

EFFORTS TO PROMOTE DIGITAL TRANSFORMATION TOWARDS BUILDING JAPAN'S DIGITAL GOVERNMENT, DIGITAL SOCIETY, AND DIGITAL ECONOMY

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Abstract: *Acknowledging its delay in the race of "digital transformation" and determining the need to quickly digital transformation to overcome this backwardness is an inevitable trend, a vital issue for the country of the rising sun; the article is considered from a number of factors affecting digital transformation in Japan, analyzed 5 reasons to slow down the current digital transformation process and presented 3 major challenges that hinder Japan's digital transformation, thereby proposing seven solutions to promote digital transformation in Japan towards building a sustainable digital government, digital society and economy in the future, maintaining the position of the world's third largest economy.*

• Keywords: *digital transformation in Japan, digital society, digital economy, digital.*

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1. Some factors affecting digital transformation in Japan

- On the current state of the economy. Over the past three decades (since the early 1990s), Japan's economy (the third largest in the world) has always been in a stagnant state, with growth rates far below those of decades after the Second World War, even many years of growth below potential. As a result, from the world's second economic superpower after the United States, since 2010, Japan has been surpassed by China, and so far, Japan is still grappling with half-hearted reforms in an attempt to break free from the state of low growth. In addition, the economy also faces long-term difficulties due to an aging population, leading to a shrinking workforce, low labor productivity growth and major risks related to climate change.

- On digital transformation in Japan. Despite being one of the world's largest users of industrial robots and the home of The electronics industry¹, Japan still lags behind other economies in digitizing businesses (which, for example, continue to depend on old IT systems, governments, and the financial sector.)

- Currently, in many countries, even in some developing countries, it is common for people to

receive many daily services with just a smartphone. On the contrary, in Japan: First, many administrative procedures are still mainly handled through a large number of papers and people, if they want to register for public services, have to go through many different departments; Secondly, many central and local government offices use different systems to store and manage data, because each agency builds its own, so the systems are heterogeneous and lack compatibility. Such processes place a tremendous burden on people to spend their precious time to complete such procedures, and there are countless other difficulties... [ictvietnam.vn, 2019].

The fact that government services have not yet fully and appropriately digitized has become a major problem during the pandemic: Causing delays in handling people's aspirations for grant applications and emergency financial support, as well as slowing down the transmission of medical data needed for virus prevention measures; many workers have struggled to switch to remote work when the pandemic began, reducing economic output and productivity at a critical time; incomplete and consistent digitization across systems has also caused delays in many schools at the beginning of the pandemic when it comes to online learning; and the adoption of non-cash payments and e-commerce has also been slowed...

¹ According to METI, Japan is currently the world's leading supplier of industrial robots, with an income of 340 billion yen in 2012, accounting for over 50% of the global robot market, 90% of the important robot market share, especially in the precision industry and force sensors [Nguyen Nham, 2017].

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- Japan still prefers to use traditional technology.

While many countries have embarked on the digital transformation process for many years, in Japan, many old technologies are still widely used.²

According to Professor Parissa Haghirian (Sophia University, Tokyo), most offices in Japan are still using fax machines to exchange work. Even the tradition of widely using personal seals (hanko), in place of personal signatures and digital signatures, is still popular in Japan.

Digital banking, electronic banking - a popular method of banking transactions in many countries - was introduced nearly a decade later than many other countries, even so many Japanese banks still do not have this application. Most Japanese citizens still use small bank books instead of online banking applications like other advanced countries. Surprisingly, recently, a government committee has discovered about 2,000 administrative procedures still requiring applications or forms on floppy disks, CDs, MDs, even cassettes [Phan Van Hoa, 2022].

