Index (CEI), based on 12 indicators; and the GovTech Enablers Index (GTEI), based on 15 indicators. To produce this ranking, the World Bank uses data from other international institutions, for instance, indicators initially produced by the United Nations E-Government Development Index. According to the World Bank, GovTech is a whole-of-government approach to public sector modernisation that promotes simple, efficient, and transparent government, with citizens at the centre of reforms.
- The Organization for Economic Co-operation and Development Digital Government Index – OECD/DGI (Organization for Economic Co-operation and Development, 2020) measures the maturity level of digital government strategies in OECD member and partner countries based on evidence gathered through the Survey on Digital Government. It grounds a qualitative and quantitative assessment and frames the methodology and survey across six dimensions of government acting: digital by design, data-driven, acts as a platform, open by default, user-driven, and pro-active.

These are EGOV-related rankings. However, the list is not exhaustive if other international rankings are considered subjects that can be impacted by EGOV, such as:

- The World Bank Ease of Doing Business Report – WB/DB (The World Bank Group, 2020) presents quantitative indicators on business regulations and the protection of property rights that can be compared across 190 economies, from Afghanistan to Zimbabwe, and over time (The World Bank, 2019, p.iii). Although important in amplitude and assessment areas, the report is no longer published. According to the official website, this report used to measure areas of business life such as: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, resolving insolvency, and labour market regulation. The indicators are used to analyse economic outcomes and identify what reforms of business regulation have worked, where and why (The World Bank, 2019). The relationship between EGOV and the Ease of Doing Business Report was reported (Martins & Veiga, 2010), suggesting that EGOV may positively influence six business areas. It is expected that an equivalent report starts to be published again by the World Bank soon.
- The World Bank Worldwide Governance Indicators – WB/WGI (Kaufmann et al., 2011) aggregates governance indicators for over 200 countries and territories for six dimensions of governance: Voice and Accountability; Political Stability and Absence of Violence; Government Effectiveness; Regulatory Quality; Rule of Law; and Control of Corruption. It is based on secondary data from several institutions, depending on the country's geographic location, as International Institutions reports are one of the primary sources. For instance, the WGI government effectiveness indicator is based on the data collected from more than 30 sources covering 196 countries about the perceived quality of public services, coupled with governments' commitment to policies geared toward improving the quality-of-service delivery. Governance is the basis of EGOV, therefore, involving all of those purposes, including the efficiency of the government, improvement of the public service delivery, accountability, and relationship between citizens and the public sector.
- The World Economic Forum Global Competitiveness Index – WEF/GCI (World Economic Forum, 2020) assesses the factors driving productivity and prosperity in 138 countries. Areas of assessment are a) economic growth, revival, and transformation; b) work, wages, and job creation; c) education, skills and learning; and d) diversity, inclusion, equity and social justice.

The report was published in 1979 and is "aimed to prompt policy-makers beyond short-term growth and to aim for long-run prosperity".

- Institute for Management Development World Digital Competitiveness Ranking IMD/WDC (Institute for Management Development, 2021) analyses and ranks the extent to which countries adopt and explore digital technologies leading to transformation in government practices, business models and society in general. It was published in 2017 and measured the capacity and readiness of 64 economies to adopt and explore digital technologies as a key driver for economic transformation in business, government and broader society. The ranking is created based on three called "Digital Competitiveness Factors", which include a) Knowledge; b) Technology; c) Future Readiness. These factors are divided into three sub-factors: talent, training and education, and scientific concentration, for Knowledge; regulatory framework, capital, and technological framework, for Technology; and adaptive attitudes, business agility, and IT integration for Future Readiness.
- The Edelman Trust Barometer – ETD (Edelman, 2020) is an annual trust and credibility survey measuring trust across several institutions, sectors, and geographies. It has been published since 2001 and aggregates data from 28 countries, consisting of data analysis of online interviews of more than 36,000 respondents, a rate of 1,150 respondents per country. The countries include Australia, Brazil, Malaysia, Mexico, Japan, Spain, the United States, and Russia. The report focuses on the study of trust based on people's relationships with institutions such as governments, NGOs, companies and brands, and the media. Trust can affect the set of EGOV purposes, especially those related to accountability and the relations between citizens and businesses within the public sector.

The impact of international rankings on EGOV strategies and vice versa inspired this research. International institutions elaborate rankings and evaluate countries indexing them according to their score in the format of international rankings. Policy-makers formulate countries' EGOV strategies by taking into account these rankings. These strategies prioritise the EGOV efforts and establish a strategic vision, principles, focus areas, objectives, goals, and projects (Rabaiah & Vandijck, 2009) (Mkude & Wimmer, 2013). These strategies are expected to produce EGOV outcomes that improve the country's performance in the EGOV rankings. FIGURE 7 systematises this "inspiration" to reproduce this relationship.

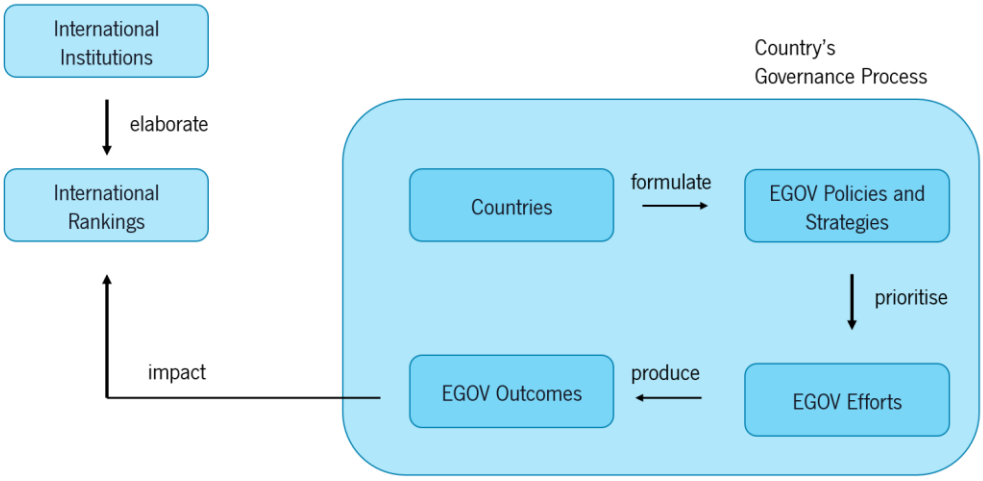


Figure 7: Relationship between International Rankings EGOV strategies. Developed by the author.

3. RESEARCH DESIGN

3.1. Introduction

The research described in this thesis aims to develop **a method for formulating EGOV strategies considering international rankings**. The idea for such a method arose to the author due to his experience in government functions as a public officer related to the definition of national strategies that address digital information technologies. The author is a Brazilian public official and, since 2008, has taken leading roles related to the use and impact of information technologies in government:

- 2008-2010 – Secretary of Information Technology and Communication, Federal District Prosecuting Council.
- 2010-2013 - National Secretary of Information Technology and Communication, Federal Prosecuting Council.
- 2014-2015 - Director of Governance and Information Systems, Ministry of Planning, Development and Administration.
- 2016-2017 - Director of Digital Government, Ministry of Planning, Development and Administration.
- 2018 – Chief Advisor of the National Secretary of Information Technology and Communication, Ministry of Planning, Development and Administration.

From 2014 to 2018, the author joined the team that produced two versions of the Brazilian Digital Governance Strategy. In 2018, he spent three months as a Government Fellow at the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV), based in the city of Guimarães, north of Portugal. This sojourn enabled the author to work on the review process of the current Brazilian National EGOV Strategy and explore new ideas relevant to a challenge all national governments are facing nowadays. His perception of the utility of using international global indexes and the corresponding rankings to identify relevant issues and benchmark one country against others led to the embryonic idea of a systematic use of international indexes and rankings along the process of formulating national digital strategies. The rich academic environment he found at UNU-EGOV challenged him to explore this idea in the context of research endeavour leading to a doctoral degree at the University of Minho. During the programme's first year, the author took a position as Research Assistant at UNU-

EGOV, acting mainly in activities related to the research line dedicated to managing e-Governance, including EGOV strategy and methodologies. After the launch of a new research programme, the author has been associated with Research Line 1 – Digital Governance, Regulations, and Policies.

In the context of the PhD in Information Systems and Technologies at the University of Minho, a method for formulating EGOV strategies taking into account international rankings became the theme for a doctoral project. The main outcome of such a project would be a method to be used by those involved in formulating national digital strategies. The target audience does not exclude elected officers involved in policy-making. However, it is more directed towards the public officers, with technical responsibilities that support politicians transforming the political agenda into public policies through a government strategy. It includes dealing with issues of international relevance and providing them with a robust basis to justify the coverage of aspects that, due to strategic and differentiation aims, could otherwise be overlooked. Thus, the development method addresses a problem common to technical policy-making and supports public officers and consultants throughout the globe. Furthermore, the method should be general in the sense that it should be applicable, with appropriate customization, to any situation that involves formulating national EGOV strategies.

3.2. Towards the Research Design

The theory is central to academic research and the academic world (Bannister & Connolly, 2015). Therefore, a first step in designing the research is to associate this objective with the type of theories usually produced in the information systems domain (Gregor, 2006). According to the taxonomy of theories in information systems proposed by the author, five categories exist: I) Analysis, II) Explanation, III) Prediction, IV) Explanation and Prediction, and V) Design and Action theory.

A method, such as the one presented in the previous section, corresponds to a theory of type V. Design and Action theory is linked to techniques or methods that give explicit prescriptions about "how to do something", providing a "recipe" that "if acted upon, will cause an artefact of a certain type to come into being Gregor (2006, p.619)". Although the author had in mind methods for the "development of IS", i.e., for the construction of IT-based artifacts, in IS, there is room for other methods. In the present case, the method aims to support the formulation of national EGOV strategies. A national EGOV strategy is an artefact of its own. Although it is not an IT-based artifact, it is an IT-related artefact. Such artefact is crucial in dealing with the impact of IT at the country level, defining the major lines on the use of IT to the benefit

of a country in all its dimensions, such as health, justice, education, economy, environment, and other governmental areas.

An adequate scientific paradigm is necessary to develop a "Design and Action" theory and accomplish the research objective. The research in the Information Systems discipline, involved in the triad of people, organisations, and technology, is generally characterised by two paradigms: design science and behavioural science (Hevner et al. 2004). The design science paradigm has its roots in engineering (Simon, 1997) and seeks to create new and innovative artefacts (Hevner et al. 2004). This paradigm is more adequate for this research than behavioural science, which is rooted in natural sciences and destinated to explain or predict human or organisational behaviour. "Design science attempts to create things that serve human purposes (p.55)" (Simon, 1997).

Many authors explored the design science paradigm in the Information Systems field, such as Hevner, et al. (2004); Peffers et al. (2007); Venable et al. (2012), and Sein et al. (2011). Hevner et al. (2004) argue that design science is inherently a problem-solving process, which fundamental principle is that "knowledge and understanding of a problem and its solution are acquired in the building and application of an artefact (p.82)". Peffers et al. (2007) remind its importance in information systems, "a discipline-oriented to creating successful artefacts (p.46)". Venable (2012) conceptualises design science as "research that invents a new purposeful artefact to address a generalised type of problem and evaluates its utility for solving problems of that type (p.142)". Hevner et al. (2004) endorses it, referring to the resultant artefacts as "extending the boundaries of human problem solving and organisational capabilities by providing intellectual and computational tools (p.76)". Sein et al. (2011) also value the design-oriented research approach and its theoretical contribution to the Information Systems discipline, with some emphasis on organisational aspects.

A key concept is "the artefact". Artefacts are constructs (vocabulary and symbols), models (abstractions and representations), methods (algorithms and practices), and instantiations (implemented and prototype systems) (Venable & Baskerville, 2012). According to Venable et al. (2012), the artefact can be "a product or a process; [...] a technology, a tool, a methodology, a technique, a procedure, a combination of any of these, or any other means for achieving some purpose (p.142)". The artefact should be "invented" and its purpose "to address a generalised type of problem". "Invention" means creation, design, improvement, or adaptation; "generalised type of problem" means that the resulting artefact should be applicable for various occurrences of that problem type. In the present case, the artefact is a method for formulating EGOV strategies.

This artefact can be considered "an invention" because none of the pre-existent ones supports the strategy formulation considering international rankings. The artefact can also be deemed applicable to a generalised type of problem because it can be used for various occurrences of that problem type: formulating EGOV strategies. The generalisation comes from the applicability of the artefact by any country that intends to consider international rankings during the EGOV strategy formulation process.

The utility of the artefact and its generalizability to solve the problem should be an object of rigorous evaluation. It will evidence that it works and that the knowledge created is true and useful (Venable & Baskerville, 2012). Hevner et al. (2004) propose an evaluation process subsequently of the design process. The evaluation will provide feedback to improve the product and the design process. The author reinforces that "the utility, quality, and efficacy of a design artefact must be rigorously demonstrated via well-executed evaluation methods (p.83)".

Considering the nature of the artefact to be produced, a method for formulating EGOV strategies considering international rankings, it is necessary to discuss what research methods can be used to carry out the evaluation. Four approaches for validating the method were considered: a case study, action research, a focus group, and a capacity-building project.

- Case study: a case study addressing the use of the method – the unit of analysis would be a strategy formulation project where the proposed method is used; the role of the author, as a researcher, would be of a non-intrusive (as much as possible) observation of the strategy formulation process; carrying out such a case study demands that there is at least one participant in the strategy formulation team that is proficient in the use of the method; as the method is still being developed, it is not feasible to have such a method proficient person (so far, the only method proficient person is the author); case studies were abandoned as a way of evaluating the method.
- Action research: having the author actively participate in a strategy formulation situation corresponds to an action research case. The challenge is to have the opportunity to gain access to a strategy formulation project, with the possibility of applying the method being developed; the fact that the author was working at UNU-EGOV provides opportunities to get involved in such projects. In 2019 and 2020, UNU-EGOV had a project regarding the definition of the EGOV strategy of São Tomé and Príncipe. In 2020 and 2021, a similar project took place with Cabo Verde. Moreover, in 2021, yet another opportunity arose to collaborate on defining a digital roadmap for Guinea-Bissau. Thus, the author had the

opportunity to get involved in strategy formulation projects for three different countries, and the use of action research was possible.

- Focus group: another way of evaluating the method involves its presentation to a panel of experts; the presentation allows the description of the method and presents its features while also enabling the gathering of experts' opinions; this method has been considered feasible, and a focus group was planned to be carried out as a workshop in an international conference on EGOV.
- A capacity-building project: in 2021, the author also got involved in a capacity-building project for another country, Egypt. In this project, the author was asked to participate in the teaching of a module about formulating EGOV strategies. This presented an opportunity of preparing teaching resources and using them in teaching activities to facilitate the development of competencies relevant to formulating EGOV strategies. This involvement in the capacity-building projects was perceived as another opportunity to evaluate the method. The preparation of the training resources, the result of the training activities, and the feedback from the trainees constitute an experience capable of providing a rich context for evaluating the method, since the author was the producer of the training resources and the trainer. Two evaluations were carried out based on two capacity-building instances.

The scenario composed of three methods for evaluation in six opportunities allowed the "build-and-evaluate loops" for the design. These loops are repeated "many times before the final version of the artefact is due (Hevner et al., 2004, p.78)". It involved different countries, multiple institutions, and many public officials. On three of these occasions, the researcher also acted as a consultant during the strategy formulation process. In other occasions, it acted as a facilitator for the focus group. In another two, as an instructor of capacity-building programmes. The set of evaluation opportunities was considered adequate for the evaluation process required in the design science paradigm.

The artefact's design was generally inspired by the Design Science Research Methodology – DSRM proposed by Peffers et al. (2007). Due to the researcher's involvement as a consultant during the application of the method, it is also inspired by the Action Design Research – ADR method proposed by Sein et al. (2011). This cross-fertilisation between Action Research and Design Science Research is not new (Sein et al., 2011), and sometimes presents limitations. Nonetheless, Sein et al. argue that technological rigour should not minimise the organisational context and the opportunity to improve the

artefact through an approach that "expanded and enhanced the design research approach, resorting to another one with organisational intervention at its very heart", the Action Research approach.

The process proposed by Peffers et al. (2007) is a model for doing and evaluating design science research in Information Systems, and it is represented in FIGURE 8. It includes six activities identified with a number from 1 to 6 preceded here by the letter "P" (from Peffers): P1) Problem identification and motivation; P2) Definition of the objectives for a solution; P3) Design and development; P4) Demonstration; P5) Evaluation; and P6) Communication". Along this chapter, it will be referred to as DSRM.

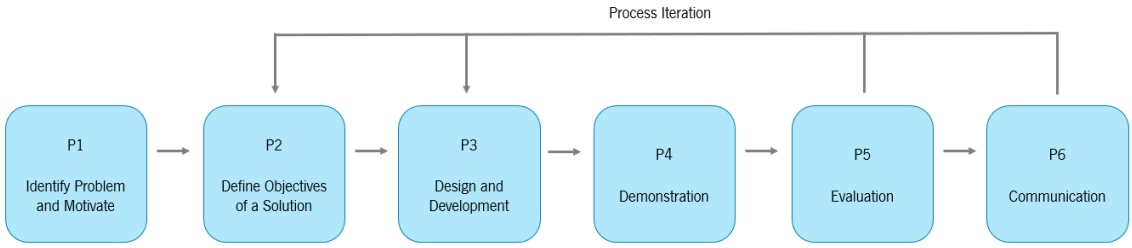


Figure 8: Design Science Research Methodology – DSRM, adapted from Peffers et al. (2007).

On the other hand, the methodology proposed by Sein et al. (2011), the Action Design Research (ADR), is presented in FIGURE 9 and is formed by four stages identified with a number from 1 to 4 preceded by the letter "S" (from Sein): S1) Problem Formulation; S2) Build, Intervention and Evaluation; S3) Reflection and Learning, and S4) Formalization of Learning. From this point onwards, it will be referred to as ADR.

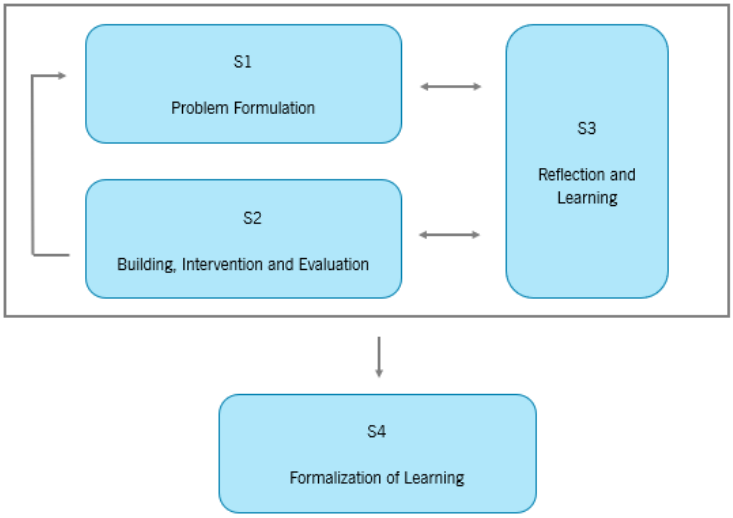


Figure 9: Action Design Research Methodology – ADR, adapted from Sein et al. (2011).

The result of combining DSRM and ADR is presented in FIGURE 10, and it is divided between development activities on the upside and application activities on the downside. Activity A is inspired by activity P1 from DSRM, problem identification and motivation, named "Identification of the problem". It should "assure the development of an artefact that can effectively provide a solution (Peffers et al., 2007, p.52)", as well as "motivate the researcher and the audience (p.55)". Activity "A" can also find some inspiration in stage S1 from ADR. The objective of this stage does not vary too much from DSRM, except that the problem is cast "as an instance of a class of problems (Sein et al., 2011, p.41)". In ADR, the time to deal with the broader class of problems will occur only after the problem solution is found in the particular organisation. In our case, since the beginning, the problem has been defined following generalisable aspects. It is a point of attention but not necessarily an issue. It is related to scholarly knowledge creation, occurring in ADR only in subsequent stages. As these ADR stages will inspire the next activities of the research design, during these activities, the generalisable aspects of the development of the artefact will be highlighted.

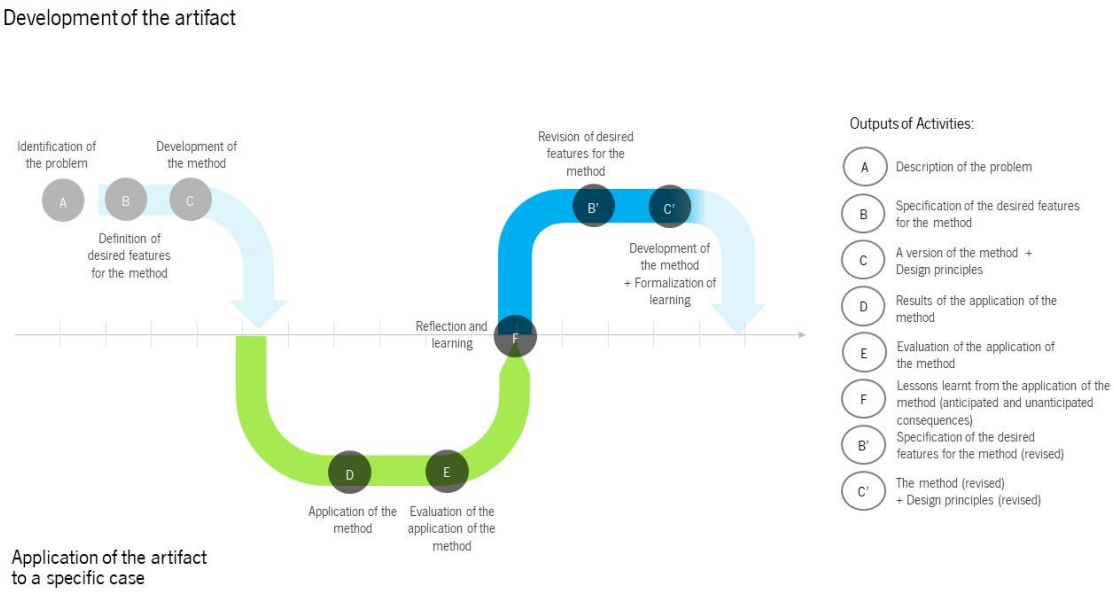


Figure 10: Combination of DSRM and ADR in the research design. Developed by the author.

Activity "B" is inspired by activity P2 from DSRM, defining the solution's objective, and named as "Definition of the desired features for the method". This activity is necessary because "identified problems do not necessarily translate directly into objectives for the artefact (Peffers et al., 2007, p.55)". The next activity, "C", is partially inspired by DSRM "P3", design and development, and named as "Development of the method". It is in this activity that the artefact is developed or improved during the iterations.

According to DSRM, "a design research artefact can be any designed object in which a research contribution is embedded in the design. Resources required for moving from objectives to design and development include knowledge of theory that can be brought to bear on a solution (Peffers et al., 2007, p.55)".

Activity "C" is also inspired in ADR stage "S2": Build, Intervention and Evaluation (BIE). ADR authors ratify that the design of the artefact occurs in "an iterative process" and "the problem and the artefact are continually evaluated, and the design principles are articulated (Sein et al., 2011, p.42)". In ADR, the design principles are statements "that prescribe what and how to build an artefact to achieve a predefined design goal (Chandra et al., 2015, p.4040)". It is important to note that in ADR, the build of the artefact is not a separate stage from intervention and evaluation, justifying the stage name and the acronym "BIE". It draws on three principles: 1) reciprocal shaping, which emphasises the inseparable influences mutually exerted by the two domains, the artefact, and the organisational context. In our case, the context of a country; 2) mutually influential roles which highlight the mutual learning among the different project participants, representing the fact that while researchers bring their knowledge of theory and technological advances, practitioners bring reasonable hypotheses and knowledge of work practices; and 3) authentic and concurrent evaluation, representing the fact that decisions about designing, shaping, and reshaping the ensemble artefact and intervening in work practices should be interwoven with ongoing evaluation. Following these principles, each "BIE" iteration generates design principles. Each one "ends with an assessment of the artefact and design principles it represents (Sein et al., 2011, p.42)". These design principles "connect the generalised outcomes to a class of solutions and a class of problems (Sein et al., 2011, p.45) and will be produced alongside activity "C". Activity "C" of the research design is inspired by DSRM and ADR. In the case of ADR, in the "BIE" stage and its building task. Activity "C" will also guarantee the ADR principle of generation of practical and ground-based knowledge in the form of design principles along with the iterations.

Activity "D" is partially inspired by the DSRM activity "P4", demonstration, and named as "Application of the method". It is dedicated to using the artefact to solve one or more instances of the problem. According to DSRM, this phase could involve its use in experimentation, case study, or other appropriate activity in a "suitable context". As described before, most "suitable contexts" resulted from the existing partnership between the University of Minho and UNU-EGOV. It led to an action research approach because the researcher assumes a concurrent role as a consultant to support the application of the method in real cases. Indeed, the action research approach "synergistically and holistically associates research and

practice (Avison et al., 2018, 177)" and is capable of producing "highly relevant research results because it is grounded in practical action, aimed at solving an immediate problem situation while carefully informing theory (Baskerville, 1999, p.2)". In this context, activity "D" is inspired in ADR stage S2 "BIE". Activity E is inspired in ADR stage S2 "BIE", namely evaluation task, and named "Evaluation of the application of the method". Through the execution of activity "E", a particular and specific case is assessed and "contributes to the refinement of the artefact (Sein et al., 2011, p.43) ". Activity "F" is inspired in ADR stage "S3", Reflection and Learning. In activity "F", "the reflection and learning stage moves conceptually from building a solution for a particular instance to applying that learning to a broader class of problems (Sein et al., 2011, p.44)". In this activity, the contribution to knowledge occurs, and the design moves from the particular case to generalisation. The outputs of Activity "F" are a list of anticipated and unanticipated consequences of artefact use, which will provide the opportunity, in the subsequent activities, "to generate and evolve design principles throughout the process (Sein et al., 2011, p.44)".

Together, activities E and F also have an evaluation purpose. They are inspired by activity P5 from DSRM "Evaluation". This activity intends to observe and measure how well the artefact supports a solution to the problem. "This activity involves comparing the objectives of a solution to actual observed results from the use of the artefact in the demonstration (Sein et al., 2011, p.56)". It is aligned with Venable et al. (2012, p.424), who argue that the "evaluation provides evidence that a new technology developed in Design Science 'works' or achieves the purpose for which it was designed". It will demand a checklist procedure between the artefact's desired features, set during activity "B", which will avoid "unsubstantiated assertions that the designed artefacts [...] achieve their purposes (Venable et al., 2012, p.424)". FIGURE 11 highlights the activities "E" and "F". DSRM inspires the whole set.

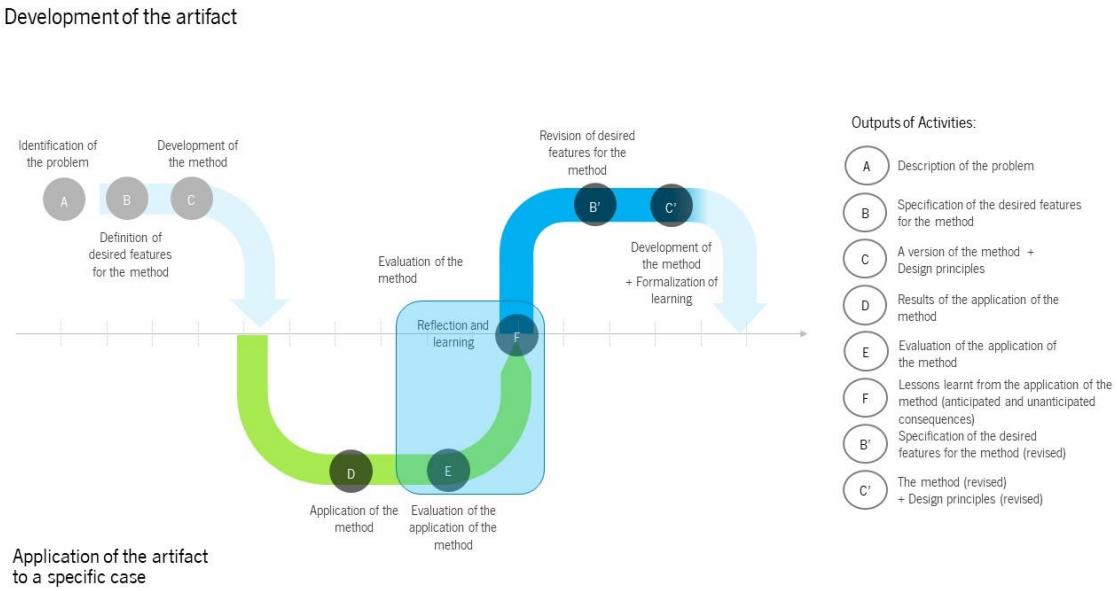


Figure 11: Activities "E" and "F" dedicated to evaluating the artefact. Developed by the author.

Activities "B"' and "C"' represent the beginning of a new iteration in the design process. They have the same purpose already stated in activities "B" and "C" in this section, but with a single and crucial difference: the formation of design principles. "Design principles" are outcomes that represent the version of the designed artefact and are responsible for the formalisation of learning resulting from "cast the problem-instance into a class of problem (Sein et al., 2011, p.44)". They should be formulated at an abstract level to be generalisable. As they depend on a new version of the artefact, after the application and evaluation of the previous one, they emerge during activity "C"'. The output is statements that "prescribe what and how to build an artefact to achieve a predefined design goal (Chandra et al., 2015, p.4040) " and use Chandra et al. template (Chandra et al., 2015, p.4045):

> *Design Principle DPx: Provide the system with [material property – in terms of form and function] for users to [activity of users – in terms of action], given that [boundary conditions – user group's characteristics or implementation settings].*
>
> *Material property: prescribe how an artefact should be built or what it should comprise; or information about the material properties that make users' action possible.*

Activity of users: give prescriptions about what actions the artefact allows for; or information about the actions made possible using an artefact.

Boundary condition: conditions under which the design will work.

To conclude the combination of DSRM and ADR in short, FIGURE 12 and FIGURE 13 represent each method's activity.

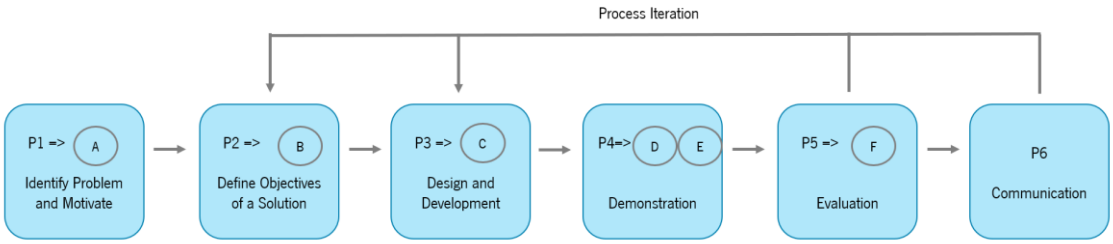


Figure 12: DSRM inspirations to the research design. Developed by the author inspired on Peffers et al. (2007).

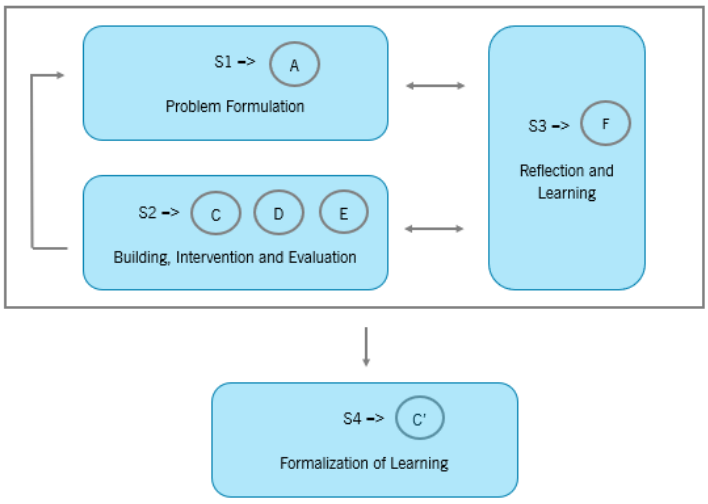


Figure 13: ADR inspirations to the research design. Developed by the author inspired on Sein et al. (2011).

3.3. The Research Design and Research Project Phases

The research phases are presented in FIGURE 14. The development activities are on top, and the application activities are on the bottom. The orange and blue activities are related to the development of the artefact versions. The orange part of the exploratory study that identified the problem and resulted in

Version 1 is considered the first iteration. The other four iterations produced the following versions until Version 5. The bottom green activities are related to applying the respective version of the artefact to a particular case and its evaluation. This evaluation process is responsible for producing the feedback information to improve the artefact by designing new versions. The fourth iteration was evaluated through a Focus Group, considered as not an application, but a demonstration. For this reason, it is shown on the upper part in blue.

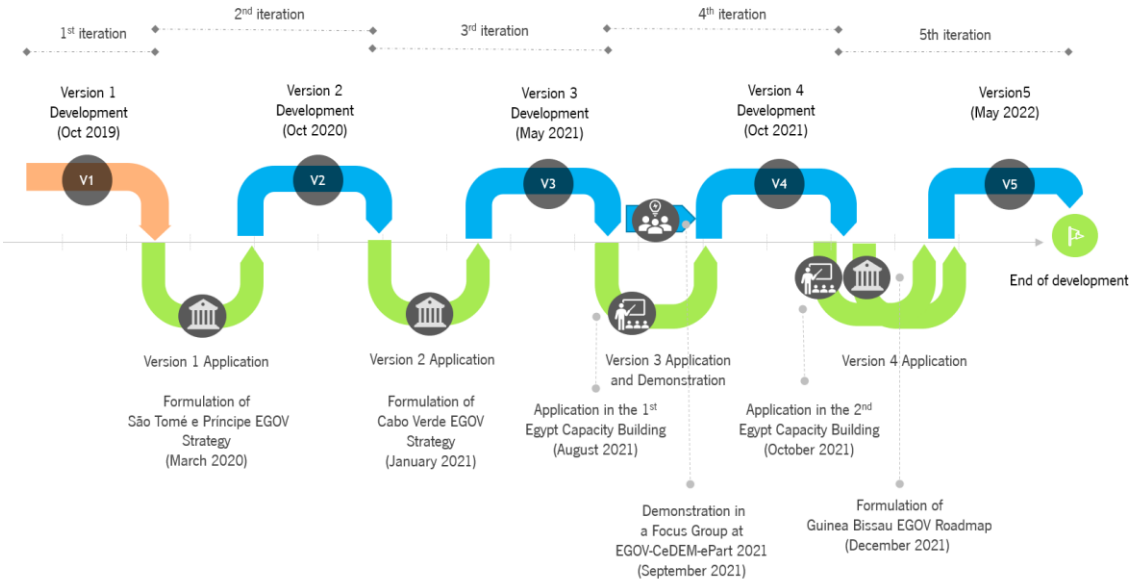


Figure 14: Phases of the research project. Developed by the author.

Five iterations produced five versions of the artefact. Version 1 has been applied to the formulation of the São Tomé and Príncipe EGOV Strategy; Version 2 was applied in the Cabo Verde EGOV Strategy formulation; and Version 3 was applied in the first edition of Egypt's Capacity Building Programme. This version was also demonstrated and evaluated through an expert meeting in a focus group session at an important EGOV conference. Version 4 has been applied in the second edition of Egypt's Capacity Building Programme and the Guinea-Bissau EGOV Roadmap formulation. Version 5 is the final version and has not been applied in a real case.

For a better understanding of the five iterations, the first and the subsequent iterations will be depicted according to FIGURE 15. The part represented in orange represents the beginning of the first iteration. It slightly differs from the next ones due to Activity A, which occurs only once. The green and blue parts will repeat along the subsequent four iterations and are interrupted on the fifth one, which is not applied in a real case. The generic iteration comprises activities D, E, F, B' and C'. In short, the sequence of activities

represents the application of the current version and its respective evaluation, which is used to design a new version.

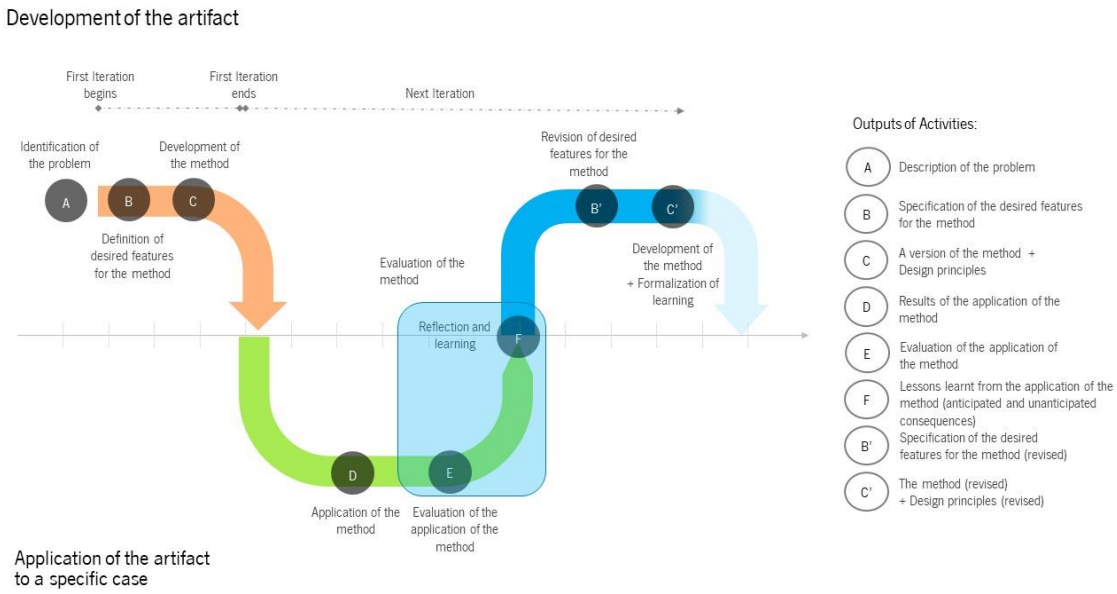


Figure 15: The first and subsequent iterations. Developed by the author.

A particularity occurred in the fourth iteration. It involved the demonstration of the artefact in a focus group. It was a valid and useful evaluation, although weaker than the application of the artefact. As explained before, it is not an application and appears in the development part of the figure, as highlighted in FIGURE 16. The expert meeting through the execution of a focus group, although not strong as an actual application of the artefact, is an appropriate activity to evaluate the artifact.

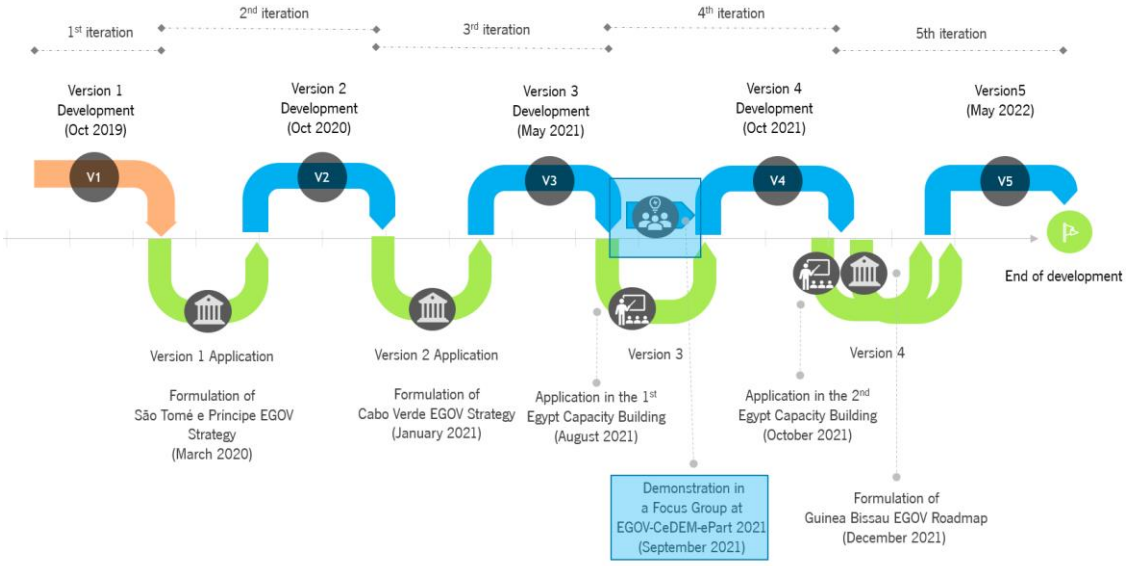


Figure 16: Evaluation through a focus group, a particularity of the fourth iteration. Developed by the author.

Besides the focus group, interviews were used in the evaluation procedures. Hennink & Leavy (2015) argue that additional techniques used in parallel can "gain a broader understanding of the research issue", each of them illuminating "different aspects (p.25)" of the research problem. These techniques are detailed in the following sections.

3.3.1.Focus Groups

Focus Groups are "collective narratives" involving a focus on specific issues "with a predetermined group of people, participating in an interactive discussion (Hennink & Leavy, 2015, p.1)". Bloor et al. (2012) endorse some advantages of the technique, such as "it demonstrates an impressive breadth, if not depth, of learning; it economises on the need for originality in one's thinking by the lengthy recapitulation of the thoughts of others (p.1)". Fern, (1982) highlights that "the group's output is in some way better than the output from individual interviews (p.2)" mainly because, according to the author, people demonstrate greater spontaneity and candour in groups, showing fewer inhibitions due to greater anonymity or security provided in that situation.

According to Hennink & Leavy (2015)," focus group discussions are a very flexible research method and therefore have a wide variety of applications", including evaluation research, "and can be a valuable component of mixed methods research designs (p.14)". The authors argue that they are particularly suitable for evaluating a service and understanding reasons for successes or failures in the design process, to "issues, terminology, or components to include (p.16)". All these issues endorse the choice of the focus group to complement the research design in the evaluation activities.

The use of focus groups followed the recommendations of Hennink & Leavy (2015), condensed below:

a) The focus group had eight to twelve participants with similar backgrounds or experiences.
b) The discussion was focused on the method and allowed enough time for a detailed discussion.
c) The aim was not to reach a consensus on the method but to uncover various perspectives and experiences.
d) The group was led by the moderator, who facilitated the discussion to gain breadth and depth from the participants' responses. The moderator prepared an online questionnaire to support and stimulate the discussion. Besides that, the moderator effectively probed the group participants to identify a broad range of views. Situations like a shallow discussion or "group

talk" were avoided. Participants conformed to what others had said even though they may not have agreed.

e) The environment, an international conference in EGOV, was essential to allow participants to feel comfortable sharing their views without fearing judgment from others.

The detailed execution of the focus group, such as local, number of participants, discussion topics, and other aspects, will be shown together with the description of the fourth iteration.

3.3.2.Interviews

Interviews have been used extensively in multiple disciplines, including Information Systems (Schultze & Avital, 2011). This study used it in the exploratory phase and in the evaluation activities in most of the iterations.

An interview is a research technique that "provides access to the context of people's behaviour and thereby provide a way for researchers to understand the meaning of that behaviour (Seidman, 2002, p.9)". Schultze & Avital (2011) argues that the technique "distinguishes itself from other research approaches by engaging participants directly in a conversation with the researcher to generate deeply contextual, nuanced, and authentic accounts of participants' outer and inner worlds, that is, their experiences and how they interpret them (p.1)".

As with any research technique, some limitations exist in getting data using interviews. Schultze & Avital (2011) argue that as "people's experiential life is not observable by other individuals (p.2)" making it checkable or accountable, a conscious researcher needs to follow some practices to see "beyond the superficial layers of their experience (p.3)", to generate valuable data about the phenomenon under study. These authors call attention to some "epistemological and discursive assumptions" that will guide the technique according to neo-positivist, localist, and romantic perspectives.

The neo-positivist perspective assumes that "interviewees are competent truth-tellers". They can identify and articulate interior, for instance, individual experiences, feelings, and values; and exterior, for instance, social practices, norms, and structures facts are relevant to the phenomenon of interest. It implies that the researcher's questions and the interviewee's answers are unequivocal. The localist perspective arises suspects about the interview's capacity to portray reality. Therefore, they consider the interview a "scene where situated and morally adequate accounts are produced (p.4)". From the romantic perspective, the

interview is considered "a socially and linguistically complex human interaction that involves active listening and interventionist engagement on the researcher's part (p.4)". It is like a conversation when the role of the interviewer is fundamental to developing the dialogue. Consequently, a scenario of trust and equality are prerequisites for exploring the participant's world of "meaning and feelings, as well as their experienced social reality (p.4)". This was the approach used in interviews during the research.

The interview process followed Saunders et al. (2008) considerations to construct a qualitative interview, an adequate type to collect the research participants' opinions. The same authors remind us that interviews could lead the discussion into "areas not previously considered but which are significant (p.324)" to address research objectives. Interviews have been conducted to get evaluative opinions about the artefact' versions. The interviews were conducted following considerations listed below (Saunders et al., 2008):

a) The significance of establishing personal contact: people are "more likely to agree to be interviewed, rather than complete a questionnaire (p.324)". Besides this point, the authors argue that there is more control over who answers the questions than other methods like questionnaires, which may be passed from one person to another.
b) The nature of the questions: questions were carefully analysed before the interview. Saunders et al. argue that interviews provide "the opportunity to 'probe' answers" where the "interviewees can explain or build on their responses (p.324)", something that was explored throughout the interview.
c) Length of time: participants were not under pressure due to the length of time.
d) Data quality issues: several data quality issues such as reliability, forms of bias, validity, and generalizability were observed. Standardisation of the interview process turns around aspects of reliability. Questions were made and commented on, observing aspects like a tone change or non-verbal behaviour that could bias the interviewees' responses. Other aspects were observed like the level of information supplied to the interviewees, the nature of the opening comments, the questioning approach, a systematic observation of the interviewer's behaviour, and understanding feedback.
e) Recording data: the interviews were video recorded.

The description of the focus group and interview techniques concludes this section. The interview technique was used in the exploratory study and most development iterations. The focus group was used

in a single iteration, the fourth one. Computer-aid tools, such as Microsoft Excel 365 and NVIVO v11, were used to analyse all the research data.

4. From the Exploratory Study to Version 1

4.1. Introduction

This chapter describes the studies that supported the justification, identification of the problem, and the first iteration of the method development. It starts with an exploratory study with two components: an analysis of a set of national EGOV strategies and an analysis of interviews with Brazilian public officials involved in EGOV strategy formulation. In the sequence of these studies, the development of the Method – Version 1 is described, comprising activities represented in the highlighted part of FIGURE 17.

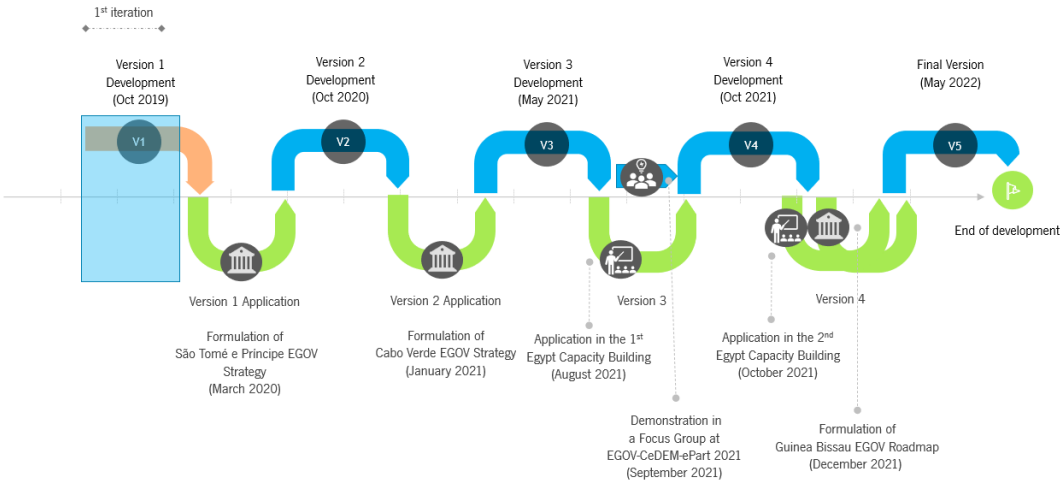


Figure 17: The 1st Iteration, concerning the development of the Method – Version 1. Developed by the author.

More appropriately, this chapter describes activity "A" proposed in the research design: the identification of the problem, followed by the first iteration, which includes activities "B" and "C" of FIGURE 18. These comprise the specification of the desired characteristics for the method for formulating EGOV strategies taking into account international rankings and the development of the Method – Version 1.

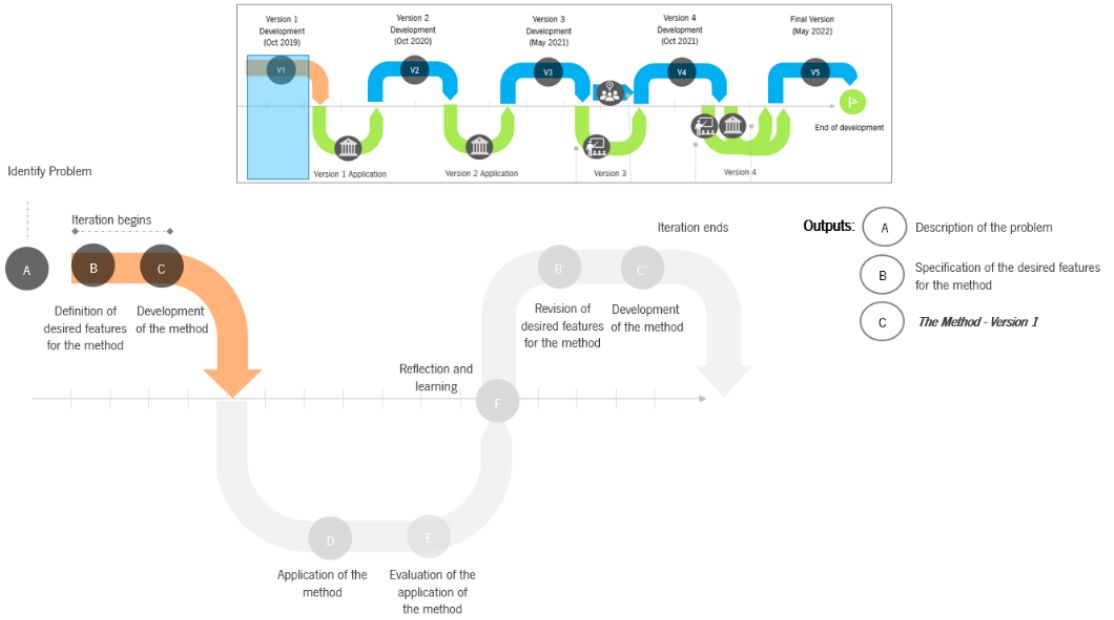


Figure 18: From the Identification of the Problem (Activity "A") to the Development of the Method – Version 1 (Activities "B" and "C"). Developed by the author.

4.2. Exploring National EGOV Strategies

Activity "A" of the research design started with the analysis of a set of national EGOV strategies published by the governments of Argentina (Presidencia de la Nación Argentina, 2018), Austria (Austria, 2016), Brazil (Brazil, 2016), Chile (Chile, 2018), Mexico (Mexico, 2013), Netherlands (Netherlands, 2018), Thailand (Thailand Electronic Government Agency, 2017), and Turkey (Turkey, 2016). This set of documents was selected from the United Nations Member States, representing different geographic locations, diverse population sizes, economic status, and each country's development level. Only official documents, available on the Internet in English and Portuguese, were considered. The objective was to demonstrate that the use of international rankings in the EGOV strategy formulation scenario is a reality by exploring their strategy content related to these indexes. According to the analysis, the use of international rankings in EGOV strategies formulation is dissimilar, occurring in many countries as shown in TABLE 3.

