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**DIGITAL TRANSFORMATION FOR  
IMPLEMENTING AN E-CABINET: THE CASE  
OF DJIBOUTI**

Master's Thesis

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PhD

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# **DIGIMUUTUSTE JUHTIMINE E-PARLAMENDI JUURUTAMISEL: DJIBOUTI JUHTUMIURING**

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## **Author's declaration of originality**

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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## **Abstract**

The e-Cabinet is an electronic system for decision-making in government that allows cabinet members to access and evaluate government documents electronically. It is a paperless system that enables cabinet members to monitor decision-making history, retrieve documents, and collaborate more effectively. National governments are working to integrate information and communication technology (ICT) into their decision-making procedures in a variety of ways. One of the most popular ways is through adopting e-governance initiatives, such as e-Cabinets, which enable electronic document management, collaboration, and decision-making procedures.

The main objective of this study is to understand how the e-Cabinet works to increase the effectiveness of record digitization and digital workflows among government agencies and to support a streamlined process for the transparent distribution of government information and data to citizens. In this thesis, with a focus on Djibouti, the case study technique is used to analyze the requirements for implementing an e-Cabinet and its challenges. Semi-structured interviews with experts in the field, decision-makers, and government representatives, as well as interviews conducted during mission workshops held in Djibouti, were utilized for collecting data. The findings demonstrated the importance of considering the organizational, technical, and legal aspects of an e-Cabinet for its successful implementation. The implementation of an e-Cabinet in Djibouti also faces challenges regarding the country's technological foundation, digital literacy, legal and regulatory framework, security concerns, organizational and cultural issues, and user acceptability and engagement.

**Keywords:** Digital Transformation, e-Cabinet Implementation, Electronic Document Records Management System (EDRMS), Paperless Document Management, Digital Service Design, Djibouti

This thesis is written in English and is 78 pages long, including 5 chapters, 25 figures and 1 table.

## List of abbreviations and terms

ICT	<i>Information Communication Technology</i>
IT	<i>Information Technology</i>
EDRMS	<i>Electronic Document Records Management System</i>
EDMS	<i>Electronic Documents Management System</i>
EstDev	<i>Estonian Centre for International Development</i>
ANSIE	<i>Agence Nationale des Systèmes d'Information de l'État</i>
eGA	<i>e-Governance Academy</i>
EU	<i>European Union</i>
UK	<i>United Kingdom</i>
DT	<i>Digital Transformation</i>
OECD	<i>Organization for Economic Co-operation and Development</i>
DEC	<i>Document Exchange Centre</i>
US	<i>United States</i>
EGDI	<i>e-Government Development Index</i>
MENI	<i>Ministry of Digital Transformation and Innovation</i>
UN	<i>United Nations</i>
ESB	<i>Enterprise Service Bus</i>
MENA	<i>Middle East and North Africa</i>
MVP	<i>Minimum Viable Product</i>
IFC	<i>International Finance Corporation</i>

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# **1. Introduction**

To lay the groundwork for this research study, the first chapter establishes the background for the study, justifies the research gap, develops the research questions and objectives, defines the research motivation and relevance of the topic, justifies the research design and methodology, and provides an overview of the thesis structure.

## **1.1 Overview of Research**

Government decision-making is accompanied by protracted bureaucratic procedures that result in a large volume of data without adequate time for analysis [1]. Governments are producing more data as part of their decision-making processes, opening new prospects for digital documentation and archiving growth. As a result, best practices for processes that foster the proper flow of information and communication should be supported. Governments must provide a framework that makes it possible to provide useful information for decision-making in a timely manner in order to advance digitalization in the best interests of their citizens. Also, a platform that shares the results of decisions with the public to increase openness is needed, as well as a well-organized archive that encourages the quick retrieval of government records and saves time. One of the key trends in both the public and private sectors is digitalization. This can be accomplished by implementing information and communication technology solutions to enhance operations and provide consumers or residents with high-quality services. As governments are challenged with legal issues, political issues, and issues related to public accountability to achieve digitalization at the national level or e-government in the process, one effect of digitalization is that it forces institutions in the public sector to transform their operations significantly [2].

E-parliaments can bring greater transparency, accountability, and citizen engagement in the e-governance processes by facilitating real-time online discussions, debates and voting on proposed legislation or policies. This can also lead to significant cost savings by reducing the need for physical meetings, while enabling broader participation and representation [3], particularly for those who may face geographical, physical, or socio-economic barriers to

participation in traditional parliamentary proceedings. Moreover, e-parliaments can help bridge the gap between citizens and their elected representatives by providing a direct channel for communication and feedback, enabling citizens to express their concerns and opinions on various issues. Furthermore, e-parliaments can also enhance the efficiency and effectiveness of parliamentary procedures by enabling faster dissemination of information, streamlining administrative tasks such as scheduling and documentation, and facilitating collaboration among members of parliament. Overall, the implementation of e-parliaments in e-governance processes can lead to a more democratic and participatory system of governance that is better equipped to meet the evolving needs and expectations of citizens in the digital age. However, it is important to note that the successful implementation of e-parliaments requires careful planning, adequate resources and infrastructure, robust security measures, and effective training of parliamentarians and citizens on the use of digital technologies.

The term "e-parliament" refers to the legislature's effective use of Information and Communications Technology (ICT) to create a more transparent, open, responsible, and inclusive government [4]. E-parliament involves more than just implementing information technology (IT), using emails and other digital tools; it also involves cultural adjustments that require engagement and connection with citizens [5]. Over the past few years, Djibouti has made significant strides in projects focused on digital transformation, leading to the definition of a national interoperability framework, the creation of a list of interoperable solutions, and the establishment of the first e-services made available through a citizen portal. Nevertheless, the nation still has difficulties in implementing an electronic cabinet to maintain proper records, transfer information, encourage transparency in parliamentary decision-making, and solicit feedback from citizens.

As a result, the objective of this study is to gather empirical and secondary data, evaluate publications on other nations' e-parliaments and Electronic Document Records Management System (EDRMS), and conclude their successes and problems. A key component of many e-governance initiatives has been paperless management. An EDRMS is frequently used as the initial software platform to enable the conversion of records management into a digital format [6]. EDRMS is one of the most widely used intergovernmental services in e-Government initiatives due to its acknowledged ability to enable the digitalization of internal institutional procedures [7]. The purpose of this study is to comprehend how the e-Cabinet functions to improve the efficiency of record digitization and digital workflows among government

agencies, as well as to support a streamlined procedure for the transparent distribution of government information and data to citizens. This study will describe the workings of an e-Cabinet system of government, the effect it has on the delivery of public services, and design best practice principles that direct the construction of e-Cabinets for governments. The findings of this study will be helpful to governments looking to increase their e-government maturity level and use digitalization to promote effective information sharing between government entities and enhance the delivery of public services to their residents.

## **1.2 Research Motivation and Relevance of the Topic**

In recent years, there has been a growing interest in implementing e-Cabinet systems to improve governance and decision-making. Such systems allow for the digitization of cabinet meetings, enabling decision-makers to access relevant documents and collaborate remotely, thereby increasing efficiency and transparency in the decision-making process [8]. E-Cabinet systems have already been adopted in Estonia promising results in terms of streamlining government operations and enhancing public trust [9]. However, the implementation of e-Cabinet systems also poses significant challenges. One of the main challenges is ensuring the security and confidentiality of sensitive government information, which requires robust cybersecurity measures to prevent unauthorized access and ensure data privacy. Another challenge is ensuring that all decision-makers are comfortable with using the new digital platform and have access to the necessary training and technical support. This is particularly important for older officials who may be less familiar with digital technologies. Despite these challenges, the potential benefits of implementing e-Cabinet systems are significant.

The conformation of governance and the impact of digitalization in this digital age modifies the relationship between public institutions and citizens involved in decision-making. In Estonia, the data required for the decisions of the Government of the Republic (the Cabinet) can be examined directly from the e-Cabinet information system, 24 hours a day. This avoids the need to prepare comprehensive documents, thereby reducing bureaucracy to a large extent. The e-Cabinet has become a multi-user information source and inventory that stores relevant information in an organised manner and keeps them updated in real-time while providing cabinet officials with a clear summary of each item under discussion. In the case of the e-Cabinet system of government in Estonia, the average length of weekly cabinet meetings drastically reduced from about 4-5 hours to as little as 30 minutes.

To maintain the faith and confidence of citizens in their government as more and more government services are moved online, it is essential that e-government systems are dependable, user-friendly, and secure. In addition to fostering citizen participation and engagement in the democratic process, a well-designed and well-running e-government system can significantly increase efficiency, accessibility, and transparency in the provision of public services. Being a citizen of African descent and with the knowledge gained through the study programme, the author is aware of the benefits of using information technology to strengthen relationships and increase trust between residents and public officials.

This research investigates how an e-Cabinet can be established and how it can be utilized to interact with several ministries and other related entities. Hence, this study will review the importance of an e-Cabinet and develop digital standards or guidelines for developing an e-Cabinet with Djibouti as a case study. With a review of several pieces of literature about this topic, there has been some research on paperless economy, and document exchange, however, little academic research has been done on the e-Cabinet system of governments and how they function. Therefore, this study is relevant as it will close the research gap in this field, provide more information on this topic, and provide a digital road map on how a government can develop an e-Cabinet system based on the results obtained after this study.

### **1.3 Research Questions and Objectives**

The main objective is to understand how African countries can establish an e-Cabinet using the experiences of other countries and various initiatives will be introduced to achieve this. The goal of the Initiative for Digital Government and Cybersecurity in the Horn of Africa Countries is to assist the governments of Somalia, Kenya, and Djibouti in enhancing e-governance and creating e-services that are centred on people. To support this effort, Estonian Centre for International Development (ESTDEV) conducts digital maturity analyses of each nation and creates implementation roadmaps for human-centred e-services [10]. Additionally, the Estonian data exchange layer (X-Road) has added yet another blue pin to the interoperability map of the world. The completion of the data exchange platform's installation by the Government of Djibouti, represented by Agence Nationale des Systèmes d'Information de l'État (ANSIE) which is translated as the National Agency for State Information Systems, is another step towards the delivery of public services that are more effective and efficient [11].

This demonstrates Djibouti's continued attempts to use digital technology to increase government accessibility to the public and boost the effectiveness, transparency, and effectiveness of its public administration [12]. Unfortunately, there hasn't been much study done about e-Cabinet adoption in Djibouti. Consequently, the focus of this study is on how Djibouti can successfully implement the e-Cabinet system of governance. A major research question was formulated to further explore this; *how can an e-Cabinet system of government be established in Djibouti?* Two research questions were developed to offer solutions to this query.

*RQ1: What are the requirements for implementing an e-Cabinet?*

The first research question aims to understand the foundational phase in the implementation of an e-Cabinet. This question is essential to gain insight into the requirements that are necessary for establishing an e-Cabinet. The e-Cabinet system is backed with digital structures that support its functionality and these structures should be considered while designing an e-Cabinet.

*RQ2. What are the challenges of implementing an e-Cabinet in Djibouti?*

The second research question is required to examine the obstacles encountered when putting an e-Cabinet system of government in place in Djibouti. By identifying and conquering these challenges, the information will offer exact actions to promote growth and development phases.

## **1.4 Research Design and Methodology**

This section describes the appropriate methodology and approach utilized to assess the research questions developed for this thesis. A case study research approach was adopted to accomplish the study's goal, and the quantitative methodology was selected to collect empirical data based on the scope of this study.

### **1.4.1 Case Study**

Due to the contextual basis of this topic and its relation to a present-day topic, a case study research approach will be used for the methodological aspect of this study. A case study is the appropriate research design to gain concrete and in-depth knowledge about a specific real-world subject [13] like e-Cabinet implementation in Djibouti, and this method explores vital features, semantics, and inferences of the study. An in-depth assessment and analysis of a

specific person, group, event, organization, or scenario are part of the case study research approach [14]. It is a qualitative research technique that is frequently used in social sciences, psychology, education, and business research. Case studies are exceptional in recognizing, and developing the best solutions, analyzing a scenario, focusing on corrective action for an occurrence, or implementing new developments [15]. To develop a thorough understanding of the case under examination, the author of this research will gather information from a variety of sources, including interviews, observations, documents, and archival records. The data was then analyzed by the author to find themes, patterns, and trends that emerge from the data. Instead of generalizing findings to a larger population, the purpose of this case study research is to develop a deeper knowledge of the implementation of an e-Cabinet in Djibouti.

The GovStack e-Cabinet mission, which was divided into several phases, is the basis for this qualitative case study. In 2020, the International Telecommunication Union (ITU), the Digital Impact Alliance (DIAL), Estonia, and Germany jointly created GovStack, a multistakeholder project. GovStack helps nations create reusable and interoperable building blocks for their digital public infrastructure. Understanding what is going on in Djibouti, the AS-IS and TO-BE stages right now, as well as the procedures and rules, requires using the case study approach. This project is a GovStack initiative, and many missions were carried out in Djibouti where primary data was gathered. Mission two was used to prepare the AS-IS and the following missions were used to validate it. The parties in charge of the correspondence validated it and acknowledged that the primary difficulties were associated with manually logging inbound and outbound paper documents. This shows the need for a more straightforward distribution system for handling correspondence and information, as well as the requirement for standardized record-keeping to guarantee consistency and accuracy in data management, all carried out at a low cost.

The research objective is to carry out in-depth research by reading a variety of articles, research papers, and books on topics such as paperless management, e-parliament, digital transformation, digital design standards in various countries, digitalization of support processes, and e-Cabinet. This is vital to comprehend the problems associated with the research topic and become familiar with the digitalization frameworks in the nations that will be examined to spot various trends.

### 1.4.2 Data Collection

Semi-structured interviews with experts in the field, policymakers, and government officials. Also included in the data collection phase is the interview during mission workshops held in Djibouti which will come in handy for the research. The interview questions which are listed as an appendix to this research were based on scenarios and events that will help to gain a better understanding of the e-Cabinet, how it functions, and its impact on the decision-making process of governments and public service delivery. Additionally, government officials involved in Djibouti's digital transformation agenda provided information on the current AS-IS phase in the digitalization journey of the country, the strategies developed to improve the country's digital profile and the vision for the future. The methodological approach was agile and co-creation based. The main requirements and status quo were gathered based on AS-IS formulation to design the TO-BE process which was a foundation for the creation of the e-Cabinet ecosystem to be prototyped and validated with the users. A high-level description of how the e-Cabinet system will be created, enhanced, and provided to clients is provided below.

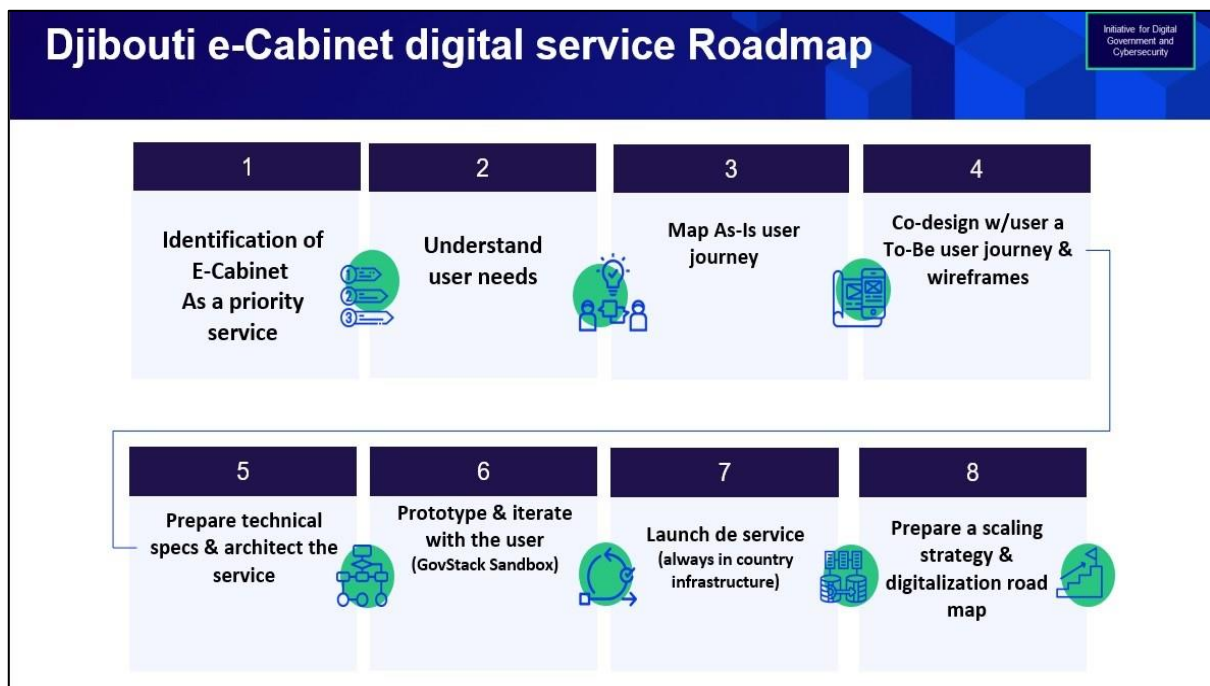


Figure 1. Djibouti e-Cabinet Service Roadmap



### **1.4.3 Phases and Activities in the Digital Service Roadmap**

Figure 1 shows the digital service roadmap for implementing an e-Cabinet system in Djibouti. Phases 1-2 focused on understanding the existing status quo where existing (IT) systems, data, legal environment, and capacity will be defined which will be an important input to analyse existing gaps and give input for the TO-BE design. During phases 3-4, the generic schemes of TO-BE processes displayed how the current Cabinet processes may be transferred into and facilitated by eDMS and relevant systems. The schemes were based on the synthesis of the collected data and a summary of meetings that have taken place within the three missions. In phases 5-6, the architectural framework along the e-Cabinet system prototype was created along with the integration of the necessary systems (eDMS, X-road etc), and the sandbox environment, procedures, documents workflows and main types of approval circles between different ministries (creation of standardised inter-organisational document exchange) were all established.

