

DEVELOPING THE DIGITAL ECONOMY IN VIETNAM IN THE CONTEXT OF INDUSTRY 4.0

Dr. Do Anh Duc

ducda@neu.edu.vn

*School of Trade and International Economics, National Economics University, Hanoi,
Vietnam*

Abstract

Digital economy is identified as one of the indispensable pillars and plays an important role in economic growth, creating a breakthrough growth for each country. In the context of Industry 4.0, which is strongly developing, the digital economy plays an increasingly important role in the economic structure of each country. Digital economic activities have developed strongly in recent years and are concerned and prioritized for development by the Government in Vietnam. This article has clarified the implications of the digital economy and the development of the digital economy in the world; evaluating the situation and trends of digital economy development in Vietnam and recommend solutions to promote digital economic development in Vietnam in the context of Industry 4.0.

Keywords: *Digital Economy, Industry 4.0, Vietnam*

1. Introduction

The digital economy is a recently-emerging phenomenon of increasing importance given estimates of double-digit annual growth around the world (WEF 2015). It is identified as one of the indispensable pillars and plays an important role in economic growth, creating a breakthrough for each country in the context of Industry 4.0. Currently, the digital economy is growing 15-25% per year in emerging markets; half of the world's population is connected online, one third is on social network, 53% is on mobile phones and is covered by all ages, races, geographies and backgrounds across the planet shows the strongly growing trend of digitizing the economy and social activities.

Industry 4.0 is having a strong impact on Vietnam, creating new opportunities for Vietnam to integrate more deeply and effectively into the world economy, move directly into the new industrial field, and take advantage of scientific advanced technology to speed up the process of industrialization and modernization of the country and narrow the development gap. In the context of Industry 4.0, which is strongly developing, the digital economy plays an increasingly important role in the economic structure of each country. Digital economy development will cause change in economic processes, systems and sectors, re-shaping existing consumer behavior, business interactions and business models (Dahlman et al. 2016). Vietnam is also not out of that trend, digital economic activities have developed strongly in recent years and are concerned and prioritized for development by the Government. According to research reports by Google and Temasek, Vietnam's digital

economy reached a scale of about \$ 3 billion in 2015, up to \$ 9 billion in 2018 and forecast to reach \$ 30 billion by 2025. Another research of Data61 Organization (Australia), Vietnam's GDP could increase by about 162 billion USD in 20 years if Vietnam successfully converts digital. On September 27, 2019, the Politburo issued Resolution No. 52-NQ/TW on a number of guidelines and policies to actively participate in the Fourth Industrial Revolution setting goals by 2025, digital economy is accounts for 20% of GDP.

This article has clarified the implications of the digital economy and the development of the digital economy in developed countries. Evaluate the current situation and trends of digital economy development in Vietnam and recommend solutions to promote digital economic development in Vietnam in the context of Industry 4.0.

2. Method

This study employs qualitative research methods that use secondary data sources. By synthesizing, analyzing, comparing, evaluating to related data and previous research outcomes, the study has clarified the implications of the digital economy and recommend solutions to promote digital economic development in Vietnam in the context of Industry 4.0 according to the goals of the article.

3. Results

3.1. Overview of digital economy.

The concept of "digital economy" has been mentioned for a long time before the Industrial Revolution 4.0. Early definitions (Tapscott 1996, Lane 1999, Mesenbourg 2001) focus specifically on the Internet while later definitions add new technologies such as mobile and sensor networks (DBCDE 2009), cloud computing and big data (G20 DETF 2016). Or they opt for the more generic notion of "digital technologies" as per the simple definitions. However, with the emergence of Industry Revolution 4.0, the digital trend or digital transformation really appears strongly in all fields, because the "core" of Industry Revolution 4.0 is digital transformation, with the integration of digitization, connection/hyperlink and intelligent data processing. According to Dahlman et al. (2016), digital technologies are spreading throughout the world at a faster pace than previous waves of technological innovation, and are re-shaping business models and sectors. Digital technology is applied in all fields and economics, from industry, agriculture to services; from production to distribution and circulation of goods to supporting infrastructure such as transportation, logistics, finance, banking, ... The digital economy is gradually becoming the economy itself. The function of digital economy also gradually coincides with the contents of the economic concept. Big data, connectivity and artificial intelligence are the buzzwords that stand for the next round of the digital revolution and underpin the concept of the digital economy.

