



BACKGROUND PAPER

Digital Entrepreneurship: Viet Nam

Quyen Pham and Luc Phan Tan

DISCLAIMER

This background paper was prepared for the report *Asian Development Outlook 2022 Update: Entrepreneurship in the Digital Age*. It is made available here to communicate the results of the underlying research work with the least possible delay. The manuscript of this paper therefore has not been prepared in accordance with the procedures appropriate to formally-edited texts.

The findings, interpretations, and conclusions expressed in this paper do not necessarily reflect the views of the Asian Development Bank (ADB), its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy of the data included in this document and accepts no responsibility for any consequence of their use. The mention of specific companies or products of manufacturers does not imply that they are endorsed or recommended by ADB in preference to others of a similar nature that are not mentioned.

Any designation of or reference to a particular territory or geographic area, or use of the term “country” in this document, is not intended to make any judgments as to the legal or other status of any territory or area. Boundaries, colors, denominations, and other information shown on any map in this document do not imply any judgment on the part of the ADB concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Digital Entrepreneurship: Viet Nam

Quyen Pham
Thu Dau Mot University, Binh Duong, Viet Nam
quyenpm@tdmu.edu.vn

Luc Phan Tan
Thu Dau Mot University, Binh Duong, Viet Nam

Highlights

1. Entrepreneurship ecosystem in Viet Nam is at the low level of development relative to other ASEAN-6 countries. However, among various pillars, the cultural support is a strength that motivates Viet Nam's entrepreneurship.
2. Unlike entrepreneurship component, digital ecosystem in Viet Nam is rapidly completing. Investments in information technology and digital infrastructure are the key force for digital start-ups.
3. Human capital is the pillar that needs most efforts to strengthen in the digital entrepreneurship ecosystem in Viet Nam, from the skills of entrepreneurs to the proactivity of the government's agencies.
4. Innovation in Viet Nam is at a low level, reflected through both AIDES score and interview results. Educational system reform toward encouraging critical thinking and innovation is required.

I. INTRODUCTION

Since the 1980s, research on entrepreneurship has attracted attention from not only the academia, but also practitioners in order to clarify its consequences on economic development. Technological development, globalization, labor supply, and consumer demand shocks are among the factors that led to a higher degree of uncertainty in the business world that a traditional concentration and centralization business model has been shifted to the lesser concentration and decentralization one (Thurik 2009). In that context, the role of small firms has been emphasized when there was empirical evidence across countries that are reporting stronger growth for those who facilitate the development of smallness (D. Audretsch 2007). Among different mechanisms through which small firms accelerate economic growth, the utmost importance relates to their constructive role to innovate activities and technological changes (Acs and Audretsch 1990, Wennekers and Thurik 1999, Carree and Thurik 2010). In small firms, the founder or a small management team who designs the company's strategies, cultures, and goals are usually described as "entrepreneurs".

Entrepreneurship, in the context of developing countries, contributes to economic development, thanks to their entrepreneurial innovation. It was not necessarily radical innovations but incremental innovations that play a crucial role in technological upgrade and efficient resource allocation. Privately owned enterprises, especially small-scale entrepreneurs, have been proven to be more flexible and innovative than their large-scale counterparts that led to the economic success in the East Asia region (Amsden 2011, Stam and Van Stel 2011).

In Viet Nam, a wave of start-ups has been witnessed since a few decades ago, thanks to the improvements in business environment that supports entrepreneurship. Political stability, young population, and low barriers to entry were assumed as Viet Nam's pros for starting a business. Recently, thanks to the popularity of the internet and smart-phones, start-ups are even more affordable when entrepreneurs can run a digital enterprise. According to Youth Mobility Index Report (DotAsia 2018), Viet Nam was in top 3 of Startup Momentum, following Hong Kong, China (#1); and Singapore (#2). For a deeper insight into how entrepreneurial environment is being promoted in Viet Nam, this chapter reviews the dynamic of Viet Nam's entrepreneurial system and its digital framework, along with a comparative examination upon a country's strengths and weaknesses relative to other peers in the Association of Southeast Asian Nations (ASEAN) region. In addition, focus is placed on the development of the digital education entrepreneurship, the sector which has experienced an energetic development in Viet Nam recently.

The remainder of this chapter is structured as follows. In section II, we dealt with the overview of Viet Nam's entrepreneurship ecosystem. Section III discusses the digitalization and

innovation of Vietnamese enterprises, subject to the empirical analysis of interview results. Section IV analyzes the development of digital education sector in Viet Nam relative to other counterparts. Section V concludes and recommends political implications.

