

## **Factors Affecting The Construction Of Digital Government In Thua Thien Hue Province Of Vietnam**

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### **Abstract:**

*Digital transformation is changes based on the breakthrough technologies of Industry 4.0 to increase the operational efficiency of production and manufacturing sectors, related industries, and the value creation process. Digital transformation is a common concept in the business field of the private sector; when applied to the public sector, digital transformation is transformed into phrases such as digital government/digital administration, smart government. Digital transformation in the public sector or the construction of digital government is influenced by many factors, verified through practical studies in various countries. These factors can also be proposed to study their impact on the construction of provincial digital government in Vietnam, specifically here in Thua Thien Hue province. Identifying the influencing factors will help managers formulate appropriate policies to promote the development of digital government.*

**Key Word:** *Industry 4.0, digital transformation, digital government, Thua Thien Hue province.*

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### **I. Introduction**

Countries worldwide are witnessing the fourth industrial revolution or Industry 4.0, a new stage in the organization and arrangement of industrial value chains. The term Industry 4.0 originated from the German Government's "High-Tech Strategy" initiative presented at the Hannover Messe Technology Fair in 2006 (Bartodziej, 2017). In 2011, the concept of Industry 4.0 was further presented by PhDs from the German Federal Ministry of Education and Research, and the German Institute for Artificial Intelligence at a press conference at the Hannover Messe 2011 Fair, since then it has been widely used globally. Industry 4.0 refers to the intelligent networking of machines and processes in industry with the support of information and communication technology. Industry 4.0 refers to the technological evolution from embedded systems (a combination of software and hardware of a machine) to cyber-physical systems (cyber-physical systems). Industry 4.0 represents the fourth industrial revolution, the path towards the internet of things, data and services. Industry 4.0 is the digital transformation of the manufacturing/manufacturing industry, related industries and the processes that create the value chain (i-SCOOP, 2021). Up to now, the phrase Industry 4.0 has many other definitions, such as Boston Consulting Group said that "Industry 4.0 refers to the convergence and application of 9 digital industrial technologies: advanced robotics, material connectivity, augmented reality, simulation, horizontal/vertical integration, industrial Internet, cloud, cybersecurity, big data and analytics" (Boston Consulting Group, 2016). Căpușneanu et al. said that "Industry 4.0 is the name for the current trend of automation and data exchange, including cyber-physical systems, Internet of Things, cloud computing and cognitive computing and creating smart factories" (Căpușneanu et al., 2020), ...

The term digital transformation also has many different definitions. In 2004, E. Stolterman and A. Fors defined that "Digital transformation is the changes that digital technology has created and affected human life" (Quoted in Tratkowska, 2019). In 2008, A. Martin said that "Digital transformation is understood as the use of information and communication technology, not the trivial automation that is performed, but is fundamentally creating new capabilities in businesses, the public sector, in human life and society" (Quoted in Tratkowska, 2019). Digital transformation is also understood as the application of breakthrough technologies to increase productivity, create value and welfare for society. Governments in many countries, multilateral organizations, and industry associations have conducted strategic studies to inform long-term policies (Ebert & Duarte, 2018).

In the public sector, digital transformation is often referred to by terms such as "smart government", "open government", "digital government", "smart governance". Technology is the key to smart governance. The application of electronic processes in the political and administrative systems will create e-government. Smart government is a higher version of e-government (Sarker et al., 2018). Smart government can be explained by the phrase SMART including Social – Mobile – Analytics – Radical openness – Trust (cited in the article by Sarker et al., 2018).

## Method And Literature Review

### Method

This article is based on the synthesis method, evaluating related research articles on digital government and evaluating the practical situation of the locality to propose factors affecting the construction and development of digital government in Thua Thien Hue province of Vietnam.

### Literature Review

Factors influencing the construction of open government (3<sup>rd</sup> generation digital government) include: leadership, policy/legal framework, institutions, application & co-creation, capacity building, citizen engagement, innovation financing, technology/infrastructure.



**Figure 1 – Important factors in building digital government**

*Source: (Rossotto, 2012)*

Digital government is also understood as a government designed and operated to take advantage of digital data in optimizing, transforming and creating government services (The World Bank & Institute of the Information Society, 2016).