Table 3: National EGOV strategies and the use of International Rankings.

Country	Strategy	Reference	Rankings Used	Type of use
Argentina	Digital Agenda 2018	(Presidencia de la Nación Argentina, 2018)	World Economic Forum (WEF) Global Competitiveness Report 2018; Institute for Management Development (IMD) Digital Competitiveness Index 2018	Diagnosis and contextualisation
Austria	Digital Roadmap 2018	(Austria, 2016)	European Digital Economy and Society (DESI) Index 2016; WEF Network Readiness Index 2016	Diagnosis and contextualisation
Brazil	Digital Government Strategy 2016	(Brazil, 2016)	United Nations/E-Government Development Index	Diagnosis, contextualisation, and definition of goals
Chile	State Digital Transformation Strategy 2018-2022	(Chile, 2018)	United Nations/E-Government Development Index	Definition of goals
Mexico	National Digital Strategy 2013 – 2018	(Mexico, 2013)	United Nations/E-Government Development Index (2012)	Diagnosis, contextualisation, and definition of goals
Netherlands	Dutch Digitalization Strategy 2018	(Netherlands, 2018)	European Digital Economy and Society index	Diagnosis and contextualisation
Thailand	Digital Government Development Plan 2017-2021	(Thailand Electronic Government Agency, 2017)	United Nations/E-Government Development Index (2016); Open Data index (2016)	Diagnosis, contextualisation, and definition of goals
Turkey	National eGovernment Strategy and Action Plan 2016-2019	(Turkey, 2016)	United Nations/E-Government Development Index (2014) WB Ease of Doing Business Ranking (2016)	Diagnosis and contextualisation

This set of EGOV strategies demonstrates that many countries use international rankings as an important source of information for the strategy formulation processes. Instances of these rankings are the United Nations E-Government Development Index, the former World Bank Ease of Doing Business, the European Commission Digital Economy and Society Index, the World Economic Forum Global Competitiveness Report, and others. Results also demonstrated that international rankings perform roles such as diagnosis, contextualisation, and definition of goals.

The analysis confirmed the literature review findings, mainly that public officials typically rely on benchmarking studies to monitor the implementation and shape investments, resorting to international rankings and their indicators to facilitate the process (Heeks, 2006b). However, the literature also alerts that the use of international rankings must be accompanied by a systematic study and reflection on the implications, possibilities, and pitfalls of this practice. The analysis of the results, associated with the literature review, suggested a research agenda to develop a method that can support public officials in

the EGOV strategies formulation taking into account international rankings. Although useful, the analysis was not enough to produce the expected outputs of activity "A", the specification of the problem. Therefore, an additional exploratory study was carried out regarding public officials' perception of the EGOV strategy formulation process. This study is presented in the next section.

4.3. Exploring Public Officials' Perception of the Use of International Rankings in EGOV Strategy Formulation.

Activity "A" continued through an exploratory study carried out in Brazil between July and August 2019. The country has been chosen due to the author's experience as a Brazilian public official. The study involved interviews with nine high-level public officials, six of them government executives who report directly to the respective Minister and three other senior technical advisors working directly with high-level government executives, not necessarily those who were part of the first group. The selection of respondents looked to include roles typically involved in EGOV strategy formulation at the national level. Eight have worked in at least one of the three Brazilian EGOV strategies since 2015. Additional prudency has been taken to cover public officials still involved in digital public policies.

The interview process sought to collect the participants' opinions while not avoiding leading the discussion to areas not previously considered but which could be significant (Saunders et al., 2008). Interviews were done in a trusted scenario resulting from a previous professional relationship with the researcher, which was relevant to exploring the participant's meaning, feelings and social reality (Schultze & Avital, 2011).

Questions have been selected to perceive the importance of a method for formulating EGOV strategies considering international rankings. Although the importance of rankings as a policy definition tool, program prioritisation, and strategy formulation has already been stated (Soares et al., 2018), questions have been selected to confirm it and explore the relevance of a method to support the process. The following questions were used:

- "Are international rankings relevant? Why?"
- "For whom?"
- "How international rankings impact EGOV strategy formulation?" and
- "Would a prescriptive method be useful for the formulation of EGOV strategies taking into account international rankings? Why?".

The results endorsed the importance of a method for EGOV strategy formulation considering international rankings. For anonymisation reasons, respondents are identified into brackets using the acronym "rsp", followed by "_x", where "x" varies from 1 to 9. Respondents 1 to 6 are government executives, while respondents 7 to 9 are technical advisors. Interview excerpts are delimited by quotation marks followed by the respondent's identification. The study results are presented in four propositions, each one of them justified by the interview excerpts.

- Proposition no. 1: rankings are relevant, although some limitations exist.

This proposition was formulated based on the question, "Are international rankings relevant? Why?" All the respondents said that rankings are relevant, some with great emphasis. According to them, they are relevant because they offer: a historical data series to make comparisons with other countries [rsp_1, rsp_2, rsp_4, rsp_8], "showing the country's evolution over time" [rsp_2]. "They have a standard evaluation process and show country experiences. They create gamification between countries and offer an independent evaluation method" [rsp_4]. They also "generate an international, productive and collaborative dialogue about efficient public policies" [rsp_4], "with technically-sense recommendations, not mandatory rules, coming from trustful International Institutions" [rsp_8]. They are relevant due to their utility: "they are useful to mid and long-term planning" [rsp_1], "to formulate public policies, independent of government level" [rsp_9], "to identify gaps and strengths in policies and strategies formulation" [rsp_7]. They are "now driving the whole work of the Brazilian presidency's public policies, especially in competitiveness agenda" [rsp_8]. They are also useful to "guarantee a slot in the political agenda, a necessary condition to engage the Public Administration into any effort" [rsp_1, rsp_2].
Nonetheless, respondents alerted that some limitations exist. "Despite the importance of an international institution's brand, some rankings are relevant only at the technical level, which is the case of the United Nations E-Government Development Index. Others, like the World Bank Ease of Doing Business, reached a higher status, driving the public policy and changing the governance process, including the actors involved" [rsp_3]. "Rankings are a simplification result of many indicators, and indicators presume resulted-oriented work, something that not all government institutions are prepared for. For this reason, rankings are relevant, but not always, especially when there is some criticism about the ranking producer" [rsp_6].

- Proposition no. 2: the relevance of rankings dependents on the stakeholders.

This proposition resulted from interpreting the answers to the question "For whom?". According to the interviewees, rankings are relevant for public officials, public agents, and policymakers [rsp_1, rsp_3, rsp_4, rsp_7]; for politicians, political actors, and Ministers [rsp_1, rsp_2, rsp_3, rsp_4]; for international investors [rsp_3]; and for top-ranked countries [rsp_2]. But, not for citizens [rsp_1, rsp_6, rsp_8, rsp_9]. "Rankings have different importance to different actors" [rsp_4]. "Policymakers look for good practices worldwide, while politicians play with the ranking rules" [rsp_4], looking for political gains. "The relevance is higher for politicians than technicians" [rsp_8]. "If a ranking endorses a public policy that a high government executive believes; or a low-cost initiative that supports climbing positionings; the relevance grows" [rsp_5]. Their "theoretical fundamentals are relevant to institutional leaders, inducing good practices and improving institutions" [rsp_6]. "Depending on the relevance, in the country context, of the institution that publishes the ranking, its indicators can be more important than countries' priorities. It occurs because a good position in the ranking means that the country is doing a good work. It means an international recognition of a 'well done' work" [rsp_4]. "Top-ranked countries use them to influence others as a soft power mechanism" [rsp_2]. However, in the opinion of some respondents, rankings are not relevant for citizens. Citizens are mainly and naturally concerned with self-demands, short-range plans, day-to-day issues, and transactional services [rsp_1, rsp_6, rsp_8, rsp_9].

- Proposition no. 3: rankings impact EGOV strategies in many ways, with constraints.

This proposition resulted from the analysis of answers provided to the question "How do international rankings impact EGOV strategy formulation?". All respondents endorsed that those rankings impact government strategies, including EGOV ones. "They did impact former strategies, do it to the current ones, and will impact the next ones" [rsp_4]. Government authorities "usually keep up with strategic deliverables and associated measures, what leads to international rankings" [rsp_2]. "They are useful to expose a situation and support a point-of-view with decision-makers" [rsp_6]. "Despite the inexistence of a formal orientation to government agencies, high-level government units, like the Presidency, use them to legitimate their work" [rsp_8]. Rankings also motivate a resulted-oriented approach, "especially when allowing regional or similar-context-countries comparisons" [rsp_2]. "If we consider a public policy as a set of government programs and projects, each one of them with success indicators, it is natural some impact of rankings and their respective indicators" [rsp_8]. Especially in EGOV, "international rankings

give a general direction of which policy aspects are considered relevant and which ones might have more priority" [rsp_7].

However, despite being "a good tool to support planning, it cannot be unique" [rsp_2]. Rankings should be the "result of a public policy, a great result if it also allows a better position in the international index" [rsp_2]. Their use is constrained "by local reality and the local context" [rsp_1]. They are "not a decision-maker; they do not decide which public policy will be done" [rsp_2]. "They are a factor, an important reference, a parameter, a message to the Estate, but with superficial influence" [rsp_3].

- Proposition no. 4: a method considering international rankings would be useful.

This proposition resulted from the replies gathered for the question, "Would a prescriptive method be useful for the formulation of EGOV strategies taking into account international rankings? Why?". In short, the method would be useful [rsp_1, rsp_2, rsp_3, rsp_4, rsp_8, rsp_9]. "As an information source, it has the potential to support the decision-process" [rsp_2], "with limitations, but more beneficial than harmful" [rsp_4]. "If it offers a direct correlation between functionality and components (process, efficiency) and results and outputs (efficacy, effectiveness), it will be valuable, something that assures impact on the perspective of public services consumers. It does not make sense to have a lot of digital public services without citizens actually using them, while a good position in a ranking when there are no e-services does not make sense. It is not about the process but about consumer satisfaction" [rsp_3].

Ranking-specific criteria have been highlighted: "certain measurements make it possible to identify core EGOV structures that must exist, like Digital ID, E-procurement, or a Unique Authentication Service" [rsp_1]. Finally, it has been mentioned the need to include into the method scope other rankings than those exclusively related to EGOV, like "trust measurements, for example" or others "that capture public service consumers' perceptions, something that the UN/EGDI does not do" [rsp_9].

The result of the exploratory study concluded Activity "A", confirming the relevance of the subject between the set of practitioners and that a method that considers international rankings for formulating EGOV strategies would be useful. Due to the relevance and impact of international rankings and the likely usefulness of a method that systematises their use in formulating EGOV strategies, which still does not yet exist, the problem was defined as **the absence of a method for formulating EGOV strategies by taking into account international rankings.** Therefore, the scope of the artefact has been limited to strategies in the public sector, particularly EGOV strategies. The scope has been limited only to the formulation process, discarding processes like strategy execution, monitoring, evaluation, and others.

Although constraints and limitations emerged along with the exploratory studies, their results were relevant as inputs for the development process. However, a re-analysis of the interview data was necessary to specify the desired features for the method, which corresponds to activity "B" of the research design described in the next section.

4.4. Specifying the Desired Features for the Method – Version 1

Activity "B'" is dedicated to revising desired features for the **Method – Version 1**. A re-analysis of all responses to define the desired features for the method has been proceeded, and involved re-screening all of them independently of the questions. According to the re-analysis, the method should be:

- Flexible, i.e., adjustable to the country context. The following interview excerpts supported the interpretation: "Strategies should not be exclusively guided by rankings, but also by local reality, local context." [rsp_1]. "Different countries have different contexts, but EGOV objectives are very common and similar. The final objective is mostly the same, for example, the unique digital identity. 'What to do' does not vary, and 'how to do it' varies according to a given country. So, the implementation should be guided by the context." [rsp_1]. "A balance is mandatory between ranking measures and country priorities." [rsp_2]. "It will depend on the country's maturity. Lower maturity, higher-ranking importance. Higher maturity, lower importance to rankings. Rankings are more important to countries which use them as a persuasive tool." [rsp_2]. "It is difficult to transfer a public policy from one country to another because it depends on the country's trajectory." [rsp_4]. "Prudence should exist to avoid choosing a 'best practice' that does not fit a country. A translation is needed, based on context analysis." [rsp_4].
- Instructive, i.e., it supports the learning process and the association of rankings characteristics to EGOV purposes. Some excerpts which supported this interpretation were: "All our strategic initiatives use core EGOV structures: interoperability, single sign-on, digital ID; all these come from international rankings." [rsp_1]. "This method, as a source of information, [...] has the potential to support decisions." [rsp_2]. "The United Nations E-Government Development Index has not yet transcended the technical barrier to a political level, what the World Bank Ease of Doing Business did. Maybe because technicians do not know how the evaluation process occurs and how indicators are measured." [rsp_3]. "Rankings are biased and have prejudices and distortions because they aggregate indicators, and some lack updates. Why? To maintain the

historical series and not lose the comparative feature. It is an eternal trade-off." [rsp_4]. "Rankings facilitate finding references to good policy implementation and learning from it. It also shows which policies need to be improved." [rsp_7].

- Easy-to-use, i.e., simplifies the use of international rankings in formulating EGOV strategy. The interview excerpts were: "Rankings can be used as a checklist of strategic items, a minimum set of what has to be done, a development guide." [rsp_1]. "Something that supports rankings interpretation, helping to correlate what society needs and what is evaluated, a ranking translator for the public official, for the society." [rsp_3]. "As much we can materialise, clarify, lower the transaction costs, allowing transfer the effort to execution, it will be helpful." [rsp_4]. "UN/EGDI was not studied in detail, due to a traditional lack of time to build a strategy" [rsp_9].
- Comprehensive, i.e., broadly covers the EGOV purposes. The support interview excerpts were: "The UN/EGDI ranking is good, but not enough to check impact. Other indexes, such as Edelman Trust Barometer, UN/Human Development Index, WB/Doing Business, are rankings with potential to evaluate digital government impact." [rsp_1]. "If the method uses more than one ranking, preferably those with a focus on results, it could work." [rsp_3]. "... not only EGOV rankings but others based on citizens perceptions, something that UN/EGDI is not, rankings that measure trust, for example, would be very useful." [rsp_9].
- Co-creative: enables the participation of multiple stakeholders. The support interview excerpts were: "Citizens are short-term oriented, with day-to-day concerns [...], politicians are mid-term, they need to legitimate what they do and why they do it every three or four years [...] public officials need to construct a long-term agenda, delivering outputs in short- and mid-term to balance the citizens and politicians' expectations" [rsp_1]. "Rankings show the common criteria used to evaluate other countries by global institutions, which impacts local authority's political agenda-setting" [rsp_1]. "They are proxies of impact, not impact itself. The citizens' objective is to obtain a retirement pension, not an online service to order a pension service. Note that if it happens seamlessly, the better. Sometimes, rankings guide countries to be efficient, but not effective." [rsp_4]. "In a conflict scenario between technicians and politicians, it would be useful if the method brings technical and rational arguments, based on evidence, showing the impact of these indexes." [rsp_4]. "Considering that international rankings influence a national EGOV strategy formulation, its design and governance should involve multiple stakeholders from multiple sectors, to avoid agenda capture by interest groups." [rsp_7].

- Effective, i.e., delivery an EGOV strategy after a complete formulation process. The support interview excerpts were: "Rankings did not show 'how to do it'. They are a checklist of what a country has or has not. If the method focuses on the EGOV strategies formulation process, it will help countries." [rsp_3]. "A method oriented by international rankings would allow a better performance in our work (strategy formulation)." [rsp_8]. "The ideal process to build an EGOV strategy involves a nominated coordinator, multi-disciplinary professionals, and teamwork from multiple government agencies. A vision definition, a context analysis, a public consultation, an action plan, a benchmarking with similar countries, and a monitoring structure." [rsp_9]

According to the re-analysis, **the method should be flexible, instructive, easy-to-use, comprehensive, co-creative, and effective.** The method should be flexible because EGOV is a particular case of ICT application in government that varies according to countries' organisation, political structure, population, size, and economy, amongst other factors. It should be instructive and easy to use since strategy formulation is a complex process. It must be comprehensive, as EGOV features a variety of purposes to link, simultaneously, to different international indexes. The co-creative feature can be associated with the governance processes, which involves many stakeholders. Finally, effectiveness is a natural goal of any artefact built to support human work, including processes of EGOV strategies formulation.

The list of desired features is considered the output of activity "B". It occurs before activity "C", which will produce as its output the Method – Version 1, described in the next section.

4.5. Developing the Method – Version 1

Activity "C" is dedicated to developing the **Method – Version 1**. It resulted in the first version of the method, composed of five stages: Stage 1 – Diagnostics and Context Analysis; Stage 2 – Definition of Vision and Principles; Stage 3 – Choice of Thematic Areas and Initiatives; Stage 4 – Identification of Structuring Pillars; and Stage 5 – Definition of Implementation and Evaluation Plans. Each stage is formed by a set of guidelines, which guide "how to do" to reach the goal of each stage.

The informing theory of version 1 comprises key questions in the EGOV strategy formulation proposed by Heeks (2006a) and commonalities found in EGOV strategies structures proposed by Rabaiah and Vandijck

(2009). The strategy formulation process was derived from the proposed questions "Where are we now?", "Where do we want to get to?", and "How do we get there?" (Heeks, 2006a), as depicted in FIGURE 19.

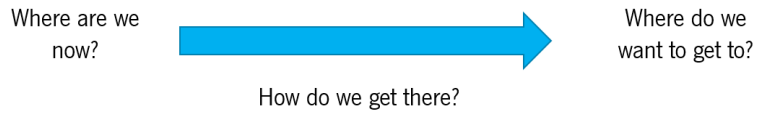


Figure 19: Questions which inspired the method development. Adapted from Heeks (2006a)

Regarding the question "Where are we now?" **Stage 1 – Diagnostics and Context Analysis** has been proposed to capture the country's status on EGOV. As described in the guidelines provided, this stage is dedicated to a diagnosis of the country, which will support the elaboration of the country's context. The question "Where do we want to get to?" justifies the proposal of **Stage 2 – Definition of Vision and Principles**. This stage is dedicated to setting the strategic vision, consisting of a primary and a general country goal in EGOV and the principles guiding the strategy formulation. The question "How do we get there?" supports the creation of Stages 3, 4, and 5, in which the main part of the strategy content is defined. **Stage 3 – Choice of Thematic Areas and Initiatives** is dedicated to setting the objectives and initiatives the government intends to achieve, clustered into key areas that will collaborate to reach the strategic vision. **Stage 4 – Identification of Structuring Pillars** sets the necessary EGOV structuring pillars to support the initiatives chosen in the previous stage. Finally, **Stage 5 – Definition of Implementation and Evaluation Plans** sets the plans for implementing and evaluating the strategy. The method and its five stages are represented in FIGURE 20.

Figure 20: The five stages of the Method – Version 1. Developed by the author.

The inclusion of Stages 2 to 5 of the **Method – Version 1** was inspired not just by Heeks (2006a) but also by the work of Rabaiah and Vandijck (2009). These authors identified commonalities in the structure and content of EGOV strategies from 21 countries and the European Union. The study presents layers depicted in FIGURE 21, representing the EGOV strategy development, including the definition of the vision,

objectives, principles, focus areas, building blocks, prioritised initiatives, and the implementation plan. It also shows the link of each layer with each stage of the method.

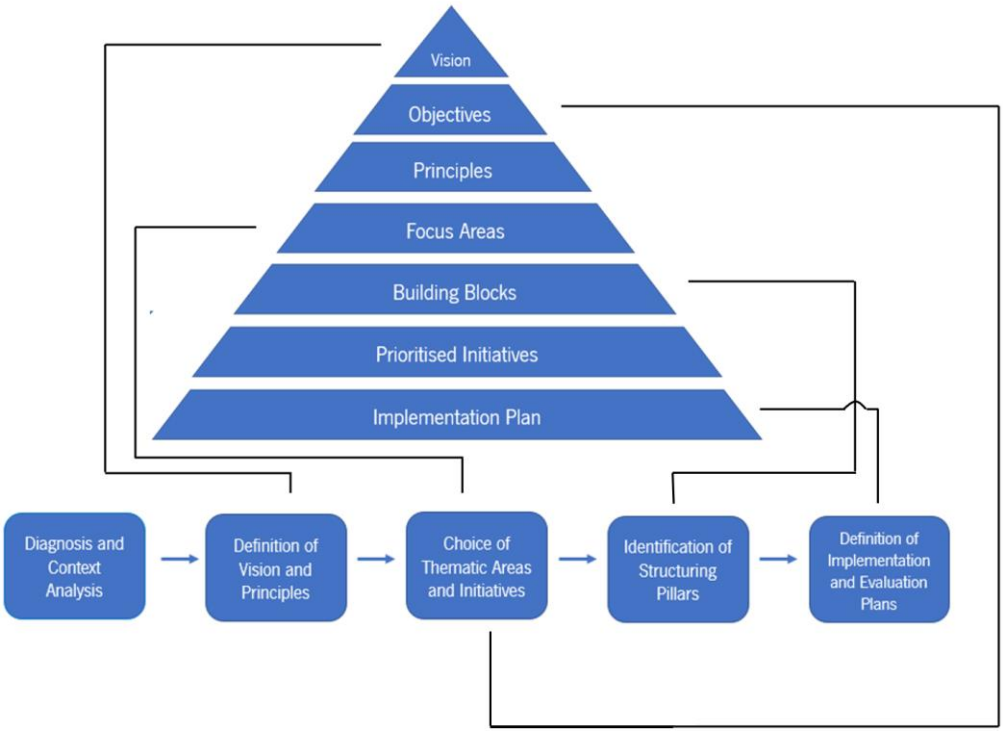


Figure 21: Adaptation of the Strategic Framework of Rabaiah and Vandijck (2009), used to develop the Method – Version 1.

According to the authors, the vision "reflects the policy of the government (p.247)" and the principles "provide focus and control over design and implementation (p.247)". It is the objective of **Stage 2 – Definition of Vision and Principles** of the method and is dedicated to reaching equivalent objectives. Following the layers, "Focus Areas" are the "key areas targeted by e-government (p.250)", such as digital services, EGOV regulatory framework, e-participation, and others. They are "declared by governments themselves in the strategies (p.250)", suggesting that these areas are chosen according to country choices based on expectations from e-government investments. Objectives "provide a complete package for what the government is going to achieve (p.247)" with "some sort of universal focus that reflects a general direction behind the initiative". As the authors did not differentiate initiatives and objectives, they have been aggregated using the terminology initiatives only, producing **Stage 3 – Choice of Thematic Areas and Initiatives**. It is dedicated to selecting the key EGOV areas, which will cluster the pack of strategic initiatives the government intends to achieve.

Stage 4 – Identification of Structuring Pillars is based on the layer "Building Blocks", "basic elements of e-government programmes (p.251)" that are interpreted as the enablers of the strategic objectives. It is dedicated to identifying the necessary structuring pillars for the chosen initiatives. Finally, **Stage 5 – Definition of Implementation and Evaluation Plans** was based on the "Implementation Plan" layer. It is dedicated to setting a plan to implement initiatives and their subsequent evaluation.

The **Method – Version 1** and the description of each stage are in TABLE 4.

Table 4: The Stages of the Method - Version 1.

Stage	Goal
1. Diagnostics and Context Analysis	Diagnosis of the country which will support the elaboration of its context
2. Definition of Vision and Principles	Set the strategic vision, symbolising a main general goal in EGOV, and the principles guiding the strategy formulation
3. Choice of Thematic Areas and Initiatives	Identify the key EGOV areas that will cluster the pack of strategic initiatives the government intends to achieve.
4. Identification of Structuring Pillars	Identify the necessary structuring pillars for the chosen initiatives.
5. Definition of Implementation and Evaluation Plans	Set a plan with the strategic initiatives and a timeline proposal.

In addition to Heeks and, Rabaiah and Vandijck, the proposed stages were also based on the analysis of several national EGOV strategies published by the governments of Argentina (Presidencia de la Nación Argentina, 2018), Austria (Austria, 2016), Brazil (Brazil, 2016), Chile (Chile, 2018), Mexico (Mexico, 2013), the Netherlands (Netherlands, 2018), Thailand (Thailand Electronic Government Agency, 2017), and Turkey (Turkey, 2016). The objective was to confirm that the Rabaiah and Vandijck structure was still valid and to inspire the method's development. The analysis of this set of national EGOV strategies is resumed in TABLE 5.

Table 5: Analysis of a set of National EGOV strategies.

Country	Diagnosis and Context Analysis	Vision and Principles	Thematic Areas and Initiatives	Structuring Pillars	Implementation and Evaluation Plans
Argentina (Presidencia de la Nación Argentina, 2018)	Diagnostico Actual (p.2)	Visión (p.4)	Objetivos (p.4); Ejes Estrategicos (p.5) e Líneas de Acción (pp.6-11)	*Embedded in* Ejes Estrategicos (p.5) e Líneas de Acción (pp.6-11)	-
Austria (Austria, 2016)	Status quo: Austria's digitalization level (p.14)	Common guiding principles (p.4); Visions for Austria 2025 (p.8)	Fields of action and measures (p.18)	*Embedded in* Measures (pp.18-39)	Measures (pp.18-39)
Brazil (Brazil, 2016)	Histórico do Governo Digital (p.8)	Propósito (p.10); Princípios para a Governança Digital (p.14)	Objetivos Estratégicos (p.15); Iniciativas Estratégicas (pp.28-32)	*Embedded in* Iniciativas Estratégicas (pp.28-32)	Metas e Indicadores (pp.16-27)
Chile (Chile, 2018)	-	Objetivos de la Estrategia de Transformación Digital (p.9 to 10); Principios Estrategicos (p.11)	Líneas de Acción (p.13 to 22); Cómo lo vamos a hacer (pp.23-31);	Principios Operacionales (p.12); and also, *Embedded in* Cómo lo vamos a hacer (pp.23-31)	Hoja de Ruta para la Transformación Digital (pp.34-39)
Mexico (Mexico, 2013)	-	La Estrategia Digital Nacional: definición, objetivos, misión y visión (p.14)	Marco Estructural de la Estrategia Digital Nacional. (pp.15-18)	Habilitadores (p.26)	Plan de Acción (pp.19-25)
Netherlands (Netherlands, 2018)	-	Ambitions and Goals (p.11)	Tracks 1 and 2, Chapters 2 to 8 (pp.15-48)	*Embedded in* Tracks 1 and 2, Chapters 2 to 8 (pp.15-48)	Moving Forward (p.46)
Thailand (Thailand Electronic Government Agency, 2017)	-	Vision of Thailand Digital Government (p.7); Thailand 5 Strategies (p.8)	Development Goals and Indicators (p.6); Thailand 5 Strategies (pp.12-21)	*Embedded in* Thailand 5 Strategies (pp.12-21)	Development Goals and Indicators (pp.6-8).
Turkey (Turkey, 2016)	General Overview of e-Government in Turkey (p.4)	e-Government Vision and Strategy (p.11)	Strategic Aims and Objectives (pp.15-52)	*Embedded in* Strategic Aims and Objectives (pp.15-52)	Action Plan (p.54)

Based on the literature and the analysis of national EGOV strategies, the guidelines presented in the **Method – Version 1** have been developed as follows.

Stage 1 – Diagnosis and Context Analysis includes 22 guidelines to support the country's diagnosis and allow the country context analysis. The guidelines are inspired by the question "Where is the country now?" adapted from Heeks' work. They are also based on analysing the national EGOV strategies from Argentina, Austria, Brazil, and Turkey. The answer to the proposed question intends to produce the necessary inputs for the following stages of the method. The 22 guidelines of this stage are presented in TABLE 6. Guidelines 1.1 and 1.22 are dedicated to producing outputs that account for international rankings.

Table 6: Stage 1 Guidelines of the Method – Version 1.

Stage 1: Diagnosis and Context Analysis	
Id	**Guidelines**
1.1	Explore the EGOV history, international rankings positioning, past EGOV deliverables, former and current EGOV and digital strategies, former and current international partnerships, economic partnerships, and other context items.
1.2	Explore risks to the strategy sustainability. They typically originate from political and financial sources but occasionally from other fields.
1.3	Explore country economic vocations and niches.
1.4	Uncover how citizens consume and evaluate the provided basic services, like water and energy supply, telecommunications, garbage collection, property registration; driver's license issues; and others.
1.5	Identify partnership opportunities between government agencies, the private sector, universities, and international institutions.
1.6	Identify the maturity of IT governance in the public sector.
1.7	Uncover the government's financial situation, including external loans/donations dependency.
1.8	Explore the citizens' perception of public service delivery.
1.9	Identify EGOV expectations among the country's authorities, politicians, and citizens.
1.10	Identify, from key actors and key institutions, priorities, expectations, and international references about EGOV initiatives and technologies.
1.11	Identify relevant government information systems and respective databases.
1.12	Identify the government interoperability platform if it exists.
1.13	Identify government data warehouses.
1.14	Identify public officials' level of knowledge and competencies in EGOV.
1.15	Identify opportunities to share the public sector's back office and technological services.
1.16	Identify and explore inhibited demand and its causes, especially those related to the service cost.
1.17	Identify and explore the existence of government assessment procedures.
1.18	Identify and explore EGOV opportunities also in the Legislative and Judiciary branches. Explore independent institutions like those involved in the electoral system, the public prosecution service, security forces, and other institutions.
1.19	Identify and explore those public services provided by mail service or telephone.
1.20	Identify EGOV technological trends that are compatible with the country's context.
1.21	Explore the country's crises that occurred and their causes.
1.22	Identify and explore important international rankings according to the country's key actors.

These 22 guidelines produce sets of information such as the country history in EGOV (guidelines 1.1); country's national context (guidelines 1.2, 1.3, 1.4, 1.6, 1.7, 1.8, 1.10, 1.11, 1.12, 1.13, 1.14, 1.16,

1.17, 1.21); country's international context (1.10, 1.22); and EGOV opportunities and challenges (guidelines 1.5, 1.9, 1.10, 1.15, 1.16. 1.18, 1.19, 1.20). Guideline 1.10 supports the production of country's national context, as well as country's international context, as well as EGOV opportunities and challenges. Guideline 1.16 supports the production of the country's national context as well as EGOV opportunities and challenges.

All produced sets of information are useful for **Stage 2 – Definition of Vision and Principles** and **Stage 3 – Choice of Thematic Areas and Initiatives**. Stages 4 and 5 do not use outputs from Stage 1 but instead from the subsequent stages. An example of content related to country history in EGOV is the set of former and current strategies and partnerships. This set can be used to avoid a strategic vision that repeats past expectations. Another example is the country's economic vocations, part of the national context, to set an EGOV strategic vision compatible with them. Nevertheless, EGOV expectations of authorities, politicians and citizens are part of the set of information EGOV opportunities and challenges.

Stage 2 – Definition of Vision and Principles is dedicated to setting the country's strategic vision and principles. The guidelines are inspired by Heeks's question, "Where do we want to get to?". Rabaiah and Vandijck's studies also inspire this stage, with the layers "Vision" and "Principles". National EGOV strategies also inspire Stage 2, namely those from Argentina, Austria, Chile, Mexico, the Netherlands, Thailand, and Turkey. Some state a properly strategic vision, such as those of Argentina, Austria, Mexico, Thailand, and Turkey. Others use synonyms like "purpose" (Brazil), "main strategic objective" (Chile), and ambitions (the Netherlands). In the same way, only some of these countries declare the strategic principles; it is the case of Austria, Brazil, and Chile.

The vision should resume the policy and general EGOV goal, while the principles provide focus and a framework to guide the strategy formulation. The guidelines of Stage 2 are presented in TABLE 7. They use all sets of information produced in Stage 1: country history in EGOV; country's national context; country's international context; and EGOV opportunities and challenges.

Table 7: Stage 2 Guidelines of the Method – Version 1.

Stage 2: Definition of Vision and Principles	
Id	**Guidelines**
2.1	Define a pragmatic and realistic strategy vision, a statement that represents the country's EGOV future.
2.2	Choose the strategy principles that will guide the formulation process, supporting, framing, and clarifying the choices of paths to achieve the strategic vision.

The definition of the strategic vision expected from guideline 2.1 should produce a pragmatic and realistic statement representing the country's EGOV future. It should utilise as many sets of information from Stage 1 as possible. The strategy principles guide the whole formulation process and support, frame, and clarify the choices to achieve the strategic vision. For instance, a principle such as "Digital by default" can be set by exploring citizens' expectations in EGOV, captured in guideline 1.9. Another possibility, "Participative governance", can emerge from the EGOV expectations among the country authorities, politicians, and citizens, identified in guideline 1.9. Indeed, many other principles can emerge from the set of guidelines in Stage 1.

In resume, Stage 2 uses as inputs all sets of information produced in Stage 1 and produces two outputs: the strategic vision and the set of strategic principles.

Stage 3 – Choice of Thematic Areas and initiatives is dedicated to identifying the key areas targeted by EGOV. It clusters the pack of strategic objectives and initiatives the government intends to achieve. The guidelines are inspired by Heeks's question, "How do we get there?". Rabaiah and Vandijck's work also inspires this stage, with the layers "Focus Areas", "Objectives", and "Prioritised Initiatives". The analysis of the set of national EGOV strategies also inspired this stage, once all present initiatives clustered into thematic areas, with some variation in the name of these concepts.

This stage contains the guidelines presented in TABLE 8, which use all four sets of information produced in Stage 1, mainly related to the country's national context and EGOV challenges and opportunities. In addition to these sets of information, Stage 3 also uses the strategic vision statement and the strategic principles produced in Stage 2.

Table 8: Stage 3 Guidelines of the Method – Version 1.

Stage 3: Choice of Thematic Areas and Initiatives	
Id	**Guidelines**
3.1	Choose initiatives according to what citizens and businesses value to adopt a citizen-centric approach design.
3.2	Identify key service providers and make a list of provided public services. Identify new opportunities, current challenges, and current strategies. Also explore partial-on-line services provision opportunities.
3.3	Define thematic areas for the public services according to the selected initiatives. Harmonise the choice taking into account country context and international rankings benchmark areas.

Guidelines 3.1 and 3.2 are dedicated to producing a list of all strategic initiatives. Examples of potential inputs for these guidelines are those outputs produced by guideline 1.3, which explores the country's economic vocations and niches and can generate a range of initiatives related to these aspects; or those produced by guideline 1.4, which identifies opportunities for the digitalisation of essential public services like water and energy supply. It can be combined with the potential partnerships between the public

and private sectors identified in guideline 1.5. Another example of potential input is the results of guideline 1.6, which can produce a set of initiatives to improve IT governance in the public sector. All guidelines from Stage 1 produced outputs that can inspire initiatives and thematic areas in Stage 3.

Regarding these thematic areas, the characteristics of international rankings, identified and explored during the execution of guideline 1.22, can inspire the creation of many of them. For example, a new thematic area dedicated to Online Services can be inspired in the Online Services dimension of the United Nations E-Government Development Index. Human Capital or Telecommunication dimensions from the same ranking can also inspire Capacity Building or an ICT Infrastructure thematic area. The same rationale can be applied to any international rankings selected through guideline 1.22.

Stage 2 also produces useful outputs for Stage 3. All thematic areas and initiatives should be framed by the strategy principles produced through guideline 2.2. The formulation team should note that all initiatives and respective thematic areas should contribute to achieving the strategic vision.

Stage 4 – Identification of Structuring Pillars is dedicated to identifying the necessary structuring pillars to implement the initiatives chosen in Stage 3. The guidelines of Stage 4 are inspired by the question, "How do we get there?". Rabaiah and Vandijck's study also inspires this stage with the layer "Building Blocks". The stage is also inspired by the content of national EGOV strategies, although some countries declare the structuring pillars mixed with strategic objectives. The guidelines for this stage are listed in TABLE 9.

Table 9: Stage 4 Guidelines of the Method – Version 1.

Stage 4: Identification of Structuring Pillars	
Id	**Guidelines**
4.1	Identify the administrative structures necessary to implement the initiatives, such as Services Simplification Team, Shared IT Services, IT Design and Development Team, Capacity Development Team, the Government CIO, and others.
4.2	Identify the legislative structures necessary to implement the initiatives, such as Electronic ID Legislation, Personal Data Regulation, Cybersecurity Law, EGOV Institutionalization Acts, EGOV Governance Regulation.
4.3	Identify the technological structures necessary to implement the initiatives, such as National Portal, Interoperability Platform, Government Data warehouse, Cybersecurity Infrastructure, and others.
4.4	Classify the structuring pillars as administrative, legislative, or technological pillars.
4.5	Identify existing government IT solutions that can be converted into a technological structuring pillar.
4.6	Explore the costs and benefits relationship of the implementation of each structuring pillar in terms of financial and political efforts.
4.7	Link each initiative to the necessary structuring pillar.

Guidelines 4.1, 4.2, and 4.3 are dedicated to identifying the structuring pillars needed to implement the list of initiatives identified in Stage 3. These pillars are classified into administrative, legislative, or technological through guideline 4.4. The literature about the structuring pillars are predominantly about

technological architectures (Baheer et al., 2020), but they are usually dependent of additional administrative or legislative aspects to complement those structures (Rabaiah & Vandijck, 2009). The administrative structure pillar can be a new government unit, sector, or organisational function that should be created because it is necessary to execute some initiative. An example of an administrative structuring pillar is a new team to support the digital transformation of public services. A legislative structuring pillar can be a new law or a regulatory framework, such as digital identification legislation. A technological structuring pillar, such as an interoperability platform, is a necessary ICT structure. These structures can be common for a range of initiatives, which is an opportunity for sharing services and resources. Existing government ICT solutions can be identified through guideline 4.5, improved, and converted into a technological structuring pillar. Other opportunities for sharing structuring pillars are unveiled during the execution of guideline 4.7.

Finally, **Stage 5 – Definition of Implementation and Evaluation Plans** is meant to establish a plan with the strategic initiatives and respective timeline, definition of indicators, and evaluation criteria setting. The guidelines are inspired by the question, "How do we get there?" from Heeks and in Rabaiah and Vandijck's layer "Implementation Plan". Analysing the national EGOV strategies from Austria, Brazil, Chile, Mexico, the Netherlands, Thailand, and Turkey inspires Stage 5. A point of attention here is that most of these EGOV strategies present only an undetailed implementation plan, which will demand additional refinement during the strategy execution. Others do not present any implementation plan. The guidelines for this stage are listed in TABLE 10.

Table 10: Stage 5 Guidelines of the Method – Version 1.

Stage 5: Definition of Implementation and Evaluation Plans	
Id	**Guidelines**
5.1	Define a strategy agenda compatible with the country authorities' mandate and international rankings evaluation periods.
5.2	Prioritise the initiatives and the necessary structuring pillars according to a cost X benefit relationship.
5.3	Prioritise initiatives that impact citizens and businesses.
5.4	Inspire the evaluation procedures according to international rankings measurements.
5.5	Define evaluation milestones based on authorities' mandate deadlines and international rankings evaluation periods.

The implementation and evaluation plans should always be compatible with the country authorities' mandate. This prevents a new government from having to implement the policies of a previous government, which contributes to minimising risks to the strategy execution. Another valuable aspect is to make these plans compatible with the evaluation windows defined by international rankings producers because the strategy results could positively impact them. That is the main objective of guideline 5.1,

which looks for political sustainability when proposing its agenda of deliverables compatible with the end of political mandates and with international rankings evaluation periods. Guidelines 5.2 and 5.3 mean to establish a prioritisation process based on cost and benefit relationships and the impact on citizens and businesses. Guidelines 5.4 and 5.5 prescribe evaluation procedures suggesting that they should follow international rankings measurements and respective evaluation periods. It also suggests that they should follow the period of political mandates.

The presentation of these five stages and respective guidelines completes the development process in the first iteration. It was designed following the desired features of the method determined in activity "B". Recapping: the method should be **flexible**, i.e., adjustable to the country context; **instructive**, i.e., support the learning process and the association of rankings characteristics to EGOV purposes/facets; **easy to use**, i.e., simplify the use of international rankings in EGOV strategy formulation; **comprehensive**, i.e., broadly cover the EGOV purposes; **co-creative**, i.e., enable the participation of multiple stakeholders; **effective**, i.e., deliver an EGOV strategy after a complete formulation process.

To be **flexible**, guidelines present in Stage 1 allow capturing the *status quo* of EGOV. All guidelines from this stage are virtually applicable to any country, with minimum adjustments made by the team involved if necessary. Stages 2 to 5, which use outputs produced in Stage 1 as inputs, are also designed to be executed by the team independently of the country's context.

To be **instructive**, the outputs of guidelines 1.9, 1.10, and 1.22 from Stage 1 are used in Stage 3, guideline 3.3. The same set of guidelines will make the method **easy to use.** These guidelines' prescriptions are listed below:

- Guideline 1.9: Identify EGOV expectations among the country's authorities, politicians, and citizens.
- Guideline 1.10: Identity from key actors and key institutions, their priorities, expectations, and international references about EGOV initiatives and technologies.
- Guideline 1.22: Identify and explore important international rankings according to the country's key actors.
- Guideline 3.3: Define thematic areas to the public services according to the selected initiatives. Harmonise the choice with country context and international rankings benchmark areas.

The method allows the country's diagnostic in Stage 1 to be **comprehensive**. It generates outputs used in the following stages, namely **Stage 2 – Definition of Vision and Principles** and **Stage 3**

– Choice of Thematic Areas and initiatives. Stage 4, with the necessary structuring pillars, and Stage 5, with the plans, will support the reach of the strategic vision and strategic initiatives produced in Stages 2 and 3. The following guidelines have been selected to demonstrate the contribution of the method to cover the EGOV purposes:

- To the EGOV purpose "Improve the relationship between citizens and businesses with the Public Sector": Guideline 1.5 "Identify partnership opportunities between government agencies with the private sector, universities, and international institutions".
- To the EGOV purpose "Make the government more efficient": Guideline 1.3 "Explore country economic vocations and niches."; Guideline 1.6 "Identify the maturity of IT governance in the public sector"; Guideline 1.11 "Identify relevant government information systems and respective databases."; "Guideline 1.12 "Identify and explore the government interoperability platform if it exists."; Guideline 1.13 "Identify government data warehouses."; Guideline 1.15, "Identify opportunities to share the back office and technological services in the public sector"; and Guideline 1.20 "Identify EGOV technological trends that are compatible with the country context."
- To the EGOV purpose "Improve service delivery": Guideline 1.16, "Identify and explore inhibited demand and its causes, especially those related to services cost."; Guideline 1.19 "Identify and explore those public services provided by mail service or telephone."
- To the EGOV purpose "Make the government more accountable": Guideline 1.17, "Identify and explore the existence of government assessment procedures."

The method enables the participation of multiple stakeholders to be **co-creative** through Stage 1, guidelines 1.4, 1.8, 1.9, 1.10, 1.14, and 1.18. Outputs of these guidelines are used as inputs in the following stages, collaborating with the co-creativeness of the method. The following stages will be the outputs of these guidelines to also aim for the co-creativeness characteristic. These guidelines are reproduced below:

- Guideline 1.4: "Uncover how citizens consume and evaluate the provided basic services, like water and energy supply, telecommunications, garbage collection, property registration; driver's license issues; and others".
- Guideline 1.8: "Explore the citizen perception of public service delivery".

- Guideline 1.9: "Identify EGOV expectations among the country's authorities, politicians, and citizens".
- Guideline 1.10: "Identify, from key actors/key institutions, priorities, expectations, and international references about EGOV initiatives and technologies."
- Guideline 1.14: "Identify public officials' level of knowledge and competencies in EGOV."
- Guideline 1.18: "Identify and explore EGOV opportunities in the Legislative and Judiciary branches. Explore independent institutions like those involved in the electoral system, the public prosecution service, security forces, and other institutions."

Finally, the method delivers an EGOV strategy after a complete formulation process and is **effective.** It uses the outputs from Stage 1 to allow the formulation of the strategy content in the subsequent stages. It includes the strategic vision through Stage 2, strategic initiatives grouped by thematic areas through Stage 3**,** and the necessary structuring pillars through Stage 4. These complete the strategy formulation process. Stage 5 produces a basic action plan. It is not a classic content of a strategy but will facilitate the construction of a proper action plan, facilitating the implementation and monitoring of the strategy.

The development of the **Method – Version 1** has been described in this section, thus concluding the Chapter. In the following Chapter, its application in a real case will be described, and the Method – Version 2 will be developed following the research design.

5. From the Application of Version 1 to the Development of Version 2

5.1. Introduction

This chapter describes the second Iteration of the method development, from the application of version 1 to the development of version 2. It starts by applying the Method – Version 1 in the formulation of the EGOV strategy of São Tomé and Príncipe, followed by the evaluation of this application and concluding with the development of the Method – Version 2. It comprises the activities represented in the highlighted part of FIGURE 22.

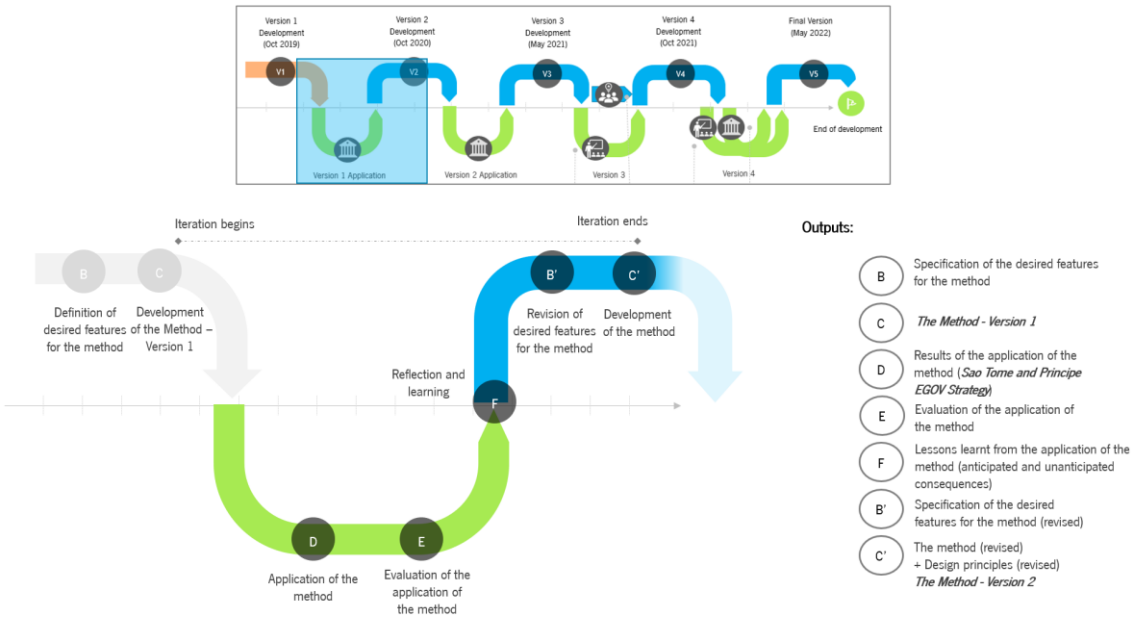


Figure 22: The 2nd Iteration, concerning the development of the Method – Version 2. Developed by the author.

More appropriately, the chapter describes activities "D", "E", and "F" for the application of the Method – Version 1. According to the research design, the development of the new version occurs after reviewing the desired features in activity "B". Then, in activity "C", the **Method – Version 2** is developed with the generation of the corresponding Design Principles.

5.2. Application of the Method – Version 1

Activity "D" is dedicated to applying the method in formulating the "Digital Governance Strategy of São Tomé and Príncipe". São Tomé and Príncipe, the "island in the middle of the world", is an archipelago formed by two islands and some islets under the equator line in the Guinea Golf, approximately 300 kilometres from the African occidental coast. It has a predominantly young population, totalising 220 000 people in 2020. The country has a natural vocation in tourism and produces quality cocoa, making it known as the "chocolate island". The development of EGOV started in 2002 but never reached high-level standards, mainly because of a lack of planning and periods of political instability. Since then, many efforts have been conducted to digitalise the back office, usually in silos-projects without a holistic vision or a citizen-centric approach. This approach limited EGOV development in the archipelago and impacted the country's performance in international rankings indexes, such as the United Nations eGovernment Development Index – UN/EGDI, for years.

However, the country achieved substantial milestones such as the institutionalisation of the Government Chief Information Officer, the Personal Data Protection Agency, and a centralised citizen database. To enhance these results, the government decided to formulate a national EGOV strategy after a complete diagnosis. A team was formed by UNU-EGOV researchers and public officials from the country represented by INIC – Instituto de Informação e Conhecimento (*INIC – Institute of Information and Knowledge*). The researchers were responsible for using the **Method – Version 1** to formulate a strategy and actively participate in the formulation process with local public officials. In parallel, the researchers examined the generalisation of the "instance of the problem" to improve the artefact. The public officials were responsible for following the guidelines provided by the researchers in each stage, sourcing the necessary information and country data, including those that demand communication with other public officials. They also actively participated in the formulation process. Feedback on the method was the responsibility of both groups.

The activity was initiated in August 2019, and a strategy draft was delivered in December of the same year. INIC officials joined the UNU's office on two different occasions, one at the end of August and the second at the beginning of October. The kick-off meeting started the diagnosis and context analysis. The occasion was used to harmonise core concepts and familiarise the set of EGOV purposes within the group. This meeting started by identifying relevant international rankings for the country, listing the United Nations E-government Development Index and the World Band Worldwide Governance Index. The group defined the EGOV history, the population pyramid, the country's national programs and plans,

and an inventory of existing EGOV structuring pillars as the initial inputs for **Stage 1 – Diagnosis and Context Analysis**. Although not fully explored by the country, tourism was identified as an economic vocation. Cabo Verde and Mauritius have been suggested as countries of reference. ICT silos within the public administration have been identified as a risk to the strategy's sustainability.

Other sources of information emerged during the execution of Stage 1. Two questionnaires were applied to 80 EGOV focal points in the country. In addition, virtual meetings were held with selected representants of the following government units: the Ministry of Education, the Ministry of Health, the Ministry of Finance – Fiscal Area, the Ministry of Finance – Customs Area, the Ministry of Labour, the Ministry of Agriculture, the Social Security National Institute, the Directorate of Notary Registers, the Directorate of Tourism, and the Directorate of Economic Activities Control. One of the meetings had, simultaneously, representatives from two government units. These meetings were organised to gather information according to the 22 guidelines of Stage 1.

These meetings allowed the team to raise information about relevant public services according to citizens' perceptions, like those related to the health system, social security, and education. Priorities for digital transformation and new public service opportunities have also been explored. In addition, possibilities for automating medical records, online scheduling of medical appointments, proof-of-life for continuing payment of social security pensions, grant of maternity allowance, online issue of birth/death certificates, and the issue of the new student card with associated benefits, such as public transport support.

Opportunities to enhance the maturity of IT governance in the public sector and the capacity building of IT employees were identified. Transparency and accountability initiatives were unveiled, like the possibility of launching a Transparency Portal and an Electronic Participation Portal. By exploring official documents and international reports, the team was able to understand the country's EGOV history. The diagnosis revealed the predominance of informal services provision, the risks associated with public policies, and the government financial situation related to international funding dependency.

The following rankings have been selected according to the key actors: World Bank Worldwide Governance Index; United Nations E-Government Development Index; World Bank Doing Business Report; and United Nations World Happiness Report. Strong points of the EGOV context were the existence of an agency for personal data protection, the informatisation level of social security data, and the ICT level of the Central Bank and the Ministry of Finance. Finally, to conclude data and information collection, INIC public officials who were members of the strategy formulation team acted as a source.