II. ENTREPRENEURSHIP ECOSYSTEM IN VIET NAM: AN OVERVIEW

According to the Asian Index of Digital Entrepreneurship Systems (AIDES), national entrepreneurship ecosystem consists of two components: (i) general framework conditions and (ii) systematic framework conditions. In turn, each component is a combination of several aspects that capture the overall framework conditions for entrepreneurship. This section makes an overview of this index in Viet Nam, taking into account the strengths and weaknesses of Viet Nam relative to other countries in ASEAN-6. Moreover, AIDES has been augmented efficiently by the structural model of entrepreneurship ecosystems (SMEE) in the study of Autio and Cao (2019) that will be integrated and analyzed in this section.

A. Pillar 1: Formal Institutions and Regulatory Framework

Considering the legal framework that is enhancing entrepreneurship, AIDES composes the level of business freedom and competitiveness. Meanwhile, SMEE proposes the consideration of political design that is specializing on entrepreneurship, which is an excellent supplement.

Business freedom in AIDES takes into account the efficiency of legal regulations in protecting rights of all stakeholders as well as the effectiveness of judicial system in solving conflicts. First, regulatory framework protecting property rights as well as contract enforcement are underdeveloped. Although Viet Nam now has established the scheme for protecting property rights by the Vietnam Intellectual Property Law 2005 and many sub-law documents, the implementation is finite, reflecting to the diffusion of counterfeits. The reasons relate to government monitoring effectiveness and the deterrence of judicial punishments. Second, legal protection for investors in Viet Nam is underdeveloped. Although the improvements in Enterprise Law 2020 and Investment Law 2014 extend the rights of investors and discourage the agency problem, the legal guarantee over the conflicts with the government are overlooked because of the lack of judicial independence. In the context of a socialist country, economic freedom in Viet Nam is lowest among ASEAN-6. The score of business risk in Viet Nam is lowest compared with other peers in ASEAN-6. According to the suggestion of The Global Entrepreneurship and Development Institute (GEDI) subject to Global Entrepreneurship Index (GEI) score, reducing business risk is the area that needs most efforts to be dedicated in Viet Nam's entrepreneurship ecosystem.

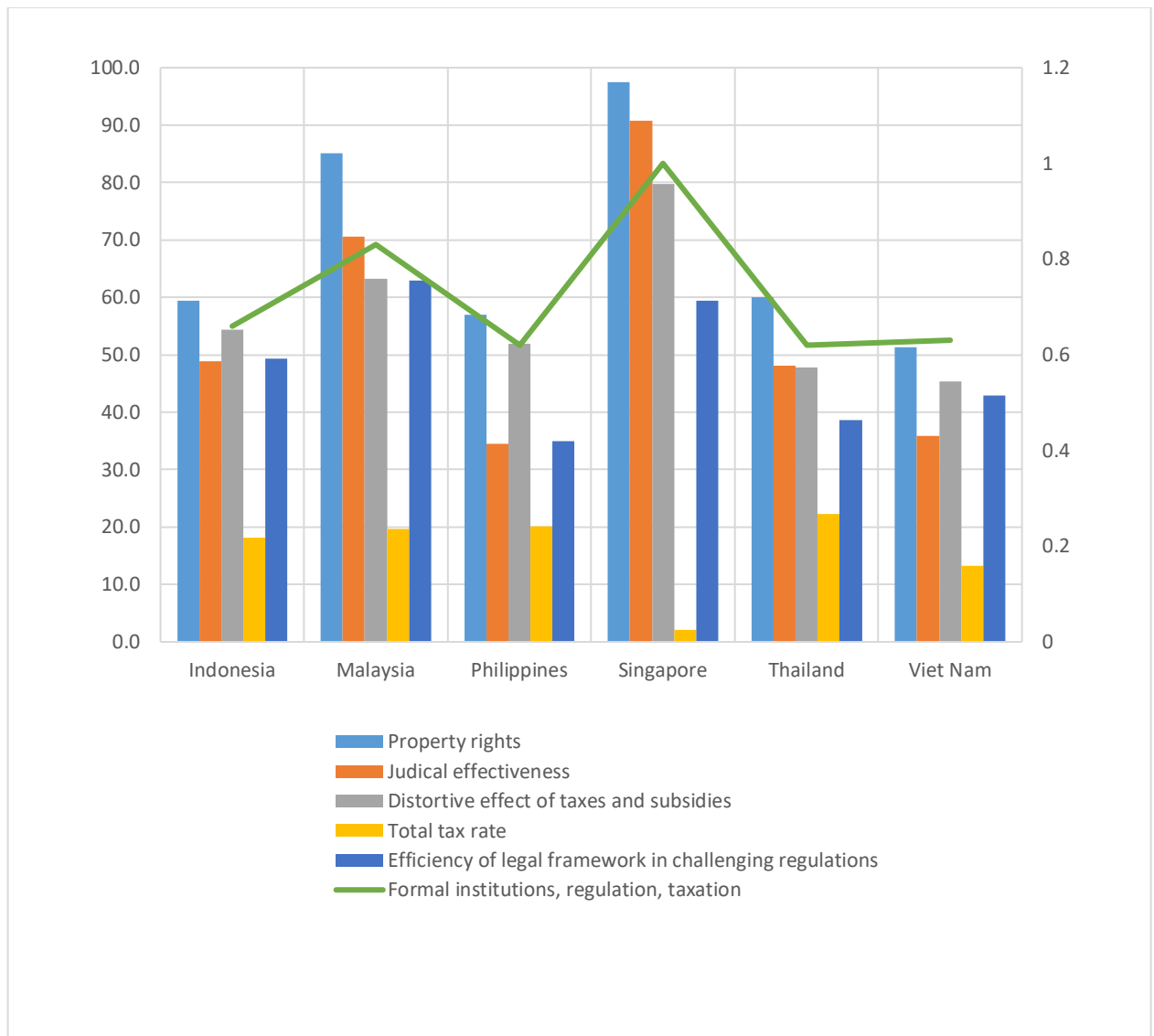
Regarding the competitive environment, AIDES pays attention to the effects of tax regulations on entrepreneurship. Fortunately, Viet Nam's tax payment index has been improved continuously in recent years that led to Viet Nam's elevation in Global Competitiveness Index. New modifications in tax law system, effective since 2015, limits the number of tax categories and simplifies the procedure of corporate tax payment. Electronic invoices and online tax payment are implemented that help reduce corporate compliance expenses. For imported goods, lots of trade barriers have been eliminated, thanks to the Viet Nam's participation in many free trade agreements and WTO, especially in sector of defense, transportation, energy, information and communication technology (ICT) and health care. Overall, AIDES score for this pillar in Viet Nam was 0.63, higher than the Philippines and Thailand in ASEAN-6.