Public sector organizations in many countries are striving to deliver public services more efficiently by integrating integrated, open, bottom-up digital systems into their operations. Digital transformation in the public sector is the adoption of digital technologies such as artificial intelligence, the Internet of Things, supply chains, and the development of smart cities. Technology helps countries modernize public service delivery to better serve businesses and citizens. Through practical research in many countries, the main factors contributing to the success of digital transformation in the public sector or building digital government (DG-Digital Government) include: leadership; culture of innovation and collaboration; strategy; skilled workforce; citizen participation, development of digital infrastructure, and a high-level focal point for digital government management (Asian Productivity Organization, 2021), specifically:

*1. Digital Leadership:* Progress in digital transformation in countries must be led by top political and administrative leadership. Malaysia's success in DG is largely due to the political commitment of governments to their country's digital agenda. In Malaysia, the political leadership initiated the move towards DG as part of a broader agenda to digitize the economy. A similar political drive to improve the efficiency and effectiveness of public services through extensive digitalization can be observed in countries such as Latvia and OECD countries. All these countries have similar goals. All emphasize on knowledge development, customer centricity, digital skills, digital security, AI applications and e-government to enhance digitalization in public services. Driven by political leadership, public service leaders must also recognize the role of technology in improving operational efficiency and achieving organizational outcomes, including enhanced service delivery. Public service leadership must ensure that appropriate digital technologies and governance models are in place and that the government has the digital capabilities to exploit them. Public service leaders also need to have the skills to design and implement an appropriate DG strategy. Leaders must be technically savvy enough to be able to recognize emerging trends in DG and adapt them to their respective services.

2. *Creative and collaborative culture factors influencing DG:* A culture that is willing to continuously adopt digital technologies when there are clear benefits in terms of operational efficiency and delivery outcomes; always enhancing collaboration between stakeholders to ensure rapid and effective solutions to citizen needs, using digital technologies. The new culture must be outward-facing, in that it must listen and engage with citizens. Asking users for feedback on service options and acting on user feedback quickly and continuously can help ensure that digital technologies are appropriate to meet the needs of citizens and the business community. Senior managers should be concerned with building and maintaining such work culture characteristics for younger civil servants to emulate, and take appropriate measures to encourage a creative and collaborative public service culture.

3. *Strategy is essential for DG:* A clearly defined digital strategy with a detailed roadmap is another important factor in ensuring an orderly transition to DG. A clear strategy will enable the public service to respond intelligently to threats and opportunities while fostering a culture of innovation and collaboration. A global digital strategy for government should form the basis for the development of digital strategies for ministries, local governments and local governments. For example, the Digital Transformation Office at the Ministry of Economy, Trade and Industry, Japan sets out an overall strategy and guides digitalization across the government and private sectors. The strategy should advocate a comprehensive approach to digitalizing public services to enhance the citizen experience. It should aim to deliver as many public services as possible online. For example, through DG, the Malaysian government has made 90% of its public services accessible online. The strategy must also aim to transform systems, processes and organizational structures from the ground up. It should also include initiatives to improve evidence-based decision-making through the use of big data analytics. For example, Digital India's strategy is to transform India's governance so that every part of government can unleash the potential of digital technology to improve operational efficiency and service delivery, while fostering collaboration between government agencies, businesses and citizens. Around 60% of government agencies in the Nordic countries have a digital strategy aimed at modernizing public services.

4. *Skilled Workforce:* A tech-savvy workforce is integral to any organization's digital transformation strategy and its implementation. With rapid advances in digital technology, governments should invest in upskilling their leaders and employees in information and communications technology (ICT) skills. They also need to have team building, research and analysis, and project management skills. Hiring people with the necessary skills can address the skills gaps in government. Creating internship and fellowship programs and hiring for short-term assignments are some of the recruitment strategies. Some governments have found ways to attract or nurture Information Technology (IT) talent for their digital projects. For example, South Korea has centralized much of its government IT infrastructure into a few data centers that provide various e-government services to its citizens. The scale and breadth of these centres can provide IT professionals with promising careers with the added challenge of improving a wide range of online services and addressing the challenges of managing a massive data centre. In the UK, the government actively attracts talent from the private sector by offering fast-track career opportunities. For example, the government's Chief Information Officer (CIO) and head of digital services have previously spent much of their careers in the private sector. In addition, high-performing graduates are offered the opportunity for rapid advancement into the IT sector. Japan's Ministry of Economy, Technology and Industry (METI) hires IT professionals from the private sector as project managers for its IT services. This enables METI to develop digital services more efficiently and effectively.