The work was carried out in steps, each consisting of preliminary work, one field mission and another task to formulate the outcomes and deliverable documents. An important step in this phase is to create templates and workflows for the e-Cabinet system along the agreed metadata, and procedures on the exchange of data through channels like e-mail between entities (ministries, departments and more) based on the e-Cabinet components. These templates specified access control to have pre-defined roles based on user profiles and responsibilities within the e-Cabinet process. Additionally, a limited release of the minimum viable product (MVP) for e-Cabinet will be tested with the assigned Djibouti task force.

After the MVP is released, phases 7 and 8 will focus on starting e-Cabinet usage with a limited number of users (basic document flow along with the workflow engine & communications between ministries) to collect feedback and utilise it to improve the service. The task force should coordinate the process with the GovStack team and based on the user's feedback, the system should be adjusted accordingly.

## 2. Literature Review

This chapter's objectives are to identify knowledge gaps, lay the groundwork for this study's theoretical framework, assess, and synthesize the body of prior research, and provide evidence for the findings and interpretation of the study. Additionally, the literature review on subjects like digital service design, the idea of digitalization and digital transformation, paperless document system, electronic documents records management system (EDRMS), the e-Cabinet system, e-government maturity model, and Djibouti's digital profile were highlighted.

A notable illustration of how ICT may be used for the effective administration of electronic records is the Electronic Document and Records Management System (EDRMS). Mutimba (2014) claims that a successful implementation of the EDRMS is essential for many organizations since it raises accuracy and productivity throughout the whole records management cycle [16]. Globally, more and more government agencies are transitioning to the use of electronic records, and the government of Djibouti is not left out of this transition. The Djiboutian government has created a program to encourage the digitalization of government operations. As a result, the integrated Electronic Document Management System is one of the primary platforms for the Djiboutian e-Government infrastructure. The Electronic Document Records Management System (EDRMS) is called a software-based solution for capturing, managing, and storing electronic documents and information.

It is a crucial component for the implementation of an e-Cabinet since it plays a significant role in digitizing workflows and data interchange. The electronic document lifecycle management system (EDRMS) is intended to handle electronic documents at every stage of their creation and capture, storage, retrieval, and disposal. Data exchange between many departments or agencies within an e-Cabinet is made easier by the EDRMS by digitizing these processes. This leads to increased productivity, quicker response times, and better teamwork results. Furthermore, a reliable and effective system that guarantees confidentiality, integrity, and availability is required for the establishment of an e-Cabinet. To reduce the danger of unauthorized access, loss, or physical damage through physical means, the EDRMS offers a system that allows secure digital access to important data. As a result, an EDRMS is a crucial

tool for implementing e-Cabinet systems in Djibouti since it facilitates data exchange processes and workflow optimization while protecting the confidentiality, security, and accessibility of digital documents.

## **2.1 The Concept of Digitalization and Digital Transformation**

According to Vial (2019), Digital Transformation (DT) is "a process that tries to improve an entity by triggering major changes to its attributes through combinations of information, computation, communication, and networking technologies" [17]. Although the phrase "digital transformation" first appeared in private businesses [18]. Public interest in this topic quickly grew [19] as a way to improve efficiency, effectiveness, and accessibility. The modernisation of service delivery also enables cost savings. Digital government, according to the Organization for Economic Co-operation and Development (OECD), is the process of modernising a government through the use of digital technologies to maximise public benefit [20]. Moreover, e-government can be considered a precursor to digital governance [21]. Digital government goes beyond e-government by aiming for a paradigm shift in service delivery and transforming government procedures into ones that are "digital by design". E-government is the use of Information and Communication Technologies (ICT) to achieve operational efficiency and subsequently improve governance methods [21].

A government must digitise its procedures, plans, and physical services to go digital [22]. Digitalization of a service refers to the process through which physically supplied services are converted into digital ones. Digital transformation includes the digitalization phase, which is critical. Demirkan *et al* (2016) define digital transformation as the significant and accelerated transformation of organizational activities, processes, competencies, and models, to fully capitalise on the changes and opportunities brought about by digital technologies and their influence across society in a deliberate and prioritised manner [23]. According to Janowski, the first phase in a government's transition to digitization is the digitalization process [24].

As practitioners attempt to implement a comprehensive approach to digital government beyond the simple digitization of already existing offline processes, researchers seek to understand how and why these initiatives succeed or fail. The term "digital transformation" is primarily used as a buzzword to denote this change in the scope and direction of digital government. Nevertheless, it is becoming increasingly crucial not to only concentrate on the advancements

of current technology. Digitization efforts represent significant gains for public sector organizations to become more effective and efficient in their operations and outputs. To build citizens' trust in the government, the development of e-government should take place within the context of the necessity to digitise public administration. To make this shift, all service processes, from service requests to execution, must be fully digitalized. These procedures must be data-driven rather than document-driven.

The literature on the fundamental change processes that can come from digital transformation approaches is sparse; most of the time, terminologies like e-government, digital government, or transformative government are used, which complicates the meaning of these various approaches. The analysis of how the public sector uses ICTs to improve service delivery and transform organisational procedures and culture, as well as its impact on value creation, is a common thread connecting the topics [18].

ICT and information are viewed as powerful tools that actors can utilise to their advantage when interacting with other actors to lessen uncertainty and dependencies. ICT has an impact on how information is distributed and shared, as well as how it is accessed, exchanged, and processed. Changes in service delivery have largely been discussed concerning "e-government" in public sector literature. In general, initiatives to increase the effectiveness and accessibility of service delivery to citizens are prioritised over the development of new economic models [25]. Information and communication technologies are at the heart of the digital revolution which has impacted industries, economies, and the administration of governance. As a result, several aspects of society including the government, governance structures, and public organizations are adapting to this digital change. A traditional way to conceptualize the changes impacted by technology and digitalization is by introducing the prefix "e-" [26]. Then terms like e-service, e-government, e-governance, e-Cabinet, and e-library are birthed.

According to Dunleavy *et al.*, (2005), digitalization and redesigning of governance in the digital age, transform the relationship between public organizations and clients in policymaking and increases productivity driven by ICT in the public sector [27]. While e-governance is the system that promotes the government-to-citizen and business relationship, with the use of information and communication technologies in service provision, e-government empowers citizens to interact and acquire services provided by federal, state, or local governments around

the clock. Thus, e-government is simply the delivery of federal or local government data and services to citizens, businesses, or business agencies via the Internet [28].

## **2.2 Electronic Documents Records Management System (EDRMS)**

One of the most popular types of information systems for managing electronic documents is an electronic document management system (EDMS) [29]. According to Sutton and Lemay (1999), it is an information system that keeps track of a company's formal business dealings and decision-making records, retrieving both abstracts and whole documents as well as significant transitory documents [30]. According to Kain and Koshy (2013), it is a computer system that allows paper notes to be scanned into an electronic document so that authorised users can access it [31]. An EDMS can also be defined as an information technology system that supports the development and upkeep of electronically created documents to enhance organisational workflow. Vevaina (2008), defines an EDMS as a comprehensive system for managing the production, capture, indexing, storage, retrieval, and disposition of a company's document and information assets [32].

Dealing with unprecedented amounts of electronic data, records, and information in a period of stricter privacy, retention, and security standards is one of the records management issues. The records management staff has traditionally handled these activities, but the quantities have outpaced their ability to manually apply access and security controls and preservation requirements. Sending the work to end users is also not working well. Employees might not have much time to do these administrative activities depending on their primary duties. As a result, even those with the appropriate training might not be able to decide for sure how long a file should be kept, to what categorization it belongs, or how long it must be kept for litigation purposes [33] [34], and several industries use electronic document management systems. Electronic document management systems are crucial for streamlining and organizing the paperwork process in government organizations. They also help civil servants work more efficiently by enabling quick and easy access to documents, automating routine tasks like document tracking, and searching, and creating flow reports [35].

Document management has a long history that dates to the development of the filing cabinet at the end of the nineteenth century. Edwin Granville Seibels' invention of 1898, shows paper documents were arranged vertically in boxes that were stacked inside cabinets that have been

folded in. Throughout most of the 20th century, these cabinets would continue to be the principal method of document storage in business fields [36]. Document management is an essential system for an organization because every operation, whether it be in management, finance, or manufacturing, leaves a trace in the form of a document. Many times, just automating document management can greatly enhance a whole organization's business operations. The primary goal of document management is to manage the production, upkeep, retrieval, usage, and disposal of documents effectively and systematically from a file system. It can be seen as a tool for managing official business dealings, records of decision-making, and storage of significant objects (like letters, e-mails, etc.), all of which can be represented in the form of documents [37].

As computer technology became more widely available in the 1980s, the history of document management underwent a dramatic upheaval. As servers evolved, organizations were able to store papers electronically on centralized mainframes. Electronic document management systems had their humble beginnings at this point. During this time, the development of scanners made it possible to turn paper documents into digital files. Due to the development of computers, offices now include computers where documents may be created and stored. Businesses and governmental organizations can benefit from EDRMS by converting to digital processes from paper-based workflows, which can increase productivity, lower costs, and increase data security. To handle digital documents and lessen the use of paper-based documents, the EDRMS uses a paperless document system as a management tool. To comply with statutory and regulatory requirements for document management, such as retention and privacy regulations, paper documents are replaced with digital ones.

### **2.2.1 Utilizing Paperless Document System**

The documents we frequently utilise impact how we perceive and comprehend documents. Documents have historically been referred to as "textual and text-like records" (e.g., books or a pile of printed records). Before the introduction of digital papers, this was the general perception of documents. New types of digital documents cannot be accommodated by the old concept of a document. The idea of what defines a document is growing more ambiguous and complex [38] [39]. A closer look at the historical analysis of the development of various aspects of documents is necessary given the resurgence of interest in several key document issues. To keep the information operationally separate from the reader, information storage mediums have developed to have higher information density. Direct exchange of information

with readers is possible when using paper as a medium. If a person reads a paper-based publication and is literate, they can obtain information without the use of any kind of gadget or intermediary [40].

A thorough approach to document classification reflects the fact that most events and processes in an organisation are started, accompanied, or formalised by some kind of documentation. The category of internal documents includes meeting minutes, service records such as job schedules, progress reports, delivery notes, sales data, and administrative documents. A few examples of external documents include presentations, advertising materials, orders, bills, queries, complaints, and legal and safety requirements. Information that makes up a sizable portion of the organisational memory is contained in the variety of papers that are kept [41].

The physical characteristics of paper that give it its credibility, such as its light weight and lack of battery dependence, make it easily portable. Its high resolution and contrast which makes it easier to read than most screens are traditionally the focus of discussions of the advantages of information on paper. Imagine that an ideal display medium could be created that has similar physical benefits to paper or even comes close to them. Would that result in digital gadgets taking the place of paper? For a fact, it would be for many reasons and in many situations. The many benefits of digital systems, including the capacity to search, edit, annotate, and transmit information, would be widely embraced if the physical limits of today's display devices could be addressed [40].

Everyone in the modern world is surrounded by several digital information sources. It is nearly impossible to deny that the digital world has a significant impact on our lives; some examples of these sources include emails, texts, digital records, and even just the continual presence of social media. In actuality, the pace of change in how we interact and conduct business because of the digital age is unparalleled. To enhance their overall effectiveness and adjust to the evolving nature of modern business, many businesses are taking action. Using a paperless document management system is one of the greatest methods to achieve this [42]. A paperless document management system enables businesses to streamline operations and eliminate unnecessary paperwork. Over time, this may result in considerable time and money savings. For most firms, putting such a system into place may be difficult and time-consuming. The process of going into the process of paperless management with the right expectations and frame of mind is critical. Additionally, the benefits of going paperless include but are not

limited to office efficiency, no lost documents, no office clutter, a significantly reduced need for office space, and promote remote work [43].

### **2.2.2 Estonia's EDRMS Implementation**

In terms of digital document and records management, Estonia is a successful nation. The implementation of electronic document management is one cause of this. Electronic document management solutions have made it possible to implement digital procedure flows and have decreased the volume of paper documents. Furthermore, it has increased record management transparency and made it easier for people to participate in organisational decision-making. The processing and management of a document life cycle in its digital form from birth to death are made possible by several technical tools that have been developed, including the document exchange centre (DEC) which was created by the Estonian Information Systems Authority in 2006, and the e-services found in the citizen portal "Eesti.ee" environment. The amount of paper papers has substantially decreased over time, which has positively impacted organisations' budgets [44]. Many times, throughout Europe, Estonia's paperless records management [45] as part of e-government has been used as an example. The European e-governance best practice project award was given to Estonia in 2009 for its move to paperless records management.

The public sector must employ more creative solutions to carry out its duties and provide services because information technologies are continually evolving and changing, including existing work processes, and EDRMSs have a significant impact on that. To ensure transparent public sector governance, the Public Information Act, which came into effect in Estonia in 2001, stipulates that all state government agencies and local governments must maintain electronic registers of the incoming and outgoing records and make these registers accessible on their websites. EDRMSs were initially implemented in public sector organisations as information systems that had to be used to comply with legal requirements. At present, EDRMSs have evolved into centralised information environments that bring together the duties, choices, and procedures of agencies [46].

Before the Public Information Act was introduced, alternative systems were being used by Estonian government agencies instead of X-Road. Because staff had been using several systems and had to switch to the new one, the Act's new requirements created challenges. Employees even had to put in long hours because of how rigorous the procedure was. To speed



up the implementation, extensive training was conducted, during which staff members learned how to use the system, which retention policies to adhere to, what the fundamentals of data privacy are, who is authorised to access a particular category of data, and other pertinent information. Records managers and IT specialists were in charge of overseeing and making sure that both techniques were taken into account because they were complementary to one another during the technical training [47].

### **2.3 Digital Service Design in e-Governance**

Digital Service Design refers to the process of designing digital services that are easy to use, accessible and efficient for citizens. In e-governance, digital service design aims to improve the delivery of public services with technology and digital platforms [48]. Effective digital service design can help governments to better understand the needs of their citizens and provide services that are tailored to their needs and preferences, ultimately leading to increased citizen satisfaction and trust in the government. Digital service design can also help governments to increase efficiency and reduce costs by automating processes and reducing the need for face-to-face interactions and paperwork. Overall, digital service design plays a crucial role in modernizing and improving the efficiency of government services while also enhancing citizen engagement and trust in government. Digital service design is a complex process that involves understanding user needs, mapping out user journeys, prototyping and testing with real users, and continuously iterating and improving based on feedback. It requires a multidisciplinary team with expertise in user experience design, information architecture, content strategy, and technology.

Service design has become an interesting discussion that aims to cautiously plan and advance the harmonized steps required to develop an excellent service. The importance of technology isn't underrated in service design; however, it isn't all about technology but about the holistic quality of the initiated service delivery made available to users. Therefore, the digitalisation process has enhanced the implementation of user-oriented applications and service designs that aim to meet end users' needs and improve user satisfaction. The level of user acceptance and participation in digital products and services largely depends on developing an exceptional user experience, tailored to solving essential needs. The procedure for designing a digital service is not ambiguous. Since value is predominantly determined by the end users of a particular digital service, co-creation with the users must be encouraged. The development of digital service

design should be improved upon to cope with the rapid development of digital service innovation [49].

The eGovernment Benchmark evaluates the way European countries provide online public services. This benchmark assesses how well eGovernment services are provided and delivered in 35 European nations, including the 27 EU member states, Iceland, Norway, Switzerland, Albania, Montenegro, North Macedonia, Serbia, and Turkey. Participating citizens visited and evaluated more than 14,000 websites as they evaluated digital government services [50]. A few other nations with more advanced levels of digital transformation were able to accomplish these achievements by creating sets of digital service standards that were then put into practice as best-practice guidelines for creating and providing government services.

