Vol 3, Issue 02, 03 March 2021

Article

E-Government in Cambodia: Challenges and Practical Paths to Achieve a Functional E-Government

Oum Chan Mono*

Abstract

This paper examines challenges in e-government adoption and provides practical policy implications that can be a venue for achieving a functional e-government in Cambodia, *under the condition that businesses operate as usual*. Utilizing the Reality Gap theoretical model developed by Heeks (2003), the findings suggest that the path approaching e-government adoption can be challenging which requires a rigorous plan, including enhancing Information Technology and Communication (ICT) infrastructure, adopting effective regulation and policy, expanding and reducing the cost of electricity, reducing the digital divide, resolving and integrating legacy workforce in the government to establish a favorable e-environment and generating sustainable financial support.

Acknowledgement:

The author would like to express special thanks to anonymous referees for their reviews and comments on this research article. The research article also benefits from two internal workshops arranged by Cambodia Development Center, offering opportunities to discuss and provide feedbacks to enrich the paper's impact quality. Without their support, publication of this article would not have been possible.

Introduction

A traditional thinking in public administration and its roles require a substantial justification in the 21st century. Information and Communication Technology (ICT) has evolved and integrated remarkably in public and private sectors, given a new ideological shift in the public administration reform. The cutting edge technology unifies and enables new initiatives to enhance the interaction among agents. ICT in public administration provokes a new communication and service delivery platform, including e-administration, e-services, e-democracy and e-diplomacy. This new paradigm shift is called the "e-government initiative". This new scheme of integrating technology into government administration enhances government's performance and generates cost-effectiveness. It is also scrutinized that e-government adoption improves government's transparency and accountability that conveys a favorable environmenment for local and foreign investments, which is a fuel for growth and development.

The Royal Government of Cambodia (RGC) understands that mobilizing a traditional to modern

***Oum Chan Mono** is a Senior Researcher at Cambodia Development Center and a PhD candidate in Economic program at the University of Waikato, New Zealand.

មជ្ឈមណ្ឌលអភិវឌ្ឍន៍កម្ពុជា
Cambodia Development Center

public administration in the form of e-government through the ICT could extend tremendous benefits in enhancing the efficiency within the government administration and offers direction for private sector and relevant stallholders with a more clear-cut policy implementation. In addition, it is pointed out that investing in e-government is one of the driving forces boosting Cambodia's engine to thrive for her development objectives, especially toward attaining the United Nations Sustainable Development Goals (SDGs) 2030.

As a lower middle income country, Cambodia's human capital and resources remain relatively low which are viewed as the main impediments for e-government initiatives. Under the financial support of approximately USD200 million from the government of the Republic of Korea, National Information Communication Technology Development (NiDA) was established in 2000 in cooperation between the Royal Government of Cambodia and South Korean's experts and technical assistants (Sinawong et al., 2009). Subsequently, NiDA[1] launched the Government Administration Information System (GAIS) and Provincial Administration Information System (PAIS) to deliver the first e-government applications and services.

The online services operated under the GAIS system enable Cambodian citizens to access applications and logging systems without dealing with public officials at the counter. The online applications connect around 27 ministries, state secretariats, and municipalities (Sinawong et al., 2009). Those applications, for example, include the Electronic Approval System (EAS), Real Estate Registration (RER), Resident Registration, and Vehicle Registration. These online applications are useful for sharing, approving, storing and transferring with the cost-effective, convenient and less time-consuming process. Essentially, applications are used to collect various types of data, including citizen information, identification, family information, and other essential statistics while vehicle registration application operates over different roles to approve and monitor all kinds of transports in terms of granting ownership, providing certificate, transferring ownership and other related certificates. The platforms provided by these online applications build a better and friendlier climate for citizens, businesses and the government itself to access profound source of information and log the applications onto the government portal without any delay or any unnecessary procrastination.

Even though Cambodian e-government initiative has been viewed as a significant step in public administration reform, achieving a complete and fully functional e-government is a tremendous challenge that requires a rigorous plan. The obstacles stem from insufficient ICT infrastructure and policy, poverty, insufficient human capital, shortage of financial support and lack of willingness. Thus, we postulate questions to emphasize challenges and constraints in e-government adoption and aim at exploring concrete alternative practical frameworks and policy in achieving e-government marturity in Cambodia.

The remainder of this article is arranged as follows: Section 2 addresses why the government pursues e-government and its importance to economic and social development. Section 3 discusses why some states fail to achieve e-government, followed by Section 4 on Cambodia's e-government development, including existing policies and contemporary challenges. Section 5 discusses implications, and the last section will concludes the key findings from this article.

Why E-Government

E-government's study area is not a new topic but it has been significantly evolving. World Bank (2002, p.2) defines e-government as:

[1] NiDA was later integrated into the Ministry of Post and Telecommunication in 2013.

> "The use by government agencies of information technology tools, such as Wide Area Networks (WANs), the Internet, and mobile computing, that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: 1) better delivery of government services to citizens, 2) improved interactions with business and industry, and 3) citizen empowerment through access to information or more efficient government management."

It is widely recognized that the adoption of e-government adoption is undoubtedly important. Since the 1990s, ICT mechanisms used in the government and business interaction have indicated paramount importance in enhancing cost-effectiveness, improving service quality and establishing responsive and accessible mechanisms (Ndou, 2004). The Institution for Electronic Government study illustrates that 70 percent of transaction costs in traditional government settings could be saved by modifying its function into electronic services (Janet, 1999). The prominence of e-government is also revealed in a study by the OECD (2003) that Australia's investment in ICT could boost growth by approximately 1.3 percent annually in four years, specifically from 1996 to 2000. Another survey carried out by Australian National Office for the Information Economics (NOIE, 2003) on 38 e-government initiative projects also showed that online transactions could save AUD100 million per year or AUD14.2 per transaction while in the United States, online transactions can save USD1.2 per transaction on tax processing paper (Lau, 2007). Similarly, a European Union study indicated that citizens in 25 EU countries could reduce approximately EUR10 per transaction on value-added tax declaration and save up to EUR500 million each year for e-procurement programs (European Commission, 2005). It precisely emphasizes that e-government adoption diminishes administrative complications and reduces unnecessary burdens leading to minimize costs under budget constraints (Godel, Harms, Jones, & Mantovani, 2016).

❖ E-Government and Development Nexus

Choi and Yi (2009) empirically tested the relationship between internet adoption and output growth among 207 countries from 1991 to 2000 by employing the endogenous growth model. The finding shows that an increase in one percent in internet subscribers could increase the likelihood of output growth by 0.05 percent. However, Clarke and Wallsten (2006) suggest that internet adoption could positively impact the promotion of trade and economic development only in developing countries while remaining less significant among developed countries. In line with Choi and Yi (2009), Srivastava and Teo (2010) used a cross-country data to estimate the impacts of e-government on business competitiveness. Employing the Partial Least Square regression model, the evidence suggests that e-government maturity would increase the likelihood of business competitive advantages as well as boosting business competitiveness and economic performances on a national level. Majeed and Malik (2016) employed another large scale panel data of 154 countries from 2003 to 2010 using both random and fixed effect models and controlled for reverse causality issue confirmed consistency and found that e-government provides a potential robustness in promoting per capital GDP by 0.12% while decomposed e-government indicators also reveal positive and statistical significance influence on per capital GDP. The e-government project initiative enables the government to boost productivity, encourage investment and equity, foster GDP growth, and significantly promote democracy (United Nations, 2014; NOIE, 2003; OECD, 2003; Alshehri & Drew, 2010; Dada, 2006).

❖ E-Government and Corruption

Corruption has been informed as a chronic disease in public institutions and one of the major

obstructions in public administration reform as well as a barrier to sustainable development. Prior to e-government adoption, it is suggested that the use of ICT mechanisms positively impacts corruption eradication to some extent. Therefore, e-government initiatives should play a potential role to induce corruption reduction among bureaucrats and promote transparency by building trust in government public services and information sharing. It is suggested that the openness of the government information through e-government adoption to the public has significant implications, including 1). increase opportunities in making government more transparent and accountable for their actions; 2). create the opportunity for business with new economic activities via the use of public information; 3). introduce a viable tool to consolidate how public information and data are organized and stored (OECD, 2010).

