ROYAL GOVERNMENT OF CAMBODIA

CAMBODIA DIGITAL GOVERNMENT POLICY 2022-2035

“Establishing digital government to improve the people’s quality of life and build trust among the people through better public service provision”

Prepared by
Ministry of Post and Telecommunications
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PREAMBLE

Cambodia has achieved complete peace and maintained territorial integrity, national unity, political stability, and socio-economic development, thanks to the win-win policy. The implementation of in-depth reform programs has improved the livelihoods of people from all walks of life, and many achievements have been made in a short period of time. With complete peace over the last two decades, Cambodia has carried out key national policies, including the Triangle Strategy, the Rectangular Strategy, the National Strategic Development Plans, and the Cambodia Industrial Development Policy, leading to the accomplishment of an average annual economic growth rate of around 7 percent prior to the Covid-19 pandemic. In this sense, Cambodia was upgraded from a low-income country to a lower middle-income country in 2015 and regarded as a new economic tiger in Asia in 2016. These are remarkable achievements that have changed Cambodia's image and role on the international stage, both regionally and globally.

Meanwhile, in order to maintain peace, security and economic growth towards sustainable development, the Royal Government of Cambodia pursues reforms, which are at the core of the country's development, through the mechanism of four main reform committees: the National Committee for Sub-national Democratic Development, the Public Financial Management Reform Steering Committee, the Committee of Public Administration Reform, and the Committee of Legal and Judicial Reform. This mechanism aims to promote good governance and provision of transparent public services to the people.

Although these reforms have been tremendously successful, there remain some challenges, including limited monitoring and evaluation mechanisms for public services, limited information and data sharing, and the remaining gap between policies and implementation. The Royal Government has continued to make reforms in all areas, especially in public administration which focuses on strengthening the capacity of ministries and institutions to provide public services to the people more effectively and efficiently. These reforms not only enhance Cambodia's development and capacity building, but also respond to the global development context, which provides opportunities for increasing economic productivity, strengthening competitiveness, fostering economic diversification, and integrating Cambodia into regional and international markets. In this new context, the Royal Government promotes and accelerates the use of digital technology as a catalyst for development, ensuring good governance and better public service delivery.

Digital government is a driver for new growth by increasing state revenue and reducing time, duplicate work, public spending, and environmental impact, as well as facilitating administrative workflows and the exchange of data among ministries and institutions. The use of digital technology requires redesigning workflows and streamlining management, division, processing, and monitoring works in a transparent, accountable, and equitable manner. A successful digital transformation is the main foundation for the Royal Government to achieve the ultimate goal of providing public services to meet the needs of the people at all times and places. The digital transformation starts with building a digital government that is a pillar for encouraging businesses and citizens to embrace digital technology with trust.

In 2000, the Royal Government began to build e-government by establishing the National Information Communication Technology Development Authority (NiDA) at the Office of the Council of Ministers. A number of e-government projects were developed during that period, and other projects have been subsequently developed.

The 4th Industrial Revolution has had a profound effect on the economy and society through the use of Artificial Intelligence technology, data analytics, and the Internet of Things. These digital technologies have led to rapid changes that are unprecedented in education, health, employment, business, public administration, and more. Necessary strategies for the Royal Government to implement in the future include ongoing modernization and expansion of digital infrastructure connectivity, promotion of the support ecosystem for research and innovation, and capacity building of civil servants through digital technology. However, the 4th Industrial Revolution brings about a number of challenges, including crimes related to digital security, protection of personal data, data security, transnational crimes, and online sexual exploitation and abuse of children and women. In this regard, the Royal Government will implement necessary policies in accordance with the **Cambodia Digital Economy and Society Policy Framework 2021-2035** to ensure a digital ecosystem that is strong and resilient to various crises, and timely responds to the development of digital technology. In compliance with the policy framework above, the Royal Government has set out the **Cambodia Digital Government Policy 2022-2035**, focusing on the vision of "establishing digital government to improve the citizens' quality of life and build their trust through better public service provision" by creating national coordination and implementation with the establishment of the Digital Government Committee and units in charge of digital transformation in ministries, institutions, and sub-national administrations; the preparation of priority national budgets; and the recruitment of technical officers.

I strongly believe in the importance and necessity for Cambodia to build a digital government, wherein ministries, institutions and sub-national administrations must work together and provide public services as needed and in a timely manner. In this sense, all ministries and institutions must cooperate in the most proactive and interactive spirit to ensure the successful implementation of the Digital Government Policy.

On behalf of the Royal Government of Cambodia, I highly commend and appreciate the efforts of **His Excellency Dr. AUN Pornmoniroth, Deputy Prime Minister, Minister of Economy and Finance**, and **His Excellency Dr. Chea Vandeth, Minister of Post and Telecommunications,** Chairman and Vice-Chairman, respectively, of the Inter-Ministerial Committee in charge of drafting the Digital Economy Policy Framework and the Digital Government Policy Framework, who successfully led the preparation of this policy document. I would also like to thank the vice-chairs as well as members of the Inter-Ministerial Committee and the Technical Working Group for their active and highly responsible participation.

Phnom Penh, January 28, 2022

Prime Minister

(Signed and Stamped)

Samdech Akka Moha Sena Padei Techo HUN Sen

PREFACE

The global trend of the 4th Industrial Revolution, coupled with the spread of Covid-19, has prompted Cambodia to accelerate its socio-economic development by using digital technology as a catalyst for new growth sources to achieve its vision of transforming into a higher middle-income country by 2030 and high-income country by 2050. In this regard, in response to the 4th Industrial Revolution, the **Cambodia Digital Economy and Society Policy Framework 2021-2035** was formulated with three main pillars: **digital citizens, digital government and digital business,** among which building digital government must begin first to promote the adoption and use of digital technology, and digital transformation in the economy and society as a whole.

Through the Inter-Ministerial Committee in charge of drafting the Digital Economy Policy Framework and the Digital Government Policy Framework, **Samdech Akka Moha Sena Padei Techo Hun Sen, Prime Minister of the Kingdom of Cambodia**, assigned the Ministry of Post and Telecommunications to lead the formulation of the **Cambodia Digital Government Policy 2022-2035,** which aims to *build a smart government based on the use of digital infrastructure and technology as an ecosystem for governance system modernization and reform in a transparent and credible manner to develop an inclusive digital economy and society.*

The policy preparation began with a study of successful establishment of digital governments in a number of countries, focusing on construction of digital government infrastructure, organization of digital governance and digital public services, promotion of digital innovation, and strengthening the partnership between the public and private sectors. The document also considers concepts arising from discussions between senior technical officials of the Ministry of Post and Telecommunications and the Supreme National Economic Council. In addition, the working group also organized several consultation meetings to receive inputs from relevant ministries, institutions, the legislature, agencies, the private sector, educational institutions, experts, and development partners.

The **Cambodia Digital Government Policy 2022-2035** is a strategic document that reflects the long-term thinking of the Royal Government and serves as a roadmap for achieving complete digital government transformation. In this sense, short-term, medium-term and long-term priority actions are organized in a coherent and comprehensive manner in line with the advancement of digital technology, the development of Cambodia, and national and international best practices. The implementation of these priority actions will contribute to improving Cambodia's rating in the E-Government Development Index published by the United Nations Department of Economic and Social Affairs every two years.

On behalf of the Ministry of Post and Telecommunications, I highly commend and appreciate the efforts of the Ministry's Technical Working Group for formulating the **Cambodia Digital Government Policy of 2022-2035.** I would also like to express my appreciation to the development partners and international institutions for cooperating with the Ministry of Post and Telecommunications in the development of our digital government, despite the Covid-19 pandemic.

I would like to express my deep gratitude to **His Excellency Akka Pundit Sopheacha AUN Pornmoniroth, Deputy Prime Minister,** Minister of Economy and Finance and Chairman of the Inter-Ministerial Committee in charge of drafting the Digital Economy Policy Framework and the Digital Government Policy Framework, for leading and coordinating with relevant ministries and institutions in the formulation of this important policy. I would also like to thank the representatives of all relevant ministries and institutions for their active participation in providing inputs to improve the quality of this document in a comprehensive manner.

I firmly believe that with the cooperation among all ministries, institutions and relevant stakeholders, this Digital Government Policy document will be implemented effectively and successfully.

Phnom Penh, January 28, 2022

Minister of Post and Telecommunications

(Signed and Stamped)

CHEA Vandeth

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As pointed out in the **Cambodia Digital Economy and Society Policy Framework 2021-2035**, which focuses on the vision of building a vibrant digital economy and society, digital transformation starts with building a digital government that is a pillar for encouraging businesses and citizens to embrace digital technology with trust.

The digital government transformation is organized in line with the *global trend* of the 4th Industrial Revolution, focused on strengthening the delivery of public services, using digital technology as an enabler. This is an important agenda to promote the reform of ministries and institutions at the national level and sub-national administrations to create a conducive environment for attracting investments and promoting inclusive socio-economic development.

The process of building a digital government in Cambodia is still in an early stage, as the digitalization of ministries and institutions has not yet been fully harmonized. Most systems focus on developing applications to facilitate the work without having a strategy for long-term digital transformation and without considering the efficiency and effectiveness that data centralization provides.

As global digital transformation and innovation of digital technology continue to accelerate, Cambodia must be ready to respond to this development *in time* to take full advantage of the development of digital technology and the 4th Industrial Revolution. According to the SWOT analysis (strengths, weaknesses, opportunities and threats) of the digital government in Cambodia, the strength is the *strong political will* of the head of the government. The support of the top leadership will facilitate coordination among ministries and institutions at the national level, sub-national administrations, the private sector, civil society, and international development partners.

The development of digital government in Cambodia faces many challenges, which are the weaknesses of the digital government system, including digital connectivity infrastructure that does not yet cover the entire country, problems with quality of services and access to financial resources, overlapped digital systems in ministries and institutions that were created according to individual needs, and the lack of a common national platform. Another weakness is the lack of a national data center for storing data and providing computing resources, while all ministries and institutions have almost no infrastructure and technical capacity for ensuring digital security.

In the process of digital transformation, the opportunities that are strategic factors for the Royal Government include a large youth population who embraces digital technology, together with the rapid growth of internet users, businesses using digital technology, and companies providing digital technology services.

The vision of this policy is to *"establish a digital government to improve the citizens' quality of life and build their trust through better public service provision."* To achieve this vision, the Cambodia Digital Government Policy 2022-2035 has set out 10 strategies: ***first***, the establishment and improvement of digital connectivity infrastructure; ***second***, the establishment and improvement of digital payment system infrastructure for public services;

third, the establishment and strengthening of digital security infrastructure; ***fourth***, the development of postal service infrastructure; ***fifth***, the organization of digital government governance; ***sixth***, the digital transformation of the government and public services; ***seventh***, the development of digital human capital; ***eighth***, the promotion of digital research and innovation; ***ninth***, the organization of collaborations with digital technology companies; and ***tenth***, the promotion of digital start-ups. Under the 10 strategies above, there are 83 priority actions comprising various projects.

To implement the above strategies and priority actions, the Digital Government Committee–established and headed by the Minister of Post and Telecommunications–has the role of leading and coordinating ministries and institutions at the national level and sub-national administrations in the digital transformation process. This includes the development of guidelines, action plans, and promotion of implementation, monitoring and evaluation in order to ensure effectiveness, interoperability and security of the entire digital information system of the Royal Government. Under the coordination of the Digital Government Committee, the Ministry of Post and Telecommunications has a key role to play in the development of digital government, such as *building integrated digital infrastructure, managing an integrated technology platform, setting out technical standards of software, hardware and digital security, and organizing digital skill training programs*. At the same time, each ministry and institution at the national level and sub-national administrations must establish *a unit in charge of the digital transformation* to promote digital transformation as part of the Digital Government Policy implementation.

To ensure a balance between expenditures and development of digital government, the Royal Government has provided a budget that is in accordance with the positive impact of socio-economic development as a result of the implementation of Digital Government Policy. In this regard, the Royal Government will allocate an *annual priority budget* and recruit an appropriate number of *digital technology officers* to meet the necessary need to implement the priority actions listed in the Cambodia Digital Government Policy 2022-2035. Moreover, there may be additional funding from the private sector, grants and/or financing from development partners.

The Digital Government Committee is responsible for setting up mechanisms to monitor and evaluate the implementation of priority actions to ensure the effective use of funds for the development of digital government. At the same time, the avoidance, mitigation, and settlement of impacts and risk management related to economic and social aspects are addressed through the coordination among ministries and institutions, streamlining work procedures, selection of digital technologies, mobilizing human capital and finance, protecting digital security, and preparedness to respond to other force majeure.

Overall, selecting priority actions for the development of digital government demonstrates the interconnection, complementation, depth, and conformity with the clear strategies in line with concrete objectives and goals towards complete digital transformation as set out by the Royal Government for 2035. Furthermore, the implementation of those priority actions will be in line with the master plan that has a precise roadmap fueled by strong political will to achieve success, efficiency, and effectiveness. Each priority action is accompanied by

concrete measurement indicators in the clear planning phases, with the ministries and institutions responsible for implementing those priority actions. Combined with precautionary measures to address various negative impacts and management of risks that may arise in the development process of the digital government, the Cambodia Digital Government Policy 2022-2035 is a comprehensive document, that serves as a practical guide to contribute to the development of the digital economy and society, where citizens' quality of life is improved and their trust in the Royal Government strengthened.

ABBREVIATIONS

4G	4th Mobile Generation
5G	5th Mobile Generation
AI	Artificial Intelligence
AAE-1	Asia-Africa-Europe 1
BPR	Business Process Re-engineering
CA	Certificate Authority
CamDX	Cambodia Data Exchange
CADT	Cambodia Academy of Digital Technology
EGDI	E-Government Development Index
eCitizen	Electronic Citizen
e-Government	Electronic Government
G2G	Government to Government
G4C	Government for Citizen
G2B	Government to Business
GDP	Gross Domestic Product
KYC	Know Your Customer
MCT	Malaysia Cambodia Thailand
NiDA	National Information Communication Technology Development Authority
NIPTICT	National Institute of Posts, Telecommunications and Information Communication and Technology
PKI	Public Key Infrastructure
RCEP	Regional Comprehensive Economic Partnership
Root CA	Root Certificate Authority
SWOT	Strengths, Weaknesses, Opportunities and Threats
UN-DESA	United Nations Department of Economic and Social Affair

1-INTRODUCTION

In line with global trends, building a digital government is an important agenda to promote the reform of ministries, institutions, and sub-national administrations, and create a favorable climate for fostering investment and inclusive economic and social development. The trend of digital government development is constantly improving in all parts of the world. The results of the digital government development assessment by the United Nations Department of Economic and Social Affairs (UN-DESA) show that the average value of the Electronic Government Development Index increased from 0.55 in 2018 to 0.60 in 2020 in 126 of 193 countries. In the regional context, the development of digital government has been identified as a key priority in the ASEAN Digital Master Plan 2025 as a basis for providing high-quality digital public services and responding to the needs of the people of the countries in the region.

As pointed out in the Cambodia Digital Economy and Society Policy Framework 2021-2035, building a digital government is a necessary pillar and first step to accelerate the realization of digital citizenry and digital businesses, and ensure high success in the development of digital economy and society as a whole. Digital government is the establishment of a governance system, and the improvement and optimization of public service delivery, through the digital transformation of the management and structure of ministries and institutions, which lead people and businesses to adopt and use digital technology to increase efficiency, effectiveness, transparency, and openness, while propelling economic and social development.

At present, digital information systems and data management developed in ministries, institutions and sub-national administrations are silo or redundant, whether they are under the same institutions or between different institutions. Although the Ministry of Post and Telecommunications has a national data center, the above challenges remain unsolved. At ministries, institutions and sub-national administrations, the necessary infrastructure development, ownership of existing systems, protection of digital security, human capital on digital technology, and regular operation and maintenance for the development and support of digital information systems and data management are lacking. Various systems' development without systematic planning or financing has caused some digital system development and data management projects to be delayed or suspended after an initial period of activities.

Therefore, the formulation of this Digital Government Policy is necessary and urgent to address the challenges related to digital information systems, connectivity infrastructure, data governance, and human capital to promote digital transformation in the economic and social sectors with consistency. The Royal Government of Cambodia sets out the Cambodia Digital Government Policy 2022-2035, excluding a number of priority activities allocated to the Digital Economy and Business Committee and the Digital Security Committee, to complement the Cambodia Digital Economy and Society Policy Framework 2021-2035, which is the whole master blueprint. This document is organized into policy sections, which make up the main document with an appendix for attachment and annexes for references.

2-CONCEPT OF DIGITAL GOVERNMENT

2.1-Definition

In the digital era, the steady advancement of digital technologies, including computers, the Internet, mobile technology, mobile devices, and technology for data analysis, has enhanced economic and social development. These digital technologies have changed people's daily lifestyle and prompted governments to change the way they provide services and communicate with people and businesses from traditional methods to modern ones. This is commonly referred to as *digital government*. In this regard, a digital government must focus on modernizing and integrating government management systems and public services to improve good governance and deliver public services that meet the needs of the people in a just, equitable, effective, transparent, accountable, and inclusive manner.

The process of digital government must be based on the whole-of-government approach, in which all ministries and institutions are constituent parts interacting within a system. Ministries and institutions can design and develop digital information systems for their internal administration and delivery of public services by interconnecting, sharing data, and functioning as a single digital government system.

In general, there are five levels to building a digital government:

- **Level 1**: E-government is the first stage of digital government, with the development and use of digital information systems to provide information and services online, but the digital information systems, infrastructure, and data are separate and yet to be integrated.

