**DIGITAL GOVERNMENT: A VIETNAMESE PERSPECTIVE**

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**Abstract:**

According to the World Bank, "Digital Government is the systematic use of digital technology by government agencies to carry out relations with citizens, enterprises and social organizations. As a result, the transactions of government agencies with citizens and organizations will be improved, the benefits will be to reduce corruption, increase openness and convenience in governance, by which contributing to growth and development of the country".

In Vietnam, the Government has strived for a long time to build e-Goverment and has gained some achievements. However, realizing that e-Government is not enough to meet the demand from the fast development of the country, as well as not making full use of the achievements of information technology, on June 3, 2020, the Prime Minister signed Decision 749 promulgating the National Digital Transformation Program with 3 main pillars: Digital Government, Digital Economy, and Digital Society. This document officially confirmed the building of digital government in Vietnam.

In this paper, the authors analyzes the importance of building of digital government in Vietnam, especially its impact on anti-corruption. The authors also examine the strategic directions and efforts of the Government of Vietnam in building a digital government, compared with the strategies of some other countries, and then points out the advantages and limitations of Vietnam. On that basis, the authors suggest a number of solutions to promote the building of digital government in Vietnam in the coming years.

**Key words:** digital Government, digital transformation, digital technology, Vietnam

**1.The Digital Government: An Overview**

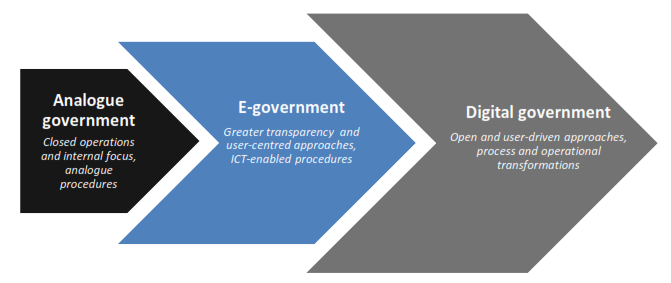
**1.1.Definition**

Since the Fourth Industrial Revolution, we have lived in the era of digital information. For instance, when a 5.9 earthquake hit near Richmond, Virginia on August 23rd, 2011, residents in New York read about the earthquake on Twitter feeds 30 seconds before they experienced the quake themselves.[[4]](#footnote-4) Therefore, there is a need for governments to adapt to the global massive changes.

According to OECD, digital government refers to the use of digital technologies, as an integrated part of governments’ modernization strategies, to create public value. It relies on a digital government ecosystem comprised of government actors, non-governmental organizations, businesses, citizens’ associations and individuals which supports the production of and access to the data, services, and content through interaction with the government.[[5]](#footnote-5)

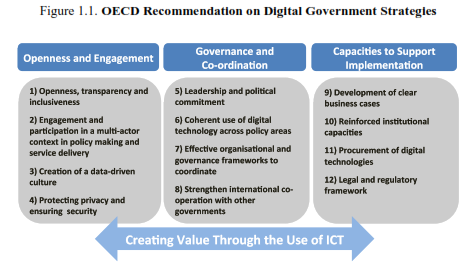
The term “public value” mentioned above can be referred to various benefits for society that may vary according to the perspective or the actors, including the following: (1) goods or services that satisfy the desires of citizens and clients; (2) production choices that meet citizen expectations of justice, fairness, efficiency and effectiveness; (3) properly ordered and productive public institutions that reflect citizens’ desires and preferences; (4) fairness and efficiency of distribution; (5) legitimate use of resource to accomplish public purposes; and (6) innovation and adaptability to changing preferences and demands.[[6]](#footnote-6)

There are distinct differences between digital government and e-government. The Public Governance Committee agrees that e-government refers to the use by governments of information and communication technologies (ICTs), and particularly the Internet, as a tool to achieve better government.[[7]](#footnote-7)

This is the progression towards the digital transformation of governments.[[8]](#footnote-8) We can argue that digital government is the next step of e-government after establishing the greater transparency and user-centered approaches as well as ICT-enabled procedures. These two attached to digital transformation, the term widely used by the public-sector organization to refer the modest initiatives such as putting services online or legacy modernization (the term is more like “digitization” than “digital business transformation”).[[9]](#footnote-9)

**1.2.Characteristics**

OECD adopted a plethora of guidelines for the process towards digital government. This organization sets out 12 principles supporting the development and implementation of digital government strategies that bring governments closer to citizens and businesses: (1) Openness, transparency and inclusiveness; (2) Engagement and participation in policymaking and policy making and service delivery; (3) Creation of date-driven culture in public sector; (4) Protecting privacy and ensuring security; (5) Leadership and political commitment; (6) Coherent use of digital technology across policy areas; (7) Effective organization and governance frameworks to coordinate; (8) Strengthen international cooperation with governments; (9) Development of clear business cases; (10) Reinforce ICT project management capabilities; (11) Procurement of digital technologies; (12) Legal and regulatory framework.



