viettonkin consulting

THE DIGITAL ECONOMY:

# Future Driver for Vietnam Economic Growth

# table of contents

# Executive summary

The digital economy of Vietnam has been fueled and accelerated by the global digital trends and the pandemic Covid-19. The movement of digital transformation is underway in every corner of Vietnamese life, strongly influencing the way people do things.

Digital economy is the future of the Vietnam economy. Realizing the potential of the digital economy, the Vietnam government has issued policies, guidelines and created legal frameworks to support and further enhance this economy. In this ebook edition, the digital economy is looked at from different angles. Perspectives from the key elements comprising Vietnam digital economy are examined and discovered.

This ebook is structured as follow

1. Overview of Vietnam digital economy
2. Key components creating the digital economy of Vietnam
3. Rising Opportunities for investors in developing Vietnam's digital economy


自助服務
SELF-SERVICE

# 01.

# OVERVIEW ABOUT DIGITAL ECONOMY IN VIETNAM

Bukht & Heeks (2017) offer a comprehensive definition of the digital economy as "that part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services".

In Vietnam, the digital economy is defined by Decision No. 411/QD-TTG issued by the Prime Minister as an economic activity that uses digital technology and digital data as key resources, the digital environment as the primary operating space, and information and telecommunications technology to boost labor productivity, renew business model innovation, and optimize the economic structure.

According to the Ministry of Information and Communication (MIC), the digital economy comprises 3 key components.

1. The core of the digital economy is the ICT digital economy. This refers to the production of hardware and software, along with digital content production. The ICT digital economy also includes information technology and telecommunication services, with internet access services. In 2020, the digital economy of Vietnam was estimated to reach US$163 billion, accounting for 8.2% of GDP. The ICT digital economy contributed US$126 billion USD, making up 5.5% of GDP.

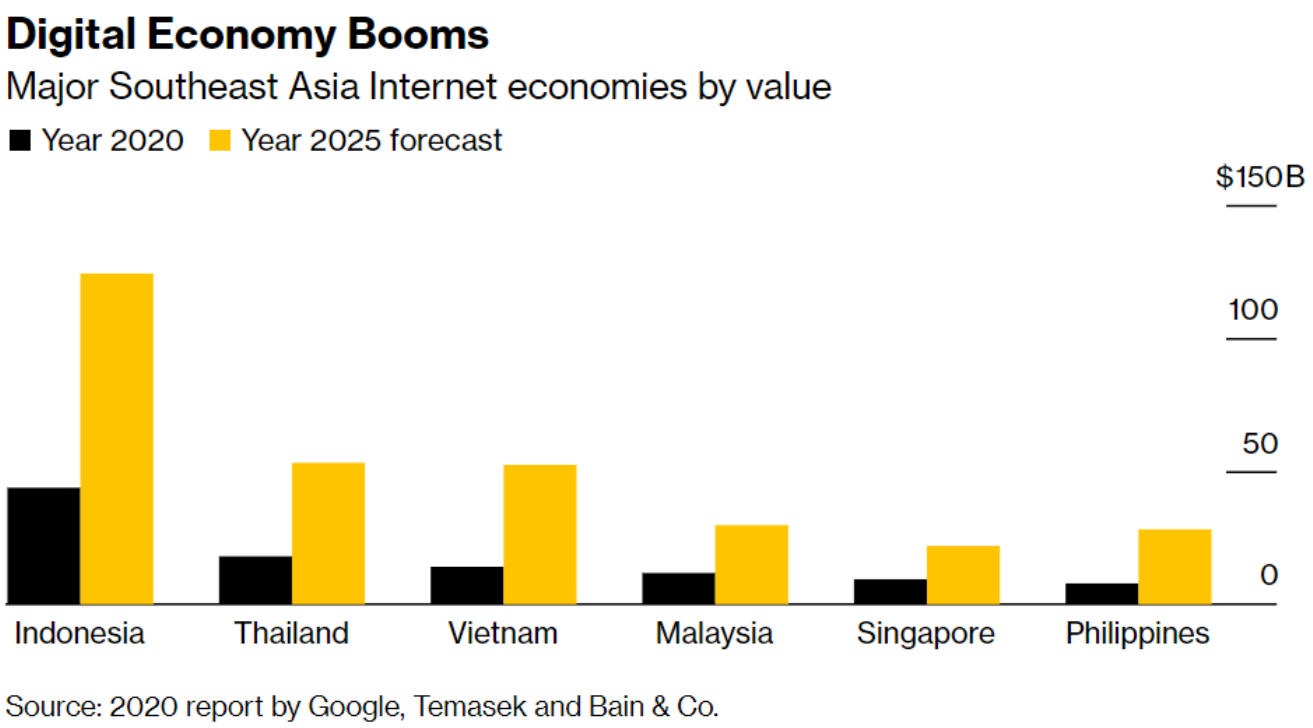



*Figure 1: Internet digital Economy forecast*
*(Source: Bloomberg based on 2020 report by Google, Temasek and Bain & Co)*

2. In narrow scope, the Internet/ platform digital economy is made up of the digital data economy, digital platform economy, digital services, digital business, sharing economy, algorithmic economy, Internet economy, and Gig economy. In 2020, out of US$163 billion in Vietnam digital economy value, the Internet/ platform digital economy generated US$14 billion. with 1% of GDP. As of "e-Conomy SEA" by Google, Bain and Temasek 2020, Vietnam Internet digital economy secured at the 3rd place in the whole region, being the country of the fastest growth rate in this sector with 16%. It is followed by Indonesia (11%) and Thailand (7%).
3. Meanwhile, the industrial/ sectoral digital economy of Vietnam in 2020 stood at US$23 billion. The industrial/sectoral digital economy belongs to a broad scope of digital economy, including e-governance, e-commerce, e-banking, smart manufacturing, precision agriculture, and smart tourism

In 2018, a report by Google and Temasek referred to the digital economy of Vietnam as a "dragon being unleashed." One year later, the same report concluded that Vietnam and Indonesia

are leading the digital economy growth of the Southeast Asian region.

Indeed, Vietnam is showing rapid expansion at a CAGR of more than 30% in the period 2015-2021. According to the 2021 update of this report, Vietnam's digital economy is valued at US$21 billion in 2021, up 31% from 2020 and accounting for 16% of total GDP.

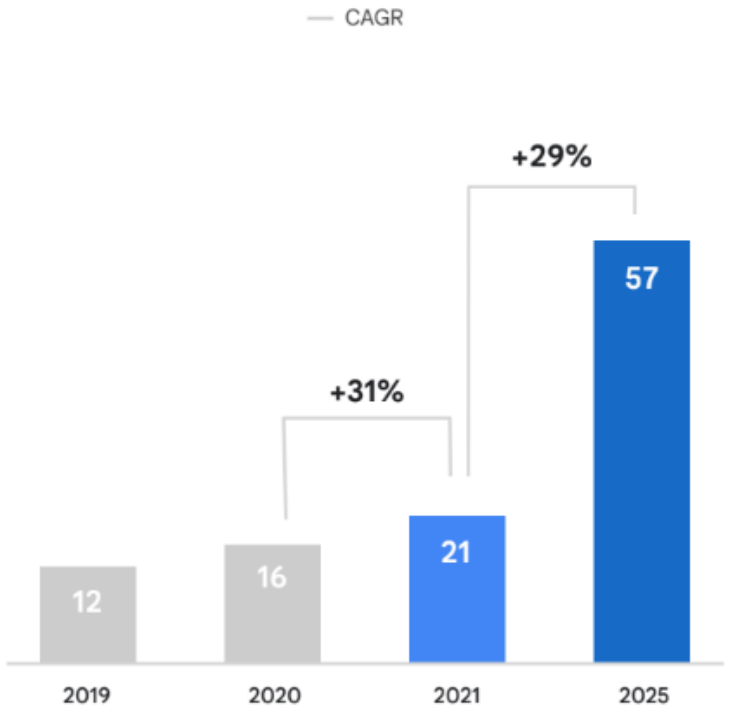



*Figure 2: The CAGR of digital economy of Vietnam in billion USD (Source: Google, Temasek and Bain & Co)*

The Ministry of Information and Communications (MIC) stated that at the current pace, the value of Vietnam's digital economy might reach USD 57 billion , accounting for 25-30% of GDP in 2025.

Despite being spontaneous, the development of Vietnam's digital economy has been rapid and promising compared to regional counterparts. This can be attributed to quite developed and advanced telecommunications - IT infrastructure with wide coverage and high user density. Also, Vietnam has a large tech-savvy young population that can adapt quickly to change and especially to technology.

**VIETNAM JAN 2020**

Total Population
**96.90 M**

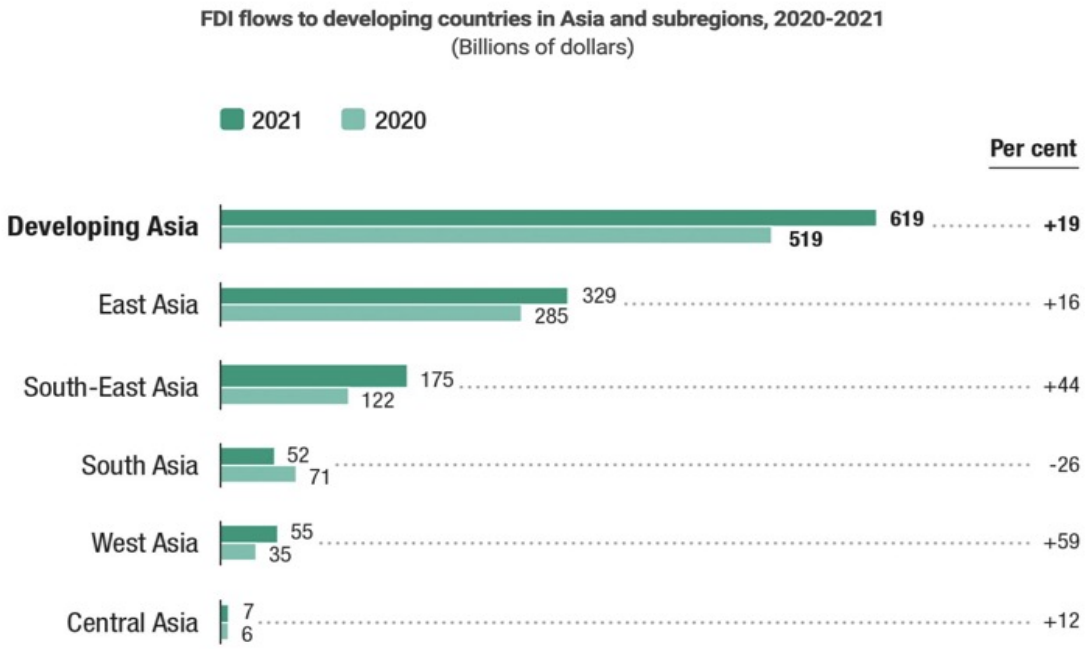
Mobile Phone Connections
**145.8 M**

Internet Users
**68.17 M**

Active Social Media Users
**65 M**

At the same time, Vietnam also has great advantages to develop the digital economy and make a breakthrough in the coming time. Vietnam's market is large with a lot of potential for new business models. Covered by a large, young and dynamic population (3rd in Southeast Asia), Vietnam possesses a large workforce in the period of a golden population structure. Further, the number of smartphone and Internet users is increasing, creating attractive markets for the digital economy.

Located in the heart of Southeast Asia, Vietnam has inherited the strong regional movement of digital technology development and benefited from the growing investment capital flows. Covid 19 is a global disaster, but with good control of the epidemic, this is also a boost for digital transformation and digital economy development.