5. *Citizen participation:* Citizens play a prominent role in the digital transformation journey. They not only urge governments to move to DG but also demand their input in the design of digital services. Crowdsourcing through competitions are some of the ways governments engage users and develop user-centric digital services. Access to skills in the wider community through open data, transparency and collaboration allows citizens to tap into their skills and contribute to improving public services. Open data from criminal records, train times and other sources have been used by civil society and businesses to create their own apps. In 2011, the Netherlands established i-NUP, a government-wide rollout program for e-government services. The program prioritizes citizen-centric design by promoting convenience, simplifying procedures and cutting red tape. Most cities are now connected with a single access number. To foster greater engagement with businesses, the Dutch government launched a comprehensive digital infrastructure project. Led by the national digital authority, Logius, the project's steering group included central and local governments as well as public IT agencies. Together, using world-class standards, they developed specifications for 13 central databases and their connections. They also created a government-wide dashboard to highlight the status and risks of the project. Conferences and social media were held to disseminate and distill key lessons with public sector IT managers across the country. As a result of these initiatives, site visits to cities and government offices were significantly reduced, by as much as 50% in some cases. On the demand side, DG will be useless if citizens are not oriented to use the online services that are made available. In this regard, the digital divide in society and in government needs to be narrowed so that more digital

citizens are developed to make online services meaningful. For example, in 2017, about 70% of Chilean citizens preferred to register and update their data at central municipal offices. They did not prefer online public sector platforms due to the lack of necessary technological knowledge. With only 22% of the population being e-literate, the Chilean government could not fully adopt digital technologies. In this case, the mismatch between technological requirements and citizens' knowledge prevented the full implementation of DG.

*6. Digital infrastructure and high-level digital transformation management:* Developed countries have taken the lead in DG, partly due to their heavy investment in R&D. For example, the Korean government has invested heavily in R&D, focusing on technologies associated with the fourth industrial revolution such as AI, augmented reality, IoT, and big data. However, legacy and disparate IT systems create an obstacle to integrating data and data systems. Agencies will have to find ways to manage interoperability issues of IT systems. In addition, developing countries find resource constraints an obstacle in their transition to DG. New technologies are not only valuable but also require constant updates. Cloud-based on-demand pay-as-you-go services can partly overcome this problem. By 2020, IoT-connected devices and platforms had generated more than 40,000 exabytes of machine-generated data. Data storage and management systems must be able to handle high volumes and continue to scale in line with data growth. A similar requirement applies to public services, although they may not handle such massive amounts of data. In addition to upgrading broadband infrastructure, many governments have established dedicated units headed by chief digital officers. In Malaysia, the Deputy Director-General (Digital Government) of the Malaysian Management and Modernization Planning Unit (MAMPU) is tasked with implementing the DG. In the UK, central leadership and strong implementation capabilities are provided by the Cabinet Office's Digital Service. The Dutch have also delegated central leadership of the DG to the national digital regulator, Logius. Given these experiences, it is important for any government accelerating its transition to DG to have a dedicated digital transformation management office at the prime minister's or president's office level to lead the implementation of a government-wide DG strategy. This office must be equipped with the highest level of authority to deliver results.

## **II. Factors Affecting The Construction Of Provincial Digital Government In Vietnam, In Connection With Thua Thien Hue Province**

Keeping up with the digital transformation trend in the world's Industry 4.0 period, Vietnam is also gradually building a digital government, digital economy and digital society. Regarding the DAI and DES measurement indexes, in 2014, Vietnam ranked 92/184 countries in the DAI Digital Adoption Index, in 2020, Vietnam's digital progress score was in the group of breakthrough economies, meaning that the digital infrastructure is still limited but the digitalization speed is taking place rapidly. To achieve the goal of national digital transformation, building a digital government at both the central and local levels is one of the important pillars. For provincial governments, to successfully implement digital government, we need to consider the influencing factors to propose appropriate directions. Based on the factors affecting the construction of digital government/digital government (DG-Digital Government) of countries around the world to apply and propose factors affecting the construction of provincial digital government in Vietnam, specifically with Thua Thien Hue province (TT Hue). This can also be considered a proposed theoretical framework to serve as a basis for expanding practical research on this issue as well as implications for policymakers to develop digital government in TT Hue province.

In the above sections, the factors affecting the construction of digital government include: Leadership, legal basis, institutions, applications and cooperation, capacity building, citizen participation, finance and infrastructure (Rossotto, 2012) or factors such as leadership, culture of innovation and cooperation, strategy, citizen participation, infrastructure and senior leadership focal point for digital government construction (Asian Productivity Organization, 2021) . Combined with the 7 indicators for evaluating provincial-level digital government prescribed by the Ministry of Information and Communications (Decision No. 1726/QĐ-BTTTT, 2020), the factors that can affect the transition to digital government in Thua Thien Hue province at the present stage are as follows: Institutions; leadership; human resources; infrastructure, data and digital applications; citizen participation.