Such a situation of digital transformation leads to the idea that Japan is still only a country that is fully automated and mechanized, not a “digital society”, or maybe just a form of society that has been “digitally transformed in a half-hearted way”. As evidenced by “many vestiges of work that could have been digitized and managed more effectively, thereby improving work efficiency, are still done by hand, as elderly people with fading eyesight and trembling fingers carefully trace each line of text to feel for customer information. Especially in administrative management, real estate, banking, taxation, education...” [Minamikawa Famu, 2021]. In recent years, although Japan has begun to promote digital transformation and minimize administrative procedures, it is notable that the My Number personal code was born to create a premise for the next movement steps. However, that may start a little late, as Japan has missed out on the “smartphone revolution”, and let South Korea and China leapfrog it, especially in Big data and artificial intelligence (AI). While QR code payment has been very popular in China for 4-5 years, in Japan it has only started in the past 2 years with a limited percentage of users and is currently in an acceleration phase. The Japanese leadership has also recognized this, and is rushing to reform to avoid falling behind [Linh Anh, 2021].

² *TechinAsia (2016), Easy to recognize Japan as a country with a developed technology background with a lot of jobs that have been recognized by robots. Even the toilets in the country are equipped with smart devices. However, the Japanese still prefer some old technology products, such as CDs, Paper newspapers, Fax machines, DVD rental services and flip phones.*

- For the semiconductor industry, after “more than three lost decades”, Japan’s share of the global chip market has fallen from half (about 50.3%) in 1988 to 10% in 2021, with the risk of falling to 0% by 2030, according to the Japanese Ministry of Industry. Its customers fall into the hands of rivals with lower prices, such as South Korea, Taiwan and China [Linh Anh, 2021]. “Japan has lost out to Taiwan, South Korea and China in semiconductor investment,” said Maitani Masato, senior manager at Mitsubishi UFJ Research and Consulting. “In the development of advanced semiconductors, we are 10-20 years behind,” said Koike Atsuyoshi, president of Rapidus Chip Manufacturing. This is the last chance to take advantage of the country’s manufacturing advantages to contribute to the world” [World Today, 2023].

- Once proud to be a world leader in outstanding advances in technology, but today, Japan is at risk of being/or even being overtaken by many countries in the field of semiconductors and digital transformation. According to the Digital Competitiveness Index of the International Institute for Management Development, in 2022, Japan ranked 29th, down 1 place from 2021, among 63 countries and territories examined, behind South Korea (12th) and China (15th) [Minh Ngoc, 2022].

In the face of that tragic situation, during the meeting of the ruling Party (LDP - Liberal Democratic Party of Japan) in May 2021 on the issue of bringing Japan to the leading position in the digital economy, it was necessary to call: “We cannot continue what we are doing. We have to do something on a completely different level” [Linh Anh, 2021].

- Tsuneo Fujiwara, Vice President of global technology research and consulting firm Gartner based in the US, said that in 2018, the Japanese government realized that it needed to do digital transformation, otherwise, the country could suffer economic losses of up to 12 trillion yen (about 71.6 billion pounds) per year [Phan Van Hoa, 2022].

2. Reasons Japan is slow in digital transformation

Firstly, from a cultural perspective

- According to senior researcher Jun Mukoyama (at the Asia-Pacific Initiative), the tradition of valuing the elderly and patriarchy in Japan is a major obstacle that makes it more difficult to eliminate outdated technology. Standards are largely dictated by the most senior leaders in an organization, who prefer the old approach and the risk-averse and infallible nature of

government officials that also slows down the process of change.

- In order to realize the digital transformation process, Japan's Ministry of Digital Affairs has announced digital governance rules, encouraging companies to launch digital transformation projects.

Like in any country, implementing digital transformation will help modernize the country of Japan. Digital transformation could once again ignite the culture of innovation that the country has lacked for the past 30 years.

Japan is known for its strong innovation after World War II, which has created an economic "miracle" and rapid development in science and technology (S&T) after the war, but in recent decades, Japan has only made improvements to existing processes rather than implementing new, revolutionary ideas. That means, for many years, Japan completely lacked a "culture of innovation" [Phan Van Hoa, 2022].

Secondly, there have also been many changes in the leadership of the Japanese government over the past time. Mr. Yoshihide Suga (LDP) is the Prime Minister who strongly supports digitalization and digital transformation. After Mr. Suga was elected Prime Minister in September 2020, he immediately established the Ministry of Digitalization of the government, but unfortunately he resigned only one year later. After Yoshihide Suga's resignation, Japan's first Minister of Digital Affairs, Yoko Ishikura, was also forced to resign. In addition, it seems that other ministries often ignore the recommendations made by the Ministry of Digitalization on how to digitize internal processes [Phan Van Hoa, 2022].