Source: UNCTAD World Investment Report 2022

# 02.

# KEY STAKEHOLDERS CREATING THE DIGITAL ECONOMY IN VIETNAM

## 1. THE PUBLIC SECTOR

The government has paid attention to and decided to prioritize digital economic activities, which have been on the rise in recent years. On March 31, 2022, the Prime Minister issued Decision No. 411/QD-TTg, authorizing the National Strategy to Develop the Digital Economy and Society through 2025, with a vision towards 2030. The execution and promotion of the National Strategy are assigned to the MIC.

At the Global Trade in Services Summit 2021, Prime Minister Pham Minh Chinh set out five directions for developing the digital economy, including:

- Narrowing the development gap between Vietnam and other countries, decreasing social inequality.
- Further strengthening the role of international agreements in collaboration on digital technology and the digital economy.
- Ensuring cybersecurity, privacy, anti-monopoly, and erasing inequality in tax liabilities.
- Focusing on cooperation in education, human resources training in science and technology.
- Emphasizing the importance of digital technology under the Covid-19 pandemic.
- Strengthening cross-border e-commerce.

In addition to such directives, the government has established broad policies as well as particular projects to help Vietnam's digital economy grow. The Government's National Digital Transformation Program to 2025, with a vision towards 2030, outlines the fundamental development goals for digital government, digital society, and digital economy in the national plan.

## 1.1. Future goals of Government in Vietnam digital economy

Before the specific regulations of the Vietnamese government on the vision and missions to develop the digital economy, on September 27, 2019, the Politburo issued Resolution No. 52-NQ/TW to enhance the Fourth Industrial Revolution across the whole country, with the overall goal:

**"Effectively taking advantage of opportunities from the Fourth Industrial Revolution to promote the process of innovating the growth model, restructuring the economy in association with the implementation of strategic national modernization; strongly developing the digital economy, ..."**

The Resolution has created a strong foundation for the industries towards the movement of the 4IR. Hence, on April 17, 2020, the Government issued Resolution No. 50/NQ-CP on the Government's Action Program to implement Resolution No. 52-NQ/TW. The Resolution also emphasized on the development of the digital economy and digital society. At the same time, the Prime Minister issued Decision No. 749/QD-TTg approving the "National Digital Transformation Program to 2025, with a vision to 2030" with the goal that Vietnam is in the group of 50 leading countries in e-Government (EGDI).

Following the Decision 411 , the Vietnamese government's future goal is to develop a digital economy through:

- Developing the ICT digital economy with a focus on "Make in Vietnam" businesses and digital technology products, in tandem with selective FDI attraction, and increasing export content.
- Developing the industry's digital economy with a focus on prioritizing the use of shared and unified digital platforms across all industries and fields.

The driving force behind the development of the digital economy in all sectors and industries is a strong growing foundation with a focus on national digital platforms, which starts with the rapid adoption and support of the Government.

The future goals are further specified under the Decision:

| Overall goals by 2025 | Overall goals 2030 |
|---|---|
| **The proportion of the digital economy reaches 20% of GDP;** | **The proportion of the digital economy reaches 30% of GDP;** |
| **The proportion of the digital economy in each industry or field is at least 10%;** | **The proportion of the digital economy in each industry or field shall be at least 20%;** |
| **Over 10% of all retail sales were made through e-commerce;** | **Over 20% of all retail sales were made through e-commerce;** |
| **Over 2% of workers in the labor force are employed in the digital economy.** | **Over 3% of workers in the labor force are employed in the digital economy.** |

According to the Minister of Information and Communication (MIC) - Mr. Nguyen Manh Hung, this second economy has fueled Vietnam economic industries to further improve and develop. In the past 2 years, the Vietnamese government has successfully initiated and encouraged a powerful wave of digital transformation.

This year, Mr. Nguyen Manh Hung places emphasis on the wide adoption of digital platforms and applications. He encourages Vietnamese to familiarize themselves with the digital environment, and expects the number of digital users to grow at least 50% by year end 2022. To meet this goal, the government has approved and issued several specific policies and guidelines for Vietnamese people and the business communities.


Keppel
SUNWAH

## 1.2. Developing infrastructure for digital economy

### 1.2.1. E-Government

In 2014, the Politburo issued Resolution No. 36-NQ / TW on e-government. The goal of the Resolution is to build an e-Government in the direction of openness, transparency, and improving the quality and efficiency of state agencies. The process of implementing the Resolution has also built a number of national databases to serve as the foundation for e-government development.

In particular, the Prime Minister issued Decision No. 714/QD-TTg in 2015 which listed the six prioritized national databases for deployment, in an effort to create an e-government development platform, including National Database on Population, National Land Database, National Database on Business Registration, National Database on General Statistics of Population, National Database on Finance, National Insurance Database. Prime Minister Pham Minh Chinh strongly emphasized the importance of such national databases as the foundation of the digital economy and strengthened data privacy and cybersecurity on both citizen and government levels. Since then, the Government has built and implemented several of these databases.

### 1.2.2.Central Bank Digital Currency (CBDC) - A suitable orientation for Vietnamese virtual currencies

The State Bank is still concerned that the emergence of Crypto will impair the State Bank's capacity to monitor interest rates through monetary policy. Therefore, in the short term, business models involving crypto trading will be difficult to be formally recognized in Vietnam.

Digital currencies are frequently issued by many nations, such as those in the EU, to gradually replace traditional banknotes. Instead of coins dug up online, the state will create its legal currency in digital form.

According to Associate Professor Dr. Dinh Trong Thinh, senior lecturer at the Academy of Finance, the Vietnamese Government will pilot and issue an electronic VND (e-VND), which will be a new type of currency and not related to current circulating virtual currencies.


The value of this currency will be adjusted and decided by the Government, not dependent on market fluctuations like cryptocurrencies.

Digital money will bring more benefits and features than traditional banknotes, like reducing the cost of issuance, printing, transportation, inventory, and storage. CBDC also enhances both individuals' and organizations' access to financial services, thereby contributing to comprehensive financial promotion. In addition, digital currencies help better control fake money and other violations such as money laundering and terrorism funding.

### 1.2.3. Non-cash payments

The basic legal foundation for non-cash payments in Vietnam is Decree No. 101/2012 / ND-CP dated November 22, 2012. 4 years later, the Prime Minister issued Decision No. 2545/QD-TTg approving the Project to develop non-cash payments in Vietnam for the period 2016-2020.

Decree 101 and Decision 2545 has brought many positive changes to the payment activities since their first implementation. They are one of the most prominent legal documents to promote the transformation and development of cashless payments.

Recently, Draft Decree replacing Decree 101/2012/ND-CP on

non-cash payments has been developed by the State Bank in accordance with the Directive No. 22/CT-TTg of the Prime Minister. The Draft introduced for the first time the concept of electronic money, correspondent banking, as a legal basis for comprehensive digital banking development.

Along the way in promoting the use of non-cash payments, the government strongly emphasized the deployment of mobile money in particular. In this way, Vietnam has launched a mobile money service (MMS) pilot program since March 2021. In November 2021, the State Bank of Vietnam officially licensed three carriers, VNPT, Mobifone and Viettel, to pilot MMS.

The Government has built mechanisms to manage and supervise the deployment of MMS, which demonstrates their substantial investment. The objective of the Vietnamese government in developing MMS aims towards unbanked users in remote areas. In this way, the government can educate distant residents on digital payment, digital finance and direct them towards digital economy and digital society. This objective aligns with the aforementioned goal of the MIC in 2022.

*On "Promoting the development of Mobile Money in Vietnam Conference 2022", Mr. Le Anh Dung - Deputy Director of Payment Department of the State Bank informed that as of March 2022, the total number of customers registered and used Mobile Money service was over 1,1 million.*

Meanwhile, the number of mobile money registration and use in remote area namely rural, mountainous, coastal and island regions, reached nearly 660,000. This figure is equivalent to 60% of the total number of current customers. At the same time, more than 3,000 business points were established, of which those in rural, remote, border and island areas accounted for about 30%.

Additionally, over 12,800 units accepted the payment method through Mobile Money. In this way, the total number of transactions by Mobile Money service has reached more than 8.5 million with a total value of more than 370 billion VND.

Further, the government put direct focus on investment in infrastructure and technology for non-cash payment. Many new and modern technologies are applied in payment such as fingerprint authentication, facial recognition, and QR codes. However, the proportion of people using cash in payment is still high compared to the set target.

## 1.3. Ensuring cyber security for digital economy development

Information security and cybersecurity are regulated by two Laws. The Law on Cyber Information Security provides regulations for activities of cyberinformation security, rights and responsibilities of agencies, organizations and individuals in ensuring information security.

Meanwhile, the Law on Cyber Security provides for the protection of national security and assurance of social order and safety in cyberspace, along with the responsibility of the institution related agencies, organizations and individuals.

***According to Dr. Nguyen Thanh Phuc - Director of the Information Security Department - MIC, the efforts of the Government and related state agencies on the national legal framework of information and cyber security have improved the standing of Vietnam in international information security rankings.***

Specifically, in 2019, Vietnam ranked 50 out of 175 countries in Global Cybersecurity Index (GCI) by International Telecommunication Union (ITU). Last year, the country climbed to 25th. Thus, the Government has set a promising goal for Vietnam to maintain 20-30th ranking in global information and cyber security

At the same time, Vietnam has defined strategic objectives in information security. In particular, at the country level, 2-3 R&D centers in information security will be established. Meanwhile, 100% of ministries, branches and localities ensure information security in 4 layers. Each agency, organization and enterprise has at least one specialized department in information security protection. And, 90% of internet users are able to access personal information protection skills. Commenting on those strategic objectives, Dr. Nguyen Thanh expressed that this will be a great pressure and challenge for Vietnam's information and cyber security industry.

Therefore, Vietnam thoroughly researches and tests new methods of information and cyber security.

In terms of personal data protection, the Ministry of Public Security has completed the draft document to request the formulation of a Decree on personal data protection. The Ministry of Public Security is collecting comments from agencies, organizations and individuals to ensure the legal framework for personal data protection and ensure the operation of e-Government.

# 2. THE STARTUP ECOSYSTEM

On May 18, 2016, the Prime Minister authorized National Project 844, ushering in a new era in the growth of Vietnam's innovation startup sector.

Project 844 has focused on capacity building, general awareness, startup culture transfer, and campaigning for associated legislation to be implemented between 2016 and 2021. One of its major achievements is the successful construction of the National Innovation Startup Portal providing information on latest technology, patents, intellectual property assets, law, human resources, and investment resources from domestic and foreign investors and organizations. In 2020, Vietnam is honored to be ranked 42nd out of a total of 131 countries in the Global Innovation Index.

Furthermore, the annual national event TECHFEST hosted by the Ministry of Science and Technology (MOST) also significantly contributes to building a startup network in Vietnam, as well as bringing the spirit of Vietnamese entrepreneurship to international friends. In 2021, TECHFEST announced Vietnam's startup ecosystem map with 5 central stakeholders as follows:


*Vietnam 2021 Map for National Innovative Startup Ecosystem*
*Source: TECHFEST 2021*

Those startup ecosystem's contributors offer a variety of support programs and services based on **5 thematic pillars of assessing SME support policy: responsive government, entrepreneurial human capital, access to finance, access to markets, and innovative business support.**

In terms of public providers, MOST is the main entity responsible for 2 major incentives in providing innovation support and developing start-up ecosystems including Project 844 and the National Technology Innovation Programme (NTIP) (Decision No. 667/QD-TTg dated 10 May 2011). It is a major innovation program aiming to boost innovation through the application of science and technology which focuses on research and development (R&D), product testing, training and hiring of experts in product design. Public organizations and startup hubs namely Saigon Innovation Hub (SIHUB), National Innovation Center Vietnam (NIC), National Association of Entrepreneurship, and universities-based incubators such as BK Holdings and FTU Incubation and Incubation Space, also provide support of facilities and technologies for startups to grow and launch their ideas. 2021 statistics also reported approximately 40 business incubators and accelerators with technology-centric support units such as Business Incubators at Hoa Lac high-tech comlex, Ho Chi Minh City Hitech Business Incubator, Da Nang incubation, SongHan Incubator, Block 71 Saigon and especially those established by major corporations such as Becamex Innovate, Viettel Innovation Lab, etc. These organizations provide a wide range of support services focusing on capital schemes, skills development or knowledge transfer, technology patenting and licensing for researchers, collaboration and matchmaking instruments.