Another perspective springing from World Bank tends to advocate that the future digital government will have three board characteristics (the 3 C’s):[[10]](#footnote-10) Contextual, Coordinated and Cognitive. The first represents for the aim of address uniquely each citizen’s need which is the core duty of government. The second one mentions the openness and interoperability of the systems and processes. This coordination of different public services is of necessity in order to reach the cross-border integration in the future. The last figure concerns the realm of increasing automation of physical labor which also have a strong connection with the improvement of artificial intelligence (AI), one of the most attractive tendency of development in these recent years. Furthermore, a well-designed digital infrastructure enables to improve the functions of governments at a wide range of scales – national, regional, and local. In addition, by taking the advantage of crowdsourcing and analytics, governments can gain prompt feedback of issues arising in the process of implementation.

It is essential for governments to enact common standards, pass data protection and privacy laws as well as carry out effective cybersecurity mechanisms as these are fundamental factors contributing to the success of the digitization. At international level, governments should also make policies to increase boost partnerships, data literacy and adapt to the technology-based restructuring of the labor market in order to ensure the relevancy of its institutions and the continued functioning of the digital economy.

Despite strategies followed by governments, digital government may focus on three main strands: efficiency, good governance, and effectiveness.[[11]](#footnote-11) These are essentials to better government as they are the key driver of public sector use of digital technologies.

**1.3.Experiences of some countries**

Among those pioneering in digital government, the United States of America and other MENA[[12]](#footnote-12) countries would be prime examples. Therefore, this section outlines the experiences of them.

In the US, President Barack Obama once declared “I want us to ask ourselves every day, how are we using technology to make a real difference in people’s lives.”[[13]](#footnote-13). After his statement, the U.S. created the digital government strategy setting out to accomplish three things. The first goal is that digital government facilitates American people and an increasingly mobile workforce to reach high-quality digital government information and services anywhere, anytime, on any device. To be more specific, they tend to operationalize an information-centric model; to design their systems for interoperability and openness; to modernize their content publication model; to deliver better and to reduce the cost of device-agnostic digital services. The second target is ensuring that as the government adjusts to this new digital world, they seize the opportunity to procure and manage devices, applications, and data in smart, secure, and affordable ways. Learning from the previous transition of moving information and services online, they now have an opportunity to break free from the inefficient, costly and fragmented practices of the past, build a sound governance structure for digital services, and do mobile “right” from the beginning. The last one is unlocking the power of government data to spur innovation across the Nation and improving the quality of services for the American people. They have to enable the public, entrepreneurs, and their own government programs to better leverage the rich wealth of federal data to pour into applications and services by ensuring that data is open and machine-readable by default.

The U.S. bases on four strategy principles:[[14]](#footnote-14) (i) Information-Centric approach; (ii) Shared platform approach; (iii) Customer-centric approach; (iv) Security and Privacy platform. The first principal changes their method from managing “documents” to managing discrete pieces of open data and content which can be tagged, shared, secured, mashed up and presented in the way that is most efficient for the consumer of that information. The second approach enables the government work together, both within and across agencies, to reduce costs, streamline development, apply consistent standards, and ensure consistency in how they create and deliver information. The next one impacts on how the U.S. create, manage, and present data through websites, mobile applications, raw data sets, and other modes of delivery, and allows customers to shape, share and consume information, whenever and however they want it. The last principle ensures the innovation happens in a way that ensures the safe and secure delivery and use of digital services to protect information and privacy.

The jump-start process of the U.S. government accelerates with the innovation. Therefore, it is reasonable to call the strategy to build digital government of this country the “innovation-centric” strategy. This orientation has the mutual point with the current policies of Vietnam which focuses on the cognitive, the awareness of public sectors. It seems that the difference between these two nations are the digital context and the specific operations.

Similar to the USA, the industrialized MENA countries are at the forefront of innovation and is driving forward on major digital transformation initiatives. In many MENA countries, the public sector is the largest employer: public sector bodies employ between 14% and 40% workers across the region, with government job wages comprising 9.8% of GDP and the ratio of public to private-sector workers at 1.3. Both these figures are higher than in other regions around the world.[[15]](#footnote-15) Therefore, the number of officials involving in the building digital government is substantial.