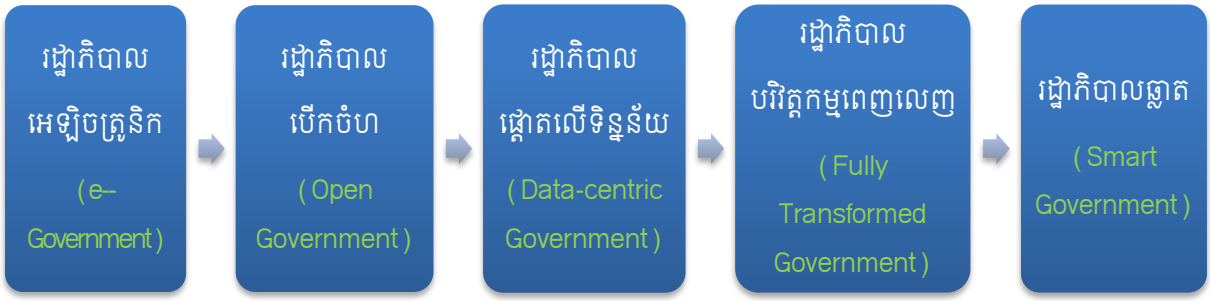
- **Level 2**: Open government is the stage at which digital information systems are created to receive feedback from citizens and interact with service recipients. In this second level, the government's information is open to the public to ensure transparency and accountability.

- **Level 3**: Data-centric government is the development of digital government that considers data as an important and necessary asset. Government priority is no longer on application development, but on the collection, use, and analysis of data. Digital information systems, infrastructure, and data of ministries and institutions at the national level and sub-national administrations are gradually being harmonized using the government's integrated digital platform (Government as a Platform) for work processes.

- **Level 4**: Fully transformed government is a phase in which all ministries and institutions are fully digitalized, with all digital information systems, infrastructure, and data integrated, and the use, management, and protection of data and service delivery are outstanding.

- **Level 5**: Smart government is the stage where the collection and analysis of data are automated as a basis for decision-making and responding to problems. Innovation of digital government services using new technologies, such as artificial intelligence, the Internet of Things, Big Data, blockchain, and cloud technology, can be fully realized at this stage.

Figure 1: Levels of digital government development



2.2-Implementation Principles

According to the experiences of some countries around the world, building a fully functional, efficient, and effective digital government is based on three fundamental principles:

1- The Once-Only Principle

The Once-Only Principle refers to the principle of developing digital information systems that require ministries, institutions, legal entities, and citizens to *provide data only once* to the competent authorities, without requesting or requiring them to submit the same data multiple times. This principle reduces the entry of inconsistent data, administrative costs, and the workload of competent authorities and stakeholders in collecting, storing, and using data.

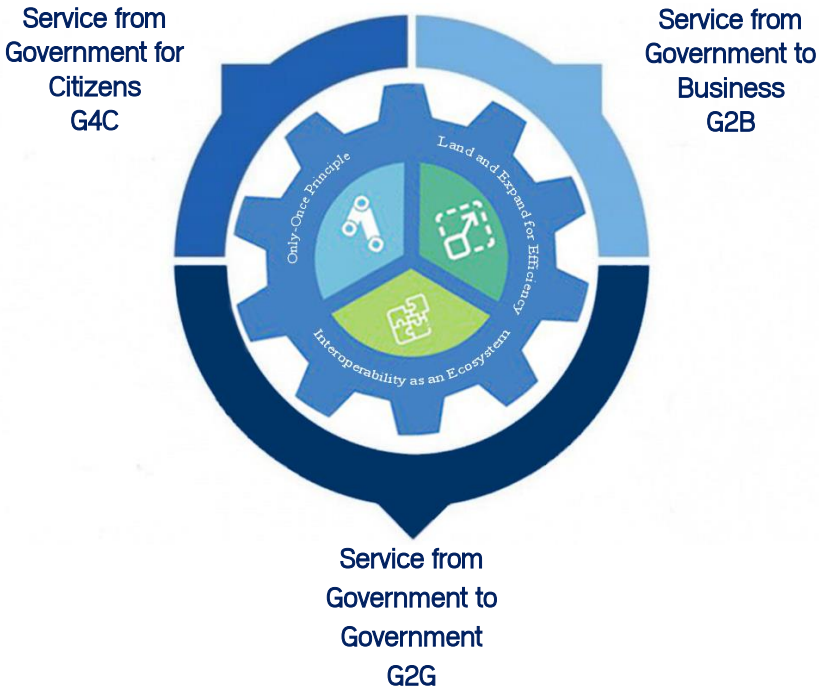
2- Interoperability as an Ecosystem Principle

This principle ensures that all government digital information systems can operate independently and with other systems as an ecosystem to complement each other in the efficient provision of public services. In this sense, the digital information systems used by ministries and institutions must have interoperability and exchange of data with each other. In addition, this principle allows government digital information systems to interact and exchange data with digital information systems of the private sector to promote data innovation and governance in the sense of increasing efficiency in the private sector's business operations.

3- Land and Expand for Efficiency Principle

This principle enables ministries and institutions to initiate the development of digital information systems by *starting small and expanding bigger* to meet the needs of their effective management and provision of public services, building on a specific basis and defined framework and in accordance with the above two principles. In this sense, digital information system initiatives need to focus on the essential priorities and effectiveness, in order to expand the scope through the use of existing components (reusability) or expand to share the use with other systems by ensuring efficiency and security of the entire system.

Figure 2: Principles on Implementation of Digital Information Systems



2.3-Positive Effect of Digital Government

According to the World Bank's World Development Report in 2016, a 10 percent increase of fixed high-speed internet would boost the gross domestic product (GDP) by about 1.21 percent in developed countries and 1.38 percent in developing countries. In the case of the People's Republic of China, its GDP grew 2.14 percent from 2004 to 2009 by reducing communication expenses and increasing the efficiency of e-commerce business.

In 2017, an assessment on the positive impact of the digital field, conducted by the Oxford Economics Research Institution, showed that the adoption and use of digital technologies boost production and productivity and, in turn, lead to economic growth. Over the past three decades, an additional US$ 1 investment in digital technology leads to a GDP growth of US$ 20 compared to investment in other sectors, which returns only US$ 3 in the same period of time.

Increasing the investment budget for digital government development will promote GDP growth based on a number of indicators, such as *increased labor productivity in the public sector, increased gross output of the public sector*, and *efficiency of public administration*. According to a study by the International Monetary Fund, the development of digital governments in European Union member states accelerated GDP growth by 2 percent from 2005 to 2010. In 2020, the broadcasting document on digital government in the Republic of Korea shows that digital services contribute positively to the economic and social development of US $ 1.3 billion and reduces greenhouse gas emissions by 22,000 tons. However, the driving forces behind economic and social development from digital government depend on the situation of developed and developing countries, where developing countries relatively receive greater benefits.

Furthermore, the digital government will take part in building a digital ecosystem that provides the foundation and environment conducive to the development of digital technology, which positively contributes to economic growth by creating innovative services and products, fair business competition, and reducing expenses and time.

In this context, the development of Cambodia's digital government is a priority for the Royal Government, in the present and future, and is an enabler for the development of a digital economy and society in response to the 4th Industrial Revolution and to contribute to achieving Cambodia's visions for 2030 and 2050.

2.4-Experiences and Best Practices of Digital Government

Based on the experiences and best practices of some countries in the world, the development of a highly effective and efficient digital government considers the following: *formulating digital government policies and legal frameworks, building and improving digital infrastructure, strengthening digital government services, promoting capacity building, digital research and innovation, promoting the partnership between government and the public, and determining sources of funding*.

Formulating digital government policies and legal frameworks is an important basis for digital government transformation. In fact, in some countries, the development of digital government has been successful based on the formulation of digital government policies and legal frameworks, political will and the support of top leadership, planning based on economic and technological developments, and the establishment of digital government coordinating mechanisms at the national and sub-national levels, etc. In some countries, the approach to building a digital government is prepared from top-down and mixed between centralization and decentralization. In centralization, the legislature, ministries and institutions at the national level, and the judiciary need to develop a master plan for the development of digital government over a set period of time, such as building a national data center. In decentralization, sub-national administrations may prepare action plans to develop digital information systems, such as delivering public services in their administrations and connecting with the digital government system. Building a digital government through decentralization can usually face the problems of systemic connectivity and interoperability at ministries and institutions. To address this problem, some countries have developed common technology platforms for connectivity and data sharing.

In addition, building and improving *digital infrastructure* is a necessary foundation to support digital government, which requires thorough consideration. The building and improvement of this digital infrastructure must focus on quality and scope, including the building of high-speed internet infrastructure, national and sub-national government connectivity networks, data centers, data exchange platforms, payment gateways infrastructure for public services, digital identity infrastructure, and digital security infrastructure to give integrity to the digital government.

At the same time, strengthening *public services* by using digital technology is a key driving factor to move these services closer to people and businesses more efficiently and transparently. In some countries, public services are provided through a national web portal and mobile applications, which provide a one-stop window for citizens and businesses to obtain

information, easily interact with the government, and make secure payment transactions at all places and times. For example, some countries have developed integrated electronic procurement systems for online procurement, including bidding function, contract preparation, and processing of payment. In addition, electronic tax and customs systems have been placed for official use, including automatic procedures for customs clearance and tax refunds, to promote public service delivery from government-to-business (G2B). Additionally, to improve efficiency of administrative work, communication, management and service delivery from government-to-government (G2G), governments of some countries have established collaboration platforms for administrative work, electronic mail (e-mail), electronic document management systems, and electronic approval systems.

At the same time, *promoting digital capacity building and digital research and innovation* is an important part to support the development of digital government. Countries with a high level of digital government development focus on strengthening their leadership and digital skills, as well as promoting digital literacy to all stakeholders, such as civil servants, national and sub-national institutions, students and citizens, and paying attention to research promotion and development, innovation, and using of the latest advanced technologies, such as big data, artificial intelligence, blockchain, cloud technology, and Internet of Things. In other countries, the integration of digital literacy programs into public and private education systems is included in the national digital development agenda through the modernization of education system infrastructure, capacity development, incentives for teachers and leaders of educational institutions, changing to digital teaching methods, and embracing digital culture in student's learning to meet the needs of the job market and sustainability of the digital society. Furthermore, investment in digital research and innovation is also encouraged in research institutions, universities, and the private sector to support the digital government.

On the other hand, *enhancing the partnership between the public and private sectors* is a good experience for promoting the development of digital government. This partnership focuses on investing in digital infrastructure and setting up ecosystems to support digital government processes, including performance, maintenance, training, research, development, and innovation. In some countries, for example, partnership mechanisms between public and private sectors have spurred investment on the development of network infrastructure and data centers on a "invest first, pay later" basis.

Determining the *sources of funding* is also a main factor in ensuring the development of a successful digital government, which includes sources from the national budget, partners between public and private, development partners, and other legitimate sources. In some countries, for example, a major source of funding is an annual budget determined by the government at a rate of the GDP to ensure the development of digital government.

However, some developing countries in the region still face some challenges at the early stage, such as (1) Human capital issues: officials and citizens adapt and change their attitudes to embrace digital technology slowly due to the lack of skills, incentives, training, and system reliability; (2) Budget issues: investment from the public and participation of private sectors are limited for the development and maintenance of large digital information systems; (3) Data and information sharing issues: integration of digital technology systems is a challenge due to the lack of laws and regulations, clear mechanisms, and the will of relevant officials, which are

obstacles to the development of digital government. In addition, the culture of data concealment causes difficulties in connecting, accessing and using data in the government.

Moreover, digital security is a challenge in the development of digital government that must be included in digital security policies and strategies as a priority. The main targets of attacks from hackers are the digital infrastructure, mobile networks, key infrastructures, websites of ministries and institutions, other media networks, and digital banking operating systems that make them inoperable throughout the country.

3-STATUS OF DIGITAL GOVERNMENT OF CAMBODIA

3.1-Evolution process

In 2000, the first digital public service in Cambodia was launched and the **National Authority for Information and Communication Technology Development** (**NiDA**) was established under the Office of the Council of Ministers. This authority established a national information infrastructure network, starting from connecting ministries and institutions and then expanding to nine priority provinces, with three data centers and three digital information systems.

In 2013, **NiDA** was integrated into the Ministry of Posts and Telecommunications, and the national information infrastructure network continues to be used by ministries and institutions to this day. Subsequently, the Royal Government of Cambodia continued to develop the telecommunications and information and communication technology sectors by enacting a number of policies, laws and regulations, which are consistent with international best practices and highlight the partnership between the public and private sectors. The Rectangular Strategy Phase 3 from 2013 to 2018 underscores the need to further develop e-Government and encourage the private sector to invest more in digital technology and infrastructure. In 2014, ***the Communication Technology Master Plan of Cambodia 2020*** was adopted with the aim of promoting the development of communication technology and information, and strengthening the development of human capital, internet connectivity, digital security, and public services through electronic systems.

In 2014, the Royal Government established the National Institute of Posts, Telecommunications, Information and Communication Technology (NIPTICT) as an agency of the Ministry of Posts and Telecommunications to partake in the training of human capital, skills and digital literacy to civil servants and to promote digital research and innovation, and this institute was developed to Cambodia Academy of Digital Technology (CADT) in 2021. By 2021, the Cambodia Academy of Digital Technology has trained 500 students in digital major, digital literacy to more than 6,700 civil servants from all ministries, institutions and sub-national administrations, and digital literacy to more than 5,000 students and sub-national administration officials in remote areas, and has researched digital technologies, such as Khmer language technology, artificial intelligence, and has contributed to the promotion of digital innovation and the building of new digital business ecosystems.

In 2015, ***the Law on Telecommunications*** was promulgated for the purpose of ensuring (1) the use of infrastructure and network and the provision of telecommunication services with efficiency, safety, quality, reliability, and affordability, (2) promoting and encouraging the private sector to participate in the development of this sector, and (3) fair competition and consumer protection.

In 2016, the Royal Government approved ***the Development Policy for Telecommunications, Information and Communication Technology 2020***, which sets out measures and goals to strengthen the basis of the development of the telecommunications, information and communication technology sectors, digital security, to promote industrial development, and the use of information and communication technology. Results on the implementation of this

policy are still limited and have not achieved its goals due to various challenges, such as financial resources and human capital.

Since 2018, the Royal Government made digital development a priority for economic and social development in response to the trends of the 4th Industrial Revolution. Starting from that, the Royal Government has been preparing policies, laws and regulations aimed at launching digital services programs with participation from citizens and all stakeholders.

In late 2019, Cambodia adopted ***the E-Commerce Law***, which determines the authenticity, accuracy, security, and reliability of electronic forms and communications, and ***the Consumer Protection Law*** to promote fair competition. At the same time, Cambodia has signed regional trade agreements, such as the Regional Comprehensive Economic Partnership (RCEP) and the ASEAN Agreement on the Trade on electronic system, which set out Cambodia's obligations to implement those agreements. In addition, the Royal Government has been preparing a ***Draft law on Information Technology Crimes*** for the purpose of preventing and suppressing information technology crimes; a ***Draft Law on Cybersecurity*** in order to identify principles and mechanisms for preventing, managing, and responding to digital security threats and digital security incidents; and the ***Draft law on Access to Information*** in order to ensure that every public has the right to freedom of information from public institutions in accordance with the spirit of the Constitution of Kingdom of Cambodia.

In 2020, there were plans to develop digital infrastructure and digital information systems, such as setting up three data centers and service rooms in 20 ministries and institutions. Ministries and institutions set up internal networks and internet connection provided by the Ministry of Posts and Telecommunications or companies, but did not connect to all relevant departments or units.

In 2021, there were about 17.65 million registered internet users, of which about 17.35 million mobile internet subscribers (as shown in Table 1). Telecommunication infrastructure is not yet covered throughout the country, while the backbone fiber-optic cable network is about 46,000 km and two submarine fiber-optic cable networks, the first submarine fiber-optic cable connecting Cambodia to Thailand and Malaysia (Malaysia Cambodia Thailand MCT), the second cable network connects Cambodia to 18 countries in Asia, Africa and Europe (Asia Africa Europe 1 AAE-1). The 4th generation mobile network (4G) is providing services to approximately 80% of the population.

Table 1: Internet and telecommunication services user rates coverage in 2021

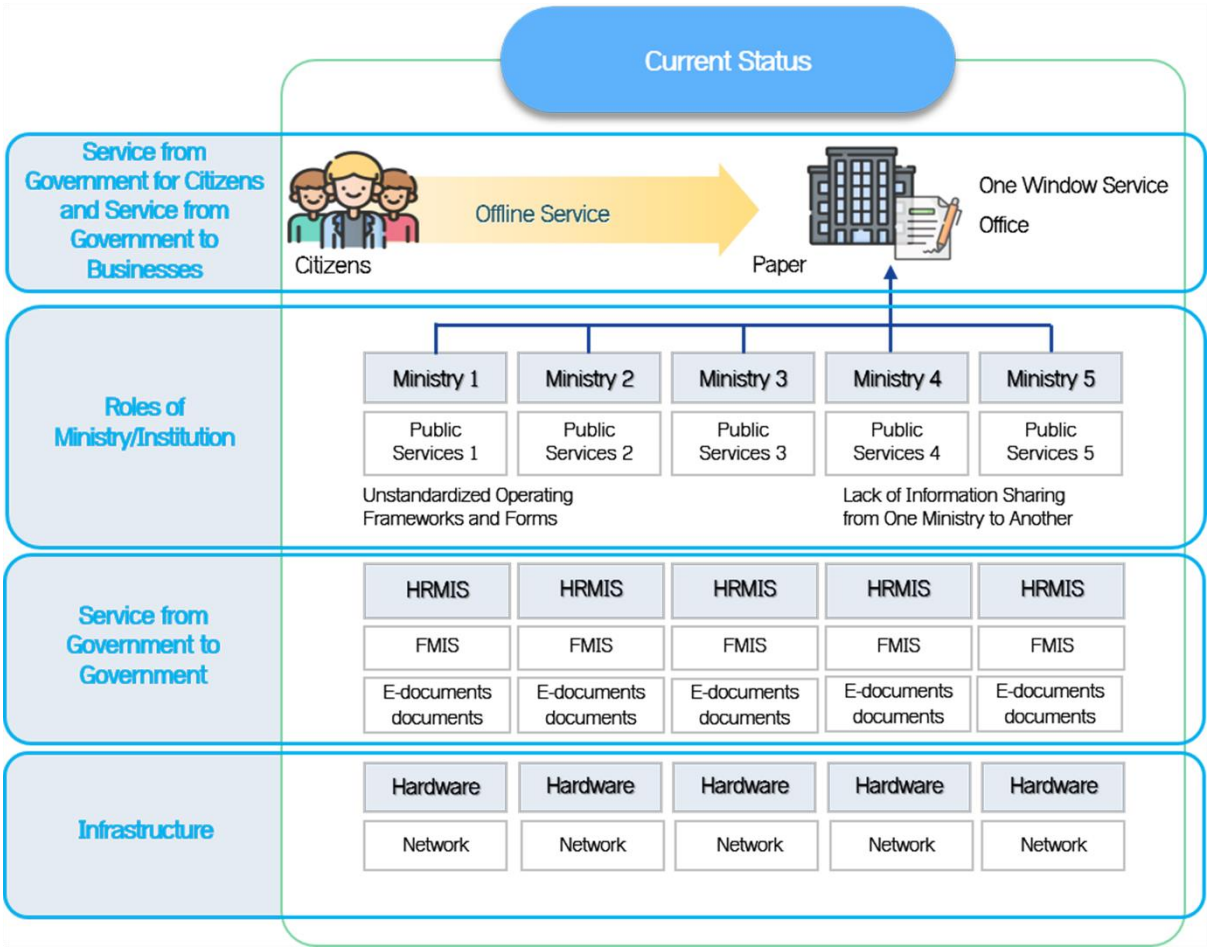
Internet user rate			
Operator	**Number of users**	**Rates per 100 people**	**Market share**
Mobile Internet service (5 companies)	17,349,261	105.60	98.30%
Fixed internet service (35 companies)	304,071	1.82	1.70%
Total	17,653,332	107.42	100%

Telecommunication Service Coverage		
Description	**Coverage rate comparing to total population (%)**	**Coverage rate comparing to total area**
Coverage of mobile phone service 2G	92.3%	79.5%
Coverage of mobile phone service 3G	85.2%	66.2%
Coverage of mobile phone service 4G	82.5%	60.4%

Source: Telecommunication Regulator of Cambodia 2021

In addition to digital infrastructure development, 3,508 public services were launched, of which 77.54% applied directly from One Window Service Office (OWSO), 10.60% applied directly but downloaded online applications and 11.86% applied through online application service. The Royal Government Digital Information System is in operation, a total of 182, as in Appendix I. Among them, 30.8% are public services from Government-for-Citizens (G4C), 9.5% from Government-to-Business (G2B), and 59.8% from Government-to-Government (G2G).