Third, the perception of digital transformation is not quite right. In the era of rapid development of digital technology, DX (Digital Transformation) has become an important trend in the global business environment. It is worth noting here that, while in other countries DX is not limited to the business sector only, but also includes the process of applying digital technology to all aspects of social and economic life, of the organization, from business operations to the management of personnel, customers and also production processes, in Japan, the DX concept is mainly known in the business sector through METI's "DX Promotion Guide" published in 2018, which shows a limited view of DX and often limits it to the business sector.

Fourth, the fixed nature of labor and employment of employees. In general, Japanese businesses do not

change jobs often, which means that they will not notice many changes in the internal process based on previous experience from the company, so everything is still the same.

Fifth, population ageing. Over the past few decades, Japanese society has been increasingly aging, causing IT-intensive human resources to be limited, making it difficult for businesses to develop new "digital platforms" based on IT. Statistics show that in 2021, Japan had 36.21 million people over 65 years old, accounting for 28.9% of the population, much higher than the US (16.6%), Sweden (20.3%), France (20.8%) or Germany (21.7%). These people make up the majority of the leadership in agencies and businesses and remain loyal to traditional technologies that have existed for decades. Therefore, the abandonment of these traditional technologies is not an overnight but will take years in Japan. At the same time, according to Professor Haghirian, the current decision-making power in agencies and businesses is often old people, so it is difficult to accept the change. On the other hand, many customers are also older, so they do not feel comfortable using new systems or applications of technology. However, they have time to go to the offices and banks in the city to do the procedures in person instead of having to rely on online services. Therefore, Professor Haghirian said: in that context, the Japanese government is difficult to abandon the use of outdated technologies. And for successful digital transformation of public services, the government needs to have an overall long-term strategy for the whole country, managed and implemented by IT professionals [Thuc Linh, 2023].

3. Some challenges of digital transformation in Japan

Although Japan has made encouraging strides in digital transformation in the past, the country continues to face certain challenges, requiring a lot of time, effort and money. The biggest challenges that can be mentioned are:

First, the challenge of traditional culture. Japanese people and in particular Japanese businesses tend to prioritize stability and trust in traditional processes. These processes usually work very well and have been proven to be effective throughout the business. Therefore, changing and introducing new processes based on digital technology can cause discomfort and difficulty for employees and management.

Parallel to that, Japanese businesses often tend to be cautious and concerned about risks when making

the decision to switch from a traditional business model to a new business model associated with digital technology. The feeling of uncertainty and fear of failure in the implementation process makes Japanese businesses delay the decision and spend a lot of time to consider before implementing.

Secondly, the challenge comes from a rapidly ageing society, making the supply of high quality labor, including information technology and digital transformation human resources.

- According to the Japanese government, 1 in 10 residents is 80 or older, equivalent to 10% of Japan's population currently over the age of 80, which is the latest worrying milestone in the demographic crisis in this rapidly aging country. As for the Japanese Ministry of Internal Affairs and Communications, the proportion of elderly people in Japan aged 65 and over reached a record high of 36.17 million by September 2023, an increase of 300,000 people compared to a year earlier, accounting for 29.1% of the population, reaching the highest level in the world, and tending to increase (predicted to account for 35.3% by 2040).

At the same time, Japan also has one of the lowest birth rates in Asia over the past few decades with a birth rate that has plummeted to 1.3 births per woman, well below the 2.1 needed to maintain a stable population in the absence of immigration. Along with that, the labor supply is shrinking, which may affect the funding for pensions and health care as the demand from the aging population increases [Thuc Linh, 2023].

- In particular, the supply of human resources with an understanding of information technology and high technical skills for digital technology and digital transformation is even more alarming. Currently and for many years to come, the demand for this type of manpower is outpacing the supply capacity of the current labor market, including programmers, artificial intelligence specialists, data specialists and cybersecurity experts, etc.