The application of 4.0 technology is also brought to the forefront in building an innovative startup ecosystem in Vietnam. The government has issued the nation-wide Technology Commercialization Project which focuses on selecting and supporting the commercialization

of potential research and experiments. The result has led to a new generation of innovative start-up businesses with new models and solutions to apply 4.0 technology in many fields, such as: Abivin (solution to optimize supply chain operation), Nami (rental housing management software), Ekid (AI-powered interactive learning platform for children), Medlink (solution to connect pharmacies), etc.

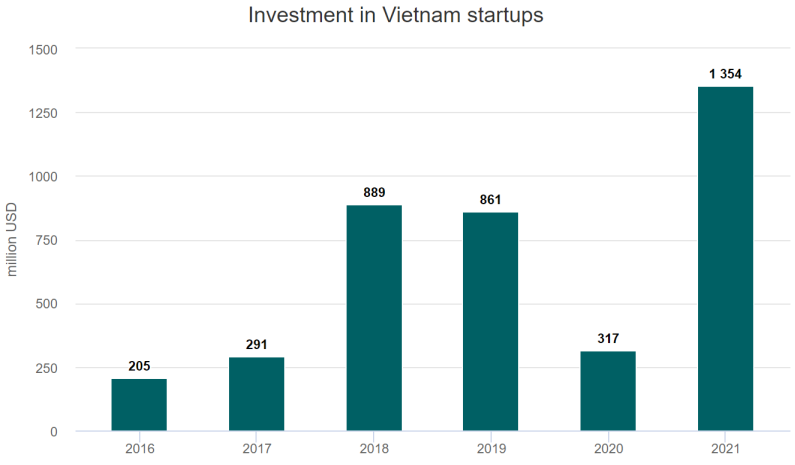
Recently, the Government issued Decree No. 80/2021/ND-CP detailing and guiding articles of the Law on Supporting Small and Medium Enterprises. Innovative start-up small and medium-sized businesses are supported with several costs and levies, according to Article 22 of the Decree.

Following the Decree, Vietnamese businesses will be supported up to 50 percent of the cost of renting space at incubators and co-working spaces, but not more than 5 million VND/month/enterprise.

The support policies and other guidelines from the Government have brought about positive impacts on business communities in startup and innovation. Director of the National Agency for Technology Entrepreneurship and Commercialization Development under the Ministry of Science and Technology - Mr.Pham Hong Quat stressed that the growing number of startups has played a part in promoting the digital economy in Vietnam.

The "Emerging Giants in Asia-Pacific 2022" report by HSBC and KPMG **has identified Vietnam as one of the nations with the most young and dynamic startup ecosystem in Asia.**

In the movement towards digital adoption, accelerated by digital transformation trends and Covid-19, Vietnam has recorded the emergence of two new unicorns, namely MoMo and Sky Mavis, in 2021. Their success magnifies the country's growing status as a rising tech hub in the region. The future looks promising for the Vietnam tech scene as a dozen of companies with valuations of over a few hundred million dollars are in the wings to become unicorns in the coming years (Do Ventures and NIC, 2021) According to the startup statistics portal Tracxn, at the time of the Covid-19 outbreak, Vietnam had just 1,600 startups , but by now this number has already risen to 3,800 startups, 11 of which are valued at over $100 million, along with 200 venture capitals (VCs) and 100 startup incubators.

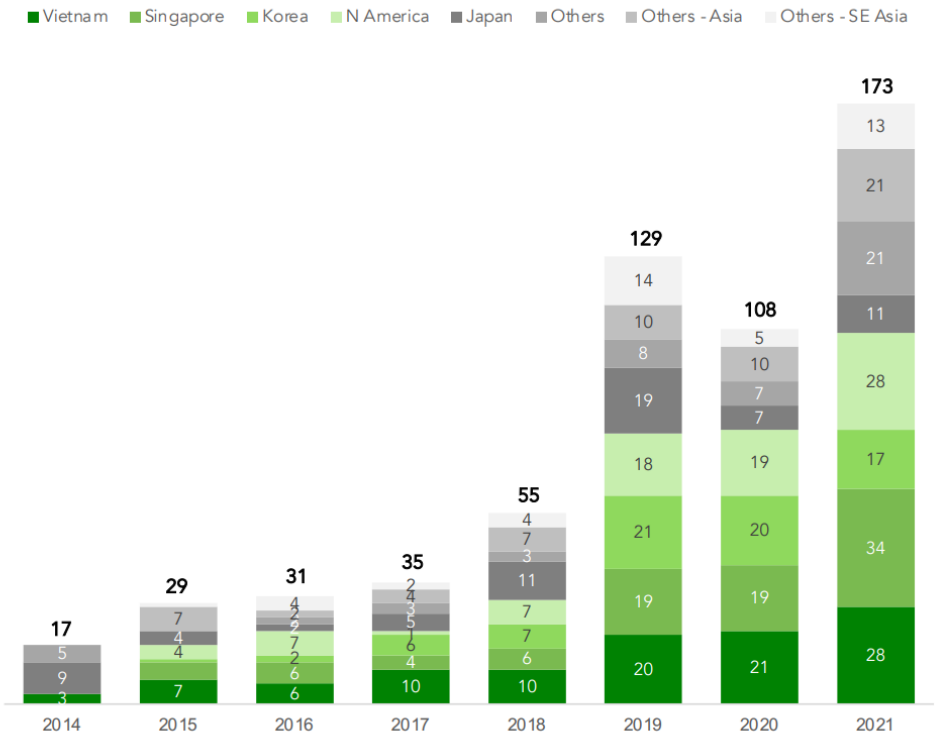



Before 2015, the VC market in Vietnam was in a severely under-developed state, being one of the smallest markets in Asia, as noted by Klingler-Vidra (2014). This was often attributed to an inadequate regulatory framework at that point, as well as the State's preference of credit financing over equity financing, which is partially due to ODA donors of Vietnam not having recommended VC financing to Vietnamese policymakers. It is worth noting that the first stock exchange in Vietnam was only established in 2000, thus the lack of IPOs in the early 2000s also correlated to insufficient flows of VC funding flowing into the market.

However, things have changed drastically since 2016 after the launch of National Project 844. The graph below shows a remarkable proliferation of investment deals being made into the Vietnamese market during the period from 2016 - now, with two significant spikes in 2018 and 2021.

Despite difficulties in due diligence and face-to-face meetings caused by Covid-19, in 2021, Vietnamese startups attracted a record-high $1.3 billion in funding, which is four times the previous year's figure, according to the National Agency for Technology Entrepreneurship and Commercialization Development.

*Investors with investment in Vietnam, # of funds*




Historically, more than 200 funds have invested in Vietnamese startups, most of which are in fintech, e-commerce, logistics, insurance, real estate, education, and healthcare. The number of active funds has 10x-ed since 2014, which is just 8 years ago. YoY growth between 2020 and 2021 also recorded a notable 60%, mostly due to activity slowdown in 2020 as a result of Covid-19.

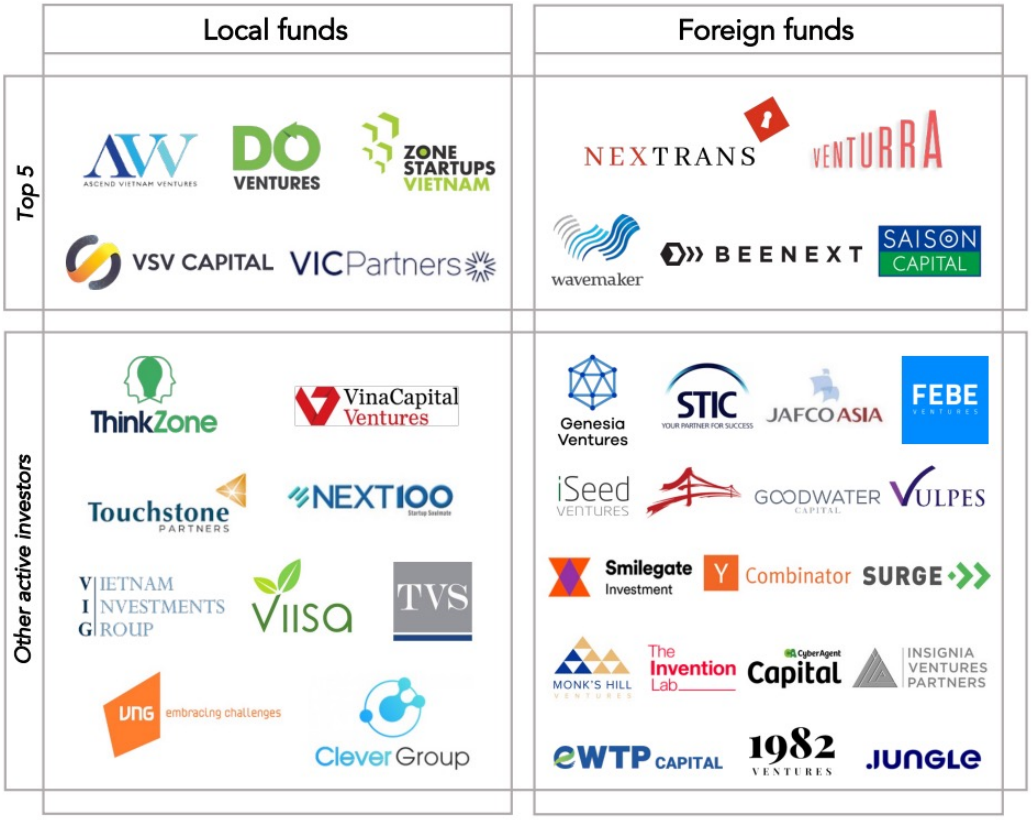
In terms of country of origin, Singapore was the most active investor in Vietnam last year, followed by local investors and US investors. Japanese investors have also gradually resumed their activities in Vietnam after a two-year slowdown. Compared across the ASEAN region in terms of YoY growth, Vietnam notably led in deal quantity and came third in investment volume after Singapore and the Philippines.

According to a report by Do Ventures, the total amount of $10M+ deals exceeded 17 deals, totaling over $1.2 billion. While Seed funding soared to a new high in both deal count and deal value, later-stage funding has been restored to pre-pandemic levels with five mega deals being closed in payment, retail, and gaming. Given a robust pipeline of early-stage firms and the favorable entrepreneurial atmosphere created by the Vietnamese government with the direct supervision of the Ministry of Planning and Investment

and the Ministry of Science and Technology, Vietnam's startup ecosystem is poised to enter a more mature stage.

Experts predicted that funding into Vietnam's startups in 2022 may soon surpass the $2 billion mark, thanks to a large network of both foreign and domestic venture capital being active in the country, such as IDG Ventures Vietnam, CyberAgent, Mekong Capital, ESP Capital, or SeedCom, FPT Ventures, VIISA, EPS, and 500 Startups Vietnam. Local VCs are becoming more and more prominent, with notable names such as Do Ventures, ThinkZone Ventures, and VIC Partners.

*Top active investors in 2021, by # of deals*




Sector-wise, Vietnamese startups are crowded in the digital payment space. With the mega deals of VNLIFE, MomoOMO, and TikiIKI, digital payment and retail remained major areas of interest to investors. Entertainment and gaming come second thanks to the contribution of globally-recognized startup Sky Mavis. At the same time, other sectors also experienced a remarkable funding increase despite the outbreak of Covid- 19, including Education, Healthcare, and Business Automation.