We reviewed empirical evidence on the impacts of e-government that indicate the essence of e-government initiatives on the control of corruption. Employing panel data from 149 countries between 1996 and 2006, the findings by Andersen (2009) suggested that e-government projects' availability is positively associated with a potential reduction in corruption and promotion of government accountability and transparency. Lio et al. (2011) examined 70 countries between 1998 and 2005 , and found a negative relationship between e-government and corruption index, suggesting that e-government is a better venue for improving governance and public reform. Accounting for the endogeneity problem and granger causality to encounter bias estimation in corruption, Elbahnasawy (2014) used a large scale data consists of 160 countries from 1995 to 2009 to estimate the impacts of e-government on corruption index. The finding indicates that e-government is a necessary tool in the anti-corruption effort but feasible only through the development of telecommunication infrastructure and improved internet services. Therefore, it shows that e-government initiatives can curb corruption through good governance (Andersen, 2009; Elbahnasawy, 2014; Loi et al., 2011; Shim & Eom, 2008).

Why Some Countries Fail to Achieve E-Government

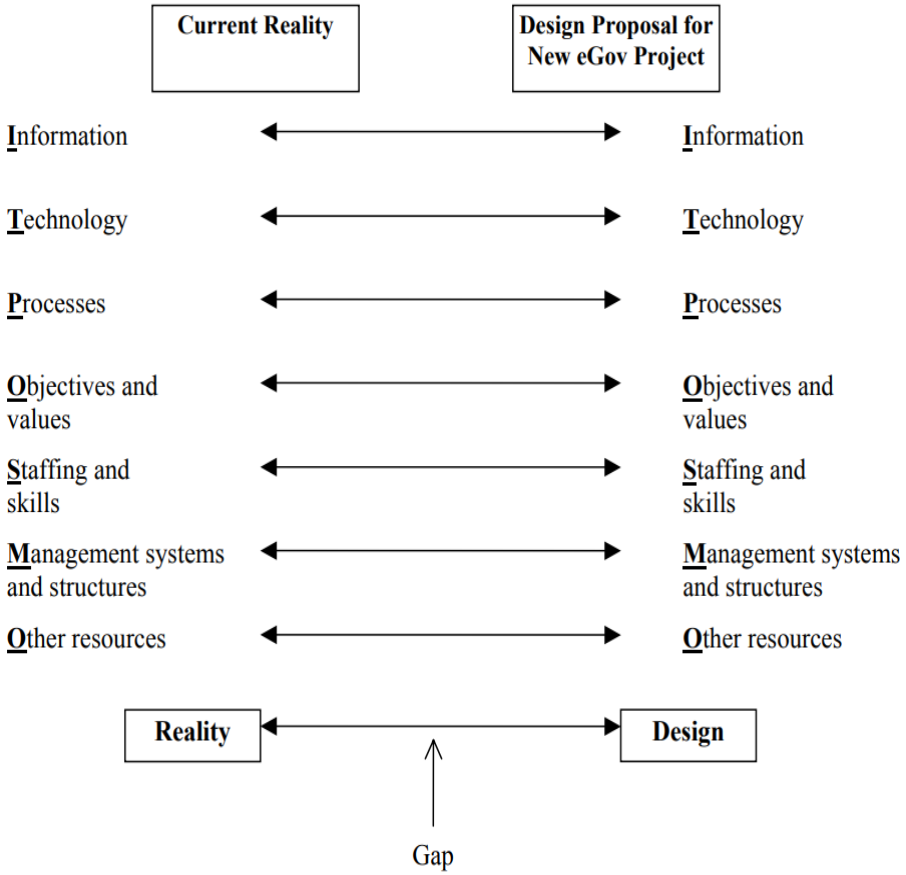
Despite the outcomes of fully functional e-government being rewarding, initiating and implementing the project can be a challenge, especially among developing countries. Based on Heeks' (2003) substantial research, the finding suggests that among developing countries adopting e-government projects, approximately 35 percent failed to achieve e-government, 50 percent is partially failing, while only 15 percent can achieve fully-functional e-governments.

Heeks (2003) designed a model called "the reality gap model" to illustrate the actual gap between country achieving e-government and country that did not. The findings suggested that the related issues stemmed from the lack of drivers and poor project management, unrealistic design, lack of requisite competencies and inadequate technology infrastructure. Similarly, the survey by United Nations (2014) conducted with 168 countries on e-government initiatives found that typical constraints, as well as the key factors leading to failures, are the lack of ICT infrastructures and the provision of education, the incapable human resources, and low-income level.

According to Alsherhi and Drew (2010) and Sinawong et al. (2009), ICT infrastructure and policy development are necessary conditions to decide the success of e-government adoption. The United Nations (2014) also emphasized that the Telecommunication Infrastructure Index (TII) development can be a tool to leverage interaction between citizens and the government. The absence of TII postulates a challenge for the

government and reduces the incentive to interact with the government due to high costs, inefficiency, and fraud. This absence can be called a digital divide—a situation in which citizens unequally access information on the internet or the government's information—as it is associated with ICT infrastructure development (Sinawong et al., 2009; Jorg et al., 2008; France & Lemuria, 2009).

Figure 1: Reality Gap Model



Source: Heeks (2003)

Another key constraint in achieving a viable e-government is insufficient human resources. This puzzle is typically addressed in e-government adoption studies. Shin (2008) observed 53 developing countries promoting the e-government projects and discovered that human capital is positively associated with e-literacy (digital literacy); the critical failure in e-government implementation is the lack of technical and human capital. The driver for e-readiness typically presents a challenge in developing countries that is commonly below world average of e-government development index (United Nations, 2020). Therefore, bolstering human resources can be a practical solution to accelerate e-governmentalization.

Another existing issue is the misunderstanding in public administration core value. On the one hand, it is viable to view e-government initiatives as the mechanisms to promote a better public administration core value—which is a good governance—in its ecosystem. On the other hand, one can argue that it posits in a reverse causality thinking. Adopting e-government without understanding how good governance should work in such a government and public administration ecosystem could be a potential drawback and key to e-government failure. It is

possible that e-government projects potentially establish under a particular circumstance in which a fully comprehensive understanding of public officer's and relevant stakeholder's perceptions—including citizens—in the value of public administration shapes the paradigm shift toward the e-government framework. As it promotes the value of public administration, e-government is likely to enhance administrative efficiency and effectiveness and allow the operation to be more functional, sustainable, and responsive. Importantly, it provides a robust approach to manage public resources and distribution better.