On the whole, these nations are providing ubiquitous, affordable connectivity (especially rural, lower-middle income countries such as Egypt, Algeria, Iran) and creating a local ecosystem of digital services and applications (Algeria, Morocco, Tunisia, and Saudi Arabia) by converting access and usage into social and economic impact as a first step on a journey of transformation for the region’s economies, and participation in the Fourth Industrial Revolution.[[16]](#footnote-16) In order to accomplish these targets, one of the prerequisite conditions are digital skills. To be more specific, the infrastructure of MENA countries joints a variety of similarities, hence, the human resources would be the most powerful generator to facilitate their nations to enhance the stature.

MENA countries are improving their public procurement systems by modernizing their procurement policies and institutional frameworks, developing procedural guidelines and building professional procurement capacity.[[17]](#footnote-17) In Egypt, the main current challenges are to adopt a new public procurement law and to complete the e-procurement system. In Jordan, there is weak infrastructure and the need for unified legislation, green procurement and an e-procurement platform to enhance transparency. In Libya, legal skills and substantial knowledge of procurement practices and procedures can be improved. The current political situation may not help to put in place fundamental changes. Legislative reform is also a challenge.[[18]](#footnote-18) From my standpoint, these three nations share mutual traits with Vietnam, hence, their experience would be beneficial in terms of identifying the issues arising during the digital transformation process.

Undoubtedly, businesses play a pivotal role in building digital ecosystem. This comes down to the online retail spending is very low: people in Qatar, the UAE, and Saudi Arabia spend about $500 per year, compared to over $700 in China and $1.500-2.000 in the US and parts of Europe[[19]](#footnote-19). Bedside, the global e-commerce giant has been slow to offer local-language sites. For instance, Alibaba, one of the biggest Chinese group, provides localized sites in the region, but does not have an Arabic language interface; Amazon has no localized sites for the region, but will presumably use its acquisition of souq.com for this purpose[[20]](#footnote-20). Therefore, it is essential for these countries to encourage fintech in the light of the poor rank of most nations in terms of retail access to financial services. Additionally, governments can also learn from and collaborate with the private sector[[21]](#footnote-21) to better understand the risks and opportunities that emerge from disruptive technology. Awareness building and change management will also be essential in increasing the take-up of digital solutions by governments and to overcoming cultural reluctance to adopt new technologies. For instance, in Moldova, cultural aversion to digital usage results in only 3 percent of citizens accessing public services online, compared with 76 percent getting them in-person[[22]](#footnote-22).

According to the 2016 Worldwide Governance Indicators compiled by the World Bank, MENA countries faced a major corruption and a poor performance in government effectiveness, and voice and accountability.[[23]](#footnote-23) By transforming institutions, policies and processes to make better use of data and new technologies, or investing in GovTech[[24]](#footnote-24), governments can increase the responsiveness, efficiency, and transparency of services they offer to citizens and businesses. These nations already employ web-bases or mobile applications to strengthen government responsiveness and citizens’ trust – such as the Hadassah mobile application and the Rassed system in the United Arab Emirates; the TALABI mobile application in Morocco; the “Smart Traveller” mobile customs application in Tunisia; and the Kollona Amn application in Saudi Arabia.[[25]](#footnote-25) The outcome of this strategy is favorable. Particularly, during the Egypt Arab Spring in 2011, social media enabled citizens coordinate and mobilize protests. The protests had a measurable effect: the values of firms with political connections fell after the protests, and these protests appeared to constrain those firms from rent-seeking behavior (using clout to get undeserved benefits).[[26]](#footnote-26) This form of social and political mobilization remains prevalent in Iraq, Morocco, Jordan and other countries in the region.

Gravitating towards digital government, in initial steps, MENA have to amplify the implementation of the procurement process through electronic means, particularly e-tendering, e-purchasing, and e-contract management. This improves public financial management by enhancing transparency, accountability, and open government; supporting the development of the private sector, especially by reducing barriers to participation by small- and medium-enterprises (SMEs); generating cost- and time= savings by increasing competition; and building the digital capabilities of citizens. Experience in MENA shows that ignoring those challenges results in social tensions and even instability. Confronting those issues through initiatives that promote inclusive governance and development is a global public good that can defuse tensions and contribute to peace and stability.[[27]](#footnote-27)