Following **Stage 2 – Definition of Vision and Principles**, the strategic vision has been set as "Articulate the goals of public policies across different governance sectors for the digital transformation of the public administration and mobilising the material and human resources necessary for its implementation". Although this vision does not directly use the term EGOV, it is compatible with a context in which the government still needs to assure ICT units' governance, articulate their goals, and orchestrate resources to reach the digital transformation of public administration. Stage 2 also resulted in the set of strategic principles: clear institutional commitment; robust and cohesive leadership; sustainable investment plan; favourable international partnerships; shared resources and services; public services digital by default. These principles guided the subsequent stages of the formulation process, framing the strategic initiatives that would contribute to achieving the strategic vision. For example, once a "robust leadership" is expected, no independent initiatives sponsored by a government agency should proceed. Initiatives in partnership with international institutions should have their benefits to the country pre-checked in terms of sustainability. Independent data centres, for example, should be avoided concerning the principle of shared technological resources. Finally, all initiatives should be sponsored by a robust and cohesive leadership, not necessarily laid in a single institution, but as a representative committee concerted by all political forces.

The execution of **Stage 3 – Choice of Thematic Areas and Initiatives** allowed the definition of 74 strategic initiatives in 9 thematic areas: Health; Education; Fiscal and Tax; Social Security; Environment; Tourism; Justice and Citizenship; Work and Employment; and Agriculture, Livestock, and Fishing. These thematic areas have been chosen based on the initiatives corresponding to the current government administrative structure. These initiatives were inspired by the information gathered in Stage 1, including data related to the selected international rankings.

The initiatives that accounted for international rankings were identified using the following procedure. First, rankings dimensions representing its benchmarking areas were identified, as depicted in FIGURE 23.

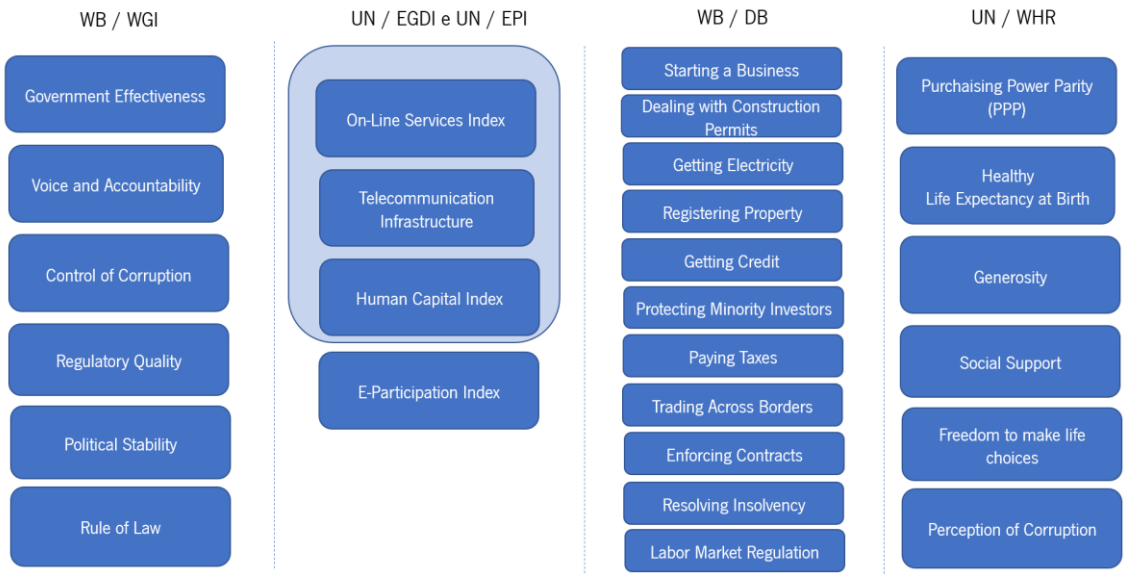


Figure 23: Analysis of International Ranking Components during the formulation of the São Tomé e Príncipe EGOV Strategy.

These dimensions were filtered and harmonised with EGOV purposes and country context. This process is demonstrated in Figures 24 and 25.

Figure 24: Selection of international rankings' components according to the country context and EGOV purposes.

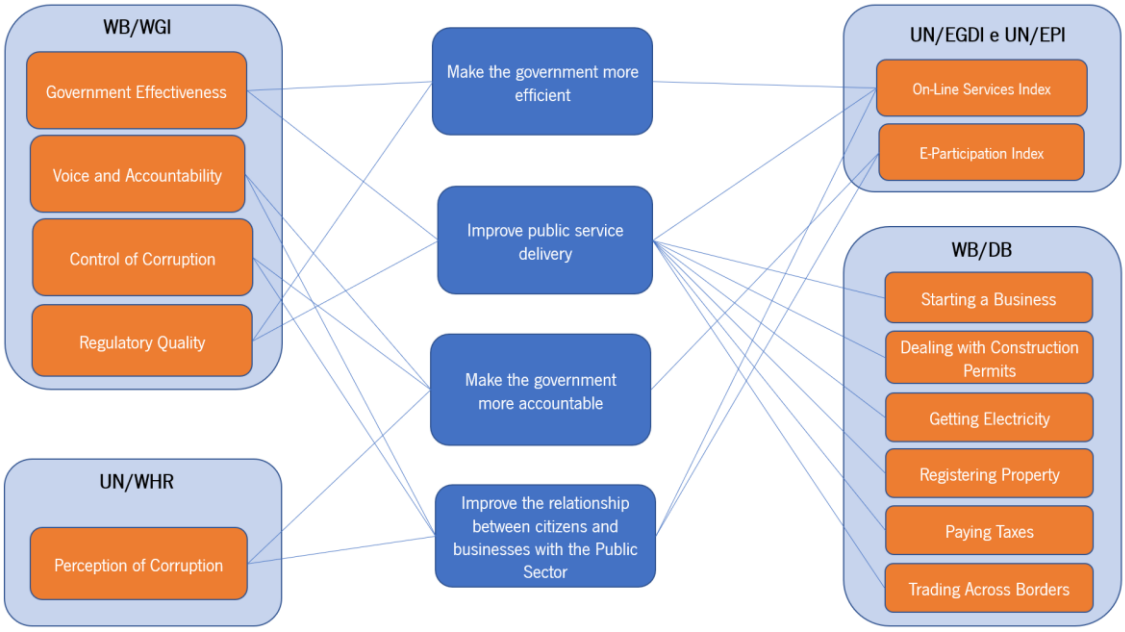


Figure 25: Link between international rankings' components and EGOV purposes.

According to the literature review, EGOV's purposes include 1) Make the government more efficient; 2) Improve public service delivery; 3) Make the government more accountable; 4) Improve the relationship between citizens and businesses with the public sector. So, these purposes were related to select components of the World Bank Worldwide Governance Index, United Nations World Happiness Report, United Nations E-Government Development Index and World Bank Doing Business Report. These relations support identifying Online Tax Services as a strategic initiative, inspired by the Government Effectiveness dimension of the World Bank Worldwide Governance Index. This strategic initiative was also inspired by the On-line Services dimension of the United Nations E-Government Development Index. It was also inspired in the EGOV purpose of "Improve public service delivery".

Another strategic initiative from this process was the online publication of social security costs and benefits, inspired by the World Bank Worldwide Governance Index's dimension Control of Corruption. This initiative was also inspired by the United Nations World Happiness Report's dimension of Perception of Corruption; and, in the EGOV purpose, "Make the government more accountable".

Stage 4 – Identification of Structuring Pillars supports the definition of structuring pillars organised into three classes: administrative, legislative, and technological. Structuring Pillars act as enablers of the initiatives produced in the previous stage. The Service Simplification Team is an example of an Administrative Structuring Pillar. It is dedicated to supporting the digital transformation in the public sector in the dematerialisation of working processes and its simplification and digitalisation. A

legal and regulatory framework for the institution of the digital signature is an example of the Legislative Structuring Pillar. An Interoperability Platform that will support the requirements for integrating existing or new digital services is an instance of a Technological Structuring Pillar.

Stage 5 – Definition of Implementation and Evaluation Plans supported the definition of the implementation and the evaluation plans, comprising a timeline for executing the 74 initiatives along the strategy period of 2020-2024. The structuring pillars have been prioritised according to the number of supported initiatives. An evaluation plan has also been set for the period, designed to be compatible with international rankings measurements and evaluation windows.

The execution of the five stages completed the strategy formulation. After that, the document was appreciated by the Council of Ministers advisory board in December 2019. A round of validation procedures followed, including a formal presentation by the strategy formulation team for public officials and government authorities in January 2019. A period of critics and contributions occurred until March 2020. The document received the final adjustments from April to June, with the Council of Ministers approving the final version in June 2020. The official document is available in the following URL: https://inic.gov.st/estrategia_planos.php

5.3. Evaluation of the Application of the Method – Version 1

Activity "E" is dedicated to the "Evaluation of the application of the method". As the artefact has been applied to a particular case, the São Tomé and Príncipe EGOV strategy formulation is now the opportunity to proceed with evaluating this case. It is not yet the time for the evaluation to expand the learning knowledge to a broader class of problems. This evaluation will occur in the next section, in Activity F.

The Activity E evaluation was supported by the researcher's reflection about the experience, recorded in research books along with the journey. The evaluation was also supported by interviews with public officials and discussions within the researchers' team. Excerpts of the interview are used when necessary and are quoted.

According to the interviewees, the partnership with the academia supported a better reception of the strategy among government members. It was recognised as "responsible for including scientific aspects and academic sustainability into the document". The diagnosis and context analysis stage allowed the

strategy content to be “rooted in the national context”. “Weak” points were considered the “lower participation of certain government sectors during the diagnosis”, especially in quantitative sourcing data about the public services demand. This lower participation was noted during the validation procedures as well. However, public officials who accepted the invitation to support the creation of the strategy recognised the opportunity, ratified the strategy's final content, and gave positive feedback. It shows that the method can be improved regarding co-creation aspects, maybe with practical guidelines suggesting a SWOT workshop involving multiple stakeholders.

“Strong points” were identified in the journey. At the beginning of the formulation process, INIC officials' expectations were limited and restricted to the governance of IT units, as they were dispersed in many government agencies without a unified direction. It directed the initial focus of country public officials in formulating an IT strategy without any relationship with public services delivery. The expectations were exceeded with the academic support and the use of the new method. “The demand for innovative, digital, and improved public services will certainly impact IT investments and technological structuring pillars”. Oppositely, “starting with investments in IT and technological structures would not impact public service delivery”. This new approach confirmed “why past efforts occurred without impacting society, once the focus was on internal administration, not service delivery”. This result can be related to the comprehensiveness aspects of the method.

Regarding the international rankings, the impact on these indexes was classified by interviewees as “desirable, but not mandatory”. It was recognised that the goal of the strategy should be “the social-economic impact, people’s quality of life, bringing better opportunities to citizens and businesses”. International rankings, however, must not be put aside, “especially because the country’s financial dependency and the importance of these benchmarking studies between international donors and foreign partners”. Interviewees confirmed that “although they should not be the single source of information, they are indeed strategic, and we should always take them into account during a strategy formulation process”. Public officials from many government units learnt about their characteristics and agreed to use the adaptation of their measurements as the strategy content. It can be related to some aspects of the method, like the ease of use and instructiveness.

Another conclusion regarding the method and the rankings, at least from the researcher's perspective, is that the method should take into account international rankings, despite being purely based on them. Not having these rankings as a single source of strategy content is an asset of the method. Another

conclusion is that the method should not depend on specific rankings but be flexible dimensions and measurements of any ranking.

The method also presented some limitations in its execution in São Tomé and Príncipe. It demanded specialised support during all stages and guidelines. In the current version, it was not feasible for public officials to perform alone following the method. In this aspect, opportunities to improve the method could include descriptive techniques for gathering data, forms, questionnaire samples, and maybe a tutorial about common characteristics of international rankings, such as evaluation windows, dimensions and measurements, publication periods, and others. The exploration of international rankings also shows that some of them, or their dimensions and measurements, do not make sense when paired with the country's context. The tutorial should cover this aspect.

Finally, applying the method resulted in an EGOV strategy formally approved by the Council of Ministers, which confirmed its effectiveness. The strategy formulation team presented the final version in an official meeting of the Council of Ministers. On that occasion, the Strategic Committee of Digital Governance had been institutionalised, offering the necessary political support for the strategy execution. This structure was part of the strategy content, which is crucial to the sustainability and execution of the strategy.

5.4. Reflection and Learning

Activity "F" is dedicated to "Reflection and Learning". In this activity, the research moves from conceptually building a solution for a particular instance to applying that learning to generalisation. Activity "F" results in anticipated and unanticipated consequences of using the artefact. These statements will support updating the method to the next version, generating the corresponding design principles. In a brief recap, these "design principles" formalise the learning resulting from the application in this case. It will occur in Activity C, detailed ahead.

The formulation of the São Tomé and Príncipe EGOV Strategy using the **Method – Version 1** allows the opportunity to "Reflect and Learn" that will feed the next iteration of the artefact. The process has been framed by the desired features of the artefact, expecting that it should be **flexible**, i.e., adjustable to the country context; **instructive**, i.e., support the learning process and the association of rankings characteristics to EGOV purposes; **easy to use**, i.e., simplify the use of international rankings in EGOV strategy formulation; **comprehensive**, i.e., broadly cover the EGOV purposes; **co-creative**, i.e.,

enable the participation of multiple stakeholders; **effective**, i.e., deliver an EGOV strategy after a complete formulation process.

During the strategy formulation process, the researcher assessed the presence or absence of these characteristics as participating in the EGOV strategy development. This process was complemented by interviews with government officials who were part of the team. Respondents' answers were used to assess specific features according to the question, but they were used to evaluate other features depending on the content. TABLE 11. presents the questions used in the interview. Q1 is a general question that starts the interview and can unveil any desired characteristics. Other questions evaluated the desired characteristics of the method.

Table 11: Questions used in the interviews.

Number	Question	Evaluated Feature
Q1	How do you evaluate the method used in formulating the São Tomé e Príncipe EGOV strategy? Please list strong and weak points.	General
Q2	Do you believe that the method was effective? Please, justify your answer	Effectiveness
Q3	Do you evaluate the use of international rankings adequate during the diagnosis and context analysis stage? Please, feel free to make any criticisms and suggestions.	Effectiveness Flexibility
Q4	International rankings were used to build the evaluation plan during the strategy formulation process. Do you think it was adequate? Please, feel free to make any criticisms and suggestions	Effectiveness
Q5	International rankings dimensions were selected according to the EGOV purposes during the strategy formulation process. Do you think it was adequate? Please, feel free to make any criticisms and suggestions.	Comprehensiveness Instructiveness
Q6	International rankings were used to choose strategic initiatives during the strategy formulation process. Do you this it was adequate? Please, feel free to make any criticisms and suggestions	Effectiveness
Q7	Do you believe other countries can use this method?	Flexibility
Q8	Do you believe the use of this method was simple?	Ease of Use
Q9	Do you agree that the method allowed the participation of multiple stakeholders?	Co-creativeness

Answers to these questions allowed the reflecting and learning process and revealed anticipated and unanticipated consequences. When necessary, excerpts from interviews are quoted.

- Anticipated Consequence AC1: the method effectively delivered the country's EGOV Strategy, which can support government investments in technology and international fundraising. It occurred because "the strategy content considered international rankings characteristics, valued criteria to international partners". The method was also evaluated as "practical and coherent" due to its strategy formulation process, including a diagnosis and context analysis,

defining a vision and principles, choosing thematic areas and initiatives, and identifying the necessary structuring pillars. It reinforced confidence that the method is **effective**.

- Anticipated Consequence AC2: the method provided a strategy formulation process that "can be followed by other countries, especially those reliant on international funding". It reinforced confidence that the method is **flexible.**
- Anticipated Consequence AC3: a method that considers international rankings is important for a country reliant on international funding. Multilateral agencies are usually involved in funding and providing value to international rankings scores and indexes because they are an essential and independent benchmarking of a particular country, in this case, São Tomé and Príncipe. The country's officials know this scenario but do not know how the rankings work, nor their features, dimensions, measurements, evaluation window, and publication intervals. The method facilitates this process, which has reinforced confidence that the method is **easy to use.**
- Anticipated Consequence AC4: the Stage 1 Diagnosis and Context Analysis allows the team to choose any international rankings depending on the key-actors opinion (Guideline 1.22). Key actors from São Tomé and Príncipe chose two rankings: the United Nations E-Government Development Index and World Bank Ease of Doing Business. The United Nations Happiness Report and World Bank Worldwide Governance Index were chosen based on the EGOV expectations of authorities, politicians, and citizens. It reinforced confidence that the method is **flexible** and **co-creative**.
- Unanticipated Consequence UC1: Stage 1 Diagnosis and Context Analysis does not suggest a technique to collect data. It allowed the group to choose both interviews and questionnaires for data collection. The number of filled questionnaires was low. It reinforced confidence that the method is **flexible but** attenuated the confidence that it is **co-creative**.
- Unanticipated consequence UC2: Stage 1 Diagnosis and Context Analysis does not have a specific guideline to raise the country's population pyramid. Despite it, this information was raised and useful during defining initiatives according to citizens' age group. It reinforced confidence that the method is **flexible** but indicated that Stage 1's guidelines should be updated.

- Unanticipated consequence UC3: Stage 1 Diagnosis and Context Analysis does not have a specific guideline for EGOV purposes. It demanded support from the researcher. It attenuated the confidence that the method is **comprehensive**.
- Unanticipated consequence UC4: Stage 3 Choice of Thematic Areas and Initiatives does not have a specific guideline for raising initiatives steamed from the international rankings, although this occurred during the execution. However, government officials supported by the researchers defined initiatives using rankings measurements as a source. "Some of them suggest new initiatives, but none of those based on international rankings has been dismissed". It reinforced confidence that the method is **easy to use** but attenuated the confidence that is **instructive.**
- Unanticipated Consequence UC5: Stage 5 Definition of Implementation and Evaluation Plans produced weak and immature plans. Regarding government staff, money and time, the resource allocation per initiative can only be done after the strategy has been approved, and a rigorous evaluation plan depends on the implementation plan. Therefore, it seems that the ideal solution is to produce independent documents. First, the EGOV strategy first; then its implementation and the evaluation plans. It attenuated the confidence that the method is **effective,** although it did not prevent concluding the strategy formulation.
- Unanticipated Consequence UC6: there were government areas that did not take part in validating the EGOV strategy. It was related to the culture of local officials, who understand that this process should involve only high-level officials or politicians. It indicates that the process should also include guidelines to allow co-participative validation. It attenuated the confidence that the method is **co-creative** and indicated an opportunity to update the process.
- Unanticipated Consequence UC7: the Method demanded support from the researchers most of the time. For example, the execution of guidelines 1.9, 1.22 and 3.3 allow public officials to learn about international rankings by simplifying their use in the strategy formulation. Still, without the support from the researchers' team, such would not happen: "The EGOV strategy has been developed with full interaction with the researchers, which could make our perception about the easiness of using the method. In this context, the method was straightforward to use". It attenuated the confidence that the method is **instructive** and **easy to use.**

5.5. Revision of the Desired Features for the Method – Version 2

Activity "B'" is dedicated to revising desired features for the method after the activity of reflecting and learning. By now, as the evaluation process of the **Method – Version 1** did not receive any feedback that justifies changes in the initial set of desired characteristics, this will remain the same. The method should be **co-creative, comprehensive, easy to use, effective, flexible,** and **instructive**.

5.6. Developing the Method – Version 2 and Formalisation of Learning

Activity "C'" is dedicated to developing the **Method – Version 2** and generating the corresponding **design principles**, which characterise the formalisation of learning. The statements representing the anticipated and unanticipated consequences of the application of the **Method – Version 1**, part of its evaluation, are crucial to developing the **Method – Version 2**. Another input is the scientific literature, updated from the one used in version 1. It resulted in the second version of the method, composed of five stages, each formed by specific guidelines. These guidelines are also different from those in the prior version. Version 2 maintained the scientific literature used in the last version and was complemented with the concepts of "strategy process" from Mintzberg and Quinn (Mintzberg & Quinn, 1996) and "strategy content" from Andrews et al. (Andrews et al., 2009). The "strategic framework" from Mkude and Wimmer (Mkude & Wimmer, 2013) inspired the update of the method stages. According to Mintzberg and Quinn, the sequence of five stages is now formally referred to as the "Strategy Formulation Process" (Mintzberg & Quinn, 1996). Stages output is referred to as "Strategy Content"(Andrews et al., 2009). The Strategy Formulation Process of the method, composed of five stages, is illustrated in FIGURE 26.

Figure 26: The Strategy Formulation Process of the Method - Version 2. Developed by the author.

Stage 1 – Diagnosis and Context Analysis maintains the same name as the previous version and uses the question "Where are we now?" (Heeks, 2006a) as inspiration.

Stage 2 – Definition of Vision has the name changed. The definition of strategic principles, present in Version 1, is now optional. The stage is still based on Rabaiah and Vandijck (2009), but also in Mkude and Wimmer (2013) framework, component "Vision". This framework is depicted in FIGURE 27. The inspiration for the question "Where do we want to get to?" (Heeks, 2006a) is still valid.

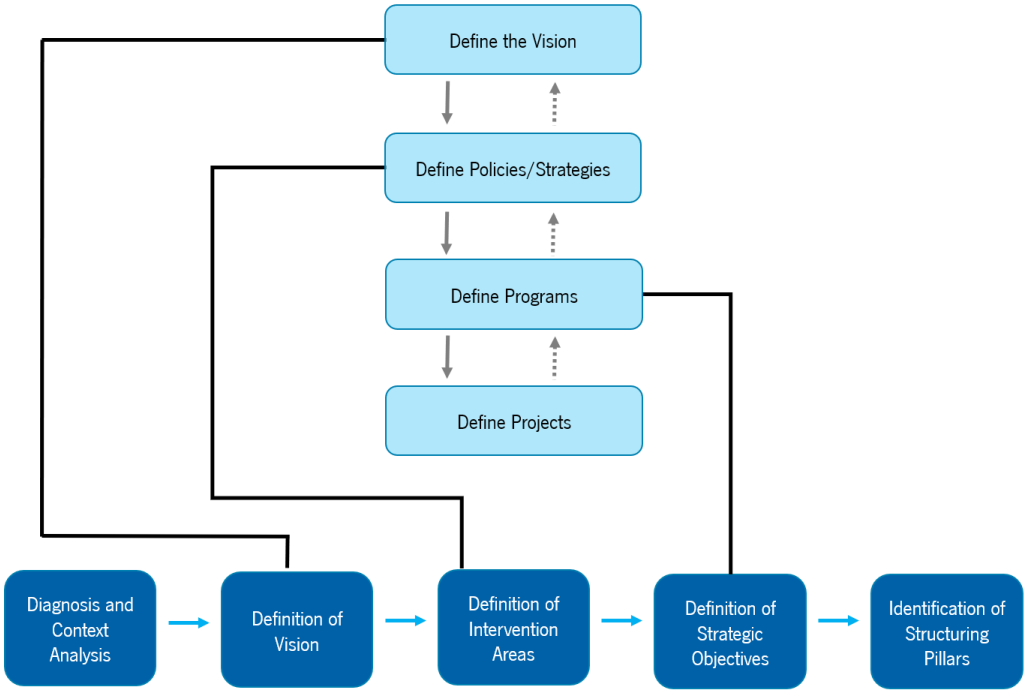


Figure 27: Adaptation of the Strategic Framework of Mkude and Wimmer, used to develop the Method – Version 2.

Stage 3 – Definition of Intervention Areas has been renamed. The new name seems adequate as it lists the areas that demand some "intervention" to reach the strategic vision.

The list of initiatives changed to "strategic objectives" and is defined in the new **Stage 4 – Definition of Strategic Objectives**. The inspiration comes from the question, "How do we get there?" (Heeks, 2006a). It also comes from Mkude and Wimmer (2013), who argue that the implementation of objectives will "reflect the overall vision (p.157)". Inspiration is also based on Rabaiah and Vandijck's layers, which are now reinterpreted to substitute "prioritised initiatives" for "objectives", as these authors do not conceptually differentiate both concepts.

Finally, **Stage 5 – Identification of Structuring Pillars** remains the same as version 1, based on Rabaiah and Vandijck (2009) and the question "How do we get there?" (2006a).

All the guidelines have been updated based on the Unanticipated Consequences UC1, UC6 and UC7 from the evaluation of version 1. Other Unanticipated Consequences and Anticipated Consequences

modify these guidelines and are highlighted according to the specific case. Guidelines remain inspired in the content of the selected national EGOV strategies, which instigated the prior version.

The five stages of the **Method – Version 2** and the respective guidelines are described in TABLES 12 to 16. There is a reference for the previous guideline and a recommended technique to support its execution. Instruments associated with the recommended techniques and instruments are also provided in FIGURES 28 to 33.

Table 12: Stage 1 Guidelines of the Method – Version 2.

Stage 1: Diagnosis and Context Analysis	
Guideline 1.1: Uncover the country's EGOV history by exploring former strategies, plans and/or roadmaps in digital areas (EGOV, Telecommunication, ICT, Cybersecurity, and others). Find out what accomplishments and deliverables were achieved through these strategies and plans. Find out what was not yet accomplished and/or delivered but is still relevant to address through the new EGOV strategy. Explore trends and shortfalls from selected international rankings through longitudinal data (10 years).	
Former guideline(s)	Guideline 1.1 (v1)
Recommended technique	Document Analysis (Instrument A)
Expected output	"EGOV History", "National Context, and "International Context" sections in the Diagnosis and Context Analysis Chapter
Guideline 1.2: Uncover the country's current strategies, plans and/or roadmaps within the government. Find out what can be supported by EGOV initiatives and what is relevant to address them through the new EGOV strategy.	
Former guideline(s)	Guideline 1.1 (v1)
Recommended technique	Document Analysis (Instrument A)
Expected output	"National Context" section in the Diagnosis and Context Analysis Chapter
Guideline 1.3*: Using EGOV purposes and facets* as a backdrop, explore key-actors opinion about: a) political and financial risks to the strategy sustainability; b) country economic vocations and niches; c) partnership opportunities between government branches, government agencies, the private sector, universities, and international institutions; d) country dependency of financial support/loans/donations; e) expectations and priorities of EGOV efforts, Executive Government Agencies, Judiciary and Legislative branches, Independent Institutions, Public Prosecution Services, Electoral System, Security Forces, and all others that impact the citizens life as public services providers; f) international references about EGOV initiatives and technologies; g) past country's crises that impacted public policies and their causes; h) international rankings that are important and relevant according to the country context; and i) *status quo* of government internal procedures and administrative processes. * EGOV purposes/facets: 1) Make the government more efficient; 2) Improve public service delivery; 3) Make the government more accountable; 4) Improve the relationship between citizens and businesses with the public sector. *This guideline has been updated due to the Unanticipated Consequence UC3.	
Former guideline(s)	Guideline 1.2; 1.3; 1.5; 1.7; 1.9; 1.10; 1.18; 1.21; 1.22 (v1)
Recommended technique	Semi-structured interview (Instrument B) and SWOT Analysis (Instrument E)
Expected output	"EGOV History", "National Context, "International Context", and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter
Guideline 1.4: Uncover how citizens perceive, consume, evaluate, and expect the delivery of public services. Also uncover inhibited demand between citizens and causes. Identify back-office shared structures (existing and potential) that support the public service delivery. If possible, make an inventory of all services the public sector offers.	
Former guideline(s)	Guideline 1.4; 1.8; 1.15; 1.16; 1.19 (v1)
Recommended technique	Public Service Inventory (Instrument C) and SWOT Analysis (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.5: Identify the status of ICT governance in the public sector, including EGOV-related issues: a) ICT administrative organisation within the government; b) existing assessment procedures; c) ICT and EGOV-related legislation and regulatory framework.	
Former guideline(s)	Guideline 1.6; 1.11; 1.17 (v1)
Recommended technique	Document Analysis (Instrument A), ICT Infrastructure and Governance Inventories (Instrument D) and SWOT Analysis (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter
Guideline 1.6: Identify the status of ICT infrastructure in the public sector, including a) telecommunications infrastructure; b) existing interoperability initiatives/actions/platforms; c) information systems and data infrastructure; d) shared ICT services (existing and potential); e) expectations and trends that are compatible with the country context.	
Former guideline(s)	Guideline 1.12; 1.13; 1.15; 1.20 (v1)
Recommended technique	Document Analysis (Instrument A), ICT Infrastructure and Governance Inventories (Instrument D) and SWOT Analysis (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter
Guideline 1.7: Identify the EGOV literacy level of public agents and citizens.	
Former guideline(s)	Guideline 1.14 (v1)
Recommended technique	SWOT Analysis (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter
Guideline 1.8*: Explore the country's profile, including the current population pyramid, economic *status quo*, geography, and Internet use rates (and access type). *This guideline has been created due to the Unanticipated Consequence UC2.	
Former guideline(s)	-
Recommended technique	Document Analysis (Instrument A)
Expected output	"EGOV History", "National Context, and "International Context" sections in the Diagnosis and Context Analysis Chapter

Table 13: Stage 2 Guidelines of the Method – Version 2

Stage 2: Definition of Vision	
Guideline 2.1: Define a pragmatic and realistic strategy vision, a statement that represents the country's EGOV future.	
Former guideline(s)	Guideline 2.1 (v1)
Recommended technique	Document Analysis (Instrument A)
Expected output	The "Strategic Vision"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges"
Guideline 2.2: If necessary, choose the strategy principles that will guide the formulation process, supporting, framing, and clarifying the chosen of paths to achieve the strategic vision.	
Former guideline(s)	Guideline 2.2 (v1)
Recommended technique	Document Analysis (Instrument A)
Expected output	The "Strategic Principles"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges"

Table 14: Stage 3 Guidelines of the Method – Version 2

Stage 3: Definition of Intervention Areas	
Guideline 3.1: Intervention Areas will organise the objectives and measures necessary to achieve the "Strategic Vision". To define an intervention area, analyse the information gathered during the Diagnosis and Context Analysis stage. International Rankings can also inspire the definition of an intervention area. The strategic objectives and measures will be defined in the next stage. When accomplished, intervention areas, objectives and measures inspired by international rankings can potentially impact a country's score in these rankings.	
Former guideline(s)	Guideline 3.3 (v1)
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of "Intervention Areas"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges" From Stage 2: "Strategic Vision", "Strategic Principles"
Guideline 3.2*: Analyse the dimensions and measurements of selected International Rankings and define a related Intervention Area, if necessary. Do it according to the country context, diagnosed in Stage 1. * This guideline has been created due to the Unanticipated Consequences UC4.	
Former guideline(s)	-
Recommended technique	International Ranking Analysis Tool (Instrument F)
Expected output	Set of "Intervention Areas"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context"

Table 15: Stage 4 Guidelines of the Method – Version 2

Stage 4: Identification of Strategic Objectives	
Guideline 4.1: Strategic objectives and measures are actions that should contribute to achieving the "Strategic Vision" defined in Stage 2. They are grouped into the respective "Intervention Areas" set defined in Stage 3. To define strategic objectives and measures, analyse the information gathered during the Diagnosis and Context Analysis stage.	
Former guideline(s)	Guidelines 3.1 and 3.2 (v1)
Recommended technique	International Ranking Analysis Tool (Instrument F)
Expected output	Set of "Strategic Objectives and Measures"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges" sections from the Diagnosis and Context Analysis Chapter From Stage 2: "Strategic Vision", "Strategic Principles" From Stage 3: "Intervention Areas"
Guideline 4.2*: Analyse the dimensions and measurements of selected International Rankings and define related strategic objectives and measures. Do it according to the country context diagnosed in Stage 1. * This guideline has been created due to the Unanticipated Consequence UC4.	
Former guideline(s)	-
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of "Strategic Objectives and Measures"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context" From Stage 3: "Intervention Areas"

Table 16: Stage 5 Guidelines of the Method – Version 2

Stage 5: Identification of Structuring Pillars	
Guideline 5.1: Structuring Pillars are structures that will support a set of strategic objectives and measures. They can and should be used in a logic of shared resources and are classified as Administrative, Legislative, and Technological. An Administrative Structuring Pillar is an organisational structure, such as a government sector, agency, or authority responsible for carrying on EGOV-related initiatives. To build the list of Administrative Structuring Pillars, examine the "Strategic Objectives and Measures" and propose sharing organisational structures such as a Team for Services Simplification, a Team for IT Design and Development, a Team for Capacity Planning and Development, a Government CIO, and others.	
Former guideline(s)	Guidelines 4.1 and 4.4
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of "Administrative Structuring Pillars"
Inputs from previous stages	From Stage 4: "Strategic Objectives and Measures"
Guideline 5.2: A Legislative Structuring Pillar is a regulatory structure such as a law, a decree or a regulation needed to set up and rule an EGOV initiative. Sometimes, Administrative and Technological Structuring Pillars also demand a regulatory framework in the form of a Legislative Structuring Pillar. To build the list of Legislative Structuring Pillars, examine the "Strategic Objectives and Measures" and propose sharing legislative structures such as an Electronic ID Legislation, a General Data Protection Regulation, a Cybersecurity Law, an EGOV Institutionalization Acts, an EGOV Governance Regulation, and others.	
Former guideline(s)	Guidelines 4.2 and 4.4
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of "Legislative Structuring Pillars"
Inputs from previous stages	From Stage 4: "Strategic Objectives and Measures"
Guideline 5.3: A Technological Structuring Pillar is an ICT technical structure necessary to support a set of EGOV initiatives. To build the list of candidates for a Technological Structuring Pillar, identify technical structures necessary to implement the proposed strategic objectives and measures, such as a National Public Services Portal, an Interoperability Platform, a Government Data Warehouse, a Government Data Centre, and others. Current government IT solutions, which are not yet shared between EGOV initiatives or used in government silos, can also be converted into a technological structuring pillar.	
Former guideline(s)	Guidelines 4.3, 4.4 and 4.5
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of "Technological Structuring Pillars"
Inputs from previous stages	From Stage 4: "Strategic Objectives and Measures"
Guideline 5.4: Explore the benefits related to the implementation of each structuring pillar. This analysis can be supported by associating each strategic objectives/measures with the necessary structuring pillar.	
Former guideline(s)	Guidelines 4.6 and 4.7
Recommended technique	Document Analysis (Instrument A)
Expected output	Graph of Structuring Pillars X Objectives and Measures
Inputs from previous stages	From Stage 4: "Strategic Objectives and Measures"

Instrument A

Document Analysis Technique

This instrument is a basic set of suggestions to proceed with a document analysis to formulate an EGOV strategy. The intention is not to be exhaustive but to support the strategists to read the collected documents following a simple and systematic set of rules, as follows:

1) Identify in the formal and official document: a) issuer institution; b) date of publication; c) formal content; d) official repository.
2) Identify which of the stages of the document's method will be used. Keep in mind the objective of each stage.
3) Remind the set of EGOV purposes: make the government more efficient; improve public service delivery; make the government more accountable; improve the relationship between the public sector and citizens and businesses. They are a filter if the document is compatible and useful for the EGOV strategy formulation.
4) Read the document carefully.
5) International rankings are special. Pay attention to the ranking process, evaluation windows, used dimensions and measurements, issuer institution, publication periods, and available data of the country and countries of reference.
6) In the draft of the strategy document, list the document(s) decided to be adequate to support that specific content of the strategy in each section. It is a draft, so there should be issues about making mistakes: having an extensive list of documents for each section is not incorrect.
7) Double-check the objective of each stage of the method. Each stage aims to produce specific content for the strategy document.
8) The draft will be refined many times. It is time to drop part of the selected documents during this process. It is also an opportunity to include new ones. It is a maturation process.

Figure 28: Instrument "A" to support the Document Analysis. Part of the Method – Version 2.

Instrument B

Key-actors Interview Guide

A preliminary step is to identify members of the key-actors set. The following questions are useful:

1) Who are the individuals who will approve the strategy?
2) Who will directly advise these individuals?
3) Who will be responsible for the strategy execution?
4) Which institutions will be involved in the strategy execution? Who within these institutions will be directly involved in the process?
5) Consider including in the key-actors group public officers from the Judiciary and Legislative branches, Private Sector, NGOs, and Government Institutions like the Public Prosecution Services, Electoral System, Security Forces, and other institutions.

After selecting the set of key actors, the following questions should be used during the interviews:

1) Which relevant objectives do you consider including in the EGOV strategy? Please consider opportunities to improve the government's internal procedures and administrative processes in your answer.
2) Which EGOV initiatives and technology use led by reference countries do you consider compatible with the context of your country and should be addressed in the strategy?
3) Which EGOV initiatives do you consider useful to support the country in overcoming current challenges?
4) Which EGOV initiatives do you consider useful to support the country in seizing current opportunities?
5) Which impact should EGOV initiatives bring to the country in the next years?
6) Which strengths and opportunities in the country's current context benefit the EGOV initiatives? Please consider in your answer the country's economic vocations and niches. Consider partnership opportunities between government branches, government agencies, the private sector, universities, and international institutions.
7) Which weaknesses and threats in the country context harm EGOV initiatives? Please consider the political and financial risks to the strategy sustainability in your answer, the country's dependency on financial support/loans/donations, and the country's crises that occurred in the past that impacted public policies and causes.
8) Which current international opportunities benefit the country's EGOV initiatives?
9) Which current international threats harm the country's EGOV initiatives?
10) Which EGOV purposes (*) should the country invest in the next years?
11) EGOV purposes: 1) Make the government more efficient; 2) Improve public service delivery; 3) Make the government more accountable; 4) Improve the relationship between citizens and businesses with the public sector.
12) Which international rankings do you consider important and relevant to the country's context? Do you agree that they should be considered when formulating the EGOV strategy?

Figure 29: Instrument "B" to support the Interviews. Part of the Method – Version 2.

Instrument C

Public Services Inventory

Proceed with the public services inventory according to the following table:

Informational Element	Kind of Answer
Category	Select a category of the list, or insert a new one if the existing list is not adequate to classify the public service
Coverage	National – if the service is available in the whole country International – if the service is available aboard Full – if the service is available national and international Local – if the service is available only at a specific locale in the country
Cost	Yes – there is a cost associated with the service No – the is no cost
Situation	Computer-assisted – a computer system supports the service Partial Computer-assisted – the service is supported partially by the system In the process of computer assistance – there is a system under development Traditional – no assistance from a computer system
Decentralised	Yes – the service is provided by other institutions besides the service owner institution No
Demand	High – taking into account other services provided by the institution, it is a highly-demanded service Medium – taking into account other services provided by the institution, it is an intermediary demanded service Low - taking into account other services provided by the institution, it is a low-demanded service
Public	Yes – the service can be demanded by any person on behalf of others No – the service can be demanded only by the user or a formal representative.
Performance	Good – capacity or performance is adequate to the users' expectations So far – capacity or performance is regular but can be improved. Insufficient – capacity or performance is below the users' expectations
Importance	High – the service is important for the institution, the country, or the users, and its modernisation is considered a priority Intermediate – the service has a moderated importance, and its modernisation should be considered Low – the service has no relevant importance, and its modernisation is not a priority
Ease to modernise	Easy – the conditions and necessary resources to modernise the service can be easily arranged. Intermediate – the conditions and necessary resources to modernise the service are moderate. Difficult – it is hard to gather the necessary resources to modernise the service.

Figure 30: Instrument "C" to support the Public Service Inventory. Part of the Method – Version 2.

Instrument D

ICT Infrastructure and Governance Inventories

1) Is there a national portal or a one-stop shop that offers public services to citizens and businesses?
2) Is there any other relevant portal that offers digital public services?
3) Are there authentication services that assure privacy and security to public service users?
4) Is there a digital identity service available in the country?
5) Is there an online service for public service complaints?
6) Is there a personal data portal that allows citizens to authorise/refuse personal data use by service providers?
7) Is a business portal allowing business owners to check and modify their data online?
8) Is there a platform for electronic payment of government taxes?
9) Is there an e-procurement portal?
10) Is there a government app where citizens and businesses can consume public services?
11) Is there a notification platform the government uses to communicate with citizens and businesses during public service provision (SMS, for instance)?
12) Is there an interoperability platform where different government institutions can exchange information to provide better public services?
13) Is there a government network restricted to public institutions?
14) For instance, is a data platform (a data warehouse) where government institutions can hold the necessary data and information for public service delivery?
15) Are there imminent risks or limitations in capacity and performance between government platforms, portals, or online services?
16) Is there an inventory of government information systems, tools, and applications? Is there documental support for them?
17) Is there a set of systems, tools, and applications to assure the government's cybersecurity?
18) Which systems, tools, and applications provided by the private sector can be part of the EGOV strategy?

Governance

1) Is there a Government Chief Information Officer, equivalent authority, or a committee with a similar role?
2) Is there a Digital Transformation Officer, equivalent authority, or a committee with a similar role?
3) Is there a formal government ICT strategy or an equivalent plan?
4) Is there an ICT procurement plan?
5) Which institutions are responsible for planning, deciding, implementing, and assessing government ICT initiatives?
6) Is there an ICT career within the public sector?
7) What was the government ICT budget for the last five years?
8) Is there an accountability report on ICT expenses for the last five years?
9) Are there formal ICT units in each government agency?
10) Is there an authority that solves conflicting ICT decisions involving different government agencies?

Figure 31: Instrument "D" to support the ICT Infrastructure and Governance Inventories. Part of the Method – Version 2.

Instrument E

SWOT Workshop Guide

The SWOT workshop is an event destinated to listening to key actors in a democratic and pluralistic environment. All of them will be able to speak and suggest the set of Strengths, Weaknesses, Opportunities and Threats related to the country's EGOV.

This event should be done in an exclusive workshop, and the group can be divided to ensure the best environment to listen to and debate. The facilitator has the role of intermediating the discussion and collecting suggestions. We suggest that the following table be divided into four cells to collect the suggestions.

While the two first lines (Strengths and Weaknesses) are dedicated to exploring the internal environment, the last two (Opportunities and Threats) are dedicated to exploring the external environment. In short, the internal environment should be presented with items the country has control over them. The external environment is the opposite; the control is minimum or absent.

Strengths	**Weaknesses**
Opportunities	**Threats**

After the workshop, the information gathered should be interpreted with the following rules:

1) For every identified Opportunity, check if there is a Strength that can be used to seize it. The strategy formulation process can generate an objective/measure seizing the Opportunity.
2) If a Strength does not exist, there is a Weakness related to the Opportunity that should be first transformed into a Strength to seize it. It could generate an objective/measure to create Strength during the strategy formulation process. Moreover, if possible, another objective/measure to seize the Opportunity soon.
3) For every identified Threat, check if there is a Strength that can be used to mitigate the risk. It can generate an objective/measure to avoid the Threat during the strategy formulation process.
4) If a Strength does not exist, there is a Weakness related to the Threat that should be first transformed into a Strength to avoid it. It could generate an objective/measure to create Strength during the strategy formulation process. Furthermore, if possible, another objective/measure to avoid the Threat soon.

There will be several alternatives for using the data and information generated through the SWOT workshop. The strategist can use them in the appropriate stage/guideline during the strategy formulation process.

Figure 32: Instrument "E" to support the SWOT Workshop. Part of the Method – Version 2.

Instrument F

International Ranking Analysis Tool

This instrument is a very basic tool to depict the International Rankings into components to be used through the method and guidelines for the formulation of EGOV strategies taking them into account. The rules are stated below:

Select the rankings according to the key-actors opinion and the country's context.

1) Identify the international institution that is responsible for it.
2) Identify the evaluation window (annual, biannual, other) and the evaluation process (people who integrate the process, stages, and used techniques, among others).
3) Gather the data/information about the country, as well as about the country-of-references.
4) Identify ranking dimensions and measurements.
5) All this data/information should be used to inspire the strategy content, such as the strategic vision, areas of intervention, objectives and measures, and structuring pillars. During this, remind the set of EGOV purposes: make the government more efficient; improve public service delivery; make the government more accountable; improve the relationship between citizens and businesses with the public sector. They are a filter if the document is compatible and useful for the EGOV strategy formulation.

Figure 33: Instrument "F" to support the International Rankings Analysis. Part of the Method – Version 2.

The following Design Principles, correspondent to the **Method - Version 2**, have been generated. They use Chandra et al. template [9,p.4040;4045] as described in the Research Design in Chapter 3.:

- Design Principle DP1: the method should provide a formal and coherent strategy formulation process with stages and respective guidelines (MATERIAL PROPERTY) that, taking international rankings into account, supports the team to build the strategy content composed of a diagnosis and context analysis, a strategic vision, intervention areas, strategic objectives, and respective and necessary structuring pillars (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Effectiveness.**

- Design Principle DP2: the method should provide a strategy formulation process with prescriptive guidelines, data collection instruments, and participatory techniques (MATERIAL PROPERTY) that assure the involvement, participation, and validation of/by multiple stakeholders and institutions (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method**:** **Co-creativeness.**

- Design Principle DP3: the method should provide a strategy formulation process with flexible guidelines (MATERIAL PROPERTY) that allows the team to build a strategy content based on

the extensive diagnosis and the broad analysis of the country's context (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Flexibility.**

- Design Principle DP4: the method should provide a strategy formulation process with stages and guidelines covering EGOV purposes and facets (MATERIAL PROPERTY), allowing the team to learn and use them to build the strategy content (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Comprehensiveness.**
- Design Principle DP5: the method should provide a strategy formulation process with stages and guidelines covering the characteristics of selected International Rankings (MATERIAL PROPERTY), allowing the team to learn about their features, dimensions, measurements, evaluation window and publication intervals to build the strategy content taking them into account (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Ease of Use** and **Instructiveness.**

6. From the Application of Version 2 to the Development of Version 3

6.1. Introduction

This chapter describes the third iteration of the method development, from the application of version 2 to the development of version 3. It starts with applying the Method – Version 2 in formulating Cabo Verde's EGOV strategy, then evaluating this application and concluding with the development of the Method – Version 3.

The application and evaluation processes are expected to result in important inputs for developing the next version in the form of anticipated and unanticipated consequences, as occurred in the last iteration. The third iteration comprises the activities in the highlighted part of FIGURE 34.

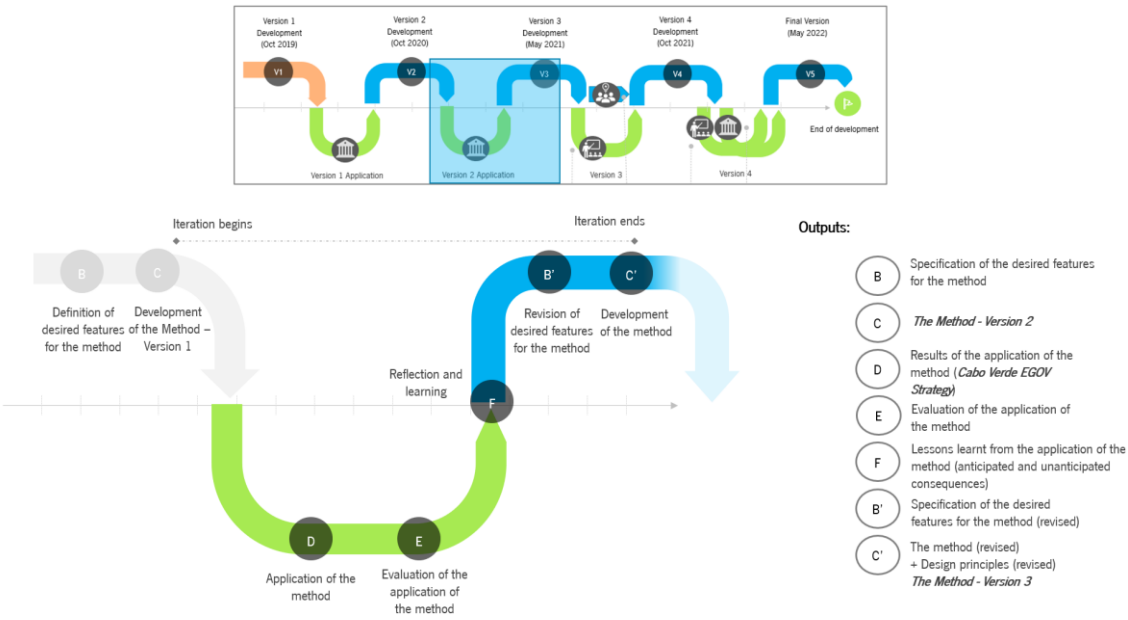


Figure 34: The 3rd Iteration, concerning the development of the Method – Version 3. Developed by the author.

The chapter describes activities "D", "E", and "F" for the application of the Method – Version 2. Following the research design, the development of the new version will occur after desired features review in activity "B'". Then, in activity "C'", the **Method – Version 3** will be developed, with the generation of the corresponding Design Principles.

6.2. Application of the Method – Version 2

Activity "D" is dedicated to the "Application of the Method" in formulating the "Cabo Verde Digital Governance Strategy". Cabo Verde is an archipelagic country with ten islands in the Atlantic Ocean on the western coast of Africa, which has been heavily investing in EGOV development since 1998. According to the UN E-Government Survey (United Nations Department of Economic and Social Affairs, 2020), the country reached the High-Level Group in the Electronic Government Development Index 2020. Cabo Verde achieved many results, including a National Digital ID, a fully operational interoperability framework, a typical digital one-stop shop, and dedicated online services to the diaspora community, which is essential to a country where most citizens live abroad.

Currently, the country's digital challenges are related to establishing an integrated governance model to aim for higher milestones, including digital inclusion, digital literacy, and developing public sector human resources in digital skills. Additional challenges include proper ICT regulation, the consolidation of an interoperability framework, improvement of the one-stop-shop platform, the nation's cybersecurity, and the enhancement of public administration and government transparency through the full implementation of open government and open data concepts (Organization for Economic Co-operation and Development, 2018; World Bank Group, 2018).

The IX Legislature Government of Cabo Verde, aiming to accomplish an integrated and mobile government, recently created the National Committee for Digital Strategy. Several initiatives have been defined to accelerate the digital transformation of the public administration through the improvement of Digital Governance, alongside the duty for improvement of the Digital Economy ecosystem with investments in better internet access, technological capacitation, and innovation. Therefore, the need for a well-defined strategy for Digital Governance was considered a must when considering all the challenges faced in the public services provided for citizens, businesses, and internally in the public sector.

This scenario was the "suitable context" where the Method – Version 2 was applied in "an instance of the problem", the Cabo Verde EGOV strategy formulation, getting feedback through the evaluation process in activities "E" and "F" to produce a new version of the method. A team was formed by three UNU-EGOV researchers and two public officers from Cabo Verde, representing the Casa do Cidadão (*Citizen House*) and the Office of the Secretary of State of Administrative Modernisation connected to the Ministry of Finance. Both were high-level public officials in management and advisory positions,

respectively. The former was nominated as the coordinator of the process with the responsibility to develop a digital strategy for the government and public administration. The team was complemented by researchers from UNU-EGOV with solid academic and practical backgrounds who acted as consultants for the method application. The endeavour has been formalised through a collaboration protocol between the country and the academic institution, establishing a research and practice bridge environment. The team's responsibility was the EGOV strategy formulation following the guidelines of the Method – Version 2. The researchers intend to improve the method by examining the application in an "instance of the problem", generalising results when appropriate. The public officials were responsible for following the researcher's guidance, mediating the sourcing of information and country data, and communicating with government units, public officials, organised civil society, the private sector, and local academic and scientific institutions. Both teams worked together in the whole process of the EGOV strategy formulation.