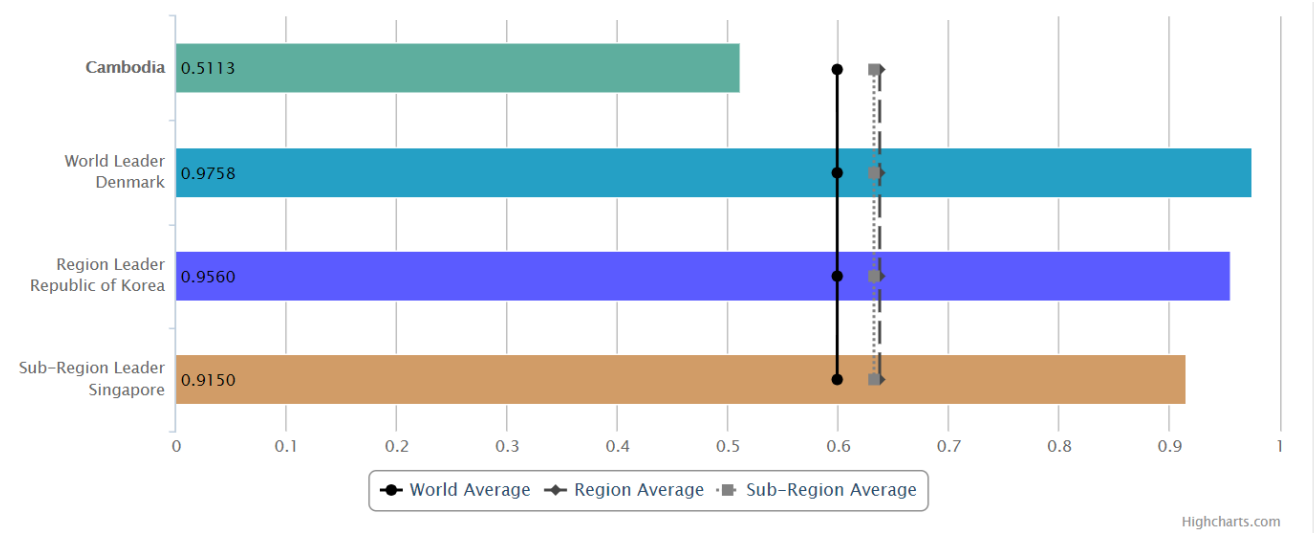
Finally, e-government adoption is perhaps obscure due to insufficient financial support. While e-government project requires a large budget, it is found that financial issue is positively correlated with the lack of ICT infrastructure (Dada, 2006; Sinawong et al. 2009). The high cost of ICT infrastructure installment decelerates and invalidates the e-government process among developing countries. Furthermore, financial availability is required in the first place to provide training and to monitor and evaluate the process of e-government adoption as well as the ex-post evaluation. In most cases, if there is no financial support from developed countries, achieving e-government in a developing country can be out of reach (Schaware & Deane, 2003).

Other main issues impeded e-government are associated with unprecise core value of e-government project, equity issues, citizen participation, cultural issues, conflict of interest, privacy concerns, and lack of leadership support (Ndou, 2004; Nugi, 2012; Quinta & Sirajul, 2013).

Cambodia's E-Government at Glance

Acknowledging the importance of e-government initiative, Cambodia has made strenuous efforts to promote better governance by strengthening public service quality. This has been emphasized in the National Development Strategic Plan (NSDP 2019-2024) and Rectangular Strategy IV (2018-2023), wherein technological infrastructure and the digital economy are among the major priorities needed for enhancing public services digital networks. Over the last ten years, Cambodia's EGDI has remarkably made a convergence, specifically at 0.2878 in 2010 and reached 0.5113 in 2020, lifting Cambodia's EGDI ranking from 140th to 124th out of the 193 countries while the e-participation index has increased from 0 in 2010 to 0.4161 in 2020 (United Nations, 2020). Unfortunately, the index for Cambodia's e-government and e-readiness is relatively low, which is considered far behind other countries, particularly in the Southeast Asia region (8th out of 10 countries) and the world average index.

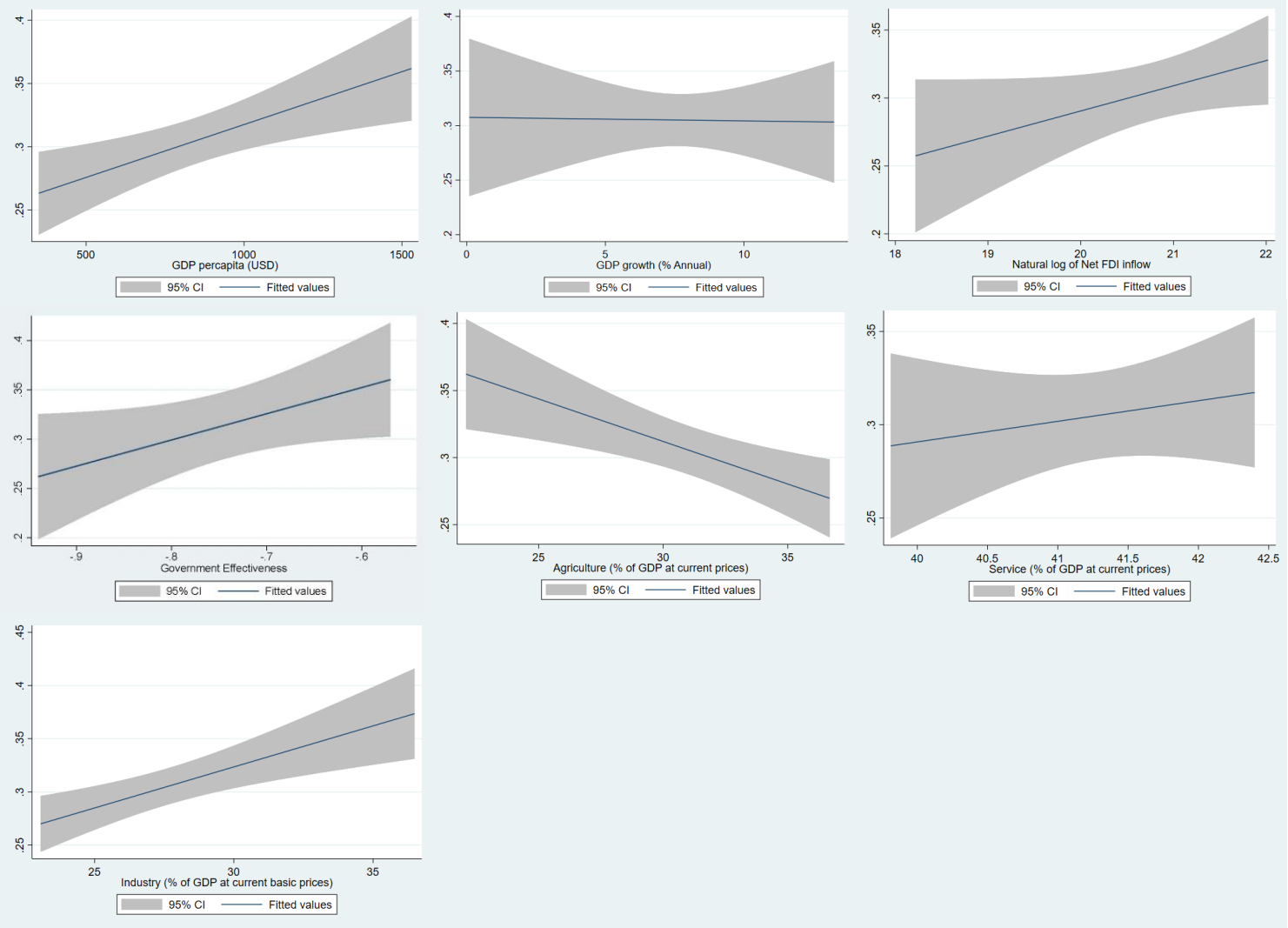
Figure 2: E-Government Development Index



E-Government Development Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Cambodia (Rank)	124	145	158	139	155	140	139	128	129	134
Cambodia (Value)	0.51130	0.37530	0.25927	0.29986	0.29021	0.28784	0.29890	0.29891	0.28590	0.26369

Source: World Bank, 2020

Figure 3: Cambodia's EDGI and Key Indicators (2003-2019)



Source: Author's calculation from UN E-Government Knowledgebase, 2021; ADB, 2020; and WGI, 2020