Currently, there are many different views on the digital economy and it is not easy to define the digital economy. It is sometimes called the Internet economy, the new economy or Web economy. Cameron et al. (2019) defined a digital economy as an economy that contains all companies, services whose business is mainly related to buying, selling and supplying products, digital services or supporting infrastructure and equipment. Digital Economy Collaborative Group of Oxford said that the digital economy is "an economy

operated mainly on digital technology, especially electronic transactions conducted through the internet". The digital economy is also sometimes referred to as the internet economy, the new economy or the network economy. Bukht and Heeks (2018) summarize 21 typical definitions of digital economy, saying that the first definition of digital economy appeared since 1999 and that there are more and more new definitions. The rapid development and widespread application of the Internet of Things to business has led to the high-speed formation and development of related economic activities, leading to the diversity and richness of digital economy definitions. The definitions of digital economy also include Information and Communication technology economy with the same target of consumption or ICT application; The penetration of information and communication technologies into the innovative economy will lead to the digitization of society 9 (Abdurakhmanova et al., 2020). It is the category that difference between the definitions.

Therefore, it can be understood that the digital economy is an economy operating mainly based on digital technology, especially electronic transactions conducted through the Internet. The current transformation caused by a massive onset of digitalization includes practically all areas of the economy and social life (Basl, 2017) such as industry, agriculture, services; manufacturing, distribution, goods circulation, transportation, logistics, finance and banking ...) that digital technology applied. Digitization of all sectors of the economy will not be easy, but without digitization it will not be possible to integrate into the world economy (Bulturbayevich and Jurayevich, 2020). In essence, these are the organizational models and operating modes of the economy based on the application of digital technology. In general, digital economy includes emerging phenomena, such as block chain technology, digital platforms, social media, e-businesses, software development-related businesses, etc., digital and media content development and application, related services and training, together with enterprises involved in the manufacture and development of information and communication technology equipment.

Characteristic of the digital economy is that it can be gathered in three main interlocking processes, including: material processing; energy processing; information processing. In which, information processing plays the most important role, information in all its forms becomes digital, which reduced to bits stored in computers and racing at the speed of light across networks ... The new world of possibilities thereby created is as significant as the invention of language itself, the old paradigm on which all the physically based interactions occurred (Tapscott, 1995). The interconnection between subjects and the economic cycle base on the achievements in information technology and the Internet helps to connect resources, eliminate many intermediaries and increase opportunities to access global value chains. The digital economy is causing rapid growth and the size of the economies is also increasing, in addition, it also changes the mode of production (infrastructure, resources, operation) and the structure of the economy. From that led to new waves: digital resources, digital wealth began to be concerned; Information power is leading the trend and the strength of each country today is measured by the development of technology, human intelligence and information.

In addition, the achievements that the digital economy has brought have contributed to stable economic growth, more efficient solutions proposed by technology to help solve

problems of environmental pollution, optimized resource usage. Since the digital economy, social problems have decreased, creating opportunities for more individuals, fuelling inequality by preventing individuals, groups, regions, etc from participating in the digital economy (OECD 2015), organizations and businesses due to low cost of participation and easy access, thereby contributing to reducing the inequality gap of rich and poor, solving social problems.