### **Institutions related to digital transformation in provincial government**

In recent years, the issue of digital transformation has received attention from our Party and State and many documents have been issued to direct its implementation. Resolution No. 52-NQ/TW dated September 27, 2019 of the Politburo on a number of guidelines and policies to proactively participate in the Fourth Industrial Revolution has set the goal by 2025 to "basically complete digital transformation in Party and State agencies, the Fatherland Front, and socio-political organizations; to be among the top four ASEAN countries in the e-government ranking according to the United Nations' assessment" (Resolution No. 52-NQ/TW, 2019). On that basis, the Government issued Resolution No. 50/NQ-CP dated April 17, 2020 on the Government's action program

to implement Resolution No. 52-NQ/TW of 2019 of the Politburo (Resolution No. 50/NQ-CP, 2020). On June 3, 2020, the Prime Minister issued Decision No. 749/QD-TTg approving the "National digital transformation program to 2025, with a vision to 2030" (Decision 749/QD-TTg, 2020). Pursuant to Decision No. 749 of the Prime Minister, the Ministry of Information and Communications issued Decision No. 1726/QD-BTTTT dated October 12, 2020 approving the project to determine a set of digital transformation assessment indicators for agencies under the Ministry, ministerial-level agencies, government agencies, provinces and the country (Decision No. 1726/QD-BTTTT, 2020). Most recently, the Resolution of the 13th National Congress of the Party in 2021, the content of the Resolution also sets out the orientation of "promoting national digital transformation" for the period 2021-2030 (Resolution of the 13th National Congress of the Party, 2021).

Based on the above documents, especially Decision 1726 of the Ministry of Information and Communications, to assess the level of digital transformation (DTI) of the provinces, it is necessary to rely on 3 main pillars: Digital Government (CQS), Digital Economy and Digital Society. Each pillar has 07 assessment indicators on: Transforming awareness; Institutional creation; Developing digital infrastructure and platforms; Information and digital data; Digital transformation activities; Safety, network security; Training and human resource development. For the provincial Digital Government pillar, the score is 400, divided to calculate through the scores of 7 main indicators, these 7 indicators have 45 component indicators and these 45 component indicators contain 133 criteria, specifically in Table 2. The final score is the aggregate score from self-assessment, assessment by the Ministry of Information and Communications, assessment on cyberspace and expert assessment.

In accordance with the direction in the above documents, the People's Committee of Thua Thien Hue province also issued many documents to implement the digital government program with the consistent motto of taking people as the center, enterprises as the driving force and the creative state: Decision No. 2012/QD-UBND dated August 10, 2020 of the People's Committee of Thua Thien Hue province on approving the e-Government Architecture of Thua Thien Hue province 2.0; Action Plan No. 70/KH-UBND dated March 30, 2019 of the People's Committee of Thua Thien Hue province on implementing Resolution 17/NQ-CP of the Government on a number of key tasks and solutions for e-Government development in the 2019-2020 period, with a vision to 2025; Plan No. 133/KH-UBND dated May 27, 2020 of the Provincial People's Committee Implementing Resolution No. 52-NQ/TW dated September 27, 2019 of the Politburo and Resolution No. 50/NQ-CP dated April 17, 2020 of the Government promulgating the Action Program to implement a number of policies and strategies to proactively participate in the Fourth Industrial Revolution; Decision No. 1957/QD-UBND dated July 31, 2020 of the Provincial People's Committee approving the Digital Transformation Program of TT Hue province; Plan No. 222/KH-UBND dated October 21, 2020 of the Provincial People's Committee promulgating the plan to implement the digital transformation program of TT Hue province until 2025 (Thai Hung, 2021).

The system of institutions on digital transformation and the foundation for developing e-Government (E-Government) and digital government in Thua Thien Hue province is in the process of further improvement. This is an advantage and has a positive impact on the successful construction of digital government.