The government of Estonia has a digital society development plan to be achieved in 2030. The long-term aim of the development plan is to ensure the success of a strong Estonian digital society where everyone can have the greatest possible online experience. Digital state, connectivity, and cyber security make up the three sections of the development strategy. The Estonian digital society programme is the most comprehensive "action plan" of the development plan. It offers a more thorough overview, including a thorough breakdown of all activities and metrics, as well as measurements of the various activities and those accountable. A four-year initial term is given to the programme, which is then annually renewed. This enables the digital state to be flexible and quick to react as it needs to. Based on the criteria, the development plan is based on Estonia 2035's long-term strategy. The strategy's goal, which is for public services to be of the highest quality, consistent, and accessible throughout the country while protecting citizens' fundamental rights, serves as the primary indicator of the proper course [51].

The government of Canada highlights sets of digital standards in a playbook for improving government services in the digital age. The Canadian government strives to offer reliable, user-friendly public services to its citizens. The foundation for the government's transition to becoming more nimble, transparent, and user-focused is laid out in the Digital Standards of the Government of Canada. They will act as a guide for teams as they develop digital services that are beneficial to Canadians. The public and important stakeholder groups participated in the co-creation of these digital standards. These are living standards, and as we gain more insight into the difficulties in putting them into practice, they will continue to develop over time [52].

In New Zealand, the government published a preferred assessment model for digital service standards after the initial one was first published in mid-2018. To produce digital design guidelines, the New Zealand government collaborated with important interest groups, stakeholders, and the government web community in the early months of 2018. A standard that aids the government in creating and delivering good services for the people of New Zealand as well as one that is appropriate for the country's digital environment were all developed thanks to the open engagement strategy. The Standard does not "reinvent the wheel," but instead takes an "umbrella" approach by combining already existing guidelines and instructions. It made mention of regional norms and recommendations, the values upheld by partners in Digital Nations, and global best practices. The Standard's objective is to teach design thinking to anybody who creates or delivers government services. It encourages the government to deliver public services that all New Zealanders can readily access, and are integrated, inclusive, and reliable [53].

The governments of Australia and the United States of America both have thirteen requirements for digital services. On its government website, the UK government also highlights an additional eighteen initiatives, all of which are crucial for promoting the timely and effective provision of public services to its inhabitants. These governments have similar goals when it comes to a few of their digital service design standards. For instance, the significance of comprehending user wants, using agile methodologies by iterating and upgrading often, and encouraging the usage of open-source data, among other things.

## **2.4 The e-Cabinet System**

The impact of digitalisation has opened a window of opportunity for paperless management which promotes the exchange of data seamlessly and digitalised workflows. The application of information technology by public sector organisations to enhance service promotion is crucial to changing the method of traditional service delivery, and this can be facilitated by the implementation of Electronic Documents and Records Management Systems (EDRMS). The impact of the EDRMS in Estonian public institutions shows that applications and documents are signed digitally within self-service portals and e-forms. Decision-making acts are also digitally signed with the workflow, repositories, and archives consisting of only digital copies. The exceptional process that used papers was the original copies of documents received from third parties. Thus, decision-making is automated and concluded almost in real time [47].

The Estonian government utilizes an information system for their cabinet sessions. This information system for the Estonian government session (ISSG) facilitates the preparation, participation, and management of documents by members of the cabinet to be performed electronically. The importance of employing the application of the Internet for such sessions is that it promotes the constant monitoring of a document's life cycle from inception to the final execution [54]. The ISSG kick-started its construction on July 5, 2000, and the first government session conducted electronically was a month later; on August 8, 2000. The introduction of the ISSG ensures the organisation of duties, and all materials were made available to the participants in electronic form. In addition, it became easier to keep an eye on the meetings from different locations and identify the item being discussed, who raised the topic of discussion and the decisions taken after deliberations.

Information technology's impact has positively improved how information is generated, transferred, stored, and retrieved. Governments can utilize the power of digital technology to improve their decision-making processes, reduce the costs that come with document preparation and promote transparency and inclusivity while making decisions. The system tasked with implementing all the previously explained digital solutions is the e-Cabinet. The e-Cabinet can be explained as the application of IT solutions in conducting cabinet meetings and related institutional appointments. Thus, the president and cabinet members are equipped with real-time information and requisite knowledge needed in decision-making. Furthermore, this ensures all decision-making processes within the government from preparations, submission, and confirmation are all coordinated with the cabinet schedule and meeting. Cabinet decisions are also communicated to government ministries, departments, and agencies [55].

The e-Cabinet is usually defined by rules that are gotten from regulations and it is one of the two information systems which are discharged by governments. Some of the advantages of the e-Cabinet are traceability, timesaving, transparency of government, paperless administration, reliability, and data security. By facilitating greater openness in the decision-making process, e-Cabinet systems can assist governments in making quicker and more informed decisions, reducing administrative expenses, and increasing public trust and accountability. However, it is crucial to understand that e-Cabinet systems should be customised to the unique requirements and environment of each nation since they are not a one-size-fits-all solution. Other solutions could need to be investigated, for instance, in nations with poor technological infrastructure or

internet access. Also, it's crucial to make sure that e-Cabinet systems are supported by broader initiatives to improve governance and accountability, such as actions to thwart corruption and encourage citizen engagement in decision-making.

Governments can improve efficiency, openness, and accountability by using e-Cabinet systems, which are promising innovations in governance and decision-making. However, their effective implementation necessitates a dedication to ensuring strong cybersecurity measures, adequate training and technical support, and complementary initiatives to strengthen governance and accountability, as well as careful consideration of the specific challenges and opportunities presented by each country's specific context. Governments should adopt a comprehensive strategy for digital transformation that places a focus on developing capacity and assuring the availability of key resources, such as money and skilled labour. The ability of governments to strike a balance between the potential advantages of digital innovation and the need to address current governance challenges and ensure that citizens can participate meaningfully in decision-making processes will ultimately determine the success of the implementation of e-Cabinet systems. These actions will enable governments to fully utilise e-Cabinet systems as a tool for fostering inclusive and efficient governance.

E-Cabinet systems should therefore be seen as a part of a larger digital transformation strategy that includes several projects aimed at utilising technology to enhance service delivery, promote public participation, and improve governance. Additionally, through enhancing effectiveness, transparency, and accountability, e-Cabinet systems have the potential to transform governance and decision-making procedures. However, how well governments can manage the problems and opportunities given by their adoption will determine their influence and successful implementation.

## **2.5 E-government Maturity Model**

In recent times, a wave of interest has emerged not only from the software and consultant industries but also in the public administration and policy institutions, and this has introduced basic new research perspectives in the e-government domain. This interest in information technology in government has developed best practices and maturity models that are implemented to keep an eye on governments and to affirm whether they are on the right track [56]. To rank the level of development of a country's e-government system, several maturity

models were developed. These maturity models are a set of stages (from the basic to the advanced stage) that establish the level of maturity of the e-government portals, and they can serve as principles that help to improve the quality of e-governments. The Layne and Lee maturity model has been iterated severally and it is one of the most influential models in the academic field. This maturity model is one of the few examples of research about e-government where a linkage and additive value can be identified [57], and it proposed a four-staged model based on the observations of e-government enterprises in the US. The first stage is the “catalogue” phase where governments attempt to have an online presence via the designing of websites and communicate with citizens through them. The second, third, and fourth stages are transaction, vertical integration, and horizontal integration respectively.

### **3. Main Findings and Analysis**

The main findings and analysis from the data gathered throughout the research process are presented in this chapter. This section serves as the study's main part and provides the evidence to support those objectives.

#### **3.1 The Case of Djibouti**

Djibouti is a low-income country in the Horn of Africa with Somalia, Ethiopia, Eritrea, and the Gulf of Aden from its southern, western, northern, and eastern borders. The country's total land area is 23,200 km<sup>2</sup> with a population of approximately 1,000,000 in 2021 [58]. The data published by the World Bank in 2020 show that 61.8% of the population have access to electricity, and 59% use the internet. About 8 – 10 services are offered online, which falls behind other countries. The Online Service Index (OSI) depicts the quality of online services based on the information gathered from an independent Online Service Questionnaire (OSQ) and Djibouti has a score of 0.2208. The e-Government Development Index (EGDI) is utilized to estimate the readiness and ability of federal organizations to implement the use of information and communication technologies to provide public services. This index is beneficial to government officials, policymakers, researchers, civil society, and private sector representatives to develop more insight into the position of a country in implementing the use of e-government for public service delivery [59].

The overall EGDI score of the country is 0.2833 securing a position 181 out of 193 nations in the 2022 UN e-Government Development Index [60]. The array of data presented above about Djibouti places the Eastern African country at the first phase of the Layne and Lee maturity model which is the Catalogue Stage. The country is still at this early stage and there is limited information available to citizens due to the challenges related to the lack of intermediate and advanced digital skills in the ICT sector and digital economy, the lack of a concrete legal framework to enact legislations that promote digital transformation, and the low funding available to support digital projects. However, there is still a possibility to progress to the next stage of the Layne and Lee maturity model if certain measures are taken to promote an effective

e-government structure and improve public service delivery. One of these measures is to introduce the e-Cabinet system of government.

Although it has not done so yet, Djibouti has a lot of potentials to use digital technologies to open new doors for inclusive growth. As the landing point for eight significant submarine fibre optic cables, Djibouti has a special opportunity to transform its economy to support more creative and sustainable growth. The goal of Vision Djibouti 2035, which was unveiled in 2014, is to establish the nation as a hub for the continental and regional economies and to advance e-government to improve the standard of services offered to consumers [61]. Therefore, the government of Djibouti needed to cooperate with the multi-stakeholder initiative; GovStack to assist Djibouti's Ministry of Digital Transformation and Innovation (MENI) to establish the digitalisation of parliament framework along with the necessary components in the implementation of an e-Cabinet.

### **3.2 The AS-IS Architectural Context**

The action plan for the Djibouti e-Cabinet project was broken up into various stages that were viewed as missions. Each mission had a defined data collection goal that provided feedback for subsequent missions. The requirements for the e-Cabinet environment were acquired during these missions following how the e-Cabinet functionalities will be developed and how system users will be instructed. The primary objectives of the first mission were to raise awareness and collect preliminary information for the preparations for mission 2. The inputs deduced from the first mission were used to determine the AS-IS processes and describe the organisational architectures in place. The objectives of the workshop held for the first mission are shown below in Figure 2.



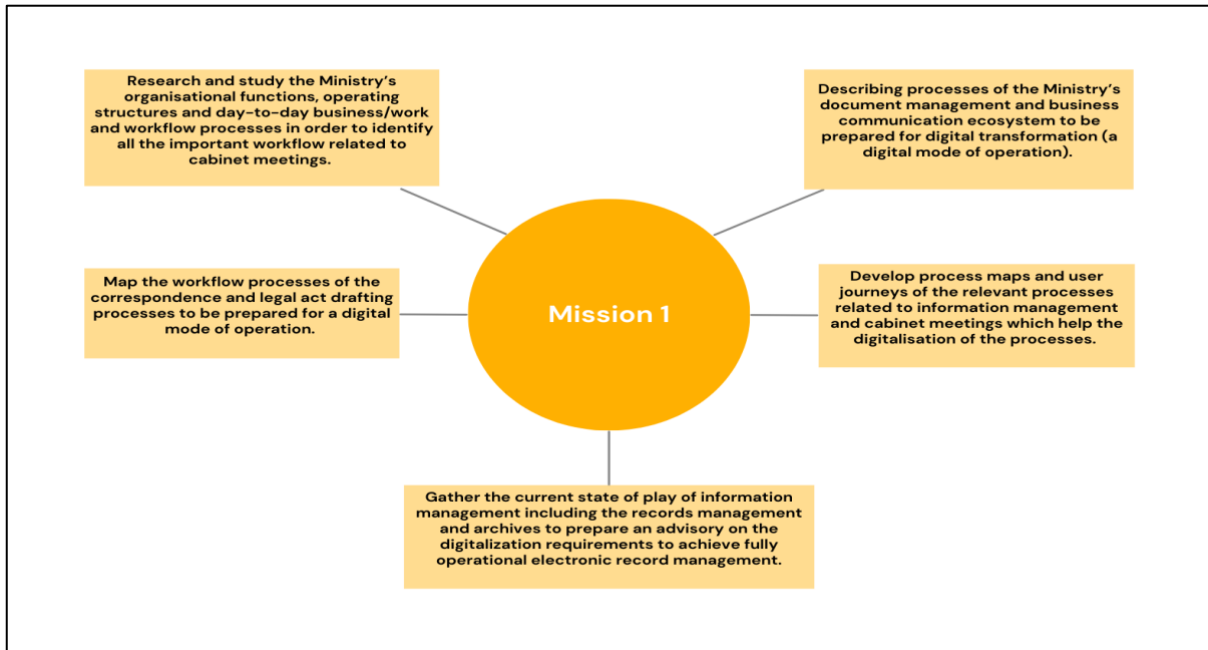


Figure 2. Objectives for Mission 1

After the first mission, a working document (MIRO user journey schemas) mapping the processes, workflows, and IT solutions in use was achieved. Subsequently, in the month of November and December 2022, the GovStack team carried out preparatory work remotely to be up to speed with the agreed timelines.

The second mission entails designing the AS-IS and gathering more information for the creation of the TO-BE processes and workflows needed to set up an e-Cabinet environment. This included mapping the IT solutions' requirements involved in the existing digital systems. The strategies utilized to achieve the objectives of this mission are shown in Figure 3.

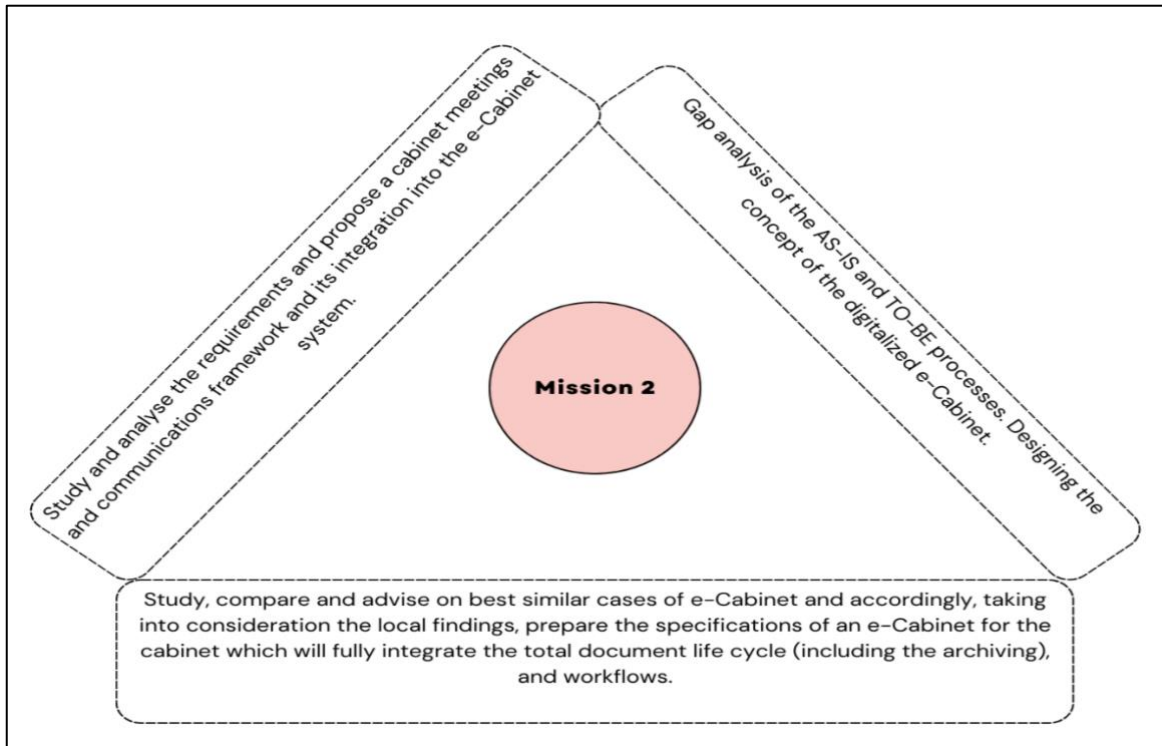


Figure 3. Strategies for Mission 2

### 3.2.1 AS-IS User Journey for Correspondence Inbound

A vital part of the nation's digital infrastructure is the electronic cabinet of Djibouti. It provides key connectivity services to numerous public and commercial enterprises around the country, providing effective data transmission for crucial operations including banking, commerce, healthcare, and government services. The electronic cabinet in Djibouti has several limits and difficulties due to its existing AS-IS architecture, which must be fixed. For instance, the current architecture has a low level of redundancy and scalability, which makes it susceptible to performance problems and outages during periods of high demand. The electronic cabinet of Djibouti also lacks adequate security mechanisms to guard against cyberattacks and other possible threats in its current AS-IS design.