3.2. Digital economy development in the world

According to Forbes (2016), the value of the world digital economic sector accounts for about 3.8% of the value of the global economy with 3,000 billion USD. In which, McKinsey data estimates that the Internet contributed more than 20% of GDP growth in developed economies during the five years to 2011 (Manyika and Roxburgh, 2011). Digitization has triggered massive structural changes across the economy and society. For ASEAN countries, this value is up to 150 billion USD, equivalent to 6% of the gross domestic product (GDP) of the member countries. The digital economy is estimated to make up around 5% of global GDP and 3% of global employment (Bukht and Heeks, 2017).

The current digital economy is developing rapidly and is reflected in the changing leadership positions of companies globally. Table 1 shows that 8 of the 10 largest companies by market cap in the world are technology companies or are directly related to technology with new digital-based business models. In recent years, industries with the number of billionaires appearing have been associated with high technology.

Table 1. List of 10 companies with the largest market capitalization in the world by the end of September 2020

Rank	Company	Year of establishment	Market capitalization (Billion USD)
1	Apple	1976	1.900
2	Saudi Aramco	1933	1.833
3	Microsoft	1975	1.500
4	Amazon	1994	1.500
5	Alphabet	2015	969
6	Alibaba	1999	729
7	Facebook	2004	711
8	Tencent Holdings	1998	637
9	Berkshire Hathaway	1839	499

10	Visa	1958	429
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(Source: Yahoo Finance)

Recognizing this trend, developed countries in the world have set up a digital platform development strategy, in which applying technology to production activities in the economy is of top priority. Many of the most developed countries in the world such as the US, the origin of the boom of information technology with many famous companies, example of information search and sharing (e.g. Google, Facebook, Twitter, Pinterest), personal services (e.g. Uber, Airbnb), entertainment online (e.g. Netflix, YouTube, iTunes), and shopping (e.g. Amazon, eBay, Alibaba such as Google, Amazon, Facebook, Apple, (Manyika et al, 2016) ... are aware of the importance of the digital economy. Russia has developed a program of "Digital economy", providing for measures to create legal, technical, organizational and financial conditions for the development of the digital economy in Russia (Lowry, 2020). European countries also have plans to "Single Digital Market", Australia has "Digital Australia", ... Countries with the following developed economies such as Korea, China also take benefit of the advantages that go behind, learning experience from previous countries, concentrating resources for digital economic development. Korea has a Manufacturing Industry Innovation 3.0 strategy that helps small and medium-sized businesses build smart, optimal manufacturing processes. China in the 10 key areas of the "Made in China 2025" initiative has prioritized two main areas: information technology development, digital tools and robotics.

The digital economy development strategies are expected to increase the GDP of ASEAN countries by about 1.000 billion USD over the next 10 years. This issue has received the attention of many countries in the region. Specifically, Thailand has established the Ministry of Social and Digital Economy and Malaysia has set a target for the value of the digital economy to account for 17% of the country's economy, Singapore uses the slogan "Smart Nation" that taking technology as the core, ...

3.3. Digital economy in Vietnam

In recent years, Vietnam's digital economy has developed rapidly and strongly in both business market and infrastructure. With a population of nearly 100 million people, Vietnam is considered as a country with a fairly good digital economic growth rate in the ASEAN region. Vietnam has recorded the emergence of digitalization in many fields, economic sectors, from commerce, payment to transportation, education, health ... Up to now, Vietnam has about 64 million internet users, Vietnamese people on average spend 3 hours and 12 minutes per day using the internet on mobile devices such as smartphones and according to the regional average, the usage focuses on social networking and streaming communications applications (52%), video apps (20%) and games (11%), with other business apps.