*Capital invested by sector*

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2020-2021 Change |
|---|---|---|---|---|---|---|---|---|---|---|
| Payments | 12 | 10 | 1 | 29 | 10 | 100 | 300 | 101 | 450 | 345% |
| Retail | 1 | 15 | 1 | 18 | 15 | 105 | 195 | 83 | 469 | 463% |
| Employment | - | 0.0 | 0.2 | 0.1 | 0 | 1 | 3 | 36 | 4 | -90% |
| Real estate and infrastructure | 1 | - | 0.1 | - | 7 | 6 | 16 | 26 | 29 | 12% |
| Financial Services | - | 0.0 | 1 | 2 | 0.0 | 3 | 40 | 25 | 61 | 144% |
| Business Automation | - | - | 0.1 | - | 0.0 | 1 | 60 | 18 | 55 | 205% |
| Local services | 0.2 | 0.1 | 4 | 2 | 0.2 | 4 | 5 | 10 | 4 | -63% |
| Travel and hospitality | - | 1 | 0 | 4 | 1 | 5 | 23 | 9 | 4 | -59% |
| Education | 0.2 | 3 | 6 | 1 | 5 | 53 | 32 | 8 | 55 | 562% |
| Entertainment / Gaming | - | - | - | - | - | 0.3 | 9 | 6 | 175 | 2,813% |
| Logistics | - | - | 0.3 | 1 | - | 5 | 58 | 4 | 8 | 103% |
| Healthcare | - | - | 0.1 | - | 0.2 | 0.2 | 12 | 3 | 37 | 1,016% |
| Entertainment / Non-Gaming | - | - | 0.1 | - | - | - | 1 | 2 | 10 | 400% |
| Advertising and Marketing Technology | 6 | 7 | 30 | 1 | 6 | 3 | 15 | 2 | - | -100% |
| Comms & communities | - | 0.2 | - | - | - | 0.0 | - | 1 | 7 | 459% |
| Multi-vertical | - | - | - | - | - | - | 29 | - | 42 | |
| Others | - | - | 0.2 | - | - | - | - | - | 33 | |

*Figure 3: Capital invested by sector (Source: NIC, Do Ventures)*

## 2.1. Key startup sectors in Vietnam digital economy

| Sectors | Value | Growth | Potentials | Outstanding examples |
|---|---|---|---|---|
| E-commerce | 21 billion USD worth of total value of goods in 2021 | Vietnam will have the fastest-growing e-commerce market in Southeast Asia by 2026, with its Gross Merchandise Volume (GMV) reaching $56 billion (Facebook and Bain & Company) | A young population, more local businesses choosing e-commerce as a distribution channel, increased internet access, and the outbreak of Covid-19 is driving e-commerce grow | Tiki, Sendo, Thegioididong, among others |
| Fintech | 11.6 billion USD worth of total transaction value in 2021 | Vietnam's fintech industry is growing rapidly, especially in terms of the number of investments and the number of new businesses, increasing by 170% between 2017 and 2020. | Digital payment has been, and continues to be, the most noticeable area of the fintech scene in Vietnam, along with the growth of e-commerce. Only 5% of the population are using e-wallets in Vietnam, leaving plenty of room for expansion (SBV). | Zalo Pay, MoMo, Moca, and others, |

| Sectors | Value | Growth | Potentials | Outstanding examples |
|---|---|---|---|---|
| Ride-hailing industry | 2.4 billion USD worth of total revenue in 2021 | Revenues in Vietnam's ride-hailing industry could reach $4 billion by 2024, with the industry growing at a CAGR of 16 percent between 2020 and 2025 | A significant increase in demand signals an upcoming bloom in the industry. Foreign firms have a strong presence in the industry. Many established firms are diversifying into related services: food delivery, rental services, and shopping services. | Grab, Be, Fast Go, MyGo, among others |
| Edtech | | Edtech is expected to reach revenue of around 3 billion USD by 2023. | COVID-19 has pushed the demand for education technology platforms to increase in 2022, observers predict that Edtech will be the leading technology. | Topica, Hocmai, Teky, Edumall, among others |
| Blockchain & Cryptocurrency | | In the years 2023–2027, the blockchain market in Vietnam is anticipated to grow by double digits. | There are currently ten Vietnamese startups in the blockchain sector, with a combined capitalization of more than $100 million. | Sky Mavis, Sipher, Summoner Arena, Kardiachain, Coin 98, among others |
| Digital Content and Entertainment Industry | 888 million USD worth of total revenue in 2020 | Vietnam's digital industry is now earning tens of trillions of dong compared to VND3-4 trillion 10 years ago. | The industry has a lot of potential because of the widespread use of the internet, smartphones, and better broadband connections . | Vietcetera, OnMic, Saudio, VietOn, among others |

## 3. PRIVATE SECTOR: THE ROLE OF CORPORATIONS AND ENTERPRISES

As Vietnam has further integrated further into the global economy, corporations and enterprises soon realized the essential role of technology in entering new industrial industries and capitalizing on sophisticated scientific and technological breakthroughs.

In 2019, the Prime Minister Nguyen Xuan Phuc proposed a brilliant national-level economic development strategy "Make in Vietnam" at the Vietnam Technology Enterprise Development National Forum.

Following, "Make in Vietnam" strategy will not only help Vietnam move towards digital economy goals, but also encourage innovative technological ideas from corporations and firms.

The report "Digital Development Index of Small and Medium-sized Enterprises in Asia - Pacific" by Cisco indicates that Vietnamese small and medium enterprises are investing in Cloud Computing technology (18%), network security (12.7%), and upgrading software and hardware for digital transformation (10.7%).

Up to now, digital transformation has been implemented in all types of enterprises across Vietnam at different levels from B2C to B2B and even B2G, and on both fronts: client-facing activities and internal operations.

## 3.1. Digital Transformation in Customer-facing Activities

The most important client-facing activity of enterprises which is undergoing rapid digital adoption is payment. Vietnam National Petroleum Group - Petrolimex has officially implemented a non-cash payment service nationwide in response to growing demand for digital payment at their gas stations across Vietnam. Mr. Luu Van Tuyen - Deputy General Director of Petrolimex - Head of the Project Department believes the official integration of cashless payment solutions to Petrolimex's infrastructure system nationwide is part of the strategy to accelerate the corporation into the position of a nation-leading enterprise in digital transformation, while optimizing service quality and growing customer satisfaction and trust.

Another Vietnamese giant corporation - VinGroup, has also built ít own uniform customer and payment management platform named VinID. The application helps its customers easily make payments, as well as integrate and manage all transaction information when using services of Vingroup or any provider, such as going to the supermarket, visiting the cinema, among others.

Other major enterprises have their eyes towards building an end-to-end client experience all powered by state-of-the-art digital technologies, with an eventual aim towards removing the need for customer-facing staff. Top Vietnamese airline Vietject has started to apply an AI-enabled robot named Amy to answer all questions from its customers related to ticket booking, check-in, payment instructions, etc. flight schedule change, ticket refund, and others. Not only serving passengers, the transportation of goods is also thoroughly digitized by Vietjet with express delivery service Swift247 combined with Grab technology vehicles for timely deliveries during the day.

The digitization process has long been initiated by Vietjet with a goal to change paper air tickets to electronic tickets, as well as selling tickets online through computer platforms and automated phone applications. All complementary products and services of this airline such as baggage, meals, souvenirs, airport transfers, insurance and COVID-19 testing are sold online with an experience nearing that of an e-commerce platform.

## 3.2. Digital Transformation in Internal Operations

Mr. Ngo Quang Trung, General Director of Ban Viet Commercial Joint Stock Bank, said that in addition to heightening consumer utility, digital transformation also helps enterprises improve productivity. Using his own bank as an example, in 2021 the application of technology solutions has helped the business save over 300 billion VND in operating costs through streamlined processes and reduced paperwork. Thereby, workforce productivity and income is greatly improved.

Another illustration comes from the household homegrown milk brand of Vietnam, Vinamilk. During the Covid-19 pandemic, Vinamilk almost maintained normal production and business operation despite sales activities being limited. The reason behind the stable performance of Vinamilk lies in its technology application to all of the stages in its operation, including production, transport and storage. Mr. Lê Thanh Liêm, Chief Financial Officer of Vinamilk said the company identified the digital transformation trend in business development nearly 20 years ago, from production, supply, and sales to financial management.

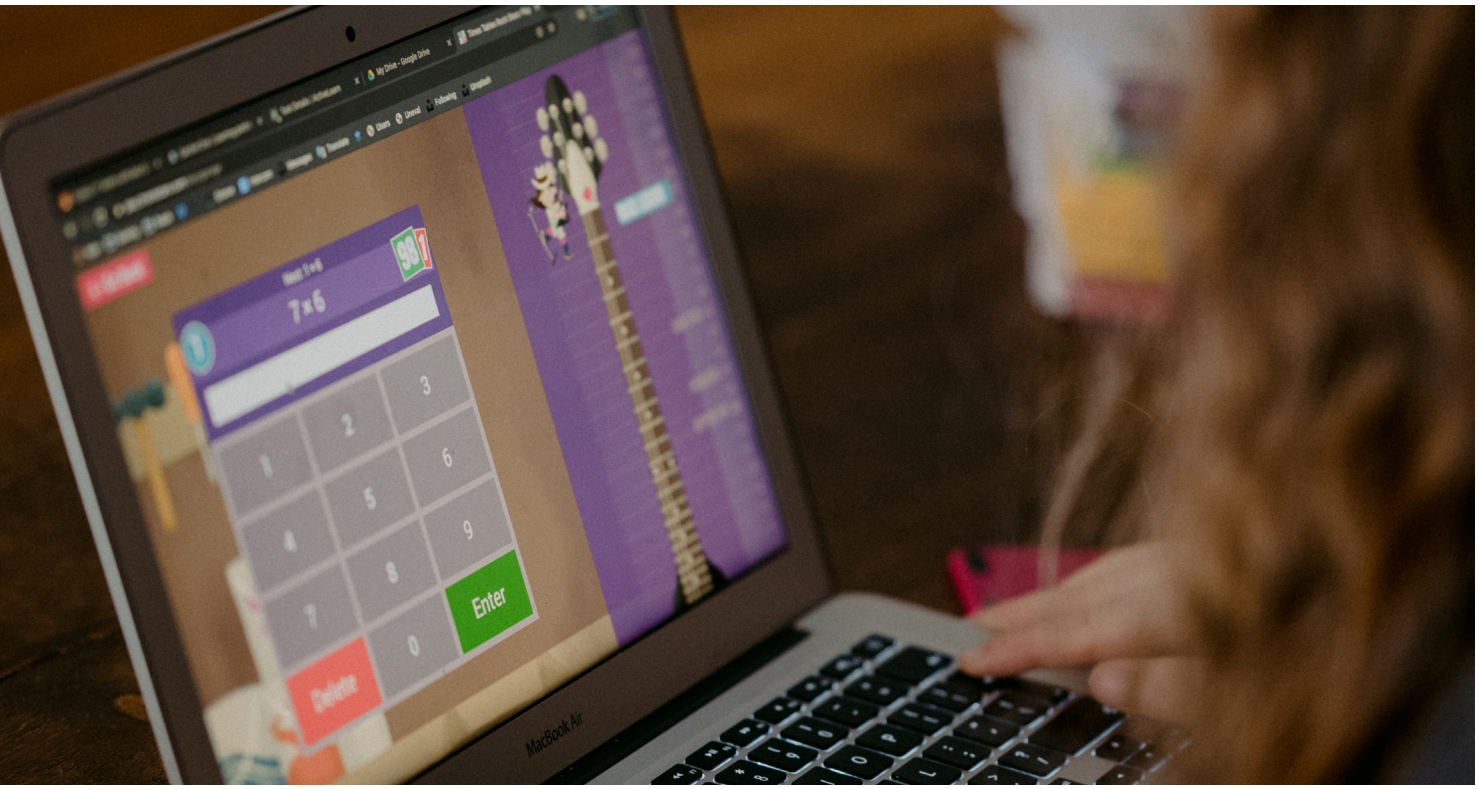
## 3.3. Digital Transformation at the B2G (Business-to-Government) level

Major corporations are also lending a helping hand towards the government in its push towards digitizing governmental activities. Vietnam Posts and Telecommunications Group (VNPT) has introduced the Intelligent Operation Center (IOC), which is an excellent solution that received special attention from the Government and other tech companies, thanks to its ability to monitor and intelligently operate any province and city. VNPT believes that the solution is a key to successfully building a smart city in accordance with the directives of the government. Since its operation, VNPT IOC has been operating in more than 30 major provinces and big cities, becoming an indispensable digital element for developing local digital government.