Figure 3: The current status of digital government of Cambodia



Source: Ministry of Post and Telecommunications Survey 2020

3.2-Cambodia Digital Government Analysis

The realities of Cambodia's digital government will be reflected in the analysis of strengths, weaknesses, opportunities, and threats (SWOT). The results of the analysis are the necessary basis for the formulation of a digital government policy with a clear vision, objectives, goals, strategies, and tactics.

Strengths

- The Royal Government of Cambodia has the political will and highly support the promotion of the building of a digital government in accordance with the rapid development in the region and the world.
- The National Council for Digital Economy and Society is the top institution to lead and nationally coordinate the implementation of the digital economic and social policy framework for digital government, digital citizenship, and digital businesses. The Ministry of Posts and Telecommunications is highly committed to coordinating and implementing successful digital government policies.
- The Ministry of Posts and Telecommunications is the leading institution in the digital revolution, with highly skilled and experienced officials in the building and implementation of digital government and digital security.
- Relevant ministries and institutions are highly committed to cooperate on the implementation of digital government policies, with a number of technical officers with experience implementing digital information system projects in the past.
- Advantages from the adoption of the latest technology for digital revolution in ministries and institutions and without the hassle of integration and modernization of the previous generation of digital systems (Legacy System).

Weaknesses

- In 2020, Cambodia was ranked 124th out of 193 countries according to the UN-DESA assessment on infrastructure, online services, and human capital. In that, the online services and human capital indexes ranked low compared to the average ranking in ASEAN.
- Lack of policies, laws, and regulations for building digital government. Policies and action plans have not been fully implemented due to various reasons, especially the limited budget.
- Some ministries and institutions have not yet set up a unit in charge of digital revolution with clear roles and responsibilities and can work effectively. On the other hand, the unit in charge of digital revolution in the sub-national administration does not yet exist.
- Ministries and institutions set up digital information systems according to their own needs and in isolation, without consistency or overlap.
- Investment in digital information systems is inconsistent compared to the increase in the number of public services in ministries, institutions, and sub-national administrations.

- Telecommunication infrastructure does not yet cover the whole country and service quality is still low.
- The network connection between ministries, institutions, and sub-national administrations is insufficient and not yet separate from the general internet network. Ministries and institutions, about 46% of which are already connected, have not properly set up an internal network and met all technical standards for the distribution of internet and other digital services in the workplace.
- The lack of a national data center, which has servers to provide computing resources and common data storage, is a major problem for ministries and institutions. Only 30 percent of ministries and institutions use local data center services while others rely on overseas cloud technology services.
- National platforms and common systems for sharing the use, exchange of data, and interoperability are insufficient.
- A common digital identity infrastructure, which is a lever to encourage online transactions, does not yet exist.
- Digital security protection in ministries and institutions is still low. Ministries and institutions have almost no digital security infrastructure, use of software with lack of security standards or proper licenses, and lack of technical capacity to monitor, analyse, control, prevent, and respond to cyber-attacks. There are only 22 percent of ministries and institutions where designated officials are in charge of digital security, and consumers' awareness of digital security remains low.
- The absence of national payment gateways for public services is a challenge in setting up the online payment system of ministries and institutions.
- The number and capacity of human resources with digital technology skills in ministries and institutions are still limited, which is a major obstacle to the development, management, operation, and maintenance of digital government system.
- Ecology systems to support partnerships between the public and private are not strong enough to create momentum, accelerate development, and drive innovation.
- Absence of final destination transportation system for public services.

Opportunities

- In 2021, there are 20.53 million mobile subscribers equivalent to 122.84 percent of the total population, and 17.35 million mobile Internet connections equivalent to 105.60 percent. About 37 percent of young people can quickly capture the use of digital technology. Businesses using digital technology have grown along with the increase of a number of digital business companies.
- Revenue from the telecommunications sector is US$ 1,100 million by 2020, equal to 4.2 percent of GDP, which is a high rate compared to other developing countries.
- The use of digital technology is a core for organizing and improving public services to serve the people and promote the connection between government and the people.

- The spread of Covid-19 has propelled countries to use digital technology in administration, business, and social networks, which is a driving force for the digital revolution and digital connectivity between countries in the region and the world.
- The evolution of the 4th Industrial Revolution by using the latest emerging technologies, such as artificial intelligence, big data, blockchain, cloud technology, and the Internet of Things.
- Regional and global consensus on policy development, regulatory frameworks to develop connectivity infrastructure, cross-border data flow, protection of digital security, discussions on the use of digital technologies in various forums, and agreements, urges developing countries to take advantage of the development of digital technology, e-commerce, and the digital economy.

Threats

- Geopolitical conflicts and cyber warfare, trade and economics can hinder and undermine the development of connectivity infrastructure, digital economy integration, and building of digital government.
- Large-scale natural disasters have a long-term impact on digital connectivity infrastructure, such as submarine fiber-optic cable networks, backbone fiber-optic cable networks, and data centers.
- Increased cyber-attacks aimed at destroying or disrupting the operation and building of Cambodia's digital government.
- Outbreaks of epidemics, regional and global financial crises, the collapse of technology companies covering the global economy that could eventually affect e-commerce, the digital economy, and the building of digital government.

Based on analysis of the actual situation, the development of Cambodia's digital government is still at the first level, as at present, digitalization by ministries and institutions has not been integrated and there remain many challenges to be addressed and further developed. Even so, there are many opportunities that will drive the development of digital government. In this regard, the Royal Government is highly committed and supportive of digital transformation and takes the opportunity as well as sets out measures to reduce the potential risks of building a strong digital government that contributes to economic and society developments.

4-VISION

The vision of this policy is to "**establish a digital government to improve the citizens' quality of life and build their trust through better public service provision**."

5-OBJECTIVES

This policy aims to ***build a smart government based on the use of digital infrastructure and technology as an ecosystem for governance system modernization and reform in a transparent and credible manner to develop an inclusive digital economy and society.***

6-STRATEGIC GOALS AND STRATEGIES

In order to achieve the above vision and objectives, the Royal Government has set four strategic goals and ten strategies as follows:

1. The first strategic goal is to **promote the development of digital government infrastructure** with the following four strategies:
   - Strategy 1: Building and improving digital connectivity infrastructure.
   - Strategy 2: Building and improving infrastructure for digital payment systems for public services.
   - Strategy 3: Building and strengthening digital security infrastructure.
   - Strategy 4: Developing postal service infrastructure.
2. The second strategic goal is to **build digital governance and create digital public services** with the following two strategies:
   - Strategy 5: Organizing digital government governance, such as through the formulation and improvement of policies, the creation and improvement of the legislative frameworks and relevant regulations, and the preparation of digital government standards and architecture.
   - Strategy 6: Digitally transforming the government and public services, such as through the improvement of Government-to-Government (G2G), Government-for-Citizens (G4C), and Government-to-Business (G2B) public services.
3. The third strategic goal is **digital capacity building and innovation**, with the following two strategies:
   - Strategy 7: Building digital human capital.
   - Strategy 8: Promoting digital research and innovation.
4. The fourth strategic goal is **to promote cooperation and partnerships between public and private sectors** with the following two strategies:
   - Strategy 9: Organizing collaborations with digital technology companies.
   - Strategy 10: Promoting digital startup

Figure 4: Vision, Goals, Strategic Goals, Strategies

VISION	"Establish a digital government to improve the citizens' quality of life and build their trust through better public service provision".				
GOALS	Build a smart government based on the use of digital infrastructure and technology as an ecosystem for governance system modernization and reform in a transparent and credible manner to develop an inclusive digital economy and society.				
STRATEGIC GOALS	Promote the development of digital government infrastructure		Build digital governance and create digital public services	Digital capacity building and innovation	Promote cooperation and partnerships between public and private sectors
STRATEGIES	Digital connectivity infrastructure	Infrastructure for digital payment systems for public services	Governance of digital government	Building digital human capital	Collaborations with digital technology companies
	Digital security infrastructure	Postal service infrastructure	Transforming digital government and public services	Digital research and innovation	Digital startups

7- PRIORITY ACTIONS

According to the Action Plan in the **Cambodia Digital Economy and Society Policy Framework 2021-2035**, there are a total of 139 key policy measures to be implemented. The key policy measures are organized according to different strategic clusters that focus on five goals: 1- Development of infrastructure, 2- Building trust and confidence in the digital system, 3- Building digital citizens, 4- Building digital government, and 5- Promoting digital businesses.

The responsibility for implementing these key policy measures is divided into three committees of the National Digital Economy and Society Council: Digital Government Committee, Digital Economy and Business Committee, and Digital Security Committee. The Digital Government Committee and Digital Economy and Business Committee are jointly and separately responsible for building digital government, building digital citizens, and digital businesses in collaboration with the Digital Security Committee.

Through the above division, the Digital Government Committee is responsible for implementing 60 key policy measures under the Cambodia Digital Economy and Society Policy Framework 2021-2035. Based on this, this Digital Government of Cambodia Policy 2022-2035 *identifies 10 strategies and 83 priority actions* as stated in Appendix 1.

7.1-Strategic Goal 1: Promoting the development of digital government infrastructure

Strategy 1: Building and improving digital connectivity infrastructure

The purpose of building and improving digital connectivity infrastructure is to ensure quality, effectiveness, and security of network connectivity and the storage, processing, sharing of data to support the development, management, and utilization of digital government systems. The priority actions of this strategy are as follows:

- Strengthen and expand mobile and broadband infrastructure through: 1. Quality improvement and coverage expansion of fourth generation mobile services (4G) as a basis for transition to fifth generation mobile services (5G); 2. Construction of telecommunications infrastructure for 5G services and the latest mobile telecommunications technology; 3. Building submarine cable network and building high-speed internet infrastructure to all communes/sangkats through partnership with the private sector and the use of the Universal Service Obligations (USO) Fund; and 4. the provision of shared telecommunications infrastructure for all telecom operators to reduce investment and operational costs in order to improve the quality of services with competitiveness at affordable prices.
- Promote the establishment of national data centers with both the operation and disaster recovery centers, using cloud technology to provide infrastructure, platform, software, and data services, including data and Big Data analysis, to support governance and decision-making in ministries and institutions to reduce costs, maintain data security, and increase effectiveness and productivity for the government. In establishing these

data centers, they will be connected to all existing data centers in ministries and institutions to ensure better and more responsible maintenance, protection, and sharing of data.

- Properly establish digital government network infrastructure that connects all ministries, institutions and Cambodian missions abroad through the government's private network, by improving existing infrastructure and investing in new network infrastructure to increase capacity for supporting digital government operations.
- Promote the development of a satellite ecosystem by 1- establishing key foundations to strengthen and promote the use of the satellite ecosystem; 2- establishing platforms for using satellite data, focusing on the continuity and effectiveness of project implementation by ministries and institutions; and 3- building human resources for the technological development and utilization of satellite systems.
- Strengthen and expand the Cambodia Data Exchange (CamDX) platform to allow the exchange of data between information systems of all ministries and institutions and be able to connect with information systems of the private sector to enhance the effectiveness of public service provision.
- Promote the connection of digital infrastructure at the sub-national level from the capital and provincial to commune levels, such as to commune offices, police stations, schools, health centers, and towns, to support digital public services, online education and training, online health counseling and diagnosis, citizens' digital adoption, and information on agricultural markets and products.

Strategy 2: Building and improving infrastructure for digital payment system for public services

The priority action of this strategy is the building and improvement of digital payment system infrastructure for public services through the connection and use of the national payment gateway infrastructure to ensure the effectiveness, security, and convenience of and high confidence in the payment methods for public and other services of the Royal Government.

Strategy 3: Building and strengthening digital security infrastructure

The aims of building and strengthening digital security infrastructure are to comprehensively protect digital infrastructure and ensure high security and safety on management, operation, and use of digital systems, in order to build trust on digital government systems. The priority actions for this strategy are as follows:

- Strengthen the management and protection system for the national information infrastructure through the establishment of security procedures and the installation of technical equipment for monitoring and preventing cyberattacks in accordance with digital security standards.
- Put in place and strengthen the security of National Internet Gateways (NIG) to increase the existing capabilities for protecting national security and maintaining social order, public morality, culture, and national traditions.

- Develop and strengthen digital identity infrastructure to support the management, use, and verification of natural persons' and legal entities' digital identities used for operating digital platforms within the framework of both the digital government and private sector, through the building of public key infrastructure (PKI) and the use of leading digital technologies. The Royal Government has developed a QR-Code application and the Vaccine App, which have been integrated together as the QR-Code Vaccine system with the function to create Digital Vaccine Certificates and digital Health Travel Passes. On this basis, the Royal Government will proceed to setting up the Health ID and Digital ID for the citizens. Mechanisms for issuing, monitoring, verifying, and using digital identities have been put in place in line with national necessities and regional and global best practices. As stated in the section on implementation mechanism, the Ministry of Post and Telecommunications will be responsible for developing and managing infrastructure to support digital identity, such as cloud-based data centers and digital security infrastructure, and the relevant ministries and institutions will manage digital identity data. The Ministry of Post and Telecommunications will cooperate with the Ministry of Interior and the Ministry of Economy and Finance to establish and strengthen digital identity infrastructure for the Know Your Customer (KYC) systems developed by the operator of Cambodia Data Exchange (CamDX), for use in public administration and the economic sector.

Strategy 4: Development of Postal Service Infrastructure

Postal service infrastructure must be continually developed through the organization and improvement of information infrastructure, support infrastructure for postal service network, and a national postal digital platform, to strengthen management of and expand the provision of postal services, such as basic postal services, postal logistics, courier services, postal financial services, digital postal services, public digital postal services, Express Mail Services and last-mile delivery.

7.2-Strategic Goal 2: Building Digital Governance and Creating Digital Public Services

Strategy 5: Organizing the Governance of Digital Government

The organization of the governance of digital government starts with the formulation and adoption of necessary policies, the creation and updating of relevant legislative frameworks and regulations, and the preparation of digital government standards and architecture in accordance with the principles, norms, models, technological evolution, and national and international best practices. These are the bases for effectively, efficiently, and securely developing the digital government to support the building and development of a strong and vibrant digital economy and society. The priority actions for this strategy are as follows:

- Develop a data governance policy to lay down principles and standards of data architecture, mechanisms and frameworks for data management, modification, localization, classification, sharing, and protection, as well as cross-border data flows

to ensure enough quality and safe data in line with the needs of users without discrimination.

- Develop an open data policy to lay down principles, standards, licenses, and mechanisms for opening, storing, and sharing of government data to public institutions, the private sector, and citizens for their use in accordance with existing laws and regulations. Open data aims to enhance transparency, equality, and accountability, and improve quality of services, thus increasing public trust in the government, while enhancing research and innovation with sustainability and inclusion.
- Prepare a policy to promote software development and use, to lay down principles, quality standards, and management and incentivization mechanisms in order to expand the market, promote investment, build up a pool of skilled human resources, provide training on how to use new software, and increase the use and supply of local software.
- Develop a digital policy for smart cities to lay down principles, standards, frameworks, and mechanisms for organizing the governance, infrastructure, platforms, data, services, and digital security arrangements for promoting smart cities development and to improve municipal governance through the use of sustainable and inclusive digital technologies and data.
- Develop a postal development policy to take full advantage of relevant opportunities, through the modernization of a number of postal services by using digital technology as a core and the development of legal frameworks, mechanisms, network infrastructure, and post, as well as the enhanced management of private sector delivery services, all with an aim to provide quality, effective, secure, comprehensive, and reliable postal services in accordance with the needs of consumers and international standards.
- Develop policy to promote the development of important digital technologies, to lay down principles, standards, frameworks, and mechanisms for promoting the development and use of leading digital technologies, such as cloud technology, Artificial Intelligence, Big Data, Internet of Things, and blockchain.
- Formulate a Law on Digital Government to determine measures, principles, mechanisms, standards, procedures, funding sources, and methods for developing, managing, and utilizing digital government systems; and formulate regulation on the use and sharing of government's data among ministries, institutions, and sub-national administrations. The Law on Digital Government will establish legal norms regarding the use and management of digital identity, which is important for digital government processes and an important component for the operation of digital information systems. Meanwhile, digital identity will enable citizens to fully access digital government services and equitably and inclusively benefit from the digital society and economy.
- Formulate a Law on Information and Communication Technology (ICT) to define the functions of competent institutions, licensing framework, service standards, competition rules, rights and responsibilities of service providers and users, in order to strengthen the management and development of the ICT sector.
- Formulate a Law on the Protection of Personal Data to determine the principles, mechanisms, and procedures for the protection of individuals' personal data, in order

to protect the rights, freedoms, dignity, and values of individuals. This law is an essential tool for increasing people's confidence and trust in the use of digital services. Natural persons and legal entities are required to take appropriate and necessary measures to ensure that the rights and data of citizens are respected and protected.