For the politically specialized design encouraging entrepreneurship, Viet Nam now makes a long step toward a solid regulatory framework. Viet Nam has an official Law for Supporting SMEs (2017) and Decree No. 39/2018/NĐ-CP, regulating the establishment, operation, and resources donated to small and medium-sized enterprises (SMEs). Vietnamese law classified SMEs of women entrepreneurs, innovative high-tech SMEs from general ones that focus on political support. Moreover, realizing the development of entrepreneurship as an ecosystem rather than individual components, Viet Nam established the National Program 844 that targets the facilitation of start-up ecosystem to promote the development of high-tech start-ups and new business models. According to this program, Vietnamese entrepreneurship ecosystem contains (i) informational system; (ii) supporting service center; (iii) financial support by three national funds: SME Development Fund, National Foundation for Science and Technology Development, and National Technology Innovation Foundation; (iv) networking; (v) education and training; and (vi) infrastructure for innovation. In general, the Vietnamese legal system for entrepreneurship can be categorized at high level of specialization, in which there is the facilitation for entrepreneurship ecosystem. However, the regulatory design is still a top-down approach that there is not much participation from ecosystem stakeholders.

Under these schemes, supporting activities can be classified into two categories: financial and nonfinancial supports. Besides assisting through soft loans, training and connecting activities are promoted via specialized events and courses. Unfortunately, despite the existence of institutional scheme, there is still not many Vietnamese SMEs and start-ups which are actually beneficiaries. First, regulatory compliance requirements for loan approval discourage applications because they are too strict. Second, although events and courses are organized quite frequently, they are not considered as a valuable source of knowledge for entrepreneurs. Government agencies, those which directly bring regulatory framework into reality, have not put sufficient

efforts to make them more reactive rather than proactive in accelerating entrepreneurship and digitalization.

Figure 1: Formal Institutions, Regulation, and Taxation in the Association of Southeast Asian Nations



Sources: Heritage Foundation, World Bank, and World Economic Forum.

B. Pillar 2: Culture and Informal Institutions

This pillar of AIDES considers the cultural factors and information institutions. Despite their nature as intangible and informal, social norms and unwritten rules orient not only entrepreneurial intention but also business operations.

In Viet Nam, political and economic freedoms are considered at a low level because of the undemocratic contexts, reflecting through the low level of economic freedom. In that context, corruption is a severe problem. Report from Transparency International for 2020 (Transparency International 2020) showed that Viet Nam was ranked as second in ASEAN-6 in terms of high corruption. Vietnamese inhabitants admire entrepreneurship as a career path, but the high level of corruption lessens their appreciation. Because of the existence of corruption as a common practice in business, the high status of entrepreneurs will be undermined. Moreover, corruption is also the cause for inefficient judicial systems in solving business disputes.