The process started at the end of July 2020. The work period coincided with the COVID-19 pandemic, and most activities occurred online using the Microsoft Teams collaboration tool. Weekly meetings were set, but the collaboration tool allowed a virtual office, where contact between team members occurred via chat and audio messages, file transfers, and videoconferences. Activities on the field, such as interviews and the SWOT workshop, have been planned to be conducted with local support by the country's public officials, trained previously to achieve them. In August 2020, **Stage 1 – Diagnosis and Context Analysis** started with four sets of information expected: EGOV history, National Context; International Context; and Opportunities and Challenges. Information gathering was supported by a group of key actors formed by high-level public officials or directors from Casa do Cidadão, several Ministries, Academia and Private Sector representatives, and the Information Society National Agency – NOSI.

For the EGOV history subset, inputs included the former strategies, plans, and roadmaps in the digital field, including any eventual execution problems and lack of deliveries. It was also composed of reports on political and financial sustainability risks associated with the former strategies and plans, crises in the country that impacted public policies, and their causes. Finally, the subset comprised the population pyramid evolution, economic data, internet use statistics, and Cabo Verde's performance on selected international rankings for the past ten years, such as the United Nations E-Government Development Index – UN/EGDI; United Nations E-Participation Index – UN/EPI; International Telecommunication

Union Global Cybersecurity Index – ITU/GCI; World Bank Ease of Doing Business Report – WB/DB; and World Economic Forum Network Readiness Index – WEF/NRI.

The analysis of EGOV history showed that international partnerships were vital to the country due to its dependency on donors' resources. EGOV development was heterogeneous through government agencies, for example, strong in the Ministry of Finance but weak in the Ministry of Health. Cybersecurity remains an issue to be solved. A subset of current strategies, plans, and roadmaps from several governments was analysed to characterise the national context, searching for addressable items to be considered in the new EGOV strategy. It also included the screening of existent international partnerships and regulatory frameworks. A SWOT workshop was done with key actors and other stakeholders in August 2020. Inventories of ICT infrastructure and available public services, online and onsite, have been held. Interviews with key actors involved 14 ministries, seven public administration entities, ten actors from the civil society and the private sector, and one from the academia / public university. To perform the interviews and the SWOT workshop, the team executed guidelines 1.3, 1.4, 1.5, 1.6, and 1.7. with the support of Instruments "B" and "E". In the face of pandemic travel restrictions, workshops and interviews were online and supervised by researchers based in Portugal.

The analysis of the national context uncovered that the NOSI agency was the primary executor of EGOV projects, concomitantly occupying the role of EGOV leader. However, following good international practices, this role was transferred to the Direcção Nacional de Modernização Administrativa – DNMA (*National Administrative Modernisation Directorate*), a branch of the Ministry of Finance. The NOSI should remain the "main technological partner" of the state. A project by the Cabo Verde embassy in Portugal to develop a digital platform dedicated to the diaspora was ongoing, a solo effort that should be harmonised in the strategy. Online services for businesses were still underdeveloped. They should be addressed through the strategy to allow opening a business in a single day or developing a web portal entirely dedicated to the entrepreneurs. ICT silos persisted in public administration, namely in the Ministries of Health, Education, and Finance, signalising the lack of initiatives related to ICT governance in the public sector.

The analysis of the national context also revealed an important reference in terms of the general government program, the Plano Estratégico de Desenvolvimento Sustentável – PEDS (*Strategic Plan for Sustainable Development*). It stated a vision of "a developed Cabo Verde, inclusive, democratic, open to the world, modern, safe, full of employment and liberty". The current online services portal is *Portal di nos Ilha,* but it should be renewed as a strategic measure. PDEX, the Plataforma de Integração e

Interoperabilidade de Cabo Verde (*Network Interoperability Platform of Cabo Verde*) provides interoperability, an operating platform lacking a business model, capacity, regulatory framework, access control and clear responsibility frame. A catalogue of data does not exist, and the demand for information that the state already has in its databases is a reality that constrains citizens and authorities. Public service inventory listed 229 services divided into 48 categories in 9 ministries and the local administration.

Regarding the set of information related to the international context, inputs were data from the international rankings: the UN/EGDI, WB/DB, WEF/GCI, and ITU/GCI. A detailed analysis of some countries considered as good references was also concluded. The countries judged as such were Luxemburg, Mauritius, and Seychelles.

Finally, the analysis of Challenges and Opportunities unveiled that the Prime Minister demanded a pragmatic, realistic, and coherent strategy, followed by a prioritisation process showing "when" and "how" the initiatives should be executed. It was expected that the EGOV strategy would be headed by DNMA, following decisions by the Comissão Nacional da Estratégia Digital – CNED (*National Commission for Digital Strategy*). All the subsequent stages of the strategy formulation received outputs produced in **Stage 1 – Diagnosis and Context Analysis**, some of them with more emphasis depending on the stage goal. All of them are traceable to their origins to ensure consistency and cohesiveness.

Stage 2 – Definition of Vision defined it as "A digital Cabo Verde, an agile, capable, resilient, reliable and transparent State, closer to citizens and business in all life events.". **Stage 3 – Definition of Intervention Areas** established nine areas for intervention: Digital Public Services; Digitalization and Simplification of Administrative Procedures; Access and Availability of Information; Integration and Interoperability; Infrastructure and Security; Technology; Legislation; Human Resources Literacy; and Governance. Some of these areas steamed from the rankings, like ITU/GCI (Infrastructure and Security), UN/EGDI (Digital Public Services), and WB/DB (Simplification of Administrative Procedures).

Stage 4 – Definition of Strategic Objectives resulted in 80 objectives and measures grouped in each intervention area to reach the strategic vision. The terms “objectives” and “measures” were used interchangeably, which should be adjusted in the next versions of the method according to the evaluation. It has been defined as 12 measures in the Digital Public Services area; nine in the Digitalization and Simplification of Administrative Procedures area; 12 in Access and Availability of information; four in Integration and Interoperability; six in Infrastructure and Security; 11 in Technology;

14 in Legislation; five in Human Resources Literacy; and seven measures in Governance area. International rankings indicators inspired many of these measures. Each measure was traceable to the data or information that motivated its creation, namely, the sets of information generated in Stage 1. For instance, the measure "Update the eProcurement Platform" was motivated by international rankings indicators, part of the international context set of information. Besides, it will demand as a technological structuring pillar the SIGOF, an information system dedicated to the state's financial and budget management. All measures have been coded according to an acronym referring to the intervention area. The measure is part of the intervention area named "Access and Availability of Information" and coded as "ADI2" in the specific example.

Finally, **Stage 5 – Definition of Structuring Pillars** defined 56 pillars. These pillars, sharing structures offering support to all the measures, have been classified into three categories: Administrative, with 11 structuring pillars; Legislative, with 18; and Technological, with 27. All structuring pillars have been coded according to the respective acronym, EST-ADM, EST-LEG and EST-TEC, followed by a unique identification number. Examples of them are, respectively, a National Program for Administrative Simplification (EST-ADM8); a Decree to implement the National Directorate for Administrative Modernisation (EST-LEG1); and a new Electronic Authentication Platform (EST-TEC24). International rankings indicators also inspired several structuring pillars. A table connecting each measure to the necessary structuring pillars has been elaborated to identify priorities easier. Pillars that did not exist and should be produced during the strategy execution are identified in a specific column showing which measure would generate them, as presented in TABLE 17. This table evidenced the number of measures supported by each structuring pillar. It is a copy of the original table that is part of the official document.

Table 17: Example of the relationship between Administrative Structuring Pillars and Measures.

Identification	Structuring Pillar	Measure which		Does it exist?
		Use it	Produces it	
EST-ADM1	A team in the National Directorate for Administrative Modernisation (DNMA) responsible for the EGOV Management	DSP3 DSP5 IEI1 IEI2 IEI3 IEI4 IES3 IES4 GOV7	GOV4	No
EST-ADM2	A business model for the development of digital services in partnership with the private sector	-	GOV6	No
EST-ADM3	A team in the National Directorate for Administrative Modernisation (DNMA) responsible for the simplification and innovation of public services	SPD1 SPD2 SPD9 SPD11 DSP1 DSP4 DSP6	DSP2	No

Following Guideline 5.4, a graph was generated with the same data as the previous table, FIGURE 35.

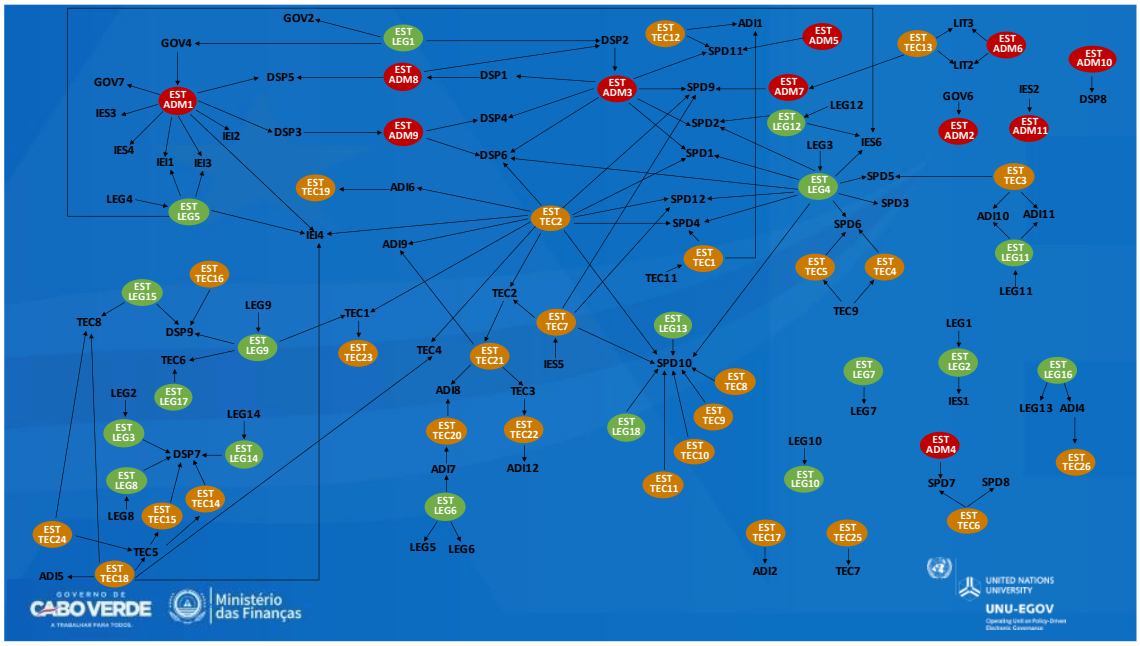


Figure 35: A graph representing the relationship between Structuring Pillars and Measures. Developed alongside the formulation of Cabo Verde EGOV strategy.

Finally, a draft version of the EGOV strategy was delivered in December 2020, and the document received adjustments in January 2021. In February 2021, a release candidate was presented to the

National Commission for Digital Strategy – CNED, receiving formal approval from the commission. CNED addressed the final document to the cabinet of the Prime Minister, and the Cabo Verde National EGOV Strategy 2021 – 2023 was published in March 2021. The official document is available in the following URL: https://governacaodigital.gov.cv/documents/

6.3. Evaluation of the Application of the Method – Version 2

Activity "E" assesses the method application in the Cabo Verde EGOV strategy formulation. The researcher's reflection supports the activity during the application of the method, followed by interviews with public officials. Excerpts of these interviews will be used when necessary. Discussions within the researchers' team also fed the process.

It was identified that a Digital Transformation Agenda for Cabo Verde existed. It was focused on the digital economy, including industry and business, civil society, and academic and scientific sectors. CNED was assuming many responsibilities, including approving a plan for the public sector, without prioritising it. Therefore, the Ministry of Finance, especially the "Casa do Cidadão" and the DNMA, identified the necessity to develop a specific strategy for the public sector and initiated an inventory of public services and general diagnosis tools.

The initial methodology used by Cabo Verde officials was unclear, with many paths and incohesive inputs and outputs through the stages. According to other regulations and instruments, the strategy had different names, signalling the existence of inconsistencies. This ongoing methodology has been adapted and replaced by the **Method – Version 2**. The work period coincided with the COVID-19 pandemic, and most activities occurred online using the Microsoft Teams collaboration tool. Weekly meetings were set, but the collaboration tool allowed an efficient virtual office, where contact between team members occurred by chat messages, file transfers, audio, and videoconferences. Activities on the ground, such as recorded interviews and the SWOT workshop, were planned to be carried out with local support by the country's public officials, who have been previously trained to achieve them. As they progressed, activities were annotated in research notebooks, and most meetings were recorded using the collaboration tool. This stage occurred as planned with only some distortion due to restrictions inherent to the elections period at the beginning of 2021. The five stages of the **Method – Version 2** were executed.

The interviews concluded that the intervention produced the expected results for the country, a formally approved strategy. Interviews also revealed that the method was considered flexible and adjustable to the country's context. The Diagnosis and Context Analysis stage resulted in a context-oriented output that the remaining stages consistently used as inputs. It was considered instructive because it guided the use of international rankings content along the EGOV strategy formulation process. It was easy to use and supported rankings features facilitating their correlation with intervention areas, measures, and structuring pillars. According to one of the interviewees, although he already knew about the rankings, he can now critically understand their components, dimensions, and measurements. It was also considered comprehensive because EGOV purposes have been embedded during the process execution since the first stage. Participation of multiple stakeholders occurred since stage 1, Diagnosis and Context Analysis, confirming the co-creative characteristic. Finally, the method's effectiveness has been confirmed because the process delivered the Cabo Verde EGOV strategy. Interviews also unveiled that the framework brought cohesiveness and consistency to the process, suggesting future development inputs. Critics were related to the absence of public consultation, which was unpracticable due to the election period restrictions. A missing Action Plan was pointed out despite not existing in the method stages anymore, therefore in the project scope. Designing an Action Plan as a separate process was considered adequate because it is challenging to define resource allocation and mature deadlines during the strategy formulation.

6.4. Reflection and Learning

Activity F is dedicated to "Reflection and Learning", representing the research movement from building a solution for the particular instance of Cabo Verde to applying the respective learning to generalisation: the development of the next version of the method. This activity results in anticipated and unanticipated consequences of using the method, it supports updating the method to the next version, and generates the corresponding design principles.

During the strategy formulation process, the researcher assessed the presence or absence of these characteristics when participating in the EGOV strategy development. This process was complemented by interviews with government officials who participated in the team. Respondents' answers were used to assess specific features according to the question, but they were used to evaluate other features depending on the content. The following questions were used in the interview. Desired characteristics

they intend to assess are in brackets, although they were not presented to interviewees. The order of the questions changed slightly when compared to the first iteration but maintained the evaluation criteria, compatible with desired features for the method. Questions are presented in TABLE 13.

Table 18: Questions used in the interviews.

Id	Question	Evaluated Feature
Q1	Do you consider the process adequate to the Cabo Verde context? Why?	Flexibility
Q2	Do you consider the process flexible enough to be used by other countries, including those with different contexts?	Flexibility
Q3	Do you consider that the process of using international ranking as inputs in the "Diagnosis and Context Analysis", "Definition of Objectives", and "Definition of Structuring Pillars" stages supported their association with EGOV purposes?	Instructiveness
Q4	Do you consider that the use of international rankings for the formulation of the Cabo Verde EGOV strategy was simplified by the process?	Ease of Use
Q5	Do you consider that, after this process, you learn how to associate international rankings characteristics to the country EGOV purposes?	Instructiveness
Q6	Do you consider Cabo Verde EGOV purposes broadly covered in the strategy content? Do you agree that the comprehensiveness of the "Diagnosis" stage enabled it?	Comprehensiveness
Q7	Do you consider that the process enabled the participation of multiple stakeholders? Why?	Co-creativeness
Q8	Do you consider the Cabo Verde EGOV strategy's process effective? Why?	Effectiveness
Q9	Do you have any additional comments about the formulation process? Did something call your attention?	General
Q10	Do you have any suggestions to improve the process?	General

Answers to these questions allowed the reflection and learning process and revealed anticipated and unanticipated consequences. When necessary, excerpts from interviews are quoted.

- Anticipated Consequence AC1: the amplitude of the diagnosis stage assured a flexible and comprehensive process for strategy formulation. Indeed, this stage is "applicable to any country (INT_1)" and "in the specific case, it was crucial due to the high level of EGOV development, a high number of important stakeholders, a wide range of e-services which demanded an intense, extensive, and complete investigation (INT_3)". "Many countries formulate a strategy without a wide diagnosis (INT_1)", which seems to be the case of Cabo Verde in previous efforts: "In the past, we did not diagnose previously to build a strategy, or we did it in a superficial way (INT_2)". In fact, "the process has all relevant main stages of formulating an EGOV strategy. The way it will be executed demands adjustments, but the methodology foresees this possibility (INT_3)".

"The same process has been used before in a country with a different profile (INT_4)". It reinforced confidence that the method is **flexible.**

- Anticipated Consequence AC2: the method broadly covered EGOV purposes. "It will also impact the flexibility of the subsequent stages, enabling many possibilities during the process, such as choosing the intervention areas. "In the past, we did it by government sectors. This time, it was possible to do it more holistically, oriented to EGOV purposes (INT_1)" and "a deeper diagnosis, something that international partners value (INT_2)". It reinforced confidence that the method is **comprehensive.**
- Anticipated consequence AC3: the method simplified the use of international rankings during the strategy formulation. The use of international rankings during stages 1, 3, and 4 was "a strong point of the methodology (INT_1)". "It allowed Cabo Verde to select three international rankings according to what is important to the country (INT_1)". They were used "to diagnosis (INT_1)" and "to select what to do, clarifying which areas to intervene (INT_1)". "International Rankings criteria and indicators offer a shortcut in diagnostic and measures setting (INT_2)". "We concretely use International Rankings as a reference, and they added value to the process [...] in the diagnosis, to show where we are, and to define measures and to structure pillars to implement (INT_3)". Besides these, "the method supported choosing rankings according to our context (INT_2) and "can be replicated by the government (INT_2)". "It is not rare to find ranking-oriented countries in a wrong way, only looking for achieving a better position in the indexes. The method does not contradict this expectation, but includes some sense situated in the country context, putting some order and not being *ad-hoc* (INT_4)". It reinforced confidence that the method is **easy to use.**
- Anticipated Consequence AC4: the method supports the learning process and the association of rankings characteristics to EGOV purposes. The process allows public officials to learn about them: "I learnt about International Rankings, and I can guide my colleagues in this (INT_1)"; "Which characteristics are assessed, which are UN/EPI indicators, and the OSI maturity criteria assessment (INT_2)"; "I knew them superficially, now I know them and the whole evaluation process (INT_2)". The method "supported the tracking of international rankings characteristics, measures and structuring pillars, helping to learn about them, interpret them, and associate them to the strategy content (INT_3)". "I can talk about my case; I learnt, and now I know about

the World Bank Ease of Doing Business report (INT_4)". It reinforced confidence that the method is **instructive.**

- Anticipated consequence AC5: there were positive aspects regarding the possibility of involving multiple stakeholders and the amplitude of the diagnosis phase. It was possible mainly because "the team at Cabo Verde supported the interaction with the stakeholders while the UNU-EGOV team scientifically supported the process, albeit remotely due to COVID-19 restrictions (INT_1)". The participation of "many focal points from many government sectors, from the academia, from the productive sector, was important to complement the government point-of-view in EGOV (INT_2)". "This is compatible with the OECD recommendation to Portuguese Speaking African Countries – PALOPS (INT_2)". "Listen to many stakeholders, the use of questionnaires, the range of interviews and the number of workshops fulfil this objective: produce a strategy aligned with as many point-of-views as possible (INT_3)". "Some stakeholders should be involved in specific stages. The method allowed to identify who should be involved and when they should be involved, which is a key aspect (INT_3)." "The method has the potential to be opened to multiple stakeholders and different institutions. The SWOT workshop was welcome and stimulating (INT_4)". It reinforced confidence that the method is **co-creative**.

- Anticipated Consequence AC6: the process effectively produced the new Cabo Verde Digital Governance Strategy for the 2021 - 2023 period, formally approved by the country's higher technical and political instance, the National Committee for Digital Strategy. "The EGD-CV has been delivered on time, using expected resources and involving the correct stakeholders (INT_3; INT_4)". Besides, "the new process was systematic and logic, turning its execution easy (INT_1)." "The Stages are interconnected and dependent on themselves, with rationality and rigour (INT_2)". "The relationship between stages inputs and outputs, followed by the interconnection between their content, enabled a compact and no-contradiction process (INT_2)". "The new process avoided inconsistent diagnosis, ambitious objectives and immature deadlines.

  "The new strategy allowed us to know where we are, define the scope of objectives and, only after that, prioritise them according to the limitations of resources (INT_2)". "The old process was not intuitive, it was complex, risky, and presented a circular sequence; the new one was intuitive, logic, linear, and natural to those involved in the strategy formulation process (INT_3)". "In Cabo Verde, stakeholders were much more capable and knew what they want. This scenario

could take us to a disorderly process, which did not occur because the systematic method is not exactly simple. To exclude the action plan and monitoring contributed to having a process with a beginning and an end, a single path, and a single exit (INT_4)" It reinforced confidence that the method is **effective** with remarks to a **coherent** aspect, indicating a potential new characteristic of the method**.**

- Anticipated Consequence AC7: the definition of the vision in the second stage of the formulation process has been confirmed as important: "It was an important driver, which framed initiatives, strategies, objectives, etc., avoiding confusion (INT_4)". It reinforced confidence that the method is **effective.**
- Unanticipated Consequence UC1: the repositioning of the Action Plan and Evaluation Plan as a separate stage has been pointed out by interviewees. They recognised the complexity of defining the allocation of resources and establishing mature deadlines during the strategy formulation process. However, some of them missed the plan: "The action plan can be formulated inside or outside the strategy formulation process. It will depend on time availability (INT_1)". It was not unanimous: "separate a different work time for the Action Plan formulation avoided a premature discussion about allocating time, money, and other resources. Nonetheless, opinions differed: "It turned possible to formulate a pure and genuine EGOV strategy, an immaculate document (INT_3)". It attenuated the confidence that the method is **effective**, not in terms of delivering a strategy, but regarding the simultaneous formulation of an action plan**.**
- Unanticipated Consequence UC2: the remote support caused by the COVID-19 pandemic was a limitation. "Carrying out the entire process in Cabo Verde close to all stakeholders with onsite workshops would be better. It would be possible to uncover additional measures and structuring pillars, a full validation, an even deeper diagnosis, and an appropriation of local culture and context by the consultants, something that is only possible *in loco* (INT_1)". A suggestion was the inclusion of a "public consultation (INT_2)" in the formulation process. "Limitations due to the COVID pandemic, lack of time to formulate the strategy, and stakeholders' unavailability impacted the diagnosis and the following stages (INT_2)". It attenuated the confidence that the method is **co-creative**.
- Unanticipated Consequence UC3: the availability of some instruments for gathering data was considered a strong point of the method. Nonetheless, the absence of instruments to gather data from onsite/online public services, public services back office, and government

technologic inventory could improve the diagnosis phase. "Better instruments to gather data, such as interview guides, model of questionnaires, and others, could improve the method (INT_3)". "The production of diagnosis instruments can improve the process, flexible and systematised instruments that could be delivered in the first moment of the diagnosis (INT_4)". It attenuated the confidence that the method was **effective.**

6.5. Revision of Desired Features for the Method – Version 3

Activity B is dedicated to revising desired features for the method after the reflecting and learning activity. The Method – Version 2 evaluation process received feedback that justifies changing the initial set of desired characteristics and updating it to include the **coherence** feature. Coherent feature has been defined as the method provide a rational process of strategy formulation, characterized as a logical, ordered, and integrated process. Therefore, the method should be **co-creative, comprehensive, easy to use, effective, flexible, instructive,** and **coherent**.

6.6. Development of the Method – Version 3 and Formalisation of learning

Activity C is dedicated to developing the **Method – Version 3** and generating correspondent **design principles**. The statements representing the anticipated and unanticipated consequences of the application of **Method – Version** 2 will be used to evolve only the guidelines because the five Stages remained the same, as illustrated in FIGURE 36. Although the anticipated consequence AC1 gives rise to a discussion about an action plan during the strategy formulation process, there was no consensus among the interviewees that justified changing the method's process.

Figure 36: The Strategy Formulation Process of the Method - Version 3. Developed by the author.

As there was no modification in the five stages of the **Method – Version 3**, if compared to the prior version, only the guidelines that have been modified (Guideline 5.4) or created (Guideline 5.5) will be addressed below. They are presented in TABLES 19 and 20. As in the description of the prior version, there are references for the previous guidelines and recommended techniques that support the execution. Some of these instruments and techniques were updated based on the evaluation results.

Table 19: Guideline 5.4, part of the Method - Version 3.

Guideline 5.4: Explore the benefits related to the implementation of each structuring pillar. This analysis can be supported by associating each strategic objective/measure with the necessary structuring pillar. It will make the formulation of the Action Plan of the EGOV Strategy easier, a subsequent and separated document that will support the strategy execution. This document can have a section dedicated to the Evaluation Plan. It will simultaneously avoid a premature discussion about resource allocation (time, money, and others) with the strategy formulation process. * This guideline has been modified due to the Unanticipated Consequences UC1 of the evaluation of the Method – Version 2.	
Former guideline(s)	Guideline 5.4 (v2)
Recommended technique	Document Analysis (see Tool Kit – Instrument A)
Expected output	Table and Graph of Structuring Pillars X Measures. These outputs will support the formulation of the Action and Evaluation Plans.
Inputs from previous stages	From Stage 4: "Measures"

Table 20: Guideline 5.5, part of the Method - Version 3.

Guideline 5.5: After producing a Release Candidate of the EGOV Strategy, organise a public consultation process to validate the strategy content. Submit the document to representatives of as many population groups as possible. Do not forget the key-actors set since Stage 1. * This guideline has been modified due to the Unanticipated Consequences UC2 of the evaluation of the Method – Version 2.	
Former guideline(s)	-
Recommended technique	Public Consultation
Expected output	Suggestions and Critics for the Strategy Content
Inputs from previous stages	-

Unanticipated Consequences UC3 motivated updates of the following recommended techniques that support the method execution. The Instrument D – ICT Infrastructure and Governance Inventories have been divided into "D" for ICT Infrastructure and "G" for ICT Governance. There were also two new techniques: Instrument H – Back Office Inventory and Instrument I – Inventory of Transparency and Accountability Tools. Instruments "G", "H", and "I" are presented in FIGURES 37 to 39:

Instrument G

ICT Governance Inventory

1) Is there a Government Chief Information Officer, equivalent authority, or a committee with a similar role?
2) Is there a Digital Transformation Officer, equivalent authority, or a committee with a similar role?
3) Is there a formal government ICT strategy or an equivalent plan?
4) Is there an ICT procurement plan?
5) Which institutions are responsible for planning, deciding, implementing, and assessing government ICT initiatives?
6) Is there an ICT career within the public sector?
7) Which was the government ICT budget for the last five years?
8) Is there an accountability report on ICT expenses for the last five years?
9) Are there formal ICT units in each government agency?
10) Is there an authority that solves conflicting ICT decisions involving different government agencies?

Figure 37: Instrument "G" to support the ICT Governance Inventory. Part of the Method – Version 3.

Instrument H

Back-office Inventory

This tool intends to inventory the Back Office associated with public service delivery. The inventory can be adapted according to the strategists and to the country's context, should be considered. During the application of this questionnaire, the team should be aware of two different situations: a) the respondent is part of the institution that offers the public service he/she is talking about; b) the respondent is talking about public services offered by institutions that he/she is not part.

1) Consider public services that have a good reputation among citizens and business owners. What are back-office structures available to these services that positively impact this perception?
2) Consider public services that do not have a good reputation among citizens and business owners. Which back-office structures should be in place to change this perception among them?
3) Are you a member of the institution responsible for this public service offering?

Figure 38: Instrument "H" to support the Beck-office inventory. Part of the Method – Version 3.

Instrument I

Inventory of Transparency and Accountability Tools

1) Is there a transparency portal with governmental data and information such as public budget and expenses in health, education, social protection, environmental protection, the justice system and citizenship?
2) Are official portals, websites, or tools for citizen participation in the public policies cycle, such as e-participation, e-consultancy, e-petition, or even social networks government accounts, dedicated to this aim?
3) Is the country a member of the Open Government Partnership (OGP)? Are there OGP-related portals, websites, or any similar tools?
4) Is there an Open Data portal with government data and related metadata related to the following areas: health, education, social protection, environmental protection, the justice system, and citizenship?
5) Is there any guidance on using available government open data and related metadata in an Open Data portal?
6) Is it possible to request new datasets if there is an Open Data portal?
7) Is there any evidence of government open data use, such as hackathons or similar events?
8) Are there institutionalised and formal policies related to Open Data, E-participation, or Open Government?

Figure 39: Instrument "I" to support the Inventory of Transparency and Accountability Tools. Part of the Method – Version 3.

Finally, Anticipated Consequence UC6, which remarked **coherent** aspects and indicated a potential new characteristic of the method, inspired the generation of a new design principle associated with the new desired feature: coherence. The following Design Principles have been generated:

- Design Principle DP1: the method should provide a formal strategy formulation process with stages and respective guidelines (MATERIAL PROPERTY) that, taking international rankings into account, support the team to build the strategy content composed of a diagnosis and context analysis, a strategic vision, intervention areas, strategic objectives, and respective and necessary structuring pillars (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Effectiveness.**

- Design Principle DP2: the method should provide a strategy formulation process with prescriptive guidelines, data collection instruments, and participatory techniques (MATERIAL PROPERTY) that assure the involvement, participation, and validation of/by multiple stakeholders and institutions (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method**: Co-creativeness.**

- Design Principle DP3: the method should provide a strategy formulation process with flexible guidelines (MATERIAL PROPERTY) that allows the team to build a strategy content based on

the extensive diagnosis and the broad analysis of the country context (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method **Flexibility.**

- Design Principle DP4: the method should provide a strategy formulation process with stages and guidelines covering EGOV purposes (MATERIAL PROPERTY), allowing the team to learn and use them to build the strategy content (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Comprehensiveness.**
- Design Principle DP5: the method should provide a strategy formulation process with stages and guidelines covering the characteristics of selected International Rankings (MATERIAL PROPERTY), allowing the team to learn about their features, dimensions, measurements, evaluation window and publication intervals to build the strategy content taking them into account (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Ease of Use** and **Instructiveness.**
- Design Principle DP6: the method should provide logic and rational strategy formulation process (MATERIAL PROPERTY), with each stage generating outputs corresponding to the necessary inputs of the following stages (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **Coherence.**

7. From the Application and Demonstration of Version 3 to the Development of Version 4

7.1. Introduction

This chapter describes the fourth iteration of the method development. It provides details on the application and the demonstration of the Method – Version 3, followed by the evaluation of both processes and the development of a new version. These activities are highlighted in FIGURE 40.

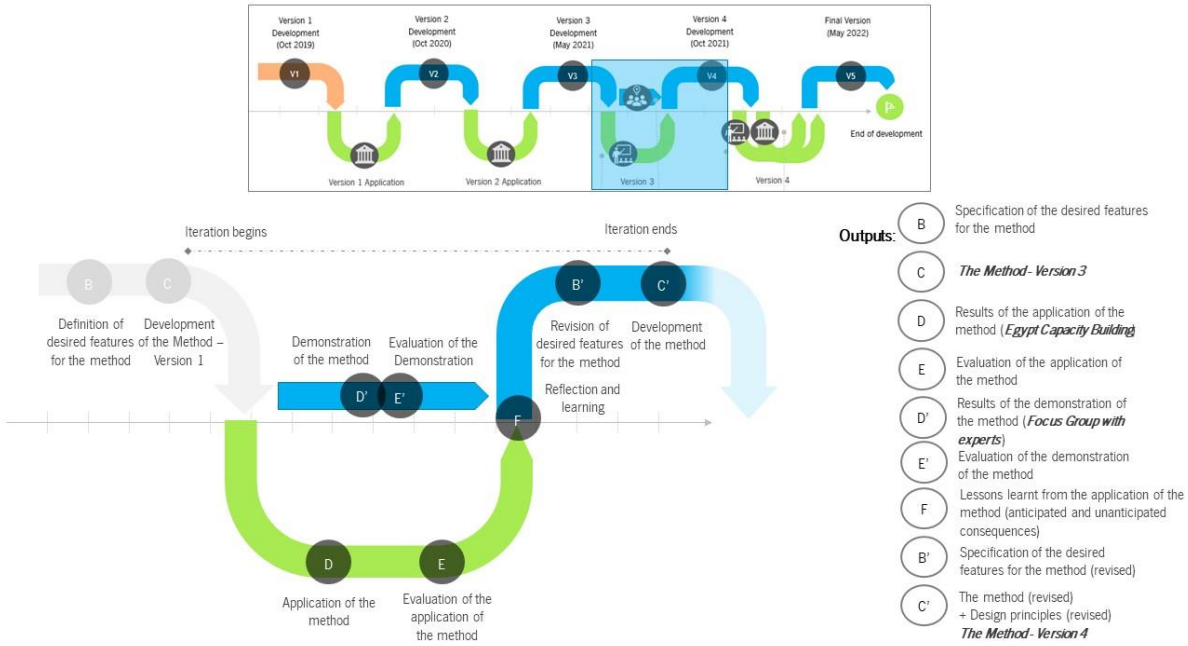


Figure 40: The 4th Iteration, concerning the development of the Method – Version 4. Developed by the author.

The Method – Version 3 was applied and demonstrated in two different situations. First, the method was applied in an Egypt Capacity Building Programme that occurred in August 2021 involving high-level public officials. It was also demonstrated in a focus group organised at the international conference EGOV-CeDEM-ePart 2021 that took place in September 2021 in Granada, Spain. Activities "D" and "E" represent the application of the method in the capacity building programme, while activities "D'" and "E'" show the demonstration in the focus group. Both tracks produced evaluation outputs used in activity "F", Reflection and Learning. Results of this activity are used to review the desired features for the

method in activity "B" and develop the **Method – Version 4** in activity "C", therefore generating the corresponding Design Principles.

7.2. Application of the Method – Version 3

Activity "D" is dedicated to the "Application of the Method" in a capacity building programme involving high-level public officials from Egypt, which was considered a "suitable context" according to the research design. The application in the capacity building programme differs from the others because it does not produce a real EGOV strategy. However, the participants used the method to simulate formulating a typical EGOV strategy and roleplaying EGOV strategists during the lecture and the exercise. Therefore, the term "application" is used in this iteration, although limitations exist to consider it a proper use of the method in a real case. Nonetheless, the activity produced outputs used in the evaluation activity, adequately feeding the development process. The programme was conducted in Guimarães, Portugal, in August 2021.

During the capacity building programme, the author assumed the instructor role, teaching a class of 26 participants from several government areas and branches of Egypt on 31 August 2021. Two modules were dedicated to EGOV strategies. One of them was exclusive to the presentation and use of the method, illustrated by the cases of São Tomé and Príncipe and Cabo Verde once the EGOV strategies of these two countries have been formulated using previous versions of the method. During the class, the participants carried out a practical exercise to formulate the Egyptian EGOV Strategy. They used the Method – Version 3, its stages and guidelines and were guided by the instructor and additional tutorial materials developed based on the method's guidelines, techniques, and correspondent instruments. Teaching resources also included a set of slides dedicated to supporting the method's practical exercises, as exemplified in FIGURE 41.

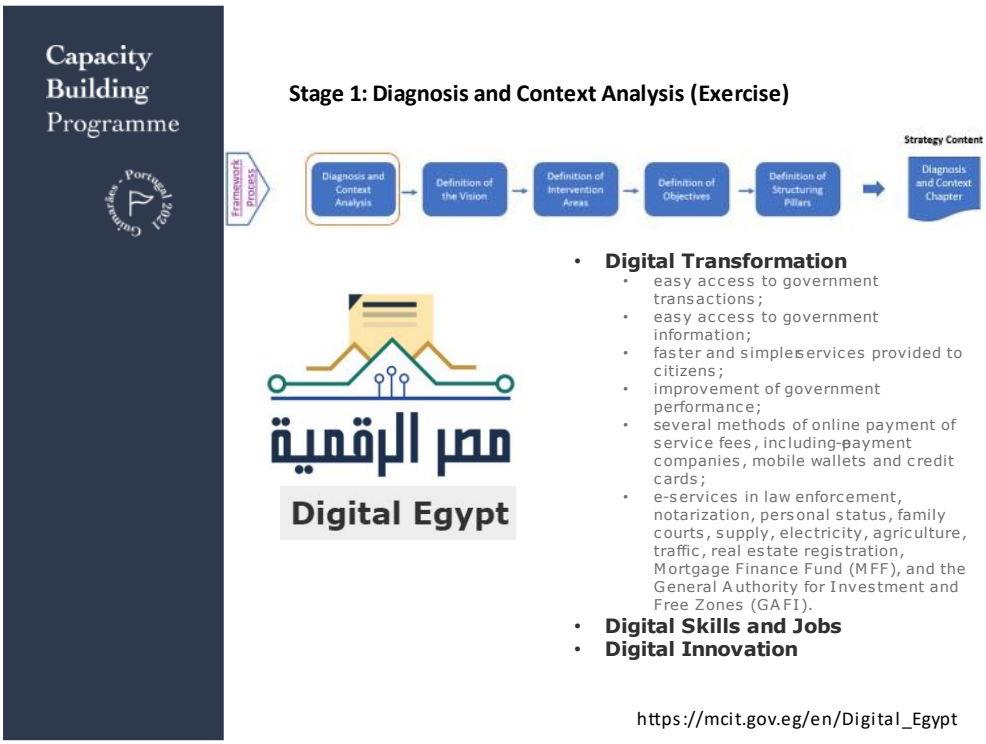


Figure 41: Example of the slides used in the Capacity Building material.

As the example shows, resources used during the lecture offered inputs for the formulation exercise, such as the current sectorial strategies of multiple government agencies. An example was Digital Egypt, the national digital strategy, which encompasses several topics in the digital area but not topics dedicated to EGOV. It was published by the Ministry of Communications and Information Technology and is derived from a major country strategy called "Egypt Vision 2030", a national plan published in 2018 covering sustainable development, economic, social, and environmental topics.

Digital Egypt and referred strategies were considered sources of data and information for developing the Egyptian EGOV Strategy. As there was a very limited time, the instructor provided most of the sources to be used as input for the Diagnosis and Context Analysis stage. It included the international ranking of UN/EGDI and Egypt-related data. Mauritius and Tunisia, EGOV leaders in Africa, and Denmark, the number one country according to UN/EGDI, were selected as countries of reference. Data from them was also provided, as shown in FIGURE 42.

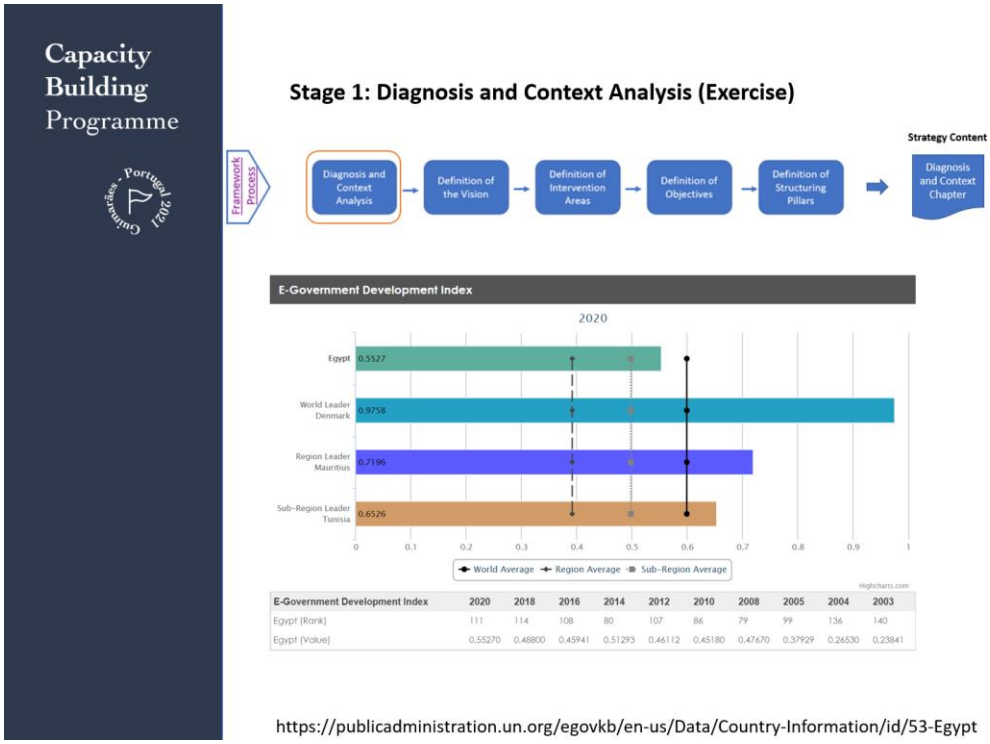


Figure 42: UN/EGDI data from Egypt and countries of reference Mauritius, Tunisia, and Denmark.

Participants were divided into six groups of a minimum of four or five people and were challenged to follow the **Method – Version 3** stages and guidelines. The exercise included the proposal of Egyptian EGOV goals based on the screening of class material, the country's multisectoral programs, plans and strategies, and the analysis of a SWOT table. This table was previously constructed with the support of a selected group of participants. Groups were encouraged to formulate the strategy content formed by a vision statement, a set of intervention areas, strategic objectives, and respective structuring pillars. They followed the proposed strategy formulation process and proceeded according to the orientation. FIGURE 43 shows part of these teaching resources used to support the participants.

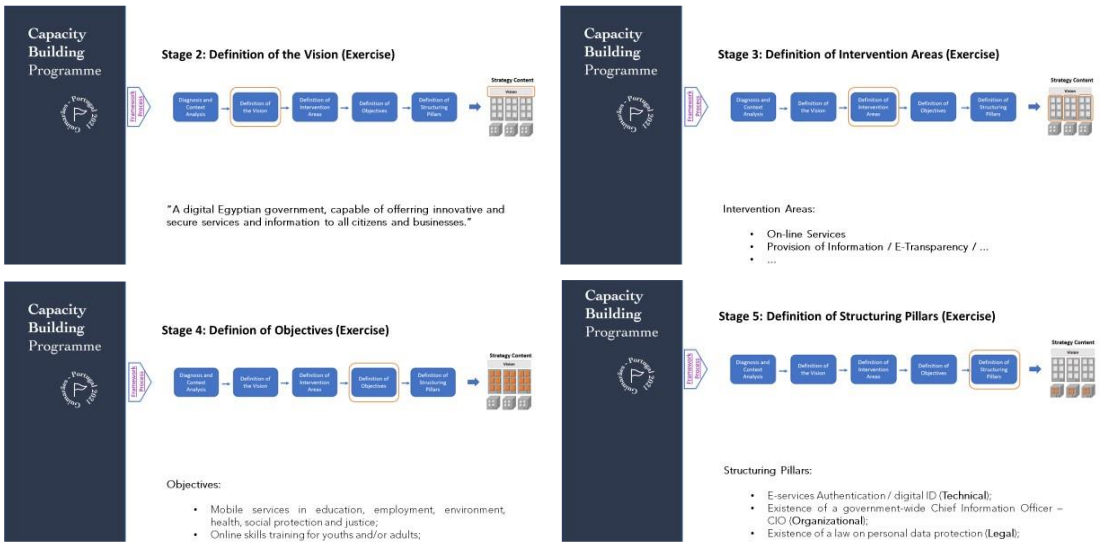


Figure 43: Teaching resources used during the five stages of the Method - Version 3.

The use of international rankings features has been detailed during all five stages according to the related guidelines. These resources and content related to the international rankings are presented in FIGURE 44.

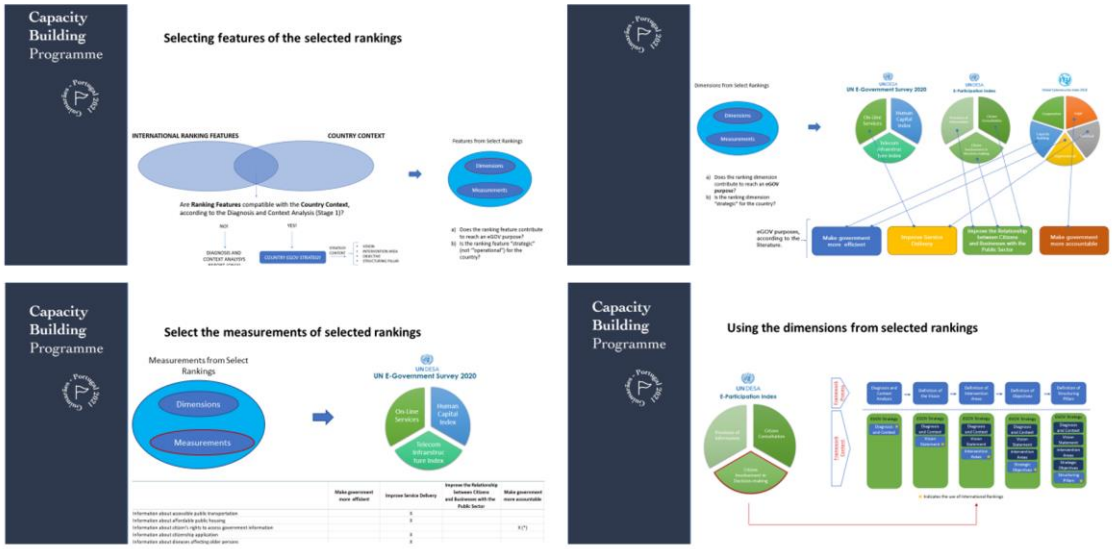


Figure 44: Resources used in class to support the use of International Rankings Data, Dimensions and Measurements, according to the Method - Version 3.

Six groups of participants presented their "Egyptian EGOV Strategy" to the entire group, followed by a debate with the whole group. The instructor conducted the debate, highlighting each aspect of the strategy content built using the method-s process. As expected, this procedure reinforced the learning process. At the same time, it prepared the participants for a final debate involving a discussion about the **Method – Version 3** itself, as is described in the next section.

7.3. Evaluation of the Application of the Method – Version 3

Method – Version 3 was used in the first edition of the Egyptian capacity building programme, an opportunity to apply it in a different context from the previous Action Research initiatives.

The evaluation of the method features was supported by questions from A to E, listed in TABLE 21.

Table 21: List of questions used to discuss and assess the method features.

Id	Question	Desired Feature
A	Were international rankings valuable content for the process of EGOV strategy formulation? Why?	General
B	How appropriate and coherent is this strategy formulation process to deliver an EGOV strategy effectively? What should be improved?	Effectiveness Coherence
C	Does the method simplify the use of international rankings in designing an EGOV strategy? Why? (You may like to identify in the exercise made how international rankings dimensions and measurements are associated with the EGOV purposes)	Ease of Use Instructiveness Comprehensiveness
D	Does the strategy formulation process enable the participation of multiple stakeholders, leading to a co-creation process?	Co-creativeness
E	Is the formulation process adjustable to the Egyptian context?	Flexible

The general feedback of the participants is that the method is adequate to formulate an EGOV strategy at the national level. During the exercise, participants mentioned that the method addresses the major components of the expected strategy content. Using international rankings dimensions and measurements during the execution was a valuable inspiration. Six groups presented their exercise results. These groups chose different strategic focuses from the "Digital Egypt" topic areas, such as public services, digital transformation, development of digital skills and jobs, and digital infrastructure. Another group, formed by public officials from the judiciary branch, focused on the legislative framework. EGOV purposes listed in the method were presented to the participants. They linked them with the Digital Egypt strategy, international rankings, and existent plans, programmes, and strategies of the country. Confusion involving the term "purposes", was noted as part of the feedback process, suggesting the necessity of improvements in terminologies used in the method. The participants

concluded they were using quite the same structure as the proposed stages in Egypt. While the method uses “Intervention Areas”, they use “Planks” in Egypt. Despite using “Structuring Pillars”, Egyptians were using “Enablers”. A significant contribution from the participants was about the use of current terminologies worldwide. As they performed a benchmark during the formulation of the Egyptian strategy, they recommended checking if the method concepts and terminologies should be changed in the future.

7.4. Demonstration of the Method – Version 3

The method was also demonstrated at an international EGOV conference in September 2021. The conference, named EGOV-CeDEM-ePart and also known as IFIP-EGOV, focuses on e-Government, Open Government, e-Participation and e-Democracy, and other related topics such as the role of social media, digital transformation in society, artificial intelligence, policy informatics, cybersecurity, legal informatics, smart governance, and social innovation. As the conference accepts different types of submissions, including workshops, it became an opportunity for an additional step of developing the method as previously planned in the research schedule of the PhD proposal.

The workshop took place on 8 September 2021, at the University of Granada, Spain, and lasted one and a half hours. Participants varied from 15 to 18 during the session, although the contributions mainly came from a group of six people. Two facilitators conducted the workshop. A set of five electronic questionnaires was produced using Google Docs to collect feedback from the participants after the presentation of each stage of the method. A sixth questionnaire was used to assess the complete process. FIGURE 45 presents an example of the slides used during the workshop.

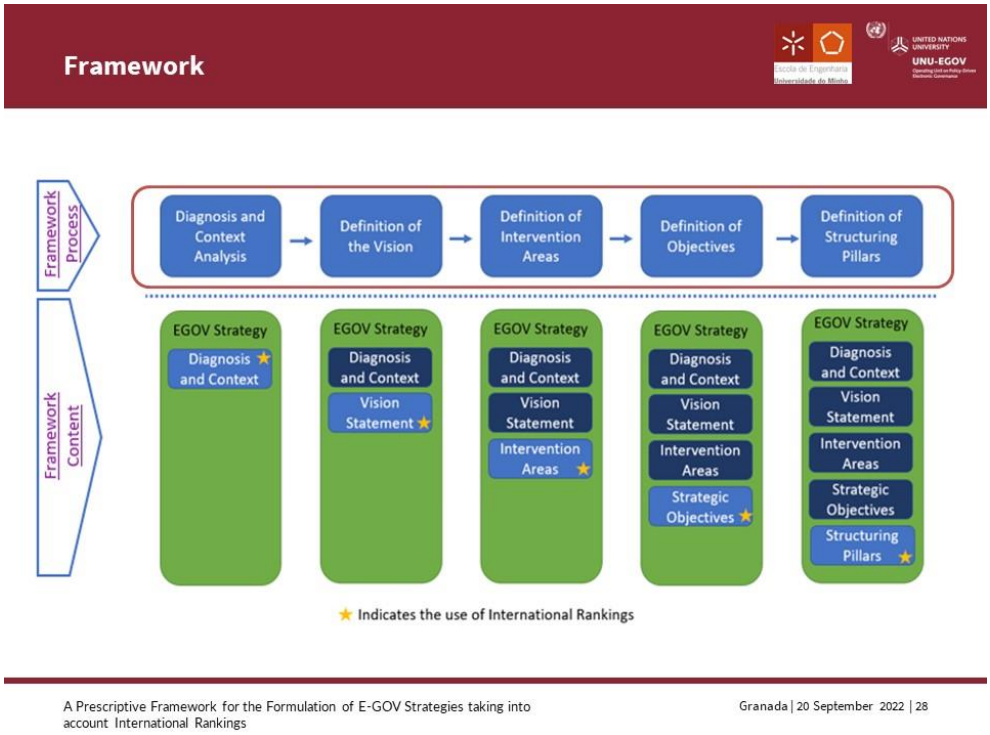


Figure 45: Example of PowerPoint slides used in the workshop.

The author was responsible for conducting the workshop and explaining the method to the audience, including its strategy formulation process and the correspondent strategy content. A researcher, acting as secretary, controlled the time, took notes, and launched the questionnaires along with the presentation of the method. After explaining each stage, the correspondent questionnaire was launched, followed by a 10-minute discussion. After the complete presentation of the method, another 10-minute debate focused on the entire process and correspondent content. Six to eight people made most of the contributions and answered the questionnaires. Almost 85% declared having some experience of being an expert in EGOV strategy formulation, with the same rate of familiarity with EGOV international rankings.