- Formulate and amend the Law on Telecommunications and related regulations to strengthen the effectiveness of the management and development of the telecommunications sector.
- Formulate norms and guidelines on digital signatures to define the mechanism for building public key infrastructure, verifying digital identities, and identifying senders and recipients of electronic documents, for the purpose of enhancing the security and safety of online correspondences.
- Formulate a new Law on Postal Services to define the functions of competent institutions, licensing framework, service standards, rights and responsibilities of service providers and users, in order to strengthen the management and development of the postal sector with the use of digital technology.
- Formulate a Law on the Right to Information to determine mechanisms and procedures to encourage public institutions to fulfill their obligations to disclose and widely disseminate information to the public.
- Amend relevant laws and prepare relevant regulations regarding content posting and creation, to define mechanisms for monitoring and controlling digital content, rights, and responsibilities, aiming at contributing to the protection of national security, social order, tradition, and national culture.
- Develop Administrative Process Standards to determine principles, norms, and procedures for effectively and efficiently executing common administrative processes within the Royal Government; and study, analyze, and re-engineer business processes (BPR) in accordance with the trends and development of digital technology.
- Develop digital administrative terminology to determine the administrative syntax and the meaning of terms used in administrative work and data standards (data format and meaning) serving information system development.
- Promote the framework for developing and designing digital government systems, aiming to ensure the effectiveness, quality, and sustainability of the development and use of digital government services.
- Develop digital service management standards to identify requirements, models, mechanisms, and procedures for directing and managing digital services, with an aim to ensure the quality, safety, and effectiveness of digital services delivery.
- Develop software engineering and information system standards to define the terminology, methodologies, instruments, and techniques for planning, analyzing, formulating, developing, testing, deploying, and maintaining software and information systems with high quality and effectiveness, to contribute to promoting and fostering the domestic software industry.
- Develop digital security standards for the digital government, to define the terminology, mechanisms, technical frameworks, operation, the digital security management system,

and code of conduct for monitoring digital security, for the purpose of ensuring the security and safety of its information systems.

- Develop smart city technical standards to define principles, terminology, technical frameworks, and mechanisms for developing infrastructure, data management, technology platform, security arrangements, and digital services for smart cities, such as smart governance services, smart economy, smart mobility, smart environment, smart people, and smart living.
- Develop data center standards to define the technical frameworks and mechanisms for the designing and constructing quality, safe, and sustainable data centers. These frameworks and mechanisms focus on physical layout, building, rooms, electrical systems, air conditioning systems, security systems, and technical equipment for government and private data centers.
- Develop standards for latest leading digital technologies to define principles, guidelines, technical standards, and mechanisms aimed at supporting the development of digital technologies, especially new technologies, such as cloud technology, Artificial Intelligence, Big Data, the Internet of Things, and blockchain, in line with national and international best practices.
- Develop digital government architecture, including business principles and designs, data, software, and technology, to serve as a guiding document for the highly effective management, development, and use of digital government systems.

Strategy 6: Digitally Transform the Government and Public Services

The digital transformation of the government and public services starts from the design and improvement of government-to-government (G2G) services to be simpler and easier to use and to increase the effectiveness of the Royal Government's administrative work, by enhancing the communication and cooperation among the ministries, institutions, and sub-national administrations, changing the practice of working on paper to working on electronic documents, and improving the work environment of ministries, institutions, and sub-national administrations by using digital technology. In addition, the digital transformation must include the organization and improvement of government for citizens (G4C) public services, which entails connecting digital information systems of ministries, institutions, and sub-national administrations to improve the effectiveness, equity, quality, and transparency of delivering public services to the citizens, and to reduce costs and necessary time. Finally, the digital transformation must encompass the organization and improvement of government-to-business (G2B) public services, aiming to reduce costs, promote participation, promote transparency, facilitate usage, and increase the effectiveness of public services to the private sector. The priority actions of this strategy are as follows:

- Build and improve a Collaboration Platform to facilitate communication and collaboration through the use of centralized communications systems (email, chat, video conference); team, project and workflow management systems; and document, information, and knowledge sharing systems.

- Build and improve common administrative management systems within the government, such as the civil servant information management system, financial information management system, electronic document management and approval system, in order to increase the effectiveness and transparency of the Royal Government's administrative work, reduce costs, and eliminate the duplicate re-creation of information systems with overlapping functions.
- Prepare and equip computers, digital devices, software, and necessary information systems through joint procurement mechanisms to reduce costs and facilitate and improve the effectiveness of ministries, institutions, and sub-national administrations.
- Develop and upgrade the National Geographic Information System to reinforce the effectiveness of the collection, storage, use, sharing, and management of geographic data for assisting economic and social development in Cambodia.
- Develop a National Infrastructure Database System to manage, monitor, and evaluate the effectiveness and needs of national infrastructure, including roads network, waterways, electricity, clean water, telecommunications, irrigation, water resources, rural infrastructure, and other national infrastructure networks.
- Develop a Knowledge Management System to create, store, transfer, or share knowledge to ministries, institutions, public enterprises, the private sector, and the people.
- Establish the One Window Service Platform to provide public services in ministries, institutions, and sub-national administrations, as well as to receive feedback and communicate with citizens digitally.
- Develop and improve the Civil Status Information Management System to reinforce the effectiveness of management and synchronization for birth, marriage, and death registration.
- Develop and improve the Identity Management Information System to strengthen the effectiveness of the management of Cambodian nationality identity cards, passports, and border passes.
- Develop and improve the Immigration Information Management System and the Visa Information Management System to strengthen the effectiveness of immigrant's movement and manage visa issuance to foreigners.
- Develop and improve the Residence and Family Information Management System to ensure the effectiveness of registration, data storage and retrieval, and issuance of residence and family books to citizens.
- Develop and improve the Real Estate Information Management System to manage and update information and set the targets for improving land and real estate ownership management services for citizens.
- Improve the Vehicle Information Check to ensure the effectiveness of vehicle registration, data storage and retrieval, and issuance of vehicle identification cards.
- Develop and improve phone systems for emergency services, such as security, traffic, fire, and emergency medical services, for the citizens.
- Develop and improve the Education Information Management System to manage, update and provide information on education to the people and set targets for improving the quality of education services.
- Improve the Labor Market Information System and Employment Services to provide job market information to job seekers, employers, educational institutions, and policymakers and planners.

- Develop and improve an Integrated Health Information and Service Management System through the establishment of a digital platform and the organization of digital identities and records for patients to support service provision, decision-making, patient and facilities management, and research and planning in the health sector.
- Develop and improve an Integrated Tourism Information Management System to collect, store, manage, and provide information related to the tourism sector.
- Develop and improve an Agricultural Information Management System to foster agricultural yields, facilitate investment, and find markets for and export agricultural products.
- Develop and improve a Disaster Management Information System and an Early Warning System to increase the effectiveness of disaster management and response.
- Foster and develop a Digital Postal Ecosystem through the establishment and use of a digital postal platform and a common national postal gate to support the provision of postal services as well as the management, use, sharing, and monitoring of postal sector's data.
- Modernize the management of postal services, including the development of the National Postal Addressing System, continued development of the National Postal Codes, and assignment of National Digital Map Code.
- Enhance the integrated Online Business Registration platform to provide a one-stop service for businesses on business registration, investment project registration and data for investors, tax registration, employment registration, and application for relevant licenses, certificates, and permits, thus facilitating the establishment and conduct of businesses.
- Develop and improve Digital Procurement Management Systems to increase effectiveness, transparency, reliability, and competitiveness by reducing procurement processes and time, establish auditing and grievance mechanisms, in order to encourage and allow businesses to participate in the Royal Government's projects.
- Improve the Online Tax Service System to facilitate tax declaration, payment, and repayment; resolve complaints; and reduce businesses' tax compliance expenses. This online system also facilitates the collection and payment of taxes by overseas companies that earn revenue from providing online services to consumers in Cambodia.
- Improve the National Single Window system to facilitate cross-border trade flows and foster Cambodia's economic integration into the region and the world.

7.3-Strategic Goal 3: Building Digital Capacity and Innovation

Strategy 7: Building Digital Human Capital

Building digital human capital starts from building the capacity of leaders and civil servants in all ministries and institutions to adopt digital technology for the use, management, and development of digital government systems in response to the needs of the people. In addition, human resources skilled in digital technology must be trained, to foster the development of digital government with effectiveness, quality, and inclusion. At the same time, promoting digital literacy to students and citizens is a necessary priority aimed at fostering the adoption and use of digital technology, bridging the digital divide, increasing competitiveness, and increasing the use of digital government services. The priority actions for this strategy are as follows:

- Develop a competency assessment and technical skill recognition framework and to formulate a policy for management, mobilization, and incentivization of digital human capital in the public sector to support the digital transformation process and the development of the digital government.
- Enhance digital leadership training, especially for women, in ministries and institutions to improve their capacities in digital governance.
- Promote digital literacy and basic digital skills among leaders, civil servants, and staff members of ministries and institutions and sub-national administrations, especially ICT focal officers, to serve the development, management, use, and provision of public services.
- Promote the development and improvement of curricula to enhance digital literacy for students from primary and secondary school to higher education and general vocational training.
- Promote digital literacy and digital instruction methodology for instructors at all levels of education and training.
- Foster modernization of digital infrastructure and systems for education and training, including internet connection, rooms installed with digital equipment, digital platforms for education and training, and digital content development, to support digital literacy education and training for all levels of educational and training institutions.
- Organize training, awareness, and educational programs on basic knowledge about digital technology and the use of digital public services, to improve digital literacy among the people, in cooperation with relevant stakeholders, especially media institutions and local authorities.
- Foster the development of national education and training platforms, providing content for bridging the digital divide among the people, especially those in rural areas through online channels, and for encouraging long-life learning.
- Develop a national digital competence framework that sets out the standards of qualification, competence, and skills with respect to important digital technologies responsive to the needs of developing the government development and digital economy and society, as well as Industry 4.0.
- Strengthen and expand digital technology skills training institutions through curriculum development, laboratory establishment, and training of trainers, covering the strengthening of digital skills and digital instruction methods, aimed at supporting the building of competent and highly competitive digital human resources.
- Organize an orientation, outreach, encouragement, and incentivization programs for more youth, especially young women, to uptake digital skills and major in fields related to digital technology, with the purpose of increasing the number of digital talents in the job markets and reducing the gender gap in digital skills.
- Promote the training of key digital skills, such as software development, telecommunications and network, Artificial Intelligence, data science, information system architecture, and digital security, through scholarship programs and incentivization programs for educational and training institutions, in order to meet the professional needs of the 4th Industrial Revolution.

Strategy 8: Promoting Digital Research and Innovation

Digital research and innovation are a key strategy for the increasing capacity, effectiveness, and efficiency of the digital transformation and for ensuring digital competition in the region. The priority actions for this strategy are as follows:

- Drive the building of a national system for digital technology research and development through the development of a master plan, encouragement mechanisms, and promotion of partnerships between research institutes, universities, and digital technology companies, to promote research and development of digital technology.
- Promote the transfer of digital technology resulting from research to the public and private sectors through collaboration, investment, and joint project implementation between research and education institutions and the private sector, to provide wide-ranging and diverse digital technology solutions.
- Foster entrepreneurships of digital innovation through the cooperation with national and international institutions and the private sector, establishment of mechanisms for recognizing fresh innovation, competition programs, and intellectual property protection, to apply those innovative ideas to the public and private sectors and ensure digital competitive advantage.

7.4-Strategic Goal 4: Promotion of Cooperation and public and Private Partnership

Strategy 9: Cooperation with Digital Technology Firm

The organization of collaborations with digital technology companies is intended to establish a mechanism for coordination and facilitation between the government and digital technology companies in order to promote the participation of the private sector in the establishment and development of the digital government, one that is efficient, productive and confident. Prioritized activities for this strategy include the following:

- Organize a forum between the Digital Government Committee and digital technology companies, aimed at accelerating the partnership between the public and private sectors for investment, service provision, and technical solutions for digital government.
- Foster the advertisement, coordination, and encouragement of digital technology companies through participating in the development and supply of the preparation of digital technology systems and services in order to mobilize skilled human resources, finance, and technology for development, operation, and maintenance of digital government systems.
- Promote coordination with operators of the postal and other sectors through participating in the provision of digital government services, such as providing assistance with service application, payment services, tax payment, parcel distribution, social services, and coordination among relevant ministries and institutions to provide better public services.

Strategy 10: Promoting Digital Startups

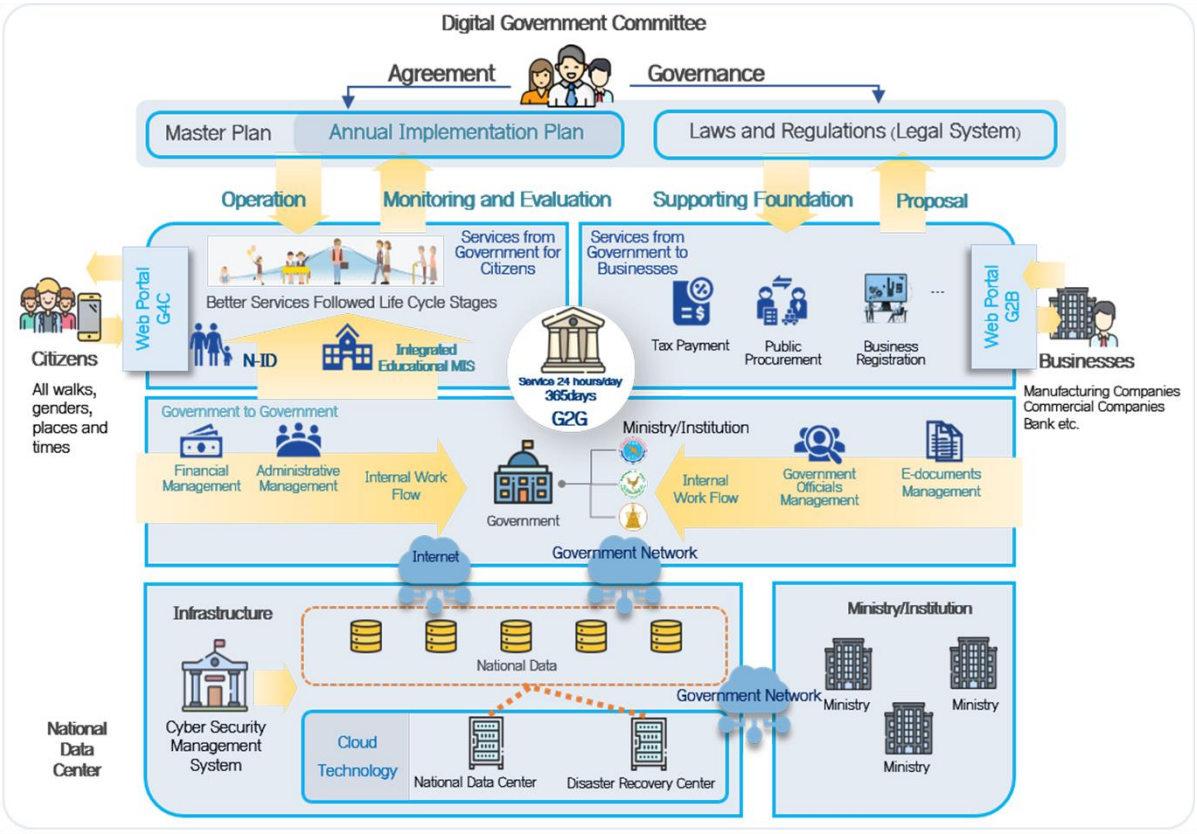
Promoting digital startups refers to the design and enforcement of incentive mechanisms and the expansion of market opportunities for digital startups. These are tasks essential to the establishment of an ecosystem for tech entrepreneurship, innovation, and digital startups, which has potential for and are conducive to the development of digital government. The priority actions of this strategy are as follows:

- Establish and strengthen the support services and incentives for digital startups, both technically and financially, through strengthening the cooperation among all relevant

stakeholders, training, protecting intellectual property, establishing connection to investor networks, among others, to increase the number and success of digital startups.

- Expand market opportunities for digital startups through the promotion of partnership between digital startups and enterprises of all sizes and sectors in order to collaboratively develop digital products or services that are highly innovative and improve the business and production processes.

Figure 5: Overview of Digital Government Policy Development of Cambodia 2022-2035



8-MECHANISMS FOR LEADING, COORDINATION, IMPLEMENTATION, AND MONITORING AND EVALUATION

8.1-Mechanism for Leading, Coordination, and Implementation

The Digital Government Policy is an instrument for the government's digital transformation. The successful implementation of this policy in line with its vision, purposes, and strategic objectives requires high commitment and participation from ministries and institutions, units at all levels, and all stakeholders. The Royal Government has envisioned the necessity of organizing institutions to lead, facilitate, and implement this policy, including: (1) establish a digital government committee for leading, facilitation, implementation, and monitoring and evaluation of this policy, (2) specify clear roles of the technical ministry in charge of managing the centralized digital infrastructure that can serve and support the digital development across various ministries and institutions of the whole government, and (3) establish units in charge of digital transformation under ministries and institutions at the national and sub-national levels for the acceleration of digital transformation. These three actors complement one another and are interdependent in the fostering of this policy implementation effectively and efficiently.