Thus, it is crucial to upgrade the electronic cabinet's architecture to ensure that it can keep offering dependable and secure connectivity services to support Djibouti's digital development and expansion. To considerably increase the capabilities of the electronic cabinet, it is urgently necessary to develop a more durable and resilient TO-BE architecture that includes cutting-edge technologies like cloud computing, virtualization, and sophisticated security protocols. Redundancy and scalability should also be given top priority in the new design to lower the possibility of outages or performance-related issues affecting various organizations throughout

Djibouti. The current state of affairs for cabinet operations will be fully understood through a detailed study of the AS-IS processes, which will also point out areas that need to be improved upon and suggest any necessary adjustments.

Figure 4 depicts the AS-IS workflow user journey for inbound correspondence during cabinet operations. The keynote of this phase is the logging of incoming documents on paper, and the filing at the ministry level, indicating a total of ten different procedures that are all performed in person.

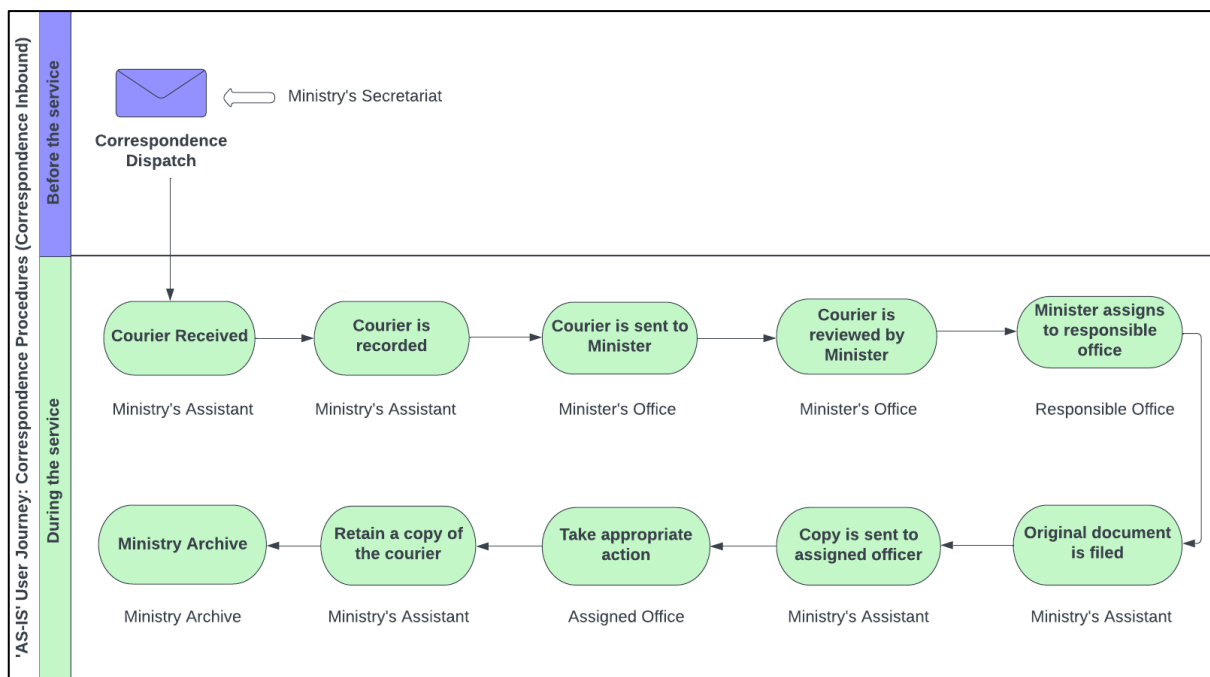


Figure 4. 'AS-IS' User Journey: Cabinet Procedures (Correspondence Inbound)

Before the service kickstarts, the correspondence is dispatched to the relevant recipient from the ministry's secretariat. This correspondence may take the form of letters, emails, memos, or other written materials and may address a variety of issues, including requests for information, summaries of recent events, updates on ongoing legislative projects or procedures, or suggestions for new pieces of legislation. It may come from a different government department, a commercial company, or an individual, and it usually contains data that is pertinent to the meeting's topic. The correspondence is physically taken from the courier during the service, and the ministry assistant records it. In this stage, documentation is essential for efficient record-keeping and to encourage process consistency. The courier is delivered to the minister at the conclusion of the paperwork, who analyzes it and designates it for the appropriate office.

The assistant for the ministry then files the original document and sends a copy to the designated officer so they can take the necessary action. To retain records, a copy of the courier is saved and stored in the ministry's archive.

### 3.2.2 AS-IS User Journey for Correspondence Outbound

The user journey for the AS-IS workflow for outgoing correspondence during cabinet operations is depicted in Figure 5. Here, the appropriate officer responds to the correspondence and then sends it back to the ministry. The intricacy of the ten steps in this process is comparable to the complexity of inbound correspondence. Paper is used for the tracking of outgoing documents, and the ministry oversees filing correspondence. Furthermore, every activity is carried out in person.

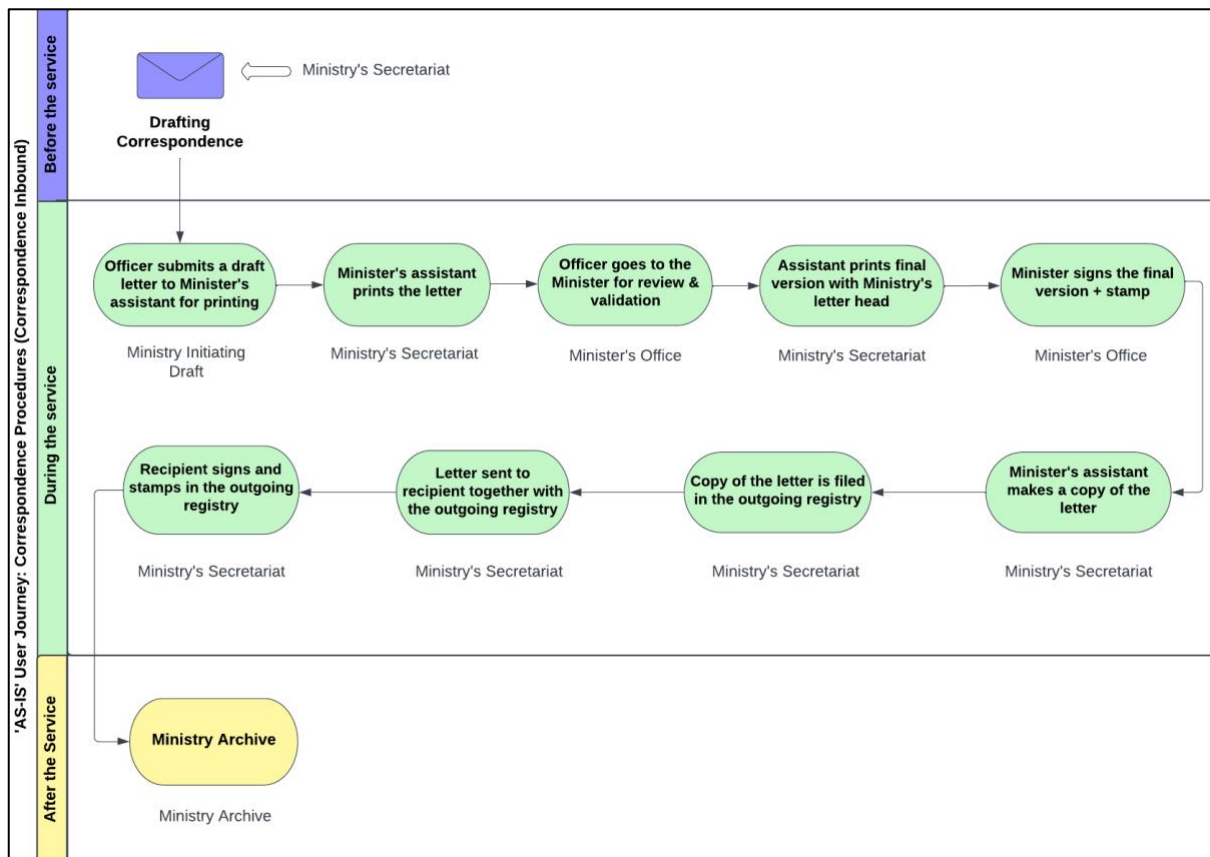


Figure 5. 'AS-IS' User Journey: Cabinet Procedures (Correspondence Outbound)

The responsible officer gives the minister's assistant a letter draft to print before meeting in person with the minister to examine and approve the task that was carried out. Once this is done, the minister's assistant prints off the final version of the verified document on the ministry's letterhead paper, and the minister adds his signature to authenticate it. The minister's

assistant then makes a copy of the letter and files it in the outgoing registry. Following that, the recipient receives both the mail and the outgoing registry. The last actions in this stage demonstrate that the recipient signs and dates the eviction registration before being put into the ministry archive. The total AS-IS architecture is highly complicated, and there are issues with the process's cost and efficiency in addition to its environmental friendliness.

### **3.2.2.1 The Basis of Digitizing Correspondence**

Keeping records on paper can be harmful to the environment if it is not done properly. In addition to using natural resources like trees, water, and energy, the manufacture of paper also produces waste and pollution. Deforestation, water pollution, and greenhouse gas emissions are only a few of the harmful effects that the production of paper, especially when using virgin wood pulp, may have on the environment [62]. Paper record transit and storage can potentially have an impact on the environment through higher energy use and emissions from vehicles. Paper records are prone to harm from environmental elements like moisture, pests, and natural catastrophes, which could lead to the loss of crucial data. While storing records on paper may have some advantages, it is often less environmentally friendly than keeping them digitally, which can drastically reduce the amount of paper used and the associated environmental effects.

It can be expensive and inefficient to keep track of in-person meetings on paper records. On the one hand, using paper records can offer a tangible record of the meeting that is simple to access and evaluate. Also, writing down your notes by hand might be a beneficial method for helping you remember crucial facts and concepts. Paper records can, however, have a detrimental impact on efficiency and cost in several ways:

- **Time and effort:** Writing down the details of physical meetings might take a lot of time and effort. Not only is it necessary for someone to take notes during the meeting, but those notes also need to be later typed up or transcribed, which might add further time.
- **Storage and organization:** After creating paper records, it is important to keep and arrange them so they're accessible and simple to find. Organizing and categorizing the information may be necessary, in addition to extra resources like filing cabinets or storage bins.

- Retrieval and sharing: Finding paper records can take some time and may necessitate going to the place where they are kept physically. Sharing paper records with others may also involve investing more time and materials, such as copying or scanning the papers.
- Material costs: The amount of paper you have, takes up space and costs money. In addition to the expenditures of printer toner and copy machine maintenance, copier paper alone can consume a significant portion of any budget [63].

Digitizing correspondence, on the other hand, can greatly save these expenditures and boost productivity. To save time and effort on storage and retrieval, digital notes can be swiftly typed out and simply shared with others. In addition, the demand for physical storage space and organization is diminished by how readily digital records can be arranged and found. The cost of resources used to create paper records can be decreased by using digital correspondence. Utilizing EDRMS to digitize correspondence handling encourages integration with other government agencies for effective information sharing and communication. It makes use of a single portal where Cabinet members and government employees can sign in with authorized access to users based on their access permissions. Workflows can be set up with real-time correspondence monitoring for various government working operations. Furthermore, using EDRMS to digitize correspondence enables the creation of cabinet protocols, planning for cabinet meetings, and digital voting throughout cabinet sessions.

### **3.2.3 AS-IS User Journey for Drafting Legal Acts**

The AS-IS workflow user journey for drafting legal acts during cabinet operations is depicted in Figure 6. The seven steps in this phase can all be completed online, while the remaining four can be completed in person. Seven distinct portals exist as well, and each one requires a unique login and password. This brings the total number of steps for creating legal acts AS-IS to eleven.

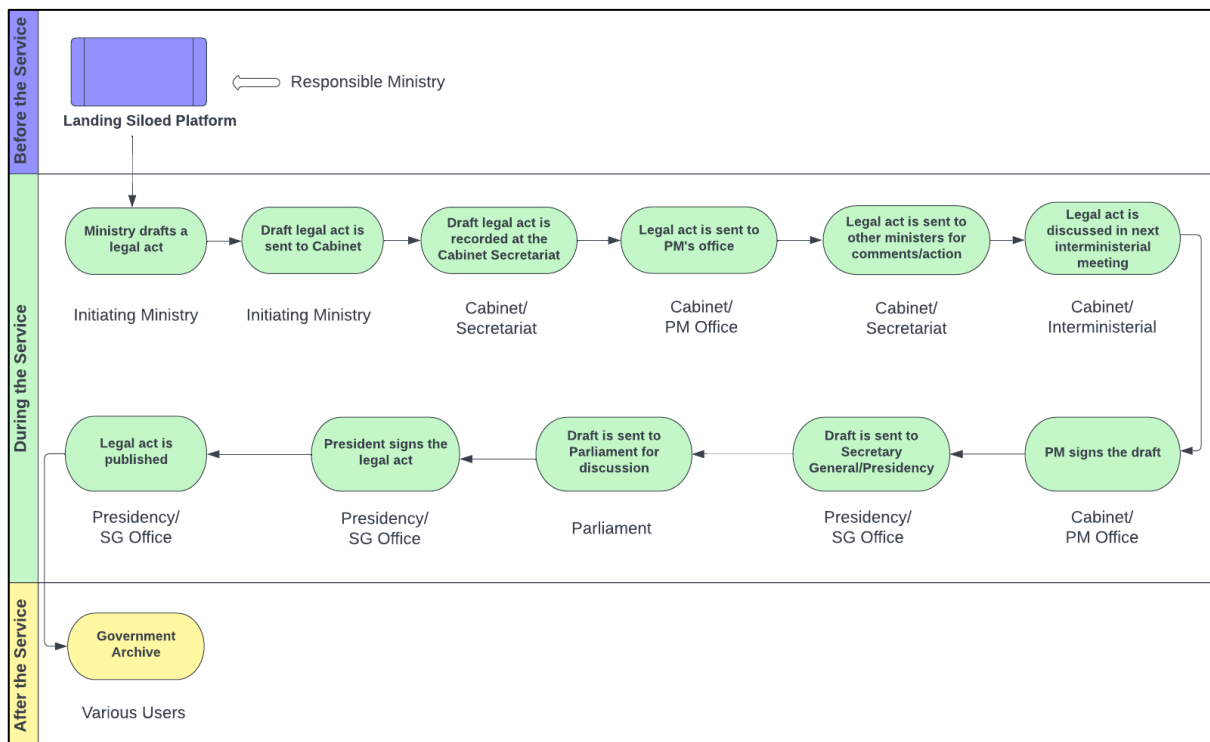


Figure 6. 'AS-IS' User Journey: Cabinet Procedures (Drafting Legal Acts)

An isolated landing page is created for the respective ministry before the service for drafting legal acts starts. The landing page has no links to other pages on the website and is not connected to the site's primary navigation. As a result, this landing page might not give consumers access to the entire range of information they might require for decision-making processes.

As shown in Figure 6, once a legal act has been drafted by the originating ministry and sent to the Cabinet, the service has commenced. The Cabinet Secretariat keeps a copy of this legal act draft and sends it along to the Prime Minister's office and other relevant ministries for their input and consideration. In the following inter-ministerial meeting, the legislative act is considered since all interested ministers have had a chance to review the necessary information. The Prime Minister then adds his signature to the document after the meeting, at which point a draft is forwarded to the Secretary-General and the Presidency with the final version of the legislative act having been approved by all parties, and the document is given to the Parliament for deliberation. The last stage of this procedure indicates that after the President approves the legal act, it is published and kept in various government archives.

### **3.3 The TO-BE Architectural Context**

This sub-chapter explains the TO-BE user journey for correspondence and drafting legal acts, and the prototype designed to test the functionality of the EDRMS.

#### **3.3.1 Future User Journey for e-Cabinet.**

The GovStack team and relevant stakeholders completed the first and second missions which aimed to design the AS-IS architecture and acquire more data to draft a TO-BE process. The third mission focused on the validation of the gathered data which should lead to more concrete steps for the further action of the establishment of the e-Cabinet environment. Meetings with the owners of key processes, function and service owners were arranged and the following topics were discussed.

- Discussing and confirming the AS-IS and TO-BE picture.
- Mapping the requirements for IT solutions to provide TO-BE and working with key people on the spot to derive results and set up the system.
- Finalizing the TO-BE processes, workflows and requirements of the necessary IT solutions and their integration needs. The architectural design of the IT solutions. Mapping implementation options.
- Perform the gap analysis of the AS-IS and TO-BE, IT functionalities supporting the business processes and decide on the priorities.