7.5. Evaluation of the Demonstration of the Method – Version 3

The presentation of the five stages of the method was intercalated with the application of an electronic questionnaire. All the questions admitted only pre-defined answers, such as "not present, slightly present, no opinion, fairly present, and present". Five features have been evaluated in each stage presentation: flexibility, instructiveness, ease of use, comprehensiveness, and co-creativeness.

Effectiveness and coherence have been evaluated only for the complete formulation process because they are better perceived when the whole process is observed. An additional open question has been proposed to collect further contributions to improve the method.

TABLE 22 presents the questions used to collect feedback and support the discussion in the focus group. Five questions were used to evaluate stages 1 to 5. The other two questions were used to evaluate the complete process.

Table 22: Questions used during the focus group.

Used to evaluate	Question	Options
Stages 1 to 5	Is it adjustable to the country context (flexible)?	Not Present Slightly Present No Opinion Fairly Present Present
	Does it support the learning process and the association of ranking characteristics to EGOV purposes (instructive)?	
	Does it simplify the use of international rankings in EGOV strategy formulation (easy to use)?	
	Does it broadly cover the EGOV purposes (comprehensive)?	
	Does it enable the participation of multiple stakeholders (co-creative)?	
Complete Process	Does it deliver an EGOV strategy after a complete formulation process (effective)?	
	Does it have a logical, ordered, and integrated process (coherent)?	

For the analysis, answers were grouped to evaluate if the method has or has not the specific desired feature in each stage. Pre-defined answers such as "not present" and "slightly present" have been used to evaluate that the method "has not" the assessed feature and marked as "No" if they reach 50% or more answers. On other sites, answers such as "fairly present" and "present" were used to evaluate that the method "has" the specific desired feature in that stage; and marked as "Yes" if they reached 50% or more answers. If the answer "no opinion" prevails among the respondents, no evaluation is possible, and they are marked as "–". This situation occurred with the "co-creativeness" feature in many stages. It also happened with the feature "ease to use" in Stage 5. These results were presented on-the-fly during the focus group discussion to support it. Usually, the group confirmed the results and enriched the discussion with further arguments during the debate. As effectiveness and coherence were assessed only at the end of the discussion, part of the cells is marked as "N/A". Results are shown in TABLE 23.

Table 23: Focus Group Assessment of the presence of the method desired features.

Stages	Flexible	Instructive	Easy to Use	Comprehensive	Co-creative	Effective	Coherent
1	Yes	--	Yes	Yes	--	N/A	N/A
2	Yes	No	Yes	Yes	No	N/A	N/A
3	Yes	Yes	Yes	Yes	--	N/A	N/A
4	Yes	Yes	Yes	Yes	--	N/A	N/A
5	Yes	Yes	--	Yes	--	N/A	N/A
Complete Process	Yes	Yes	Yes	Yes	Yes	Yes	Yes

7.6. Reflection and Learning

Activity “F” is dedicated to "Reflection and Learning". It comprehends the process of learning that occurred during the application and demonstration of the method used for the development of the next version. As they used the same method version, activity “F” consolidates both evaluations from the different tracks of application and demonstration. As occurred with the previous versions, results appear as anticipated and unanticipated consequences. These consequences were based on the researcher's observation, participants' feedback, and the focus group results.

- Anticipated Consequence AC1: participants that attended the training considered the method adaptable to the country's context, according to the instructor's perception, participants' presentations, and debates that occurred in the class. The Focus Group confirmed the “flexibility” of the method and its five stages. It reinforced confidence that the method is **flexible.**
- Anticipated Consequence AC2: although the occurrence of a slight confusion with the term “purposes” demanded clarification by the instructor, participants understood the concept of EGOV purposes and could associate them with the main country's policies and the international rankings. In addition, a participant suggested replacing the term “Structuring Pillars” with “Enablers” based on the recent benchmark of national strategies, which proceeded before the formulation of the Egyptian EGOV policy. Regarding the EGOV purposes, focus group participants demonstrated that they correctly understood the meaning of it without additional clarification. It reinforced confidence that the method is **comprehensive**, although certain terminology and concepts used in the method could be improved.
- Anticipated consequence AC3: the method coherently systematises the use of rankings' dimensions and measurements during the strategy formulation process, according to the

participants. This outcome becomes clear along with the exercise's presentations and subsequent discussions. Results are compatible with those achieved through the focus group. Both outcomes endorse the effectiveness and coherence of the method, reinforcing confidence that the method is **effective** and **coherent**.

- Anticipated consequence AC4: Participants recognised that the method simplified and made using international rankings content easier along the strategy formulation process. Results reinforced confidence that the method is **instructive** and **easy to use.**
- Unanticipated Consequence UC1: the results from the Focus Group showed that Stage 2 should be improved, demanding "instructiveness" refinements. It attenuated the confidence that the method is **instructive**.
- Unanticipated Consequence UC2: the results from the Focus Group indicated that the method should be improved in terms of "co-creativeness". It occurred as shown in the TABLE 16 results, especially in Stage 2, but also in other stages that got inconclusive results regarding the feature. It should be noted that although the complete method has been evaluated during the Focus Group as "co-creative", individual evaluation of each stage presented divergent results. It attenuated the confidence that the method is **co-creative.**
- Unanticipated consequence UC3: the Focus Group qualitative evaluation, collected in the form of an open question in the electronic questionnaire, indicated that the absence of a step to define general strategic objectives, simultaneously with the definition of the vision at the beginning of the formulation process, can difficult the development of the strategy content. It attenuated the confidence that the method is **effective.**

7.7. Developing the Method – Version 4 and Formalisation of Learning

Activity C is dedicated to developing the **Method – Version 4** and the generation of correspondent **design principles**. The statements representing the Anticipated and Unanticipated Consequences will be used to evolve the method, besides the scientific literature that will support the modifications.

First, the Anticipated Consequence AC2 suggested improvement opportunities and motivated the modification of Stage 5. It has been renamed Identification of Enablers to clarify and avoid misunderstandings like those found during the Egypt training. Unanticipated Consequences UC1 and UC2 motivated modifications in the method guidelines and will also be described in due course.

The method's process and the Unanticipated Consequence UC3, which indicated the absence of a step to define general objectives, motivated the split of Stage 2 into three sub-stages. They are the definition of strategic objectives, the definition of the strategic vision, and the definition of strategic principles. Strategic objectives will define general and broad goals to pursue, as proposed by the Focus Group participants. As the motivation is to provide focus and a framework guide for formulating the strategy content, the definition of Strategic Principles embedded into the guideline of Stage 2 will also be transformed into a sub-stage. It is a similar status that it already had in version 1 of the method. Both will be executed simultaneously with the definition of the strategic vision and will guide the entire strategy content. In fact, during the application of the Method – Version 2 in Cabo Verde, nine strategic objectives were defined in parallel with the strategic vision definition and were useful to guide the whole country's strategy. That experience reinforces the adequacy to define general objectives as a sub-stage in Stage 2 of the method. The new strategy formulation process of the method is illustrated in FIGURE 46.

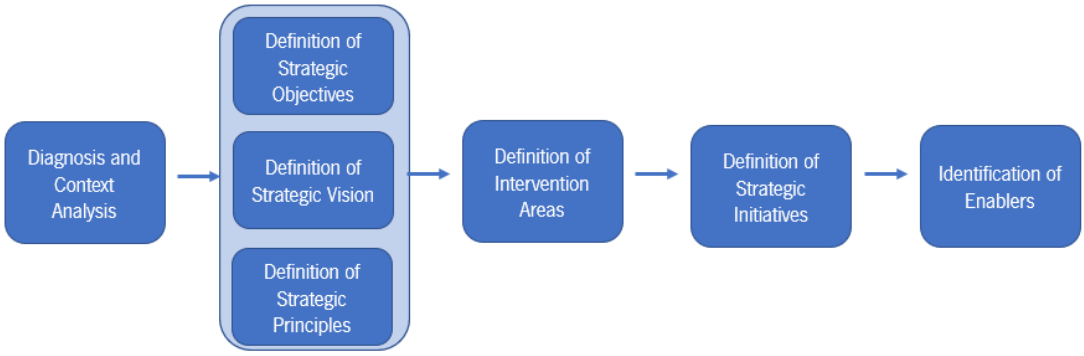


Figure 46: The Strategy Formulation Process of the Method - Version 4. Developed by the author.

Regarding the method guidelines, the Anticipated Consequence AC2 and Unanticipated Consequences UC1 and UC2 motivated the updates. UC1 contested the method as instructive, pointing out that Stage 2 does not support the learning process and the association of rankings characteristics to EGOV purposes. Indeed, there were no guidelines in that Stage that refer to EGOV purposes or International Rankings, although they are present in Stage 1, and respective outputs were supposed to be used in Stage 2. Nonetheless, the situation motivated the revision of the guidelines, especially those related to the international rankings: Guidelines 1.1 and 1.3, as shown in TABLES 24 and 25. As none of them has the recommendation to use the Instrument F – International Ranking Analysis Tool, an instructive instrument, they will now recommend it. Another modification occurred in instrument "F", improving its

learning characteristics and its application in defining the strategic vision. Instrument "F" is shown in FIGURE 47.

Table 24: Guideline 1.1, part of the Method – Version 4.

Guideline 1.1*: Uncover the country's EGOV history exploring former strategies, plans and/or roadmaps in digital areas (EGOV, Telecommunication, ICT, Cybersecurity, and others). Find out which accomplishments and deliverables were achieved through these strategies and plans. Find out which ones were not yet accomplished and/or delivered but it is still relevant to address them through the new EGOV strategy. Explore trends and shortfalls from selected international rankings through longitudinal data (10 years). *This guideline has been updated due to the Unanticipated Consequence UC1.	
Former guideline(s)	Guideline 1.1 (v3)
Recommended technique	Document Analysis (see Tool Kit – Instrument A) International Ranking Analysis Tool (see Tool Kit – Instrument F)
Expected output	"EGOV History", "National Context, and "International Context" sections in the Diagnosis and Context Analysis Chapter

Table 25: Guideline 1.3, part of the Method – Version 4.

Guideline 1.3:** Using EGOV purposes* on the horizon/as a backdrop, explore key-actors opinion about: a) political and financial risks to the strategy sustainability; b) country economic vocations and niches; c) partnership opportunities between government branches, government agencies, private sector, universities, and international institutions; d) country dependency of financial support/loans/donations; e) expectations and priorities of EGOV efforts Executive Government Agencies, Judiciary and Legislative branches, Independent Institutions, Public Prosecution Services, Electoral System, Security Forces, and all others that impact the citizens life as public services providers; f) international references about EGOV initiatives and technologies; g) country's crises that occurred in the past that impacted public policies and causes; h) international rankings that are important and relevant according to the key actors opinion, and to the country context; and i) *status quo* of government internal procedures and administrative processes. * EGOV purposes: 1) Make the government more efficient; 2) Improve public service delivery; 3) Make the government more accountable; 4) Improve the relationship between citizens and businesses with the public sector. **This guideline has been updated due to the Anticipated Consequence AC2.	
Former guideline(s)	Guideline 1.3 (v3)
Recommended technique	Interview Guide (see Tool Kit – Instrument B) and SWOT Analysis (see Tool Kit – Instrument E) International Ranking Analysis Tool (see Tool Kit – Instrument F)
Expected output	"EGOV History", "National Context, "International Context", and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter

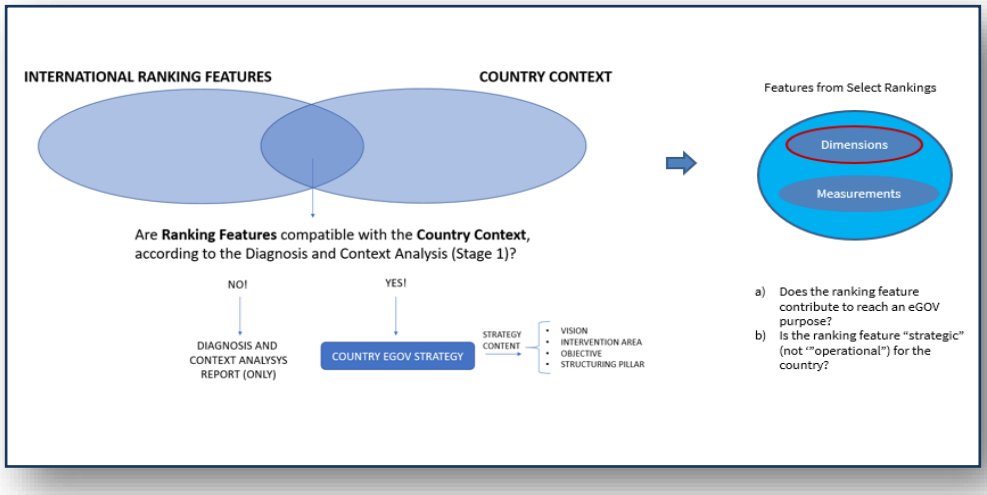
Instrument F
International Ranking Analysis Tool

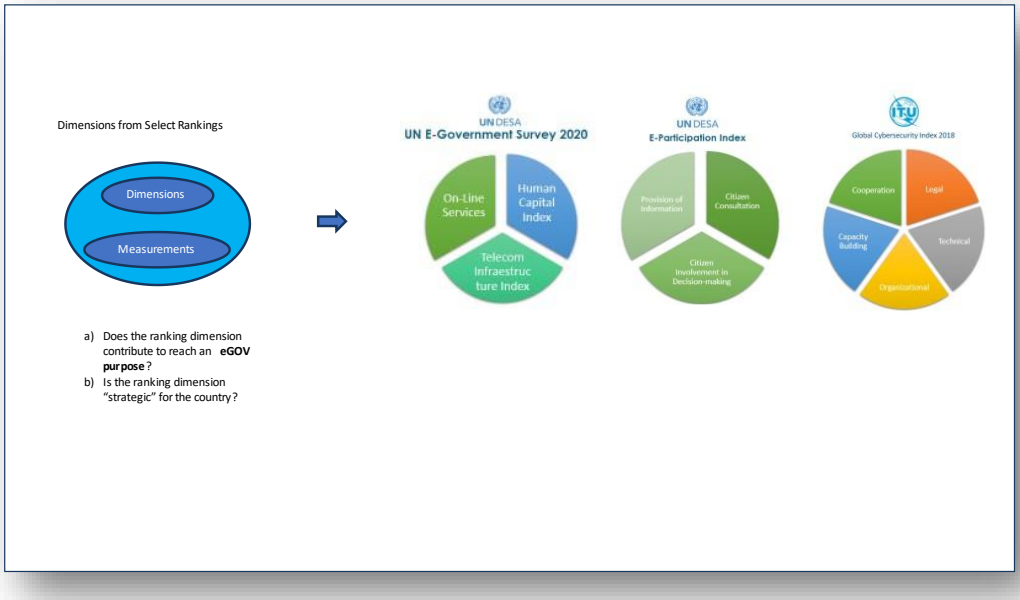
This instrument supports depicting the International Rankings into components to be used through the method and guidelines for the formulation of EGOV strategies taking them into account. The instructions are stated below:

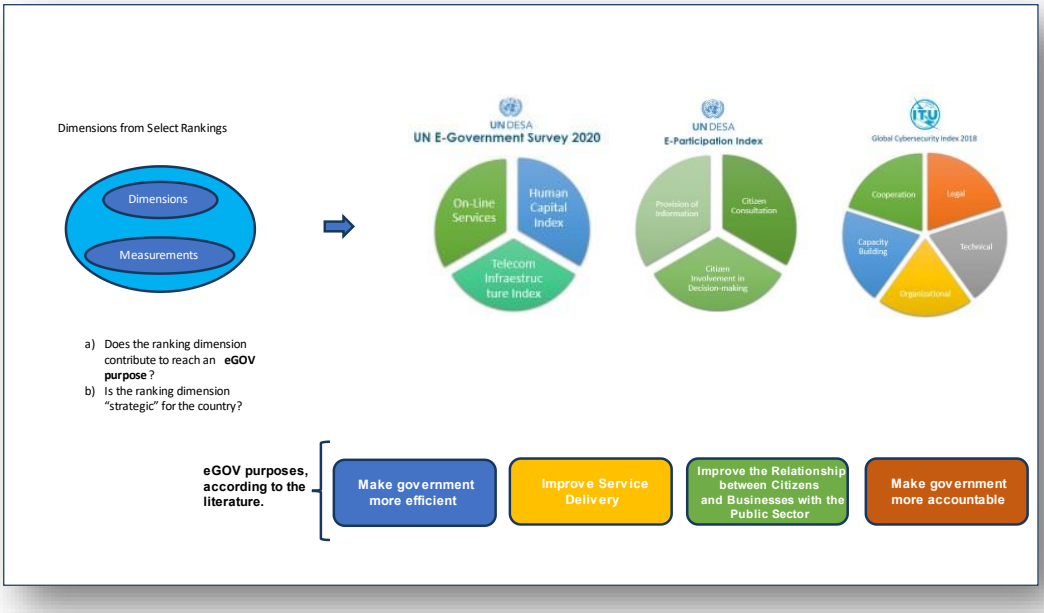
1. Select important and relevant rankings according to the key-actors opinion and the country's context.
2. Identify the international institution that is responsible for it.
3. Identify ranking features, evaluation window (annual, biannual, etc.), publication intervals, and the evaluation process (people that integrate the process, the process stages, techniques used, etc.).
4. Gather the data/information about the country, as well as about the country-of-references. Explore trends and shortfalls from selected international rankings through longitudinal data (10 years).
5. Identify ranking components such as dimensions and measurements.
6. Explore eventual relationships between components of international rankings and EGOV purposes.
7. Define intervention areas, strategic objectives, and measures inspired by international rankings components.

All this data/information should be used to inspire the strategy content, such as the strategic vision, areas of intervention, objectives and measures, and structuring pillars. During this, remind the set of EGOV purposes: make the government more efficient; improve public service delivery; make the government more accountable; improve the relationship between citizens and businesses with the public sector. They are a filter if the document is compatible and useful for the EGOV strategy formulation.

The following images exemplify the procedure:




Dimensions from Select Rankings
Dimensions
Measurements
a) Does the ranking dimension contribute to reach an eGOV purpose?
b) Is the ranking dimension "strategic" for the country?
UN DESA
UN E-Government Survey 2020
On-Line Services
Human Capital Index
Telecom Infraestructure Index
UN DESA
E-Participation Index
Provision of Information
Citizen Consultation
Citizen Involvement in Decision-making
Global Cybersecurity Index 2018
Cooperation
Legal
Technical
Organisational
Capacity Building


Dimensions from Select Rankings
Dimensions
Measurements
a) Does the ranking dimension contribute to reach an eGOV purpose?
b) Is the ranking dimension "strategic" for the country?
UN DESA
UN E-Government Survey 2020
On-Line Services
Human Capital Index
Telecom Infraestructure Index
UN DESA
E-Participation Index
Provision of Information
Citizen Consultation
Citizen Involvement in Decision-making
Global Cybersecurity Index 2018
Cooperation
Legal
Technical
Organisational
Capacity Building
eGOV purposes, according to the literature.
Make government more efficient
Improve Service Delivery
Improve the Relationship between Citizens and Businesses with the Public Sector
Make government more accountable

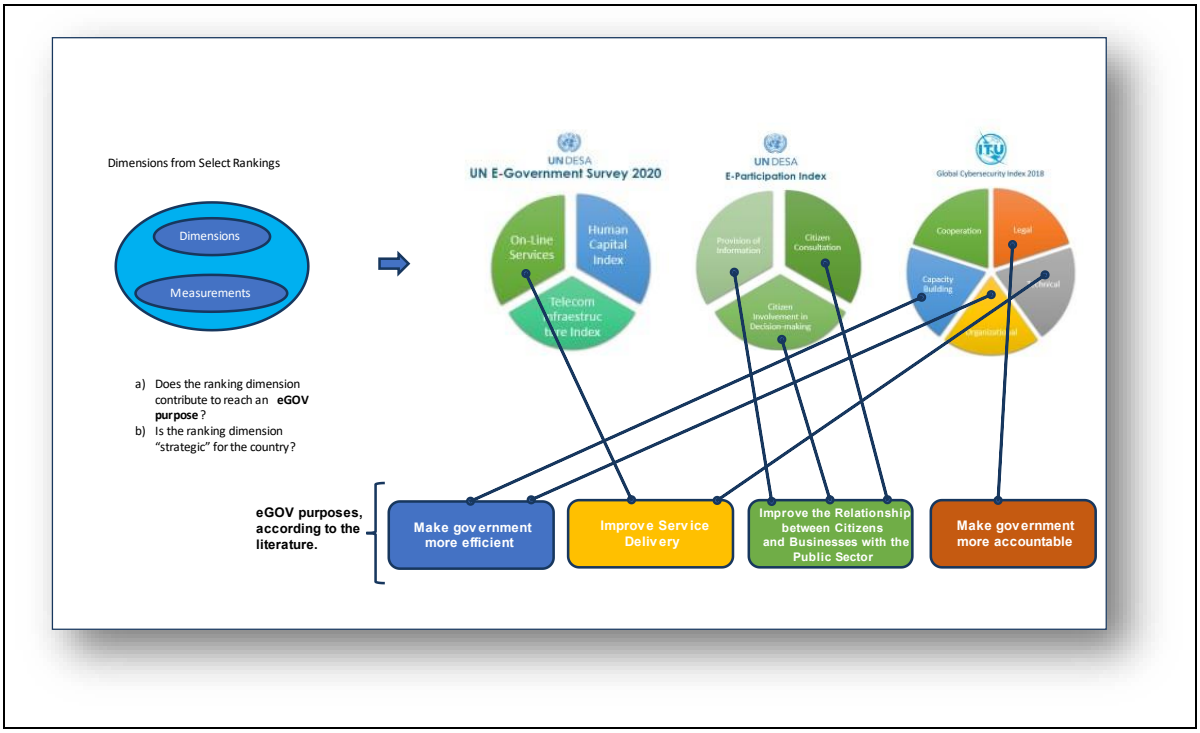


Figure 47: Instrument "F" to support the International Ranking Analysis. Part of the Method – 4.

Unanticipated Consequence UC2 was addressed through improvements related to the "co-creativeness" feature of the method. It impacted the method guidelines, which include the participation of stakeholders such as citizens, business owners, public agents, politicians, and other key actors in the form of interviews or a SWOT workshop: guidelines 1.3; 1.4; 1.5; 1.6; and 1.7. In addition, the new guideline 5.5 prescribe a public consultation process to validate the strategy content. Two other modifications occurred to improve the "co-creativeness". First, the SWOT Workshop Guide included a validation procedure with the participants to conclude the workshop. Second, the public consultation that only occurred to validate the strategy content will occur after Stage 1 to validate the diagnosis and context analysis through the new guideline 1.9, as shown in TABLE 26.

Table 26: Guideline 1.9, part of the Method - Version 4.

Guideline 1.9*: After concluding Stage 1, organise a public consultation process to validate de Diagnosis and Context Analysis. Submit the document to representatives of as many population groups as possible. Do not forget the set of key actors. * This guideline has been included due to the Unanticipated Consequences UC2 of the evaluation of the Method – Version 3. *This guideline has been updated due to the Unanticipated Consequence UC2.	
Former guideline(s)	-
Recommended technique	Public Consultation
Expected output	Suggestions and Critics for the Diagnosis and Context Analysis
Inputs from previous stages	-

After these modifications in the method's process, guidelines and recommended techniques, the following Design Principles have been generated for the **Method – Version 4**:

- Design Principle DP1: the method should provide a formal strategy formulation process with stages and respective guidelines (MATERIAL PROPERTY) that, taking international rankings into account, support the team to build the strategy content composed of a diagnosis and context analysis, the set of strategic objectives, the strategic vision, the set of strategic principles, the set of intervention areas, the strategic initiatives and respective and necessary enablers (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **effectiveness.**

- Design Principle DP2: the method should provide a strategy formulation process with prescriptive guidelines, data collection instruments, and participatory techniques (MATERIAL PROPERTY) that assure the involvement, participation, and validation of/by multiple stakeholders and institutions (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method**: co-creativeness.**

- Design Principle DP3: the method should provide a strategy formulation process with flexible guidelines (MATERIAL PROPERTY) that allow the team to build a strategy content based on the extensive diagnosis and the broad analysis of the country context (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method **flexibility.**

- Design Principle DP4: the method should provide a strategy formulation process with stages and guidelines covering EGOV purposes (MATERIAL PROPERTY), allowing the team to learn and use them to build the strategy content (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **comprehensiveness.**

- Design Principle DP5: the method should provide a strategy formulation process with stages and guidelines covering the characteristics of selected International Rankings (MATERIAL PROPERTY), allowing the team to learn about their features, dimensions, measurements, evaluation window and publication intervals to build the strategy content taking them into account (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION).

It is related to the following desired characteristics of the method: **ease of use** and **instructiveness.**

- Design Principle DP6: the method should provide logic and rational strategy formulation process (MATERIAL PROPERTY) with each stage generating outputs corresponding to the necessary inputs of the following stages (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **coherence.**

8. From the Application of Version 4 to the Development of Version 5

8.1. Introduction

This chapter describes the fifth iteration of the method development. It details the application of the Method – Version 4 and the development of Version 5. These activities are highlighted in FIGURE 8.1. Version 4 was applied in two different situations. First, the method was applied in the 2nd edition of the Egypt Capacity Building Programme, which occurred in October 2021, with public officials involved in the digital transformation of the public sector. Second, the method was applied in formulating the Digital Government Roadmap of Guinea-Bissau. The iteration is highlighted in FIGURE 48.

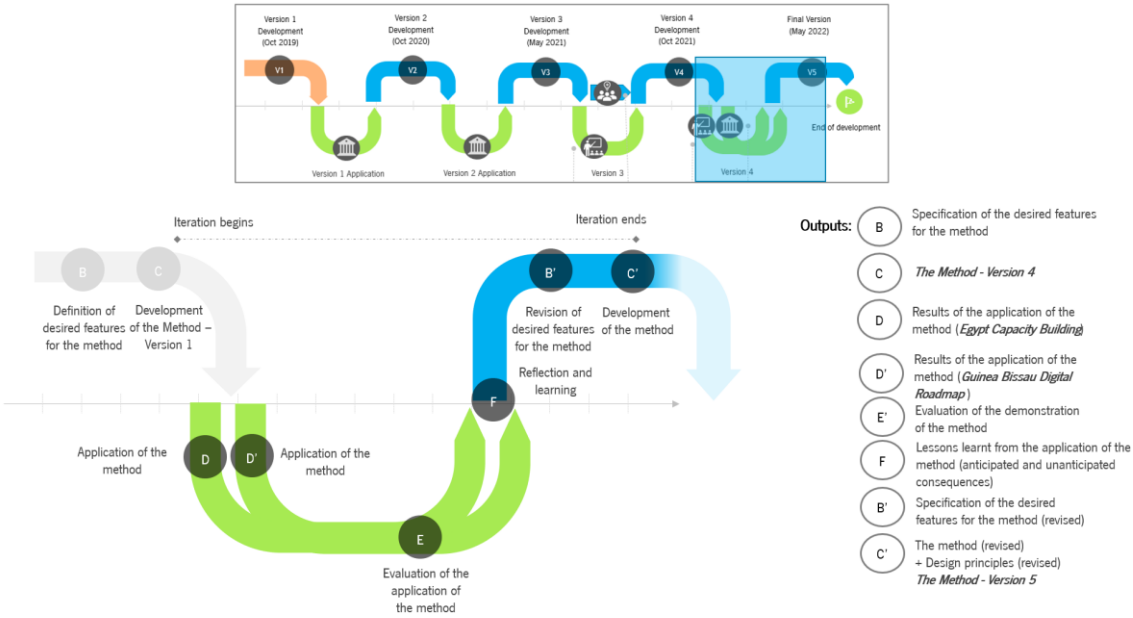


Figure 48: The 5th Iteration, concerning the development of the Method – Version 5. Developed by the author.

Activities "D" and "D" represent the application of the method on the two occasions, while activity "E" represents the evaluation of these applications. Activity "F", reflection and learning, occurs in the sequence followed by the review of the desired features for the method in activity "B"' and development of the **Method – Version 5** in activity "C", thus generating the corresponding Design Principles.

8.2. Application I of the Method – Version 4

Activity D is dedicated to the "Application of the Method" in the 2nd Egypt Capacity Building Programme. Unlike the previous occasion, this programme involved only people directly engaged in digital policies. The programme was conducted in Guimarães, Portugal, in October 2021. According to the research design, it was considered a "suitable context" where "the artefact" was used. As explained in the previous chapter, the application in a capacity-building programme does not produce a real EGOV strategy. However, using the method by the participants to simulate the formulation of a strategy and roleplaying EGOV strategists produces outputs that feed the development process, although offering limits if compared to a real case scenario.

The researcher assumed the instructor role and taught a class of 27 participants from different government areas, 7 women and 20 men. Nine governmental institutions were represented. Examples were the Presidency, the Administrative Control Authority, the Ministry of Planning and Economic Development, and the National Institute for Governance and Sustainable Development. The lecture was held on 21 October 2021, and this time was split into three modules: EGOV strategy lecture; EGOV Strategy Formulation Method, which used Version 4 of the method; and EGOV Strategy Case Studies, which also included the Brazilian case as a national strategy example, although it did not precisely follow the method. Since the instructor was part of the team that worked on the Brazilian EGOV strategy of 2016 and its revision in 2018, it was easy to link the case with the method stages and guidelines. The course also included the case of the state of South Australia to illustrate a subnational case to the participants. The presentation of the method was illustrated by the cases of São Tomé and Príncipe and Cabo Verde once the strategies of these two countries had been formulated using previous versions of the method. The participants performed a practical exercise dedicated to formulating an Egyptian EGOV Strategy. They use the **Method – Version 4**, its stages and guidelines, guided by the instructor, and teaching resources developed based on the method's guidelines, techniques, and correspondent instruments.

The lecture resources, including current country strategies, offered inputs for formulating the strategy content. Digital Egypt and referred strategies were a good source of information for developing an Egyptian EGOV Strategy during the training. As there was a very limited amount of time, most data and information were sourced by the instructor to be used as input for the Diagnosis and Context Analysis stage. It included the international ranking of UN/EGDI and Egypt-related data. Data from countries of reference was also provided.

Participants were split into six groups of three to five people and were challenged to follow the **Method – Version 4** stages and guidelines. The exercise included the proposition of Egyptian EGOV goals based on the screening of class material; the country's programs, plans and strategies, such as Digital Egypt; and the analysis of a SWOT table, previously built with the support of Egyptian public officials. The participants were encouraged to formulate the strategy content formed by strategic objectives, a vision statement, and strategic principles. Afterwards, a set of intervention areas, strategic objectives, and respective enablers was also carried out. According to the teaching material used in the class, participants should follow the proposed strategy formulation process. FIGURE 49 show a slide used to support the participants, with the Method – Version 4 and its new strategy formulation process.

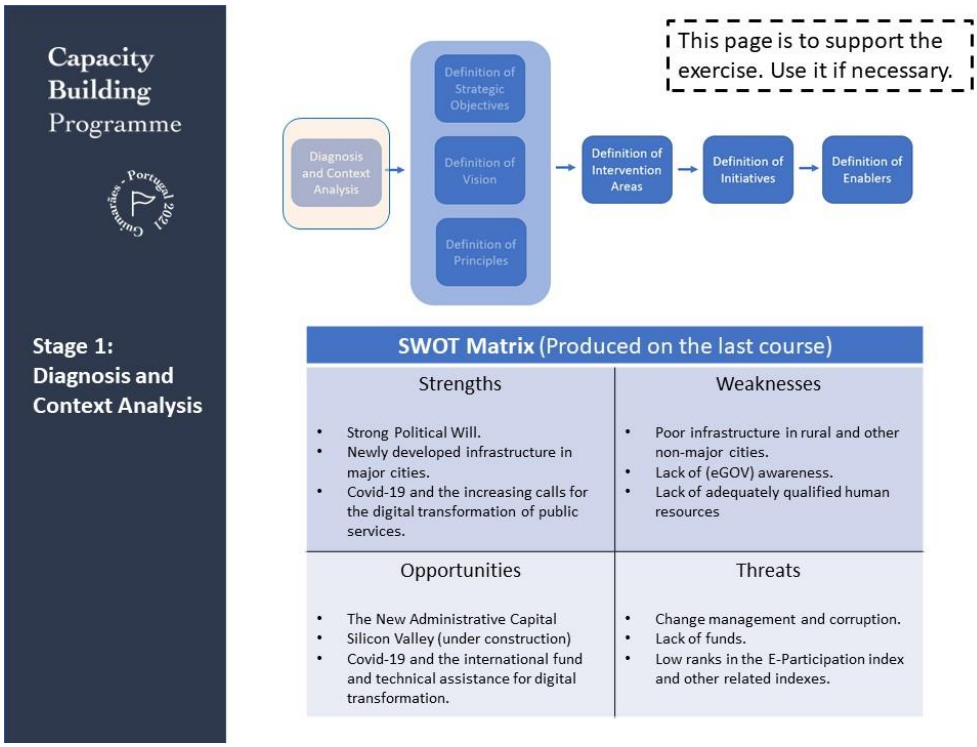


Figure 49: Slide used during the five stages of the Method - Version 4.

The use of international rankings dimensions and measurements has been detailed during all five stages according to the associated guidelines. Teaching resources were the same material used in the previous edition. Unlike the first edition in August 2021, directives of class exercises and respective time limits were explicit. Forms have been created to assure the coherence of the strategy content, stimulating participants to connect the inputs and outputs of each stage. The instructor provided most data and

information for Stage 1 to improve the relationship between the available time and the exercise results. FIGURE 50 illustrates part of this effort and the slides used during the training.

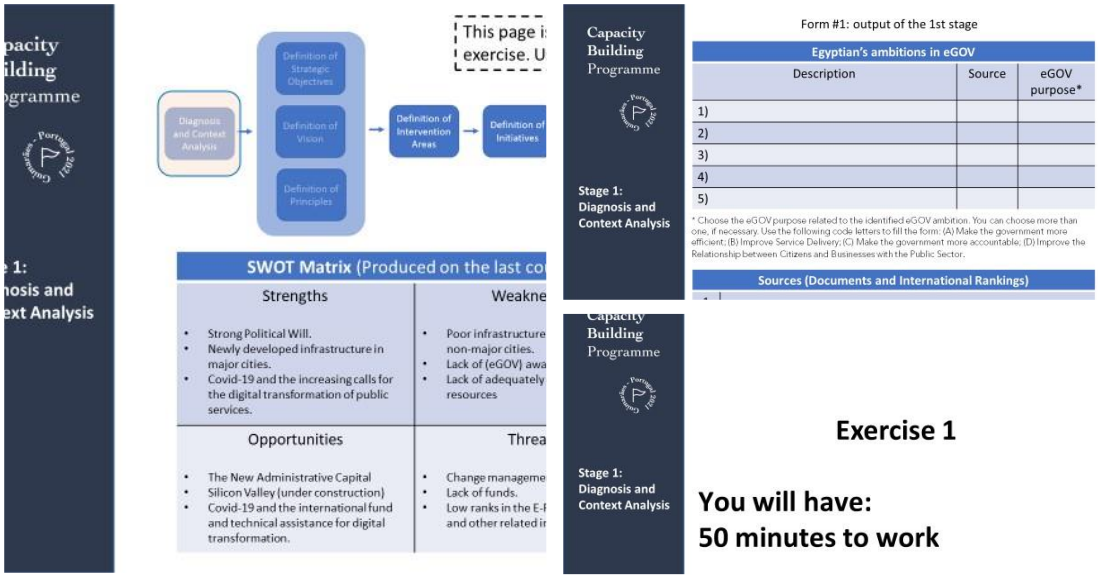


Figure 50: Slides used during the 2nd Egypt Capacity Building.

Only five groups presented exercise results because two of the six groups decided to join efforts. As a result of pre-defined forms, the strategy content produced by the participants was consistent and coherent. Egypt's ambitions in EGOV were associated with the EGOV purposes and documents used as sources of information, such as Egypt Vision 2030 and Egypt Digital Transformation Strategy 2021. FIGURE 51 illustrates it.

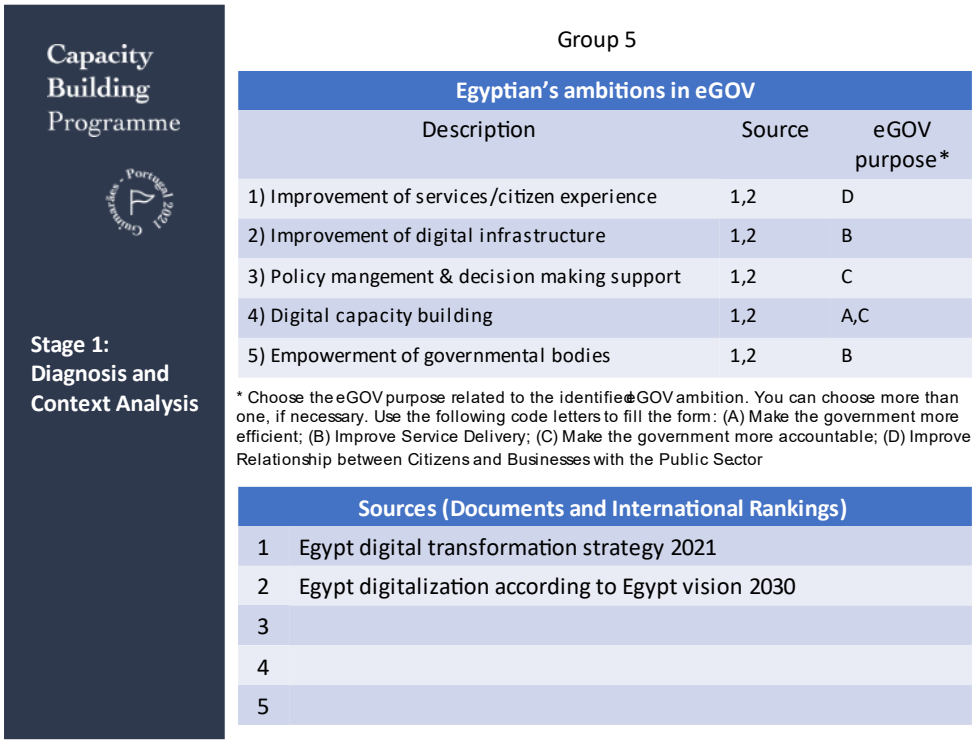


Figure 51: Partial results of the EGOV Strategy exercise, produced by Group 5.

General feedback from the participants was positive, confirming that the method is adequate to formulate an EGOV strategy. According to one of the participants, it can be adequate for the sub-national level, based on the case of the state of South Australia presented in class. During the exercise, participants mentioned that the method addresses the major components of the expected strategy content, including the use of international rankings, which was considered a great value.

8.3. Application II of the Method – Version 4

The fifth iteration also applied the method in formulating the Guinea-Bissau EGOV Roadmap. Although the name is particular, the roadmap included practically all the specific content of an EGOV strategy. The name was chosen by the international agency that sponsored the project since the intention at the time was to formulate other planning documents related to the theme.

Guinea-Bissau is a west African country and a member of the African Union, bordering Senegal to the north and Guinea to the southeast. The Atlantic coast comprises an archipelago with more than 100 islands. It is organised into eight regions and an autonomous sector called Bissau. Each region is divided into sectors, formed by "tabancas". The capital of the country is the city of Bissau. Its population

comprises multiple ethnic groups, languages, and religions, with almost two million people. It has been an independent country since 1974 and is characterised by a fragile political and institutional situation. Since its independence, the country has had four *coup d'états* and 16 attempted, plotted, or alleged coups, characterising it as politically unstable. Constitutionally, however, it is a representative democracy based on the National People's Assembly with political parties organised and alternation in power. As the main challenge, the country has persistent poverty, low growth rates, and fragile political institutions, which are also considered opportunities for change seizing EGOV opportunities. The GDP grew 4.5% in 2019, mainly due to private activities and exportations, but in 2020 there was a sharp drop to negative values, mainly because of the COVID-19 pandemic effects and the fall in the price of cashew nuts. Indeed, the country's economic performance is related to the production of cashew nuts, which are responsible for almost 70% of labour opportunities and 90% of international trade. The unemployment rate among people from 15 to 34 years old is 72%, mainly women. To face these challenges, the country's authorities prepared the National Development Plan 2020-2023.

The Guinea-Bissau EGOV Roadmap project was a partnership between UNU-EGOV and the local office of the United Nations Development Program. It started in March 2021 and was concluded in October of that year. The roadmap presentation to the country authorities took place in December 2021.

During Stage 1, Benin, Ghana, Cabo Verde, and East Timor were the countries of reference. Ghana and Benin are countries geographically nearby, with many similarities but quite different in EGOV development. Cabo Verde is a historical and usual reference for the development model. East Timor, also a Portuguese-speaking country, has a similar level of development compared to Guinea-Bissau.

Four questionnaires have been applied to selected key actors, corresponding to the Instrument B – Key-actors Interview Guide, Instrument D – ICT Infrastructure Inventory, Instrument G – ICT Governance Inventory, and Instrument H – Back-office Inventory. A SWOT workshop was held on 15 June 2021 for 23 people from several government agencies and ministries. It has been done following Guidelines 1.3, 1.4, 1.5, 1.6, and 1.7, using the Instrument E – SWOT Workshop Guide as support. After the application of the questionnaires, a set of interviews was done. The interviews were structured and oriented based on each actor's answers to the questionnaires. These one-hour interviews were useful to complete the information needed, including that related to the rare initiatives of online public services and efforts on transparency and accountability using online tools.

Four international rankings have been selected: International Telecommunication Union Global Cybersecurity Index – ITU/GCI; United Nations E-Government Development Index – UN/EGDI; and the World Bank Ease of Doing Business- WB/DB.

A comparison of international rankings data of Guinea-Bissau and its countries of reference was also carried out. Data has shown that the country has the potential to improve in a range of areas evaluated through the international rankings, in a leapfrog strategy, seizing opportunities and learning good practices from countries of reference. Investments and intervention in the areas listed in the EGOV Roadmap can impact international rankings, including those not directly related to EGOV, such as the World Bank Ease of Doing Business. Finally, the information produced in this stage was used to identify and propose strategic objectives that would contribute to the EGOV development of the country.

Stage 1 – Diagnosis and Context Analysis was concluded at the end of July 2021, producing outputs to be used in the following stages. Updates to Stages 2 to 5 during 2021 have been reflected in the Guinea-Bissau EGOV Roadmap. Stage 2, now composed of three substages, resulted in the Strategic Objectives (Substage 2.1), the Strategic Vision (Substage 2.2), and Strategic Principles (Substage 2.3).

Seven Strategic Objectives were defined: 1) improve the public service delivery through digital channels; 2) improve the effectiveness of the Public Administration; 3) make the government more transparent and accountable; 4) increase the participation of the society in the decision processes; 5) develop the country's digital literacy; 6) improve the technological infrastructure; 7) promote and seize the opportunities of relevant international partnerships.

The Strategic Vision has been defined as "A Guinea-Bissau that explores the potential of the digital governance to build a better country to live in, offering better public services to society, strengthening institutions, and developing with sustainability". To conclude Stage 2, six Strategic Principles have been defined: 1) universal public services, digital and simple to use; 2) a democratic process supported by digital tools; 3) digital literacy for the population; 4) synergy between all digital strategies, projects, and initiatives; 5) adequate infrastructure for good digital governance; 6) international partnerships for the EGOV development.

After the execution of Stage 3 – Definition of Intervention Areas, seven intervention areas have been defined: 1) Digital Public Services, to improve the quality and capacity of public service delivery; 2) Public Administration Structures, to develop back-office structures dedicated to the public service delivery; 3) Transparency of the Public Sector, to improve trust between citizens and government through transparency and accountability initiatives; 4) Citizen Participation, to engage multiple actors

from the civil society to join the public policies decision process; 5) Digital Literacy, to capacity building of citizens, public officials and business owners in digital tools; 6) Governance and Digital Transformation Regulation, to enhance the EGOV regulatory framework; and 7) Technological Infrastructure, to develop the local infrastructure necessary to enable the digital governance efforts.

Stage 4 – the Definition of Initiatives listed several EGOV initiatives grouped into the seven Intervention Areas. Each initiative presents its justification based on the diagnosis and context analysis gathered in Stage 1. For example, the initiative "Digital Transformation of the Business Creation Centre", part of the Intervention Area "Digital Public Services", used as justificative the results of a) international ranking analysis (WB/Ease of Doing Business); b) analysis of national strategies, policies, and plans; c) analysis of public services offered in the country; d) countries-of-reference analysis and e) analysis of interviews and questionnaires data.

Finally, Stage 5 – Definition of Enablers, proposed structuring pillars such as the "Public Services Portal", a "Mobile Notification Service", the "Transparency Portal", and the "e-Participation Portal", and the creation of the "National Government CIO". In the end, 20 initiatives and respective enablers have been proposed using the same coherent structure. There is not an official version of the document available on-line once it is not formally approved by the Council of Ministers yet.

8.4. Evaluation of the Applications of the Method

Using the **Method – Version 4** in the second edition of the Egyptian capacity-building programme was a new opportunity to apply the method, with the researcher assuming the role of the instructor and the participants as strategists. Although it was a simulation, it produced valuable results for the method development. As occurred on the first occasion, the participants ratified the method as useful to formulate a strategy. The method taking into account international rankings was considered a plus by the participants. This time, they did not propose any improvement to the method, which signalises a satisfactory level of the method development. Throughout the lecture, participants worked into groups formulating an EGOV strategy, passing by a prescriptive process and producing the strategy content. According to the instructor's reflections about the absence of suggestions during the course, the method reached a certain level of maturity. This opinion was shared by other researchers that were invited to join the lecture.

Applying the **Method – Version 4** in the formulation of the Guinea-Bissau EGOV Roadmap was another opportunity to apply the method and produce the respective evaluation. This process was based on the researcher's observation in the consultant role. A debate among the research team and a conversation with technical consultants from the local office of the United Nations Development Program complimented the evaluation process. It was possible to confirm that the method is adjustable to the context of Guinea-Bissau (flexible); supported the learning process and the association of ranking characteristics to EGOV purposes (instructive); simplified the use of four international rankings in EGOV strategy formulation (easy to use); covered the EGOV purposes in the roadmap content (comprehensive); enabled the participation of multiple stakeholders (co-creative); delivered the roadmap after a complete formulation process (effective); and presented a logical, ordered and integrated process (coherent).

8.5. Reflection and Learning

Activity F is dedicated to "Reflection and Learning" after applying the Method – Version 4 in the Egypt capacity building programme and formulating the National EGOV Roadmap of Guinea-Bissau. It represents the application of the learning that occurred during the applications in the format of Anticipated – AC and Unanticipated Consequences – UC:

- Anticipated Consequence AC1: participants considered the method adaptable for the Egyptian context, according to the results of the EGOV strategy exercise and comments during the group presentations. The adaptation of the method for formulating the EGOV roadmap of Guinea-Bissau succeeded, although it was developed as a roadmap without all content types as in a complete EGOV strategy. For example, the enablers were identified considering the strategic initiatives in a separate stage. Still, due to the country's EGOV status maturity, they resulted in a minimal set insufficient to be listed in a separate chapter in the roadmap document. Despite this, the result was considered satisfactory and reinforced confidence that the method is **flexible.**
- Anticipated Consequence AC2: contrary to the first occasion, the participants correctly perceived and used the list of EGOV purposes in the EGOV strategy exercise. During the formulation of the Guinea-Bissau EGOV Roadmap, there was a similar perception among key actors and stakeholders involved in the project. It reinforced confidence that the method is **comprehensive.**

- Anticipated Consequence AC3: during the lecture, the five groups of participants successfully concluded the EGOV strategy formulation exercise using the method. The same result occurred in Guinea-Bissau, with the EGOV roadmap formulated following the method. It reinforced confidence that the method is **effective**.
- Anticipated Consequence AC4: both the participants and the consultants who formulated the Guinea-Bissau roadmap build the strategy content making a clear and rational relationship between the data and information gathered in Stage 1 – Diagnosis and Context Analysis, and their respective use as inputs for the Stages 2 to 5. It reinforced confidence that the method is **coherent**.
- Anticipated Consequence AC5: participants and the Guinea-Bissau Roadmap team recognised that the method simplified and made using international rankings easier along the strategy formulation process. It reinforced confidence that the method is **instructive** and **easy to use.**
- Unanticipated Consequence UC1: there was some misunderstanding and confusion regarding terminology and concepts used in the guidelines. The description of each guideline should be improved in terms of uniformity. For example, guidelines will be rewritten to start with a verb. Different terms used with the same purpose will be standardised, such as the verbs "uncover" and "define", which were used indistinctly in some guidelines. The guidelines that present some definitions will be highlighted with a clear indication. It attenuated the confidence that the method is **effective** and **coherent.**

8.6. Revision of Desired Features for the Method – Version 5

Activity "B"' is dedicated to revising desired features for the method. In this iteration, no modification occurred in the set of desired features after the reflection and learning activity.

8.7. Development of the Method – Version 5 and Formalisation of Learning

Activity "C" is dedicated to developing the **Method – Version 5** and generating the corresponding **design principles**. Usually, statements representing the Anticipated and Unanticipated Consequences are used to evolve the method, besides the scientific literature that will support the modifications. Based

on the Unanticipated Consequence UC1, the guidelines have been improved to clarify terminology and concepts. For example, all guidelines have been rewritten to initiate with a verb. Each stage has standardised the list of verbs. Concepts presented along with the guidelines have been highlighted. References for the support instruments have been uniformised as well. Fine-tunes were done regarding the method presentation to clarify and avoid misunderstandings by the end-users.

The strategy formulation process has not been updated. The modifications did not impact the Design Principles, which remain the same for the Method – Version 4 and are listed below.