Challenges in Cambodia E-Government Adoption

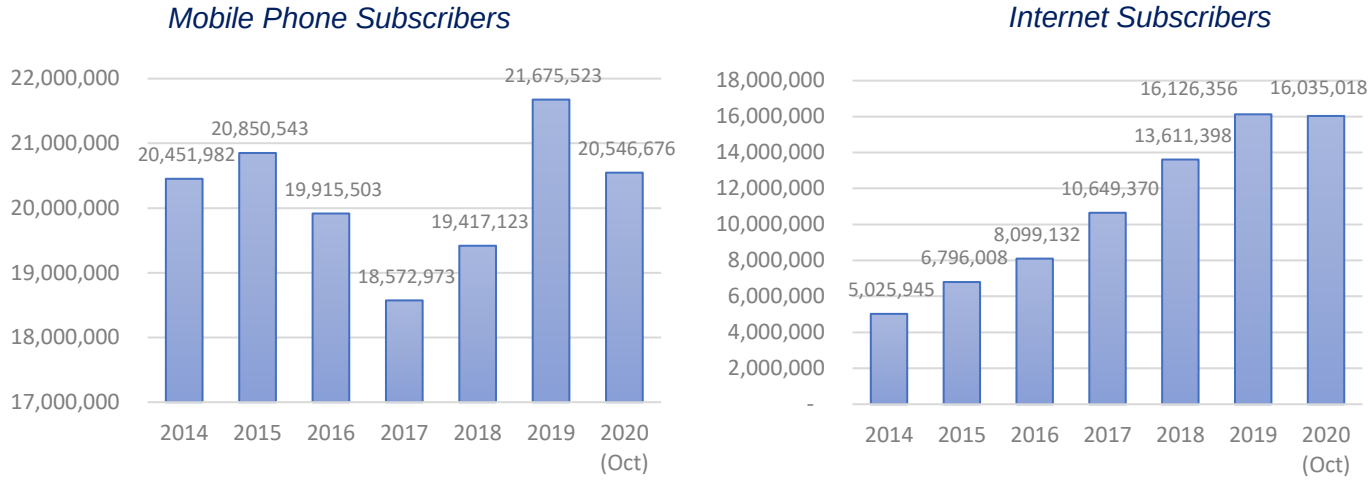
Figure 2 shows that Cambodia's readiness for e-government implementation is lagged behind other countries. Therefore, we are going to look at the constraints and challenges impeding e-government in four main aspects: 1). lack of ICT infrastructure and policy; 2). lack of digital literacy; 3). shortage of financial support; and 4). willingness.

❖ ICT Infrastructure and Policy

ICT infrastructure: The central theme that is commonly discussed in e-government implementation is ICT infrastructure readiness. It plays a vital role in distributing e-services to citizens to engage with the government administrative provisions. A recent study suggests that Cambodia is ranked 8th among ten countries in Southeast Asia in terms of ICT infrastructure, including electronic infrastructure, electronic commerce, electronic society, and electronic government (United Nations, 2020). By October 2020, the number of mobile phone subscribers is 20,546,676 (see Figure 4). In addition to phone subscribers, by October 2020, the number of internet subscribers was 16,035,018 (see Figure 4). Even though phone subscribers are relatively high, which is above average compared to other countries in Asia and

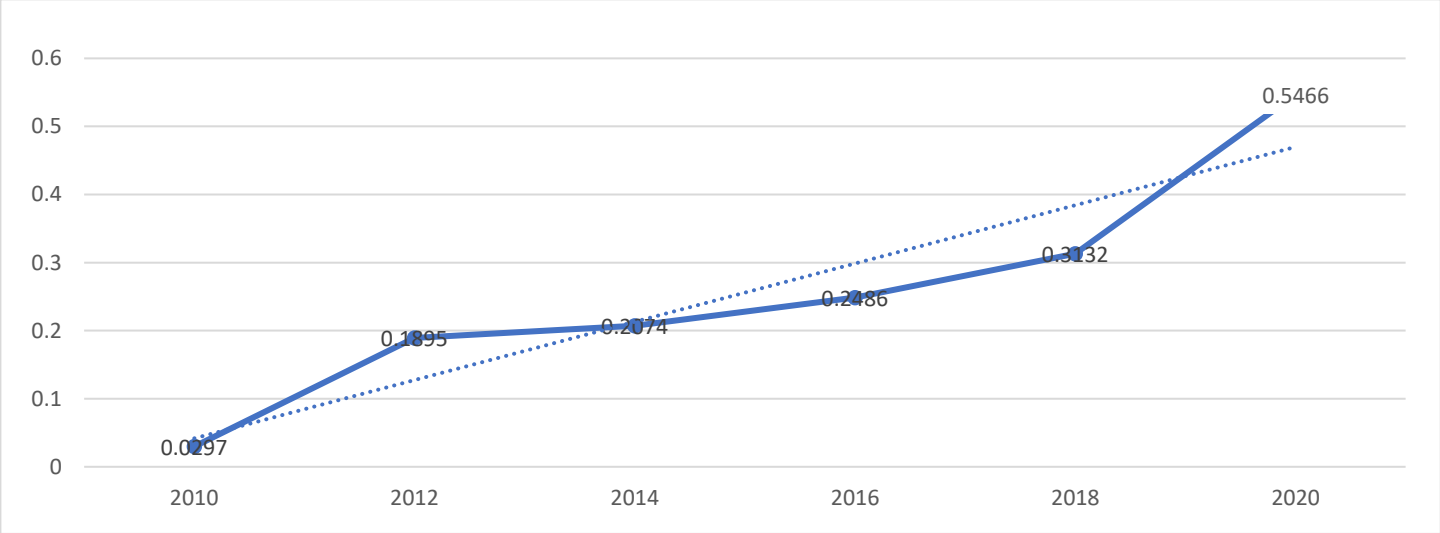
Pacific region, internet penetration rate and access to computers which are the tools for digital adoption are relatively low, particularly among ASEAN countries which can postulate a challenge to access online public services (World Bank, 2018).

Figure 4: Number of Phone and Internet Subscribers, By the End of October 2020



Source: Telecommunication Regulator of Cambodia, 2020

Figure 5: Cambodia Telecommunication Infrastructure Index*



Source: United Nations, 2020

***Note:** The highest index is 1 and the lowest is 0.

ICT Policies and Regulations: Industry 4.0 is a major driving force that pushes the globe toward a new chapter of AI (artificial intelligence), IoT (internet of things), ICT and Fintech (financial technology). The digital revolution is a key driving vehicle to produce good governance and e-government in each country in the entire world with effectiveness, efficiency, and transparency. Nevertheless, the matter is, how can one country adapt to the digital age? It is challenging to answer this question for a lower-income country like Cambodia. Digital readiness is one of the Cambodian government's key objectives to converge and to become a middle-income and high-income country in 2030 and 2050 respectively, according to the Rectangular Strategy Phase IV updated in September 2018. Simultaneously, in 2016, the Prime Minister said that he wanted to move his

government from a physical form to e-government (Sun & Weiss, 2019, p.49).

Transforming the Kingdom from a physical to digital society necessarily requires digital skills, knowledge, experiences, and concrete policies and regulations, so the ICT policies and regulations are among the priority topics in Cambodia's government's agenda. The digital potential is a knife with two sensitive edges. It is a tremendous benefit for good governance, particularly e-government, but also poses severe threats to privacy and national security. Therefore, a precise digital policy and regulation with strong political institutions in charge of and implement it is a 'must'. Some policies have been set up and developed such as Cambodian ICT Masterplan 2014-2020 (known as ICTopia Cambodia) supported by KOICA (Korean International Cooperation Agency), the Telecom-ICT Development Policy 2020, the Policy and Strategies on Information and Communication Technology in Cambodia in 2004 by MoEYS (Ministry of Education, Youth, and Sport), the Cambodia E-government Master Plan (2017-2022) and National ICT Policy proposed by JICA (Japan International Cooperation Agency) in 2015.

Figure 6: Key Areas in ICTopia Cambodia

ICTopia Cambodia aims to achieve four main areas: empowering people, ensuring connectivity, enhancing capability, and enhancing e-services (ICTopia Cambodia, 2014, p.5).