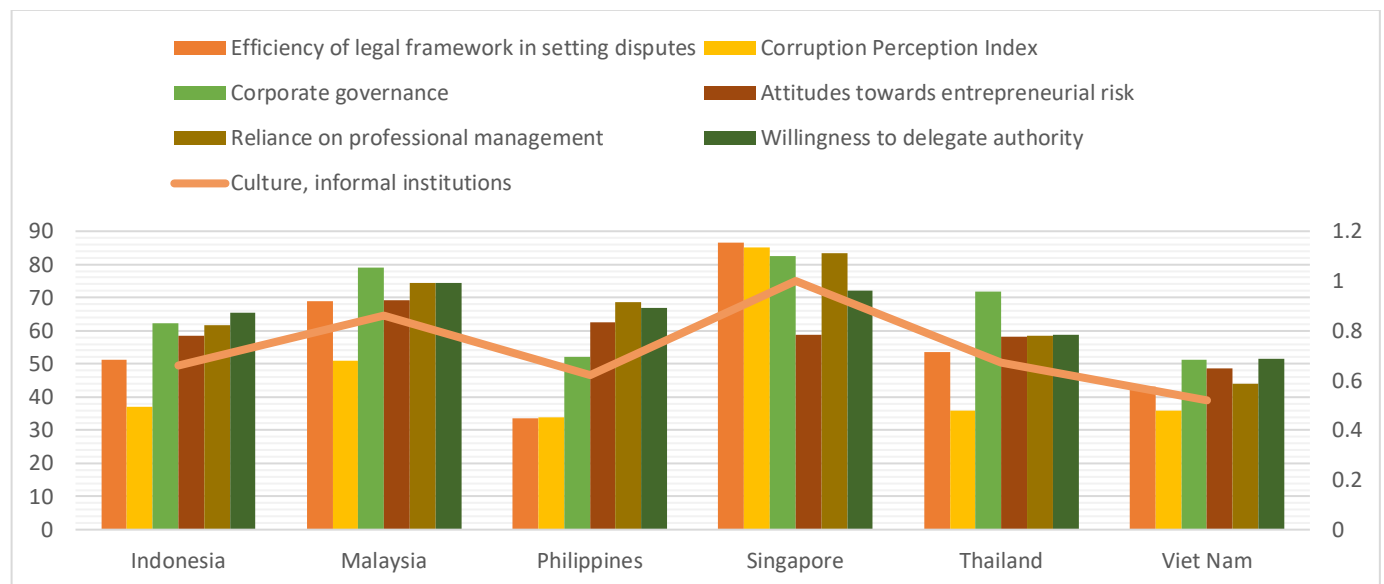
Another element in this pillar considers the level of risk acceptance. Being an entrepreneur is a risky decision and Vietnamese are not really willing to take risk. There were three motivations for Vietnamese starting business (Benzing et al., 2015): having jobs, gaining public recognition, and self-verification in which public recognition had strong effects on entrepreneurial intention. Being driven under Confucianism paradigm, social recognition has played an important role in Vietnamese value systems for a long history (Penner and Anh, 1977 and Le et al. 2014). Unfortunately, this motivation is simultaneously associated with the fear that failure will reduce their value from the public's point of view.

Although AIDES assessment for this pillar in Viet Nam is the lowest compared to other peers in ASEAN-6, it overlooked the important aspects in cultural framework that should be augmented by SMEE. SMEE proposed the underlying components for a strong entrepreneurial culture. First, social norms must discourage opportunism in doing business. Thanks to this, entrepreneurs will not be equated with cheating. An interesting study of Crittenden et al. (2009) including Vietnamese students showed the status of the cheating culture in Viet Nam. Accordingly, respondents from Viet Nam and the Philippines expressed a high tolerance for cheating behavior associated with a less-aggressive attitude toward business ethics relative to other Asia countries in the sample. Among antecedents, corruption plays a significant role in making cheating an acceptable behavior. Vietnamese higher education's emphasis on business ethics was less than that of other counterparts in Southeast Asia, according to the study of Srinivasan (2011). Consequently, Vietnamese entrepreneurs prefer short-term benefits over sustainable development and social responsibilities, even with mature enterprises. Because of this perception, Vietnamese entrepreneurs usually do not trust people other than themselves to delegate authority even when they lack professional management skills. Moreover, the effectiveness of corporate governance was affected negatively by those unwritten but common practices. Despite a complete legal requirement for accounting and reporting standards, information transparency and disclosure are applied now for public companies only, while it is difficult to find and rely on unaudited reports from SMEs. Second, the entrepreneurial community

must be aware that being a part of it is respectful. Vietnamese entrepreneurial community is rapidly developing, thanks to the flourishing of people becoming businessmen. The establishment of several business and entrepreneur associations enhances the awareness of society regarding the importance of entrepreneurs in the economy. Annually, 13 October is being celebrated as Viet Nam Entrepreneurs Day with a series of events and festivals. This is Viet Nam's strength in accelerating entrepreneurship that contributes to the raising status of entrepreneurs in public perception. Third, success stories must be spread to inspire entrepreneurship. In Viet Nam, successful entrepreneurs are honored by the government both by national rewards and facilitating their participation in the National Assembly. It is easy to find stories about outstanding Vietnamese entrepreneurs in media and social network. Many of them frequently participate in seminars, talk shows, and social network to encourage young people regarding their career path choice.