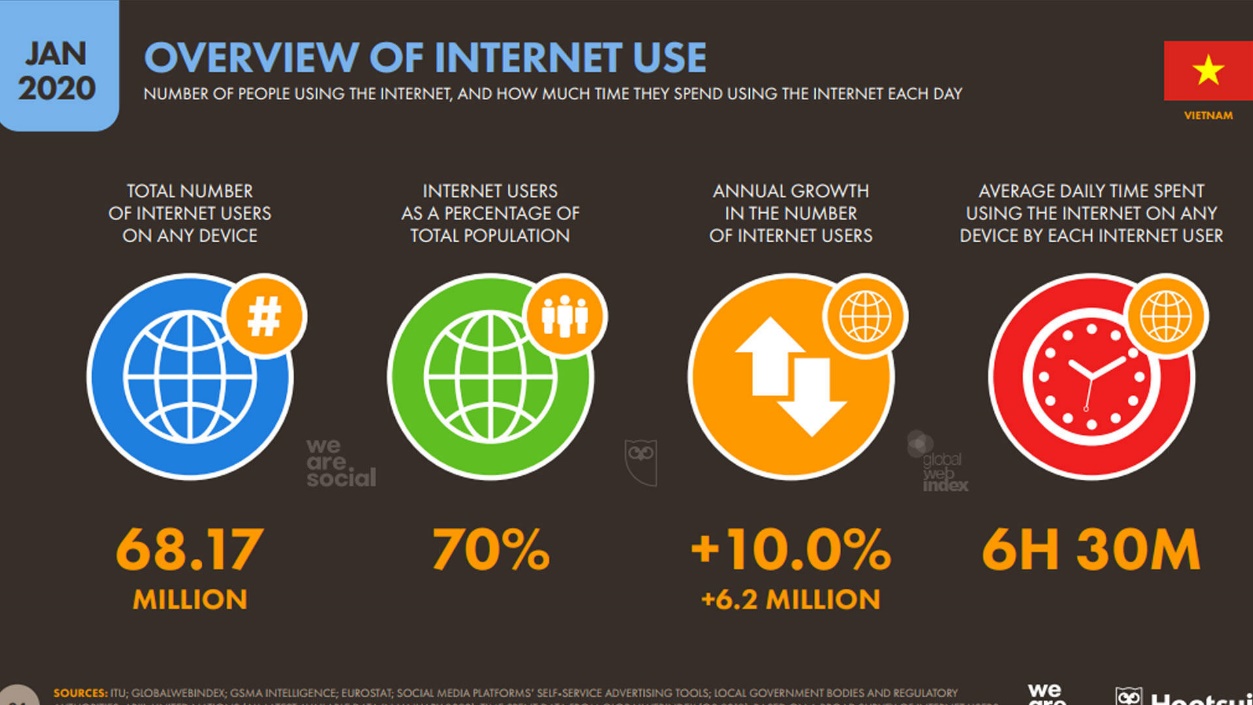
Despite different priorities, governments took a holistic approach to their digital agendas and ensured involvement of all kinds of stakeholders from government, the private sector, NGOs, and civic society, as well as technical experts. This can be explained by ensuring digital transformation requires both investments in IT infrastructures and complementary investments in regulations, skills and accountable institutions.

**2.Building digital government in Vietnam**

**2.1.The Context**

The Internet has appeared in Vietnam since 1991 thanks to efforts of Dr. Rob Hurle (Australia National University) and Mr. Tran Ba Thai (IOIT). In 1995, the increasing demand of Internet has been overloaded and the financial aid of Australia government could not afford anymore. Therefore, Dr. Rob and his counterparts started to cooperate with VNPT (Vietnam Posts and Telecommunications Group) to develop this service. After years of experimenting, Vietnam connected to the world through digital service in 1997. In 2010, Bill Gates provided a 30-million-dollar aid for Vietnamese Government in order to expand the network to the rural areas.

In the 2000s, a number of Decree was enacted by Vietnamese Government to enhance the application and development of technology serving the process of industrialization. Besides, the cooperation of different departments and bodies also contributed to the improvement of Internet in Vietnam. According to the statistic of ComScore in 2013, Vietnam had 16.1 million people using Internet every month. Hence, this country possessed the biggest online population in ASEAN which was impressed. Back to the present, the figure of Vnetworks, the total number of Internet users on any device is 68.17 million people, which accounts for more 70% of Vietnam total population.[[28]](#footnote-28) The data mentioned proves that Vietnam has the potential base to build a digital government in the light of the crowded online users.



Additionally, the efforts of the Government of Vietnam to catch up the global governance tendency are considered as one of the prerequisite factors in building digital government. The human solidarity of Vietnamese inhabitants in the past war with France and the U.S. is potential for the heading “technology jump”.

**2.2.Objective and efforts**

The State needs to have the bind structure internally as well as process efficiently the external relations. The former is the function of contribution, cooperation and political power control and the latter could be regarded as fundamental factors. From political and social perspective, Michel Crozier described the *mass social relations* as the phenomenon of quick connection on the social basis.[[29]](#footnote-29) The achievements of technology simplified and enhanced the process of receiving and processing information therefore some issues arisen: (1) it breaks the monopoly of political institutions, initially the State in resolving the problems appeared; (2) it changes the principles of providing information which is the essential of governance and the tendency is gravitating towards the creative resource as new knowledge and new methods of governance. Thus, the reform of governance system in Vietnam is of significance in order to create flexible structure which is able to adapt promptly to the process of receiving and processing information and demands in practice.