- For empowering people:
  - ICT Human Resource Development (HRD) (ICTopia Cambodia, 2014, p.7-9)
  - E-Awareness (ICTopia Cambodia, 2014, p.10-12)
- For ensuring connectivity:
  - National ICT Infrastructure (ICTopia Cambodia, 2014, p.13-15)
  - Legal Framework (ICTopia Cambodia, 2014, p.16-18)
  - Cyber Security (ICTopia Cambodia, 2014, p.18-19)
- For enhancing capabilities:
  - ICT Industry (ICTopia Cambodia, 2014, p.21-22)
  - ICT Standards (ICTopia Cambodia, 2014, p.23)
  - ICT Research and Development (ICTopia Cambodia, 2014, p.24-25):
  - Building-up governance and policy for ICT Research and Development
- For enriching e-services (ICTopia Cambodia, p.27-39)
  - Expanding e-Government Services
  - Extending e-Public Services
  - Improving e-Commerce Environment
  - Enhancing e-Banking and Financial Network
  - Improving e-Tourism Services
  - Enabling e-School Services
  - Improving e-Learning Services

Source: Cambodian ICT Masterplan 2014-2020

So far, the Cambodian government has tried to promote social media usage in all government institutions and agencies, encouraging all individual government officers in each ministry to use Facebook as a communication tool for their daily work. The government understands that Cambodian people prefer using Facebook to contact government officers to address their daily concerns. In October 2020, H.E. Sar Kheng, Minister of Interior, encouraged his associates to

use Facebook to receive cases or problems from the people in general. Some issues must be dealt with quickly; therefore, Facebook is a convenient and reliable tool to communicate (Voun, 2020). Additionally, PM Hun Sen has used Facebook to communicate with his ministers and Cambodian people in general. He encouraged his associates to use Facebook for daily communication among government officers and between government officials and Cambodian citizens to respond to their needs and concerns. Since then, it has seen remarkable developments in social media usages, including Facebook, Telegram, Instagram, and Twitter in the government ministries (Sun & Weiss, 2019, 49).

Even though there are some positive signs of ICT development in government institutions and a significant number of government officers and millions of Cambodian citizens using Facebook, Telegram, Instagram, or Twitter for their communication and entertainment, the government has yet to enforce any ICT policy. Cyberlaw to manage privacy and cybercrimes, for example, has not been put in place (Sun & Weiss, 2019). Therefore, this leads to a question of national security, privacy, and private sectors in Cambodia, potentially being put at risk. AT Kearney reports that "hackers are 80% more likely to attack organizations in Asia, [with this], attacks in the cyber realm ranked 5th among Asian top risks" (the ASEAN Post, 2018). In February 2017, 850 individuals' data was stolen from the Singapore Defense Ministry's online database portal. The Philippine government websites were also simultaneously hacked in July 2016 (the ASEAN Post, 2018). Continuing to adapt and adjust with the digital revolution without concrete ICT policies, rules and regulations can be a critical and a potential threat for the Kingdom of Cambodia. Thus, policies, rules and regulations to prevent privacy breaches, public sectors, private sectors and stakeholders from cyber-crime, cyber-espionage, cyber-attack and any cyber-threat is a 'must'.

Electricity Costs and Insufficiency: Availability of electricity and electricity cost play a vital role in developing e-government projects. They are considered a means of connecting people to the internet and accessing information and data on government databases and websites. Despite significant supply and expansion progress, electricity remains unreliable (71% domestic generation, and 29% imported (EAC, 2020)) and expensive. Therefore, e-government projects might partially or completely fail. Two main reasons that electricity impedes the acceleration of e-government adoption are 1). the high electricity cost; and 2). an increase in electricity demand. Although Cambodia's electricity supply capacity has made a significant progress in overcoming the electricity gap, in which 97.6% of the total household can now access to at least one source of power, the price is relatively high compared to the neighboring country, giving it a less comparative advantage to Thailand, Laos, and Vietnam. In 2015, Cambodia's electricity price was at USD0.17 per kWh, which was relatively higher than in Thailand at USD0.13; Lao at USD0.08; and Vietnam at USD0.12 per KWh (EAC, 2019; Parliamentary Institute of Cambodia, 2019). Additionally, although the Energy Sector Development Plan (2004-2024) and the Rural Electrification Master Plan (REMP) are currently implemented to reduce tariffs and electricity costs for households in the rural area, according to EAC (2020), the cost of electricity has not been adjusted which significantly remains between 380 Riels and 740 Riels per kWh (USD0.095-USS0.185) [2] for residents in Phnom Penh and provinces. Meanwhile, the project to expand the electricity coverage is still undergoing (Cambodia ICT Master Plan 2014-2020).

[2] Assuming that the exchange rate is 4,000 KHR/USD. For more information, please refer to EAC's (2020) page 34 on "Electricity Tariff of EDC for Sale to Consumers and Licenses".

❖ Lack of Digital Literacy

Human Capital: As one of the least developed countries, Cambodia is considered one of the lowest literacy rate countries, according to the Human Development Index (HDI), ranking at 146th among 189 countries in 2019 (UNDP, 2019). Cambodia's HDI value is 0.581, which has added Cambodia to medium HDI categories, although it remains below average among East Asia and the Pacific countries. This is a result of decades of civil war and the genocide in the Khmer Rouge regime (1975-1979) which has left most Cambodians vulnerable, uneducated and trapped in extreme poverty.

Table 1: Cambodia's Human Development Index Trend (1998-2018)

Year	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (2011 PPP$)	HDI value
1990	53.6	6.7	2.7	1,381	0.384
1995	55.2	7.1	3.0	1,084	0.387
2000	58.4	7.6	3.2	1,338	0.419
2005	63.1	10.2	3.5	1,888	0.490
2010	66.6	10.7	4.4	2,410	0.535
2015	68.6	11.2	4.7	3,085	0.566
2016	69.0	11.3	4.7	3,248	0.572
2017	69.3	11.3	4.8	3,418	0.578
2018	69.6	11.3	4.8	3,597	0.581

Source: UNDP, 2019

Digital Literacy: While human capital positions at a deficient level, electronic/digital literacy is another issue beyond the general concept of human capital. The idea of using the internet for both students and teachers is difficult because the understanding of how to access information system and the use of ICT is a new concept for most Cambodian people. To develop digital skills for Cambodian citizens, in 2009, the MoEYs established the Masterplan for ICT Education 2009-2013. In 2018, Cambodia's government also set up a pilot digital school project called “distance e-learning” via a joint venture between Telecom Korea and Telecom Cambodia, allowing instructors to hold classes online with 2,000 students (Sun & Weiss, 2019). According to SET (2020), approximately 32.4% of Cambodian individuals who possessed tertiary education could use computers and the internet while the rate was at 68.1% in Bangladesh, 87.8% in Indonesia, 52.6% in Pakistan and 89.7% in Thailand. About 30% of the Cambodian population possesses basic digital skills while 50% of the Indonesian acquires all the essential digital skills (SET, 2020). Also, it is suggested that less than 3% of the Cambodian population has intermediate skills while less than 1% has advance digital skills, giving Cambodia population a larger digital gap than in Indonesia and Thailand (SET, 2020).

Digital Divide: Basically, the digital divide is one of the major impediments to implementing e-government in Cambodia because the inequality to access the internet and information technology among regions is considerably large. This gap is usually presented by the different accessibility of people living in rural and urban areas. People living in rural areas have limited access to internet and information technology for several reasons such as inability to pay the internet fee, poor electricity connection, insufficient knowledge for internet usage, poor knowledge of foreign languages, and minimal internet coverage (Wijers, 2010).

❖ Financial Support

The e-government project is a million-dollar project whose financial support contributes a tremendous role in e-government implementation. Financially, the challenge in adopting e-government in LDCs is mainly associated with financial issues such as the high cost of installing ICT infrastructure (Sinawong et al., 2009; Dada, 2006). So far, digital development projects have been supported by JICA and USAID. The government itself does not have a package for digital development.

Installation Cost: According to the literature review, there are positive benefits driven by e-government adoption. One of those is revenue generation. However, this revenue is not enough to install new projects and develop the existing e-government into an advanced level. In 2001, the government of the Republic of Korea provided technical assistance, expertise, and financial support to Cambodia with a USD20 million loan to operate the GAIS development (Phu, 2006). Furthermore, spending on information technology and communication has increased over time. In 2013, at the IT and Telecommunications Expo in Phnom Penh, the International Data Corporation (IDC) illustrates that the Cambodian IT spending grew from USD100 million in 2011 to USD260 million by 2019 (Chhun, 2012; International Data Corporation, 2016). This amount of money is relatively large, while Cambodia's national budget has long been in deficit (Parliamentary Institute of Cambodia, 2019). In this regard, the project on e-government requires private sectors and donors to invest in this sector cooperatively.