In conclusion, entrepreneurship has been bolstered in Viet Nam, thanks remarkably to the cultural support that furnishes the image of entrepreneurs in public perception. According to the study of Audretsch and Fiedler (2021), entrepreneurship in Viet Nam has flourished despite the Vietnamese institutional conditions that challenge the common beliefs that economic freedom is dispensable. The compelling case of Viet Nam provides insights on how socialist countries can encourage start-ups by cultural support despite the absence of democracy.

Figure 2: Culture, Informal institutions



Sources: World Economic Forum and Transparency International.

C. Pillar 3: Market Conditions

This pillar reflects the different features of the country's market that enhance the establishment of new businesses, indicated by the extent of monopoly, market size, product's knowledge content, and nontariff protectionism. Among ASEAN-6, Viet Nam's score for this pillar is at the lowest level.

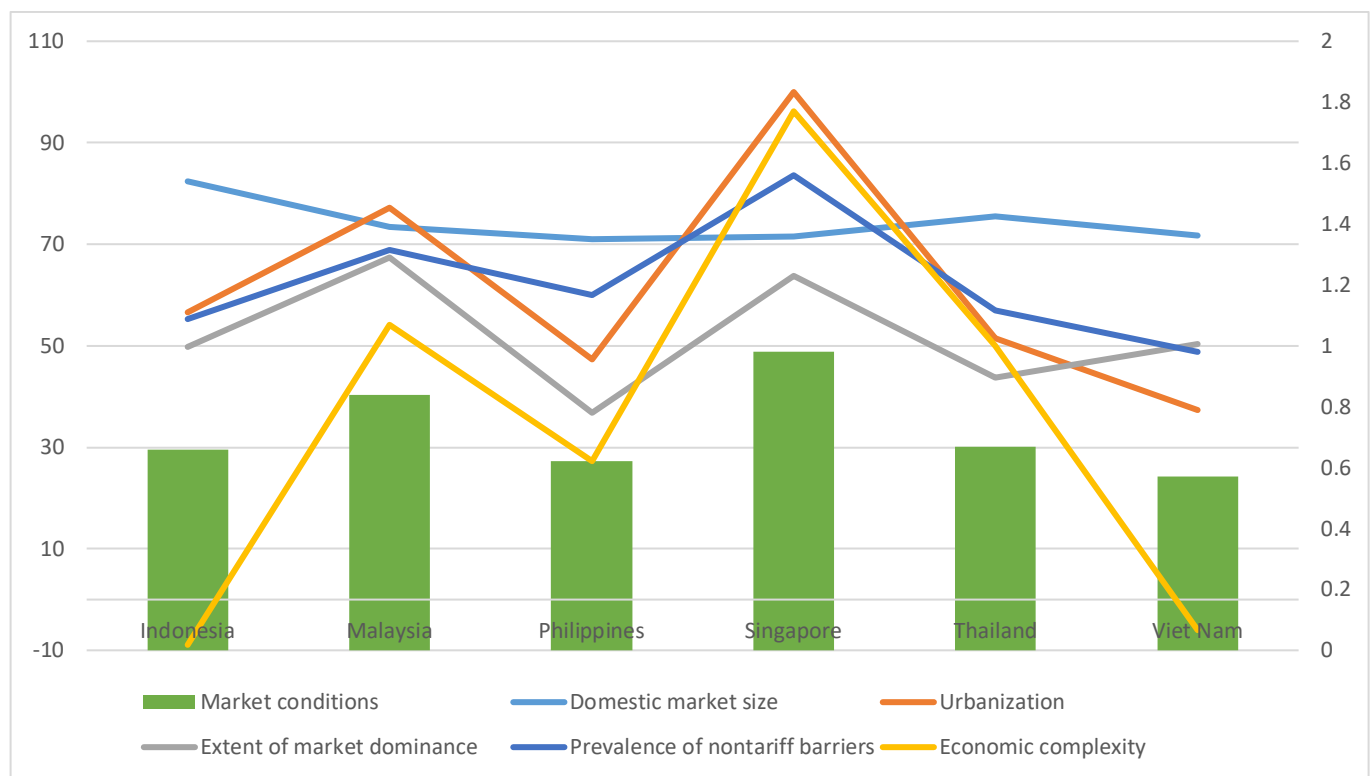
Vietnamese domestic market size is quite small compared to other countries in the sample. Viet Nam imports mostly machineries and equipment for manufacturing, while the trade balance is positive. However, thanks to globalization and international trade, this feature does not make any significant restriction on the development of Viet Nam's entrepreneurship. Viet Nam now is a member of many free trade agreements that facilitate the expansion of market outside the country's boundaries. Besides market breath, urbanization is also a factor encouraging entrepreneurship. According to Bosma and Sternberg (2014), the high rate of economic growth and economic diversity in urban regions generate more business opportunities that motivate entrepreneurship. Viet Nam's share of urban population reached 37.3% in 2020, but still the lowest compared with other ASEAN-6 countries. Although both market size and urbanization are less favorable compared with other countries, Viet Nam is in the third quartile of GEI score in which 72% of population has ability to identify business opportunities around them. According to the study of Baughn et al. (2014), the ability of identifying opportunities in Vietnamese community usually came from (i) work experiences and educational background, (ii) family members, and (iii) personal network. Vietnamese entrepreneurs have a strong ambition for starting their own business because of two intrinsic motivations: benefits and self-verification. This ambition helps them to be more sensitive to business opportunities. However, among factors that drive the ability to recognize opportunities, educational background showed limited role relative to family members and networking (Loc 2013).