Besides, VNPT also presented its competitively innovative solutions by introducing 4.0 technologies ecosystem, namely vnFace, eKYC, SmartBot, vnSocial, among others. These applications are of the most advanced AI and Big Data applications in identification, virtual assistants, multi-channel social networks, helping enterprises in digital business projects.

During the pandemic Covid-19, Viettel provided a digital platform for the national Covid-19 Immunization Management System, which effectively supported the nationwide vaccination campaign.

Additionally, Telehealth of Viettel - a support and consultation platform for remote medical examination and treatment has connected over 1,500 national medical facilities, allowing the doctors and nurses to provide instant medical help.




# 4. EDUCATION AND TRAINING FOR THE DIGITAL ECONOMY

A recent report of the Ministry of Information and Communications (MIC) revealed that by the end of 2020, the total quantity of IT human resources in the country would have reached 1 million. This is the direct result of an education system that focuses on developing IT-related skills of its workforce ever since their early ages.

In recent years, the Ministry of Education and Training (MOET) has redesigned the system of general education, which contributes to the development of Vietnam's digital economy by introducing mandatory programs of digital skills and STEM/STEAM in elementary and secondary education.

**Thus, computer science with innovative technologies of Industry 4.0 is becoming popular among young generations.**

Teachers, as part of the digital acceleration created by Covid-19, are applying new methods of teaching with diverse applications of digital technologies in their classrooms. A clear example of this is the success of Azota, a home-grown edtech startup officially endorsed by the MOET for the 2021 national online teaching training programme. Recently receiving $2.4M of funding in a pre-series A round led by GGV Capital, the one-year-old startup has recorded over 700,000 teachers and 10 million students as its users, with about 300 million

exercises having been submitted. During peak periods of Covid-19, the edtech service served over 06 million users monthly, comprising over 30% of the total number of teachers and students nationwide.

At the higher level, Vietnam currently has nearly 250 universities, of which around 150 are providing training in IT, producing more than 50,000 IT engineers annually. In addition, there are over 410 IT vocational training schools at the collegiate and intermediate level, annually providing about 12,000 talents for the industry.

Aside from public schools, the private sector is also investing heavily in the field of training high-quality IT personnel for the market, such as FPT University, Lac Hong University, and Duy Tan University. The most common IT-related fields being trained in Vietnamese universities include: Information Systems Engineering, Multimedia and Communication Engineering, Software Engineering, and Communication System Engineering. It can be said that Vietnam has a strong HR foundation to make leapways in the Industrial Revolution 4.0.

Nonetheless, for such leaps to take place, the quality of its IT human resources must grow at the same pace as their quantity, since only an estimated 27% of the total IT workforce are deemed well-qualified. Educational programs that teach new and emerging technology fields, such as Big Data and Blockchain, are in their infancy and not at all meeting any international standards.

One of the first and only notable examples would be the artificial intelligence (AI) training program, offered in cooperation between the University of Information Technology (Ho Chi Minh City) with Naver Corporation of South Korea.

As a result, the Prime Minister issued Decision No.677/ QD-TTg on approval of the project "Development of a digital Vietnamese knowledge system".

The project focuses on strengthening capacity to approach the Fourth Industrial Revolution. Concurrently, MIC has outlined a plan "Raising awareness, preparing skills and developing human resources for national digital transformation by 2025, with a vision until 2030" with the goal of providing approximately 100,000 highly qualified IT engineers annually, of which about 10,000 are digital experts.

The Project points out the two most important skills that Vietnamese IT talents must improve upon to thrive in the new digital economy: foreign languages and communication skills. It also places emphasis on standardizing and improving the existing literature, materials, and educational resources in IT teaching by working closely with MOET.

## 5. THE FINANCE SECTOR & FINANCIAL SERVICES

According to the State Bank of Vietnam, in the first 4 months of 2022, payment via mobile phones has grown by 97.65% in transaction quantity and 86.68% in total value, and QR code payment increased by 56.52% and 111.62% respectively over the same period in 2021. Nearly 70% of Vietnamese adults ảe banked, among which 5.5 million accounts and approximately 8.9 million bank cards have been opened electronically; and 1.77 million Mobile Money accounts have been opened, of which more than 67% are in rural, remote and isolated areas.

These statistics reflect drastically shifting consumer behavior in how they earn, manage, and spend their money in a digital society. Demand for convenient cashless, digital-based financial solutions are higher than ever, and financial services providers are forced to adapt at a blazing speed.

As the backbone and life force of every thriving economic system, financial services must surely take the lead in any movement of the economy, and Vietnam is no exception.

## 5.1.Banks are leading the push

Banks, the most prominent players in the financial services ecosystem, have led the push towards digital transformation and thus accelerating the provision of financial services (both for consumers and enterprises) using digital platforms and tools, even applying Internet of Things (IoT) technologies. The IoT adoption has allowed customers to access and experience the banking services linked with other digital ecosystems on the Internet.

Typical examples include digital bank Timo, the Live Bank service of TP Bank, E-Zone of BIDV, to name a few. According to SBV Governor Nguyen Thi Hong, many domestic banks have 90% of their transactions conducted on digital platforms, surpassing the target of 70% set for 2025.

Among the "Big Four" - the group of largest banks in Vietnam, digital transformation also took place with a robust pace starting in 2020. For example, Foreign Trade Joint Stock Commercial Bank of Vietnam (Vietcombank) has launched the VCB Digibank application, which is a prominent new service with uniform experience, ease of usage, and integration with superior security solutions.

Bank for Agriculture and Rural Development of Vietnam (Agribank) also pioneered the installation of multi-function ATM (CDM) in the card market, from which the bank continued to expand into further modern digital banking services, including: Autobank automatic banking, online customer identification (eKYC) application, cardless withdrawal transactions, among others, which would gradually replace inefficient physical offices.

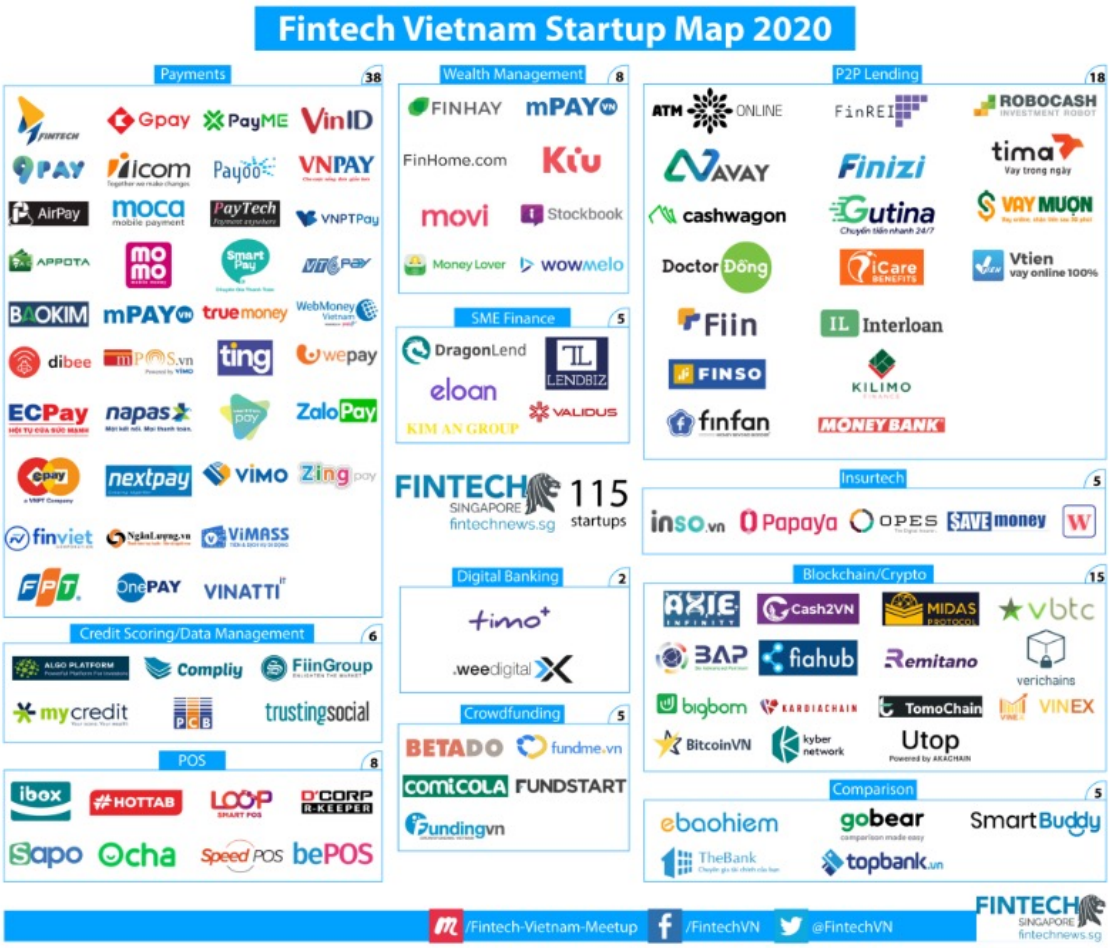
## 5.2. Fintech and alternative digital financing solutions are on the rise

Though banks are still considered as the current dominator in the financial sector, fintech companies enjoy rapid growth thanks to their access to a significant number of underbanked customers (FiinGroup 2021).

The Vietnamese Fintech field, together with Singapore and Indonesia, contributes to the large market share of Southeast Asia. With more diversity, Vietnam's FinTech market experienced a considerable increase by 215% in the number of startups from 2015-2020 (Saigon Entrepreneur Newspaper 2021).

New trends are shaping the fintech world. Digital payment is still the most attractive segment to investors, with prominent unicorns namely MOMO and VnPay. Meanwhile, personal finance and investment are pulling new attention. A plethora of personal finance solutions, notably Finhay, Anvui, Infina are accessible in the market, with several incentives to entice clients, making the market more crowded than ever. Crowdlending for businesses has also gained popularity. In 2020, crowdlending's transaction value surged 50% to reach $0.9 million, compared to $0.1 million of marketplace lending for customers.

Overall, nearly half of fintech startups are engaged in digital payment solutions, such as 2C2P, VTPay , OnePay, VTCPay, BankPlus, VinaPay, VNPay, Senpay, NganLuong, ZingPay, BaoKim, 123Pay, among others. Regarding the types, e-wallet and online payment takes up a significant part in the FinTech market (31%), followed by P2P Lending (17%) and Blockchain (13%).