- Design Principle DP1: the method should provide a formal strategy formulation process with stages and respective guidelines (MATERIAL PROPERTY) that, taking international rankings into account, support the team to build the strategy content composed of a diagnosis and context analysis, the set of strategic objectives, the strategic vision, the set of strategic principles, the set of intervention areas, the strategic initiatives and respective and necessary enablers (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **effectiveness.**
- Design Principle DP2: the method should provide a strategy formulation process with prescriptive guidelines, data collection instruments, and participatory techniques (MATERIAL PROPERTY) that assure the involvement, participation, and validation of/by multiple stakeholders and institutions (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method**: co-creativeness.**
- Design Principle DP3: the method should provide a strategy formulation process with flexible guidelines (MATERIAL PROPERTY) that allow the team to build a strategy content based on the extensive diagnosis and the broad analysis of the country context (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method **flexibility.**
- Design Principle DP4: the method should provide a strategy formulation process with stages and guidelines covering EGOV purposes (MATERIAL PROPERTY), allowing the team to learn and use them to build the strategy content (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **comprehensiveness.**

- Design Principle DP5: the method should provide a strategy formulation process with stages and guidelines covering the characteristics of selected International Rankings (MATERIAL PROPERTY), allowing the team to learn about their features, dimensions, measurements, evaluation window and publication intervals to build the strategy content taking them into account (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **ease of use** and i**nstructiveness.**
- Design Principle DP6: the method should provide logic and rational strategy formulation process (MATERIAL PROPERTY), with each stage generating outputs corresponding to the necessary inputs of the following stages (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION). It is related to the following desired characteristics of the method: **coherence.**

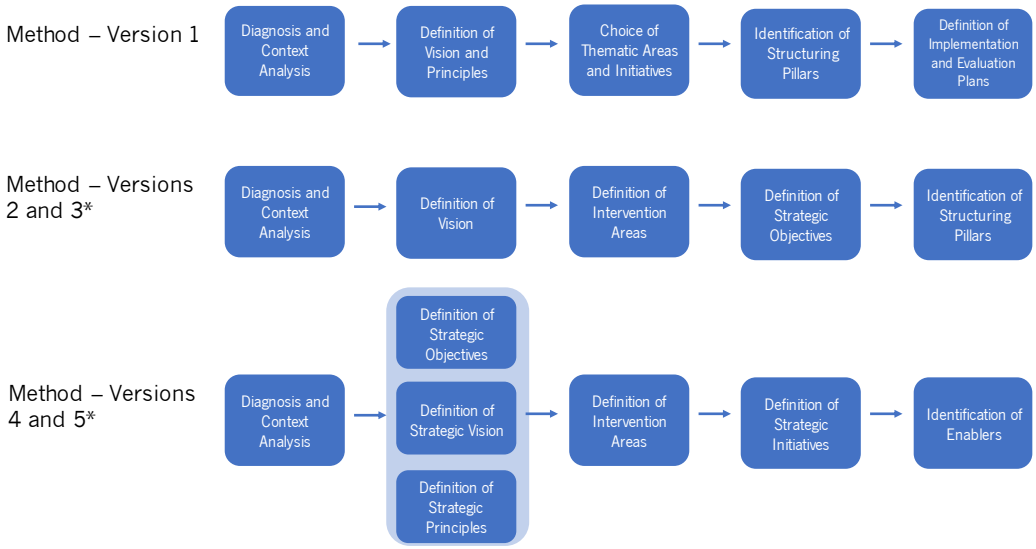
9. A Discussion About the Journey

9.1. Introduction

This section summarises and discusses the journey of the development of the method. It covers all four intermediary versions of the method, concluding with Version 5. The discussion includes the evolution of the strategy formulation process, detailing its evolution in terms of stages, guidelines, techniques, and instruments. The strategy content generated through the strategy formulation process execution is also detailed. Finally, the Design Principles linked to each version of the method are presented, highlighting their evolution along the way.

9.2. Evolution of the Strategy Formulation Process

The method's strategy formulation process evolved significatively since the first version, although remaining relatively simple and maintaining the number of five stages in total, as can be observed in FIGURE 52, which show each stage of the method in versions 1 to 5. It should be noted that versions 4 and 5, although presenting three sub-stages embedded in Stage 2, still maintain the number of five stages. The arrangement of Stage 2 into sub-stages did not change its primary objective: to frame the strategy formulation by defining a vision, principles, and strategic objectives.



* Versions with similar strategy formulation process, but different guidelines and supporting instruments.

Figure 52: Strategy formulation process of the Method – Versions 1 to 5. Developed by the author.

FIGURE 52 show the evolution of the method at a high level of abstraction. During the development of the method, the stages and the guidelines linked to each one evolved. From Version 2, recommended techniques and instruments have been developed to support the guidelines. They also received some updates along the method evolution. TABLES 27, 28, 29, 30 and 31 detail the stages and number of guidelines, techniques, and instruments for each version of the method.

Table 27: Stages of the Method Version 1.

Version	Stages	Number of Guidelines	Techniques and Instruments
1	1. Diagnosis and Context Analysis	22	N/A
	2. Definition of Vision and Principles	2	
	3. Choice of Thematic Areas and Initiatives	3	
	4. Identification of Structuring Pillars	7	
	5. Implementation and Evaluation Plans	5	
	Total of Guidelines and Techniques/Instruments:	39	0

Table 28: Stages of the Method Version 2.

Version	Stages	Number of Guidelines	Techniques and Instruments
2	1. Diagnosis and Context Analysis	8	A, B, C, D, E
	2. Definition of Vision	2	A
	3. Definition of Intervention Areas	2	A, F
	4. Definition of Strategic Objectives	2	F
	5. Identification of Structuring Pillars	4	A
	Total of Guidelines and Techniques/Instruments:	18	6

* Techniques/Instruments: A) Document Analysis Technique; B) Key-actors Interview Guide; C) Public Services Inventory; D) ICT Infrastructure; E) SWOT Workshop Guide; F) International Ranking Analysis Tool.

Table 29: Stages of the Method Version 3.

Version	Stages	Number of Guidelines	Techniques and Instruments
3	1. Diagnosis and Context Analysis	8	A, B, C, D, E, F, G, H, I
	2. Definition of Strategic Vision	2	A
	3. Definition of Intervention Areas	2	A, F
	4. Definition of Strategic Objectives	2	F
	5. Identification of Enablers	4	A
	Total of Guidelines and Techniques/Instruments:	18	9

* Techniques/Instruments: A) Document Analysis Technique; B) Key-actors Interview Guide; C) Public Services Inventory; D) ICT Infrastructure; E) SWOT Workshop Guide; F) International Ranking Analysis Tool; G) ICT Governance Inventory; H) Back-office Inventory; I) Inventory of Transparency and Accountability Tools.

Table 30: Stages of the Method Version 4.

Version	Stages	Number of Guidelines	Techniques and Instruments
4	1. Diagnosis and Context Analysis	9	A, B, C, D, E, F, G, H, I
	2.1. Definition of Strategic Objectives 2.2. Definition of Strategic Vision 2.3. Definition of Strategic Principles	3	A
	3. Definition of Intervention Areas	2	A, F
	4. Definition of Strategic Initiatives	2	F
	5. Identification of Enablers	5	A
	Total of Guidelines and Techniques/Instruments:	21	9

* Techniques/Instruments: A) Document Analysis Technique; B) Key-actors Interview Guide; C) Public Services Inventory; D) ICT Infrastructure; E) SWOT Workshop Guide; F) International Ranking Analysis Tool; G) ICT Governance Inventory; H) Back-office Inventory; I) Inventory of Transparency and Accountability Tools.

Table 31: Stages of the Method Version 5

Version	Stages	Number of Guidelines	Techniques and Instruments
5	1. Diagnosis and Context Analysis	9	A, B, C, D, E, F, G, H, I
	2.1. Definition of Strategic Objectives 2.2. Definition of Strategic Vision 2.3. Definition of Strategic Principles	3	A
	3. Definition of Intervention Areas	2	A, F
	4. Definition of Strategic Initiatives	2	F
	5. Identification of Enablers	5	A
	Total of Guidelines and Techniques/Instruments:	21	9

* Techniques/Instruments: A) Document Analysis Technique; B) Key-actors Interview Guide; C) Public Services Inventory Tool; D) ICT Infrastructure Tool; E) SWOT Workshop Guide; F) International Ranking Analysis Tool; G) ICT Governance Inventory Tool; H) Back-office Inventory Tool; I) Guide for Inventory of Transparency and Accountability Tools.

As can be observed, versions 4 and 5 are very similar, only varying in refinements of specific terms used in the descriptions of the guidelines, techniques, and instruments. The instruments of version 5 have been renamed for standardisation. The similarity of these versions resulted from the low demand for updates in its stages and guidelines, evidencing the convergence of the method.

The process in Version 1 was developed based only on the literature review and a set of National EGOV strategies. Its application in the formulation of the São Tomé and Príncipe EGOV strategy allowed an evaluation of the version, which helped develop Version 2. This version was applied in formulating the Cabo Verde EGOV strategy, which promotes the development of Version 3. This version, used in the Egyptian capacity-building programme, and demonstrated in a Focus Group at an international conference, produced an evaluation result relevant to the subsequent version. Version 4, used in the

second capacity-building programme of Egyptian public officials and the formulation of the EGOV Roadmap of Guinea-Bissau, resulted in an evaluation that led to Version 5, considered mature due to the level of convergence towards the desired features. The level of convergence was considered adequate because of the decreasing number of necessary updates in the stages, guidelines, techniques, and instruments of the method.

Along the development process, Version 1 presented 39 guidelines, while Versions 2 and 3 presented only 18. Three new guidelines have been produced in Version 4 for a total of 21. Version 5 received no updates in the number of guidelines. Refinements in Version 5 regarding the standardisation of verbs and concepts were not counted as guidelines guidance did not change.

If compared to the number of guidelines that remained the same throughout the whole process until Version 5, Version 1 has only one (4.8%) guideline, Version 2 and Version 3 have 16 guidelines (76.2%), while Version 4 has all guidelines similar to Version 5, therefore 100% (21). If observed oppositely, i.e., the number of guidelines that changed along the process until Version 5, Version 1 had almost all guidelines modified if not excluded/jointed in a total of 20 (95.2%), Version 2 and Version 3 had five (23.8%), while Version 4 had none (0%). The detailed data of this analysis is shown in TABLE 32. The table includes correspondence between Version 5 guidelines and correspondent guidelines in previous versions.

Table 32: Guidelines according to the Version of the Method

Stages	Correspondent Guidelines according to the Method's Versions				
	Version 1	**Version 2**	**Version 3**	**Version 4**	**Version 5**
1	1.1	1.1	1.1	1.1	1.1
	1.1	1.2	1.2	1.2	1.2
	1.2;1.3; 1.5;1.7; 1.9;1.10; 1.18;1.21; 1.22	1.3	1.3	1.3	1.3
	1.4;1.8; 1.15;1.16; 1.19	1.4	1.4	1.4	1.4
	1.6;1.11; 1.17	1.5	1.5	1.5	1.5
	1.12;1.13; 1.15;1.20	1.6	1.6	1.6	1.6
	1.14	1.7	1.7	1.7	1.7
	-	1.8	1.8	1.8	1.8
	-	-	-	1.9	1.9
2	4.1;4.2	4.1;4.2	-	2.1	2.1
	2.1	2.1	2.1	2.2	2.2
	2.2	2.2	2.2	2.3	2.3
3	3.3	3.1	3.1	3.1	3.1
	-	3.2	3.2	3.2	3.2
4	3.1;3.2	4.1	4.1	4.1	4.1
	-	4.2	4.2	4.2	4.2
5	4.1;4.4	5.1	5.1	5.1	5.1
	4.2;4.4	5.2	5.2	5.2	5.2
	4.3;4.4;4.5	5.3	5.3	5.3	5.3
	4.6;4.7	5.4	5.4	5.4	5.4
	-	-	-	5.5	5.5
Updated Guidelines when compared to those in Version 5	20/21 (95.2%)	5/21 (23.8%)	5/21 (23.8%)	0/21 (0%)	N/A
Similar Guidelines when compared to Version 5	1/21 (4.8%)	16/21 (76.2%)	16/21 (76.2%)	21/21 (100%)	N/A

The techniques and instruments linked to each guideline were initially developed in Version 2 and improved in Versions 3 and 4. While in Version 2, there were only six of these instruments and in Version 3, there were nine. Versions 4 and 5 have the same number of instruments, although some refinements in standardising verbs and concepts occurred in the last version. Compared to the number of techniques/instruments that remained the same throughout the process until Version 5, Version 1 has none (N/A), and Version 2 has six (66%). Versions 3 and 4 have all instruments/techniques similar to Version 5; therefore, nine (100%). If observed oppositely, i.e., the number of instruments/techniques that changed along the process until Version 5, Version 2 had three (34%), and Versions 3 and 4 none (0%). It should be noted that Instrument "D" was divided into two along the process, becoming Instruments "D" and "G". Three instruments were considered new in Version 3: "G", "H", and "I". The detailed data of this analysis is shown in TABLE 33. The table includes correspondence between Version 5 guidelines and correspondent guidelines in previous versions.

Table 33: Techniques and Instruments according to the Versions of the Method

Correspondent Techniques/Instruments according to the Method's Versions				
Version 5*	**Version 1**	**Version 2**	**Version 3**	**Version 4**
A	-	A	A	A
B	-	B	B	B
C	-	C	C	C
D	-	D	D	D
E	-	E	E	E
F	-	F	F	F
G	-	D	G	G
H	-		H	H
I	-		I	I
Updated Techniques/Instruments when compared to Version 5	N/A	3/9 (34%)	0/9 (0%)	0/9 (0%)
Similar Techniques/Instruments when compared to Version 5	N/A	6/9 (66%)	9/9 (100%)	9/9 (100%)

* Techniques/Instruments: A) Document Analysis Technique; B) Key-actors Interview Guide; C) Public Services Inventory; D) ICT Infrastructure; E) SWOT Workshop Guide; F) International Ranking Analysis Tool; G) ICT Governance Inventory; H) Back-office Inventory; I) Inventory of Transparency and Accountability Tools.

An extra analysis of the strategy formulation process of the method focuses on the contribution of each guideline of each stage to achieve the method's desired features. A screening in each guideline of Version 5 has been done, pairing it with desired features description. As Version 5 consolidates all updates and improvements along the development process based on the evaluation of the application and demonstration of the previous four versions of the method, it was considered adequate to proceed with the analysis of this version's guidelines. Besides, previous versions have been evaluated according to the same criteria, although with a different methodology. The results are summarised in TABLE 34.

Table 34: Contribution of each Guideline to the Desired Feature of the Method.

Stage	Version 5	Desired Features						
		Effectiveness	Co-Creativeness	Flexibility	Comprehensiveness	Instructiveness	Ease of Use	Coherence
1	1.1	X		X		X	X	X
	1.2	X		X				X
	1.3	X	X	X	X	X	X	X
	1.4	X	X	X	X			X
	1.5	X	X	X	X			X
	1.6	X	X	X	X			X
	1.7	X	X	X	X			X
	1.8	X		X				X
	1.9	X	X	X	X			X
2	2.1	X		X	X	X		X
	2.2	X		X				X
	2.3	X		X				X
3	3.1	X		X				X
	3.2	X		X		X	X	X
4	4.1	X		X				X
	4.2	X		X		X	X	X
5	5.1	X		X		X	X	X
	5.2	X		X		X	X	X
	5.3	X		X		X	X	X
	5.4	X		X				X
	5.5	X	X	X				X

9.3. Evolution of the Strategy Content

The strategy content generated through the execution of the method's strategy formulation process also evolved along the development process. The evolution will be described stage by stage, detailing the changes that occurred along the journey.

9.3.1. Stage 1

Stage 1 results in a country diagnosis and an analysis of its context. Stage 1 – Diagnosis and Context Analysis did not vary too much along the five versions, maintaining the same terminology in all versions. The stage is dedicated to the country's diagnosis, allowing the team to analyse the country's context. It was inspired by the question, "Where is the country now?". This stage was initially designed with 22 guidelines, which have been condensed into eight guidelines in Version 2, and finally consolidated into nine guidelines in Versions 4 and 5. Initially, there was not any support on instruments or techniques, which have been aggregated in Version 2 with five techniques and instruments: "A" (Document Analysis Technique), "B" (Key-actors Interview Guide), "C" (Public Services Inventory Tool), "D" (ICT Infrastructure Tool) and "E" (SWOT Workshop Guide). In Version 3, this set was complemented with techniques and instruments "F" (International Ranking Analysis Tool), "G" (ICT Governance Inventory Tool), "H" (Back-office Inventory Tool), and "I" (Guide for Inventory of Transparency and Accountability Tools). Without updates, Version 5 maintained the number and set of techniques and instruments. The final output of this stage is a country diagnosis that allows the team to analyse the EGOV context. TABLE 35 summarises the evolution of Stage 1 along the five versions.

Table 35: Evolution of the Strategy Content produced in Stage 1.

Stage 1 Evolution				
Version	**Stage Name**	**Expected Output**	**Guidelines**	**Techniques / Instruments***
V1	Diagnosis and Context Analysis	A country diagnosis that allows the team to analyse the EGOV context	22	-
V2	No update	No update	8	A, B, C, D and E
V3	No update	No update	8	A, B, C, D, E, F, G, H and I
V4	No update	No update	9	No update
V5	No update	No update	No update	No update

* Techniques/Instruments: A) Document Analysis Technique; B) Key-actors Interview Guide; C) Public Services Inventory Tool; D) ICT Infrastructure Tool; E) SWOT Workshop Guide; F) International Ranking Analysis Tool; G) ICT Governance Inventory Tool; H) Back-office Inventory Tool; I) Guide for Inventory of Transparency and Accountability Tools.

9.3.2. Stage 2

Stage 2 focuses on the strategy setting general high-level objectives, the strategic vision and principles. They are based on the question, "Where do we want to get to?". During the design of stage 2, variation of the expected outputs impacted the stage name. In the first version, the stage name directly refers to the strategic vision and principles corresponding to the expected outputs of the stage in that version. In versions 2 and 3, the stage name barely varied, referencing just the strategic vision output, although the strategic principles were still a result of that stage. In versions 4 and 5, sub-stages have been defined according to the expected results: the strategic vision, principles, and objectives. The strategic objectives specified in this stage are defined with a relative degree of abstraction and demand refinements in further stages. It intends to guide the strategy formulation process together with the strategic vision and principles defined in simultaneous sub-stages. Stage 2, from the second version onwards, is supported by the technique and instrument "A" (Document Analysis Technique). The final output of this stage is a set with three components: strategic objectives, vision, and principles. A summary of the evolution of Stage 2 is presented in TABLE 36.

Table 36: Evolution of the Strategy Content produced in Stage 2.

Stage 2 Evolution				
Version	**Stage Name**	**Expected Output**	**Guidelines**	**Techniques / Instruments***
V1	Definition of Vision and Principles	A vision statement that resumes the EGOV policy and general goals and a set of principles will provide focus and a guiding framework for the strategy formulation.	2	-
V2	Definition of Vision	A vision statement that resumes the EGOV policy and general goals	2	A
V3	Definition of Strategic Vision	A statement with the strategic vision resumes the EGOV policy and general goals.	2	No update
V4	Divided into three sub-stages: • Definition of Strategic Objectives • Definition of Strategic Vision • Definition of Strategic Principles.	Strategic objectives, representing high-level goals that will be refined during the following stages: Strategic Vision, a statement that resumes the EGOV policy and general goals; and a set of Strategic Principles, providing focus and a guiding framework for the strategy formulation.	3	No update
V5	No update	No update	No update	No update

* Techniques/Instruments: A) Document Analysis Technique.

9.3.3. Stage 3

Stage 3 was initially designed to choose thematic areas and correspondent initiatives. Along the development process, it became clear that these two sets of strategy contents should be defined in separate stages. Stage 3 is based on the question, "How do we get there?" and features three guidelines in the first version. In Version 2, the scope was limited to the thematic areas only, renamed to intervention areas. The definition of initiatives was moved to the subsequent stage. In this version, two guidelines were defined for Stage 2, supported by techniques and instruments "A" (Document Analysis Technique) and "F" (International Ranking Analysis Tool). No updates occurred in versions 3, 4 and 5. The final output of this stage is a list of areas of intervention. TABLE 37 summarises the evolution.

Table 37: Evolution of the Strategy Content produced in Stage 3.

Stage 3 Evolution				
Version	**Stage Name**	**Expected Output**	**Guidelines**	**Techniques / Instruments***
V1	Choice of Thematic Areas and Initiatives	List of thematic areas and correspondent initiatives.	3	-
V2	Definition of Intervention Areas	List of intervention areas.	2	A and F
V3	No update	No update	No update	No update
V4	No update	No update	No update	No update
V5	No update	No update	No update	No update

* Techniques/Instruments: A) Document Analysis Technique; F) International Ranking Analysis Tool.

9.3.4. Stage 4

Stage 4 was one of the most challenging stages of the development process, mainly due to how changes in the previous Stage 3 impacted it. As it received part of the original outputs from Stage 3 - the list of strategic objectives - it resulted in the set of structuring pillars being moved to Stage 5 instead. Another relevant impact is the use of the term "strategic objectives". After Version 4, this term is used to define the high-level objectives of the strategy in Stage 2, which made Stage 4 use the term "strategic initiatives". As the strategic objectives proposed in Stage 2 have a high degree of abstraction, they must be detailed into "strategic initiatives" in Stage 4. As the final output, the stage features the list of strategic initiatives through the execution of two guidelines and support of techniques and instruments "A" (Document Analysis Technique) and "F" (International Ranking Analysis Tool). No updates occurred in version 5. The design of Stage 4 is also based on the question, "How do we get there?". TABLE 38 summarises the evolution of Stage 4.

Table 38: Evolution of the Strategy Content produced in Stage 4.

Stage 4 Evolution				
Version	**Stage Name**	**Expected Output**	**Guidelines**	**Techniques / Instruments**
V1	Identification of Structuring Pillars	List of Structuring Pillars	7	-
V2	Definition of Strategic Objectives	List of Strategic Objectives	2	F
V3	No update	No update	No update	A and F
V4	Definition of Strategic Initiatives	List of Strategic Initiatives	No update	No update
V5	No update	No update	No update	No update

* Techniques/Instruments: A) Document Analysis Technique; F) International Ranking Analysis Tool.

9.3.5. Stage 5

Stage 5 was as challenging as the previous stage. The first update regards the elimination of the implementation and evaluation plans. Both plans were the output of Stage 5 in Version 1, in which the evaluation demonstrated how immature and harmful the construction of these plans could be when done along the strategy formulation. Other updates occurred due to the impact of the modifications of the previous stages, which pushed the definition/identification of structuring pillars to Stage 5. Another update regards replacing the term "structuring pillars" with the term "enablers". Stage 5 is based on the question, "How do we get there?" and includes five guidelines supported by technique and instrument "A" (Document Analysis Technique), resulting in a list of enablers. No updates occurred in version 5. TABLE 39 summarises the evolution of Stage 5.

Table 39: Evolution of the Strategy Content produced in Stage 5.

Stage 5 Evolution				
Version	**Stage Name**	**Expected Output**	**Guidelines**	**Techniques / Instruments**
V1	Definition of Implementation and Evaluation Plan	Implementation and Evaluation Plans	5	-
V2	Identification of Structuring Pillars	List of Structuring Pillars	4	A
V3	No update	List of Structuring Pillars	5	A
V4	Identification of Enablers	List of Enablers	5	A
V5	No update	No update	No update	No update

* Techniques/Instruments: A) Document Analysis Technique.

This Section concludes the discussion of the evolution of the Strategy Content, corresponding to the method strategy formulation process enhanced along the development. The following Section will discuss the Design Principles linked to each version of the method.

9.4. Evolution of Design Principles

Design principles were generated according to the method versions during the development process. They were produced considering the desired features. Following the Research Design, they were formulated at an abstract level to be generalisable. The output is statements that "prescribe what and

how to build an artefact to achieve a predefined design goal (Chandra et al., 2015, p.4040)" and use Chandra et al. template (Chandra et al., 2015, p.4045):

> *Design Principle DPx: Provide the system with [material property – in terms of form and function] for users to [activity of users – in terms of action], given that [boundary conditions – user group's characteristics or implementation settings].*
>
> *Material property: prescribe how an artefact should be built or what it should comprise; or information about the material properties that make users' action possible.*
>
> *Activity of users: give prescriptions about what actions the artefact allows for; or information about the actions made possible using an artefact.*
>
> *Boundary condition: conditions under which the design will work.*

Besides Version 1, which has no associated design principles due to the research design of iteration 1, all other versions have associated design principles. They will be presented according to the correspondent's desired features: **effectiveness, co-creativeness, flexibility, comprehensiveness, instructiveness, ease of use,** and **coherence**. The presentation is followed by a discussion about the evolution of the respective design principle. FIGURE 53 presents the six Design Principles associated with the seven Desired Features, as **instructiveness** and **ease of use** features were merged as one.

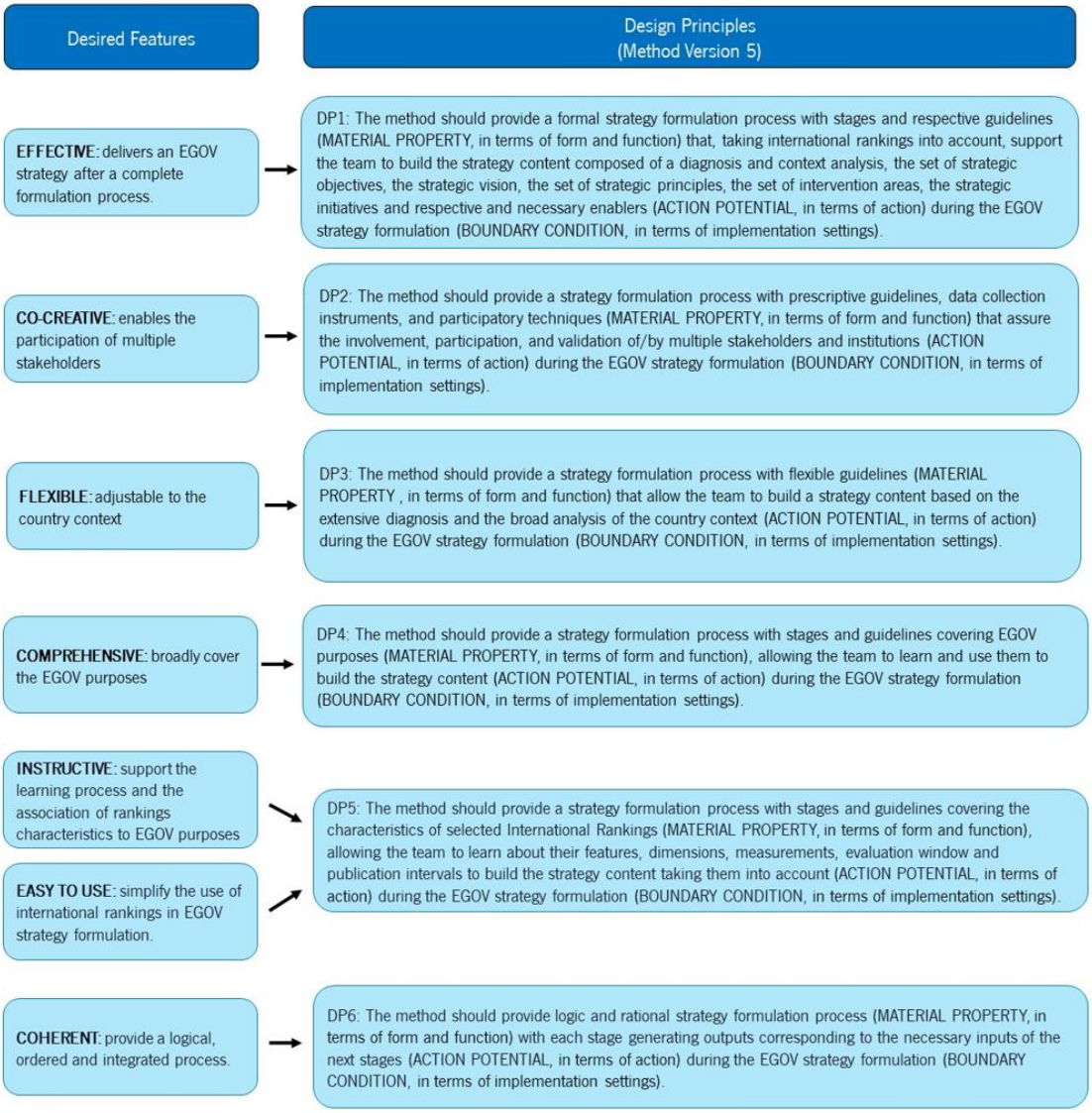


Figure 53: Evolution of Design Principles and their association with the Desired Features. Developed by the author.

In the following Section, each Design Principle is going to be discussed. The discussion includes the evolution alongside the different versions of the method, the informing theory, and the evaluation results in the form of Anticipated Consequences – AC and Unanticipated Consequences – UC resulting from the evaluation of the application or the demonstration of each version of the method.

9.4.1. Effectiveness and associated Design Principle 1

The method has been designed to be **effective**, i.e., **to deliver an EGOV strategy after a complete formulation process**. The method's evolution was based on the literature, which informed the design process, and on evaluating previous versions of the method. Design Principle 1 varied according to the modification of the strategy formulation process used to deliver the EGOV strategy. There were significant changes from Version 1 to Version 2, as already discussed in the previous Section of this Chapter. Nonetheless, Versions 2 and 3 maintained the same Design Principle 1, reflecting the same strategy formulation process of these versions. It is reproduced below. The strategy formulation process is highlighted in italics:

> "Design Principle DP1 (Version 2 and 3): The method should provide a formal strategy formulation process with stages and respective guidelines (MATERIAL PROPERTY) that, taking international rankings into account, support the team to build the strategy content composed of a *diagnosis and context analysis, a strategic vision, intervention areas, strategic objectives, and respective and necessary structuring pillars* (ACTION POTENTIAL) during the EGOV strategy formulation (BOUNDARY CONDITION)."

For Versions 4 and 5, informing theory and evaluation results were responsible for the evolution, impacting the corresponding Design Principle. FIGURE 54 summarised the evolution of Design Principle 1.

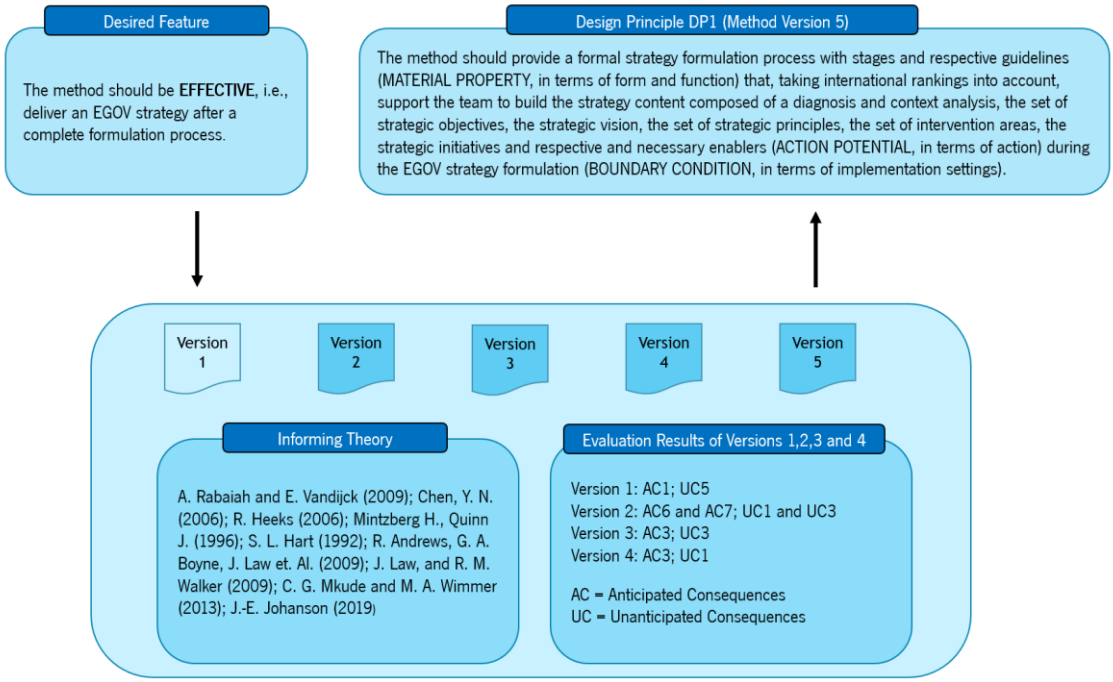


Figure 54: Evolution of the Design Principle 1, corresponding to the desired feature Effectiveness. Developed by the author.

9.4.2. Co-creativeness and associated Design Principle 2

The method has been designed to be **co-creative**, i.e., **to enable the participation of multiple stakeholders**. Design Principle 2 was generated in Version 2 and did not receive additional updates since then. Although there were many changes in subsequent versions of the method regarding co-creativeness, mainly regarding guidelines, techniques, and instruments, the level of abstraction of the Design Principle made any changes unnecessary. As expected, updates in informed theory and previous version evaluations motivate the evolution of the method, which can be observed in FIGURE 55, which summarises the evolution of Design Principle 2.

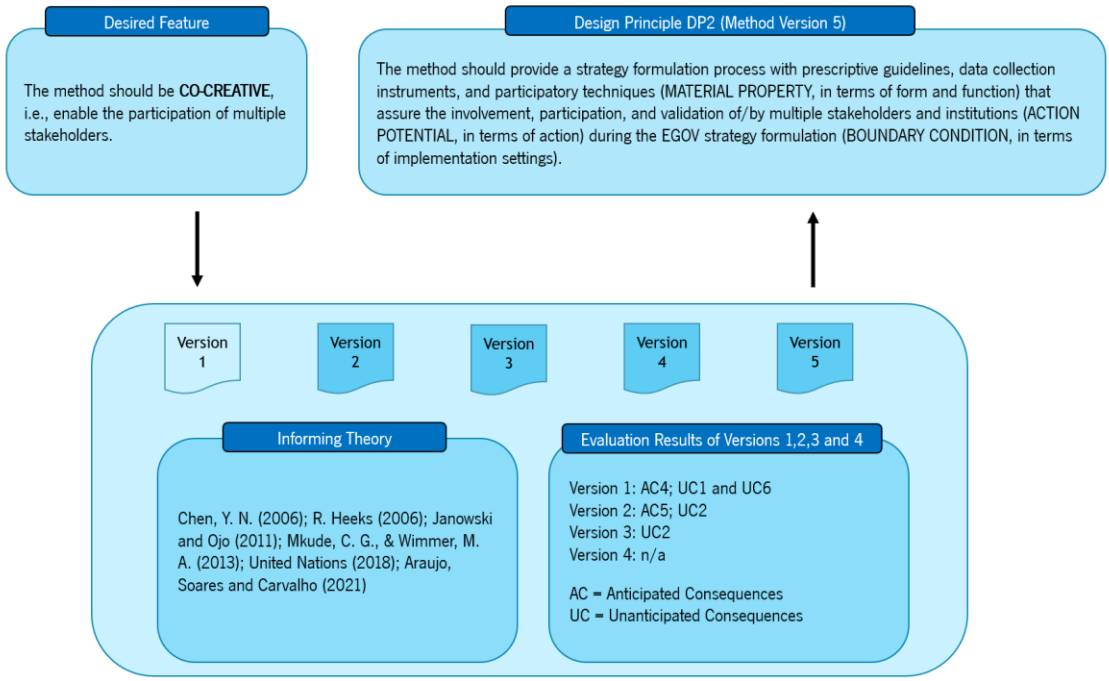


Figure 55: Evolution of the Design Principle 2, corresponding to the desired feature Co-Creativeness. Developed by the author.

9.4.3. Flexibility and associated Design Principle 3

The method has been designed to be **flexible**, i.e., **adjustable to the country's context**. The Design Principle 3 was generated in Version 2 and did not receive additional updates. Although there were many changes in stage names, guidelines, techniques, and instruments, the level of abstraction of the Design Principle made updates not necessary. FIGURE 56 summarises the evolution of Design Principle 3.

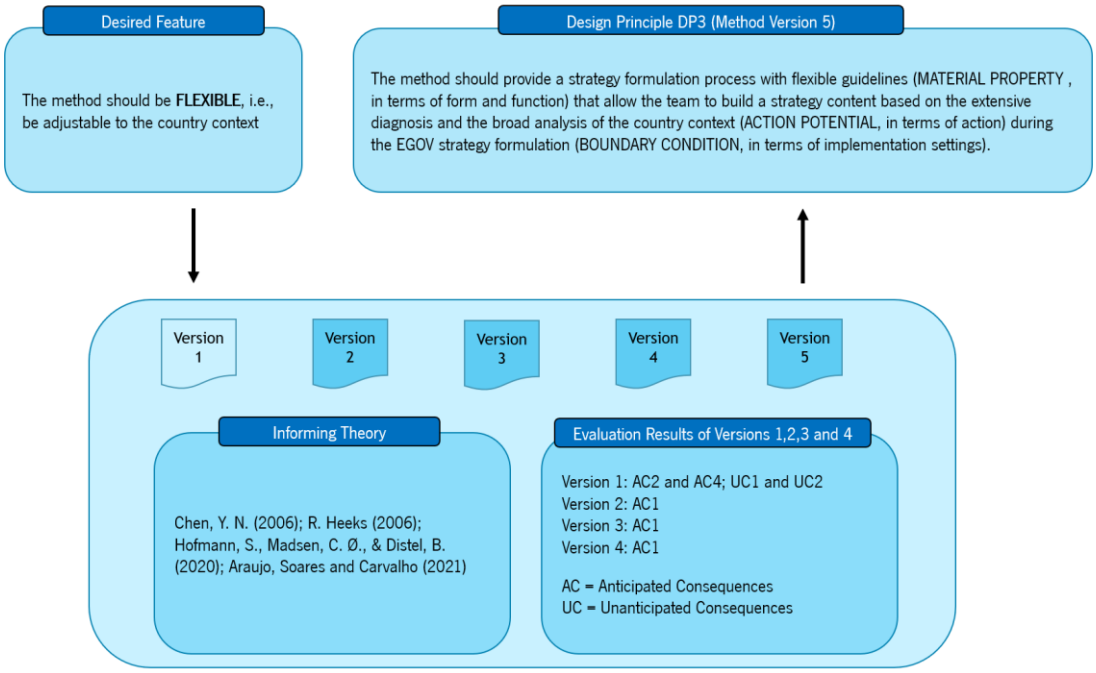


Figure 56: Evolution of the Design Principle 3, correspondent to the desired feature Flexibility. Developed by the author.

9.4.4. Comprehensiveness and associated Design Principle 4

The method has been designed to be **comprehensive**, i.e., **broadly covering EGOV purposes**. The Design Principle 4 was generated in Version 2, and although there were many changes in stage names, guidelines, techniques, and instruments, its abstraction level made updates unnecessary. FIGURE 57 summarises the evolution of Design Principle 4.

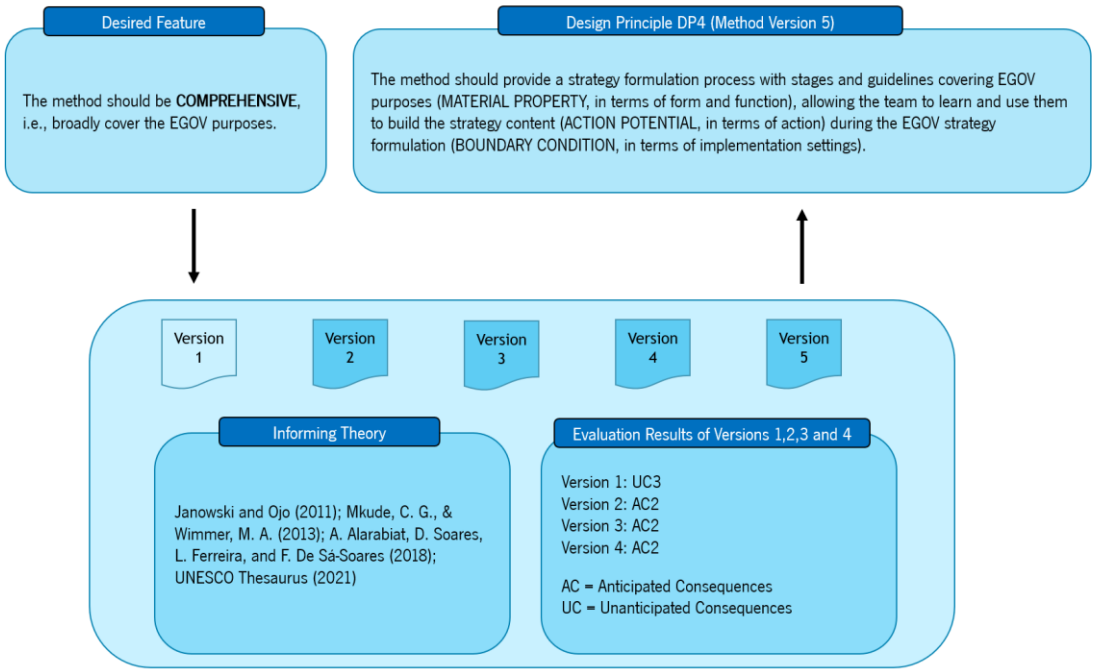


Figure 57: Figure 9.6: Evolution of the Design Principle 4, corresponding to the desired feature of Comprehensiveness. Developed by the author.

9.4.5. Ease of Use and Instructiveness and associated Design Principle 5

The method has been designed to be **easy to use**, i.e., **simplify the use of international rankings in EGOV strategy formulation**. Besides, the method has also been designed to be **instructive**, i.e., **to support the learning process and the association of ranking characteristics to EGOV purposes**. Design Principle 5 was generated in Version 2 and adequately represented the method, especially its features related to ease of use and instructiveness. It occurred due to the evaluation results when the interview results or the research perceptions were used to lead the conclusion in this direction. FIGURE 58 represents this process.

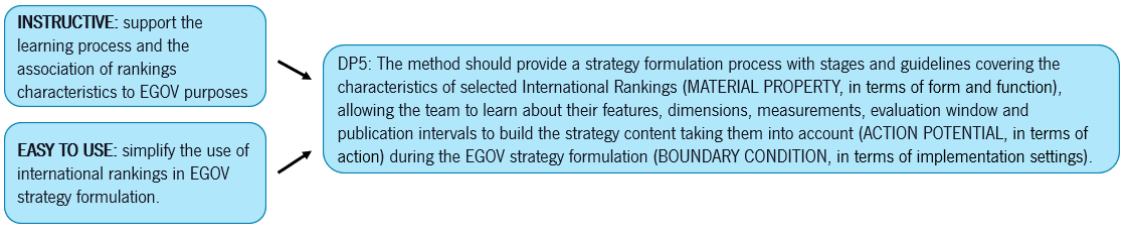


Figure 58: Desired Features Instructiveness and Ease of Use and a single correspondent Design Principle 5. Developed by the author.

Although there were many changes in stage names, guidelines, techniques, and instruments, its abstraction level made updates unnecessary. FIGURE 59 summarises the evolution of Design Principle 5.

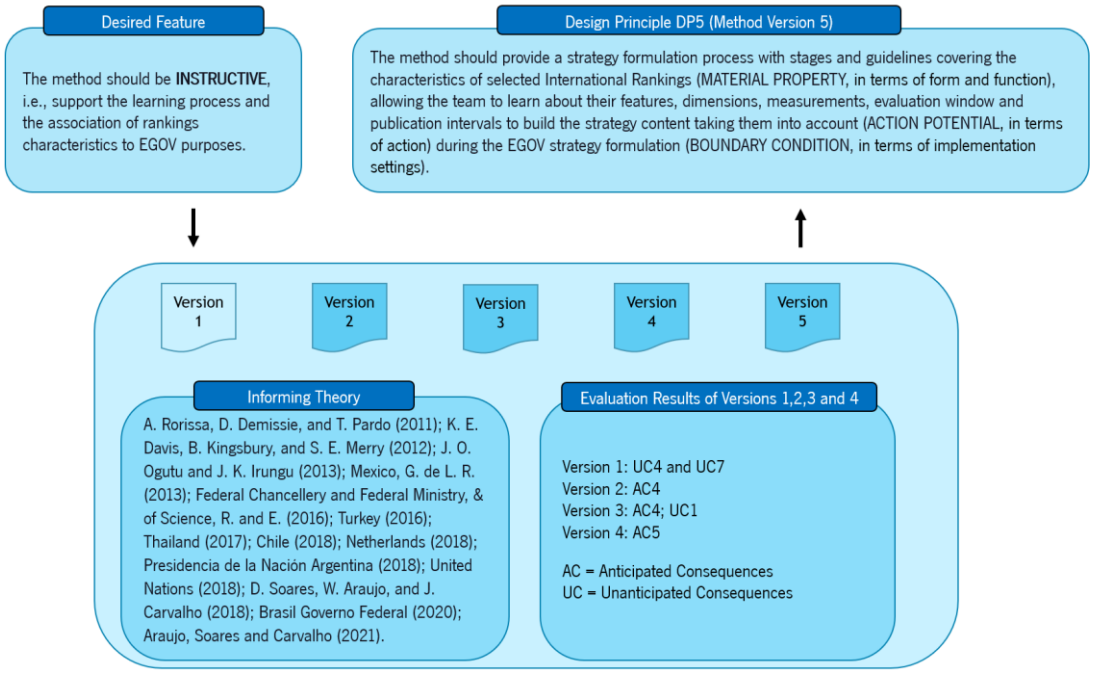


Figure 59: Evolution of the Design Principle 5, corresponding to the desired feature Instructiveness. Developed by the author.

Although generating the same Design Principle, the evaluation and consequent analysis of Anticipated Consequences – AC and Unanticipated Consequences – UC of the desired feature Ease of Use was different, as summarised in FIGURE 60.

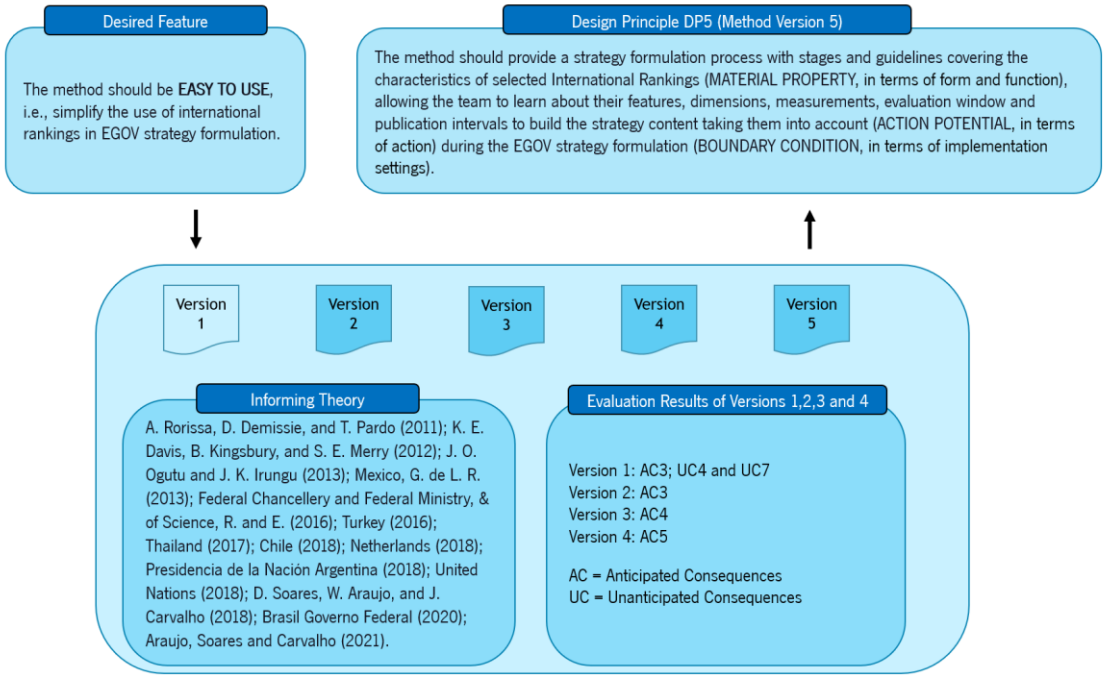


Figure 60: Evolution of the Design Principle 5, correspondent to the desired feature Ease of Use. Developed by the author.

9.4.6. Coherence and associated Design Principle 6

The method has been designed to be **coherent**, i.e., **provide a logical, ordered, and integrated process**. This desired feature has been included after the application of Version 2 in the case of Cabo Verde. On that occasion, evaluation results demonstrated the opportunity to differentiate it from another desired feature established since the beginning of the development process, effectiveness. The interview results and the researcher's observation identified terms related to coherent and logical processes during the report on the effectiveness feature. It motivated the definition of a new feature present in the method, represented by Design Principle 6. It was generated in Version 3; its evolution is shown in FIGURE 61.

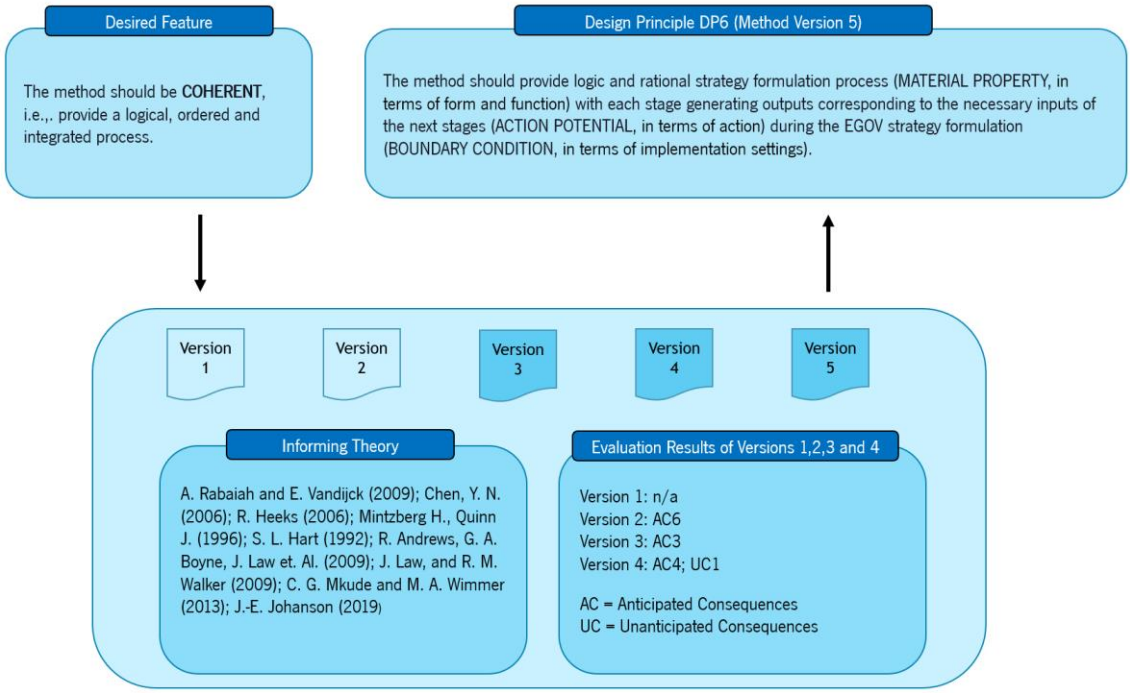


Figure 61: Evolution of the Design Principle 6, correspondent to the desired feature Coherence. Developed by the author.

This Section concludes the description and discussion of the evolution of the Design Principles. It also closes the Chapter, which discusses the evolution of the strategy formulation process and the strategy content. Many evolutions occurred during the development process of the method for formulation of EGOV strategies taking into account international rankings. The strategy formulation process presented five versions with respective guidelines that also evolved. Techniques and instruments have been created along the process to support these guidelines. As expected, the Strategy Content also evolved, as described in this Chapter. Finally, as expected by the research design, Design Principles linked to each method's version were produced. They were presented and discussed, along with the corresponding informing theory and evaluation results of each version of the method.

10. CONCLUSION

This research produced **a method for the formulation of strategies taking into account international rankings**. This method has been developed to be effective, flexible, easy to use, instructive, co-creative, comprehensive, and coherent. The development followed a research design inspired in the Design Science Research Methodology – DSRM and the Action Design Research – ADR. As it is part of a doctoral thesis, it is expected to result in contributions to the science, as detailed in this Chapter. Relevant contributions to practitioners were produced through this research and are also listed. The study presents some limitations, which are as well detailed. The remaining sections present the future research agenda and a list of publications produced alongside the research development, followed by final comments which concludes the Chapter.

10.1. Contribution

The contribution of this research is a **method for the formulation of EGOV strategies taking into account international rankings**. Many countries use international rankings to formulate strategies, and this process generally occurs without proper systematisation. The method developed during this doctoral project has the potential to fill such gap.

It is possible to list many contributions to EGOV scholars and practitioners alongside the thesis. To scholars, the organisation of the knowledge in EGOV planning, the reflection on it, and the subsequent application in the design and development of each version of the method offer several benefits. First, the research systematised a range of knowledge in EGOV planning, strategy formulation, and international rankings. Second, it was developed following a research design that is rich and complex in combining research approaches, Design Science Research – DSR and Action Design Research – ADR, but relatively simple in terms of execution. To reproduced it in another research challenge to develop a rich and innovative artefact is much simpler from this point.