Competition is another relevant market condition that reflects the entrepreneurial dynamic. Among ASEAN-6, Singapore, Malaysia, and Indonesia made a great achievement in lessening the dominance of large corporations while Viet Nam's ranking was lower over time. Along with the expansion of big corporations, a major proportion of market share has been in the hands of some big players in which state-owned enterprises were leaders in several industries. According to Vietnamese Competition Law, a company has a market-dominant position when it holds more than 30% of the market share, or a group of up to four that holds more than 75% of the market share. However, the legal prohibitions applied on those dominating players help lessen the distortion on competitiveness. Regarding competitiveness of imported goods, Viet Nam now is applying nontariff barriers to particular products, such as footwear, textiles, fuels, transport, metal, and minerals. These nontariff measures relate to technical and nontechnical requirements on

imported goods to adjust the quantities traded or prices. Among ASEAN, Viet Nam has the lowest number of nontariff measures applied.

Although Viet Nam, at present, plays an increasing important role in both regional and global value chains and economic growth also accelerates entrepreneurship, knowledge content of products and goods is acknowledged widely as a weakness of the Vietnamese economy. The economic complexity index ranking of Viet Nam is mostly lowest in ASEAN (ranked 64), only higher than Indonesia. According to Decision 418/QĐ-TTg for science and technology development strategy, Viet Nam targeted 45% of gross domestic product (GDP) contributed by high-technology products in 2020. Although the assessment report with respect to Decision 418 has not been published, Viet Nam documented the remarkable increased proportion of hi-tech products in 2020 which was 50%. However, the contribution mostly came from the foreign direct investment sector that Vietnamese enterprises' performance is limited.

Figure 3: Market Conditions



Sources: World Economic Forum, World Bank, and The Observatory of Economic Complexity.

D. Pillar 4: Physical Infrastructure

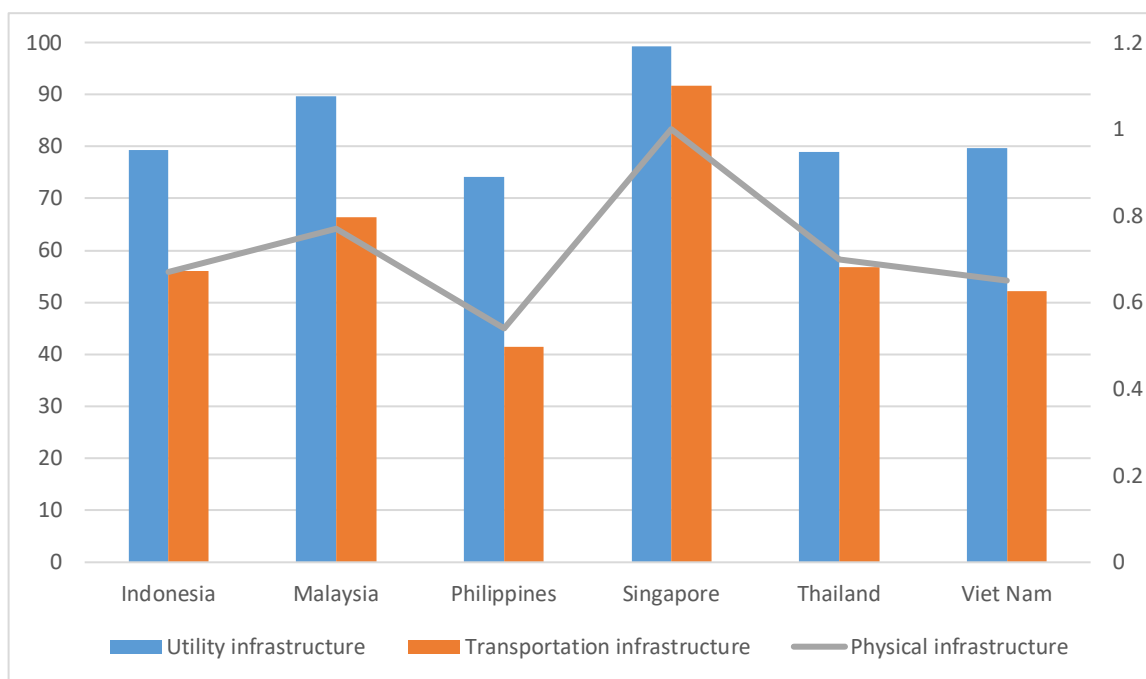
In Viet Nam, economic development and urbanization put pressure on domestic supply of electricity. At present, the state-owned Vietnam Electricity is dominating in terms of transmitting, distributing, regulating, and selling electricity. Besides, investments on power plants is insufficient and have to face significant barriers. According to Reuters, Viet Nam is predicted to struggle with intense power shortages from 2021. The shortage of energy infrastructure could possibly pose a threat to investment inflows into the manufacturing factor in Viet Nam. Among different energy categories, Viet Nam is relying on hydro and thermal that involve the use of the fossil resources for power generation. In recent years, renewable energy has been encouraged including wind and solar power.