According to the research of Microsoft in Asia – Pacific (2017), the statistic for the impact of digital transformation on GDP of was 6%. They also predict that this figure of 2019 and 2020 will be 6% and 60% respectively. Digital transformation contributed to the increasing productivity by 15%; expected to reach 21% in 2020. Furthermore, McKensey, a research company, pointed out that in 2025, the impact of this process on the USA’s GDP could be roughly 25% and on European countries at around 36%.

The analysis above proves that not only countries recognize the evident advantages of building digital government but also the Communist Party of Vietnam and the State also aware of this tendency. Mr. Nguyen Xuan Phuc, Prime Minister of Vietnam, insisted continuously the undeniable importance of establishing digital government as an appropriate policy to enhance national prosperity and stature[[30]](#footnote-30). Therefore, he states that “we need to agree certainly that 2020 will be the digital-transformed and starting year in the process of making Vietnam as a numerical nation”[[31]](#footnote-31).

Looking back in time, since 2000s, the State of Vietnam has focused on the application of technology in government’s activities in order to be the industrialized and modernized country. In 2014, the Politburo of Communist Party of Vietnam (CPV) adopted Resolution 36-NQ/TW of enhancing the scientific application, developing technology that gravitates towards the sustainable development and international integration. To specific the policy of CPV, the Government enacted the first Resolution concentrating e-government which includes the target of improving the integrity and transparency of national authorities as well as ranking up in the chart of United Nations (UN). In addition, the Politburo of CPV imposed Resolution 52-NQ/TW (2019) including the policy to engage directly into the Fourth Industrial Revolution. This document and the latest Decision 749/QĐ-TTg adopted by the Prime Minister Nguyen Xuan Phuc in 2020 are the two influential guidelines that all public authorities have the obligation to conduct with best efforts.

Despite that the policy has just been adopted since 2020, Vietnam gained some achievement in building digital government, particularly establishing some significant platforms and portals such as National Document Transition System, e-Cabinet, National Public Service Portal[[32]](#footnote-32) and lately National Reporting Platform, the Centre for Information and Directions from the Government[[33]](#footnote-33).

Building digital government could reduce trillion of VND each year for national budget (not included other social costs). Specifically, the National Document Transition System (the first product of digital government in Vietnam) connect to 100% departments, bodies, sectors, localities and a plethora of different institutions and organizations. There are 2.2 million of online documents sent and received on this system yet. According to preliminary calculations, this center saved 1200 billion VND/year for national budget.[[34]](#footnote-34) The information system for Government sessions (e-Cabinet) aims the innovation of working and a paperless government. In early 2020, e-Cabinet served 20 conferences and sessions and processed 470 feedback cards of government members. Therefore, it spared 169 billion VND by replacing 200.000 paper files and documents.[[35]](#footnote-35) Furthermore, in the period 2019-2020, the National Public Service Portal, another fruit of Vietnam, connected with 18 ministries and agencies, all 63 localities in the country, and eight banks or other e-wallet service providers. It has registered the 1000 services to be online recently, and logged more than 56.4 million accesses, more than 14 million documents synced and 260.000 processed online. The portal helps save 6.7 trillion VND a year.[[36]](#footnote-36)

Economic saving is not the only motivation for building digital government in Vietnam but also the public administration reform – a base to enhance the efficiency and the integrity of national operations. Mr. Mai Tien Dung, Chairman of the Office of the Government, stated that: “Digital government facilitates public institutions to innovate working methods, which plays a pivotal role in building a developmental government of integrity, serving citizens and companies”[[37]](#footnote-37). Thanks to digital government, instead of sending and receiving reports every month, quarter, six months, and year or any irregular paper documents, departments and bodies of government can update these documents on National Reporting Platform having the time display. Hence, Mr. Mai Tien Dung puts forward that: “The chief of Government, departments and treaties are able to recognize the developments of socio-economic or other issues in different sectors. This will facilitate Government to predict, evaluate the situation; provide sound solutions; process exactly the issues that citizens, companies and international communities subscribe to…”[[38]](#footnote-38) In addition, digital government encourage inhabitants to use public service online, which saves time and reduces direct interactions with public officials. Therefore, it is considered as an effective solution contributing to the fight against the common corruption in Vietnam currently.

At international level, according to the evaluation of the United Nations, Vietnam ranks up continuously in terms of digital government in the period 2014-2020, from 99 to 86 thanks to their consecutive efforts. The E-government development index (EDGI) in 2020 shows that Vietnam goes up two ranks compared to 2018, at 86/193 nations, territories and stays at 6/11 ASEAN countries. Composite index of Vietnam reach’s 0.6667 which ranked as countries developing digital government with high EDGI, even higher than the global medium (0.5988), Asian (0.6373) as well as Southeast Asian (0.6321) EDGI.