The serious shortage of suitable high-quality human resources will certainly remain a major obstacle to Japan's digitalization, causing many consequences for the country. According to the Ministry of Economy, Trade and Industry, it is expected that there will be about 1.13 million people working in the IT industry by 2030, which means a shortage of about 790,000 people [Hoang Ha, 2023].

Thirdly, the challenge comes from investment capital. Although Japan is the world's third economic

power, finding investment resources to bridge the gap in semiconductors, information technology and digital transformation with leading countries in this field is not easy.

- First of all, at the macro level, to revive the semiconductor manufacturing industry, promote information technology, develop digital government, digital society and digital economy, digital citizens, etc. also require a large amount of money, while the Japanese economy is stagnating for many years, resources are not as abundant as before, so it is difficult to compete with the United States, China, even South Korea, and Germany in investing in this field? Although cloud computing has been a focus of investment in information technology recently; however, with investments in cloud computing accounting for only 4% of Japan's total information technology spending in 2021, Japan is lagging behind many countries [Phan Van Hoa, 2023].

- At the micro level, ie the costs necessary for a business to start implementing digital transformation, not all businesses (large and small) can meet and boldly deploy investment. The cost of digital transformation of an enterprise includes many contents, such as: (1) Investment costs in technology application: investment in strategy, human resources, technology solutions,... This will not be a small investment and can be a significant financial burden for small and medium enterprises (SMEs), currently accounting for 98% of the total number of enterprises in Japan; (2) The costs of changing processes and training personnel, is also one of the challenges that small and medium enterprises often face. Therefore, so far, Japan has been a drowning country in the digital transformation race, which is due to the fact that many businesses often do not allocate enough budget for the digital transformation process, significantly hindering the implementation of the transformation at present and in the future.

4. Solutions to develop digital government, digital society and digital economy in Japan

4.1. Dismantling old technology to enter the digital era

- Recently, the new Minister of Digital Taro Kono has officially spoken out and declared war on the use of floppy disks, CDs and even cassettes in Japan. Through the discovery of a government committee, nearly 2,000 administrative procedures are still required to submit applications or forms on floppy disks, CDs.

In early August 2022, at his inauguration as Minister of Digital Affairs, Mr. Kono was outspoken in his criticism of the use of fax machines and “hanko” marks in paperwork related to the COVID-19 pandemic. With the emergence of the internet and cloud computing, Minister Kono is trying to eliminate these outdated technologies to switch to using online applications. It is the Digital Ministry’s responsibility to examine and review national public service processes and procedures. The country’s Digital Agency hopes to introduce a bill revising all those regulations by 2023, while guidelines that do not require legal amendments will be revised in 2022.

Currently, this Ministry is reviewing and re-evaluating about 60,000 regulations and administrative procedures related to the regulation of data storage on floppy disks in specific processes so that they can be transferred to online storage.

At the same time, in 2021, the Japanese government implemented a cleanup of fragmented or non-standardized data to create accurate, unified, and reliable databases.

In addition, the government also outlined inter-ministerial roadmaps to plan for the coming years and build a Personal Number System called My Number, which is part of the digital tax and social security code system. With the above steps, it is hoped that the digital transformation process will be carried out more smoothly in the coming years in Japan.

4.2. Promote the development of science and technology in general

In order to promote science and technology development, in January 2016, the Japanese Government announced the “5th Science and Technology Basic Plan 2016-2020”, which proposes to build a super-smart society or “Society 5.0” capable of providing customized solutions through the application of new technologies such as artificial intelligence (AI), robots, big data and drones, etc. That idea is based on the rapid development of current information technology that allows to establish the combination of cyberspace - information with the physical space - the real world. Strengthening the connection and combination of information between Cyber-Physical System (CPS) and real world entities is expected to bring about great change to Japanese society [Phuong Ha, 2023].

According to a report by UK data analytics and consulting firm GlobalData, the “Society 5.0” initiative will boost Japan’s Internet of Things (IoT)-based information technology solutions market from

42.1 billion USD in 2021 to 60 billion USD in 2026, with a compound annual growth rate of 7.4% over the period. In particular, the manufacturing sector, related to the use of robots and automation, will account for 13.1% of the revenue of The information and communication technology (ICT) market in Japan [Phan Van Hoa, 2023].