Table 2. Economic development target of Vietnam by 2030

Year	GDP account for	Digital economy forms of each sector	Annual productivity	ICT Development Index (IDI)	Global Competitiveness Index (GCI)	Global Innovation Index (GII)
To year 2025	20%	10%	7%	Ranked in the top 50	Ranked in the top 50	Ranked in the top 35
To year 2030	30%	20%	8%	Ranked in the top 30	Ranked in the top 30	Ranked in the top 30

(Source: Decision 749/QĐ-TTg by 3/6/2020)

In September 2019, Resolution No. 52-NQ/TW expected the target of Vietnam's digital economy to be 20% of GDP, issued by the Politburo. On June 3, 2020, the Prime Minister issued Decision No. 749/QĐ-TTg approving the "National Digital Transformation Program to 2025, with an orientation toward 2030" with the goal that Vietnam belongs to group of 50 leading country in e-government, related to digital economic development, enhancing the competitiveness of the economy, the target by 2025 is digital economy accounting for 20% of GDP; the digital economy forms in each sector reaches at least 10%; by 2030, the digital economy will account for 30% of GDP; the digital economy forms in each sector reaches at least 20% (Table 2).

Vietnam has identified the goal of the digital economy to create digital-based business models based on all economic activities and digital economic development using digital technologies and data. Digital technologies create the right technical conditions for a series of new business models that can fundamentally alter the structure and competitive situation of existing markets and put old business models under pressure (Hungerland et al., 2015). Along with the development of the digital economy, organizations will shift to an eco-business model instead of the traditional business model, which means there is a link between production and application, from there contribute to improving productivity as well as labor efficiency. Enterprises in the digital economy will renew their production processes and use ecosystem models instead of traditional business models, linking production, commerce to consumption, and application of regulations process and use digital technology, thereby, increasing labor productivity and efficiency.

In recent years, Vietnam has always been looking for new momentum for growth and has proactively seized opportunities from digital in general and e-commerce in particular for economic growth. The policy system on digital economic development has been completed in the direction of creating favorable conditions for organizations and enterprises. The government and the state economic sector are the driving force behind digital economic development. During the transition to the digital economy, labor relations will change such as cooperation relationships, employer-employee relationship. In addition, employees will have improved skills, contributing to change and build Vietnam's digital economy. In many,

especially rural areas of developing countries, 4G and even 3G are still inaccessible (Okeleke and Stryjak, 2015). Thereby, Vietnam's digital economy is still on the rise and contributes a large part to economic growth and structural change, helping to promote the development of science, technology and technology. In addition, Vietnam is also one of the first countries to deploy 5G early in the world. 5G network is the driving force for digital economic development in 2020, Vietnam has become the fifth country to master 5G technology, produce 5G phones and infrastructure equipment, which helps Vietnam catch up with the trend and keeping up with leading countries such as the United States, Korea, ...

4. Discussion and Conclusion

In the context of Industry 4.0, the digital economy is strongly developing and contributing to the economic development of many countries around the world such as the US, South Korea, China, ... Digital economy is considered to be an important goal for Vietnam in many coming years, contributing to the strong development of society, opening up opportunities to catch up for developing countries, including Vietnam. Alongside these opportunities, though, are various challenges, for example due to low levels of digital skill and technology penetration both within and between countries (Dahlman et al., 2016), lack of resources, capabilities, institutions, relations (Murphy and Carmody, 2015); specific volatility of developing country digital enterprises (Foster and Heeks, 2010). Therefore, to develop the digital economy, Vietnam needs to focus on the following solutions:

romote propaganda to raise awareness of the whole society about digital economy and development of Vietnam's digital economy: The fastest way to accelerate the digital economy is to use digital technology to change the way we produce and work. Using digital technology to solve Vietnamese problems, and from the cradle of Vietnam, these technology businesses will go global. Technology is born to solve problems, where there is a problem, there is technology, there is a solution. Problems are everywhere, it may in our daily work, and each of us can start a technology start-up to solve our problems. Therefore, the State needs to promote propaganda to raise awareness of the whole society about the digital economy. The press and media agencies need to guide the public opinion, help businesses, people and the whole society to have a correct awareness of the digital economy, thereby best preparing for the adaptation of this development trend. It is necessary to make society realize that Government, businesses and people all have separate responsibilities and roles in the digital economy. Enterprises need to actively prepare to seize opportunities and ensure international competitiveness in the global digital economy, must be ready for a digital future with new forms of business, must investing in technology infrastructure, human resources and ensuring network safety and security. Individuals also play an important role in the digital economy. Each individual needs to equip and improve their skills to use digital technology for future jobs, and must protect themselves against the dangers of being threatened or stealing personal information online.