In 2020, Vietnam stays the same position of 2018 which is 6th in Southeast Asia (five countries above are Singapore, Malaysia, Thailand, Brunei, and Philippines). Indonesia, the country ranked next to Vietnam, narrow considerably the gap between two nations. Therefore, at least in ASEAN countries, digital government is not only the goal of Vietnam and they have to strive in order to catch up the progress of other nations.

**2.3.The strategies and goals**

The Decision 749/QĐ-TTg adopted by the Prime Minister Nguyen Xuan Phuc in 2020 determine the tendency which the process will move forwards in the process of digitalization. To be more specific, (1) Cognitive plays a vital role; (2) Citizens are the center; (3) Institutions and technology are the generator; (4) Development of digital platform is the striking solution to enhance digitalization, reduce cost and increase effectiveness; (5) Protection the security of Internet is essential and (6) Participation of whole political system is the fundamental factor of successful digital transformation.

The most important factor in these orientations is the cognitive of whole political system. A digital government cannot be built successfully without the participation and cooperation of departments and bodies of government. By this way, the process can take advantage of the old mechanisms and infrastructure to save resources such as money, time and human. In the contrast, if we have to establish all over again, it will take years to accomplish that goal.

The Government of Vietnam set the goal in two different checkpoints which are 2025 and 2030. The basic target is developing digital government more effective and competent. This can be seen in the statistics: 80% public online service reached level 4, provided on a wide range of electronic devices including cellphones; 90% files at ministry level, 80% at district level and 60% at village level processed online (except the classified files at national level); 100% reports of annual meeting and statistics regarding socio-economic serving the dictation of Government and Prime Minister are synchronized and shared in Governmental Reporting System; 100% national database regarding Population, Land, Registering company, Finance, Insurance is completed, connected and shared publicly as well as opening the database of public institutions to operate effectively and timely; 50% evaluating operations of public institutions are carried out through digital platform and information system of these organizations; Vietnam is listed in 70 leading countries of digital government (EGDI).[[39]](#footnote-39) In practice, digital government is focusing on three subjects: citizens, government, and companies. The interaction between these three are: G2C: government – citizens; G2B: government – companies; G2G: public institutions.

According to Decree 43/2011 of Government enacted 13/6/2011, public online service has four level: level 1 provides full information of administrative procedures and documents concerned; level 2 based on level 1, allows people to download the sample of documents and complete the file as required. The completed file will be sent directly or via post to organizations and institutions; level 3 based on level 2, help citizens to fill out and send documents directly to organizations and institutions. Transactions which arise during the process of receiving the file and providing service will be conducted online. Paying the bill (if any) and receiving the result are carried out directly at organizations and institutions; level 4 based on level 3, allow citizens pay the bill (if any) online. The results will be notified online, sent directly or via post to users.[[40]](#footnote-40)

Furthermore, Government adopted Decree 61/2018 to set out a mechanism called “cơ chế một cửa” (one-door system). To be more specific, this term represented for the operation flow of different institutions which is highly effective and straightforward. This comes down to the fact that in the past, most of administrative procedures in Vietnam are conducted by a wide range of departments and bodies, there by leading to the complexity in receiving, processing, and resolving the increasing demand of citizens.

**2.4. Challenges**

The first obvious trait is that Vietnam is considered as a developing country. Hence, we may have to encounter a wide range of difficulties such as financial, political, and human resources. As we all know, any reform requires the large sums of money that could be billions dollar. In the contrast, the economics of Vietnam almost springs from the agriculture sectors, which seems to find the lack of sponsorship for the application and development of technology as well as digital government. The fact shows although the number of Internet users are massive, the direct access to the online world could be limited owing to the capacity of farmers in the nation.

The second barrier springs from the system itself. Vietnamese political system originates from the model of bureaucracy and subsidy in the past, hence, the influences from this period still appears currently despite the alterations of Renovation policy in 1986 (considered as a reapplication of New Economic Policy of Vladimir Lenin[[41]](#footnote-41)). The current political system seems to be poor, bureaucratic, and inefficient. Particularly, the endemic corruption is hard to tackle from its root. Additionally, the fundamental factors of building digital government such as integrity, transparency, openness, and accountability are limited. This restricts severely the operations of updating, connecting, and sharing data to establish and enrich database regarding socio-economic sector which serves the administration and direction of digital government.