ICT is also considered as a key growth priority by the Government of Viet Nam. For greater involvement of Viet Nam's enterprises in the global supply chains and trade, the expansion of local telecommunication infrastructure is indispensable. In fact, the finite number of fixed line and mobile platform causes a relative low level of broadband penetration in Viet Nam. Internet speed also needs to be faster along with limiting the connectivity disruption because of submarine cable breaks. For the improvement of telecommunication infrastructure, the Government of Viet Nam is now starting to liberalize and privatize this sector. A more advanced telecoms infrastructure is also being implemented to facilitate further globalization and economic growth.

Government investment on transport infrastructure is intensive in Viet Nam. In the period from 2010 to 2019, Viet Nam brought into use 1,041 kilometers (km) of expressways, upgrading all international airports in Ha Noi, Ho Chi Minh City, and Da Nang; and constructing new ones in Phu Quoc and Van Don with total capacity of 100 million passengers per year. However, the performance has not yet met the expectations and objectives. The expressway length has not reached the target of 2,000 km, Vietnamese century-old North–South railway network has remained relatively unchanged for more than 100 years, sea ports are underused, and airports are overload. This is mainly because of limited funding capital sourced from the national government as well as the restrictions in attracting private sector investment because of the existing complex mechanisms and policies. To improve the condition of local transport, several actions have been taken. The North–South high-speed railway project is under construction to replace the current rail lines. The development of a seaport master plan was approved for cutting down on logistics costs and promoting sustainable marine economic development. Currently, the first urban railway projects are under construction in two major cities—Ho Chi Minh City and Ha Noi—which are expected to reduce the overload on the local transport infrastructure. Private developers are being engaged to construct and develop these metro projects.

In terms of physical infrastructure as a requirement for entrepreneurship, Viet Nam was ranked #2 in AIDES score for this pillar, after only Singapore in ASEAN. Thanks to the remarkable investments in infrastructure, doing business in Viet Nam is booming with decreasing transport and logistics costs.

Figure 4: Physical Infrastructure



Source: World Economic Forum.