## 5.3. Ministry of Finance - the leading government body in digital transformation

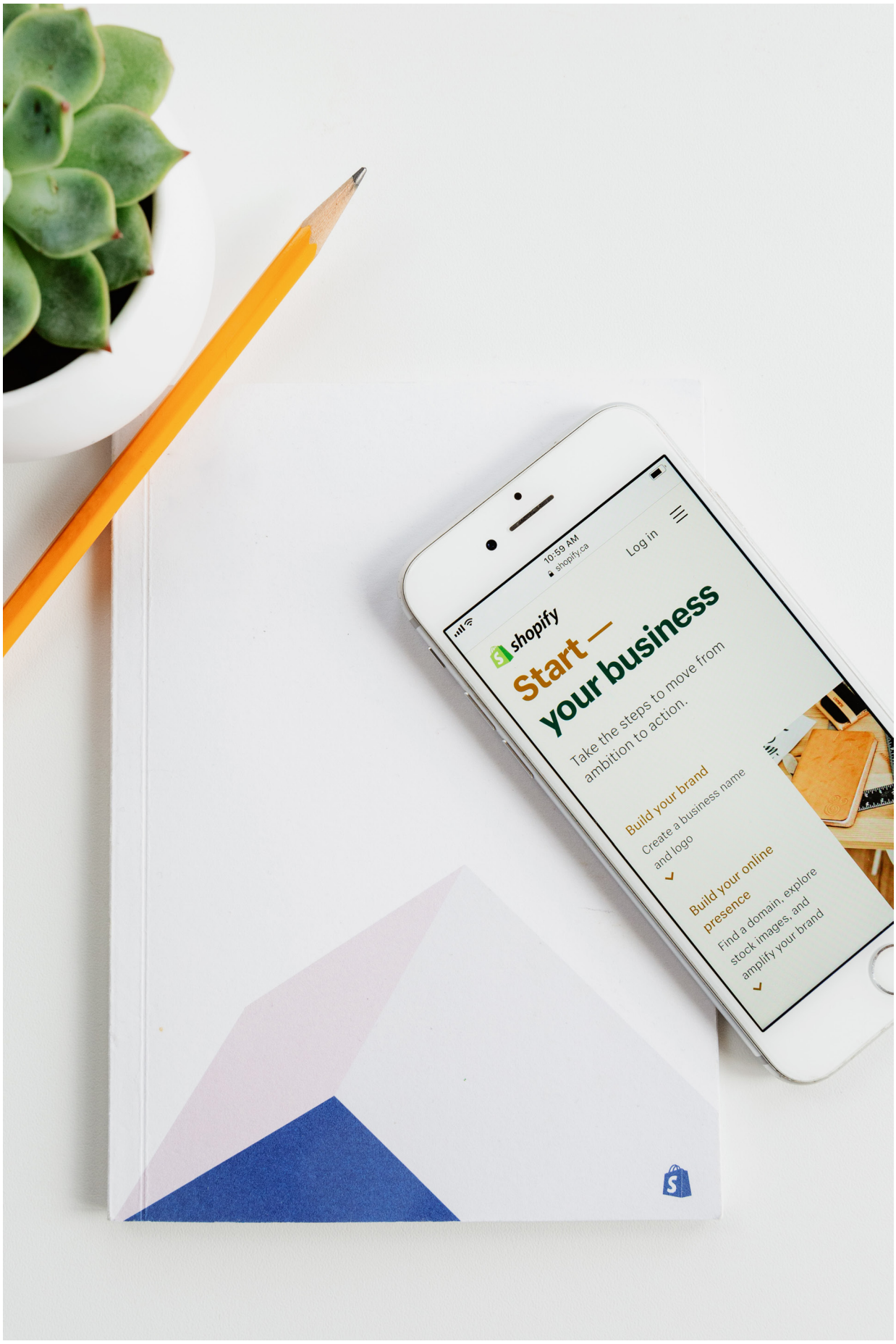
From the perspective of the public sector, according to the published results of the national digital transformation assessment, the Ministry of Finance (MOF) ranked first in terms of digital transformation in 2020 among 18 ministries and sectors providing digital public services. The second place belongs to the State Bank of Vietnam, which is the central governing body for monetary policies. These rankings are a welcoming sight for the future of digital finance in Vietnam.

MOF has achieved outstanding digital transformation results in 2020, proven by the rate of participating in electronic tax payment from people and businesses: 96.28% of businesses favoring e- tax refund; 98 million total dossiers processed online, equal to 89.3% of total processed; and total visits to the Ministry of Finance's portal reaching nearly 3.4 million in 2020. As of September 2021, more than 99% of companies have used the electronic tax declaration service and 99.11% of businesses have registered to use the electronic tax payment service.

To achieve these remarkable results, MOF has effectively implemented various new and core technologies such as mobile technology, big data analysis, and cloud computing in implementing administrative procedure reforms and improving public administration capacity. For example, since 2017, the Ministry has applied artificial intelligence technology to deploy and provide automatic FAQs on financial policies on MOF's portal, so that people and businesses can conduct their own search for questions and answers on the finance sector's policies in a smart automated flow.

In addition, the national financial database and specialized sub-databases are researched and constructed on the basis of applying big data analysis, gradually working towards meeting the information requirements for the management, administration and policy making of the Finance sector, ensuring the sharing of quality financial data with other ministries, branches and localities who need access, and assuring the linkage, integration and transparent intelligence sharing among internal and external stakeholders of the sector.
The entire Finance sector has researched and applied server virtualization technology in the IT system to optimize the efficiency of hardware investment as well as quickly solve the requirements of hardware infrastructure growth in a short period of time.

The synchronous and effective implementation of IT application solutions in recent years has not only supported the sector's own financial management, but also generated positive effects to the whole society. Notable improvements in financial and budgetary management have been made, gradually increasing the effectiveness and efficiency of financial supervision, making an important contribution to promote institutional reform, administrative reform, procedural restructuring, and increase the accuracy, timeliness and transparency in state budget management.


10:59 AM
shopify.ca
Log in
shopify
Start —
your business
Take the steps to move from ambition to action.
Build your brand
Create a business name and logo
Build your online presence
Find a domain, explore stock images, and amplify your brand

# 03.

# RISING OPPORTUNITIES FOR INVESTORS IN DEVELOPING VIETNAM'S DIGITAL ECONOMY

## 1. E-COMMERCE

Vietnam is entering its "digital decade" and facilitating e-commerce is the Government's priority as they view it as the key drive to the inclusive digital economy.. Vietnam's e-commerce is becoming a prime market for foreign investment and quickly catching up with its ASEAN peers.

The sector currently ranks fourth in size among Southeast Asian countries, and is expected to surpass Malaysia and Thailand to claim the second spot in the region. Besides the government's incentives, the growth of e-commerce in Vietnam can also be explained by the increasing online society and middle class, substantial foreign investment and Fintech as an essential driving force.

## 1.1. Opportunities

### 1.1.1. B2B e-commerce in Vietnam is thriving in the near future

In recent years, the B2B e-commerce marketplace in Vietnam has gained momentum. Various B2B organizations opt to expand their network and collaboration with dealers, VARs, wholesalers, e-commerce platforms and so on to offer products and services. This demonstrates their ultimate goal of maximizing business potential and achieving extensible development.

Although the B2B model is much more challenging than B2C due to customer quantity, large order size and more complex contracts, several successful B2B e-commerce businesses predict strong growth for this model in the coming years. For example, EI Industrial is Vietnam's first industrial-focused B2B marketplace where purchasers can easily source from multiple suppliers and identify the best deals available. Telio, a B2B fintech startup with the mission of connecting businesses with retailers, has recently received funding of US$22.5 million from Vietnamese tech unicorn VNG.

It can be seen that other e-commerce models apart from the B2C model, such as B2B, M-Commerce, and F-Commerce, are also worth considering investment as they are all untapped potentials. Therefore, for investors seeking opportunities in Vietnam's e-commerce, this is the golden time to enter the market.

### 1.1.2. Niche markets possess huge hidden potential

E-commerce niches are another leading trend in 2022 and the coming years . Mr. Nguyen Tuan, Deputy Director of the Investment and Trade Promotion, said that targeting niche markets was appropriate for small businesses in the fiercely competitive post-pandemic situation in Vietnam.

By learning deeply about the culture and consumption habits of the Vietnamese to identify a niche, small businesses could gain great benefits, without confronting big players who have powerful financial capabilities, he added. For example, Mio, an e-commerce start-up that focuses on agricultural food and FMCG, announced a US$8 million Series A funding round in mid-January, bringing its total funds raised since inception to $9.1 million.

It leverages the buying power of consumers in the areas where major players haven't reached dominance yet: residents of small and mid-size cities who must put up with longer delivery wait times.

Mio takes advantage of this to offer a unique selling point of next-day delivery to this group of consumers. Another Vietnamese platform, Aemi is focusing on secondhand luxury beauty and wellness products by creating a suite of backend software that helps its sellers manage inventory, ordering and payment.

## 1.2. Challenges

### 1.2.1. Insufficient legal regulations

Some individuals and organizations are abusing e-commerce as a cover for criminal activities through various counterfeiting and trade fraud activities. During the first nine month of 2020, about 30,000 e-commerce stores were taken down due to trade fraud, counterfeit and contraband goods. Specifically, the Vietnam E-commerce and Digital Economy Agency co-operated with the Vietnam Competition and Consumer Protection Authority, together with the Department of Cyber Security and High-tech Crime Prevention had checked over 2,400 cases and handled over 2,200 e-commerce violations, while issuing fines of nearly VNĐ17 billion (US$730,500).

The administration of taxes on e-commerce activity presents difficulties for the government as well. The legal framework behind the development of e-commerce was not sufficiently comprehensive and robust to deter violations.

### 1.2.2. Insufficient infrastructure and high cost of logistics

Insufficient traffic infrastructure and restricted connectivity between road, rail and waterway have led to high transportation costs and decreased logistical efficiency. Companies are seeking innovative tactics such as e-logistics to save costs. However, these innovations could potentially cost millions of dollars for infant companies - a hefty price that not all businesses are able to afford.

### 1.2.3. Barriers to rural consumers

Currently, about 80% of e-commerce serves the urban

market mostly in big cities like Hanoi and Ho Chi Minh City. The majority of the Vietnamese population are still scattered across distant areas, which makes it more expensive and challenging to operate rapid delivery. Besides, consumers in those areas are still wary of making online purchases and reluctant to make digital payments. Vietnam is still a cash-based society, especially in small cities and remote areas where the cash-on-delivery (COD) method is still predominant.

## 2. METAVERSE

In Vietnam, Metaverse is still considered a new concept and has not really attracted the attention of business owners. Despite 100% of IT or online service suppliers knowing about Metaverse, most of them do not understand the concept very well. Vietnam-originated Metaverse projects, which have been developed in small numbers, are still unknown to these suppliers. However, Metaverse presents a fair opportunity for both developed and developing countries.

The first Metaverse project to prove the success of Vietnamese technology developers was Axie Infinity. This Metaverse related technical game has raised $7.5 million of investment from Mark Cuban and Alexis Ohanian in 2021; and at one point was valued at up to US$8 billion. The success of Axie Infinity has also inspired many other developers to create metaverse projects in Vietnam, focusing on games, including projects that have called for an investment of millions of USD from the seed round.

Along with game developers and publishers, other stakeholders are taking an interest in the Metaverse trend. One of the big names is Viettel High-Tech Industry Corporation (VHT), which is a part of the Viettel Group. VHT has invested in researching, designing and mastering modern simulation technologies not only in the military field but also in the civilian

population. the. At the same time, Viettel also determined that the virtual universe will soon be a large revenue-generating segment for the group in the coming years. It is still early to clearly identify the development trend and the number of achievements that Metaverse will achieve in the Vietnamese market in the future.

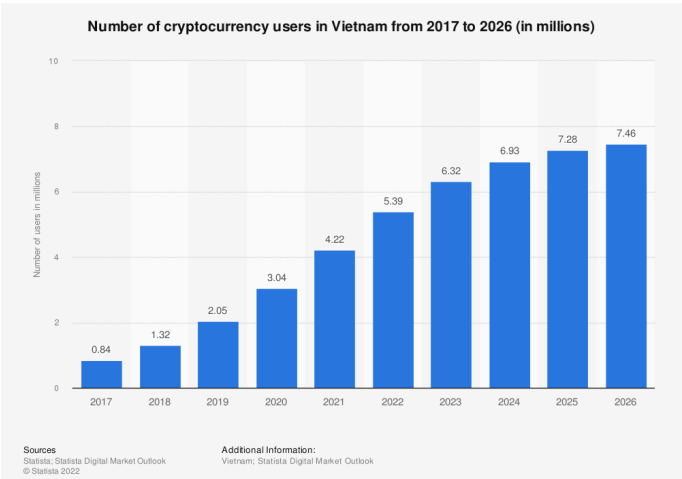
However, the current signs are very positive. The important problems that need attention will be the utilization and improvement of the quality of existing personnel; and the combination and cooperation between developers and businesses from diverse industries to expand opportunities for Metaverse in Vietnam.