Digital Government Committee

The Digital Government Committee serves as a subordinating organ for the National Digital Economy and Society Council, in charge of accelerating digital government transformation, focusing on technical and policy areas. The said committee is chaired by the Minister of Post and Telecommunications and includes representatives of relevant ministries and institutions as members. The committee is to lead, facilitate, foster, monitor, and evaluate the implementation of the policy, strategies, measures, technical standards, and other relevant plans relating to the development of the digital government. In addition, the committee is endowed with a main role of facilitating and ensuring the connection of infrastructure and digital systems and encouraging the use of the government's shared systems. The committee shall encourage digital transformation planning in each ministry-institution and shall receive all plans proposed by ministries and institutions for review and evaluation of technical and financial requirements, and submit them for approval from the National Digital Economy and Society Council.

To ensure a successful implementation of the Digital Government Policy, the Digital Government Committee, Digital Economy and Business Committee, and Digital Security Committee shall closely intercommunicate and complement each other in all sectors.

The Digital Government Committee shall apply a consultative mechanism with all stakeholders on plans and projects related to digital government. The Royal Government will provide funding out of the national budget and mobilize additional financial resources from other sources for implementing priority projects, which have been examined and assessed technically and financially by the Digital Government Committee and approved by the National Digital Economy and Society Council.

An inter-ministerial technical working group shall be led by a representative from the Ministry of Post and Telecommunications as chair and a representative from the Ministry of Economy and Finance as vice chair and composed of senior officials and technical officers of the units tasked with digital transformation from various ministries and institutions, with consideration of women's participation. The Inter-ministerial Technical Working Group also

has a role in technical and financial coordination in implementing and evaluating projects and in digital security tasks at the ministries and institutions. If necessary, the Digital Government Committee can establish various technical working groups and may recruit and appoint any advisors to assist and handle technical issues related to the digital government projects.

The Digital Government Committee has a general secretariat to assist on administrative and legal affairs, planning, training, cooperation, monitoring and evaluation, supervision of technical requirements, and assisting the Inter-ministerial Technical Working group. The working group is tasked with implementing the digital government projects of various ministries and institutions and other related projects, with due consideration to existing mechanisms and infrastructures of relevant ministries and institutions at the national level and sub-national administrations.

The Digital Government Committee will prepare guidelines on the establishment of units in charge of digital transformation at ministries, institutions and subnational administrations.

The Digital Government Committee and National Committee for Sub-National Democratic Development (N.C.D.D) work collaboratively to harmonize the digital transformation both at national and sub-national levels, enhancing and expanding digital service provision in a coherent, seamless, and effective manner.

Roles of the Technical Ministry

The Ministry of Post and Telecommunications is the technical ministry responsible for the development and management of the telecommunication and ICT infrastructure necessary to the digital transformation and digital government. The infrastructure includes mobile and fixed phone infrastructure, Internet infrastructure, digital government network infrastructure, the establishment of data centers and a cloud system in a hybrid format, the adoption of norms, protocols, and standards, and the operational management of digital identity infrastructure and the digital government security operation center. In addition, the Ministry of Post and Telecommunication shall set up and provide common digital information systems for all ministries and institutions. These systems include a common email system, web portal, collaboration platform, messaging system, and electronic document and approval system. Aside from the above infrastructure and services, the Ministry of Post and Telecommunications is responsible for setting standards, ensuring sustainability, advising and supporting ministries and institutions, and providing digital skill training to government officials, particularly senior and focal technical officials, aiming to accelerate digital transformation.

Units in Charge of Digital Transformation

Each ministry and institution must establish a unit in charge of digital transformation; this unit has a specific role and structure in promoting digital transformation at its respective ministry or institution, which will contribute to the digital government policy implementation. At the sub-national level, there must be units in charge of digital transformation at the capital municipality and provinces with the provincial departments of post and telecommunications as the technical secretariats for municipal and provincial governors in facilitating the digital government policy implementation.

Approach

The implementation of the digital government projects may have the characteristics of decentralization but must follow the principles, protocols, common standards, and technical requirements determined by the Digital Government Committee so that all project

implementation effectively meets the common objectives of digital government. In this context, each actor of the digital government can collectively organize, create, manage, and implement digital government projects, simultaneously and separately, in line with the plans and objectives of digital government. Moreover, the Royal Government must consider building a data center, using cloud technology, within the digital government framework, in a hybrid format, with due consideration to the effectiveness of management, resource utilization, investment, digital security, and human resource for management. The data center construction must comply with the laws and regulations in force. Ministries and institutions with their own active data centers will continue to use the existing infrastructure and will establish connections to the national data centers to back up their data. However, ministries and institutions without their own data centers must use the national data centers built within the digital government framework. The establishment of the hybrid cloud solutions will ensure cost-effectiveness and better allocation of computing resources as well as reduce risks associated with the disruption of the whole digital government, which may be caused by technical issues and cyber attacks.

Stages

To successfully implement the Cambodia Digital Government Policy 2022-2035, the Royal Government sets a timeframe of three phases, including building digital government foundation, digital technology adoption, and the government's digital transformation. Based on the 14-year timeframe, all activities shall be divided and implemented in phases and sequences based on the actual priorities and opportunities that are interrelated and complement each other. The establishment of the digital government is categorized into five levels and must be attained by 2035. At present, the establishment of the digital government at Level 1 has already begun. From a technical perspective, Level 2 and 3 of digital government establishment can begin in parallel with Level 1, and these three levels can be completed in the phase of building the digital government foundation 2022-2025. Next, Level 4 of the digital government establishment will commence and is scheduled to complete in the phase of digital technology adoption 2026-2030. Lastly, Level 5 of the digital government establishment will be implemented after Level 4 and is scheduled to complete by the phase of the government's digital transformation 2031-2035. These five levels of digital government establishment rely on the priority actions, divided into stages with detailed timeframe as listed in Appendix 1.

1- Building Digital Government Foundation 2022-2025 refers to the establishment of facilitation institutions, units in charge of digital transformation, and relevant digital government laws, regulations, and standards. Moreover, digital infrastructure must be improved and developed, including digital government connectivity, data centers, cloud technology, and digital payment services for public service provision and last-mile delivery. These aim to enhance digital services, particularly the government-to-government services (G2G), government-for-citizens services (G4C), and government-to-business services (G2B), as well as strengthen the ability to develop, manage, and use digital government systems. Open government data is made available to the public to ensure transparency and accountability.

2- Digital Technology Adoption 2026-2030 refers to the capability building and enhancing of the digital government to promote innovation so that the G2G, G4C, G2B services

are improved by prioritizing data governance, open data, data exchange, data protection, and digital transformation. In this phase, the use of digital systems has become widespread and diverse among the public sector, private sector, and citizens.

3- Digital Government Transformation 2031-2035 refers to the development of a smart government based on the foundation of digital government, digital technology adoption, and the government's digital transformation. In this phase, the process of collecting and analyzing data is automatic, and the innovation using the latest technologies, such as Artificial Intelligence, Big Data, and the Internet of things, has been established maximally to assist in decision-making and problem-solving.

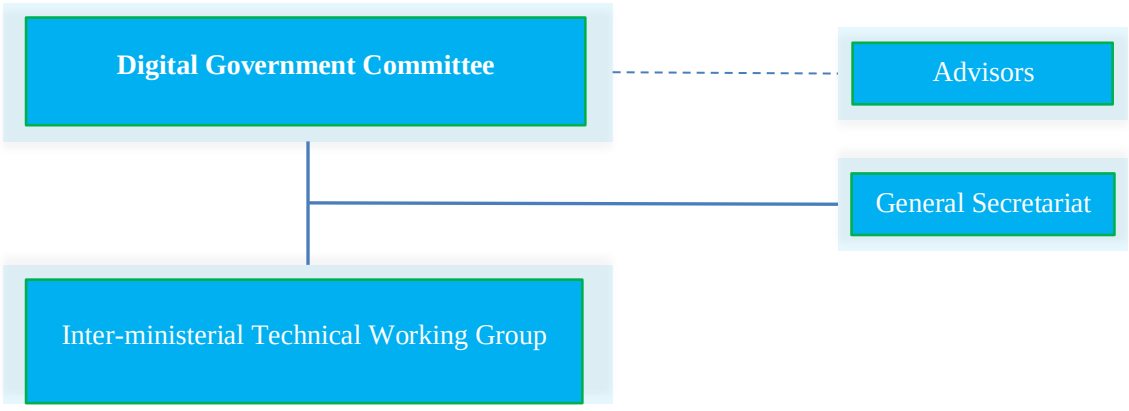
Human Capital and Financial Resources for Digital Government Development

In order to successfully implement the Digital Government Policy, the Royal Government of Cambodia has set main priorities on the reform of human resources in the civil service framework by providing digital technology skill training for existing officials and recruiting officials skilled in digital technology in an appropriate quantity.

The Royal Government will prepare prioritized budgets with sources from the national budget, development partners, private sectors, and other legitimate sources for the development and sustainability of the digital government system.

Digital government projects must be reviewed and advised on by the Digital Government Committee–with the Inter-ministerial Technical Working Group as its supporting technical subordinate–before proceeding to financing procedures for project implementation in accordance with applicable laws and regulations.

Figure 6: Diagram on the Leading, Coordination, and Implementation Mechanism



International cooperation

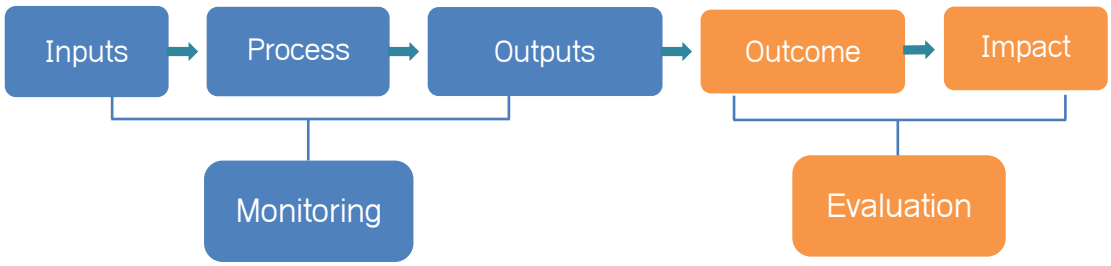
International cooperation plays an important role in strengthening and expanding bilateral and multilateral relations, policy dissemination, and mobilizing financial and technical resources from development partners in addition to the government resources, as well as providing facilitation, consultation, and support for effective, efficient, and sustainable implementation of digital government projects. These aim to ensure mutual benefits and foster connectivity and harmonization in the development of digital technology and digital

government through the sharing of experiences and knowledge, integrated investment, and coordinating digital strategies that ensure interoperability. The dissemination of digital government policies and master plans to partner countries and regional and international organizations needs to be comprehensive to contribute to the development of digital government projects.

8.2-Monitoring and Evaluation Mechanism

In order to ensure the progress, effectiveness, consistency, and timely resolution of the challenges in the implementation of this policy, the Digital Government Committee is responsible for creating a joint monitoring and evaluation mechanism determined by the National Digital Economy and Society Council, which has a General Secretariat to facilitate and advise on the technical aspects. The monitoring and evaluation are carried out in each stage as shown in the figure below:

Figure 7: Stages of Monitoring and Evaluation



Monitoring and Examination

This stage requires the preparation of a priority action plan with clear indicators as a basis for monitoring and examination on a quarterly, semesterly, and annual basis according to the priority action table, for which the Digital Government Committee is responsible, as stated in Appendix 1. The Digital Government Committee submits a priority action plan to the National Digital Economy and Society Council for review and approval.

After the monitoring and examination plan is approved, the Digital Government Committee shall hold quarterly internal monitoring meetings and other extraordinary meetings as necessary to monitor the progress and set up a coordination mechanism in case the progress is not achieved as planned, or there is any significant deviation from the outcome indicators.

The Digital Government Committee will hold a meeting to review all priority actions every three years to enhance the effectiveness of the policy implementation to achieve outcomes as planned and to respond to the advancement of digital technology and the actual development of the digital transformation. In practice, the Digital Government Committee will prepare the following two forms of reports:

- Report on the work progress, challenges, or proposals to the National Digital Economy and Society Council for quarterly review and comments.

- Achievement report describing the progress of the implementation under each indicator, based on the list of priority actions in Appendix 1 to the National Digital Economy and Society Council to review, advise, and set further directions every two years.

Evaluation

Evaluation is a mechanism for reviewing the final outcomes from the policy implementation in a predetermined time frame or every three to five years as a basis for adjusting and reorienting the policy as necessary.

The evaluation can be done by a joint working group from relevant ministries and institutions and/or with the participation of the private sector and relevant development partners as deemed necessary according to the objective of the evaluation.

For the evaluation to be highly effective and implemented smoothly, the Digital Government Committee needs to develop an evaluation method, plan, and resources for the implementation.

The evaluation plan must include a preliminary study of the policy implementation and priority action plan and a list of projects or evaluation objectives based on the priority action list in Appendix 1. The evaluation priority list must specify: (1) the name of the project or policy, (2) identifying evaluation priorities, (3) the purpose and necessity of the evaluation, and (4) the expected outcomes.

The General Secretariat of the Digital Government Committee plays an important role in coordinating and summarizing the policy implementation evaluation plan for submission to the Committee's annual meeting to review and adopt.

9-IMPACT AVOIDANCE, MITIGATION AND SOLUTION, AND RISK MANAGEMENT

9.1-Avoidance, Mitigation, and Solution of Impact related to Socio-Economic Aspects

As indicated in the Cambodia Digital Economy and Society Policy Framework 2021-2035, to contribute to the avoidance, mitigation, and solution of impact relating to socio-economic aspects, such as culture and traditions, that may arise from the digital transformation, the Digital Government Committee shall prepare and amend relevant laws and regulations to regulate and monitor the posting and creation of contents, to preserve the culture and traditions while encouraging creativity and innovation. At the same time, the Digital Government Committee implements projects and/or organizes events to promote the awareness of the culture, arts, and civilization through digital platforms; promotes positive attitudes and mindsets; and explains decision-making rationale, as well as infusing digital technology-related development targets into the public sector and people's daily livelihoods. Furthermore, the development and implementation of a national outreach program framework will promote the development of digital knowledge and skills and advice on the safe use of digital technology, providing assurance for children, youth, teachers, and parents.

9.2-Risks Associated with Institutional Coordination

In order to avoid risks during the implementation of this policy, all relevant ministries and institutions must (1) responsibly participate in the development of the digital government, (2) appoint competent officials to lead, manage, and implement tasks, endowed with the authority to organize and allocate resources and set priorities for their respective ministries and institutions, and (3) foster close cooperation within and among ministries and institutions and with relevant actors to share information and experiences and strengthen transparency and integrity in carrying out their tasks to ensure trust and effective and seamless collaboration.

9.3-Risks Associated with Changes in Work Procedures

The development of the digital government will lead to changes in work procedures and behaviors across ministries and institutions; for instance, the transformation from a traditional paper-based work procedure with limited knowledge-sharing into an automatic, transparent, paperless digital information system that will boost quick data and information sharing. These changes may face risks stemming from (1) some officials, businesspersons, investors, and citizens not participating in or hindering the processes of developing digital technology systems due to perceived conflict with their personal interests, (2) some officials, businesspersons, investors, and citizens having yet to trust or adopt new technologies, (3) the digital gap among the population, (4) the digital information system made available to the public being complicated, or the lack of trainings through various forms of dissemination, (5) the lack of laws and regulations related to digital technology-based work procedures, which hinders the development in both the public and private sectors, and (6) other challenges which may hinder the development and adoption of digital information systems. To prevent and avoid the above risks, the Royal Government must extensively promote the understanding to all

leaders, officials, businessmen, investors, citizens, and stakeholders on the use and benefits of digital technologies by setting up the necessary coordinating mechanisms, guidelines, and regulations for public awareness.

9.4-Risks Associated with Human Capital and Finance

Human capital and finance are key components for digital government development, policy implementation, institutional operations, and development of other sectors. The risks associated with human capital include the shortage of experts, lack of commitment and integrity in duty fulfillment, and high occupational turnovers, due to the wage gaps between the public and private sectors and between local and overseas employment. The risks associated with finance, on the other hand, include two main elements, namely the shortage of financial capital to meet the investment and project implementation needs, and the ineffective and inefficient use of capital. The government must focus on effective and efficient management of these two elements and significantly reduce any associated risks that may arise. Good governance, openness, strict compliance to laws and regulations, and encouragement are key factors critical to success.

9.5-Risks Associated with Rapid Evolution of Technology

Digital technology has evolved rapidly, requiring the Royal Government to clearly plan out the adoption and use of technologies to avoid wasting time and additional investment in new software systems and digital equipment to maintain compliance with IT security, increase operational effectiveness, and respond to the growing needs of the users. In this regard, the Digital Government Committee and relevant ministries and institutions must participate in planning the adoption and use of digital technology in line with the digital development plan, as well as strengthening the capacity of educational and research institutions to ensure effectiveness, security, continuity, and ownership of data and core digital technologies used in the digital government systems.

9.6-Risks Associated with Digital Security and Management in the Case of Force Majeure

The assurance of strong security and sustainability for technology use plays an important role as the digital government facilitates the work processes across the whole country. Some of the major risks include cyberattacks, national security threats, breach of classified information, force majeure, etc. As such, the government must (1) maintain secure and resilient infrastructure, complementing one another, (2) backup data for digital government service operations, and (3) enhance digital security capacity at ministries and institutions. The Royal Government must invest in infrastructure in collaboration with relevant development partners and the private sector, develop policies, laws, and regulations for the management and maintenance of digital security, as well as establish management mechanisms in the event of force majeure to ensure the continuity of digital government services.