❖ Willingness

As the e-government project is viewed as one of the administrative reform programs affecting public servants at all levels, a scenario in which it postulates a conflict of interest among public officers should not be overlooked, particularly for those who have been receiving benefits from a conventional approach or from unofficial fees. Several other issues can be derived endogenously within legacy workforces, corruption, and conflict of interest in adopting e-government services.

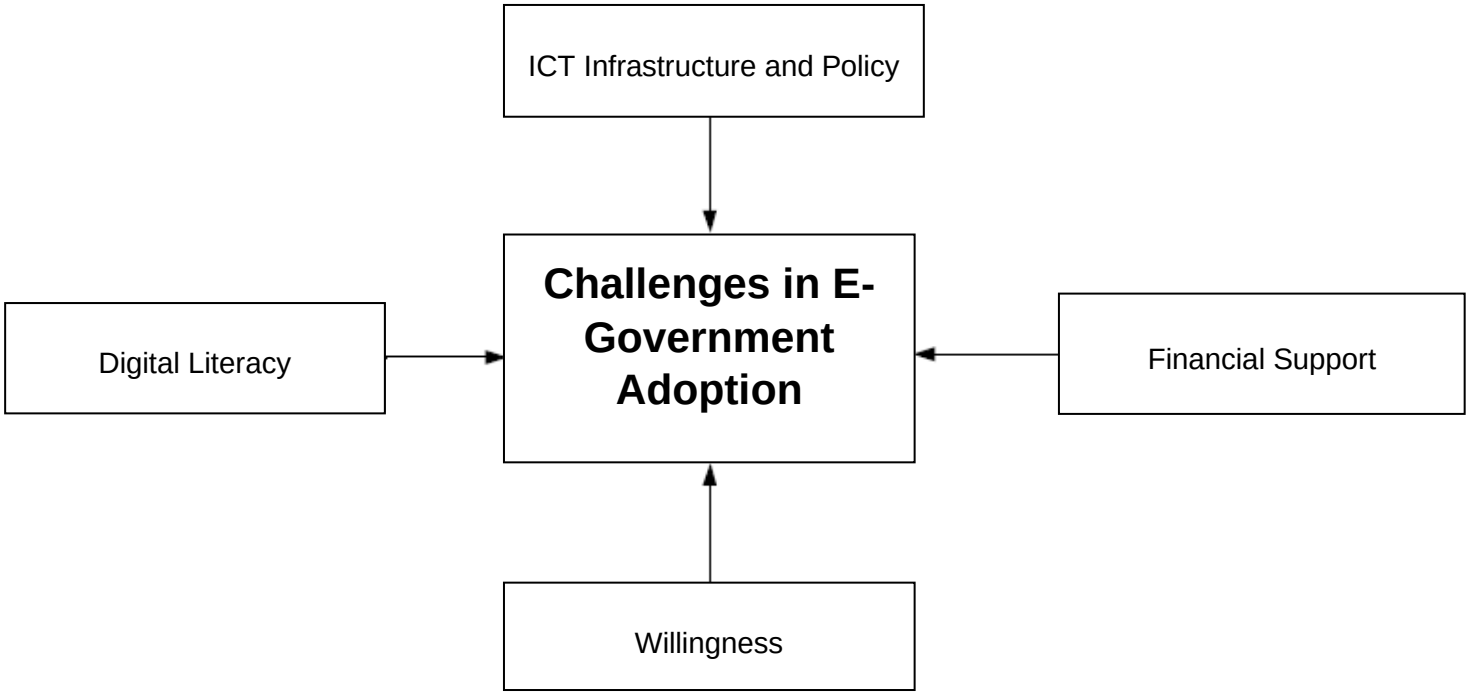
Government Legacy Work Forces: This workforce can be seen as aging public officials who survived the civil war and genocide in the last decades. They could have limited knowledge and understanding toward the cutting-edge information technology and how to utilize it. In addition, while most applications employ English as a means of communication, language barrier becomes problematics. Officials are likely to have difficulties delivering those services to the citizens because they could not catch up with those technologies and struggle with language barriers (Phu, 2006). As a result, the e-government project is going to face complication when public officers have limited capability to handle and monitor the public services on the electronic platform.

Conflict of Interest: This idea can be understood as the disagreement of losing benefits among public officials from integrating e-government and its applications in public administration (Phu, 2006). It is typically associated with corruption. As indicated in the literature review, corruption is one of the main themes that impedes e-government services in the least developed countries. However, many studies have revealed that corruption can be reduced by developing e-government initiative and promoting transparency and accountability in government administration (Andersen, 2009; Lio et al., 2011).

According to the Corruption Perception Index (2020), Cambodia is one of the most corrupt countries in the world, ranking 160th out of 180 countries in 2020. Some public officers are more likely to be unsatisfied when there are e-services available because they could no longer benefit from the same services they have been working on without an electronic system. Low-paid salary is scrutinized as one of public administration's main corruption

themes in Cambodia. This encourages public servants to seek other sources of income in order to cope with the costs of living. This reflects that e-government adoption and related policies should be developed to cope with radical corruption in Cambodia's public administration; otherwise, e-services cannot be operated properly and could potentially lead to a new form of corruption.

Figure 7: Challenges in Cambodian E-Government Adoption



Source: Author's Elaboration

Implications

Even though the issues addressed above are considered as chronic problems in achieving a mature e-government, effective policies and regulations can be a practical solution to minimize those issues. Therefore, in this section, policy implications regarding the challenges in e-government adoption in Cambodia are going to be addressed as follows:

❖ ICT Infrastructure

Even though Cambodia is seen as a least developed country where ICT infrastructure is minimal which cannot allow the citizens to fully participate in the government's e-services, there is still a possible policy option that can facilitate and improve ICT access for the people. Local authorities should be funded to install and provide local internet services where poor people can learn and understand how to use basic e-services. Each provincial department with related e-services should set up a team to facilitate citizens in logging documents and other procedures in e-applications. Another practical option is that the government should enhance and provide more public internet where people can easily access to the internet for free. Since the number of mobile phone subscribers and demands keep increasing significantly in the last few years, it is a good opportunity for the government to build up more e-applications on mobile phones, allowing individuals to easily access with less time-consuming. The government should partner with private companies or offer this opportunity for telecommunication development competition to private companies in order to deploy basic ICT

infrastructures such as broadbands in some rural areas. This encouragement could allow people to access the internet and communicate with public officers via online or phone without having to go to the counter.

❖ ICT Policies and Regulations

As mentioned in the challenges part, to allow Cambodia to smoothly adopt digital revolution to transform its physical government to e-government, it is indispensable to have clear and concrete national ICT policies, rules and regulations. A few questions must be addressed in advance. Is Cambodian governance system/ environment sufficient enough to allow the establishment of the "e-government"? To what extent is the government commited to allow parties or stakeholders such as civil societies, private sectors, experts, interest groups and think-tanks to participate in the discussions, monitoring and evaluation processes to establish the national ICT policies and cyber law? And final consideration is whether the government and citizens are ready for e-ID, e-public health, e-voting and other types of e-service?

First, Cambodia should start examining countries that are now leading in digitalization around the world such as Denmark, Republic of Korea and Estonia, and learn from how they have developed their versions of e-government. Second, the government should set up a committee and research groups to assess impact and magnitudes, including the opportunities and challenges of digital evolution, and to explore what Cambodia should do to successfully adjust to the e-government ecosystem and forecast how cope with the problems in the future, both foreseeable and unforseeable. Third, the government should create a budget package for a national ICT development. As discussed above, the funds for digital development in Cambodia are typically received from development donors such as JICA, KOICA and USAID. The Kingdom must prepare its own budget for digitalization. Fourth, the government should encourage private sectors such as Smart, Cellcard and other telecom companies to work with MPTC to develop the national ICT system. Typically, private sectors have enormous human resources and financial capitals which are able to support the government to reach its ambition. Fifth, the government should inject budgets into public and private universities to promote research on relevant topics of Industry 4.0. Denmark, Estonia, and South Korea are the excellent examples. Sixth, the government should provide necessary digital skills to high schools, secondary schools, and government officials. Seventh, the government should develop digital infrastructure in remote areas across the country to connect the unconnected. When the majority of citizens earn a basic knowledge of digitalization and are aware of digital impacts on their daily lives, cyber law should be discussed. Again, to have an effective ICT policy and cyber law that protects national security and privacy and promote public and private services, all stakeholders must be involved.