A new project called Metaverse Village made its debut in Danang on June 15 within the framework of TECHFEST Vietnam 2022. The village's establishment intends to assist 800 Vietnamese enterprises and startups in gaining access to the most recent technology platforms, keeping up with global trends, and creating new values in the field of virtual reality technology in Vietnam.

## 3. CRYPTOCURRENCIES

Cryptocurrencies (particularly bitcoin) have recently risen in Vietnam as investors see its potential for profit. According to Statistic estimates, as of 2021, 4.28 percent of the Vietnamese population (equal to more than 4.22 million individuals) own cryptocurrencies, and by 2026, this number could reach 7.46 million people. Moreover, Vietnamese users of crypto trading websites and platforms are among the top five worldwide.

*Figure : Number of cryptocurrency users in Vietnam from 2017 to 2026 in millions (Source: Statista)*




Blockchain technology, the core technology behind cryptocurrencies, has made significant progress in Vietnam in recent years. The Ministry of Information and Communications has officially launched akaChain, a blockchain technology platform created and used as a digital identification solution by FPT Software. Many blockchain projects starting out of Vietnam have achieved international success, including Axie Infinity, KardiaChain, My Defi Pet, and others.

## 3.1. The prospect of cryptocurrency in Vietnam in the next few years

In the coming years, the Vietnamese government will research and implement two essential steps to address legal issues concerning virtual currencies, which are (i) perfecting the legal framework for the management and handling of virtual assets, cryptocurrency, and virtual currency and (ii) focus on researching the possibility of issuing State Bank's digital currency (CBDC). These regulations will serve as the foundation not only for the growth of virtual currencies but also for promoting blockchain applications in Vietnam's socio-economic development, such as e-government.

Vietnam Blockchain Association was established under Decision No. 343/QD-BNV, becoming the first formal legal institution to research and apply blockchain technology on a national scale. Mr. Phan Duc Chung, Vice President of the Blockchain Vietnam Association, stated during the Vietnam NFT Summit 2022 that the Association will collaborate with the Binance trading floor to conduct research and develop blockchain applications in many fields, including decentralized finance and new technologies like NFTs, Web3, and Metaverse.

The sector of decentralized finance (Defi) is one of the directions for investors interested in crypto in the next one to two years. It is a financial application and service ecosystem built on a blockchain network.

Over the last two years, the Defi model has expanded at an incredible rate and has the potential to replace many traditional financial services. Investment funds and securities firms can construct investment products based on Defi while still complying with existing licenses.

## 4. AR/ VR

VR and AR development is predicted to soar globally, particularly in the health, training, digital games and tourism sectors. Predictions suggest the global market for AR/VR will reach US$94.4 billion by 2023, with the Asia Pacific being the primary center of growth.

The AR and VR market in Vietnam is expected to expand rapidly over the next five years, with varying development trends for each market sector. In which, the "Retail and Consumption" segment is expected to take the lead in AR - VR application due to its strong growth rate and attractiveness to the market. In the last year, Unilever Vietnam applied AR marketing in their Tet Lifebuoy campaign to attract customers and garnered more than 11 million engagements on AR ads.

Several other sectors have also applied VR and AR. In particular, Vietnam International Bank (VIB) recently released a mobile banking application that uses AR technology in performing financial tasks such as card/account management and payment, search for promotions, locate and direct the location of branches and ATMs.
Real Estate follows the VR/AR

trend as well. The impact of the COVID-19 pandemic has forced real estate agents to apply digital tools like augmented reality (AR) and virtual reality (VR) into transactions. Customers can use AR and VR applications to virtually experience a room's dimensions and interior layout without physically visiting the apartment.

In the travel industry, since 2018, Hue Monuments Conservation Center has opened "The Information Center interprets the history of Hue Imperial Citadel and experiences VR virtual reality - Finding the Lost Palace." The center uses VR technology for visitors to experience a virtual reality simulation view of the Hue Imperial Palace.

In museums and heritage preservation, the Vietnam Fine Arts Museum has organized an exhibition on the architectural heritage of the One Pillar Pagoda with the application of VR technology. Visitors may explore the architectural replica of Dien Huu Monastery and the One Pillar Architecture from the Ly Dynasty using 3D models and virtual reality glasses.

Last year, Vietnam and Korea cooperated to promote the adoption of VR technologies in gaming, content and esports industries. Thus, Korean VRCIA signed a Memorandum of Understanding (MoU) with Vietnam Digital Communications Association to further push the growth of VR technologies in gaming, content industry and Esports.

**Vietnam and Korea join hand to promote the utilization of virtual reality technologies**


**10/2019 – Business meetings between Vietnamese and Korean gaming companies in Hanoi**

- Korean representative assess Vietnam has huge potential to develop VR games, but lack of high quality technologies and devices. Actual R&D for virtual reality applications in Vietnam is still trivial, with very few players existent
- 3 Korean VR start-ups signed memorandum of understanding (MoU) during the meetings

**14/10/2021 – Meeting between Vietnamese Ministry of Culture, Sports and Tourism and Mr. Park No Wan, Korean Ambassador in Vietnam**

- Talk about incoming year 2022 with many activities to celebrate 30 years of establishing diplomatic relationship between Vietnam – Korea, with many exhibitions using VR technology

**29/11/2021 – Vietnam & Korea sign MoU to develop VR content industry and Esports**

- The MoU is signed between Vietnam Digital Communications Association and Korean VRCIA, with the aim to push the growth of VR content industry and Esports in Vietnam
- The MoU will establish the collaboration between the two associations and their members

# 5. AI/ BIG DATA

Among those emerging technologies of the new digital era, Artificial Intelligence - AI is a game-changing sector, which was identified in the National Strategy on Research, Development and Application of AI to 2030 (Decision No. 127/QD-TTg in 2021) by the Vietnamese government.

The effectiveness and productivity of AI applications is diverse across industries and organizations such as Logistics, E-commerce, Space Science, National Security, Education, Healthcare. In the Covid-19 pandemic, the AI automatic health declarations system (Callbot) has supported millions of Vietnamese people. Another outstanding example is VinAI Research of VinGroup. In the top 100 leading global companies in AI research, Vietnam ranked in the top 20 for the first time with the impressive acceleration of VinAI.

Parallel with the breakthroughs of the 4.0 Industrial Revolution, Big Data technology has also become the heart of the digital economy. According to Mr. Nguyen Minh Hong - Chairman of the Vietnam Digital Communications Association, a significant number of enterprises have taken the first steps to deploy Big Data technology, which yielded VND 81,000 billion in digital-based commerce activities in 2017. This number is expected to grow over ten-fold by 2030.

Besides, the Draft National Strategy for 2021-2025 period, with a vision to 2030, shows a positive future with the data economy contributing 5% of total GDP. For the data economy to thrive and lead to great economic growth, tMIC has presided over the development of the draft "National Data Strategy for the period 2021-2025, with a vision to 2030", which will play a leading role in developing and managing data in all fields.

Admittedly, the Vietnamese government has paid remarkable attention to the smart city development plan and e-government program in the 2020-2025 period with Hanoi city being the center area.

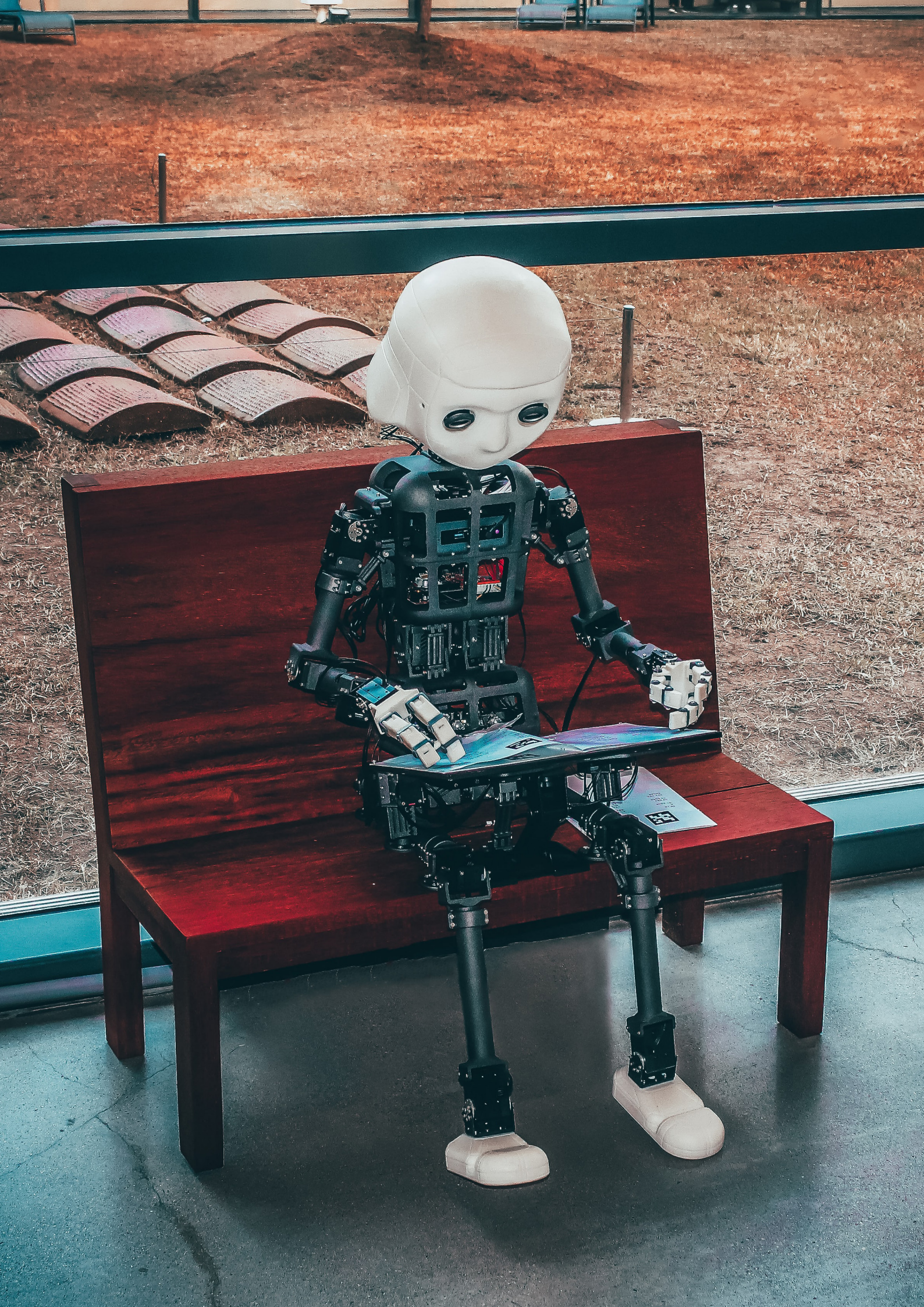
Hanoi has implemented a series of technology applications in management and administration, as well as providing public services for the people since 2017. Hence, in the field of administrative reform - FSI is pioneering the market with a go-to solution to digitize documents and text

recognition & extract technology. Following this, the government has prioritized the promotion of the data economy's infrastructure. On May 18, 2017, the Prime Minister issued Decision No. 677/ QD-TTg approving the project "Development of a digital Vietnamese knowledge system". The project built a knowledge connection base through the synthesis, systematization, digitization, storage and dissemination of knowledge in all fields.