After the third mission, a working document with processes and workflow maps as an e-Cabinet Roadmap for Djibouti was developed. To make communication between many stakeholders, including business analysts, process owners, and IT specialists, easier, a "TO-BE" process must be defined. Everyone can work together to realize the intended future state if they have common knowledge of it. The "TO-BE" process can also be used as a benchmark for evaluating the effectiveness of processes and monitoring the development of goals for process improvement. The 'TO-BE' model for this GovStack project will incorporate innovations including more effective parliamentary processes, greater technology use for communication and cooperation, higher openness and accountability, and improved representation of all stakeholders. It will also include plans for resolving any difficulties or problems with Djibouti's current parliamentary structure.



### 3.3.2 TO-BE User Journey for Correspondence

Figure 7 depicts the TO-BE workflow user journey for correspondence during cabinet operations. The keynote of this phase is the reduced complexity from logging incoming documents on paper to sharing all documents online. As well as introducing the use of one portal utilizing technology like digital identity and e-signatures to approve and authenticate documents, as opposed to filing at the ministry level for the AS-IS architecture. Additionally, the TO-BE simplifies the process, reducing it to just four different procedures in total, as opposed to ten different procedures for the AS-IS and they were all performed in person.

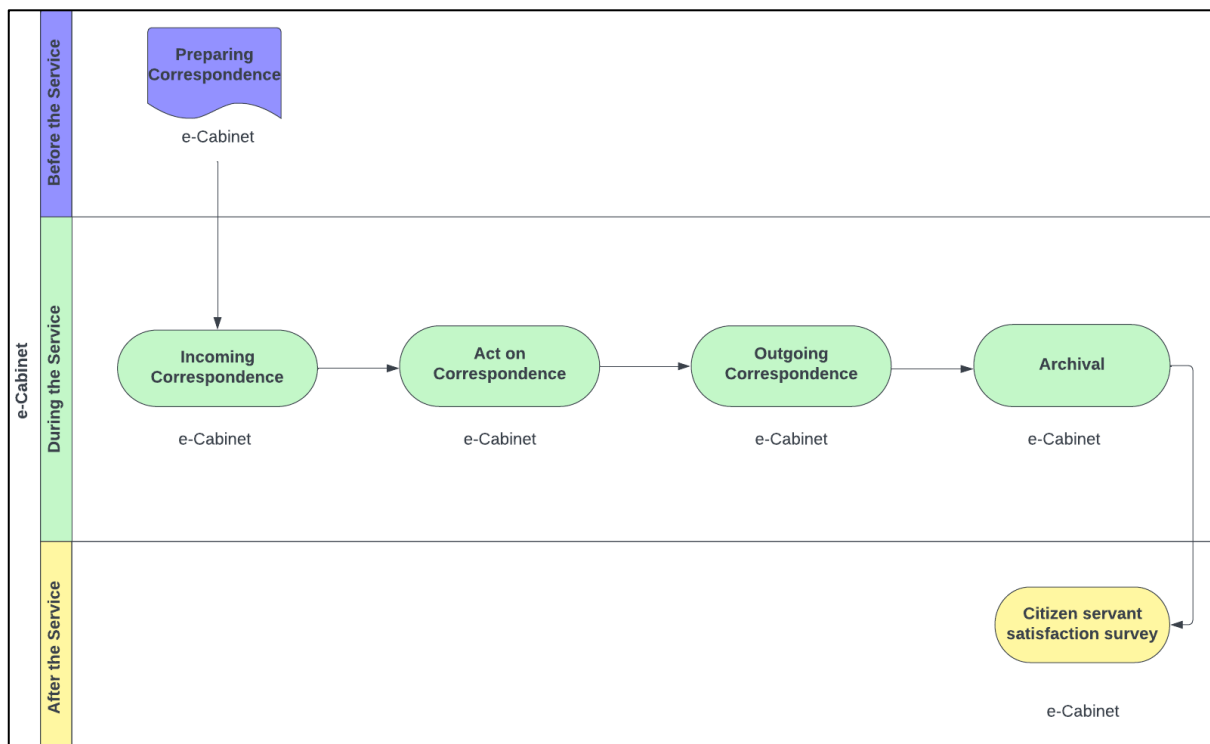


Figure 7. 'TO-BE' User Journey: Correspondence

The correspondence is first created in the e-Cabinet system before the start of the service. To accomplish this, an initiator logs into the system, uses an existing template or creates a new one, fills out the document metadata, including any attachments, and submits. The service then starts with a notification on the recipient's homepage about the incoming letter and the necessary action; either signature, approval, notice, or execution is mentioned explicitly. The arriving documents are subsequently automatically kept for the designated retention period. Upon receiving the notification, the designated person responds to the letter following the instructions and responses. Before sending the response, the designated party is informed when the action is finished. As soon as the relevant action is taken, the recipient of the outgoing

correspondence is likewise informed. The last stages of this process reveal that the outgoing correspondence is automatically preserved following the retention schedule and can be accessed in the future depending on access and user permissions. The National Archive receives the file when the retention term has passed, and the file is automatically deleted after that. Data history and versioning are enabled, which encourages access to previous database states through versioning of the data model. Feedback is gathered from users and stakeholders following the completion of the service to assess and enhance it.

### 3.3.3 TO-BE User Journey for Drafting Legal Acts

For generating legal acts during cabinet operations, Figure 8 depicts the TO-BE workflow user journey. The observable change in this scenario is the decrease in the number of procedural stages from eleven in the AS-IS to seven overall. In contrast to some steps that must be performed in person and are provided AS-IS, all documents can be shared online. In addition, this TO-BE architecture is made simpler by centralizing all service delivery on a single portal and utilizing digital identification and e-signature technology, as opposed to the AS-IS procedure, which made use of seven different portals with unique logins and passwords.

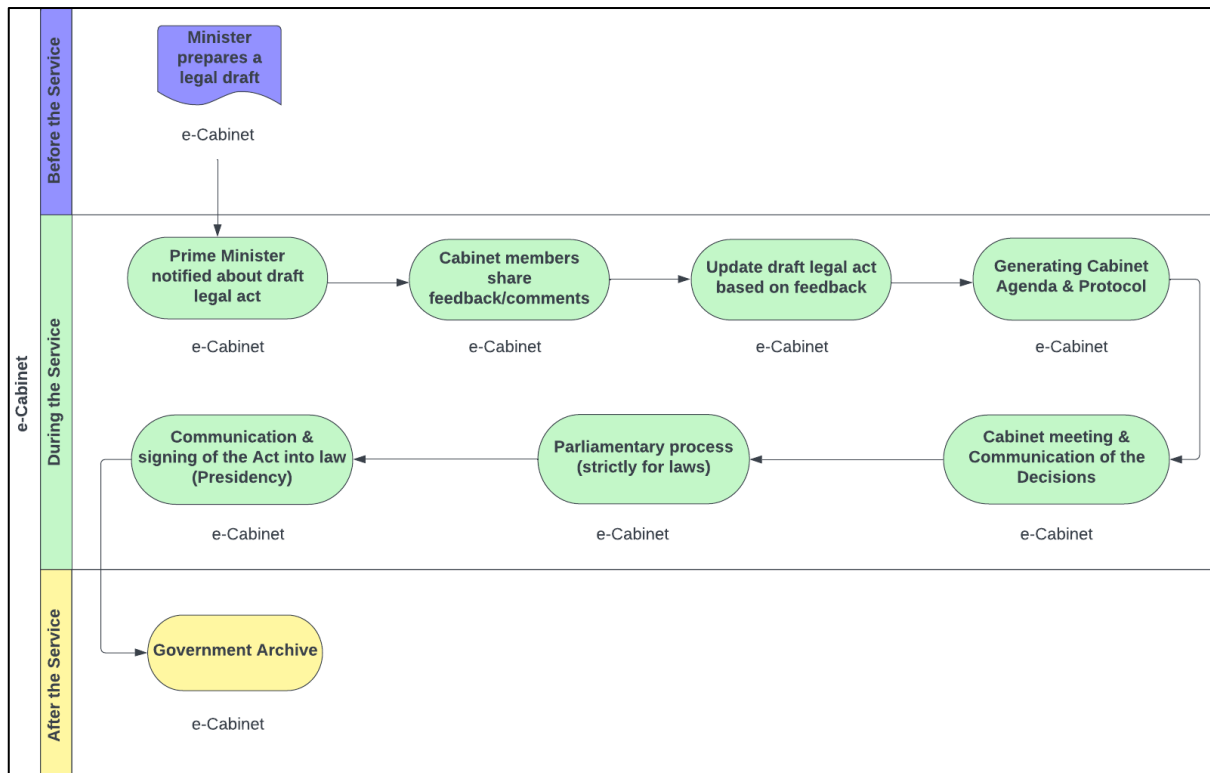


Figure 8. 'TO-BE' User Journey: Drafting Legal Acts

The Minister logs into the e-Cabinet system before the start of the service and creates a new template or uses an existing one to compose a legal document. When the document's metadata is complete and the legal draft is attached, the document is then submitted. Within the e-Cabinet system, the Prime Minister is informed and evaluates if the legal draft complies with relevant standards. The draft is given back to the responsible minister for amendment in cases where it is not in compliance; in all other cases, the Cabinet is informed and invited to provide comments. The draft's initiator is alerted of each comment made by the Cabinet members, who subsequently share their feedback via the e-Cabinet. A legal act is then submitted to the Cabinet Secretary and added to the agenda for the following inter-ministerial session when the responsible Minister has updated the drafts considering the comments. Following the procedure for creating Cabinet meeting agendas, the legal act draft is given an official number and scheduled for a parliamentary session.

After that, invitations to the meeting are delivered to the Cabinet along with the agenda and the final draft of the legal act. Ministers then participate in the discussion by adding comments and casting their votes. The protocol includes recordings of the meeting as well as minutes that list the choices that were made. The Prime Minister signs the draft, which is then transmitted to the Presidency (for other types of documents) or to the Parliament (for laws) for final approval. The e-Cabinet platform is also used for the parliamentary process, which includes debate and voting on legislative decrees, and the Presidency is informed of the final decision. Conclusively, the Act or Decree is then signed by the President into law and published in the official gazette. The act or decree is delivered to the national archive to maintain records, and it is always amendable as needed.

### **3.3.4 TO-BE Prototype**

This section presents the prototype that was designed to test and refine the functionality, design, and usability of an electronic document records management system.

After concentrating on comprehending the current situation, where existing (IT) systems, data, the legal environment, and capacity were defined, which is a crucial input to analyze current gaps for the TO-BE architecture, the generic schemes of TO-BE processes that showed how the present Cabinet processes will be transferred into and facilitated by the EDMS and pertinent system was established. Also, a prototype of the design concept was created as a virtual representation to test, assess, and improve the concept before its full-scale implementation

based on the schemes, the data gathered, and the meeting summaries. The registration of incoming communication with the essential data fields, including date, delivery mode, sender, receiver, and recipient message, is shown in Figure 9.

The screenshot shows a web form titled "Deliverys - In". The form is divided into several sections:

- Delivery method:** A dropdown menu set to "e-mail".
- Transferred:** A date and time field showing "25.01.2023 11:29".
- Sender:** Radio buttons for "Client", "Person" (selected), and "New addressee". Below is a search box containing "Josephine Lusi" and an "Add new" button.
- Personal code:** A field with "E-mail: jolusi@taltech.ee" and "Phone:" labels.
- Recipient:** A dropdown menu set to "Djibouti". Below are fields for "Register code:", "E-mail:", and "Phone:".
- Message for recipient / Cover Letter:** A text area containing the message: "Dear Ingrid, Thank you for sending in the Strategic Plan for the Ministry of ICT. Please find attached my suggestions."
- Buttons:** "Ready" and "Back" buttons at the bottom.

Figure 9. Incoming Correspondence Registration Form

The search box can be used to add an existing user as the sender, as shown in Figure 8, and the 'Transferred' column displays the date and time the mail was registered. The sender can be a company (Ministry) or a person (Secretary).

**Sender**  ,  
 , Josephine Lusi, jolusi@taltech.ee

**Delivery method** e-mail

**Files**  With files  
 Without files

**Receivers**

Organization	<input type="text"/>	Register code	<input type="text"/>
First name	<input type="text"/>	Last name	<input type="text"/>
Department	<input type="text"/>	Position	<input type="text"/>
Phone	<input type="text"/>	Fax	<input type="text"/>
E-mail	<input type="text"/>	Personal code	<input type="text"/>
Address	<input type="text"/>	Index	<input type="text"/>
Town	<input type="text"/>	County	- select -
Country	<input type="text"/>	<input type="button" value="Clear Content"/>	

Figure 10. Adding a New Contact or New Addressee

As seen in Figure 10, it is possible to add a new addressee (for a person or an organization outside the prototype environment) and a new contact (for an individual) and send them emails.

Document scanning

**Document scanning**

**Scanner control**

Page:  /

**Scanner settings**

Scanner selection:

Bilateral  
 Automatic document feeder  
 Advanced settings

**The name of the file**  
 .pdf

Figure 11. Scanning A Physical Mail into the System

Figure 11 depicts the procedure for scanning physical mail and how, before it is stored, all necessary document information is filled out to register the physical mail into the system.

All (5)	For coordination (2)	To fill (1)	For information (2)	For signing (0)	Completed (0)
No.	Job	From whom	Date	Deadline	
1	Decree No. 2022-138 /PR/MENFOP approving the provisional budget for the 2023 financial year of CRIPEN.	Prime Minister	24.01.2023	25.01.2023	Forward Coordinate
1	Decree No. 2022-138 /PR/MENFOP approving the provisional budget for the 2023 financial year of CRIPEN / Decree No. 2022-138 /PR/MENFOP Approved. Proceed with the Parliamentary discussion.	President of Djibouti	24.01.2023	25.01.2023	Forward Coordinate
2	Letter from the Ministry of Education	Josephine Lusi	25.01.2023	25.01.2023	Forward Mark as done
16	Decree No. 2022-125/PR/MB forfeiture and allocation of a plot of land located in the port area. - workflow - Secretary to the President	Josephine Lusi	24.01.2023		Forward Mark as done
14	Notice to Convene A Cabinet Session To Discuss the Digital Transformation Agenda with the GovStack Digital Team on 20.01.2023 - delegation - Secretary to the President	Prime Minister	23.01.2023		Forward Mark as done

Figure 12. Initiating Workflow for Incoming Mail

As shown in Figure 12, the new task that needs the responsible user's action or response is shown on the home page, and when an email has been saved, the responsible person receives a notification of the new task.

### 3.3.4.1 Loading a Legal Act Draft into the System

The process for the TO-BE architecture for drafting a legal act draft is initiated when the ministry creates the draft. The entire process is shown below.

Step 1:

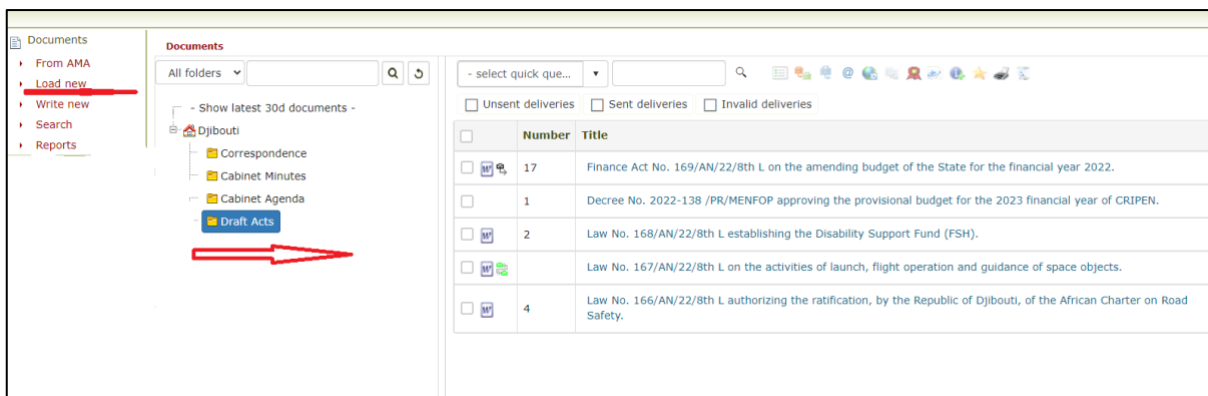
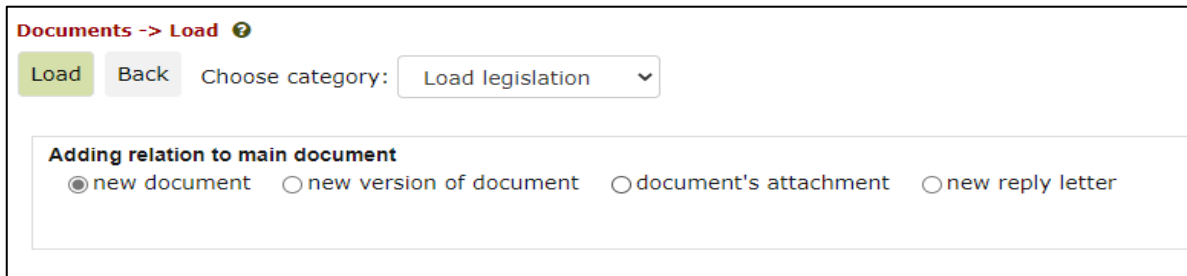


Figure 13. Loading New Legislative Act

A few draft laws are displayed in Figure 13 under the "Draft Acts" folder. On the documents page, you can see the titles of the legal acts and the special numbers assigned to them. Several of these legal acts include supporting documentation.