4.3. Establishment of a digital agency to promote the country’s digital ambitions

In order to become a developed country leading in digital government, digital economy and digital society. In September 2021, Japan established a Digital Agency with the task of basically solving e-Government issues through digitizing public administrative procedures and promoting standardization and coordination of data systems; in order to focus on reforming the old and outdated governance systems of government agencies, the system has clearly shown many shortcomings and inadequacies in responding to the COVID-19 pandemic.

An important task of the Digital Agency is to solve the problems of fragmentation and overlap in public administration systems. The agency aims to drastically improve the level of data connectivity of individual government organizations, helping to increase efficiency in their services and operations. The Digital Agency also focuses on leveraging the expertise of the private sector by actively using these professionals, so that there will be a more flexible and fast approach, compared to what has been done in the past. In that way, the Digital Agency is expected to be the one that promotes two-tier e-Government (national and local) - and improves the performance of government agencies. Digital Agency is responsible for eliminating previous inefficiencies and focusing on the value of “improving people’s daily lives”, enhancing the security of data and systems, and providing a platform for collective governance efforts, the agency will speed up digitization in a user-oriented manner [Bao Thoa, 2021].

- "Currently, the Japanese Digital Agency is encouraging local governments to fully switch to government cloud computing services by fiscal 2025. A full shift to cloud computing could reduce annual IT spending by about 30%, which currently stands at about 800 billion yen (7 billion USD)", one official said.

4.4. Identify 5G technology as a key enabler for digital transformation

Japan has been promoting the development of 5G technology in industrial markets and other use cases

to positively impact its economy. According to the Yomiuri Newspaper, the Japanese government aims to increase 5G coverage nationwide, from a rate of only 16.5% by the end of fiscal 2020, rising to 98% by the end of fiscal 2023. To accomplish this goal, the Japanese government has decided to support enterprises in the development of 5G telecommunications technology in urban areas through reducing VAT by 9% in 2022, 5% in 2023 and 3% in 2024. Meanwhile, 5G telecom technology development enterprises in local areas maintained at 15% in 2022, but then decreased to 9% in 2023 and finally decreased to 3% in the same way as urban areas in 2023. Besides reducing taxes, the Japanese government will also set aside a subsidy for businesses to develop 5G technology, according to Nikkei. However, in order to qualify for tax reduction and receive subsidies, businesses must meet requirements such as having a safe and reliable development plan, ensuring a stable supply, meeting international standards. The goal of this program is to quickly disseminate domestic 5G telecommunications network towards promoting local digitalization, independent of Huawei products, ensuring cybersecurity [Long Nguyen, 2021].

- Besides continuing to promote the development of 5G technology, the Japanese Government is funding the research and development (R&D) of the next generation mobile technology (6G) in the future. Specifically, since the beginning of 2020, Japan has started to have discussions and deployments on 6G technology. In order to realize the goal of developing and commercializing 6G technology, the Japanese Government is expected to invest 50 billion yen (about 482 million USD) to promote the R&D of this new technology. With the goal that the Japanese Government will focus on developing core network technologies for 6G systems by 2025 and commercially deploying this technology by 2030 [Phan Van Hoa, 2023].

4.5. Invest resources to eliminate the digital imbalance between urban and rural areas.

At the Cabinet meeting on December 14, 2022, the Japanese Government for the first time mentioned a “comprehensive strategy to promote digital transformation” to address development imbalances between urban and rural areas.

Prime Minister Kishida’s government plans to spend 5.7 trillion yen (42.5 billion USD) on digitization programs, including building a “digital superhighway” of Japan’s submarine cable system for high-speed data transmission within three years, recruiting 250,000

new technologists each year to build an IT force of 2.3 million to accelerate digitization in Japanese society, especially in rural areas [Eicky Ho, 2022].

The above strategy and investments are mainly aimed at: “addressing the imbalanced development between large urban areas and other localities of Japan”, especially the concentration of large companies and young human resources in the Capital Region (including Tokyo and three neighboring provinces, Chiba, Kanagawa and Saitama). The policy of the comprehensive strategy is to promote digital development to increase remote working opportunities under the motto: “change accommodation but not change jobs”.