❖ Electricity Capacity

Since electricity cost is relatively expensive compared to the level of income per person, the government agency, particularly the Electricity Authority of Cambodia (EAC), has to play a vital role to critically monitor the price provided by private suppliers and agents in rural areas to match with EAC's quotas. The government and EAC should continue to set a clear master plan to build infrastructures connecting essential areas where electricity is needed. As fuel is the primary input for producing electricity, the government should also consider providing subsidies to lower the oil price; therefore, the price of electricity can be reduced to an appropriate level where poor people can afford it. The government can also continue working with private sector, NGOs and INGOs to introduce solar systems in some rural areas, particularly the northern and southern parts of Cambodia to reduce the amount of electricity imported from Thailand and Vietnam, in which the imported price is much higher than that of the EAC's.

❖ Digital Literacy

Digital literacy is one of the determinants of a successful e-government implementation in Cambodia. Therefore, several policy implications for promoting digital knowledge should be firstly introduced in the education system. In this case, the MoEYS is the leading player. The MoEYS should continue to pay more attention to improve and provide training for teachers, especially in high schools, with basic understanding of electronic services such as e-library or e-books, e-learning, and other e-services to deliver lessons to students. Broadcasting through local media such as televisions and radios to the primary education about e-government services and e-services should also be made frequently. The government should set up community outreach workshops and trainings for each local community in provinces to provide basic computer and internet literacy, allowing people, especially women, to participate and understand the importance of information technology to bridge the gap from the digital divide. Government, civil society (CSOs) and other relevant stakeholders should work cooperatively to build a portal that is user-friendly and specifically designed based on people's preferences to provide important information and services. On the other hand, the government and relevant stakeholders should regularly provide updated information; therefore, citizens can start to familiarize with information sharing from the government. Subsequently, it could enhance citizen digital literacy and digital participation.

❖ Government Legacy Work Forces

The legacy workforce is one of the major impediments in public administration reform. This type of public servant is an obstacle to a functional e-government. Proper mechanisms and policies need to be put in the right place. The government, mainly the MPTC, should provide necessary trainings and workshops to target public officials on how to use e-system and other related technologies which enable them to handle the e-applications and e-procedures more effectively. This preparation can serve as a venue in public administrative transition which is essential to provide them with ideas on applying methodology and encountering potential malfunctions in the system. To deal with language barrier facing from the legacy workforce, a bilingual approach should be prioritized and utilized in both training and implementation. Besides providing trainings and basic understanding of the e-system, the government should pay more attention to these legacy workforces regarding the correlation between productivity and aging. This mechanism can be a tool allowing a young official workforce who has a higher level of productivity to integrate in technology; hence, promoting e-services effectively.

❖ Conflict of Interest

Since the conflict of interest is associated with corruption in Cambodia’s public administration, mechanisms to combat corruption are much undertaken by the Anti-Corruption Unit (ACU). However, in order to facilitate e-governmentalization without taking anti-corruption law into account, each ministry or institution should undertake internal frameworks and mechanisms to make sure that public officials will not lose their positions because the introduction of e-government applications would take over some of their responsibilities and tasks. The government should increase basic salary for officials who are currently working and responsible for the e-applications operation at a sufficient rate; hence, it enables public servants to get rid of bribes and concentrate more on delivering e-services and responding to the citizens.

Conclusion

Adopting e-government has been confirmed with a profound impact on growth and development documented in theoretical and empirical literature. The evidence and discussion inform us that the Cambodian government is at the crossroad and

should pursue in the development of e-government projects, but with a rigorous plan. However, it undeniably requires an in-depth and comprehensive approach to overcome potential challenges and impediments. Four key challenges that impede the success of e-government in Cambodia are: *1). lack of ICT infrastructure and ICT policy; 2). Digital literacy problem; 3). limited financial support and 4). willingness.*

Rigorous and precise measures from both the government and other involved stakeholders to deal with those challenges are required with a systematic plan focusing on improving ICT infrastructure and appropriate ICT policy, providing effective e-education and language by integrating the platforms into colleges and high schools and to old civil servants working on related e-applications, promoting gender-based equity to access e-services, building a friendly government portal that allows citizens to practice and familiarize with online applications and strengthening government revenues through further tax system reform and other government services. If the policy is effective, an e-government project would be achieved and the government would be able to realize their development strategies and goals, including the Sustainable Development Goals (SDGs).

Even though many studies demonstrate a positive relationship between e-government and growth in general, there is no clear evidence that can be used to estimate and measure the magnitude of the costs and benefits of the e-government on growth at a country-specific. There is also no clear explanation of when or whether a country should invest in an e-government project. The magnitude measurement is crucial, particularly for developing and least developed countries, to adopt and enrich the advantages of ICT. Therefore, extensive empirical research is required to illustrate the predicted outcomes of e-government adoption to shed light for policymakers to construct practical policies in developing e-government projects and inform the priority areas that government should pin down as an initial approach to develop e-government and its implementation.

References

Alsherhri, M., & Drew, S. (2010). *Implementation of e-government: Advantages and Challenges. Proceedings of the IASK International Conference E-Activity and Leading Technologies & Inter TIC 2010.* Queensland: Griffith University. Retrieved from https://research-repository.griffith.edu.au/bitstream/handle/10072/40620/72631_1.pdf;jsessionid=2E82097272292DF0C72184FB502FCD8A?sequence=1

Andersen, T. B. (2009). E-Government as an anti-corruption strategy. *Information Economics and Policy, 21*(3), 201-210. doi:https://doi.org/10.1016/j.infoecopol.2008.11.003

Becker, J., Niehaves, B., Bergener, P., & Räckers, M. (2008, August). Digital divide in eGovernment: The eInclusion gap model. In *International Conference on Electronic Government* (pp. 231-242). Springer, Berlin, Heidelberg.

Belanger, F., & Carter, L. (2009). The Impact of the digital divide on E-government use. *Communication of the ACM, 52*(4), 132-135. doi:10.1145/1498765.1498801

Buth, R. (2014). Hackers cut deal to work for gov't. *The Phnom Penh Post.* Retrieved from https://www.phnompenhpost.com/national/hackers-cut-deal-work-gov't

Caldow, J. (1999). *The quest for electronic government: A defining vision*. Washington DC: Institute for Electronic Government, IBM Corporation.

Chhun, K. (2012). *IT and Telecommunications Expo Aims to Attract Investment*. Retrieved from CCFC: http://www.ccfcambodge.org/en/single-news/n/it-and-telecommunications-expo-aims-to-attract-investment/

Choi, C. & Yi, M. (2009). The effect of the Inernet on economic growth: Evidence from cross-country pandel data*. Economic Letters, 105*(1), 39-41.

Clarke, G. R. G., & Wallsten, S. J. (2007). Has the Internet Increase Trade? Developed and Developing Country Evidence. *Economic Inquiry, 44*(3). 465-484.

Conceição, P. (2019). *Human Development Report 2019: Beyond Income, Beyond Averages, Beyond Today: Inequalities in Human Development in the 21st century*. United Nations Development Programme.

Corruption Perceptions Index. Transparency.org. (2019). Retrieved from https://www.transparency.org/en/cpi#

Dada, D. (2006). The failure of e-government in developing countries: A literature review. *The Electronic Journal on Information Systems in Developing Countries, 7*(26), 1-10.

Elbahnasawy, N. G. (2014). E-Government, Internet Adoption, and Corruption: An Empirical Investigation. *World Development, 57*(C), 114-126.