10-CONCLUSION

The Cambodia Digital Government Policy 2022-2035 has been prepared with detailed content in line and consistent with the Cambodia Digital Economy and Society Policy Framework 2021-2035 and with analysis on the current status, challenges, and opportunities of digital transformation at ministries and institutions; on digital ecosystems; and on international best practices. This policy sets out the vision, objectives, strategic goals, strategies, and priority actions in a step-by-step and interconnected manner, including the development of digital infrastructure, strengthening of digital security, promotion of digital public services, establishment of governance and related legal documents, human resource development, partnerships between the public and private sectors and with development partners, as well as good cooperation between states in the region and the world, in order to enhance the trust of the people, businesspersons, and stakeholders to participate in achieving the 2035 Vision in building a digital government and digital economy and society. Meanwhile, the Digital Government Committee, chaired by the Minister of Post and Telecommunications and composed of representatives from relevant ministries and institutions, will be set up to lead and coordinate the implementation of this policy, in collaboration with the Digital Economy and Business Committee, the Digital Security Committee, and relevant actors under the joint leadership and coordination of the National Council for Digital Economy and Society. In addition, human capital, financial resources, and monitoring and evaluation mechanisms are clearly defined in line with the priorities needed to ensure the success of and risk management associated with the policy implementation.

Overall, the above policy document responds to the current situation, technical specification, digital development, and international best practices. This document has a clear implementation mechanism, with a top institution to lead, coordinate, and direct cooperation among ministries, institutions, and stakeholders to ensure the successful implementation of the Digital Government Policy. The full commitment from ministries, institutions, and sub-national administrations in a proactive and interactive spirit will serve as the driving force in building a digital government to provide the required and timely public services to improve the people’s quality of life.

Appendix 1: Priority Actions List of the Strategic Framework under the Digital Government Committee

No.	Strategy	Priority Activity	Ministry/institution in charge	Phase
1	**Strategy 1: Building and improving digital connectivity infrastructure**	Strengthen and expand mobile and high-speed internet infrastructure through (1) strengthening and expanding coverage of 4G mobile service, (2) building telecommunication infrastructure for 5th generation mobile service (5G) and latest mobile telecommunication technology, (3) building submarine fiber optic network and high-speed internet infrastructure construction, and (4) organizing joint telecommunications infrastructure.	Ministry of Posts and Telecommunications Ministry of Economy and Finance Relevant Ministries and Institutions	2022 - 2035
2		Building national data center	Ministry of Posts and Telecommunications Ministry of Economy and Finance Relevant Ministries and Institutions	2022 - 2035
3		Build a strong network infrastructure for digital government	Ministry of Posts and Telecommunications Ministry of Economy and Finance Relevant Ministries and Institutions	2022 - 2030
4		Promote the development of satellite ecosystems by (1) preparing the basic foundation, (2) developing a platform for satellite system data, and (3) developing human resources.	Ministry of Posts and Telecommunications Ministry of Economy and Finance Relevant Ministries and Institutions	2022 - 2035

5		Strengthen and expand Data Exchange Platform (CamDX)	Ministry of Posts and Telecommunications Ministry of Economy and Finance Relevant Ministries and Institutions	2022 - 2030
6		Promote digital infrastructure connectivity at the sub-national level from the provincial level to the commune level	Ministry of Posts and Telecommunications Ministry of Economy and Finance Ministry of Interior Relevant Ministries and Institutions Sub-National Administration	2022 - 2035
7	**Strategy 2: Building and improving infrastructure for digital payment systems for public services**	Build and strengthen national payment gateway infrastructure for public services	Ministry of Economy and Finance National Bank of Cambodia Non-Banking Financial Services Authority Ministry of Posts and Telecommunications Relevant Ministries and Institutions	2022 - 2030
8	**Strategy 3: Building and strengthening digital security infrastructure**	Strengthen digital security management and protection systems for national information infrastructure	Ministry of Posts and Telecommunications Ministry of Interior Ministry of National Defense Relevant Ministries and Institutions	2022 - 2035
9		Build and strengthen the security of national internet gateway	Ministry of Posts and Telecommunications	2022 - 2035
10		Build and strengthen digital identity infrastructure	Ministry of Posts and Telecommunications Ministry of Interior Ministry of Economy and Finance	2022 - 2030

			Relevant Ministries and Institutions	
11	**Strategy 4: Developing postal service infrastructure**	Improving information infrastructure, supporting infrastructure for postal network, and national digital postal platform	Ministry of Posts and Telecommunications Ministry of Public Works and Transport Ministry of Economy and Finance	2022 - 2030
12	**Strategy 5: Organizing digital government governance**	Formulate data governance policy	Ministry of Posts and Telecommunications Ministry of Economy and Finance Ministry of Planning Relevant Ministries and Institutions	2022 - 2025
13		Formulate an open-data policy	Ministry of Posts and Telecommunications Ministry of Economy and Finance Ministry of Planning Relevant Ministries and Institutions	2022 - 2025
14		Formulate policies to promote the development and use of software	Ministry of Posts and Telecommunications Ministry of Economy and Finance Relevant Ministries and Institutions	2026 - 2030
15		Formulate digital policy for smart cities	Ministry of Posts and Telecommunications Ministry of Interior Ministry of Land Management, Urban Planning and Construction Ministry of Public Works and Transport Ministry of Economy and Finance Relevant Ministries and Institutions	2026 - 2030

16		Formulate policy for postal sector development	Ministry of Posts and Telecommunications Relevant Ministries and Institutions	2022 - 2025
17		Formulate policies to promote the development of key digital technologies	Ministry of Posts and Telecommunications Ministry of Economy and Finance Ministry of Industry, Science, Technology and Innovation Relevant Ministries and Institutions	2026 - 2030
18		Formulate law on digital government	Ministry of Posts and Telecommunications Ministry of Economy and Finance Ministry of Interior Relevant Ministries and Institutions	2022 - 2025
19		Formulate law on information and communication technology	Ministry of Posts and Telecommunications Relevant Ministries and Institutions	2022 - 2025
20		Formulate a law on the protection of personal data	Ministry of Posts and Telecommunications Ministry of Economy and Finance Ministry of Interior Ministry of Commerce National Bank of Cambodia Ministry of Justice Ministry of Health Relevant Ministries and Institutions	2022 - 2025

21		Formulate and amend law on telecommunications and related legal documents	Ministry of Post and Telecommunications Relevant Ministries	2022-2025
22		Formulate legal norm and guidelines on digital signature	Ministry of Post and Telecommunications Relevant Ministries	2022-2025
23		Formulate law on postal services	Ministry of Post and Telecommunications Relevant Ministries	2022-2025
24		Formulate law on access to information	Ministry of Information Relevant Ministries	2022-2025
25		Amend law and formulate relevant legal documents on posting and creating contents	Ministry of Post and Telecommunications Ministry of Culture and Fine Arts Relevant Ministries	2022-2025
26		Develop standards on administrative work	Ministry of Civil Service Ministry of Post and Telecommunications Ministry of Industry Science Technology and Innovation Relevant Ministries	2022-2025
27		Develop digital terms for administration	Ministry of Post and Telecommunications Ministry of Civil Service National Council on Khmer Language Relevant Ministries	2022-2025

28		Promote development framework and digital government structure	Ministry of Post and Telecommunications Relevant Ministries	2022-2025
29		Develop standards on digital service management	Ministry of Civil Service Ministry of Post and Telecommunications Ministry of Industry Science Technology and Innovation Relevant Ministries	2022-2025
30		Develop standards on software engineering and information system	Ministry of Post and Telecommunications Ministry of Industry Science Technology and Innovation Relevant Ministries	2026-2030
31		Develop digital security standards for digital government	Ministry of Post and Telecommunications Relevant Ministries	2022-2025
32		Develop technical standards on smart city	Ministry of Post and Telecommunications Ministry of Industry Science Technology and Innovation Relevant Ministries	2026-2030
33		Develop standards of data centers	Ministry of Post and Telecommunications Ministry of Industry Science Technology and Innovation Relevant Ministries	2022-2025

34		Formulate standards of latest digital technology	Ministry of Post and Telecommunications Ministry of Industry Science Technology and Innovation Relevant Ministries	2026-2030
35		Create digital government enterprise architecture	Ministry of Post and Telecommunications Ministry of Economy and Finance Relevant Ministries	2022-2025
36	**Strategy 6: Digitally Transforming digital, government and public services**	Build and improve the Collaboration Platform	Ministry of Post and Telecommunications Relevant Ministries	2022-2030
37		Build and improve information management system for public servants	Ministry of Civil Service Ministry of Post and Telecommunications Relevant Ministries	2022-2030
38		Improve financial information management system	Ministry of Economy and Finance Ministry of Post and Telecommunications Relevant Ministries	2022-2030
39		Prepare and improve document and electronic approval systems	Ministry of Post and Telecommunications Relevant Ministries	2022-2030
40		Prepare and equip computers, digital devices, software and necessary information systems	Ministry of Post and Telecommunications Relevant Ministries	2022-2030

41		Develop and improve the National Geographic Information System	Ministry of Land Management, Urban Planning, and Construction Ministry of Environment Ministry of Agriculture, Forestry, and Fisheries Ministry of Interior Ministry of Post and Telecommunications Relevant Ministries	2022-2030
42		Develop the National Infrastructure Database System	Ministry of Post and Telecommunications Relevant Ministries	2022-2030
43		Develop the Knowledge Management System	Ministry of Post and Telecommunications Relevant Ministries	2022-2030
44		Develop a One Window Service platform	Ministry of Post and Telecommunications Ministry of Interior Ministry of Economy and Finance Ministry of Civil Service Relevant Ministries	2022-2030
45		Develop and improve a civil registration information management system	Ministry of Interior Ministry of Post and Telecommunications	2022-2030
46		Develop and improve an identification information management system	Ministry of Interior Ministry of Foreign Affairs and International Cooperation Ministry of Post and Telecommunications	2022-2030

47		Develop and improve immigration and visa information management systems	Ministry of Interior Ministry of Foreign Affairs and International Cooperation Ministry of Post and Telecommunications	2022-2030
48		Develop and improve a residence and family information management system	Ministry of Interior Ministry of Post and Telecommunications	2022-2030
49		Develop and improve a real estate information management system	Ministry of Land Management, Urban Planning, and Construction Ministry of Post and Telecommunications	2022-2030
50		Improve the Vehicle Information Check	Ministry of Public Work and Transport Ministry of Post and Telecommunications	2022-2025
51		Develop and improve phone systems for emergency services for citizens	Ministry of Interior Ministry of Health Ministry of Post and Telecommunications Relevant Ministries	2022-2025
52		Prepare and improve an educational information management system	Ministry of Education, Youth and, Sport Ministry of Labor and Vocational Training Ministry of Post and Telecommunications	2026-2030
53		Improve the labor market information system and employment services	Ministry of Labor and Vocational Training Ministry of Post and Telecommunications	2022-2025

54		Develop and improve an integrated health information and service management system	Ministry of Health Ministry of Economy and Finance Ministry of Post and Telecommunications Relevant Ministries	2022-2030
55		Develop and improve an integrated tourism information management system	Ministry of Tourism Ministry of Environment Ministry of Post and Telecommunications Relevant Ministries	2022-2025
56		Develop and improve an agricultural information management system	Ministry of Agriculture, Forestry, and Fisheries Ministry of Post and Telecommunications Relevant Ministries	2026-2030
57		Develop and improve a disaster information management system and an early warning system	National Committee on Disaster Management Ministry of Post and Telecommunications Relevant Ministries	2026-2030
58		Foster and develop a digital postal ecosystem	Ministry of Post and Telecommunications	2022-2030
59		Modernize postal service management	Ministry of Post and Telecommunications	2022-2030

60		Improve integrated business registration platform	Ministry of Economy and Finance Ministry of Commerce Ministry of Industry, Science, Technology, and Innovation Ministry of Labor and Vocational Training Ministry of Post and Telecommunications Council for the Development of Cambodia Relevant Ministries	2022-2030
61		Develop and improve digital procurement management system	Ministry of Economy and Finance Ministry of Post and Telecommunications	2022-2030
62		Improve online tax service system	Ministry of Economy and Finance Ministry of Post and Telecommunications	2022-2030
63		Improve National One Window system	Ministry of Economy and Finance Ministry of Post and Telecommunications Relevant Ministries	2022-2030
64	**Strategy 7: Building digital human capital**	Formulate competency assessment and technical skill recognition framework and digital human capital management, mobilization, and incentivization policies	Ministry of Post and Telecommunications Ministry of Civil Service Relevant Ministries	2022-2025
65		Promote digital leadership training	Ministry of Post and Telecommunications Ministry of Civil Service Relevant Ministries	2022-2035

66		Promote training on digital literacy and essential digital skills for leaders, civil servants and staff members of ministries, institutions and sub-national administrations	Ministry of Post and Telecommunications Ministry of Civil Service Relevant Ministries	2022-2035
67		Promote the development and improvement of curricula to enhance digital literacy for students from primary and secondary school to higher education and general vocational training	Ministry of Education, Youth, and Sport Ministry of Post and Telecommunications Ministry of Labor and Vocational Training Relevant Ministries	2022-2025
68		Promote digital literacy and digital instruction methodologies for instructors at all levels of education and training	Ministry of Education, Youth, and Sport Ministry of Post and Telecommunications Ministry of Labor and Vocational Training Relevant Ministries	2022-2030
69		Foster modernization of digital infrastructure and system for education and training	Ministry of Education, Youth, and Sport Ministry of Post and Telecommunications Ministry of Labor and Vocational Training Relevant Ministries	2022-2035
70		Organize training and awareness programs and education on basic knowledge about digital technology and the use of digital public services	Ministry of Post and Telecommunications Ministry of Civil Service Ministry of Information Ministry of Interior Relevant Ministries	2022-2035
71		Foster the development of national education and training platform	Ministry of Post and Telecommunications Ministry of Education, Youth, and Sport Ministry of Labor and Vocational Training Relevant Ministries and institutions	2022-2025

72		Develop the national digital competence framework	Ministry of Post and Telecommunications Ministry of Education, Youth, and Sport Ministry of Labor and Vocational Training	2022-2025
73		Strengthen and expand digital technology skills training institutions	Ministry of Post and Telecommunications Ministry of Education, Youth and Sport Ministry of Labor and Vocational Training	2022-2035
74		Organize orientation, outreach, encouragement, and incentivization programs for more youth, especially young women, to uptake and major in digital technology skills	Ministry of Post and Telecommunications Ministry of Education, Youth and Sport Ministry of Labor and Vocational Training	2022-2035
75		Promote the training of important digital professionals	Ministry of Post and Telecommunications Ministry of Education, Youth and Sport Ministry of Labor and Vocational	2022-2035
76	**Strategy 8: Promoting digital research and innovation**	Drive the building of a national system for digital technology research and development	Ministry of Post and Telecommunications Ministry of Industry, Science, Technology, and Innovation Relevant Ministries/Institutions	2022-2035
77		Promote the transfer of digital technology resulting from research to the public and private sectors	Ministry of Post and Telecommunications Ministry of Industry, Science, Technology, and Innovation Relevant Ministries/Institutions	2022-2035

78		Promote entrepreneurship of digital innovation	Ministry of Post and Telecommunications Relevant Ministries/ Institutions	2022-2035
79	**Strategy 9: Organizing collaborations with digital technology companies**	Organize a forum between the Digital Government Committee and digital technology companies	Ministry of Post and Telecommunications Relevant Ministries/ Institutions	2022-2035
80		Promote information-sharing and facilitation with and incentives for digital technology companies	Ministry of Post and Telecommunications Relevant Ministries/Institutions	2022-2035
81		Promote cooperation with operators in the postal and other sectors through participation in digital government service provision	Ministry of Post and Telecommunications Relevant Ministries/Institutions	2022-2035
82	**Strategy 10: Promoting Digital Startups**	Establish and strengthen services to support and encourage the creation of digital startups	Ministry of Post and Telecommunications Ministry of Economy and Finance Relevant Ministries/Institutions	2022-2035
83		Expand market opportunities for digital startups	Ministry of Post and Telecommunications Ministry of Economy and Finance Relevant Ministries/Institutions	2022-2035

Annex 1

MINISTRY OF POSTS AND TELECOMMUNICATIONS

STUDY REPORT ON THE SITUATION OF DIGITAL GOVERNMENT IN CAMBODIA

Secretariat of the Digital Government Policy Working Group
October 2020

I. Introduction

A 2020 survey was conducted to understand the status of digital government in Cambodia, analyzing the challenges and gaps, to provide some feasible recommendations for setting out necessary and effective policy measures to develop a digital government with high results, consistency, and sustainability, in accordance with the reforms of the Royal Government. This survey was conducted within a controlled scope, with the participation of relevant stakeholders from only 28 ministries and institutions of the Royal Government, without expending further understanding on consumers and other stakeholders due to limited time and resources. The team used both qualitative and quantitative research methods. Apart from this, we used the basic framework of Gartner's digital government level by dividing it into five levels to measure the evolution of digital government in Cambodia. In order to gain a deeper understanding of the root causes of the problems and gaps in the digital transformation clearer, the Technical Working Group studied the status of existing software and data systems, digital security issues, infrastructure, technology governance, telecommunication and information, and providing public service to the ministries and institutions in the overall image and more in depth. The data obtained from the status study on these important elements will reflect the level and status of digital government in Cambodia clearer.

In fact, the evolution of technology has changed the context of the use of technology to improve efficiency and provision of public services of government. In the past, in terms of efficiency and effectiveness for government work, telecommunication and information technology, especially the Internet, was used for good governance, but in general, the replacement of technology for work and provision of services did not change the form and the job structure. Such an e-government has facilitated work performance and public services provision to a greater and more efficient level, but it has not yet added value from the integration of any systems and data consolidation resulting from the connection of all technology systems from all sections and ministries and institutions of the government. The potential that results from such a gradual development has transformed the concept of digital government development, not only for turning to use of digital technology to improve work's efficiency and public services provision, but also to prepare the long-term strategic use of new technologies linking with the data generated from the collection system to assist decision-making, change work procedures, support development goals, and other reforms.[1]

In the past, Gartner, a large consulting firm, established a digital government framework and divided the evolution of digital government into five levels.[2] Each level has different characteristics and forms as follows:

- Level 1: Electronic government (e-Government) is the first stage of Digital Government. At this stage, the development and use of digital systems focuses on the transformation of providing online services in terms of convenience and cost savings. Digital systems and data storage in the first stages are separated.