### **Leadership for digital transformation in provincial government**

Although resources are still limited, the leaders of TT Hue province always pay attention to directing TT Hue to build e-government according to the roadmap from easy to difficult, from simple to complex, to be a pioneer in IT and digital technology. TT Hue is a pioneer in building digital government and smart cities (ICTVietnam, 2021). Provincial leaders advocate increasing investment in infrastructure, popularizing mobile phones and essential services for people, promoting connections from the central to local levels and setting a goal that by 2025, 100% of the activities of state agencies in TT Hue from the province to the commune will use electronic documents with digital signatures, connecting from the commune level to the provincial level and connecting with the country in state management activities (VOV Vietnam, 2021). This will be a favorable condition to promote the construction of digital government in TT Hue province to achieve early success.

### **Skilled human resources**

Human resources are certainly a prerequisite for building a digital government. The human resources in the state agencies of Thua Thien Hue province are increasingly trained and improved to serve the digital transformation strategy. In the 3 years of 2018, 2019 and 2020, the ICT index (index of readiness for development and application of information technology and communications) of Thua Thien Hue province has always been in the top 5 and the rankings are 5/2/2 over 3 years. Regarding the component indexes, the IT application index over 3 years is ranked 2/1/4, IT application within state agencies is 8/2/4, online public services are ranked 1/1/4 over the years.

The human resource infrastructure index of state agencies includes the proportion of IT specialists at all levels and with university degrees or higher, information security specialists, trained staff, and staff instructed in using software and training in information security. This index of TT Hue over the 3 years 2018-2020 is 19/1/2

respectively, showing the investment of TT Hue province in improving the capacity of cadres, civil servants, and public employees in state agencies, especially in the field of IT.

### **Digital infrastructure, databases and applications**

When the infrastructure is better, the database and big data are guaranteed, diverse digital applications will contribute positively to the construction of digital government. TT Hue province is completing the infrastructure to promote the construction of digital government. TT Hue province has recently cooperated with Tien Bo International Joint Stock Company to put the Provincial People's Committee Operation Center into operation. This center is the central "brain", collecting, standardizing data, analyzing, processing, ... as a basis for reports, decisions, serving the management and operation activities of provincial leaders, departments, and localities. In the center, there is a smart meeting room processed on an AI platform with integrated features of facial recognition, smart signature system, automatic recording, ... helping the drafter and the operator make quick decisions. TT Hue also has the Hue IoT Innovation Hub center, which will be a place for research and application development with the goal of creating products for deployment to people in Hue. Regarding big data, TT Hue province is completing the database system on citizen and business data, storing all documents. TT Hue Provincial People's Committee has issued the Provincial E-Government Architecture version 2.0. includes 07 main components: users; access channels; technical infrastructure - technology; application layer and database; integrated services - provincial integration, sharing, and interconnection platform; information security; management and direction.

In the ICT ranking of technical infrastructure of state agencies over the 3 years 2018-2020, TT Hue ranked 9/5/1 respectively, showing the efforts to upgrade infrastructure to serve the construction of digital government of Thua Thien Hue province.

### **Citizen participation in digital government**

In building digital government, people are the objects of service of digital government, and they also contribute their opinions to the construction of digital government. Therefore, the more actively people participate, the sooner the construction of digital government will achieve good results. With the e-Government Architecture of Thua Thien Hue province, *users* are the agents participating in using e-Government services, including citizens, organizations, businesses, civil servants, tourists through communication access channels such as Public Service Portal/Provincial Electronic Information Portal/electronic information pages, email, telephone (landline or mobile), fax machine, kiosk or can go directly to Public Administration Centers/offices of agencies/units,... .Currently, HueS application, Information Portal <https://tuongtac.thuathienhue.gov.vn>, facebook <https://facebook.com/HueIOC>; Zalo: Smart urban services (0941260505); Zalo HueIOC Center; Email:dtm@thuathienhue.gov.vn; Hotline: 0815751575, 19001075, are some of the channels that people participate in the most. According to the report of the Smart Urban Operations Center of Thua Thien Hue province in 2020 and the results of a random survey of 500 people of the research topic "People's participation in state management through smart urban models" of Hue Institute, 66% (> 50%) of the surveyed people know about smart cities but only 47.9% (<50%) of the surveyed people participate in interactions on digital government channels.

## **III. Conclusion**

Digital transformation in the public sector is inevitable in the current period in our country. The COVID-19 pandemic is evolving complicatedly, requiring digital government to be more complete in order to provide online public services to the people. Digital government will bring many benefits to both the government and the people. The effectiveness of building digital government will promote digital economic development. For Thua Thien Hue province, building digital government has many advantages because in recent years, the province's ICT index has always been high. Based on the factors affecting the construction of digital government in other countries, provincial governments in Vietnam, specifically Thua Thien Hue province, can consider to come up with appropriate directions.

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