Step 2:

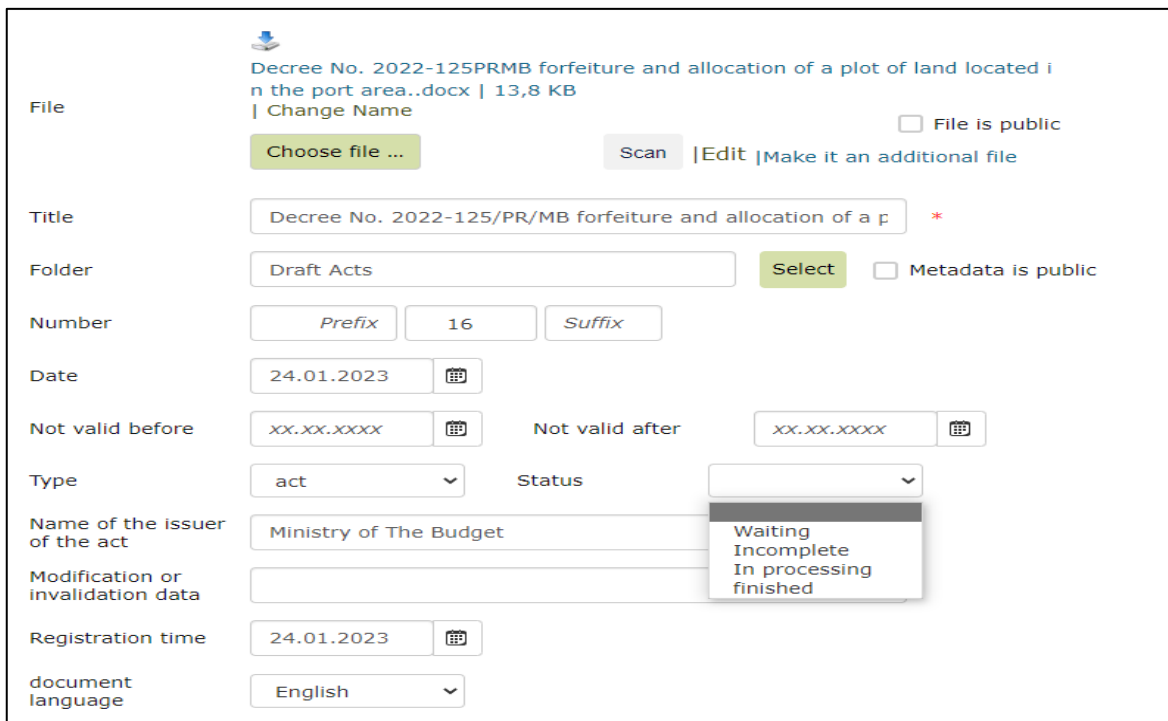


The screenshot shows a web interface for loading documents. At the top, it says "Documents -> Load" with a help icon. Below this are two buttons: "Load" (highlighted in green) and "Back". To the right is a "Choose category:" label followed by a dropdown menu currently set to "Load legislation". Below this is a section titled "Adding relation to main document" with four radio button options: "new document" (selected), "new version of document", "document's attachment", and "new reply letter".

Figure 14. Loading New Document

Figure 14 shows the options available to include additional files to a document; like creating a new document, creating a new version of a document when uploading a new version of a document, adding attachments to documents and a new reply letter.

Step 3:



The screenshot shows a detailed form for filling in document metadata. The "File" section shows a document icon, the filename "Decree No. 2022-125PRMB forfeiture and allocation of a plot of land located in the port area..docx | 13,8 KB", and a "Change Name" link. There are checkboxes for "File is public" and "Metadata is public". A "Choose file ..." button is highlighted in green. Other buttons include "Scan", "Edit", and "Make it an additional file". The "Title" field contains the same text as the filename, followed by a red asterisk. The "Folder" field is set to "Draft Acts" with a "Select" button. The "Number" field has "Prefix", "16", and "Suffix" sub-fields. The "Date" field is set to "24.01.2023". The "Not valid before" and "Not valid after" fields are set to "xx.xx.xxxx". The "Type" field is set to "act" and the "Status" dropdown menu is open, showing options: "Waiting", "Incomplete", "In processing", and "finished". The "Name of the issuer of the act" field is set to "Ministry of The Budget". The "Registration time" field is set to "24.01.2023". The "document language" field is set to "English".

Figure 15. Filling Metadata Fields & Scanning Physical Copies of Document

In Figure 15, there is an option to upload physical copies of documents into the system. This is achieved by scanning and thereafter uploading the relevant document.

Step 4:

Figure 16. Adding Restrictions to Documents

Restrictions in legal contracts help to produce unambiguous, enforceable, and compliant agreements that safeguard the rights and interests of all parties, manage risks, and maintain the agreement's goals. Figure 16 shows how to enable this feature in the e-Cabinet system.

Number	Title	Date
16	Decree No. 2022-125/PR/MB forfeiture and allocation of a plot of land located in the port area.	24.01.2023 11:09
17	Finance Act No. 169/AN/22/8th L on the amending budget of the State for the financial year 2022.	23.01.2023 17:57
1	Decree No. 2022-138 /PR/MENFOP approving the provisional budget for the 2023 financial year of CRIPEN.	23.01.2023 16:03
2	Law No. 168/AN/22/8th L establishing the Disability Support Fund (FSH).	23.01.2023 16:00
	Law No. 167/AN/22/8th L on the activities of launch, flight operation and guidance of space objects.	23.01.2023 15:48
4	Law No. 166/AN/22/8th L authorizing the ratification, by the Republic of Djibouti, of the African Charter on Road Safety.	23.01.2023 14:51

Figure 17. Legal Act Draft Loaded Successfully

After the document is loaded and saved, it shows versioning and appears in the draft act folder as shown in Figure 17.

### 3.3.4.2 Sending the Legal Act to the Cabinet

After the legal act draft is successfully loaded into the system, it is then sent to the Cabinet for deliberation. The first step to achieving this is to select the draft as shown in Figure 14 and initiate a workflow process as shown in Figure 18.



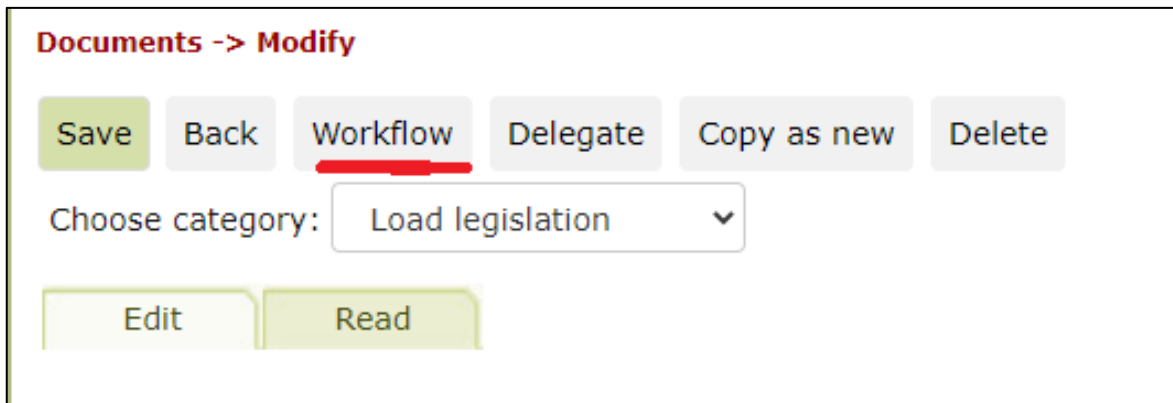


Figure 18. Workflow Process for Sending Documents

During this workflow process, there are choices for both parallel and sequential execution as shown in Figure 19. Therefore, it is crucial to select parallel execution at this stage so that activities or processes be run concurrently, simultaneously, or in parallel, allowing for the execution of numerous tasks at once. As a result, actions can be executed in parallel or simultaneously, starting and finishing independently of one another without having to wait for the completion of earlier tasks.

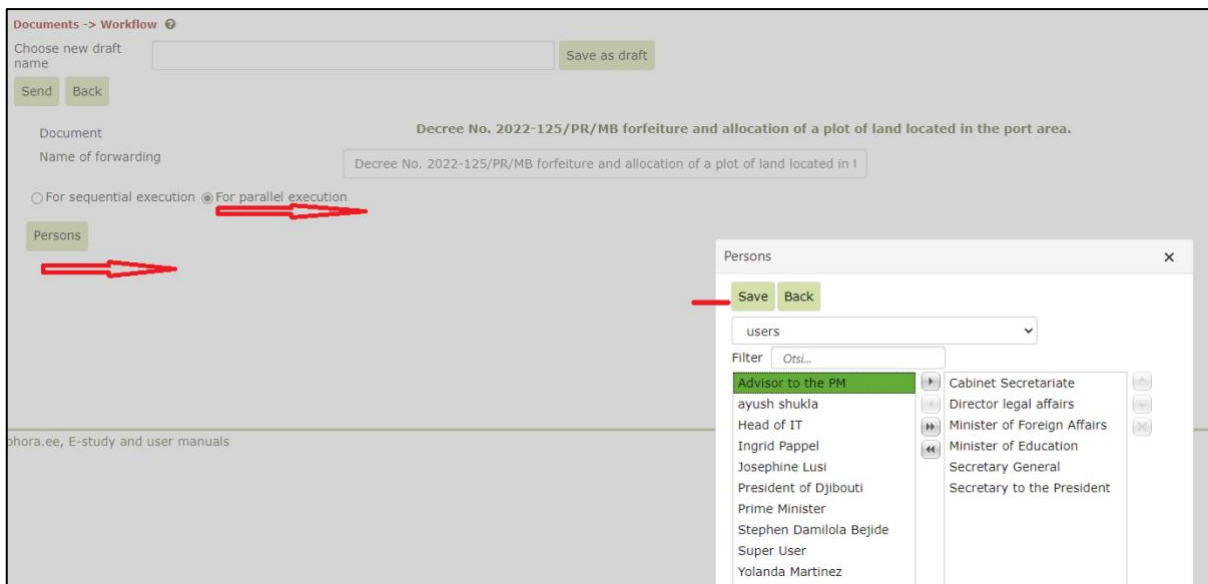


Figure 19. Selecting Cabinet Members and Required Stakeholders

The Cabinet members and required stakeholders are selected as recipients of the Legal Act and then saved.

Persons						
Performer	Task description	Deadline	E-mail	Attachment		
Prime Minister	<input type="radio"/> For signing <input type="radio"/> For approval	<input checked="" type="radio"/> For execution <input type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲
Cabinet Secretariate	<input type="radio"/> For signing <input type="radio"/> For approval	<input type="radio"/> For execution <input checked="" type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲
Minister of Education	<input type="radio"/> For signing <input type="radio"/> For approval	<input type="radio"/> For execution <input checked="" type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲
Minister of Foreign Affairs	<input type="radio"/> For signing <input type="radio"/> For approval	<input type="radio"/> For execution <input checked="" type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲
Secretary to the President	<input type="radio"/> For signing <input type="radio"/> For approval	<input type="radio"/> For execution <input checked="" type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲
Secretary General	<input type="radio"/> For signing <input type="radio"/> For approval	<input type="radio"/> For execution <input checked="" type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲
Director legal affairs	<input type="radio"/> For signing <input type="radio"/> For approval	<input type="radio"/> For execution <input checked="" type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲
Advisor to the PH	<input type="radio"/> For signing <input type="radio"/> For approval	<input type="radio"/> For execution <input checked="" type="radio"/> For notice <input type="checkbox"/> High priority	<input type="checkbox"/>	<input type="checkbox"/>		▼ ▲

Figure 20. Setting Required Tasks & Deadline for Recipients

Figure 20 shows the task descriptions sent to the Cabinet members and relevant stakeholders and their respective deadlines. Some tasks are delivered to the receivers for execution, while others are sent for notice. Some tasks only need the recipients' signatures, while others need their approval. Then the document is forwarded by clicking the button 'Send' as shown in Figure 21.

Documents -> Delegate

Delegation  Workflow

Document: Decree No. 2022-125/PR/MB forfeiture and allocation of a plot of land located in the port area.

Name of forwarding: Decree No. 2022-125/PR/MB forfeiture and allocation of a plot of land located in 1

For sequential execution  For parallel execution

Persons

Performer	Task description	Deadline	E-mail	Attachment
Minister of Foreign Affairs	<input type="radio"/> Advise, comment, or propose action plan <input type="radio"/> For signing <input type="radio"/> For approval	<input checked="" type="radio"/> For execution <input type="radio"/> For notice <input type="checkbox"/> High priority	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Minister of Education	<input type="radio"/> Advise, comment, or propose action plan <input type="radio"/> For signing <input type="radio"/> For approval	<input checked="" type="radio"/> For execution <input type="radio"/> For notice <input type="checkbox"/> High priority	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 21. Legal Act Draft is Forwarded

### 3.3.4.3 Sending Legal Act to Other Ministries for Comments/Actions

The legislative process must include sending legal draft acts to the President and other ministries for evaluation to maintain constitutional and legal validity, examine policy implications, assure consistency and coordination, and promote stakeholder involvement. It aids in enhancing the standard, viability, and validity of the legislative process, ultimately

resulting in solid and reliable legislation. Figure 22 illustrates the view of the Prime Minister showing the draft received from the Cabinet Secretariat and awaiting approval.



Figure 22. Prime Minister's e-Cabinet View

Figures 23 and 24 show how the legal act draft can be sent to the President and other Ministers for execution using the e-Cabinet system.

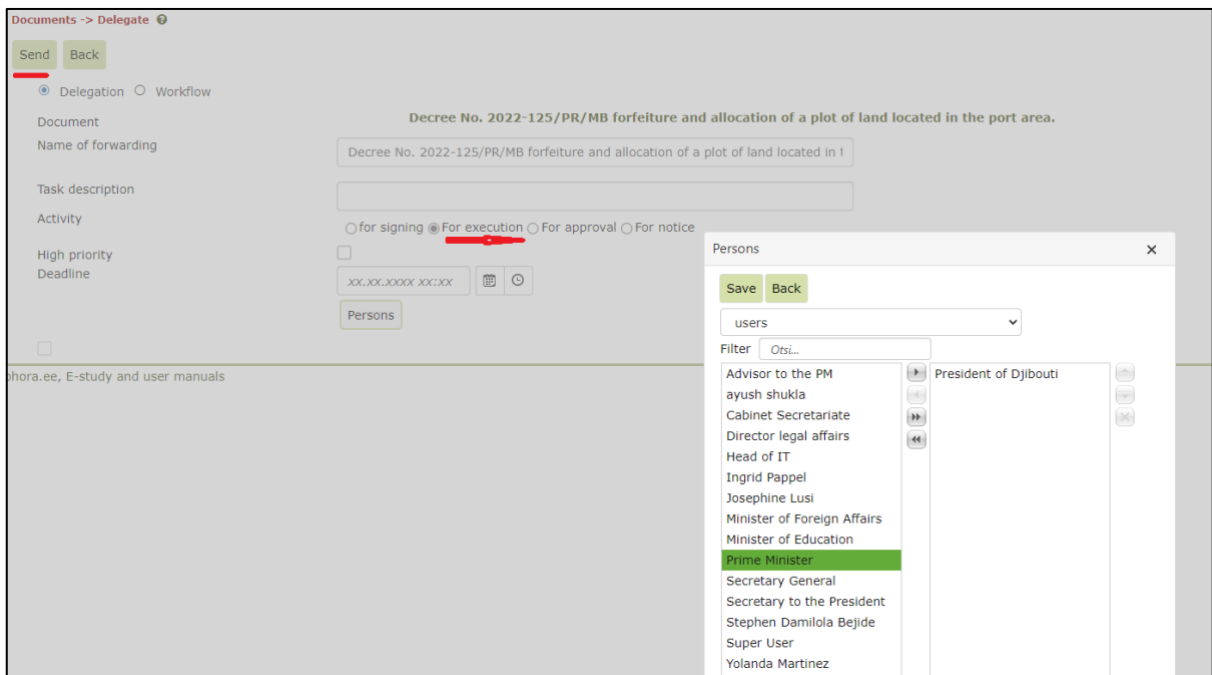


Figure 23. Sending Draft to President for Execution

Documents -> Delegate

Send Back

Delegation Workflow

Document

Name of forwarding: Decree No. 2022-125/PR/MB forfeiture and allocation of a plot of land located in 1

For sequential execution For parallel execution

Persons

Performer	Task description	Deadline	E-mail	Attachment
Minister of Foreign Affairs	Advise, comment, or propose action plan	26.01.2023 15:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="radio"/> for signing <input type="radio"/> For approval <input checked="" type="radio"/> For execution <input type="radio"/> For notice	<input type="checkbox"/> High priority		
Minister of Education	Advise, comment, or propose action plan	26.01.2023 15:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input type="radio"/> for signing <input type="radio"/> For approval <input checked="" type="radio"/> For execution <input type="radio"/> For notice	<input type="checkbox"/> High priority		

Figure 24. Sending Draft to Other Ministers for Execution

## **4. Discussion and Recommendation**

This chapter provides an in-depth analysis and interpretation of the research findings. It entails the importance of structuring the AS-IS and TO-BE architectures into user journeys and the different perspectives recommended for the implementation of an e-Cabinet as per the data from EstDEV and eGA.