To practitioners, the research results are not less valuable. The practitioners who benefited from this research include government officials, consultants, and advisors who can use the designed method, its guidelines, instruments, and techniques. International institutions can now better perceive how their rankings are used by countries when formulating a National EGOV strategy. Such institutions can also get some inspiration to adjust or develop their indexes. The method has the potential to be used by all

193 Member States of the United Nations, especially by those that do not have EGOV strategies yet. The 151 Member States that already have a digital strategy can improve the topics related to EGOV themes.

The research objective is considered achieved, filling the gap of a method to systematically support EGOV strategists by using international rankings components alongside the strategy formulating process. The method has been improved dans multiple development-and-evaluation loops. Some of these loops encompasses more than a single evaluation. The use of a method version in the formulation of real EGOV strategies was considered an application. This situation occurred with the formulation of the São Tomé and Príncipe EGOV strategy, the Cabo Verde EGOV strategy, and the Guinea-Bissau EGOV Roadmap. The use of the method in two capacity-building programmes for public officials, which involved a simulated application with participants roleplaying as EGOV strategists, was also considered an application. This situation occurred twice and involved high-level public officials from Egypt. These scenarios differed from another, considered a demonstration, i.e., the presentation of the method during a focus group with EGOV experts in an international conference. All scenarios were valid to evaluate a method version, totalising six opportunities in five iterations, in which five versions of the method were produced.

10.2. Limitations of the Study

EGOV is a multidisciplinary discipline with influences from many fields of study, such as political science, public administration, information systems, and other areas. EGOV purposes, according to the literature review, involve facets such as making the government more efficient, improving public service delivery, enhancing accountability, and improving the relationship between citizens and businesses within the public sector. Developing a method for EGOV strategy formulation is, therefore, a complex endeavour. The particularity of taking into account international rankings leads to other constraints inherent to its peculiar context, which brings more difficulty to the research project.

Some efforts have been developed to enhance the project, for example, the exploratory study with public officials involved in multiple EGOV strategies. It was important not only to confirm the importance of the research theme but also to define the desired features for the method considering genuine opinions from stakeholders compromised with implementing a public policy throughout the formulation of a

strategy. Moreover, the use of the method in real cases helps minimise eventual limitations. Five versions have been developed, with six opportunities to apply or demonstrate them.

Limitations, unfortunately, exist. They can be observed in the following list:

- The method has been applied and demonstrated in six opportunities. None of them occurred without the direct supervisor of the author. EGOV strategists worked by following the method but always with the author's presence and supervision. A team of strategists has not yet tested the method independently, without direct support from the author.
- The method was applied in a particular set of countries. All three countries are members of the Community of Portuguese Speaking Countries – CPLP. Moreover, all countries are considered developing countries. This scenario characterises a limitation in the context the method was applied.
- The impact of the strategies formulated using the method was not evaluated. This evaluation could be in terms of the quality of the strategy and the impact on the rankings scores. Although the method does not intend to impact the rankings position, it is reasonable to consider the implications. Unfortunately, as international institutions conduct these studies in specific timeframes, it was not possible to evaluate this impact. Although reasonable, it is out of the scope of strategy formulation but related to the strategy evaluation. They are different phases of strategic planning, and this research project did not include strategy evaluation in its scope.

10.3. Future Research

The conclusion of the PhD research project opened a range of possibilities for the future in academic and business areas oriented to developing countries. Based on the study's limitations, it is reasonable to expect that the method should be applied without the intervention of the author. A case study that analyses the application of the method by EGOV strategists acting by themselves is welcome. This case would be valuable to improve the method in many directions, including its content in terms of stage, guidelines, techniques, and instruments.

The application of the method in a country in a different context other than a developing country could also be interesting, particularly regarding the feature of flexibility. Applying the method in a context outside of the Community of Portuguese Speaking Countries is also welcome.

Still, in the academic field, the research left some gaps that can be turned into opportunities. As the project was focused on strategy formulation, other topics related to strategic management remain open to exploration. For example, research projects focus on strategy execution or strategy evaluation. A possibility is to develop a method to elaborate action plans unfold from an EGOV strategy formulated considering international rankings. Another possibility is to develop an evaluation framework to assess EGOV strategies execution. A different approach can be to develop a method or framework that goes beyond Information Systems area by exploring fields such as competitiveness, national health systems, sustainable development, and many others that exist in international rankings related to them.

Another feasible scenario is a partnership with an international institution to the dissemination of the method to support public officials in developing EGOV strategies. An additional module with the capacity-building programme is a possibility to be included in the dissemination material. International institutions such as The World Bank, The African Development Bank, or the Inter-American Development Bank usually fund digital transformation projects in the public sector. The volume of financial resources is significant; typically, formulating an EGOV strategy is part of the challenge. Local public officials who prepared to develop the strategy are a valuable resource. In this scenario, there is potential to apply the method without the supervision of the author. In addition, the possibility of applying the method in countries in different contexts is real. Independently of the partnership with international institutions, a project to develop a platform to disseminate the method were proposed to the Department of Information Systems of the University of Minho. This project is waiting for the analysis by the direction of the programme.

Finally, exploring the application of the method at the subnational level of government, namely municipalities, is possible. It is particularly interesting as the United Nations launched the Local Online Service Index – LOSI as part of the traditional E-Government Development Index. The LOSI methodology is now being applied in the most populated cities of the 193 United Nations Member States, demonstrating the application's importance in this scenario.

10.4. Publications

The research project allowed the author to publish five papers at international conferences related to the EGOV theme. All papers are indexed in at least the most important academic research engines, such as Scopus and Web of Science.

1. Araujo, W., Soares, D., & Carvalho, J. (2021). International Rankings in E-GOV Strategy Formulation: Appraisal of Their Use and Relevance. In CEUR Workshop Proceedings (Vol. 3049, pp. 163–175). CEUR-WS.
2. Araujo, W., Soares, D., Carvalho, J., & Carvalho, J. (2021). A Prescriptive Framework for the Formulation of E-GOV Strategies Taking into Account International Rankings. In CEUR Workshop Proceedings (Vol. 3049, pp. 297–300). CEUR-WS.
3. Araujo, W. S., Cardoso, M. G., & Cruz, J. (2021). Improving Cape Verde's Digital Governance Strategy Formulation Process. In ACM International Conference Proceeding Series (pp. 488–490). Association for Computing Machinery.
4. Araujo, W.S., Soares, D., Carvalho, J.(2022). Towards a Method for the Formulation of an EGOV Strategy Considering International Rankings. In Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). 13429 LNCS, pp. 49-62.
5. Araujo, W. S., Andrade, C. (2022). EGOV strategy formulation taking into account international rankings: application of a method in an African country. In ACM International Conference Proceeding Series. Association for Computing Machinery.

The publications cover only part of the research project, namely iterations 1 to 3. The author intends to publish the results of iterations 4 and 5, closing the cycle of publications according to the iterations. Another publication opportunity arose from the research design used in the project, combining DSRM and ADR methodologies, a paper submission with a different focus and field of study. Finally, the author intends to publish the result of the entire research project in a relevant journal after the conclusion of the PhD.

10.5. Final Comments

A **method for formulation of EGOV strategies taking into account international rankings** was developed in this doctoral project. The design research occurred under a protocol involving the University of Minho and the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV). This partnership was fundamental to involve United Nations Member States,

something difficult in another context. Moreover, the result can benefit other Member States. As a Brazilian public official, the author acquired knowledge to benefit his country. The design research is intended to develop a useful and effective artefact for solving problems that affect people. In the present case, the author considered that it happened, and the results can positively impact nations and people's lives.

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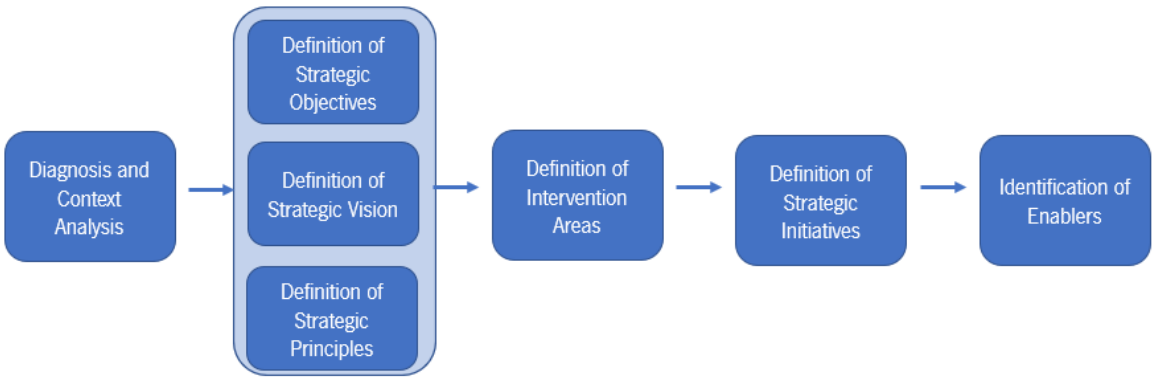
APPENDIX I: THE METHOD – VERSION 5

The Appendix I contains the **Method – Version 5.** It includes five stages, 22 guidelines, and nine instruments to support the formulation of EGOV strategies, taking into account international rankings. The figure below summarizes the method's formulation process.



Strategy Formulation Process of the Method – Version 5

The Stages, Guidelines, Techniques, and Instruments of the Method – Version 5 are presented in the next pages.

Stage 1: Diagnosis and Context Analysis

Guideline 1.1: Identify the country's EGOV history exploring former strategies, plans and roadmaps in digital areas (EGOV, Telecommunication, ICT, Cybersecurity, and others). Find out which accomplishments and deliverables were achieved through these strategies and plans. Find out which ones were not yet accomplished or delivered but addressing them through the new EGOV strategy is still relevant. Explore trends and shortfalls from selected international rankings through longitudinal data (10 years).	
Recommended technique	Document Analysis (Instrument A) International Ranking Analysis Tool (Instrument F)
Expected output	"EGOV History", "National Context, and "International Context" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.2: Identify the country's current strategies, plans or roadmaps within the government. Find out what can be supported by EGOV initiatives and what is relevant to address them through the new EGOV strategy.	
Recommended technique	Document Analysis (Instrument A)
Expected output	"National Context" section in the Diagnosis and Context Analysis Chapter

Guideline 1.3: Identify key-actors opinions, using EGOV purposes* as a backdrop, about: a) political and financial risks to the strategy sustainability; b) country economic vocations and niches; c) partnership opportunities between government branches, government agencies, the private sector, universities, and international institutions; d) country dependency of financial support/loans/donations; e) expectations and priorities of EGOV efforts, Executive Government Agencies, Judiciary and Legislative branches, Independent Institutions, Public Prosecution Services, Electoral System, Security Forces, and all others that impact the citizens' life as public services providers; f) international references about EGOV initiatives and technologies; g) past country's crises that impacted public policies and their causes; h) international rankings that are important and relevant according to the country context; and i) status quo of internal government procedures and administrative processes. * EGOV purposes: 1) Make the government more efficient; 2) Improve public service delivery; 3) Make the government more accountable; 4) Improve the relationship between citizens and businesses with the public sector.	
Recommended technique	Interview Guide (Instrument B) and SWOT Analysis (Instrument E) International Ranking Analysis Tool (Instrument F)
Expected output	"EGOV History", "National Context, "International Context", and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.4: Identify how citizens perceive, consume, evaluate, and expect the delivery of public services. Also, identify inhibited demand between citizens and causes. Identify back-office shared structures (existing and potential) that support the public service delivery. If possible, make an inventory of all services the public sector offers.	
Recommended technique	Public Service Inventory (Instrument C) and SWOT Workshop Guide (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.5: Identify the status of ICT governance in the public sector, including EGOV-related issues: a) ICT administrative organisation within the government; b) existing assessment procedures; c) ICT and EGOV-related legislation and regulatory framework.	
Recommended technique	Document Analysis (Instrument A), ICT Infrastructure and Governance Inventories (Instrument D) and SWOT Workshop Guide (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.6: Identify the status of ICT infrastructure in the public sector, including: a) telecommunications infrastructure; b) existing interoperability initiatives/actions/platforms; c) information systems and data infrastructure; d) shared ICT services (existing and potential); e) expectations and trends that are compatible with the country's context.	
Recommended technique	Document Analysis (Instrument A), Infrastructure and Governance Inventories (Instrument D) and SWOT Workshop Guide (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.7: Identify the EGOV literacy level of public agents and citizens.	
Recommended technique	Infrastructure and Governance Inventories (Instrument D) and SWOT Workshop Guide (Instrument E)
Expected output	"National Context" and "Opportunities and Challenges" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.8: Identify the country's profile, including the current population pyramid, economic status quo, geography, and Internet use rates (and access type).	
Recommended technique	Document Analysis (Instrument A)
Expected output	"EGOV History", "National Context, and "International Context" sections in the Diagnosis and Context Analysis Chapter

Guideline 1.9. Organise a public consultation process to validate de Diagnosis and Context Analysis content. Submit the document to representatives of as many population groups as possible. Don't forget the key-actors set.	
Recommended technique	Public Consultation
Expected output	Suggestions and Critics for the Diagnosis and Context Analysis

Stage 2: Definition of Strategic Objectives, the Vision, and Strategic Principles

Sub-Stage 2.1: Definition of Strategic Objectives

Guideline 2.1: Define a set of Strategic Objectives. The strategic objectives are general and broad goals to pursue in the EGOV Strategy. They must be defined according to the Strategic Vision to me achieve and will guide the formulation of the strategy content. If necessary, recover the set of EGOV purposes: Make the government more efficient; Improve Service Delivery; Make the government more accountable; Improve the Relationship between Citizens and Businesses with the Public Sector.	
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of Strategic Objectives
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges"

Sub-Stage 2.2: Definition of Strategic Vision

Guideline 2.2: Define the Vision, a pragmatic and realistic statement representing the country's EGOV future. The Vision is a single and strong statement which will frame the entire EGOV strategy content. The strategic vision definition is important because it resumes the policy in a single phrase to which the e-government strategists are held accountable[1]. It should be feasible and coherent with the strategy time frame.	
Recommended technique	Document Analysis (Instrument A)
Expected output	The "Strategic Vision"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges"

Sub-Stage 2.3: Definition of Strategic Principles

Guideline 2.3: Define Strategy Principles that will guide the formulation process, supporting, framing, and clarifying the choices of paths to achieve the strategic Vision. They will also clarify doubts during the strategy execution.

Recommended technique	Document Analysis (Instrument A)
Expected output	The "Strategic Principles"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges"

Stage 3: Definition of Intervention Areas

Guideline 3.1: Define the set of Intervention Areas analysing the information gathered during the Diagnosis and Context Analysis stage. Intervention Areas will organise the initiatives necessary to achieve the "Strategic Vision".	
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of "Intervention Areas"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges" From Stage 2: "Strategic Vision", "Strategic Principles"

Guideline 3.2*: Define Intervention Areas based on the analysis of dimensions and measurements of selected International Rankings. Do it if necessary, based on the country context, diagnosed in Stage 1.	
Recommended technique	International Ranking Analysis Tool (Instrument F)
Expected output	Set of "Intervention Areas"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context"

Stage 4: Identification of Strategic Initiatives

Guideline 4.1: Identity Strategic Initiatives based on analysing the information gathered during Stage 1. Strategic initiatives should contribute to achieving the "Strategic Vision". They are framed by the "Strategic Principles" and contribute to reaching the "Strategic Objectives". Strategic Initiatives are grouped into "Intervention Areas" defined in Stage 3.	
Recommended technique	International Ranking Analysis Tool (Instrument F)
Expected output	Set of "Strategic Initiatives"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context", and "Opportunities and Challenges" sections from the Diagnosis and Context Analysis Chapter From Stage 2: "Strategic Vision", "Strategic Principles" From Stage 3: "Intervention Areas"

Guideline 4.2: Analyse the dimensions and measurements of selected International Rankings and define related strategic objectives and measures. Do it according to the country context diagnosed in Stage 1.	
Recommended technique	Document Analysis (Instrument A)
Expected output	Set of "Strategic Initiatives"
Inputs from previous stages	From Stage 1: "EGOV History", "National Context, "International Context" From Stage 3: "Intervention Areas"

Stage 5: Identification of Enablers

Guideline 5.1: Identify Administrative Enablers* by examining the "Strategic Initiatives", uncovering which government organisational structures are necessary to execute them. Propose administrative enablers such as a Team for Services Simplification, a Team for IT Design and Development, a Team for Capacity Planning and Development, a Government CIO, and others. International rankings components can inspire many of these enablers. (*) An Administrative Enabler is an organisational structure, such as a government sector, agency, or authority responsible for carrying on EGOV-related initiatives. They can be and should be used by strategic initiatives as shared resources. Enablers can also be Legislative and Technological.	
Recommended technique	Document Analysis (Instrument A) International Ranking Analysis Tool (Instrument F)
Expected output	Set of "Administrative Enablers"
Inputs from previous stages	From Stage 4: "Strategic Initiatives"

Guideline 5.2: Identify Legislative Enablers* by examining the "Strategic Initiatives" and uncovering which regulatory structures are necessary to execute them. Propose legislative enablers such as an Electronic ID Legislation, a General Data Protection Regulation, a Cybersecurity Law, an EGOV Institutionalization Acts, an EGOV Governance Regulation, and others. Sometimes Administrative and Technological Enablers also demand a regulatory framework like a Legislative Enabler. International rankings components can inspire many of these enablers. (*) A Legislative Enabler is a regulatory structure such as a law, a decree or a regulation needed to set up and rule an EGOV initiative.	
Recommended technique	Document Analysis (Instrument A) International Ranking Analysis Tool (Instrument F)
Expected output	Set of "Legislative Enablers"
Inputs from previous stages	From Stage 4: "Strategic Initiatives"

Guideline 5.3: Identify Technological Enablers* by examining the "Strategic Initiatives", uncovering which technical structures are necessary to execute them. Propose technological

enablers such as a National Public Services Portal, an Interoperability Platform, a Government Data Warehouse, a Government Data Centre, and others. Existing government, IT solutions, not yet shared between Strategic Initiatives or used in government silos only, can also be converted into a Technological Enabler. International rankings components can inspire many of these enablers. (*) A Technological Enabler is a technical structure based on Information and Communication Technology (ICT) necessary to support a set of EGOV initiatives. Generally, they can be proposed as a shared resource between government agencies.	
Recommended technique	Document Analysis (Instrument A) International Ranking Analysis Tool (Instrument F)
Expected output	Set of "Technological Enablers"
Inputs from previous stages	From Stage 4: "Strategic Initiatives"
Guideline 5.4: Identify the benefits related to the implementation of each Enabler. This analysis can be supported by associating each strategic initiative with the necessary Enabler. It will make the formulation of the Action Plan* of the EGOV Strategy easier. (*) An Action Plan is a subsequent and separated document supporting the strategy execution. This document can have a section dedicated to the Evaluation Plan. Subsequent development will avoid a premature discussion about resource allocation (time, money, and others) with the strategy formulation process.	
Recommended technique	Document Analysis (Instrument A)
Expected output	Table and Graph of Enablers X Initiatives.
Inputs from previous stages	From Stage 4: "Strategic Initiatives"

Guideline 5.5: Organise a public consultation process to validate the strategy content. Submit the document to representatives of as many population groups as possible. Do not forget the key-actors set since Stage 1.	
Recommended technique	Public Consultation
Expected output	Suggestions and Critics for the Strategy Content
Inputs from previous stages	-

Instrument A: Document Analysis Technique

This instrument is a basic set of suggestions to proceed with a document analysis to formulate an EGOV strategy. The intention is not to be exhaustive but to support the strategists to read the collected documents following a simple and systematic set of rules, as follows:

1) Identify in the formal and official document: a) issuer institution; b) date of publication; c) formal content; d) official repository.
2) Identify which of the stages of the document's method will be used. Keep in mind the objective of each stage.
3) Remind the set of EGOV purposes: make the government more efficient; improve public service delivery; make the government more accountable; improve the relationship between the public sector and citizens and businesses. They are a filter if the document is compatible and useful for the EGOV strategy formulation.
4) Read the document carefully.
5) International rankings are special. Pay attention to the ranking process, evaluation windows, used dimensions and measurements, issuer institution, publication periods, and available country and countries of reference data.
6) In the draft of the strategy document, list the document(s) decided to be adequate to support the specific content of the strategy in each section. It is a draft, so there should be issues about making mistakes: having an extensive list of documents for each section is not incorrect.
7) Double-check the objective of each stage of the method. Each stage aims to produce specific content for the strategy document.
8) The draft will be refined many times. It is time to drop part of the selected documents during this process. It is also an opportunity to include new ones. It is a maturation process.

Instrument B: Key-actors Interview Guide

A preliminary step is to identify members of the key-actors set. The following questions are useful:

1) Who are the individuals who will approve the strategy?
2) Who will directly advise these individuals?
3) Who will be responsible for the strategy execution?
4) Which institutions will be involved in the strategy execution? Who within these institutions will be directly involved in the process?
5) Consider including in the key-actors group public officers from the Judiciary and Legislative branches, Private Sector, NGOs, and Government Institutions like the Public Prosecution Services, Electoral System, Security Forces, and other institutions.

After selecting the set of key actors, the following questions should be used during the interviews:

6) Which relevant objectives do you consider including in the EGOV strategy? Please consider opportunities to improve the government's internal procedures and administrative processes in your answer.
7) Which EGOV initiatives and technology use led by reference countries do you consider compatible with the context of your country and should be addressed in the strategy?
8) Which EGOV initiatives do you consider useful to support the country in overcoming current challenges?
9) Which EGOV initiatives do you consider useful to support the country in seizing current opportunities?
10) Which impact should EGOV initiatives bring to the country in the next years?
11) Which strengths and opportunities in the country's current context benefit the EGOV initiatives? Please consider in your answer the country's economic vocations and niches. Consider partnership opportunities between government branches, government agencies, the private sector, universities, and international institutions.
12) Which weaknesses and threats in the country context harm EGOV initiatives? Please consider the political and financial risks to the strategy sustainability in your answer, the country's dependency on financial support/loans/donations, and the country's crises that occurred in the past that impacted public policies and causes.
13) Which current international opportunities benefit the country's EGOV initiatives?
14) Which current international threats harm the country's EGOV initiatives?
15) Which EGOV purposes (*) should the country invest in the next years?
16) EGOV purposes: 1) Make the government more efficient; 2) Improve public service delivery; 3) Make the government more accountable; 4) Improve the relationship between citizens and businesses with the public sector.
17) Which international rankings do you consider important and relevant to the country's context? Do you agree that they should be considered when formulating the EGOV strategy?

Instrument C: Public Services Inventory

Proceed with the public services inventory according to the following table:

Informational Element	Kind of Answer
Category	Select from a list, or insert a new one if the existing list is not adequate
Coverage	National – if the service is available in the whole country International – if the service is available aboard Full – if the service is available national and international Local – if the service is available only at a specific locale in the country
Cost	Yes – there is a cost associated with the service No – the is no cost
Situation	Computer-assisted – a computer system supports the service Partial Computer-assisted – the service is supported partially by the system In the process of computer assistance – there is a system under development Traditional – no assistance from a computer system
Decentralised	Yes – the service is provided by other institutions besides the service owner institution No
Demand	High – taking into account other services provided by the institution, it is a highly-demanded service Medium – taking into account other services provided by the institution, it is an intermediary demanded service Low - taking into account other services provided by the institution, it is a low-demanded service
Public	Yes – the service can be demanded by any person on behalf of others No – the service can be demanded only by the user or a formal representative.
Performance	Good – capacity or performance is adequate to the users' expectations So far – capacity or performance is regular but can be improved. Insufficient – capacity or performance is below the users' expectations
Importance	High – the service is important for the institution, the country, or the users, and its modernisation is considered a priority Intermediate – the service has a moderated importance, and its modernisation should be considered Low – the service has no relevant importance, and its modernisation is not a priority
Ease to modernise	Easy – the conditions and necessary resources to modernise the service can be easily arranged. Intermediate – the conditions and necessary resources to modernise the service are moderate. Difficult – it is hard to gather the necessary resources to modernise the service.

Instrument D: ICT Infrastructure and Governance Inventories

1) Is there a national portal or a one-stop shop that offers public services to citizens and businesses?
2) Is there any other relevant portal that offers digital public services?
3) Are there authentication services that assure privacy and security to public service users?
4) Is there a digital identity service available in the country?
5) Is there an online service for public service complaints?
6) Is there a personal data portal that allows citizens to authorise/refuse personal data use by service providers?
7) Is a business portal allowing business owners to check and modify their data online?
8) Is there a platform for electronic payment of government taxes?
9) Is there an e-procurement portal?
10) Is there a government app where citizens and businesses can consume public services?
11) Is there a notification platform the government uses to communicate with citizens and businesses during public service provision (SMS, for instance)?
12) Is there an interoperability platform where different government institutions can exchange information to provide better public services?
13) Is there a government network restricted to public institutions?
14) For instance, is a data platform (a data warehouse) where government institutions can hold the necessary data and information for public service delivery?
15) Are there imminent risks or limitations in capacity and performance between government platforms, portals, or online services?
16) Is there an inventory of government information systems, tools, and applications? Is there documental support for them?
17) Is there a set of systems, tools, and applications to assure the government's cybersecurity?
18) Which systems, tools, and applications provided by the private sector can be part of the EGOV strategy?

GOVERNANCE

19) Is there a Government Chief Information Officer, equivalent authority, or a committee with a similar role?
20) Is there a Digital Transformation Officer, equivalent authority, or a committee with a similar role?
21) Is there a formal government ICT strategy or an equivalent plan?
22) Is there an ICT procurement plan?
23) Which institutions are responsible for planning, deciding, implementing, and assessing government ICT initiatives?
24) Is there an ICT career within the public sector?
25) What was the government ICT budget for the last five years?
26) Is there an accountability report on ICT expenses for the last five years?
27) Are there formal ICT units in each government agency?
28) Is there an authority that solves conflicting ICT decisions involving different government agencies?

Instrument E: SWOT Workshop Guide

The SWOT workshop is an event destinated to listening to key actors in a democratic and pluralistic environment. All of them will be able to speak and suggest the set of Strengths, Weaknesses, Opportunities and Threats related to the country's EGOV.

This event should be done in an exclusive workshop, and the group can be divided to ensure the best environment to listen to and debate. The facilitator has the role of intermediating the discussion and collecting suggestions. We suggest that the following table be divided into four cells to collect the suggestions.

While the two first lines (Strengths and Weaknesses) are dedicated to exploring the internal environment, the last two (Opportunities and Threats) are dedicated to exploring the external environment. In short, the internal environment should be presented with items the country has control over them. The external environment is the opposite; the control is minimum or absent.

Strengths	**Weaknesses**
Opportunities	**Threats**

After the workshop, the information gathered should be interpreted with the following rules:

1) For every identified Opportunity, check if there is a Strength that can be used to seize it. The strategy formulation process can generate an objective/measure seizing the Opportunity.
2) If a Strength does not exist, there is a Weakness related to the Opportunity that should be first transformed into a Strength to seize it. It could generate an objective/measure to create Strength during the strategy formulation process. Moreover, if possible, another objective/measure to seize the Opportunity soon.
3) For every identified Threat, check if there is a Strength that can be used to mitigate the risk. It can generate an objective/measure to avoid the Threat during the strategy formulation process.

4) If a Strength does not exist, there is a Weakness related to the Threat that should be first transformed into a Strength to avoid it. It could generate an objective/measure to create Strength during the strategy formulation process. Furthermore, if possible, another objective/measure to avoid the Threat soon.

There will be several alternatives for using the data and information generated through the SWOT workshop. The strategist can use them in the appropriate stage/guideline during the strategy formulation process.

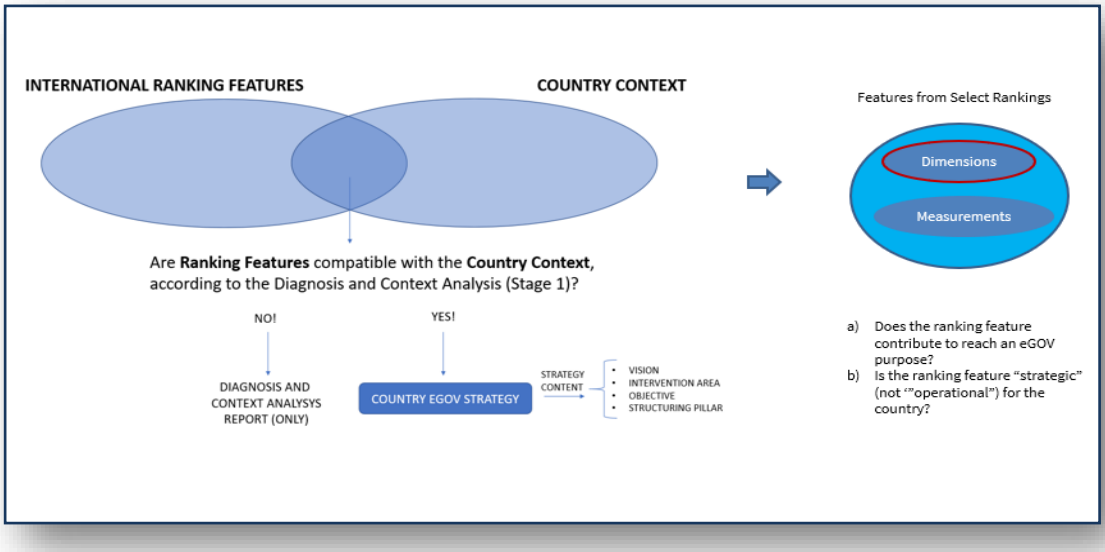
Instrument F: International Ranking Analysis Tool

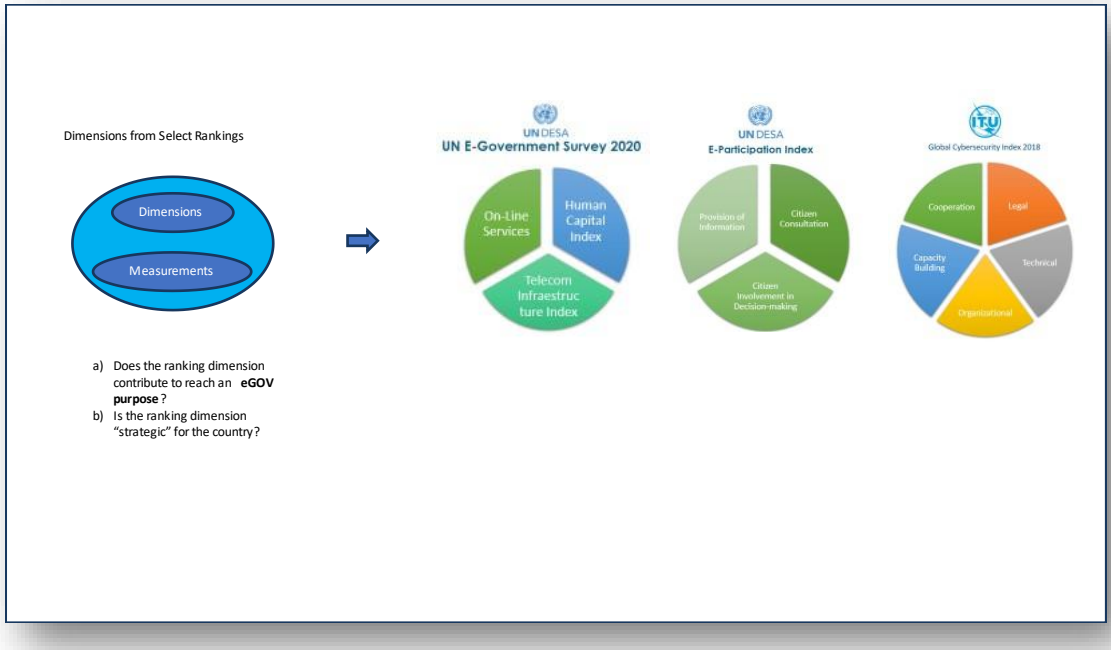
This instrument supports depicting the International Rankings into components to be used through the method and guidelines for the formulation of EGOV strategies taking them into account. The instructions are stated below:

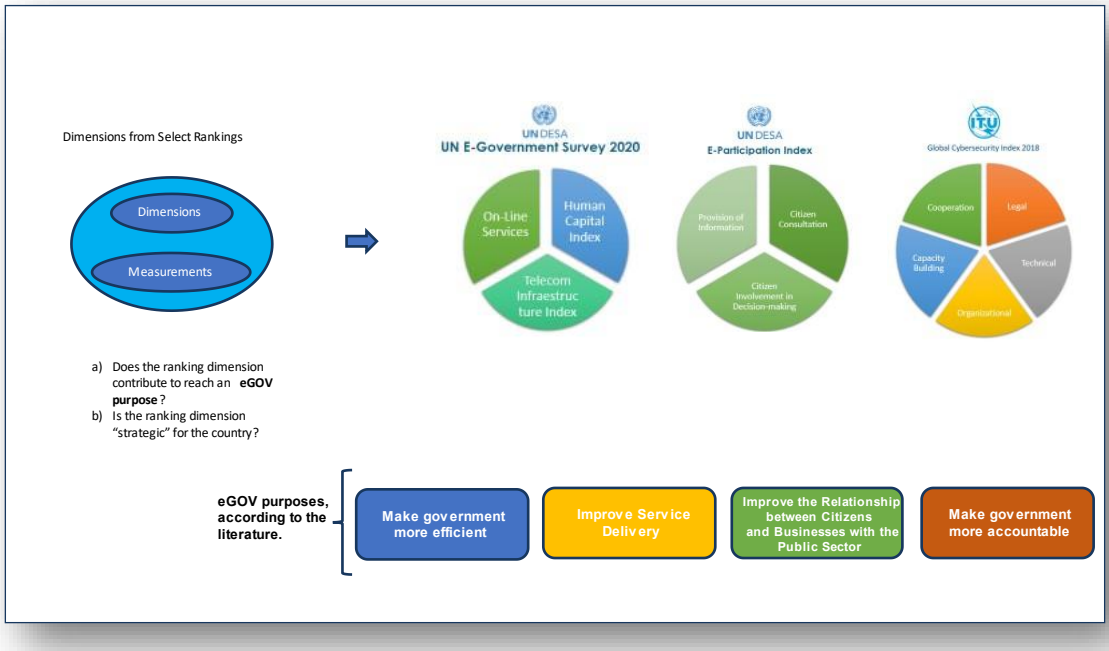
1) Select important and relevant rankings according to the key-actors opinion and the country's context.
2) Identify the international institution that is responsible for it.
3) Identify ranking features, evaluation window (annual, biannual, etc.), publication intervals, and the evaluation process (people that integrate the process, the process stages, techniques used, etc.).
4) Gather the data/information about the country, as well as about the country-of-references. Explore trends and shortfalls from selected international rankings through longitudinal data (10 years).
5) Identify ranking components such as dimensions and measurements.
6) Explore eventual relationships between components of international rankings and EGOV purposes.
7) Define intervention areas, strategic objectives, and measures inspired by international rankings components.

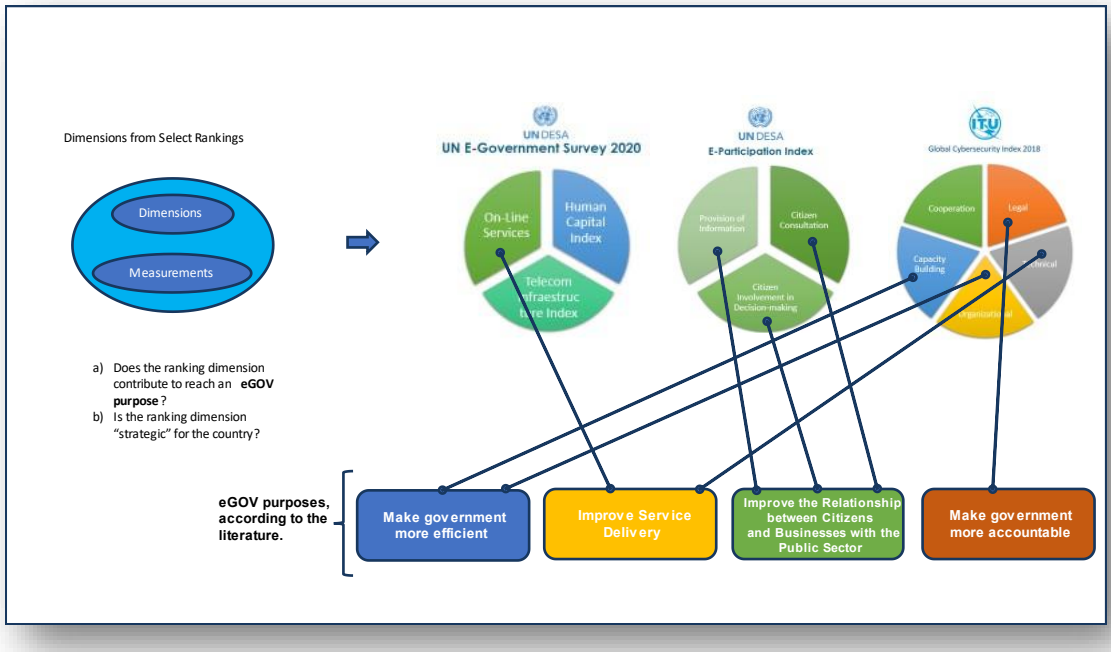
All this data/information should be used to inspire the strategy content, such as the strategic Vision, areas of intervention, objectives and measures, and structuring pillars. During this, remind the set of EGOV purposes: make the government more efficient; improve public service delivery; make the government more accountable; improve the relationship between citizens and businesses with the public sector. They are a filter if the document is compatible and useful for the EGOV strategy formulation.

The following images exemplify the procedure:


INTERNATIONAL RANKING FEATURES
COUNTRY CONTEXT
Are Ranking Features compatible with the Country Context, according to the Diagnosis and Context Analysis (Stage 1)?
NO!
DIAGNOSIS AND CONTEXT ANALYSYS REPORT (ONLY)
YES!
COUNTRY EGOV STRATEGY
STRATEGY CONTENT
VISION
INTERVENTION AREA
OBJECTIVE
STRUCTURING PILLAR
Features from Select Rankings
Dimensions
Measurements
a) Does the ranking feature contribute to reach an eGOV purpose?
b) Is the ranking feature "strategic" (not '"operational") for the country?


Dimensions from Select Rankings
Dimensions
Measurements
a) Does the ranking dimension contribute to reach an eGOV purpose ?
b) Is the ranking dimension "strategic" for the country ?
UN DESA
UN E-Government Survey 2020
On-Line Services
Human Capital Index
Telecom Infraestructure Index
UN DESA
E-Participation Index
Provision of Information
Citizen Consultation
Citizen Involvement in Decision-making
Global Cybersecurity Index 2018
Cooperation
Legal
Technical
Organizational
Capacity Building


Dimensions from Select Rankings
Dimensions
Measurements
UN DESA
UN E-Government Survey 2020
On-Line Services
Human Capital Index
Telecom Infraestructure Index
UN DESA
E-Participation Index
Provision of Information
Citizen Consultation
Citizen Involvement in Decision-making
Global Cybersecurity Index 2018
Cooperation
Legal
Capacity Building
Technical
Organizational
a) Does the ranking dimension contribute to reach an eGOV purpose?
b) Is the ranking dimension "strategic" for the country?
eGOV purposes, according to the literature.
Make government more efficient
Improve Service Delivery
Improve the Relationship between Citizens and Businesses with the Public Sector
Make government more accountable


Dimensions from Select Rankings
Dimensions
Measurements
UN DESA
UN E-Government Survey 2020
On-Line Services
Human Capital Index
UN DESA
E-Participation Index
Provision of Information
Citizen Consultation
Citizen Involvement in Decision-making
Global Cybersecurity Index 2018
Cooperation
Legal
Capacity Building
Technical
Organizational
a) Does the ranking dimension contribute to reach an eGOV purpose?
b) Is the ranking dimension "strategic" for the country?
eGOV purposes, according to the literature.
Make government more efficient
Improve Service Delivery
Improve the Relationship between Citizens and Businesses with the Public Sector
Make government more accountable

Instrument G: ICT Governance Inventory

1) Is there a Government Chief Information Officer, equivalent authority, or a committee with a similar role?
2) Is there a Digital Transformation Officer, equivalent authority, or a committee with a similar role?
3) Is there a formal government ICT strategy or an equivalent plan?
4) Is there an ICT procurement plan?
5) Which institutions are responsible for planning, deciding, implementing, and assessing government ICT initiatives?
6) Is there an ICT career within the public sector?
7) Which was the government ICT budget for the last five years?
8) Is there an accountability report on ICT expenses for the last five years?
9) Are there formal ICT units in each government agency?
10) Is there an authority that solves conflicting ICT decisions involving different government agencies?

Instrument H: Back-office Inventory

This tool intends to inventory the Back Office associated with public service delivery. The inventory can be adapted according to the strategists and to the country's context, should be considered. During the application of this questionnaire, the team should be aware of two different situations: a) the respondent is part of the institution that offers the public service he/she is talking about; b) the respondent is talking about public services offered by institutions that he/she is not part.

1) Consider public services that have a good reputation among citizens and business owners. What are back-office structures available to these services that positively impact this perception?
2) Consider public services that do not have a good reputation among citizens and business owners. Which back-office structures should be in place to change this perception among them?
3) Are you a member of the institution responsible for this public service offering?

Instrument I: Inventory of Transparency and Accountability Tools

1) Is there a transparency portal with governmental data and information such as public budget and expenses in health, education, social protection, environmental protection, the justice system and citizenship?
2) Are official portals, websites, or tools for citizen participation in the public policies cycle, such as e-participation, e-consultancy, e-petition, or even social networks government accounts, dedicated to this aim?
3) Is the country a member of the Open Government Partnership (OGP)? Are there OGP-related portals, websites, or any similar tools?
4) Is there an Open Data portal with government data and related metadata related to the following areas: health, education, social protection, environmental protection, the justice system, and citizenship?
5) Is there any guidance on using available government open data and related metadata in an Open Data portal?
6) Is it possible to request new datasets with an Open Data portal?
7) Is there any evidence of government open data use, such as hackathons or similar events?
8) Are there institutionalised and formal policies related to Open Data, E-participation, or Open Government?

APPENDIX II: FOCUS GROUP SUPPORTING MATERIAL

The Appendix II contains the material used to support the author in the demonstration of the **Method – Version 3** at the international conference IFIP EGOV-CeDEM-ePart - Conference on Electronic Government, Electronic Participation, E-Democracy and Open Government of the International Federation for Information Processing, in September 2021, at Granada Spain.

A Prescriptive Framework for the Formulation of E-GOV Strategies taking into account International Rankings

Wagner Araujo [ab], Delfina Soares [b], João Carvalho [a], Joana Carvalho [ab]

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[b] United Nations University (UNU-EGOV), Portugal

The research

- **Context**: A previous study confirmed that many countries use International Rankings for the formulation of E-GOV Strategies. They use them to contextualize, diagnosis and goals setting.
- **Relevance:** The relevance of the theme has also been confirmed through interviews with key stakeholders involved in E-GOV Strategies.
- **Research Objective**: To develop a framework for the formulation of E-GOV strategies, taking into account international rankings.

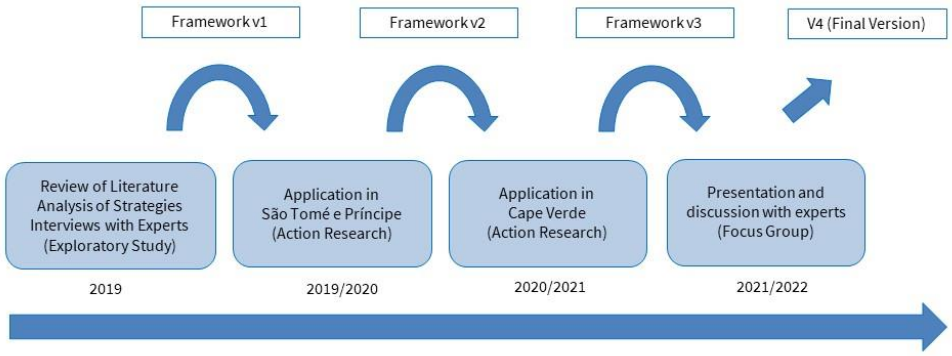
International Rankings use in eGOV strategy formulation

COUNTRY/STRATEGY	RANKINGS USED	KIND OF USE
Argentina Digital Agenda 2018	World Economic Forum (WEF) Global Competitiveness Report 2018 IMD/Digital Competitiveness Index 2018	Diagnosis and contextualization
Austria Digital Roadmap 2018	UE/European Digital Economy and Society Index 2016 WEF/Network Readiness Index 2016	Diagnosis and contextualization
Brazil Digital Government Strategy 2020-2022	UN/E-Government Development Index (2016) (2018)	Diagnosis, contextualization Definition of goals
Chile State Digital Transformation Strategy 2018-2022	UN/E-Government Development Index	Definition of goals
Mexico National Digital Strategy 2013 – 2018	UN/E-Government Development Index (2012)	Diagnosis and contextualization Definition of goals
Netherlands / Dutch Digitalization Strategy 2018	UE/European Digital Economy and Society index	Diagnosis and contextualization
Thailand Digital Government Development Plan 2017-2021	UN/E-Government Index (2016) Open Data index (2016)	Diagnosis, contextualization Definition of goals
Turkey National E-Government Strategy and Action Plan 2016-2019	UN/E-Government Index (2014) WB/Ease of Doing Business Ranking (2016)	Diagnosis and contextualization

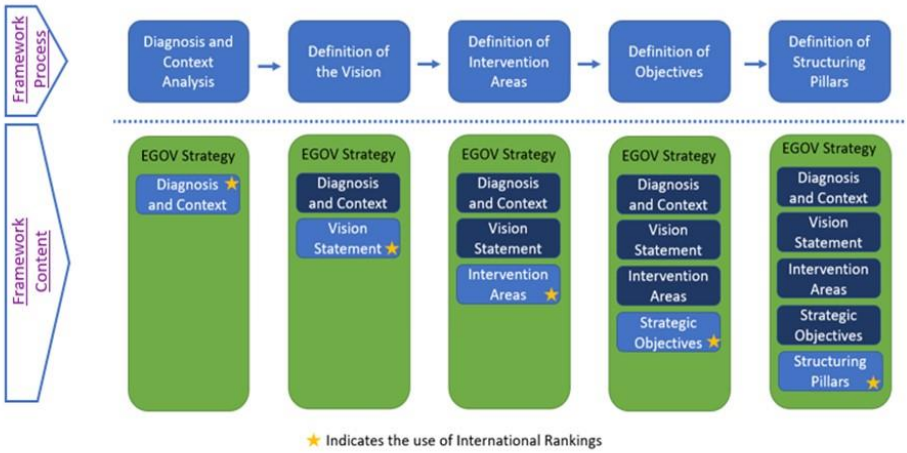
Expected characteristics of the framework

CHARACTERISTIC	DESCRIPTION	SOURCE
Flexible	Adjustable to the country context	Literature Review Exploratory Study V1 and V2 Iteration
Instructive	Supports the learning process and the association of rankings characteristics to E-GOV purposes	Exploratory Study V1 and V2 Iteration
Easy to use	Simplifies the use of international rankings in E-GOV strategy formulation.	Literature Review Exploratory Study V1 and V2 Iteration
Comprehensive	Broadly covers the E-GOV purposes	Literature Review Exploratory Study V1 and V2 Iteration
Co-creative	Enables the participation of multiple stakeholders	Exploratory Study V1 and V2 Iteration
Effective	Delivers an E-GOV strategy after a complete formulation process	Exploratory Study V1 and V2 Iteration
Coherent (NEW)	Has a logical process, ordered and integrated	Literature Review V2 Iteration

Development process



Framework's process and content



Workshop objective

Evaluate if the framework is **flexible, instructive, ease to use, comprehensive, co-creative, effective and coherent**.

Workshop activities

1. A brief framework overview will cover its **process** and its **content.**
2. Each of the 5 stages of the framework **process** and respective **content** will be presented.
3. After each stage is presented, you will be asked to answer a short online survey on whether you think the set of characteristics is present in that stage.
4. Follows a 10 minutes discussion on the presence of the characteristics.
5. After all stages are presented, a discussion will be held about the whole **process** and generated **content**.

Stage 1: Diagnosis and Content Analysis

The content generated at this stage is the **Diagnosis and Context** and will describe the country eGOV *status quo* regarding national and international context. To do this:

1.1. Analyze the national context:
- i. Raise the country's ambitions in Digital area, checking previous and current digital strategies (eGOV included);
- ii. Recover current national strategies in government main areas (health, education, social security, environment, employment, justice, …);
- iii. Proceed an eGOV SWOT workshop with key-actors;
- iv. Make interviews with key actors and raise eGOV expectations;
- v. Make an inventory of existent public services;
- vi. Make an inventory of existent IT infrastructure in the government;
- vii. Make an inventory of existent eGOV legal framework.

1.2. Analyze the international context:
- i. Identify the countries of reference, and proceed a benchmark;
- ii. Identify country's international partnerships and check for co-signed documents in the digital area;
- iii. Select international rankings that are relevant to the country, according to the key-actors' interviews, SWOT analysis, and national strategies;
- iv. Recover the country data from these ranking.

1.3. Produce a Diagnosis and Context Chapter with the analysis result.

Discussion (10 minutes)

Please answer the online survey:

https://bit.ly/workshop2stage1

Question for debate: Which characteristics are present in stage 1?

Answers

CHARACTERISTIC	DESCRIPTION
Flexible	Adjustable to the country context
Instructive	Supports the learning process and the association of rankings characteristics to E-GOV purposes.
Easy to use	Simplifies the use of international rankings in E-GOV strategy formulation.
Comprehensive	Broadly covers the E-GOV purposes
Co-creative	Enables the participation of multiple stakeholders.

Stage 2: Definition of the Vision

The content generated at this stage is the Vision. It is a single and strong statement which will frame the whole EGOV strategy content. The strategic vision definition is important because it resumes the policy in a single phrase to which the e-government strategists are held accountable[1]. To do this:

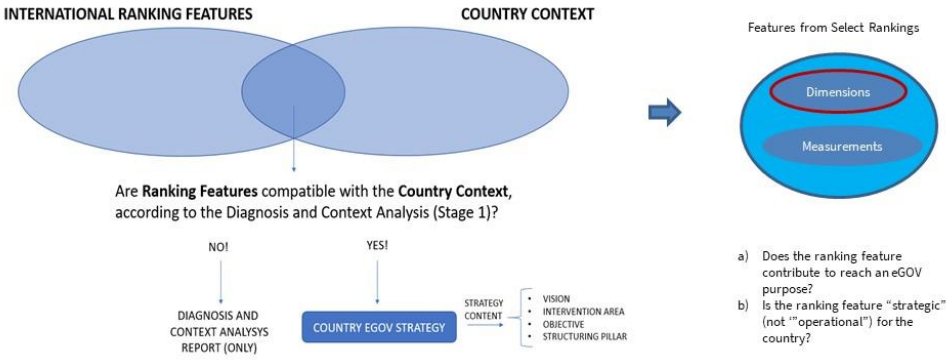
2.1. Analyze the content generated in Stage 1, especially:

- the set of objectives contained in current national strategies that can be supported by eGOV efforts [1.1.i;1.1.ii]
- the analysis of SWOT workshop [1.1.iii];
- the set of eGOV expectations reflected in the key-actors' interviews, beaconed by the current national strategies [1.1.iv].
- dimensions of selected International Rankings [1.2.iii].

2.2. Synthetize the information gathered and declare a single and strong statement which reflects the main goal of the whole eGOV strategy. It should be feasible and coherent with the strategy time frame.