Plus, under Decision 127/QD-TTg 2021, the goal by 2025 is to build a national center for Big Data, and to build 3 national centers for Big Data and high-performance computing by 2030. In recent years, many enterprises such as FPT, VNPT, CMC TS, MISA, HIPT have developed software solutions and telecommunications technology equipment specialized in data management, integration and analysis. In particular, Vietnam Digital Map (Vmap) and Humanitarian Information System (iNhandao) are two pioneer projects that have achieved some important results in phase 1 to introduce to the public.

As the government has created favorable infrastructure, the business sector started to actively join the data economy. FPT, VNG, VCCorp are among the pioneers to participate in the research and application of Big Data in analyzing customer behavior and preferences. The effect of data economy does not limit to the commerce sector but also other leading industries namely Finance - Banking, Aviation, Real Estate, Healthcare, etc.

The application of Big Data for the banking sector is to analyze customer data including consumption, borrowing, payment location, etc to determine whether a transaction is valid or fraudulent. On the other hand, Vietnam Airlines was the first Vietnamese airline that has completed the first phase of the Skywise open data platform developed by Airbus and its Big Data partner - Palantir, which helps integrates databases of flight schedule information, onboard sensor data (AGS), warnings techniques from aircraft, etc into Skywise system.



# 6. ROBOTICS & AUTOMATION

Vietnam has been the seventh-largest robotics market in the world since 2017, and by 2021, it is predicted that the automation market would be worth $184.5 million (Frost & Sullivan, 2017). Vietnam also has the second-highest rate of labour replacement by automation. Up to 13.8% of Vietnamese workers (about 7.5 million people) could be forced to shift jobs by 2028 in order to make place for robots.

## 6.1. Policy

The Vietnamese government is also making efforts to advance the development of robots and speed up the automation process, typically the Strategy for Science and Technology Development (S&T) for the period 2011-2020. This is the government's plan to improve economic competitiveness and accelerate industrialization, with a focus on industrial robots and high-tech automation.

Currently, MOST is chairing the National Science and Technology Program on "Research, application and development of mechanical and automation technology" for the period 2021-2025, with the goal of research and applying core technologies in the design and manufacture of next-generation automation systems for key economic sectors.

## 6.2. Robotics & Automation

In recent years, nearly 94% of foreign-invested enterprises in Vietnam are increasing the use of robots for the purpose of expanding production and business. In particular, during the Covid-19 epidemic, robots and automation also assist in meeting production demands, even when the number of workers has been significantly reduced as a result of isolation regulations.

According to Huynh Phong Phu, Managing Director of Robotics at ABB Vietnam, there are now only six foreign-owned robot suppliers serving the Vietnamese market.

Due to the rising demand for robots, it can be seen that the local robot industry offers a lot of potential and prospects for suppliers and manufacturers to expand their businesses.

Robotics and automation are used extensively in manufacturing, hence they are closely linked and developed alongside FDI flows from MNCs into Vietnam.

The supporting industry for production in Vietnam is growing rapidly due to the entry of large-scale multinational brands like Samsung, LG, Toyota, Honda, and Canon as well as the requirement to increase the scale of domestic businesses to satisfy international production standards.

**6.2.1. Advanced Manufacturing**

Advanced manufacturing plays a vital role in almost every sector of the Vietnam economy. In the past few years, the effort of Vietnam companies has been paid off as many achievements of science and technology in the world have been transferred and executed successfully within the production process.

Despite the catastrophic damage of Covid-19 on the global economy, the high-tech industry sectors in Vietnam accounts for a significant percentage of the total GDP as the leading export industry in 2020 was computers and parts with nearly one third of the total export volume. The number of new tech-driven businesses increased 28% YoY in 2020.

Up to now, Vietnam has formed key manufacturing industries of the economy such as textiles and garments, construction materials - mechanical engineering, electronics, automobiles, motorcycles, among others. Textiles and electronics have emerged as the two primary industries that accounted for the highest proportion of total manufacturing output for Vietnam.

With the participation of large corporations in the world in hi-tech parks, industrial parks - export processing zones, Vietnam has gradually approached smart production lines, producing industrial high-tech products. Vietnam's key manufacturing industries are mainly for export purposes towards major markets including the US, EU, China, Korea and Japan.

However, the market space for high-tech and advanced manufacturing FDI enterprises still contain untapped potential. Therefore, the Vietnam government has introduced a number of incentives to help investors gain more confidence to join the Vietnam market when a new investment wave has hit Vietnam's high-tech economy throughout the year 2021.

The 2008 Law on High Technology prioritizes giving the highest incentives in terms of land, taxes, investment and other incentives for high-tech activities. The Law also encourages enterprises to improve their high technology application capacity and invest in hi-tech development as well as create favorable conditions for small and medium-sized enterprises to participate in forming a network of providing auxiliary products and services for the high-tech industry.

High-tech enterprises are also eligible for corporate income tax exemption, being exempted from land rent for the whole land lease term for land for construction of scientific research facilities if meeting the requirements. Some cases are entitled to the preferential tax rate of 10% within 15 years.

Raw materials, supplies and components that cannot be domestically produced and are imported for production by high-tech enterprises, science and technology enterprises, and science and technology organizations are exempt from import tax for a period of 05 years from the beginning of production.

## 6.3. Some automation applications in Vietnam today:

**6.3.1. Industrial production**

Mitsubishi Electric Vietnam is a leading industrial manufacturer in smart factory technology with control technology using the Internet of Things, enabling manufacturers to remotely manage and control factories via smartphone, tablet or laptop.

**6.3.2. Agricultural production**

In 2013, Vietnam Dairy Products Joint Stock Company (Vinamilk) put into operation a "super factory" of milk production in Binh Duong with self-propelled robots that can handle the entire process, from raw materials to packaging without human intervention. In 2017, Ba Huan Company invested in a 100% automatic clean egg processing line with a processing capacity of 65,000 eggs per hour.

**6.3.3. Medical examination and treatment**

In 2014, the National Children's Hospital was the first medical facility in the country to have a surgical center applying robotic laparoscopic surgery. Vietnam is also the second nation in Asia and the first in Southeast Asia to have this type of surgical center.

# 7. IOT & SMART CITIES

Vietnam is entering a period of explosive awareness about the Internet of Things (IoT). In Vietnam, IoT has been applied for a long time. However, there is currently no real application that has a strong influence on Vietnamese social life. In the coming years, IoT applications are forecasted to become popular, having a lot of influence on life in various potential fields. One of them is smart cities.

Vietnam is accelerating the construction of infrastructure to support the establishment of smart city projects combined with top-class technology to enhance both the country's management and the economy. Following the fast-growing demand among young Vietnamese, property developers are establishing many smart city projects in big cities around the country, such as Hanoi, Ho Chi Minh City, Danang, Binh Duong, and Nha Trang, with the highest number of projects developed in the capital. The aim is to develop smart, eco-friendly neighborhoods where people can live in a walkable, connected urban complex that prioritizes convenience, safety, and integrated services.

Sunshine Group is a pioneer in integrating 4.0 technology into the real estate industry. Sunshine City Saigon, the first enthusiastic project from the Sunshine Group, truly combines the benefits of a smart life with top-rate ease. When purchasing a home at Sunshine City Saigon, residents will enjoy technological benefits from 4 groups of solutions, including Smart Parking, Smart Security, Smart Home, and Smart Management, to fully serve residents' lifestyles in the direction of automation.

Over a third of the area of the smart city project in Hai Boi, Vinh Ngoc, and Kim No communes, Dong Anh district, Hanoi, which is funded by BRG Group and Sumitomo Corporation (Japan), has been cleared, totaling more than 66 hectares. BRG expects to finish all 5 phases of the smart urban planning along the Nhat Tan - Noi Bai axis by 2028, with a total project investment capital of 4.2 billion USD and a 272 hectare area. The project's key feature is the application of numerous smart technologies across six key areas, including smart energy, smart traffic, smart governance, smart learning, smart life, and smart economy.

The development of smart cities in Vietnam has also inspired the spawning of technological solutions in real estate management in the country. This is considered an inevitable change when accompanying a smart city, which is the continuous application of high technology, rising service needs are based on new technology platforms such as Blockchain, AI, Big Data, Fintech , IoT, NFT, etc.

According to many experts, smart city development, despite the participation of many large domestic and international corporations and technology

companies, still offers many opportunities for startups. As large enterprises will focus on big issues such as infrastructure and overall solutions, smaller issues such as operations and new services development are more suitable for startups thanks to their small and flexible model.

The Vietnamese government has issued many supportive policies and opened corridors to create an ecosystem for creative startups. As smart city development and national digital transformation are promoted by the Government, the time right now could prove to be an excellent opportunity for tech startups to grow, compete, and make a name for themselves in this new and dynamic market.

# References


https://www.vietnamplus.vn/viet-nam-da-co-gan-11-trieu-nguoi-dung-dich-vu-mobile-money/789571.vnpw

https://doventures.vc/en/insights/reports/vietnam-innovation-and-tech-investment-report-fy2021

https://ocd.vn/bao-cao-thi-truong-ar-vr-tai-viet-nam/

https://vnpt.com.vn/gioi-thieu/tin-tuc/vnpt-hop-tac-voi-eon-reality-thanh-lap-trung-tam-ky-thuat-so-tuong-tac-thuc-te-ao-tai-viet-nam.html

https://vietnamnews.vn/economy/1207637/vib-the-first-bank-in-viet-nam-provide-augmented-reality-technology-on-mobile-banking-app.html

https://vietnamnews.vn/economy/996710/virtual-reality-live-streams-esential-for-selling-real-estate-during-pandemic.html

https://vietnamnet.vn/en/vietnam-made-virtual-reality-technology-allows-on-the-spot-travel-539457.html,

https://en.nhandan.vn/culture/item/9373002-trend-of-virtual-reality-technology-museum.html

https://www.rmit.edu.vn/news/all-news/2017/dec/rmit-vietnam-graduate-demonstrates-vr-app-prestigious-global-event

https://cncvina.com.vn/xu-huong-ung-dung-tu-dong-hoa-tai-viet-nam/

https://vietnamnet.vn/en/growing-demand-for-robots-in-vietnam-553672.html

https://www.quanlynhanuoc.vn/2021/03/18/phat-trien-ha-tang-big-data-du-lieu-lon-o-viet-nam-hien-nay/

https://www.brandsvietnam.com/22202-Big-Data-van-nang

https://diendandoanhnghiep.vn/ung-dung-ai-va-bigdata-de-xay-dung-gia-bat-dong-san-kinh-nghiem-quoc-te-223573.html

https://vietnamnet.vn/bo-truong-nguyen-manh-hung-noi-ve-linh-vuc-tttt-nam-2022-2006149.html

https://mic.gov.vn/mic_2020/Pages/TinTuc/153620/Bo-truong-Nguyen-Manh-Hung--Chuyen-doi-so-tao-ra-dong-luc-moi-cho-phat-trien.html

https://kinhtevadubao.vn/bao-dam-an-toan-an-ninh-mang-de-chuyen-doi-so-thanh-cong-va-ben-vung-22459.html

https://tapchinganhang.gov.vn/chuyen-doi-so-giai-phap-phat-trien-doanh-nghiep-trong-cuoc-cach-mang-cong-nghiep-lan-thu-tu.htm#:~:text=T%E1%BA%A1i%20Vi%E1%BB%87t%20Nam%2C%20chuy%E1%BB%83n%20%C4%91%E1%BB%95i,(Cloud%20Computing)...

https://www.vietnamplus.vn/chuyen-doi-so-lien-tuc-doi-moi-voi-tu-duy-dot-pha-tam-nhin-chien-luoc/809867.vnp

https://innolab.asia/2022/03/21/fintech_vietnam/

viettonkin consulting

**Address:** Level 6A, Dien Bien Building, No.9A Lane 9 Hoang Cau Street, Dong Da, Hanoi, Vietnam

www.viettonkinconsulting.com