### **4.1 Why design AS-IS & TO-BE User Journeys?**

An e-Cabinet system's implementation is a challenging task that involves multiple parties and several procedures. As a result, it's crucial to divide the implementation process into achievable steps or phases that everyone involved can comprehend. Using user journeys to differentiate the AS-IS and TO-BE for effective e-Cabinet implementation is one efficient approach to do this. The document management process in an organization is shown as-is, whereas the desired future state following the implementation of the e-Cabinet system is represented by TO-BE. It is possible to assess and comprehend the whole end-to-end experience of users with the e-Cabinet system, from the current state to the anticipated future state, in a methodical manner by breaking down the implementation process into user journeys. User journeys are a sequence of actions or interactions that a user makes when utilizing the e-Cabinet system to carry out a particular activity or achieve a particular objective. Usually, they involve a variety of touchpoints, including the production, uploading, indexing, retrieval, sharing, and other essential operations of documents. Organizations can learn more about the present state of their document management process and identify pain points, inefficiencies, and opportunities for development by mapping out user journeys.

Understanding how documents are now managed, processed, and retrieved within an organization is made easier by AS-IS user journeys. They could point out existing bottlenecks, redundant processes, or places where errors or delays are being brought on by manual or paper-based operations. The AS-IS user journeys give a starting point for introducing improvements by giving a general overview of the state of document management as it is presently. The ideal state of the document management procedure, when the e-Cabinet system is deployed, is

represented by TO-BE user journeys, on the other hand. These represent the projected modifications and improvements to the document management process that the e-Cabinet system is supposed to bring. The TO-BE user journeys assist organizations in defining and visualizing the ideal end-to-end user experience with the e-Cabinet system, which includes improved user interactions, more simplified and effective operations, and increased productivity.

Dividing the implementation process into user journeys helps to identify pain points and areas of improvement. Analyzing AS-IS user journeys can assist in locating problem areas and instances where the present document management procedure is tedious or ineffective. This helps to comprehend the difficulties that must be overcome to adopt the e-Cabinet system. Organizations utilising TO-BE user journeys can also establish the ideal future state of the document management process. This involves determining what the e-Cabinet system needs to do and what users should expect, such as enhancing the user experience and streamlining workflows. User journeys can also act as a roadmap for creating implementation strategies and goals. While implementing the e-Cabinet system, they can assist organizations in identifying the precise areas where adjustments or improvements to the document management process are required and then assign a priority to each one. By concentrating on user journeys, the project team can better comprehend and relate to users' points of view, increasing the likelihood that the new system will be adopted successfully. Leveraging user journeys to separate the AS-IS and TO-BE for e-Cabinet deployment offers a more structured approach that fosters improved stakeholder participation, communication, and collaboration throughout the implementation process.

In the current digital era, switching to an e-Cabinet form of government has become more crucial than ever because it provides various advantages over conventional paper-based methods. While lowering the expenses associated with paper-based systems, it can significantly increase efficiency and transparency in government operations. It also necessitates thorough planning, policy creation, the purchase of technology, training, testing, and monitoring. Thus, for a transition to be effective, it's imperative to involve the appropriate parties, handle information security issues, and implement strong capacity-building and change management strategies. Based on the design process for the TO-BE architecture, data was collected on the legal, organisational, and technical perspectives for implementing an e-Cabinet in Djibouti.

## 4.2 The Legal Perspective for Establishing an e-Cabinet

This section will go over Djibouti's laws on electronic communication and data management, including how crucial they are to creating an e-Cabinet.

The transition to an e-Cabinet system of government depends heavily on changes to the law. They offer the essential structure and guidance for the implementation and operation of the e-Cabinet system. Governments must take all necessary steps to ensure that the legal framework is changed to enable the transition to an e-Cabinet system of government. To give the e-Cabinet system's electronic records and decision-making processes the requisite legal legitimacy and enforceability, legislative frameworks that cover data protection, electronic signatures, document management, governance protocols, and dispute resolution are needed. For the e-Cabinet system to be compliant with new laws and function effectively, coordination with the appropriate legal authorities may be necessary, as well as careful analysis and implementation. The areas related to digital governance and transformation where new legislation must be drafted, and current legislation must be strengthened in Djibouti to support the successful implementation of an e-Cabinet are listed below.

- **Telecommunication**

The legislation in this area aims to create the necessary conditions for the development of electronic communications. The existing law: Law No. 80/AN/14/7ème L, approves the Integrated Strategic Plan (ISS) for the Information and Communication Technologies (ICT) sector in the Republic of Djibouti.

- **Cyber Security and Cybercrime**

A set of laws, rules, and policies intended to protect information technology (IT) systems, networks, data, and users from cyber threats and offer legal redress for offences involving cyberspace make up the legal framework for cyber security and cybercrime. The existing law in Djibouti is Law No. 66/AN/14/7ème L relating to cyber security and the fight against cybercrime. In addition, a Digital Code (Code du Numérique) is in preparation, which would also address cybersecurity and cybercrime issues. The related project is funded by the World Bank.

- **Public sector information**

The public should have access to information intended for general use, and public control mechanisms on the performance of public obligations should be established by law. There is currently no law in Djibouti that establishes the right to access public information.

- **Personal Data Protection**

Legislation aimed at preserving the confidentiality and security of an individual's personal information is referred to as personal data protection legislation. To protect the rights and interests of persons, these laws typically regulate how individuals, organizations, and governmental bodies gather, utilize, process, store, and share personal data. The legislation should stipulate a person's fundamental rights and freedoms in line with public interests when their data are processed. No personal data protection law is currently in place in Djibouti, but the Digital Code (Code du Numérique) intends to cover data protection comprehensively.

- **Digital signature and PKI infrastructure**

Electronic transactions and cybersecurity both depend on digital signatures and public key infrastructure (PKI). The development and use of PKI systems and the legal acceptance, validity, and enforceability of electronic signatures are often governed by legislation on digital signatures and PKI infrastructure. This area is also planned to be covered by the new Digital Code, which would regulate areas such as electronic communications, electronic services, e-commerce, electronic/digital signatures, surveillance procedure over certification, and timestamp services.

- **Data Exchange Regulation**

The regulation, which is preferably not a law, should establish standards for the use and administration of the information systems' data interchange layer. The draft "Regulation on the management system of the State Information System, the creation and management of the Catalogue of Interoperable Solutions and the National Interoperability Platform (NIP) of Information System" was prepared by the e-Governance Academy (eGA).



- **Management of Registries and Information Systems**

The goal of legislation in this area should be to support the interoperability of databases used by the state, local governments, and private individuals carrying out public duties, ensure the transparency of the management of the state information system, and plan the management of the state information system. The draft regulation was prepared by the e-Governance Academy (eGA).

- **Archiving**

Law on archiving primarily refers to rules and laws that control the administration, preservation, and accessibility of records and documents (including digital) with important historical, cultural, administrative, or legal value. These laws are intended to guarantee that records and papers are properly stored and maintained over time and that they are available for reference, research, and accountability purposes. The existing law relating to archives in Djibouti is Law No. 132/AN/11/6ème L.

Overall, establishing an e-Cabinet from a legal perspective necessitates a thorough knowledge of the legal and regulatory framework governing electronic communication and data management in Djibouti, as well as the creation of policies and procedures to ensure adherence to these rules.

### **4.3 The Organizational Perspective for Establishing an e-Cabinet**

This part will discuss the organisational perspective for establishing an e-Cabinet and the importance of capacity building to achieve this. In addition, this part also highlights the components involved while establishing an e-cabinet and the task force assigned by Djibouti's team to promote an effective organisational structure for establishing an e-Cabinet.

Changes in how the government institution operates, handles information, and collaborates in a digital environment are all crucial components of the organizational requirements for implementing an e-Cabinet system of government. Changes in organizational structure, processes, culture, skills, information management procedures, and interdepartmental collaboration are necessary when transitioning from a traditional paper-based cabinet system to an electronic one. A seamless and successful switchover to the e-Cabinet system depends on

effective change management methods, which include leadership support, communication, and training.

### **4.3.1 Capacity Building**

Capacity building is crucial to properly integrate the e-Cabinet system within an organization. The process of improving an organization's infrastructure, skills, and human resources to increase its capacity to provide services efficiently is known as capacity building. The introduction of an e-Cabinet system ushers in a new mode of operation that necessitates staff to possess adequate technical expertise. Employees can develop the skills and confidence they need to use the e-Cabinet system effectively with the aid of capacity building. Due to staff members being able to accomplish jobs more quickly and accurately than when utilizing paper-based systems, productivity may increase as a result. When switching to an e-Cabinet system of government, capacity building is essential to ensure an effective organizational structure. It aids in developing the necessary digital skills among staff members and their ability to evolve, adapt, and increase their understanding of cybersecurity. It also strengthens leadership and governance, enhances data management, and fosters collaboration and communication.

A well-trained and skilled team is necessary to successfully adopt and run an e-Cabinet system, which increases efficiency and effectiveness in government operations. When staff members grow more accustomed to using technology to accomplish their objectives, capacity building can also aid in developing an innovative culture within the company. A staff member's resistance or hesitation to adopt the new method can also be addressed via capacity building. This can be achieved by including the staff in the development and implementation of the e-Cabinet system, including training sessions, workshops, and continuous assistance to guarantee that the staff can utilize the system efficiently. Additionally, by developing a pool of competent workers with technical abilities who can be used in other parts of the organization, capacity building can help the organisation in the long run.

Government employees in Djibouti must possess digital skills and competencies to make the switch to an e-Cabinet system efficient. Employees' ability to use digital technologies, comprehend e-governance procedures, and manage digital information can all be improved through training and development opportunities offered through capacity-building initiatives. This makes it possible for them to work efficiently in a digital environment, which is essential for the e-Cabinet system to run well. The World Bank assessment asserts that few digital skills

are available in the nation. Together with literacy and numeracy abilities, Djibouti now views digital skills as a fundamental prerequisite. Most Djiboutians, however, are unfamiliar with ICT tools and systems and lack the fundamental knowledge required to use digital technology, hence there is an urgent need for widespread training in basic digital skills. The difficulty begins in the school-age years, where access and quality are important challenges. Basic foundational abilities, including literacy and numeracy, are at the core of the development of digital skills.

The development of Djibouti's ICT sector and digital economy is also hampered by the shortage of intermediate and advanced digital skills. ICT firms are in high demand for specialized engineers and technicians trained in coding, cyber security, etc., as well as new managerial skills centred on flexibility and innovation. World Bank's Djibouti Digital Foundation Project in 2022 will help build basic digital skills for young men and women and enhance their access to employment. The World Bank and the International Finance Corporation (IFC) will explore ways to increase the production of advanced digital skills, in partnership with the private sector.

#### **4.3.2 Task Force Distribution**

The project management component in carrying out organizational changes is an important factor. Shifting to a digital environment is a continuous process that may take up to several phases. A substantial commitment is required to ensure steady and consistent growth of the online presence. Thus, giving authority to the relevant directorate ensures the continuity of the process. An essential component of the e-Cabinet establishment is to have a task force assigned by Djibouti's team. That team will work closely with the GovStacks experts to understand the needs of the e-Cabinet environment and design an eco-system that supports e-Cabinet functions. Presented in Figure 22 are suggested roles with specific responsibilities and competencies that should be assigned to the e-Cabinet eDMS task force for further maintenance of the e-Cabinet system.

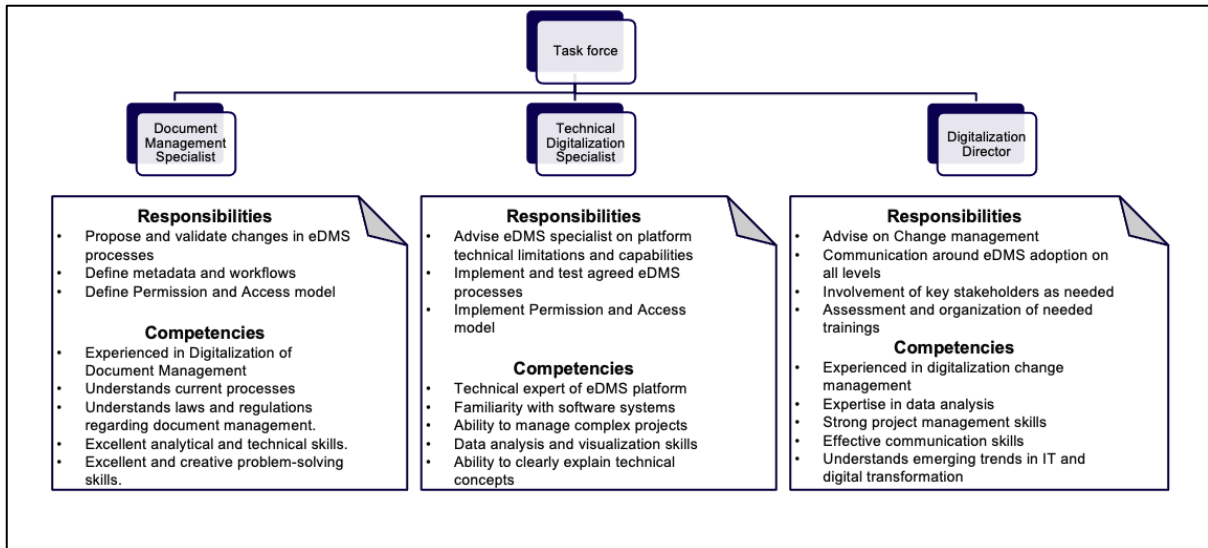


Figure 25. Task Force Description

As knowledge transfer plays a huge role in the success of eDMS adoption, thus, it must not be underestimated. The aim is not only to understand the level of current awareness of civil servants but also to make estimations on which actions should be taken in terms of organizational culture and change management, as well as training. In addition to communication, the digitalization initiative should be kicked off with orientation training to emphasize the importance of the change, manage expectations on what is going to happen next and ensure that everyone knows how to join webinars, which is an important channel for sharing information further in the e-Cabinet project. This will also allow people to ask questions and air their concerns directly to the management team rather than spreading fear and disbelief among colleagues. The following training plan track division helps to shape the capacity accordingly to paperless management needs and gives future users a better understanding of how the e-Cabinet ecosystem works and why it is needed:

- Training Track 1: Provide context explaining the need for digital document management and what the main working procedures within the e-Cabinet ecosystem are.
- Training Track 2: Specific workflow training based on user profiles who are involved in the legal draft act processes.
- Training Track 3: Records hierarchy, procedures, and creation of the workflows, archiving and preservation (for individuals responsible for document procedures).

### **4.3.3 Components of an e-Cabinet & the Implementation Phases**

The implementation of an e-Cabinet is a complex undertaking that requires a step-by-step approach. To begin with, the author recommends focusing on digitizing the document workflow and correspondence between the Ministry of Digital Transformation and Innovation (MENI) and the PM's office in the first phase. This will serve as a foundation to expand the implementation to all government ministries in due course. Essentially, correspondence sets defined procedures for transferring documents, guaranteeing consistency and uniformity in how information is shared, saved, and accessed. This enhances interoperability across several ministries within the e-Cabinet, streamlines procedures, and increases efficiency. Also, correspondence aids in developing secure document transmission protocols, assuring the protection of adequate methods for authentication and permission. Along with improving openness and traceability inside the e-Cabinet, it also establishes roles, responsibilities, and accountability for document flow. Establishing correspondence also makes it easier to manage change and contributes to the development of a productive digital document management system inside the government.

The eDMS (Electronic Document Management System) document workflow is a process that electronically manages the flow of documents within an organization, from creation to storage, retrieval, and disposal. The functions of the eDMS are explained thus.