Coping the problem above, Prime Minister Nguyen Xuan Phuc sternly warned: “Ministries, branches and localities cannot keep information on them, do not beautify data to get achievements. Information and data need to be accurate, reliable, transparent, unified, and digitalization should be accelerated, information sharing must work towards building a digital government”.[[42]](#footnote-42) However, the reality shows that the Government will still face the system's stagnation in the construction of digital government. Specifically, according to the plan, the ministries, branches, and Governmental agencies must standardize and electricize more than 200 reporting regimes to be sent to the Prime Minister, the Government, and the National Assembly for integration with the Information System; completing the standardization, digitizing the model to connect and integrate socio-economic indicators into the National Reporting Information System; The People's Committees of provinces and cities must also implement the information and statistics system integrated with the Government system in 2020. Also, according to the plan, the National Public Service Portal must complete the integration of essential public services such as import and export, land, construction, minerals, taxes, handling of administrative violations, hospital fees, tuition fees ... with the goal of completing the target of 30% of online public services level 4 in 2020. However, the stated tasks are unlikely to be completed as planned. In addition, the phenomena "pretending to comply" poses huge obstacles in the construction of digital government. Specifically, on the National Public Service Portal, although the number of accounts is very large, the implementation rate on the profile stays low, showing that the operating system is still formalistic. In fact, some ministries and localities have not actively chosen to deploy essential public services but prefer public services with few records (few users) to provide on the National Public Service Portal, which leads to a very low number of state synced profiles. In this regard, Minister Mai Tien Dung said: "If the procedure appears complex, the process uploading to the National Public Service Portal will be a major barrier for citizens and companies."[[43]](#footnote-43)

Another obstacle is human resources – which play an essential role in building digital government. In the field of information technology, Vietnam is ranked in the top 10 countries in Asia-Pacific and 30 in the world in terms of manufacturing and software development, but still ranks at the bottom or the bottom of the table ranking on some important technology indicators such as: e-government; technology innovation; disseminate modern technology; workforce skills; information society and data access[[44]](#footnote-44)… It proves that the national capacity regarding science and technology sector as well as the level skills of Vietnam's IT experts is still low. One of the reasons is the limited quality of information technology human resources training. At the time of 2016, Vietnam has more than 300 universities and colleges training high-tech majors, including information technology, but the number of graduates can work in practice is restricted. Specifically, out of more than 110,000 information technology engineers every year universities and colleges across the country supply the market, only 10% of engineers can serve this industry well.[[45]](#footnote-45) The 2014 Vietnam Science and Technology White Paper shows that in 2013, the whole country had 164,744 people participating in research and development activities. In which, the number of people doing professional research at institutes and research centers is 37,481 people. In terms of working functions, research and development human resources are distributed as follows: 128,998 research staff (with college, university, or higher degrees); 12,798 technical staff; 15,250 support staff; 7,800 people in other functions. However, Vietnam still does not have many outstanding and breakthrough projects and products at regional and international level.[[46]](#footnote-46) The number of internationally published scientific works has an average growth rate of 22% per year, but the absolute value and citation index are still low, especially when compared with regional and world countries. The total number of scientific and technological publications in Vietnam in the Web of Science database for the period 2010-2014 is 9,976 articles, ranked 59th in the world; Compared to the region, Vietnam ranks behind Singapore (ranked 32nd), Malaysia (ranked 38th) and Thailand (ranked 43rd), higher than Indonesia (ranked 62) and the Philippines (ranked 66). The number of patent applications registered for protection in the period 2011-2013 of Vietnamese people is 1,126, while there are 10,690 applications of foreigners; the number of patent patents granted by Vietnamese people is much lower, only 144 degrees, 21.7 times lower than the number of patents granted by foreigners (3.128)[[47]](#footnote-47). Besides, Vietnam has a shortage of excellent scientists and leading scientists, although the number of science and technology staff with doctorate and master’s degrees is quite large.[[48]](#footnote-48)

In addition, while there is a shortage of experts, (according to data from the Vietnamworks recruitment page, by the end of 2018, Vietnam still has a shortage of 70,000 workers in the information technology field, by 2020, the number will be up to 500,000)[[49]](#footnote-49) in recent years, Vietnam faced the brain drain like many other developing countries. The outstanding persons stay abroad after finishing their study there while those who attend domestically cannot bear the burden of this process. One of the prime examples for this statement is twelve champions of quiz show called “Conquer Mount Olympia” which the winner gets the chance to study at Swinburne University, Australia. Only one of them come back to Vietnam to serve their home country and this shows the inefficient core resources – human being.

**3.Solutions**

From the experiences of industrialized countries, the institutional base of digital government needs to be completed initially. Particularly, the lack of provisions and policies in Vietnam is one of the current issues. Hence, it is pivotal for government to adopt Decree regarding sharing data; protecting personal information; online identification; assuring individual’s confidentiality; reporting mechanism of administrative institutions. Furthermore, the policy concerns the investment in technology sector responding to its characteristics by replacing Decree 102/2009 – investing and applying IoT in the operations of the state and Decision 80/2014 – hiring technology services. In the immediate future, there is a necessity of researching and adopting new legislation of digital government as well as complementary documents to assure the legal framework of digital government.