In addition, a series of preferential policies will be implemented to create maximum conditions for startups in rural areas, including: attracting diverse human resources, bringing more business opportunities in remote areas of Japan.

In June 2022, Japanese Prime Minister Fumio Kishida announced the basic contents of the “Digital Country, Urban and Rural” initiative, in order to effectively deal with the aging population, declining birth rate, overcrowding in urban areas and lack of development resources in rural areas. With the goal of: “doubling the investment in digital transformation of both the public and private sectors”, this concept is positioned as an important growth strategy and one of the pillars to promote a digital society in Japan [Pham Tuan, 2022].

4.6. Promote the revival of the semiconductor industry

- Identifying the semiconductor manufacturing industry as a spearhead, playing an important role in future technologies from artificial intelligence (AI), Japan has advocated investment to restore its leading position in this field. In fiscal year 2023, the Japanese Government will allocate 1,990 billion yen (13 billion USD) to support the promotion of the chip manufacturing industry [VTV.vn, 2023]. In addition, METI proposed an additional budget of 1.85 trillion yen for chip-related subsidies. The subsidy package is part of a broader blueprint to revive Japan’s economy.

- Regarding this issue, Japanese media reported that some funds are expected to be used to support semiconductor manufacturing company - TSMC (Taiwan Semiconductor Manufacturing Company) and chip manufacturing joint venture Rapidus. Specifically, Tokyo has decided to support half of the cost of building TSMC’s chip plant in Kumamoto

Prefecture and continue negotiations on the level of support for the company's second chip plant. Earlier this year, Nikkan Kogyo newspaper reported that TSMC plans to invest more than 1 trillion yen (6.6 billion USD) to build a second chip plant in Japan. The plant will produce high-end chips in 5 nanometer (nm) and 10 nm sizes. The Japanese government is also willing to provide about 1.5 billion USD to fund the expansion of Micron Technology's Hiroshima plant. In addition, by the end of 2022, the Japanese government said it would invest up to 70 billion yen (nearly 462 million USD) in startup Rapidus (a joint venture between Toyota, Sony and six other companies including chipmaker Kioxia, electronics and semiconductor firm Tokyo Electron, SoftBank Investment Group, automotive parts company Denso, telecommunications company NTT, information technology and electronics group NEC). Rapidus was founded to develop the next generation of high-end chips with a size of 2 nanometers. The move, along with previously announced aid of up to ¥46.5 billion, will contribute to Japan's efforts to secure a steady supply of chips [VTV.vn, 2023].

4.7. Developing high-quality human resources for digital transformation

Identifying the lack of high-level human resources with digital skills as one of the reasons for its lag in this field in recent years, investing in building a digital skills force is considered by Japan as a decisive factor for the success of the digital transformation strategy, to create success: digital society, digital economy, and digital government in the future, and to bridge the digital divide between urban and rural areas; between regions, thereby promoting the country's economic growth.

The government has encouraged universities to establish and expand training faculties in digital technology and digital transformation, and hopes that technical colleges and vocational schools will play a fundamental role to develop the digital workforce. The Ministry of Education, Culture, Sports, Science and Technology has spent 62.5 billion yen to upgrade 57 state technical colleges in the fiscal year 2022/2023. These funds will help promote the development of technology human resources. However, since there are only 57 technical colleges (both public and private), Japan needs to make effective use of the country's approximately 2,700 vocational and professional schools in training digital human resources [Hoang Ha, 2022].

Conclusion: Japan, the world's third largest economy, is grappling with half-hearted reform to find a way out of decades of stagnation. Digital

transformation is the basic solution and has an important boost to bring Japan back to the world economic superpower. To do so, the Japanese Government needs to carefully study the reasons why the country is slow to implement digital transformation, the challenges and factors affecting this process. At the same time, in the coming time, Japan needs to well implement some of the following solutions: eliminate the old technology, develop science and technology, develop 5G technology, establish a digital agency, implement a reasonable investment policy to create a digital balance between regions, focus resources on the semiconductor industry and have a reasonable policy to develop high-quality human resources for digital transformation.

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