Policies are often outdated that lead to unable to accommodate the emerging trends of new technologies and services offered through the digital economy (Van Welsum, 2016; Bukht and Heeks, 2018). Therefore, building and completing the institution to create a complete and comprehensive legal basis for the implementation and development of e-

Government,: The State needs to soon promulgate Decrees on data sharing; on personal data protection; about electronic authentication; on personal data protection and privacy protection; on reporting regime among state administrative agencies. In the coming time, it is necessary to study and propose the development of an e-Government Law and guiding documents to ensure the legal corridor for e-Government development based on open data and the application of new technologies towards the digital economy, digital society.

Completion of digital national databases: The State needs to focus on perfecting the construction of national fundamental databases, especially the digital national database on population, land ... And to ensure effective use of these national databases, it is necessary to build a platform for integrating and sharing data between central and local information systems; the interconnection system sends and receives electronic documents; electronic identity authentication system; linkage between the government's specialized digital signature authentication systems and public digital signatures; National payment gateway ... to ensure uninterrupted data and information among governments at all levels. To serve the management and administration of the Government, in the coming time, paperless Government Information Systems; Electronic system of policy consultation; The national reporting information system towards the construction of the Steering and Operation Center of the Government and the Prime Minister is being focused on research and establishment.

Investing in upgrading digital infrastructure, IT resources as well as modern digital technology solutions. According to Quinones et al., 2015 and Damarillo, 2011, infrastructural weaknesses are identified as a major barrier to digital entrepreneurship in the global South: The State needs to invest in upgrading the digital infrastructure system as well as modern digital technology solutions to deploy smart connection digital applications. Especially non-cash payment applications, effective e-government... The government needs to take the lead in applying information technology to management activities, formulating and publicizing the sectorial master plan on information technology development and application. On that basis, will issue standards for information exchange between agencies and units to create linkages and synchronization in the process. Along with building and developing modern telecommunications infrastructure, becoming a the foundation of the digital economy, it is necessary to focus on ensuring network safety and security, creating conditions for people and businesses to easily and equally access opportunities to develop digital content. Ensuring safety and network security will help Vietnam gain the trust of foreign partners, a safe environment for business investment, and also an opportunity for us to develop products serves network security.

Forming a team of senior digital economic experts: In the context of low economic level, Vietnam lacks senior digital economic experts who have sufficient knowledge and skills in many fields (science, technology, economy, management, society, etc.), to shape the development of the digital economy at national level. The government should form senior experts in relevant fields (science, technology, economy, management, society, etc.) to participate in the development of a digital economy plan. A plan that is tested in practice will create a premise for building a long-term national digital economy strategy.