[1] Broadband Policies for Latin America and the Caribbean: A Digital Economy Toolkit © OECD, IDB 2016, p.361
[2] https://www.gartner.com/smarterwithgartner/5-levels-of-digital-government-maturity/

- Level 2: Open government, open stage, is the stage where the system program is designed to receive feedback and interact with service recipients. In this second level, government information is open to the public to ensure transparency and accountability.
- Level 3: Government is data-centric, development of digital government in this level focuses on data as an important and necessary asset. The development application is no longer a priority; on the contrary, data collection, use, and analysis are the important strategies for the government. The operating systems of the subordinate units of government are gradually interconnected, and the implementation of the work will run on a digital platform (Government as A Platform).
- Level 4: Fully digital government is a phase in which all government ministries and institutions focus on data to develop innovative digital systems for better work, management and service delivery, based on aggregated data.
- Level 5: Smart government is a stage where the process of collecting and analyzing data occurs automatically to assist in decision-making and respond to problem-solving. Service innovations with new technologies, such as artificial intelligence and the Internet of Things can be fully operational at this stage.

Compared to this five-level division, the digital government in Cambodia is still at the first level, as the current digitalization of ministries and institutions focuses on the development of applications for facilitating work without having a strategy for digital transformation in the long-term or considering the added-value that can arise from the collected data. Development has many challenges and gaps that need to be addressed to be fully ready to participate in the development of digital government, in the development of application systems, data systems, digital security systems, infrastructure, in charge units for technology at ministries and institutions, human resources issues, and prioritizing public services for digitalization.

II. Status of Program and Database System

Among 28 ministries and institutions, around 182 program systems have been developed to serve those ministries and institutions. Of these, about 167 program systems have been in use, six programs are already developed and being tested, seven programs are under development, and other two programs are deactivated (these deactivated programs are programs that were provided to the ministry within a framework of assistance in various projects, with an unmodifiable code, and there is a lack of funds for maintenance).

Table 1. Status of system in ministries and institutions

Status	No. of System	Percentage
Currently in use	167	91.75
Ceased using	2	1.09
Currently developing	7	3.84
Currently testing	6	3.29
Total	**182**	100

The growing trend and demand for technology demonstrates an understanding and recognition of the benefits of systems to assist work in units and governments. The purpose of establishing these systems is to respond to the needs of reform in the internal management and management of the sector, which is the responsibility of ministries and institutions. However, these usage trends and needs do not consider the context of long-term digital transformation strategies and the importance of data, and added-value creation from data collection. In general, the implementation and use of the program has the following features and issues:

- ***Silo and Redundancy***: Almost all systems are designed to serve their respective functions without considering the interconnection of each program, even in the framework of each unit under the same ministry or inter-ministries. On the other hand, in addition to systems for sector management, systems that have functions to support administrative management, especially personnel management, have been doubly developed for several ministries and even in a unit within the same ministry. These factors occurred due to the fact that all ministries and institutions do not have a common plan for digital change, and present specific directions and strategies for subordinate units to implement in planning and establishing their own program systems.

- ***Ownership issues on the code program system***: among the program systems that have already developed, about 24 percent of the programs that own ministries and institutions are unable to modify the code even under full ownership. Most of these programs are purchased from an external service provider or provided by development partners, given limited access to code modifications once the development project has been completed. Lack of ownership of the code systems caused difficulties to maintain, modify function of program systems, or link those systems to other systems for any purpose. This is the point that shall pay high attention in the development of sustainable digital government.

- ***Ownership issues on data systems and considerations of existing data***: For more than 30 percent of systems, ownership does not grant full access to manage the database. The database is managed by the private sector or development partners. More than 18 percent of systems stored data on overseas cloud systems, which increases the risk of information and data leakage. More importantly, ministries and institutions do not have clear legal norms for data sharing or data management.

- ***Vulnerability in data loss***: The risk of data loss is high due to the low consideration of security of systems at ministries and institutions. Despite deliberations of system management technicians of most ministries and institutions in setting passwords and using a Firewall (Network, Web Application) to protect the system and back up their data, more than 56 percent of ministries and institutions have never checked the security on websites and programs, 77 percent have never checked for attacks on their systems, and 85 percent have not complied with the basic digital security standards. All of these are vulnerabilities in technology systems, and data loss can occur if there is a hack into these systems.

- ***Lack of digital identity of civil servants***: Digital identity of civil servants is important while the digital government evolves to a higher level because it can verify the identity of civil servants accessing or working in the common digital platforms. In the current situation, the

development of used program systems so far did not take into account the digital identification of officials who work in the program system today and in the future.

III. General Status of Digital Security

Despite security issues in those systems, the ecosystem of digital security, in general, in ministries and institutions is still low, especially at the user level.

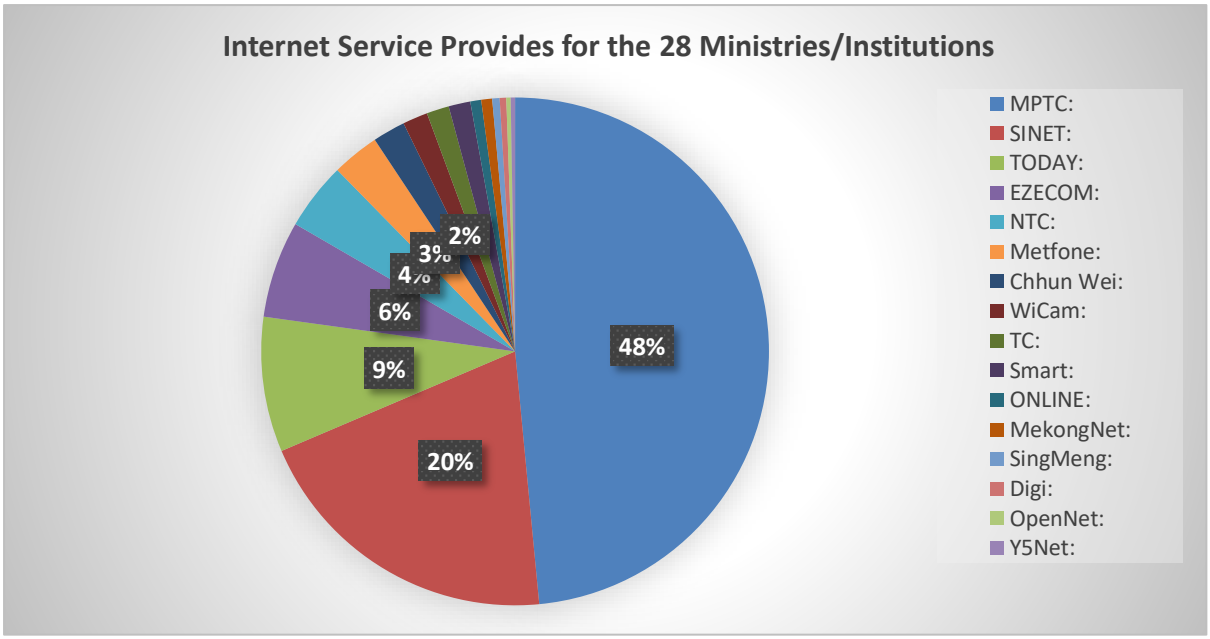
- ***Excessive use of unlicensed software***: About 63 percent of ministries and institutions use unlicensed software, while 37 percent are able to purchase licensed software only for important data and processing systems. On the other hand, almost 100 percent of software for general use is not properly licensed.

- ***Vulnerability to computer viruses for users***: More than 70 percent of users of technology equipment in ministries and institutions do not use anti-virus software, do not update, or regularly scan for viruses. In addition, more than 56 percent of ministries have never trained or introduced security rules to users. This situation opens up opportunities for access to and control of databases and other programs through the users' technological devices.

- ***Lack of officials in-charge of digital security***: Although digital security is an important issue, fundamental to a successful and highly trusted digital transformation, around 22 percent of ministries and institutions have officers in charge of digital security. Lack of officials in-charge of digital security, high level of risk, and inability to timely respond when an incident occurs on the database and software systems.

IV. Status of Connectivity Infrastructure and Technical Equipment

Connectivity infrastructure and internet services are indispensable components of digital transformation. Presently, all ministries/institutions obtain internet access to support their work through the connection provided by the Ministry of Post and Telecommunications and additional purchases from 16 private internet service providers. The total bandwidth utilized by the ministries/ institutions is 7,211 Mbps, of which 3,496 Mbps is provided by MPTC. Despite all ministries/institutions having connections, difficulties remain which hamper the allocation of Internet connection to all subordinating units in each ministry and institution.



- ***Inadequate intra-institutional connectivity***: Around 46 percent of ministries/ institutions do not have a local network for organizing and allocating internet services, causing the non-exhaustive use of the Internet service provided and a growing expense for external purchases. Some ministries' subordinating units have subscribed to Internet services from external providers on their own. The inadequacy of intra-institutional connectivity and proper management of the Internet service subscription also pose a security risk to the ministry/institution's Internet infrastructure. The inadequacy is caused by the limitations in budget and equipment, and the lack of a designated unit responsible for setting up and administering the network.

- ***Lack of common data storage servers and data centers***: This is a major problem for all the ministries/institutions hoping to introduce application systems and to store data. Around 30 percent of all ministries/institutions have their own data centers. The trend of establishing separate data centers for each respective ministry and institution is growing. This is expensive in terms of both investment and separate maintenance costs. Investment on a common data center for the government will reduce a significant burden on all the ministries/institutions in respect of the digital transformation process.

V. Technology Unit and Human Resources

All ministries/institutions have units charged with ICT functions in their organizational structure, with personnel serving this function. However, only 10 of them (equivalent to 40 percent) have clearly delineated the functions into clear divisions of roles and responsibilities. In the rest (equivalent to 60 percent), the responsibilities for discharging the functions are not clearly articulated and mixed up with other roles and responsibilities.

Unclear roles and responsibilities of the ICT units will hamper the progress of digital government, particularly when the development focuses on integrating different systems within

the same ministry, coordinating interconnection across ministries, centralizing data, and ensuring digital security to reach the final phase of digital government.

Aside from the issues mentioned above, human resources needed to support the digital transformation at ministries and institutions remain limited. In fact, all ministries/institutions mentioned the lack of IT human resources both in terms of quantity and quality. Furthermore, technical officers have not been supported by their ministries and institutions to receive professional development training on new technology. The majority of expenses for such training or certification tests is paid for by the officers themselves. Lack of encouragement and human resource development planning will present the digital transformation process with many challenges.

Human resources in the IT sector will remain in high demand in the future. According to the responses by technical units, 784 additional highly-skilled officers are needed in order to support the development, maintenance, and administration of systems for the next three years. The currently the most-needed ICT skills are networking, software development, security, and data management and analytics, while demands related to new technologies have not yet come to the fore.

VI. Status of Public Service Delivery

Only around 18 of all the government ministries and institutions provide more than 20 public services. Some ministries and institutions do not provide any public service and some have only 1 or 2 services. In total, there are 3,196 public services.

Since one of the objectives of digitizing ministries and institutions is to provide public services quicker and more effectively, a study on the current status of public service delivery is essential. With the same objective, the government has previously reformed service delivery through the creation of numerous programs, such as the five-year Administrative Reform Program 2004-2008, the National Administrative Reform Program 2015-2018, and the establishment of many implementation mechanisms as follows:

- One window service mechanism at the sub-national level in order to provide administrative and authentication services.
- One window service office as a place 1) for providing administrative services in cities, districts, and Khans, 2) for gathering administrative services (commerce, culture, tourism, land management, industry, mine and energy, public work, education, and health) and administrative laws, 3) where users receive forms and information and pay fees, and 4) where users receive the final product of the services.

Despite the reforms aiming to expedite public service delivery and despite rolled-out mechanisms having facilitated and simplified the processes for service applicants, applications for and delivery of services still require physical presence and are paper-based. Document processing for applicants still follows pre-existing procedures.

In order to further increase effectiveness, certain ministries and institutions have separately moved their services online. These include the Ministry of Commerce, the Ministry of Public Works and Transport, the Ministry of Labor and Vocational Training, the Ministry

of Economy and Finance (General Department of Taxation), and the Council for the Development of Cambodia, etc. The siloed systems for online service delivery presents a complicated problem to applicants who need to access different websites and provide redundant information for application purposes. This was a primary reason for the Ministry of Economy and Finance to initiate the business registration system through the Cambodia Data Exchange (CamDX) platform for integrating online service systems (focusing on business registration) and exchanging data among separate systems. With this system, it takes 8 working days at most with costs reduced in half for businesspersons to undertake business registration with the Ministry of Commerce and tax registration with the General Department of Taxation, and declare the opening of their enterprise to the Ministry of Labor and Vocational Training, all at once. The CamDX mechanism is expanding to cover business registration services of all relevant ministries. This means that public services (business registration) that accounts for 52 percent of all public services will be provided digitally.

Although the success of CamDX represents a significant progress of the digital transformation in the government and a high level of convenience for businesspersons, other important public services should be prioritized for digitalization, particularly those that are in high demand, complex, and relevant to individual citizens. Those services have already been determined in the national public service reform programs and include those related to health, education, commerce, public work and transport, land registration and construction, civil registration, passport, and identity card. Digitalization of those services will not only provide confidence and convenience to citizens, but will also create a database (basic citizen data) which is important for analyzing socio-economic and other issues in order to guide decision-making process in policy and planning targeted development programs.

VII. Target and Policy Recommendations

- Through this study, the status of Cambodia's digital government is in Level 1 with the purposes of using technology to facilitate work and provide public services, and with the main focus on building applications. In this situation, pushing the digital transformation to a higher level requires a change of mindset, particularly among both the government and technical leaderships. This includes switching the emphasis from application development to the importance, collection, and use of data as an added value in the government and to the encouragement of innovation based on the centralized data. This switch will also lead to a change in work procedure and structure over time. The change of mindset can be achieved through actual demonstration of innovative data-driven products, the integrated system and the use of centralized data at all levels and across various sectors.

- In order to create value for promoting changes and reliably collecting data, primary legal instruments that need to be promptly formulated include a data privacy law and data sharing mechanism within the government. The lack of these laws will cast doubt on data governance and lead to distrust, which could hamper the data sharing process among ministries and institutions. Thus, basic digital security norms should be established and implementation encouraged at ministries and institutions in order to enhance technology security.

- Digital transformation requires an organized planning and participation from all levels of subordinating units of ministries and institutions and between ministries. Aside from formulating a common digital government policy that promotes digital transformation at all ministries and institutions, each ministry should be required to prepare their internal digital transformation plans in conformity with the overall government plans.

- Digital transformation is not possible if the roles and responsibilities of the ICT units are not clearly defined. As such, a necessary policy intervention is needed to encourage the establishment of ICT units with clearly defined roles and responsibilities and proper planning on network management and digital security.

- Create a training mechanism and regularly develop the essential and new skills of the responsible officers based on technology trends, and encourage them to take internationally recognized certification tests. Aside from the specialized skills on network management, application development, digital security, and data management, there are a number of important skills that should be taken into consideration for training technical officers, both to promote effectiveness and creativity. Such skills include project management, behavioral science, design thinking, data analytics, data science, and so on.

- The investment on supporting infrastructure, network, and data centers should be the government's common investment for the entire transformation of all ministries. Having a common infrastructure will help reduce complexity in management and ensure a high level of security. The data centers should be utilized to store government data and to host other necessary services such as email services, among others.

- Expedite digitalizing public services, particularly in the health and education sectors, as well as the registration services of land and construction, civil status, passport, and identity card in order to manage and collect basic data relating to important citizen identities as these services are in high demand.

- Prioritize developing common applications for shared use by all government ministries and institutions; these applications include the civil servant management system, financial system, document management system, electronic approval system, and so on. The systems may be developed once and shared for use across all government ministries and institutions.

- Should initiate the creation of a single digital platform for public services (in addition to business registration) convenient for citizens to seek and request services and for new public services to be added, changed, and modernized.

- Explore the possibilities of using official email systems at ministries and institutions as the digital identities for officials in using the digital government.

- Should initiate a GovTech Startup program that is receptive to innovative digital solutions for the government, the scope of which may be extended for use at various ministries and institutions in order to save costs and ensure the effectiveness of these digital solutions.

- Set achievable and specific visions for each phase. A smart government can be accomplished only after all ministries and institutions, including subordinating units, have fully completed digitalization. The current outlook, however, suggests that Cambodia still has many challenges to overcome to achieve full digitalization at all ministries and institutions. Successful handling of the structural challenges may allow Cambodia to attain at most Level 3 of digital government maturity in the next five years.