The second crucial orientation is that the national database considering population, land, and so on should be fulfilled as soon as possible. Moreover, an accessible system plays a crucial role in connecting the state with provinces and regions with ease. The last measure is that the media have to raise the inhabitants ‘awareness towards the new face of government. In the light of a national technology reform, digital government requires the community participation. This means that not only the public officials, civil servants but also the private sectors have responsibility to intervene into this reform owing to their potential investment and capability of development. The participation and the education have to be alongside to optimize the effectiveness.

From another aspect, establishing digital government attaches to digital transformation. According to the standpoint of an expert, it is essential for Vietnam to implement these solutions in order to enhance the process of numeric reform[[50]](#footnote-50):

First, in the light of digital transformation requiring the participation of different departments, bodies, and society, government must provide a mutual operation assuring the process efficient, synchronized, coordinated, connected, and widely shared.

Second, continue to develop digital infrastructure, especially soon to officially deploy 5G mobile networks, and simultaneously pay attention to ensuring information safety and security.

Third, promote sharing of digital data resources as this is a prerequisite for digital transformation.

Fourth, develop an infrastructure to provide digital signature authentication services to deploy electronic identity and authentication. This is a crucial base for digital transformation since it will become important and urgent to identify, authenticate or provide digital identities when real-world objects transferred to virtual world.

Fifth, increase training, improve qualifications and retain the information technology workforce in the context of heavy brain drain, especially senior personnel.

Sixthly, improve the legal framework supporting information technology development. In recent years, although a range of legal documents have been adopted by the State to help the application and development of information technology (such as the Law on Information Technology, Law on Cyber information Security, Law on Cybersecurity, decrees ...), the legal framework in this field is not yet completed. This can be explained by the fact that there is a lack of a legal corridor for the development of the shared economy; sharing and opening data of government agencies and businesses; protection of personal data, private information; the issue of rights, ethics when applying artificial intelligence (AI) ... This greatly impedes the digital transformation process.

**Concluding Remarks**

Vietnam took the right step in building digital government and conducting digital transformation. Coping with this issue, the government shows their strong determination, hence, they gained some encouraging achievements. Yet Vietnam have to face a variety of tough challenges from both objective and subjective aspects.

In order to overcome the challenges in building digital government, Vietnam should acquire the knowledge and experiences of the U.S. and MENA countries in setting out the strategy with precise plans and operations. They really need to study deeply about the current situation regarding technology sector with exact statistics. Through these figures, the Government could enact or revise the appropriate policy and campaign to actualize the ambition in digital era. Furthermore, the digital government plays the role of a data revolution which ensures the sustainable development. Particularly, policy makers have the responsibility to minimize the risks and maximize the opportunities of this reform. The risks could appear in the gaping hole of personal privacy and confidentiality. In the contrast, protecting the rights and obligations of citizens should not restrict the ability of research and application in practice. The privacy law has to be architected to corporate with all the criteria mentioned.

In addition, the United Nations (UN) recommends governments should urgently leverage emerging data sources for SDG monitoring, through an “SDG data lab”.[[51]](#footnote-51) This lab should mobilize key public, private and civil society data providers, academics and stakeholders to identify available and missing data and indicators as well as opportunities for benefitting from new methods, analytical tools and technologies to improve the coverage, timeliness and availability of indicators in each of the SDG areas. The next thing to do for Vietnam is therefore to develop systems for global data sharing. The cooperation at international level helps to identify areas where the development of common infrastructures to exploit the data revolution for sustainable development. It is essential for Vietnamese Governments to fill research gaps such as the relationships between data, incentives and behavior. The final recommendation is the creation of incentives to engage social entrepreneurs, private sectors, academia, media, civil society and other individuals and institutions in this global effort through initiatives such as prizes and data challenges.

Although Vietnam learn experiences from any model or nation (OECD guidelines, MENA countries or China), building digital government is architected to serve citizens and bussinesses. Therefore, the innovation has to spring from inhabitants. To be more specific, the prompt feedback coming from people contributes essentially to the success of digital-government establishment. This is strongly correlated with the enactment and amedement of law since building digital government encompasses these activities. In practice, the executive branch – government contributes most of initiatives of law instead of Congress, the legislative branch. This can be explained by the fact that the practical test and assessment measures the effectiveness of polices. Thus, nation leaders should enhance the mechanism of receiving, processing the feedbacks from citizens to improve the digital reform.

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