1. **Document Creation:** The document is created from accessible HTML, RTF, Word, or PDF templates in the eDMS environment. Manual documents can be scanned and initiated into the workflow.
2. **Document Distribution:** The document is distributed to the appropriate parties electronically or by printing a hard copy. The distribution could be done automatically or manually.
3. **Workflow Engine:** The workflow engine automatically routes documents to the appropriate person or department for the needed task. i.e., review, approval, or action. It can also set reminders and notifications to ensure that documents are processed promptly.
4. **Document Status Tracking:** The workflow engine allows users to track the status of a document as it moves through the workflow, providing a real-time view of its progress.
5. **Document Access and Retrieval:** Authorized users can then access and retrieve the document from the eDMS, either through a web portal or a desktop application.

6. Information Versioning: The eDMS provides version control, so users can access previous versions of the document.
7. Document Archival: The document is then archived in the eDMS for future reference or compliance purposes. The eDMS can also enforce retention policies to ensure that documents are retained for the required period before being disposed of.
8. Document Disposal: When the document's retention period is over, the eDMS can automatically dispose of the document or flag it for manual disposal.

In Table 1, the components involved with establishing an e-Cabinet, the various steps that must be taken and their descriptions, as well as the expected outcomes after completing each step are illustrated.

Element	Step	Description	Result/Outcome
Change management	Intermediate milestones for the action plan	Agreeing on the next steps and activities within a specific timeline	Setting up the task force and implementing team
Legal framework	Identifying and understanding legal acts related to eDMS	Analyzing all aspects of eDMS that are regulated by current legal acts and adding provisions that will capture KMS/IMS	Understanding of system restrictions and permissions while creating roles and access rights
Gathering Data that will be needed to generate workflows	Creating List of Procedures	Creating regulating and normative acts specific to further digitalization and those focused on the eDMS implementation	The whole spectrum will be defined and developed step by step
	Developing document hierarchy compatible with eDMS	Document hierarchy that describes not only names of the documents but also includes their descriptions, access rights, preservation time	Structure of the Document hierarchy is defined
	Mapping existing document hierarchy (paper based to the new one)	Analyzing and describing how to link paper documents to digital ones (creating referencing and identifier systems)	Hard and electronic documents are merged
	Description of roles and activities	Describing roles within eDMS (e.g., approver, signer, executor, substitute) and listing the activities and permissions accordingly	eDMS roles are identified
	Identifying metadata for document types	Describing all metadata for different document types e.g., memos, agreements, etc. This metadata will be created in eDMS as document attributes on different forms	Metadata for each document type is fixed

	Creating document forms with metadata	All document types should be described accordingly	All metadata is described in order to be embedded in eDMS
<b>Setting up eDMS environment</b>	Establishment of identity management	Describing the procedure on the authentication methods (internal/external login, Active Directory, etc.)	Authentication methods are defined
	Creating List of prioritized reports	Based on metadata, data for the most useful reports for statistical purposes can be defined e.g., “correspondence extended deadlines”, “expiring contracts”, etc.	Relevant statistics to performance monitoring is gathered
	Access management and monitoring	Describing relevant user groups and explaining their roles and activities within eDMS (can be linked to Document Hierarchy). Establishing monitoring capabilities across organizational IT infrastructure.	The list of user groups is defined
	Description of basic cyber hygiene rules	Describing basic rules for workplace usage	Basic cyber hygiene rules are fixed within the act/manual
<b>Training the Trainers</b>	Training of the implementers and IT team	Training the implementers and IT team	Trainers are able to train the users in Djibouti
<b>Testing the eDMS environment with real data</b>	Testing the eDMS platform	Testing the eDMS platform with data from users from the two government ministries	Platform is adjusted and ready for the service between the two ministries
<b>Launching service between PM and MENI’s office</b>		Official launch of correspondence between the two ministries	Paperless ecosystem between MENI and PM office
<b>End user training for correspondence handling</b>		End user training for correspondence handling	All users have the required knowledge on how to operate the eDMS. Suggest training plans for sustainability: continual in-house capacity and skills building
<b>Launching Service</b>		Launching service in Djibouti	All ministries are integrated and able to use the eDMS

<b>Stabilization and scaling of the service</b>	Scaling the service	Scaling the service across all government ministries	All ministries and government offices adoption of the paperless ecosystem
<b>Official Handover</b>	Launching of the service	Launching of the nationwide service, and official handover from the GovStack team	Full paperless ecosystem launched in Djibouti

Table 1. Timelines for establishing an e-Cabinet

The first phase of Table 1 is to construct the task force and implementing teams while also developing intermediate milestones for the action plan to manage change during implementation. Secondly, the legal system is examined to find and comprehend the laws on eDMS. Understanding the system constraints and permissions necessary while designing roles and access privileges is the desired outcome of this stage. The following step is to collect data that will be necessary to create workflows, which entails making a list of procedures, developing a document hierarchy compatible with eDMS, mapping the old document hierarchy (paper-based to the new one), outlining the roles and activities, identifying metadata for document types, and creating document forms with data. The hard and digital documents will be combined, the eDMS roles will be identified, and all metadata for each document type will be fixed after this process.

Establishing identity management, making a list of prioritized reports based on metadata, establishing access management and monitoring, and outlining fundamental cyber hygiene guidelines are all part of the fourth stage, which is to build up an eDMS environment. As a result of this stage, a defined authentication technique, relevant statistics for performance monitoring, a defined user group list, and fundamental cyber hygiene rules fixed within the act are all produced. The subsequent phases involve educating the trainers, testing the eDMS environment with real data, launching the service between two ministries, and end-user training for managing communication. Concurrently, internal capacity building is still going on and all users have the necessary understanding of how to utilize the eDMS. After that, the service is officially turned over after being launched, stabilized, and scaled.



#### **4.4 The Technical Perspective for Establishing an e-Cabinet**

This section will outline all the variables to consider while establishing the building blocks, and technological infrastructure necessary for operating an e-Cabinet system in Djibouti.

The transition to an e-Cabinet system of government is critically dependent on technological advancements. These adjustments entail the adoption and implementation of infrastructure and technologically based solutions that support the operation of an electronic cabinet system. To ensure the successful deployment and operation of an e-Cabinet system, which can considerably improve governmental operations, communication, and decision-making, it is crucial to properly design and carry out technical modifications. For the successful transition to an e-Cabinet system, technical changes are essential, including updating or creating new IT infrastructure, installing strong information security measures, integrating various software applications into a cohesive system, designing user-friendly interfaces, establishing data management processes, ensuring scalability and resilience, and giving users the right training and support. These technical adjustments are required to create a strong, secure, and effective e-Cabinet system that can successfully support the digitization and automation of governmental operations, improve decision-making, and increase the efficacy of governance. Increased efficiency, openness, and accountability in governmental operations are the results of their ability to allow officials and stakeholders to access, process, store, and communicate information digitally and securely.

Furthermore, the user experience is also impacted by technical advancements, which guarantee that the e-Cabinet system is simple to use, accessible, and fits the requirements of various user positions and responsibilities within the government. The e-Cabinet system will be scalable and resilient, able to handle growing workloads, accommodate future expansion, and continue to function during unforeseen events or emergencies, thanks to the proper technical adjustments. In addition, the three most significant platforms (structural building blocks) of the e-Government infrastructure in Djibouti are X-Road, eID (digital identity & digital signatures), and the integrated electronic document management system.

##### **X-Road**

To achieve an e-Government system, it is first necessary to set up a national data exchange system. Such a system would serve as middleware between the different information systems

of the administration and thus ensure communication between the different business applications of the public administration. For its national data exchange system, the Agency has chosen X-Road. Among the so-called ESB (Enterprise Service Bus) systems that facilitate data exchange, X-Road developed and published under an open-source license by Estonia is the only system intended exclusively for public service data exchange. It is maintained by the National Agency for State Information Systems (ANSIE).

### **eID (Digital Identity & Digital Signatures)**

The Djiboutian eID and public key infrastructure (PKI) is being built with the financial help of the World Bank. This has been one of three focus areas of recent years' public administration modernization project. While the Direction General de la Population et de la famille (DGPF, General Directorate of Population and Family) is leading the project implementation there are additional stakeholders:

- The DGPF is responsible for personal identity management and for electronic/digital identity management and issuance.
- The ANSIE is responsible for certification management and for the management of the provision of trust services.
- Djibouti Mobile ID has a contract with the ANSIE for the implementation of Mobile ID.
- Other stakeholders: banks, CNSS, Agence Nationale de l'Emploi, de la Formation et de l'Insertion Professionnelle (ANEFIP, National Agency for Employment, Training and Professional Integration) etc.

### **Integrated Electronic Document Management System**

The implementation of the Integrated Electronic Document Management System (SIGED) is a prerequisite and is an integral part of the Public Administration Modernization Support Project (PAMSP) under the coordination of the Agency and with the financing of the World Bank Group. The aim is to share and enable instant access to information thus reducing the problems of information flow and communication between government departments and institutions and to develop digital archiving to remedy the cumbersome filing and insufficient storage space.

From a technical perspective, setting up an e-Cabinet requires a thorough grasp of the hardware, software, networking, and technological infrastructure needed to support the system.

To guarantee the efficiency, security, and dependability of the e-Cabinet system, careful design, choice, and implementation of the technological components are also necessary.

#### **4.5 Challenges of Implementing an e-Cabinet in Djibouti**

Djibouti has great potential to leverage digital technologies to unlock new pathways for inclusive growth but has so far failed to do so. As a landing site for eight major submarine fiber optic cables, Djibouti has a unique opportunity to transform its economy to support more innovative and sustainable growth. Only 1% of the population used fixed internet in 2020, and the digital gap remains large. Among the richest 20% of the population, 89% of households own at least one mobile phone, compared to 41% among the bottom 20%. The price of mobile internet remains high and is more than 40 times higher than the average in Sub-Saharan Africa and 69% higher than in MENA (Middle East and North Africa). The cost of prepaid mobile broadband for low consumption of data represents over 12% of per capita gross national income. As a result, Djibouti ranks 158th of 175 countries in the ICT Development Index 2017 published by the International Telecommunications Union. Based on Djibouti's digital governance profile designed by estDEV and eGA in July 2022 to provide input to international development cooperation stakeholders to accelerate digital transformation and support the implementation of propriety actions in Djibouti, some of the challenges involved while implementing an e-Cabinet system in Djibouti are explained below.

- **Technology Infrastructure:** It may be challenging to set up an e-Cabinet system in Djibouti due to the unreliability and availability of technological infrastructure, such as internet connectivity, electricity, and hardware/software resources. Infrastructure that is inadequate or unreliable could interfere with the system's ability to operate properly and reduce its efficiency.
- **Digital Literacy:** It may be challenging to determine the level of digital literacy among government officials and staff. The successful installation of an e-Cabinet system may be hampered by user resistance, adoption challenges, and a learning curve if they are unfamiliar with using digital tools and technologies, such as document management systems.

- **Legal and Regulatory Framework:** The construction of an e-Cabinet system may need to consider the legal and regulatory considerations that apply to Djibouti. Regulations governing electronic signatures, data privacy and security laws, and other legal issues may be included. There may be further work and resources needed to align the e-Cabinet system with the current legislative and regulatory environment.
- **Security Issues:** It's essential to ensure the protection of private information and documents stored in an e-Cabinet system. The confidentiality, integrity, and accessibility of government data may be in danger if Djibouti is unable to put in place effective security measures to guard against unauthorized access, data breaches, and cyber-attacks.
- **Cultural and Organizational Issues:** The deployment of an e-Cabinet system may be hampered by specific cultural and organizational issues in Djibouti. Hierarchical systems, the current workplace culture, and change resistance may all be examples of this. Careful planning, stakeholder participation, and specialized strategies may be necessary to address these cultural and organizational obstacles.
- **User Acceptance and Engagement:** A successful e-Cabinet system depends on user acceptance and involvement. It is possible that the system won't function as efficiently and effectively as desired if government officials and staff don't fully embrace and actively use it. It might be difficult yet crucial to promote user acceptance and involvement through training, assistance, and ongoing communication.

## **5. Conclusion**

This chapter provides a summary of the main findings, and interpretations while answering the research questions. Additionally, further areas of study in this field are highlighted. The introduction of an e-Cabinet system of government has the potential to significantly alter current cabinet procedures and decision-making, with electronic platforms and digital technology. The main steps in implementing an e-Cabinet have been examined in this thesis, and their importance has been highlighted.

In response to the first research question which was regarding the requirements for developing an e-Cabinet. To effectively incorporate and use digital technology in governmental decision-making processes, the development of an e-Cabinet involves careful consideration of legal, organizational (capacity building), and technical perspectives. In terms of law, creating an e-Cabinet necessitates creating a strong legal framework that controls the application of digital technologies to decision-making processes in government. Assuring adherence to e-governance regulations, cybersecurity measures, and data protection and privacy legislation are all part of this. Existing laws may need to be changed to reflect the digital age, and new rules may need to be put in place to handle the problems that an e-Cabinet entails. To answer the second research question, the challenges of implementing an e-Cabinet in Djibouti are related to technological infrastructure, digital literacy, legal and regulatory framework, security issues, cultural and organizational issues, and user acceptance/engagement.

Establishing an e-Cabinet also requires organizational change, particularly capacity building. To effectively use digital technology in decision-making, it is crucial to develop the appropriate skills and competence among government employees and authorities. This involves training programs, capacity-building initiatives, and change management methods to guarantee that government employees have the information and skills necessary to properly utilize an e-Cabinet. To construct an e-Cabinet, technical transformation is also essential. This entails creating a solid and secure ICT infrastructure, putting in place the proper hardware and software, ensuring interoperability between various government systems, and creating dependable connectivity. Technological factors are essential for an e-Cabinet to operate smoothly and to be effective at facilitating decision-making processes.

## **5.1 Research Limitations**

Case study research provides insightful analysis of cases or circumstances, but it is crucial to recognize its limitations and proceed with caution when using its results. Rigour, validity, and reliability are the main goals of a case study of high calibre [14]. Thus, the absence of interpersonal communication and nonverbal cues when conducting online interviews is one of this study's limitations. As a result, the researcher-expert relationship and the quantity and quality of the data that are gathered may be impacted. Online interviews may have a limited scope for case study research. The research findings may be less generalizable if the researcher is unable to observe the expert in their natural environment or gather data from several sources.

The possibility of bias is another restriction that needs to be taken into consideration. It's critical to realize that researchers choose topics because they are interested in them, and they anticipate a specific outcome from their research [64]. Additionally, experts who consent to take part in online interviews might have a personal stake in or a unique viewpoint on the subject under research. Personal biases, assumptions, and opinions of the expert could influence their interpretation as well as how they respond to enquiries. Certain experts may be overly focused on nation-based strategies, which might cause a lack of objectivity and potential bias in the research conclusions. Finally, not all nations or regions may have equal access to dependable internet connections, so geographic location could be a problem.

## **5.2 Prospects of the Future Work**

It is impossible to overstate how crucial it is to set up an e-Cabinet. It could result in more effectiveness, accountability, and transparency in governmental decision-making processes. Also, it can increase civic engagement, minimize corruption, and advance fact-based policymaking. An e-Cabinet can act as a platform for seamless, real-time collaboration among government officials in the digital age, resulting in quicker and more accurate judgments. To improve the comprehension and application of e-Cabinets, more study is required in some crucial areas. The first area of research that can be explored is the creation of thorough legislative frameworks that regulate the use of digital technology in government decision-making processes, covering concerns like data protection, privacy, and cybersecurity in the context of e-Cabinets. Second, initiatives for capacity building can be investigated further to find efficient ways to give government employees the abilities and information they need to

use e-Cabinets efficiently. Third, additional study is needed to develop the KPIs that may be used to evaluate the effectiveness of an e-Cabinet. It is essential to set up and monitor relevant KPIs depending on the organization's unique goals and objectives as well as the e-Cabinet implementation. The e-Cabinet system's efficiency can be obtained from regular monitoring and analysis of these KPIs, which may also help pinpoint areas that need improvement and evaluate the overall success of the document management procedures. Finally, research can concentrate on examining how e-Cabinets affect governance outcomes, such as openness, accountability, and citizen participation, to better understand their success and find areas for improvement. Insight from this research can assist governments overcome the difficulties of implementing the e-Cabinet and can ensure that the system is efficient, inclusive, and responsible.

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## **Appendix 1 - Interview Questions**

1. Kindly explain how the electronic documents management system (EDRMS) can help your organization.
2. Do you think the e-Cabinet system will help to access and monitor documents and legal acts?
3. What are the obstacles experienced while exchanging paper correspondence between different ministries?
4. Do you think electronic records management will improve cabinet decision-making processes? If yes, please explain.
5. What are the existing legislation and regulatory frameworks supporting e-government?
6. How will a document exchange system improve efficiency in cabinet decision-making processes?
7. Do you think cabinet meetings can be effectively conducted remotely with the use of the electronic document management system?
8. Will the EDRMS improve the digital workflow or automation while working virtually?
9. How does electronic records management improve the accountability of government officials?
10. What are the difficulties experienced while working with an electronic document management system?

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