5. References

1. Abdurakhmanova, G., Shayusupova, N., Irmatova, A., and Rustamov, D. (2020). The role of the digital economy in the development of the human capital market. *International Journal of Psychological Rehabilitation*, 24(7), 8043-8051.
2. Basl, J. (2017). Penetration of Industry 4.0 Principles into ERP Vendors' Products and Services – A Central European Study. Proceedings of the International Conference on Research and Practical Issues of Enterprise Information Systems.
3. Bukht, R., and Heeks, R. (2017). Defining, conceptualising and measuring the digital economy. *Development Informatics working paper*, (68).
4. Bukht, R., and Heeks, R. (2018). Development implications of digital economies. Manchester: University of Manchester.
5. Bulturbayevich, M. B., and Jurayevich, M. B. (2020). The Impact Of The Digital Economy On Economic Growth. *International Journal of Business, Law, and Education*, 1(1), 4-7.
6. Cameron, A., Pham, T.H., Atherton, J., Nguyen, D.H., Nguyen, T.P., Tran, S.T., Nguyen, T.N, Trinh, H.Y., Hajkowicz, S. (2019). Future of Vietnamese digital economy towards 2030 and 2045. CRISO, Brisbane
7. Carlsson, B. (2004). The Digital Economy: what is new and what is not?. *Structural change and economic dynamics*, 15(3), 245-264.
8. Dahlman, C., Mealy, S. and Wermelinger, M., 2016. Harnessing the Digital Economy for Developing Countries, OECD, Paris.
9. Dahlman, C., Mealy, S., and Wermelinger, M. (2016). Harnessing the digital economy for developing countries.
10. Damarillo, W. (2011). How Cloud Computing Can Boost Developing Nations. *Forbes*, 3 Nov.
11. DBCDE, 2009. Australia's Digital Economy: Future Directions, Department of Broadband, Communications and the Digital Economy, Canberra.
12. Do, A. D. (2020). Innovation in Vietnam in the context of Industry 4.0. *Economy and Management Review*, 33, 57–60.
13. Foster, C. and Heeks, R. 2010. Researching ICT micro-enterprise in developing countries, *The Electronic Journal of Information Systems in Developing Countries*, 43(7), 1-20.
14. G20 DETF, 2016. G20 Digital Economy Development and Cooperation Initiative, G20 Digital Economy Task Force.
15. Google Temasek, "e-economy SEA: Unlocking the \$200 billion digital opportunity in Southeast Asia," May 2016; McKinsey and Company, "Unlocking Indonesia's digital opportunity," September 2016; Onno W. Purbo, "Narrowing the digital

divide,” in Edwin Jurriëns, Ross Tapsell (eds.), *Digital Indonesia: Connectivity and Divergence*, Singapore: ISEAS – Yusof Ishak Institute, 2017.

16. Hungerland, F., Quitzau, J., Zuber, C., Ehrlich, L., Growitsch, C., Rische, M. C., ... and Haß, H. J. (2015). *The digital economy* (No. 21e). Strategy 2030-Wealth and Life in the Next Generation.

17. Lane, N. (1999). Advancing the digital economy into the 21st century. *Information Systems Frontiers*, 1(3), 317-320.

18. Lowry, A. (2020). Russia’s Digital Economy Program: An Effective Strategy for Digital Transformation?. In *The Palgrave Handbook of Digital Russia Studies* (pp. 53-75). Palgrave Macmillan, Cham.

19. Manyika, J. and Roxburgh, C., 2011. *The Great Transformer: The Impact of the Internet on Economic Growth and Prosperity*, McKinsey Global Institute, New York, NY.

20. Manyika, J., Lund, S., Bughin, J., Woetzel, J. R., Stamenov, K., and Dhingra, D. (2016). *Digital globalization: The new era of global flows* (Vol. 4). San Francisco, CA: McKinsey Global Institute.

21. Mesenbourg, T. L. (2001). Measuring the digital economy. *US Bureau of the Census*, (1).

22. Murphy, J.T. and Carmody, P. 2015. *Africa’s Information Revolution*, John Wiley, Chichester, UK

23. OECD. (2015). *In It Together: Why Less Inequality Benefits All*. OECD, Paris.

24. Okeleke, K., and Stryjak, J. (2015). *Building Digital Societies in Asia*. *GSM Association*.

25. Quinones, G., Nicholson, B., and Heeks, R. (2015). A literature review of Entrepreneurship in emerging economies: Positioning research on Latin American digital startups. *Entrepreneurship in BRICS*, 179-208.

26. Tapscott, D. (1996). *The digital economy: Promise and peril in the age of networked intelligence* (Vol. 1). New York: McGraw-Hill.

27. Van Welsum, D. (2016). Sharing is caring? Not quite. Some observations about ‘the sharing economy’. *World Development Report Background Papers*.

28. WEF, 2015. *Expanding Participation and Boosting Growth: The Infrastructure Needs of the Digital Economy*, World Economic Forum, Geneva.