Ministries/Institutions Digital Information System

No.	Ministries/Institutions	Quantity	Digital Information System	Major Functions
1	Ministry of Agriculture, Forestry and Fishery (MAFF)	3	Human Resource Management Information System – HRMIS	Management of civil servant information
			Cambodia Agriculture Market Application	Sales of agricultural product
			Agricultural Data Monitoring and Retention System – AgriSys	Agricultural product information management and price facilitation
2	Ministry of Civil Service (MCS)	10	Civil Servant Data Management System	Management of civil servant information
			Information Management System for Civil Servants In the Archives	Management of civil servant records
			Retirement Management System	Retirement management
			Room and Meeting Management System	Room and meeting management
			File Flow Management System	File Flow System (data, reports, and statistics)
			Contract Management System for Contract Officers and Teachers	Management of contract information
			Civil Servant Information Sheet Management System	Management of civil servant information documents
			Overtime Management System	Overtime Management
			Civil Servant Information System	Civil Servant Information Management Management of civil servant information
			Salary Payment System	Payroll management

3	Ministry of Commerce (MoC)	7	MoC Cloud	Cloud-Based Management
			Business Registration System	Business registration
			MoC News	Ministry News
			National Single Window - ATIGA	Integrated management of the National Single Window
			E-Filing	Electronic document management
			Trademark Search	Trade name check
			Civil Servant Information Management System	Management of civil servant information
4	Ministry of Cult and Religion (MoCaR)	0	N/A	
5	Ministry of Culture and Fine Arts (MCFA)	1	HR Management System	Management of civil servant information
6	Ministry of Economy and Finance (MEF)	13	Financial Management Information System	National Budget management
			Cambodia Data eXchange Platform - CamDX	Inter-ministerial data exchange
			Business Registration System	Business registration
			Document Management System	Document management
			Attendance Management System for the Ministry's Office	Attendance management
			Management System for State Property for Internal Affairs and Other Ministries	Management of the properties of government institutions (various ministries)
			Q&A System	Q&As
			Personnel Management System for the Ministry Office	Management of civil servant information

			Customs Data Automation System - ASYCUDA	E-Custom Payment
			Electronic Customs System	Electronic customs
			Personnel Management System	Civil servant management
			Attendance Management System	Attendance management
			Tax Registration System	Tax registration
7	Ministry of Education, Youth and Sport (MoEYS)	7	Educational Information Management System - EMIS	Educational information management
			Personnel Management Software	Human resource management
			Textbook Distribution System	Status monitoring of textbook distribution to each school
			Scholarship Management System	Scholarship information management (Data, reports, and statistics)
			Student Information Tracking System	Student information management (Data, reports, and statistics)
			School Management System	School Information Management System (Data, Reports and Statistics)
			Library Management System - Koha	Library Management System
8	Ministry of Environment (MoE)	1	Application for Import of Refrigeration Equipment and Ozone Depleting Substances	Management of Import Permits for refrigeration equipment and ozone depleting substances
9	Ministry of Foreign Affairs and International Cooperation (MFAIC)	9	Digital Library or e-Document System	Digital library and various Electronic Documents
			Human Resource Management Information System	The entry and retrieval of civil servant information

			Meeting Utility - Sign Board	Confirmation of meeting schedule and room
			Management Software for IT Resources	Equipment resource management
			Employee Attendance Management System	Management of clock-in and clock-out of civil servants
			Entry and Exit of Staff at the Ministry Building	Entry management of civil servants
			Entry and Exit of Vehicle and Small Motorcycles at the Ministry Building	Entry management of vehicles
			Visa Application for Foreigners through Online Registration	Online provision of eVisa service to foreigners
			Diplomatic Passport Application Program – Official via Online Registration	Online provision of e-Passport service
10	Ministry of Health (MoH)	13	Malaria Information Management System	Management of malaria endemic region and patient information (Data, reports, and statistics)
			Management System of Human Resource for Health	Management of personal information, work history, workplace changes, promotion, retirement, foundation training courses, and ongoing training for civil servants (civil servant knowledge management)
			Patient Management and Registration System - PMRS	Registration and management of patient information in the Event of Using Monitoring, Assessment, Verification and Payment on All Expenses on Health Equity Fund Services

			Cambodia Pharmaceutical Online Registration System - CamPORS	Management of online registration of medicines, medical Equipment, pharmaceutical establishments, and cosmetic products (Data, Reports, and Statistics)
			Logistic Management Information System – LMIS	Inventory and supply management
			Health Management Information System - HMIS	Registration and announcement on healthcare service tasks and healthcare conditions at all levels of healthcare bases in the National Healthcare Management System
			Cambodia Laboratory Information System - CamLIS	Data management system of test results and standards (general lab testing and microbiology) in analysis and culture as well as outbreak monitor and diagnosis critical to public health
			Donor Data Management System	Management of donor locations and other information (data, reports, and statistics management)
			Medical Equipment Information Management System – Inventory	Medical equipment management
			District Health Information Software - Version 2 - DHIS2	Data management software on HIV/AIDS prevention, care, and treatment
			TB Management Information System - TBMIS	Management and dissemination on TB cases that have been identified and treated at all levels of health facilities

			Information Communication and Technology System for National Quality Enhancement and Monitoring Program - NQEMP ICT System	Data management system on the Results of Quality-of-Service enforcement on healthcare services at the provincial departments of health, operational health district offices, referral hospitals, and health center levels throughout the Kingdom of Cambodia, through Healthcare Service Assessment
			Zero Reporting System	Weekly report on the cases of priority infectious diseases by health centers, referral hospitals, and hospitals throughout the country
11	Ministry of Industry, Science, Technology & Innovation (MISTI)	5	Internal Online Approval System	Management of document reception and transmission and document flow (data, reports, and statistics)
			SME Registration Management System	Management of online registration of SMEs
			Business Management System	Management of requests, accounting, inventory, payment, payroll, and labor (report and statistics management)
			Mobile Water Billing Printing Program	Mobile water billing printing (report and statistics management)
			Water Supply Monitor System - WSMS	Monitoring of water supply services (report and statistics management)
12	Ministry of Information (MINFO)	1	Journalist Management System	Management of journalists
13	Ministry of Interior (MoI)	28	Administrative Document Management System - DMS	Document management
			Prison Officer Data Management System	Management of prison officers information

			Task Record and Management System	Management of task records
			Data Management System for Civil Servants	Data Management of Civil Servants
			Passport Production and Management System	Management of passports
			Khmer Nationality Identity Card Production and Management System	Production and management of national identity cards
			Legal and Legal Research System	Compilation of laws and legal research
			Student Management System	Student management
			Criminal Information Management System	Criminal information management
			Bodyguard Identity Management System	Bodyguard identity management
			Archive Management System	Archive management
			Drug Crime Data Management System	Drug crime data management
			Traffic Violation Vehicle Data Management System	Traffic violation vehicle data management
			Weapons Registration and Management System	Weapons registration and management
			Cambodia Border Pass Management System	Cambodia border pass management
			Sub-National Administration Project Implementation Management System)	Sub-national administration project implementation management

			One Window Service Office for Service Delivery Management Information System – Municipality, District, Khan	Management and service provision at one window service office - municipality, district, khan
			One Window Service Office for Service Delivery Management Information System – Capital and Province	Management and service provision at one window service office – capital and province
			Cambodia Border Management System - CBMS	Border information management
			Arrival Visa System	Provision of on-arrival visa
			Target Management System	Target management
			Passenger Safety System	Passenger safety management
			Visa Extension System	Visa extension
			Foreigner Presence Management System - FPCS	Management of foreigners' stays
			Ministry of Interior Information System – MOI Mobile App	Announcement
			Identification Services Program - e-Service App	Information on the identity card issuance
			Identity Information Search System	Identity information search
			Online Visa Application System	Online visa application
14	Ministry of Justice (MoJ)	3	Judgment Letter Management System – Criminal Management Report	Management of criminal record application
			Civil Servant Management System	Management of Ministry of Justice's personnel information

			Administrative Management Software	Management of e-documents
15	Ministry of Labor and Vocational Training (MLVT)	11	Foreign Worker Centralized Management System - FWCMS	Management of foreign workforce
			Cambodia Public Employment Service - CPES	Employment search and provision of vacancy information
			Salary Management System	Payroll management
			Civil Servant Management System	Management of personnel information and retirement
			National Social Security Fund System	Management of the national social security fund's information (management of data, reports, and statistics)
			Manpower Training and Overseas Sending Board – MTOSB	Management of the information of workers who plan to repatriate from the Republic of Korea
			Card Issuance System for Workers – Overseas Cambodian Worker Card	Issuance of worker cards (management of data, reports, and statistics)
			Contract Suspension System	Termination of workers' employment contracts
			Ministry's Internal Reporting System – Digital Reporting System	Management of various units' work report submission
			Technical and Vocational Education and Training Management Information System - TVETMIS	Management of the statistics regarding technical and vocational education and training institutions' management, academic staff, officers, faculty members, trainers, trainees, and students
			National Technical and Vocational Education and Training E-Learning Platform – TVET E-	Supporting distant/online teaching and learning for faculty members, trainers, trainees, and students in technical and vocational

			Learning (Note: This platform began to be developed in October 2020 and is currently in trial operation)	education and training institutions
16	Ministry of Land Management, Urban Planning, and Construction (MLMUPC)	9	Land Management System	Land management
			Immovable property ownership certificate issuance system	Issuance of immovable property ownership certificates
			Civil Servant Data Management System 2.0	Management of civil servant information
			Construction Digital Data Management System	Management of construction data
			Construction Document Tracking System	Tracking of construction documents
			Public service request management system	Management of application for public services
			Electronic system for providing Cadastral Information Service	Electronic disclosure of cadastral information
			Cambodia Construction Information Software – "Cambodia Construction" App	Providing access to construction information in Cambodia
			Construction Company Electronic Registration System	Electronic registration of construction companies
17	Ministry of Mines and Energy (MME)	4	Civil Servant Management System	Management of civil servant information
			Inbound and Outbound File Tracking System	Management of the reception and sending of electronic documents
			Accounting Management System	Accounting management
			Atmospheric Radiation Measurement System	Recording of environmental parameters (such as atmospheric radiation)

				(management of data, reports, and statistics)
18	Ministry of National Assembly-Senate Relations and Inspection (MoNASRI)	4	Civil Servant Management System	Management of ministry's civil servants
			Public Financial Management System	Management of public finance
			Online Law and Regulation Library (e-Library)	Dissemination of laws and regulations
			Online Complaint Management System	Online reception of complaints
19	Ministry of National Defense (MoD)	2	File Management System	Management of electronic documents
			Personnel Data Management	Management of personnel information
20	Ministry of Planning (MoP)	4	Data Processing System for Surveying and Census - CSPro	Research and census for data organization system
			Data File Management and Statistical Analysis System – Stata & SPSS	Management of data file and analysis of statistics
			Electronic Data Collection System – Survey Solution	Data collection
			Metadata Management System - NADA	Metadata management
21	Ministry of Post and Telecommunications (MPTC)	4	Email Management System	Email usage
			Inventory Management System	Management of inventory
			Human Resource Management and Payroll System	Management of personnel
			Content Management Platform for Public Institutions	Content management for public institutions
22		20	Public Information and Transportation	Information software for public works and transport

	Ministry of Public Works and Transport (MPWT)		Information Systems and Programs	
			Vehicle Registration and Driving License Systems	Management of vehicle registration and issuance of driver license
			Ministry Website	Ministry's website
			Administrative Document Flow Management System	Management of reception and sending of official documents
			Civil Servant Attendance Management System	Management of personnel through determination of benefits or management of their presence and absence using fingerprint scanning
			Joint Report Management System	Management and review of reports
			Road Information Management System	Management of road information
			Complementary System for Providing Road Transport Services	Provision of land transport services
			Ship Authorization System of the Kingdom of Cambodia	Issuance of vessel entry permit (Immigration)
			Entry/Exit Port Approval System (Immigration)	Management of vessels' entry at various Cambodia's ports to maintain security and contribute to environmental protection
			Driving Theory Test System	Administration of driving theory test
			Payment System	Payment through affiliated banks
			Vehicle Registration Application System	Application and auctioning of vehicle registration number
			Driving Theory Awareness Program	Dissemination of driving theory via mobile phones
			Vehicle Information Checker	Vehicle information verification

			Road Transport Data Sharing System	Information-sharing with other institutions
			Meeting Schedule Management System	Management of the Ministry's meeting schedule
			Road Maintenance System and Program	Road condition reports and decision on maintenance
			Road Transport Business Application System	Management and application processing for road transport business permit
			Vehicle Technical Inspection Application System	Management and application processing for vehicle technical inspection
			Driving License Application System	Application processing for driving license
23	Ministry of Rural Development (MRD)	2	Civil Servant Information Management System	Management of civil servant information
			Rural Road Management System	Management of rural road information
24	Ministry of Social Affairs, Veterans, and Youth Rehabilitation (MoSVY)	8	Personnel Management System	Entry and query of civil servant information
			Child Protection Management Information System	Management of nationwide child protection information
			Residential Care Facilities Digital Inspection System	Management of nationwide Resident Care Facilities information
			Primero Information Management System	Management of child victims and vulnerable children nationwide
			Program Management System for Cash Transfer for Pregnant Women and Children under 2 Years Old	Management of information of pregnant women and children in impoverished families nationwide
			Retired Information Database	Management of information of retired civil servants and their families nationwide
			Veteran Information Database	Management of information of veterans and their families nationwide

			Disabilities Management Information System	Management of information of persons with disabilities nationwide
25	Ministry of Tourism (MoT)	2	Management System for Training and Management of Skills in Tourism	Management of training of skills in tourism
			Online Travel License System	Online issuance of licenses
26	Ministry of Water Resources and Meteorology (MoWRaM)	1	Meteorological and Irrigation Management System (Xconnect Meteorology and Climatology)	Management of meteorology and irrigation system
27	Ministry of Women's Affairs (MoWA)	2	Civil Servant Information Management System	Management of civil servant information
			Financial Management Information System FMIS	Management of national expenditures for effectiveness, transparency, accountability, and better revenue collection
28	Office of the Council of Ministers (OCM)	4	Disaster Information and Monitoring System	Monitoring of disaster information
			Legal Document Management System	Management of legal documents
			E-Meeting	Management of online meetings
			Electronic Document Management System	Management of electronic documents
29	Council for Development of Cambodia (CDC)	4	QIP Online Application	
			Master List Online Application	
			Supplier database with sustainability Dimensions (SD2)	
			CRDB's ODA Database	
Total		**182**		

Annex 2: Glossary

No.	Word/phrase	Definition
1.	Artificial Intelligence (AI)	An aspect of computer science that focuses on the creation of software, programs, or tools that are capable of making its own decisions or act on behalf of people.
2.	Big Data	Large quantities of datasets, with multiple sources and forms, that are fast-growing and require special methods and technology to manage and analyze all the data to assist in decision-making and serve other interests.
3.	Blockchain	Set of transaction logs that is securely interconnected using encrypted identification numbers and non-modifiable transaction records and is shared across relevant networks.
4.	Business Process Re-engineering	Analysis, organization, and improvement of workflow to enhance the value of institutions to be competitive and reduce costs.
5.	Carbon Emission Reductions	The reduction of carbon emissions into the atmosphere by using various methods, such as reducing the uses of electricity or vehicles, and substituting them with the use of environmentally friendly technologies.
6.	Chat	Friendly or informal conversations.
7.	Cloud Technology	Technology that enables the use and sharing of computing resources, network resources, data storing resources, software resources, and software development platforms on the Internet, effectively meeting the needs of users, without having to manage these resources directly.
8.	Collaboration Platform	A platform that uses digital technology as a tool to facilitate administrative collaboration for key functions, such as e-mail, voice messaging, chats, IP telephony, calendars, progress monitoring, and videoconferencing.
9.	Computing Resources	Resources in a computer or device that are physical or virtual, such as CPU/GPU, memory, storage resources, and network bandwidth.
10.	Cyber Warfare	Act of war on the Internet where one or more states attempt to attack and/or destroy computers, media networks, or the economies of other states through various means, such as computer viruses, service interruption, data theft, espionage, defamation, dissemination of false information, etc.
11.	Data-centric Government	Government, in the age of digital technology, that collects data from different sources to store, analyze, and produce insights to assist in decision-making.

12.	Development Framework and System Design Standard	Set of principles, standards, guidelines, and digital tools to facilitate the design and development of information systems to ensure quality, security, efficiency, and harmony.
13.	Digital Identity	Information in the digital form for the identification of individuals or objects that may be natural persons, legal entities, programs, or devices. The Digital Identity allows for the automation of user identification and verification of user identities of the user who interacts with digital systems without the need for direct verification by humans.
14.	Digital Transformation	The transformation process of governance, businesses, and work procedures through digitalization to enhance efficiency and effectiveness at economic and social institutions.
15.	Digital Vaccine Certificate	A certificate in the digital form to verify the vaccination records of people, especially the Covid-19 vaccine, to meet travel conditions domestically and internationally.
16.	Digitalization	The process of facilitating governance, businesses, or workflows for efficiency through the use of digital technology and digital data.
17.	Enterprise Architecture	Blueprint for the development of enterprises with efficiency and effectiveness by linking the development and use of digital technology to the visions, purposes, goals, and strategies of the enterprises. The essential components of an enterprise architecture include business design, data design, program design, and technological design.
18.	Fully Transformed Government	A digital government in which all ministries and institutions use digital technology and have good digital interoperability for the management of governance and provision of services, by taking into account the needs of the general public and emphasizing the importance of using data for decision-making.
19.	Government as a Platform	A digital government that is developed and operates on a digital platform which can be connected and shared among ministries and institutions.
20.	GovTech	New and emerging technologies that are used for the development of a digital government system to improve governance and quality of service.
21.	Health Travel Pass	A certificate that verifies the vaccination and testing records for Covid-19, to meet travel conditions domestically and internationally.

22.	Internet of Things (IoT)	A network of objects connected to the Internet that has a sensor function and can interact with other objects or external environments.
23.	Interoperability	The ability of digital systems to interact with each other in the exchange and use of data, which generally occurs under predetermined conditions.
24.	Interoperability as an Ecosystem Principle	The principle to ensure that all digital information systems under the government framework can not only operate independently but also collaborate with each other and securely with other systems in the form of an ecosystem to complement each other's tasks.
25.	Land and Expand for Efficiency Principle	The principle of starting a project at a small scale before expanding to a large scale, where the expenditures and results of the work are efficient and effective.
26.	Last Miles Delivery	Fast delivery of goods or other documents from the supplier to the end recipients.
27.	Legacy System	A digital system that currently operates using outdated methods, hardware, and software technologies.
28.	Open Government	A governance model based on the principle of transparency and open data, that gives confidence to and has participation from the people in decision-making, such as policy implementation or project implementation according to the needs of the people.
29.	Private Network	A computer network organized separately from the Internet for the internal connection of ministries and institutions to ensure security and enhance efficiency of digital government systems.
30.	Public Value	Value created by the government from the provision of public services and the creation and implementation of laws and regulations according to the needs of the people.
31.	Reusability	Possibility of reusing resources, such as parts of a system code, platform, equipment, etc.
32.	Smart Citizen	An individual who is knowledgeable about digital technologies and can take advantage of digital technologies to problem-solve and participate in digital economic and social activities.
33.	Smart Devices	Electronic devices that can automatically analyze communications, make decisions, and exchange data with other devices.

34.	Smart Government	A government that utilizes new and innovative digital technologies in the automatic collection, processing, and analysis of data to aid decision-making and problem-solving.
35.	The Once Only Principle	The most common principle in the digitalization of public services, where the recipient of the service is required to provide their personal data only once, and the data received will be shared and re-used internally among ministries and institutions or cross-border in accordance with the laws and regulations to protect personal data.
36.	Web Portal	Website system that is established through the connection with other digital systems and serves as a gateway to search for information or operate digital services.

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