EAC [Electricity Authority of Cambodia]. (2019). *Report on Power Sector of the Kingdom of Cambodia.* Retrieved from https://eac.gov.kh/site/viewfile?param=annual_report%2Fenglish%2FAnnual-Report-2018-en.pdf&lang=en

EAC [Electricity Authority of Cambodia]. (2020). *Report on Power Sector of the Kingdom of Cambodia*. Retrieved from https://www.eac.gov.kh/site /viewfile?param=annual_report%2Fenglish%2FAnnual-Report-2019-en.pdf&lang=en

Godel, M. I. M., Harms, A., Jones, S., & Mantovani, I. (2016). *Reducing Costs and Barriesrs for Buesinesses in the Single Market.* European Parliament. Retrieved from https://www.europarl.europa.eu/RegData/etudes/STUD/2016/578966/IPOL_STU(2016)578966_EN.pdf

Heeks, R. (2003). *Most e-government for development project fails: How can risks be reduce?.* Manchester: Institute for Development Policy and Management. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3540052

Heeks, R. (2006). *Implementing and Managing eGovernment: An international text.* London: Sage Publications.

Infocomm Development Authority of Singapore. (2020). *Singapore's Experience Initiatives to promote e-Participation*. Retrieved from https://www.un.org/esa/socdev/egms/docs/2013/ict/KarenTan.pdf

Korea International Cooperation Agency, 2014. *Cambodian ICT Master Plan 2020*. Telecommunication Regulator of Cambodia.

Lio, M. C., Liu, M. C., & Ou, Y. P. (2011). Can the internet reduce corruption? A cross-country study based on dynamic panel data models. *Government Information Quarterly*, *28*(1), 47-53.

Majeed, M. T., & Malik, A. (2016). E-government, Financial Development and Economic Growth. *Pakistan Journal of Applied Economics, 26*(2), 107-128.

Ministry of Education, Youth, and Sport (MoEYS). (2009). *[CITATION] Master Plan for Information and Communication Technology in Education*. Cambodia

National Bank of Cambodia. (2020). *Balance of Payments Statistics Bulletin-Second Quarter 2020*. Retrieved from https://www.nbc.org.kh/download_files/economic_research/bop_eng/Bulletin%20Text%20No%2068_Photo.pdf

Ndou, V. (2004). E–Government for developing countries: opportunities and challenges. *The electronic journal of information systems in developing countries*, *18*(1), 1-24.

Nkohkwo, Q. N. A., & Islam, M. S. (2013). Challenges to the Successful Implementation of e-Government Initiatives in Sub-Saharan Africa: A Literature Review. *Electronic Journal of e-government*, *11*(1).

Nkwe, N. (2012). E-government: challenges and opportunities in Botswana. *International journal of humanities and social science*, *2*(17), 39-48.

NOIE. (2003). *E-Government Benefit Study.* Canberra: National Office for the Information Economy.

Organisation for Economic Co-operation and Development. (2010). *Towards Smarter and more Transparent Government*. Retrieved from https://www.oecd.org/gov/digital-government/44934153.pdf

Organization for Economic Cooperation and Development OECD. (2003). *The E-Government Imperative: OECD E-Government Studies*. OECD.

Parlimentary Institute of Cambodia. (2019). *Budget 2020 Debrief.* Phnom Penh: Senate of the Kingdom of Cambodia. Retrieved from https://www.pic.org.kh/images/2019Research/20191227_Budget-2020-Debrief-En.pdf

Phu, L. (2006). *The Road to E-government of Cambodia: A Comprehensive Analysis of E-Government Project.* Phnom Penh: NiDA.

Royal Government of Cambodia. (2013). *Achieving the Millennium Development Goals*. Retrieved from UNDP: http://www.undp.org/content/dam/undp/library/MDG/english/MDG%20Country%20Reports/Cambodia/CMDG%20Annual%20Report%202013_Final%20Draft.pdf

Royal Government of Cambodia. (2014). *National Strategic Development Plan (NSDP) 2014-2018*.

Royal Government of Cambodia. (2019). *National Strategic Development Plan (NSDP) 2019-2023*.

Schware, R., & Deane, A. (2003). Deploying e-government programs: the strategic importance of “I” before “E”. *info*.

SET [Supporting Economic Transformation]. (July, 2020). *Fostering an inclusive digital transformation in Cambodia.* Retrieved from https://set.odi.org/wp-content/uploads/2020/06/Fostering-an-Inclusive-Digitalisation-Transformation-in-Cambodia-Final.pdf

Shim, D. C., & Eom, T. H. (2008). E-Government and Anti-Corruption: Empirical Analysis of Internaational Data. *International Journal of Public Administration, 31*(3), 298-316.

Shin, S. (2008). *Implementing e-government in developing countries: its unique and common success factors.* 104th Annual Meeting of the American Political Science Association: Boston, Massachusetts, USA. Retrieved from http://195.130.87.21:8080/dspace/handle/123456789/1025

Sinawong, S. (2010). *E-government adoption in Cambodia: a partial least squares (PLS) approach* (Doctoral dissertation, 서울대학교 대학원).

Sinawong, S., Lee, J., Lee, J., (2009). E-Government Adoaptation in ASEAN: The Case of Cambodia. *Internet Research*, *195*(519), 517-534.

Srivastava, S. C., & Teo, T. S. H. (2010). E-Government, E-Business, and National Economic Performance. *Communications of the Association for Information Systems, 26*(14), 268-286.

Sun, K., & Weiss, R. (2019). *E-government: What can Cambodian learn from Estonia?.* Phnom Penh: Konrad Adenauer Stiftung. Retrieved from https://www.kas.de/documents/264850/7993338/Chapter+3.pdf/841a157a-51d2-0b32-abbe-296169fe0e6e?version=1.0&t=1579754071438

Te Velde, D. W. et al. (2020). Fostering an inclusive digital transformation in Cambodia. Retrieved from Supporting Economic Transformation: https://set.odi.org/wp-content/uploads/2020/06/Fostering-an-Inclusive-Digitalisation-Transformation-in-Cambodia-Final.pdf.

Telecommunication Regulator Cambodia. (2020a). *Mobile Phone Subscriptions.* https://www.trc.gov.kh/en/mobile-phone-subcribers/

Telecommunication Regulator Cambodia. (2020b). *Internet Subscribers*. Retrieved from https://www.trc.gov.kh/en/internet-subcribers/

The ASEAN Post. (2018). *Strengthening ASEAN's cybersecurity*. https://theaseanpost.com/article/strengthening-aseans-cybersecurity-0

Transparency International. (2014). *Corruption Perceptions Index*. Retrieved from https://www.transparency.org/en/cpi/2014/results

United Nations. (2014). *United Nations E-Government Survey 2014: E-Government for the Future We want.* New York: United Nations. Retrieved from https://publicadministration.un.org/publications/content/PDFs/UN%20E-Government%20Survey%202014.pdf

United Nations. (2020). UN E-Government Knowledge: Cambodia. Retrieved from https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/29-Cambodia/dataYear/2020

Voun, D. (2020). Sar Kheng: Facebook campaign a success. *The Phnom Penh Post.* https://www.phnompenhpost.com/national/sar-kheng-facebook-campaign-success

Wijers, G. (2010). Determinants of the digital divide: A study on IT development in Cambodia. *Technology in Society, 32*, 336-341. doi:doi:10.1016/j.techsoc.2010.10.011

World Bank. (2002). *Electronic Government and Governance: Lessons for Argentina.* Washington DC: World Bank. Retrieved from http://documents1.worldbank.org/curated/en/527061468769894044/pdf/266390WP0E1Gov1gentina1Final1Report.pdf

World Bank. (2018). *The Digital Economy in Southeast Asia: Strengthening the Foundations for Future Growth.* Washington DC: World Bank. Retrieved from http://documents1.worldbank.org/curated/en/328941558708267736/pdf/The-Digital-Economy-in-Southeast-Asia-Strengthening-the-Foundations-for-Future-Growth.pdf

Cambodia Development Center

Cambodia Development Center (@cd.centerkh)

Cambodia Development Center

Cambodia Development Center (t.me/cdcenterkh)

Building E, University of Puthisastra, #55, Street 180-184, Sangkat Boeung Raing, Khan Daun Penh

info@cd-center.org | (+855) 10 950 456 www.cd-center.org

មជ្ឈមណ្ឌលអភិវឌ្ឍន៍កម្ពុជា
Cambodia Development Center