2.3. Produce a chapter with the content resulted from the Vision definition process.

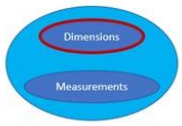
Selecting features of the selected rankings



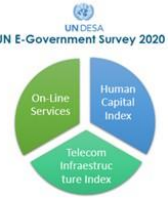
a) Does the ranking feature contribute to reach an eGOV purpose?
b) Is the ranking feature "strategic" (not '"operational") for the country?

Select the dimensions of the selected rankings

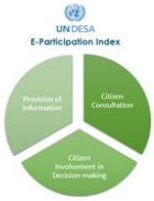
Dimensions from Select Rankings



Exemplo 1: UNDESA/EGDI



Exemplo 2: UNDESA/EPI

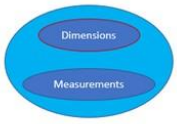


Exemplo 3: ITU/GCI

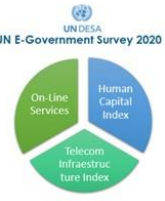
a) Does the ranking dimension contribute to reach an **eGOV purpose**?
b) Is the ranking dimension "strategic" for the country?

Select the dimensions of the selected rankings

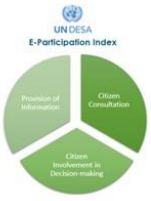
Dimensions from Select Rankings



Exemplo 1: UNDESA/EGDI



Exemplo 2: UNDESA/EPI



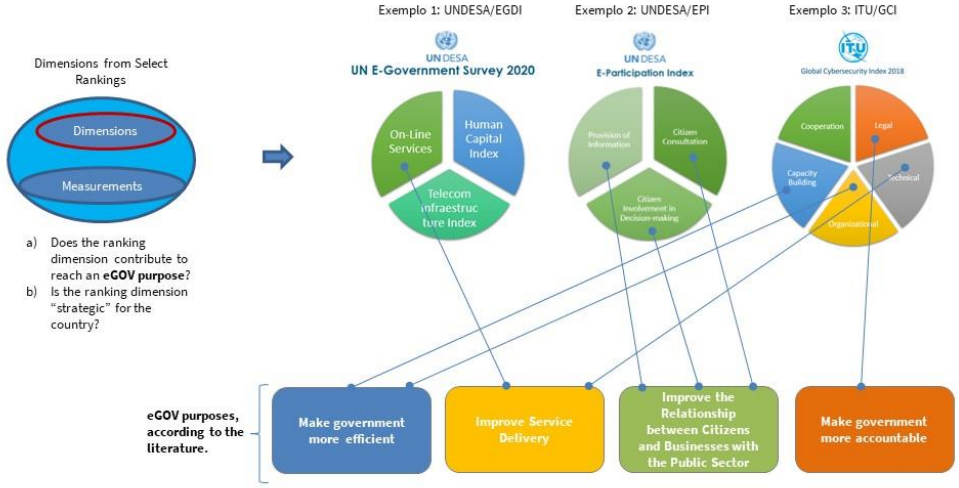
Exemplo 3: ITU/GCI

a) Does the ranking dimension contribute to reach an **eGOV purpose**?
b) Is the ranking dimension "strategic" for the country?

eGOV purposes, according to the literature.

- Make government more efficient
- Improve Service Delivery
- Improve the Relationship between Citizens and Businesses with the Public Sector
- Make government more accountable

Select the dimensions of the selected rankings



Discussion (10 minutes)

Please answer the online survey:

https://bit.ly/workshop2stage2

Question for debate: Which characteristics are present in stage 2?

Answers

CHARACTERISTIC	DESCRIPTION
Flexible	Adjustable to the country context
Instructive	Supports the learning process and the association of rankings characteristics to E-GOV purposes.
Easy to use	Simplifies the use of international rankings in E-GOV strategy formulation.
Comprehensive	Broadly covers the E-GOV purposes
Co-creative	Enables the participation of multiple stakeholders.

Stage 3: Definition of Intervention Areas

The content generated at this stage is the set of Intervention Areas. These set of intervention areas should support the achievement of the declared vision. Intervention areas will also organize the strategic objectives chosen in the next stage. To do this:

3.1. Examine the stated strategic vision and its embedded information [2.2]. Choose part of the intervention areas identifying which government / country areas should be worked on to achieve of the vision;

3.2. Re-examine the Stage 2 entry information to choose more intervention areas [2.1] based on:

- the set of objectives contained in current national strategies that can be supported by eGOV efforts [1.1.i;1.1.ii]
- the analysis of SWOT workshop [1.1.iii];
- the set of eGOV expectations reflected in the key-actors' interviews, beaconed by the current national strategies [1.1.iv;1.1.ii].
- dimensions of selected International Rankings [1.2.iii].

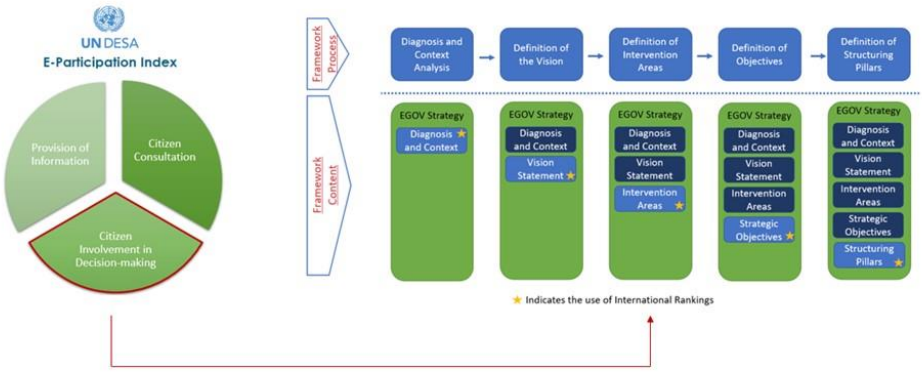
3.3. Analyze further content generated in Stage 1 to choose new intervention areas based on:

- country shortcomings, from the benchmark with other countries [1.2.i];
- digital country commitments, from international partnerships compromises [1.2.ii].

3.4. Double check the dimensions of selected international rankings to choose new Intervention Areas based on them [2.1].

3.5. Produce a chapter with the content resulted from the Intervention Areas definition process.

Using the dimensions from selected rankings



Discussion (10 minutes)

Please answer the online survey:

https://bit.ly/workshop2stage3

Question for debate: Which characteristics are present in stage 3?

Answers

CHARACTERISTIC	DESCRIPTION
Flexible	Adjustable to the country context
Instructive	Supports the learning process and the association of rankings characteristics to E-GOV purposes.
Easy to use	Simplifies the use of international rankings in E-GOV strategy formulation.
Comprehensive	Broadly covers the E-GOV purposes
Co-creative	Enables the participation of multiple stakeholders.

Stage 4: Definition of Objectives

The content generated at this stage is the set of Objectives. They should be organized in the defined Intervention Areas, filling them, jointly supporting the achievement of the declared vision. To do this:

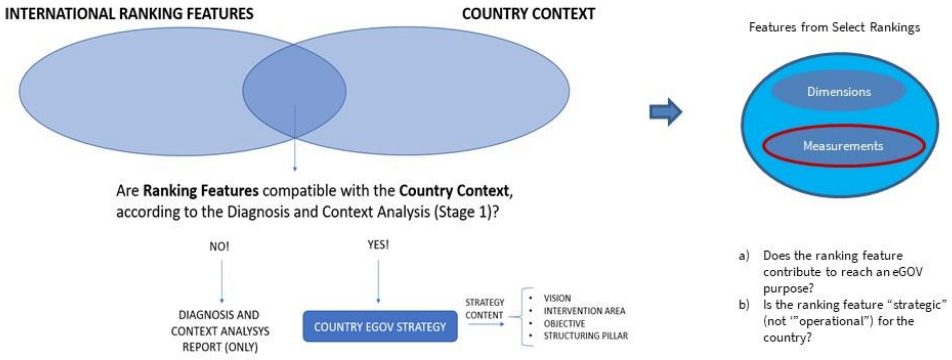
4.1. Guided by the Intervention Areas, re-examine the Stage 3 entry information:
- the declared vision [2.2];
- the set of objectives contained in current national strategies that can be supported by eGOV efforts [1.1.i;1.1.ii]
- the analysis of SWOT workshop [1.1.iii];
- the set of eGOV expectations reflected in the key-actors' interviews [1.1.ii], beaconed by the current national strategies [1.1.iv].
- dimensions of selected International Rankings [1.2.iii].
- country shortcomings, from the benchmark with other countries [1.2.i];
- digital country commitments, from international partnerships compromises [1.2.ii].

4.2. Analyze further content generated in Stage 1 to choose new objectives:
- Identify gaps analyzing eGOV related inventories [1.1.v; 1.1.vi;1.1.vii];
- Identify shortcomings analyzing international rankings country data [1.2.iv];

4.3. Analyze the measurements of selected international rankings. Be aware that some of them are not strategic, but operational. This limitation will demand aggregation with other measurements to become a strategic objective.

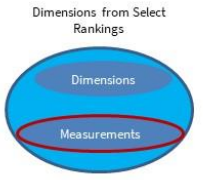
4.4. Produce a chapter with the content resulted from the Objectives definition process.

Selecting features of the selected rankings

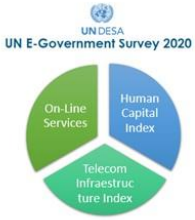


a) Does the ranking feature contribute to reach an eGOV purpose?
b) Is the ranking feature "strategic" (not '"operational") for the country?

Select the measurements of the selected rankings

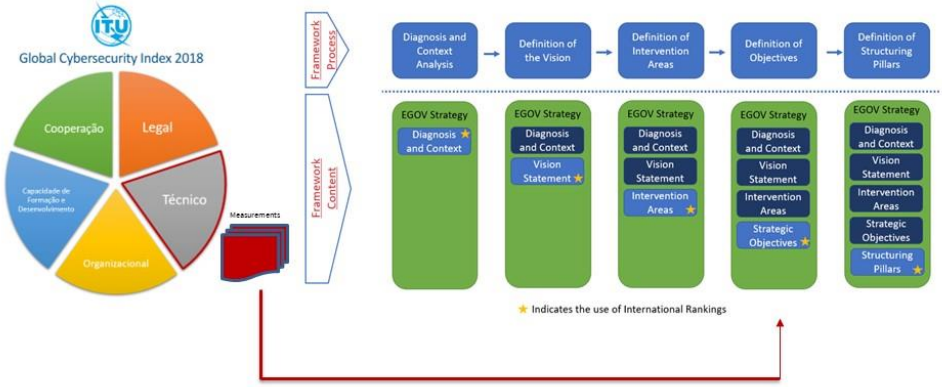


a) Does the ranking dimension contribute to reach an **eGOV purpose**?
b) Is the ranking dimension "strategic" for the country?



	Make government more efficient	Improve Service Delivery	Improve the Relationship between Citizens and Businesses with the Public Sector	Make government more accountable
Information about accessible public transportation		X		
Information about affordable public housing		X		
Information about citizen's rights to access government information				X (*)
Information about citizenship application		X		
Information about diseases affecting older persons		X		
Information about early childhood development, care and pre-primary education		X		
Information about education policy or budget				X (*)
Information about electricity or power outage		X		
Information about employment/labor policy or budget				X (*)
Information about environment-related policy or budget				X (*)
Information about equal access to education for children in vulnerable situations		X		
Information about equal access to education for persons with disabilities		X		
Information about gender equality (policy/legislation)				x (*)
Information about government scholarship programs or education funding		X		
Information about government-wide Chief Information Officer (CIO) or equivalent online	X			
Information about health policy or budget				X (*)
Information about health-emergency preparedness		X		

Using the measurements from selected rankings



Discussion (10 minutes)

Please answer the online survey:

https://bit.ly/workshop2stage4

Question for debate: Which characteristics are present in stage 4?

Answers

CHARACTERISTIC	DESCRIPTION
Flexible	Adjustable to the country context
Instructive	Supports the learning process and the association of rankings characteristics to E-GOV purposes.
Easy to use	Simplifies the use of international rankings in E-GOV strategy formulation.
Comprehensive	Broadly covers the E-GOV purposes
Co-creative	Enables the participation of multiple stakeholders.

Stage 5: Definition of Structuring Pillars

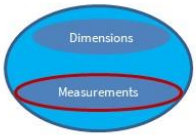
The content generated at this stage is the set of Structuring Pillars. Structuring pillars are part of the eGOV architecture and are necessary to support the strategic objectives. They are grouped in three subsets: legal, organizational, technical. To do this:

5.1. Screen each defined objectives [4.4] and check the necessary legal, organizational or technical structure to accomplish it.
5.2. Check for gaps on legal, organizational or technical structure re-examining:
- i. the key-actors' interviews [1.1.ii];
- ii. the SWOT analysis [1.1.iii];
- iii. legal framework inventory [1.1.vi];
- iv. country shortcomings, from the benchmark with other countries [1.2.i];
- v. gaps on eGOV related inventories [4.2];
- vi. measurements of selected international rankings [4.3].

5.3. Repeat the process to find gaps on the government organizational structures.
5.4. Repeat the process to find gaps on the government technical infrastructures.
5.5. Build a graph connecting each objective to each structuring pillar, to detect priorities.
5.6. Produce a chapter with the content resulted from the Structuring Pillars definition process.

Select the measurements of the selected rankings

Dimensions from selected Rankings



UNDESA
UN E-Government Survey 2020

	Structuring Pillar	Structuring Pillar Name
Information about government-wide Chief Information Officer (CIO) or equivalent online	Organizational	CIO Position
Information about health policy or budget		
Information about health-emergency preparedness		
Information about housing support for older persons		
Information about justice policy or budget		
Information about labor laws and regulation		
Information about laws and regulations against discrimination		
Information about local/regional government agencies		
Information about national budget or budget policy		
Information about organizational structure of the government		
Information about payments for government services through different channels	Legal + Technical	E-Payment Platform
Information about personal data protection	Legal	GDPR
Information about pollution and precautionary measures		
Information about primary government expenditures		
Information about privacy statement		
Information about programs/initiatives benefiting the poor or vulnerable groups		
Information about public sector workforce distribution by sex		
Information about reduction, recycling and reuse of waste		
Information about reproductive healthcare services		
Information about results of any government procurement/bidding process	Legal + Technical	E-procurement Platform
Information about road safety		
Information about road traffic accidents statistics		
Information about schools with accessible facilities		
Information about services in partnership with 3rd parties	Legal + Technical	Co-created Applications
Information about social protection policy or budget		
Information about technical and vocational skills training for youth		
Information about upcoming e-participation activities	Legal + Technical	E-procurement Platform
Information about upcoming procurements	Legal + Technical	E-procurement Platform
Information about using open data sets	Legal + Technical	Open Data

Discussion (10 minutes)

Please answer the online survey:

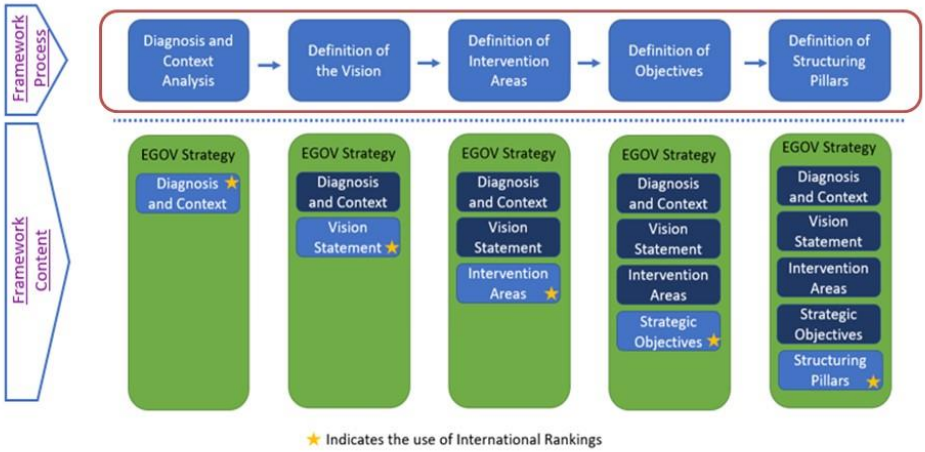
https://bit.ly/workshop2stage5

Question for debate: Which characteristics are present in stage 5?

Answers

CHARACTERISTIC	DESCRIPTION
Flexible	Adjustable to the country context
Instructive	Supports the learning process and the association of rankings characteristics to E-GOV purposes.
Easy to use	Simplifies the use of international rankings in E-GOV strategy formulation.
Comprehensive	Broadly covers the E-GOV purposes
Co-creative	Enables the participation of multiple stakeholders.

Framework



Discussion (10 minutes)

Please answer the online survey:

https://bit.ly/workshop2framework

Questions for debate:

Which characteristics are present in the framework?

Answers

Do you suggest any new characteristic other than those already presented?

CHARACTERISTIC	DESCRIPTION
Flexible	Adjustable to the country context
Instructive	Supports the learning process and the association of rankings characteristics to E-GOV purposes.
Easy to use	Simplifies the use of international rankings in E-GOV strategy formulation.
Comprehensive	Broadly covers the E-GOV purposes
Co-creative	Enables the participation of multiple stakeholders.
Effective	Delivers an E-GOV strategy after a complete formulation process
Coherent (NEW)	Has a logical process, ordered and integrated

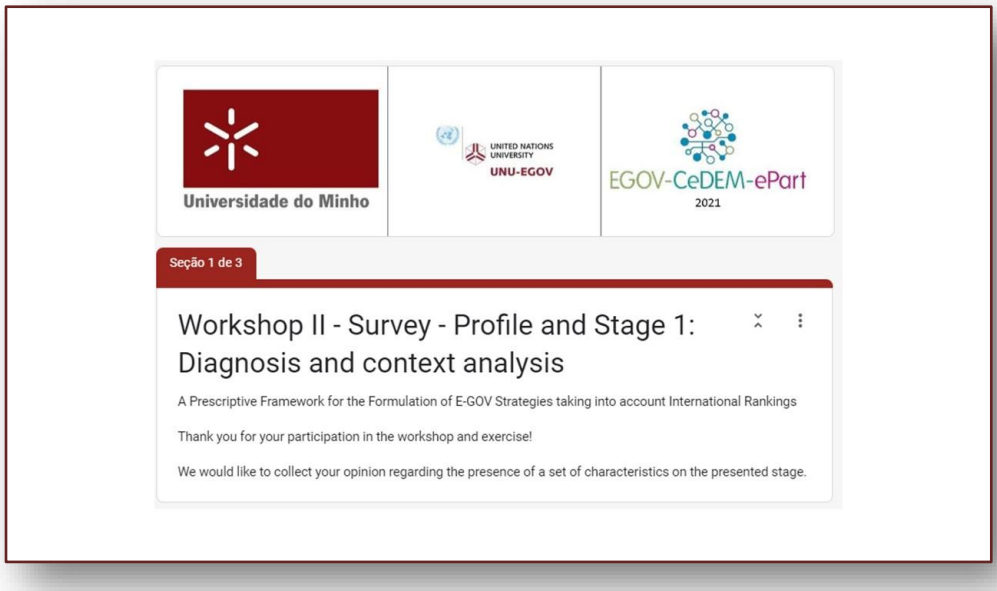
UNITED NATIONS UNIVERSITY
UNU-EGOV
Operating Unit on Policy-Driven Electronic Governance

Escola de Engenharia
Universidade do Minho

Thank you.
Any questions?

Wagner Araújo
wagner.s.araujo@unu.edu

EGOV-CeDEM-ePart



Universidade do Minho

UNITED NATIONS UNIVERSITY
UNU-EGOV

EGOV-CeDEM-ePart
2021

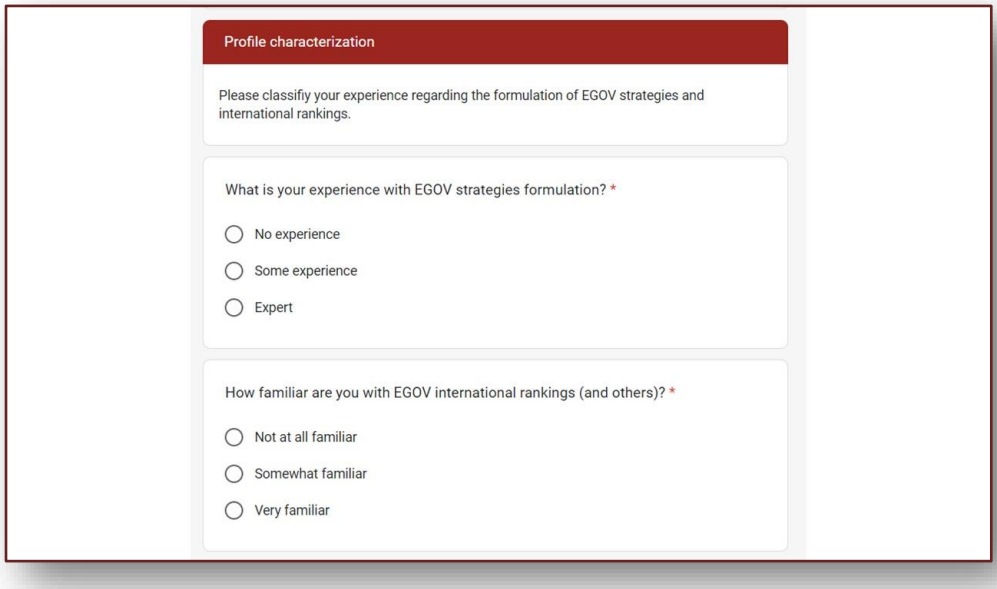
Seção 1 de 3

Workshop II - Survey - Profile and Stage 1: Diagnosis and context analysis

A Prescriptive Framework for the Formulation of E-GOV Strategies taking into account International Rankings

Thank you for your participation in the workshop and exercise!

We would like to collect your opinion regarding the presence of a set of characteristics on the presented stage.



Profile characterization

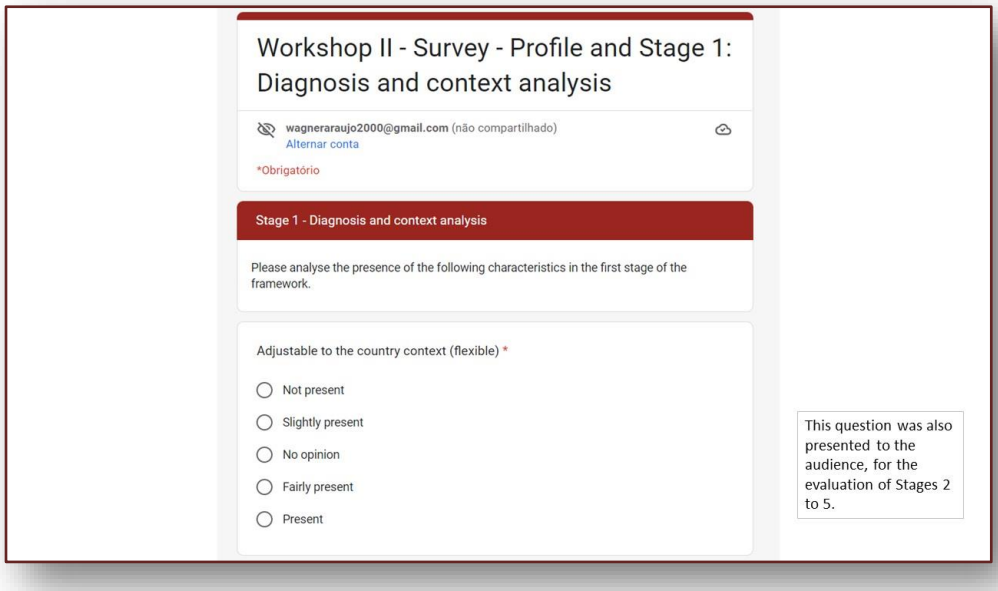
Please classifiy your experience regarding the formulation of EGOV strategies and international rankings.

What is your experience with EGOV strategies formulation? *

- ◯ No experience
- ◯ Some experience
- ◯ Expert

How familiar are you with EGOV international rankings (and others)? *

- ◯ Not at all familiar
- ◯ Somewhat familiar
- ◯ Very familiar



Workshop II - Survey - Profile and Stage 1: Diagnosis and context analysis

wagneraraujo2000@gmail.com (não compartilhado)
Alternar conta

*Obrigatório

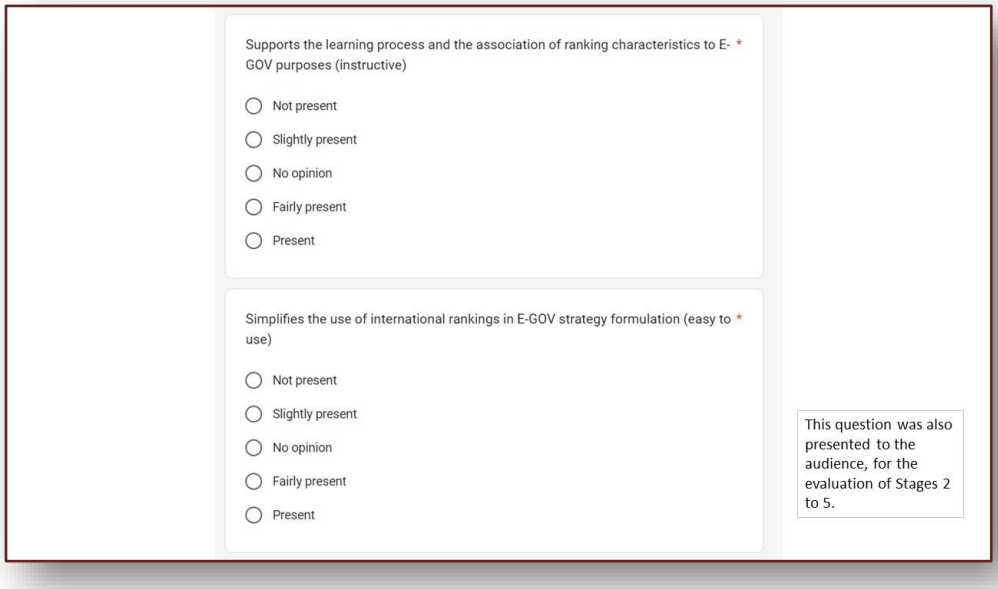
Stage 1 - Diagnosis and context analysis

Please analyse the presence of the following characteristics in the first stage of the framework.

Adjustable to the country context (flexible) *

- Not present
- Slightly present
- No opinion
- Fairly present
- Present

This question was also presented to the audience, for the evaluation of Stages 2 to 5.



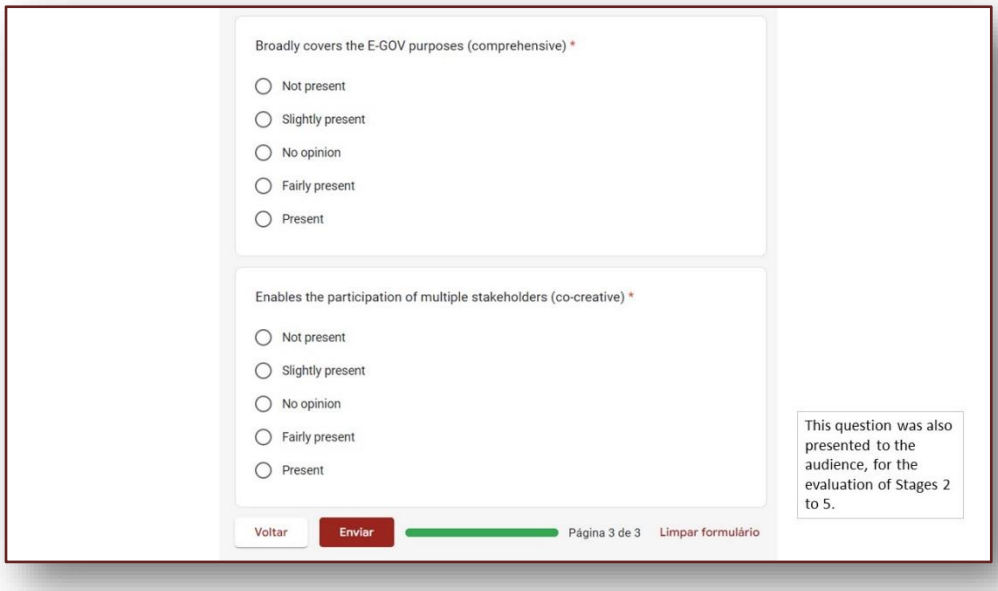
Supports the learning process and the association of ranking characteristics to E-GOV purposes (instructive) *

- Not present
- Slightly present
- No opinion
- Fairly present
- Present

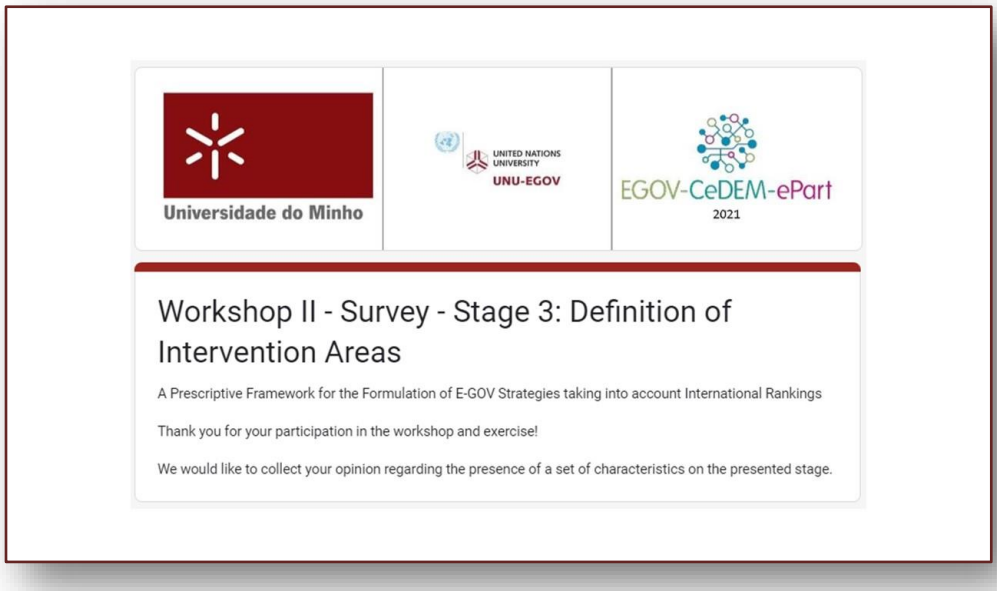
Simplifies the use of international rankings in E-GOV strategy formulation (easy to use) *

- Not present
- Slightly present
- No opinion
- Fairly present
- Present

This question was also presented to the audience, for the evaluation of Stages 2 to 5.


Broadly covers the E-GOV purposes (comprehensive) *
Not present
Slightly present
No opinion
Fairly present
Present
Enables the participation of multiple stakeholders (co-creative) *
Not present
Slightly present
No opinion
Fairly present
Present
Voltar
Enviar
Página 3 de 3
Limpar formulário
This question was also presented to the audience, for the evaluation of Stages 2 to 5.

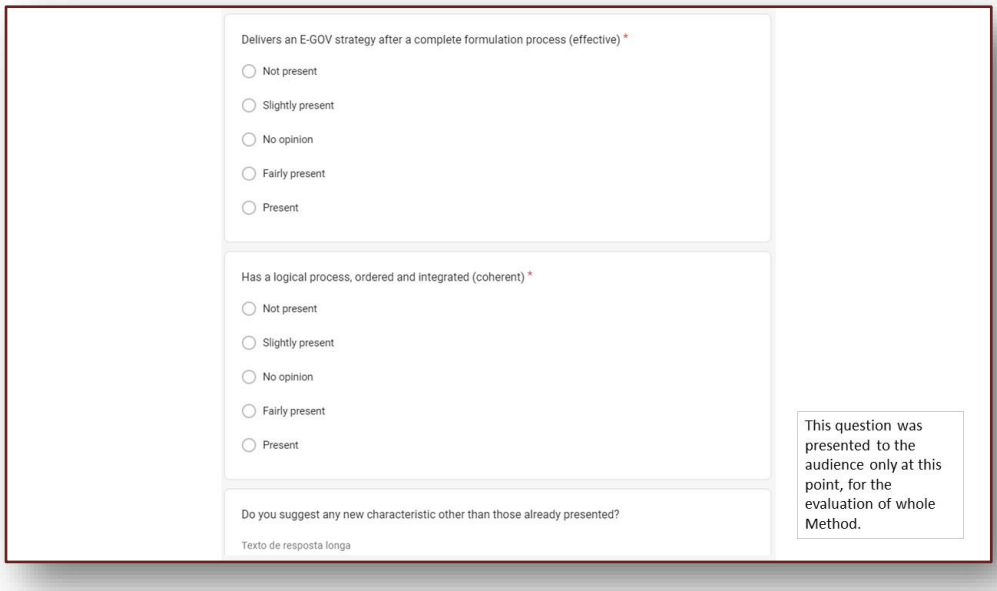

Universidade do Minho
UNITED NATIONS UNIVERSITY
UNU-EGOV
EGOV-CeDEM-ePart
2021
Workshop II - Survey - Stage 2: Definition of the Vision
A Prescriptive Framework for the Formulation of E-GOV Strategies taking into account International Rankings
Thank you for your participation in the workshop and exercise!
We would like to collect your opinion regarding the presence of a set of characteristics on the presented stage.


Universidade do Minho
UNITED NATIONS UNIVERSITY
UNU-EGOV
EGOV-CeDEM-ePart
2021
Workshop II - Survey - Stage 3: Definition of Intervention Areas
A Prescriptive Framework for the Formulation of E-GOV Strategies taking into account International Rankings
Thank you for your participation in the workshop and exercise!
We would like to collect your opinion regarding the presence of a set of characteristics on the presented stage.


Universidade do Minho
UNITED NATIONS UNIVERSITY
UNU-EGOV
EGOV-CeDEM-ePart
2021
Workshop II - Survey - Stage 4: Definition of Objectives
A Prescriptive Framework for the Formulation of E-GOV Strategies taking into account International Rankings
Thank you for your participation in the workshop and exercise!
We would like to collect your opinion regarding the presence of a set of characteristics on the presented stage.


Universidade do Minho
UNITED NATIONS UNIVERSITY
UNU-EGOV
EGOV-CeDEM-ePart
2021
Workshop II - Survey - Stage 5: Definition of Structuring Pillars
A Prescriptive Framework for the Formulation of E-GOV Strategies taking into account International Rankings
Thank you for your participation in the workshop and exercise!
We would like to collect your opinion regarding the presence of a set of characteristics on the presented stage.


Universidade do Minho
UNITED NATIONS UNIVERSITY
UNU-EGOV
EGOV-CeDEM-ePart
2021
Workshop II - Survey - Framework for the Formulation of E-GOV Strategies
A Prescriptive Framework for the Formulation of E-GOV Strategies taking into account International Rankings
Thank you for your participation in the workshop and exercise!
We would like to collect your opinion regarding the presence of a set of characteristics on the presented framework, as well as any suggestion you might have of new characteristics.


Delivers an E-GOV strategy after a complete formulation process (effective) *
Not present
Slightly present
No opinion
Fairly present
Present
Has a logical process, ordered and integrated (coherent) *
Not present
Slightly present
No opinion
Fairly present
Present
Do you suggest any new characteristic other than those already presented?
Texto de resposta longa
This question was presented to the audience only at this point, for the evaluation of whole Method.

APPENDIX III: CAPACITY BUILDING TEACHING RESOURCES

The Appendix III contains the teaching resources used in the 2nd edition of the Capacity Building Program to the Egyptian Public Officials. In that occasion, the **Method – Version 4** was used.

Capacity Building Programme

EGOV Strategies Formulation Framework (Exercises)

Capacity Building Programme

Module 2.2: A design framework for eGOV Strategies (11h00 – 12h40 /13 – 14h30 / 14h50 – 16h

Aim: This module is dedicated to a practical exercise, beginning with the presentation of a framework for the formulation of eGOV Strategies that takes into account international rankings.

The framework will be demonstrated along the presentation of two case studies: **S. Tomé e Príncipe** and **Cabo Verde**. The eGOV strategies of these two countries have been developed using this framework.

After the presentation, an exercise of formulation of an eGOV Strategy using the framework will be performed.

Capacity Building Programme

Schedule	
11h00 – 12h40	Theory (50') + Exercise 1 (50')
12h30 – 13h00	Coffe-Break
13h00 – 14h30	Theory (20') + Exercise 2 (30') Theory (20') + Exercise 3 (20')
14h30 – 14h50	Coffe-Break
14h50 – 16h00	Presentations (70') + Final comments

Capacity Building Programme

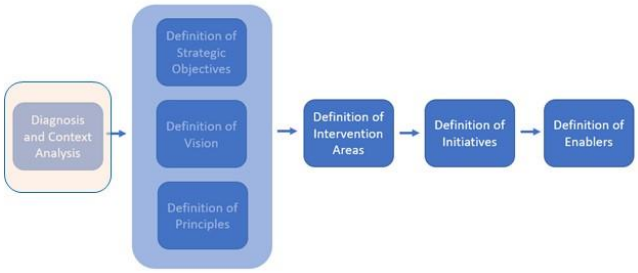
Stage 1: Diagnosis and Context Analysis

Exercise 1

You will have:
50 minutes to work

Capacity Building Programme

Stage 1: Diagnosis and Context Analysis



You will formulate an eGOV Strategy. In this stage you will make a **Diagnosis and Context Analysis** unveiling Egyptian eGOV *status quo* regarding national and international context..

1.1. Analyze the national context:
   i. Identify at least 5 (five) Egyptian ambitions in eGOV. You should cover all eGOV purposes (check theory used this morning). Search also on the web looking into previous / current national strategies, programs and plans. Remember to take a look in the Egyptian National Digital Strategy;
   ii. Analyze the SWOT Analysis built in the last course by your colleagues. Try to identify other Egyptian ambitions in eGOV;
   iii. Talk to your group colleagues and raise their eGOV expectations as Egyptian citizens. Evaluate if it can be included in the list of Egyptian ambitions in eGOV.

1.2. Analyze the international context:
   i. Recover the country data from UNDESA/EGDI ranking and analyze them. Which ranking dimensions Egypt should improve?

1.3. Produce a Diagnosis and Context report using the form provided by the instructor.

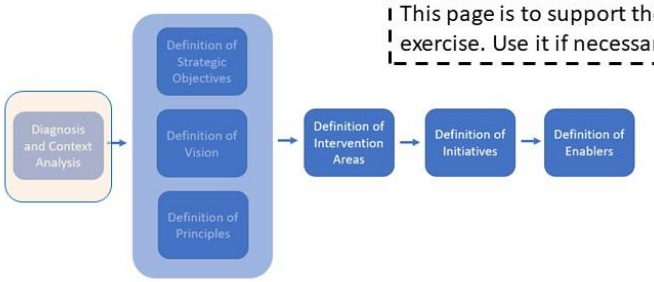
Links of reference (only a suggestion, be free to check others):

https://mcit.gov.eg/en/Digital_Egypt
https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/53-Egypt

Capacity Building Programme

Stage 1: Diagnosis and Context Analysis

This page is to support the exercise. Use it if necessary.



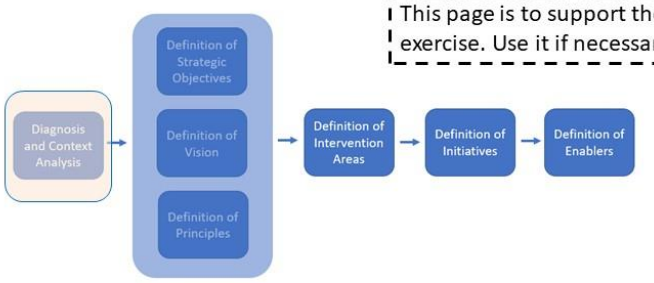
SWOT Matrix (Produced on the last course)

Strengths	Weaknesses
• Strong Political Will. • Newly developed infrastructure in major cities. • Covid-19 and the increasing calls for the digital transformation of public services.	• Poor infrastructure in rural and other non-major cities. • Lack of (eGOV) awareness. • Lack of adequately qualified human resources
Opportunities	**Threats**
• The New Administrative Capital • Silicon Valley (under construction) • Covid-19 and the international fund and technical assistance for digital transformation.	• Change management and corruption. • Lack of funds. • Low ranks in the E-Participation index and other related indexes.

Capacity Building Programme

Stage 1: Diagnosis and Context Analysis

This page is to support the exercise. Use it if necessary.



مصر الرقمية

Digital Egypt

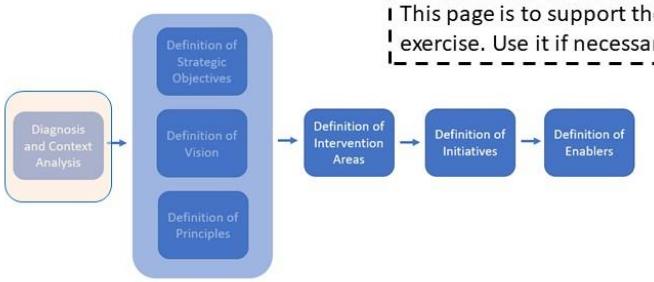
- **Digital Transformation**
  - easy access to government transactions;
  - easy access to government information;
  - faster and simpler services provided to citizens;
  - improvement of government performance;
  - several methods of online payment of service fees, including e-payment companies, mobile wallets and credit cards;
  - e-services in law enforcement, notarization, personal status, family courts, supply, electricity, agriculture, traffic, real estate registration, Mortgage Finance Fund (MFF), and the General Authority for Investment and Free Zones (GAFI).
- **Digital Skills and Jobs**
- **Digital Innovation**

https://mcit.gov.eg/en/Digital_Egypt

Capacity Building Programme

Stage 1: Diagnosis and Context Analysis

This page is to support the exercise. Use it if necessary.



- **From the Egyptian Strategies, related to eGOV purposes.**

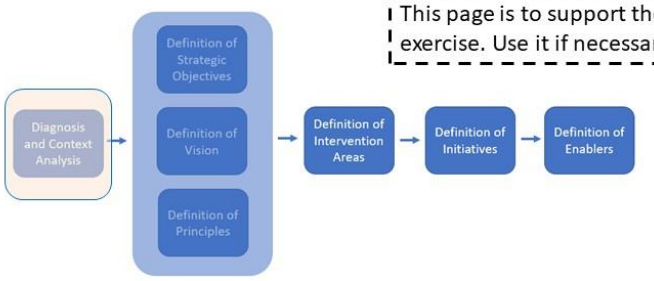
1) All government transaction will be online at one place
2) High accessibility to government services, with low costs (no one left behind) each access to a large number of people with less costs
3) Offering security and fast financial e-services
4) Fast and simple online education e-services
5) access to information for the right use of e-services
6) turning the justice system digital to achieve quick and precise response, while preserving rights and freedom

https://mcit.gov.eg/en/Digital_Egypt

Capacity Building Programme

Stage 1: Diagnosis and Context Analysis

This page is to support the exercise. Use it if necessary.



E-Government Development Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Egypt (Rank)	111	114	108	80	107	86	79	99	136	140
Egypt (Value)	0.55270	0.48800	0.45941	0.51293	0.46112	0.45180	0.47670	0.37929	0.26530	0.23841

https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/53-Egypt

Capacity Building Programme

Stage 1: Diagnosis and Context Analysis

Form #1: output of the 1st stage

Egyptian's ambitions in eGOV		
Description	Source	eGOV purpose*
1)		
2)		
3)		
4)		
5)		

* Choose the eGOV purpose related to the identified eGOV ambition. You can choose more than one, if necessary. Use the following code letters to fill the form: (A) Make the government more efficient; (B) Improve Service Delivery; (C) Make the government more accountable; (D) Improve the Relationship between Citizens and Businesses with the Public Sector.

Sources (Documents and International Rankings)	
1	
2	
3	
4	
5	

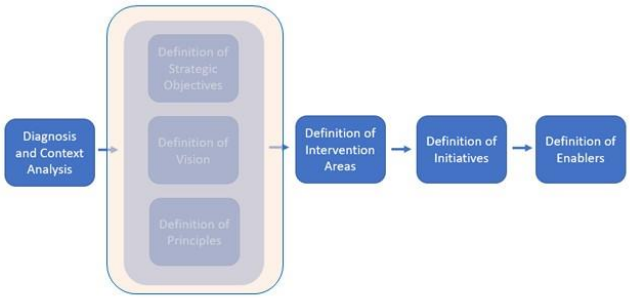
Capacity Building Programme

Exercise 2

You will have:
30 minutes to work

Capacity Building Programme

Stage 2: Definition of the Strategic Objectives, Vision and Principles



You will continue the exercise of eGOV Strategy formulation. At his stage, you will define:

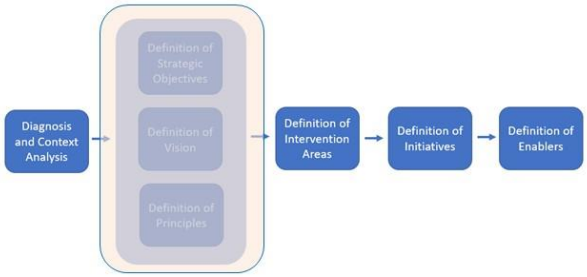
A) the set of **Strategic Objectives**, and:
B) the **Vision**. To do this:

2.1. Analyze the content generated in Stage 1, i.e., the set of Egyptian ambitions in eGOV. If necessary, review:

- the set of objectives contained in current national strategies that can be supported by eGOV efforts
- the SWOT analysis;
- the set of eGOV expectations;
- dimensions of UNDESA/EGDI ranking.

Capacity Building Programme

Stage 2: Definition of the Strategic Objectives, Vision and Principles



To set the **Strategic Objectives:**

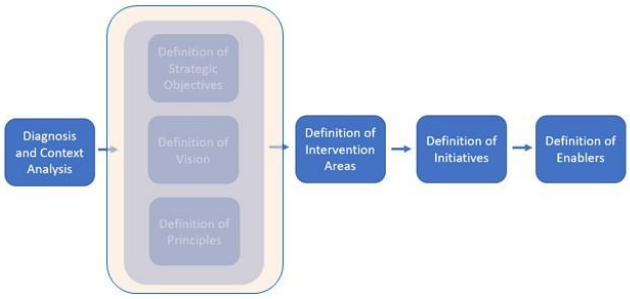
2.2. Recover the set of EGOV purposes (from the EGOV Strategy Theory):
- Make the government more efficient;
- Improve Service Delivery;
- Make the government more accountable;
- Improve the Relationship between Citizens and Businesses with the Public Sector.

2.3. Synthetize the information gathered in the Diagnosis and Context Analysis (Stage 1), beaconed by this set of EGOV purposes, and define the **Strategic Objectives** according to your country context.

The set of **Strategic Objectives** are the core of an EGOV Strategy and define what must be done to reach the Strategic Vision, defined in the next slide.

Capacity Building Programme

Stage 2: Definition of the Strategic Objectives, Vision and Principles



To output (B) the **Vision**:

2.4. Synthetize the information gathered in the Diagnosis and Context Analysis (Stage 1) and declare a single and strong statement which reflects the main goal of the whole eGOV strategy.

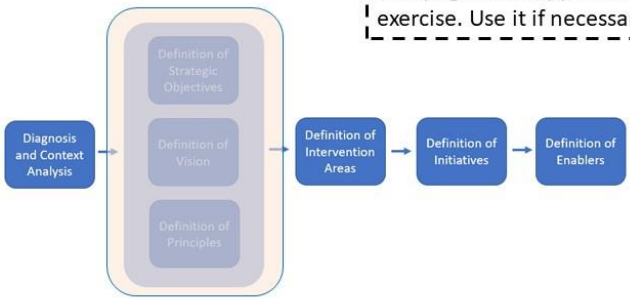
The **Vision** is a single and strong statement which will frame the whole EGOV strategy content. The strategic vision definition is important because it resumes the policy in a single phrase to which the e-government strategists are held accountable[1]. It should be feasible and coherent with the strategy time frame.

[1] Mkude, C. G., & Wimmer, M. A. (2013). Strategic framework for designing e-government in developing countries. In Lecture Notes in Computer Science

Capacity Building Programme

Stage 2: Definition of the Strategic Objectives, Vision and Principles

This page is to support the exercise. Use it if necessary.



STRATEGIC OBJECTIVES: To be defined by the students.

VISION (EXAMPLE)

"A digital Egyptian government, capable of offerring innovative, secure and effective services and information to all citizens and businesses."

Capacity Building Programme

Stage 2: Definition of the Strategic Objectives, Vision and Principles

Form #2: output of the 2nd stage

Strategic Objectives
Description
1)
2)
3)
4)
5)
6)
N)

Vision Statement

Capacity Building Programme

Stage 3: Definition of Intervention Areas

Exercise 3

You will have:
20 minutes to work

Capacity Building Programme

Stage 3: Definition of Intervention Areas

This page is to support the exercise. Use it if necessary.

Intervention Areas:

- On-line Services
- E-Participation
- E-Transparency
- Regulatory Framework
- Government Infrastrucuture
- (...)

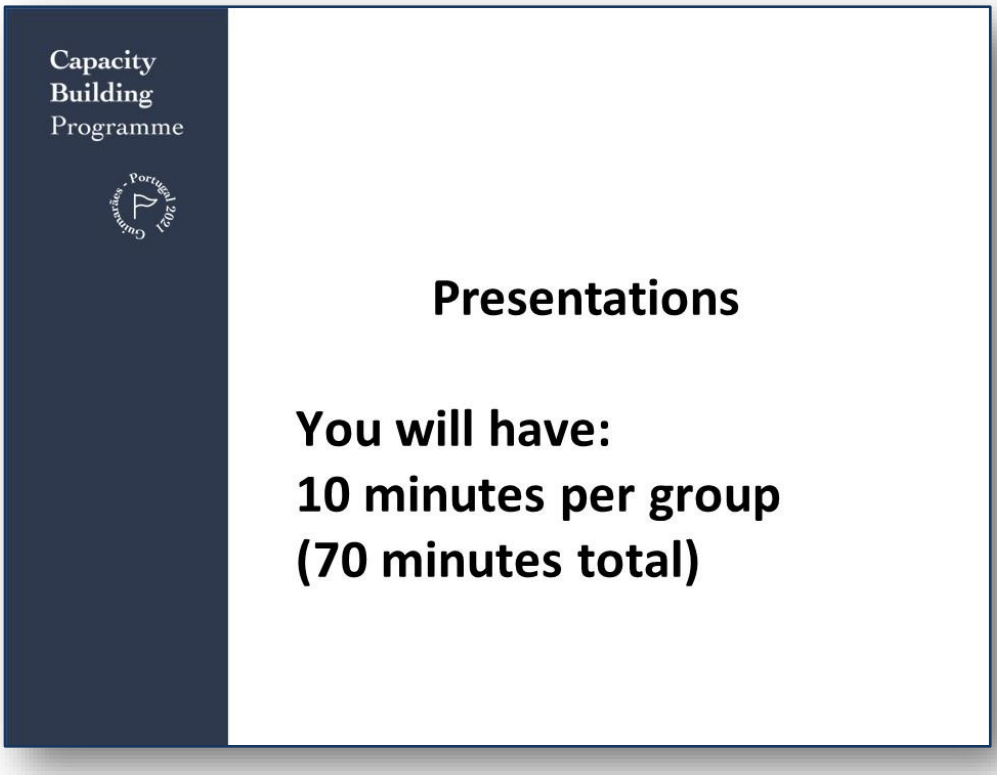
Capacity Building Programme

Stage 3: Definition of Intervention Areas

Form #3: output of the 3nd stage

Intervention Areas
Description
1)
2)
3)
4)
5)
6)
N)

Remember: You have to reach the Vision (write it down again, if necessary)


Capacity
Building
Programme
Guimarães - Portugal 2021
Presentations
You will have:
10 minutes per group
(70 minutes total)