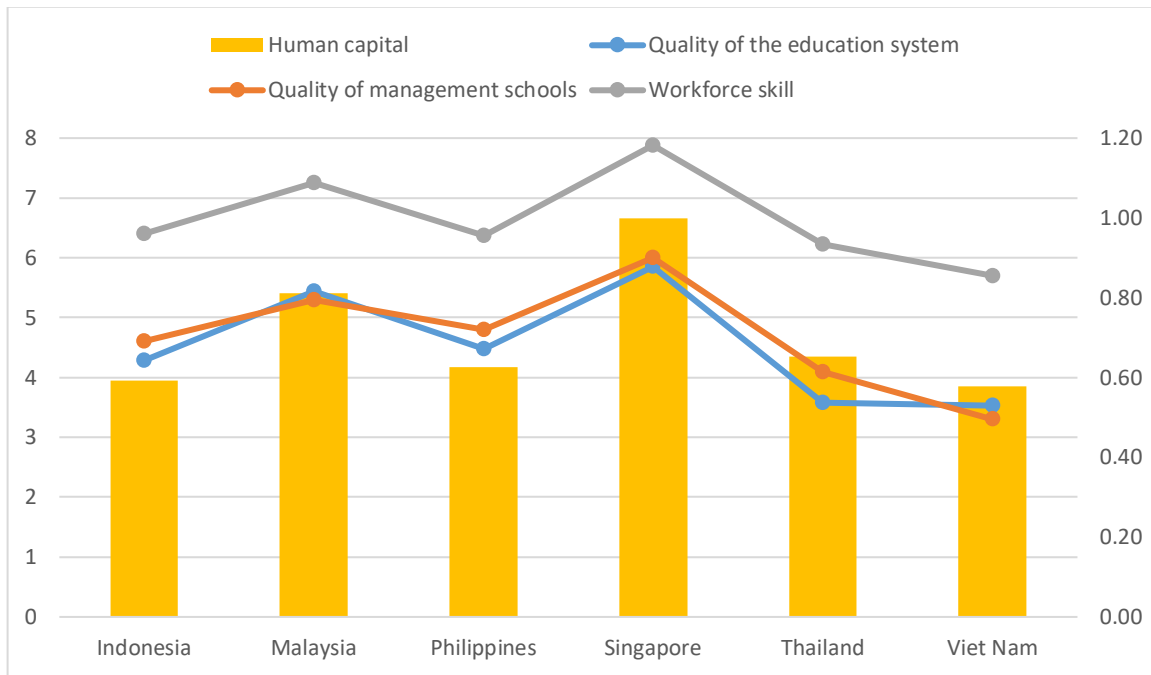
E. Pillar 5: Human Capital

Viet Nam's score for human capital is 0.24 in AIDES, only higher than the Philippines and mostly lowest among ASEAN countries. Regarding the education policy, Vietnamese legal framework shows some limitations compared to other ASEAN countries. Viet Nam's basic free and compulsory education has the lowest number of years, which is only 5 years of primary. Although government expenditure for education is quite high subject to regional average (4.17% of GDP as of 2018), the allocation of finance in education is not linked to national medium-term and long-term expenditure framework to enhance the robustness and sufficiency of educational expenditures. Although the Education Law stipulates the 20% of total government expenditure for education and training, the actual performance is quite lower which is only 3.8%. This proportion is lowest relative to other ASEAN countries, even compared to those with lower level of state budget expenditures. Because of partly limited budget for education, partly the imperfection of a

quality assessment system for tertiary education, the quality of Vietnamese education system is under concern. Because of the insufficiency of investments for education, public schools suffer from low conditions of infrastructure and low standards of teachers. Also, the high ratio of pupils per teacher hamper the effectiveness of studying in public schools. Because of an assessment system that emphasizes nominal achievements, innovation and creative thinking are not encouraged but rather teacher-based and memorization study. For mobilizing social resources into education, Viet Nam now encourages investments from the private sector through financial and nonfinancial favors. Private education is expanding rapidly, thanks to the raising awareness of the Vietnamese people regarding the quality of education.

Although the quality of tertiary education is struggling, Vietnamese higher education system is developing rapidly in terms of both qualitative and quantitative aspects. In 2013, General Secretary Nguyen Phu Trong agreed on the Resolution No. 29-NQ/TW of fundamental and comprehensive renovation for education and training. Since then, Vietnamese higher education system has been reformed and got closer to international qualifications. Quality accreditation now is a new trend in Vietnamese universities to promote Viet Nam's ranking in the global education map. In recent years, strong research groups have been accelerated that international publication has grown rapidly compared to the previous period. From strong research groups of universities, modern laboratories and research centers have been established, which play a leading role in the nation's science and technology activities. Theses of doctor of philosophy students have been published in international journals.

Figure 5: Human Capital



Source: World Economic Forum.

F. Pillar 6: Knowledge Creation and Dissemination

Consistent with a low score in human capital, Viet Nam belongs to the low group of knowledge creation and spillover AIDES score. Regarding the relevance of education curriculum toward the needs of the economy, both the government and citizens acknowledge this issue as a major weakness of the Vietnamese education system. The Vietnamese national curricula for secondary education do not emphasize the importance of equipping students with practical knowledge and skills. The pressure is being placed on undergraduate and vocational education, which is insufficient for preparing qualified human resources. For digital start-ups, the human resource problem is even more severe because of the separation between business and technology disciplines. Students in technological universities have not engaged in business classes and vice versa, which leads to lack of skill sets demanded for digital entrepreneurs. According to the study of Minh and Mai (2018), among 10 determinants of successful digital start-ups in Viet Nam, education has the weakest impacts. In Viet Nam, according to GEI report, 71% of the population assumes that they have adequate skills for running a business. Although the level for tertiary education is pretty low in Viet Nam, Vietnamese people feel confident about their entrepreneurial skills which was usually come from experiences rather than acquired through

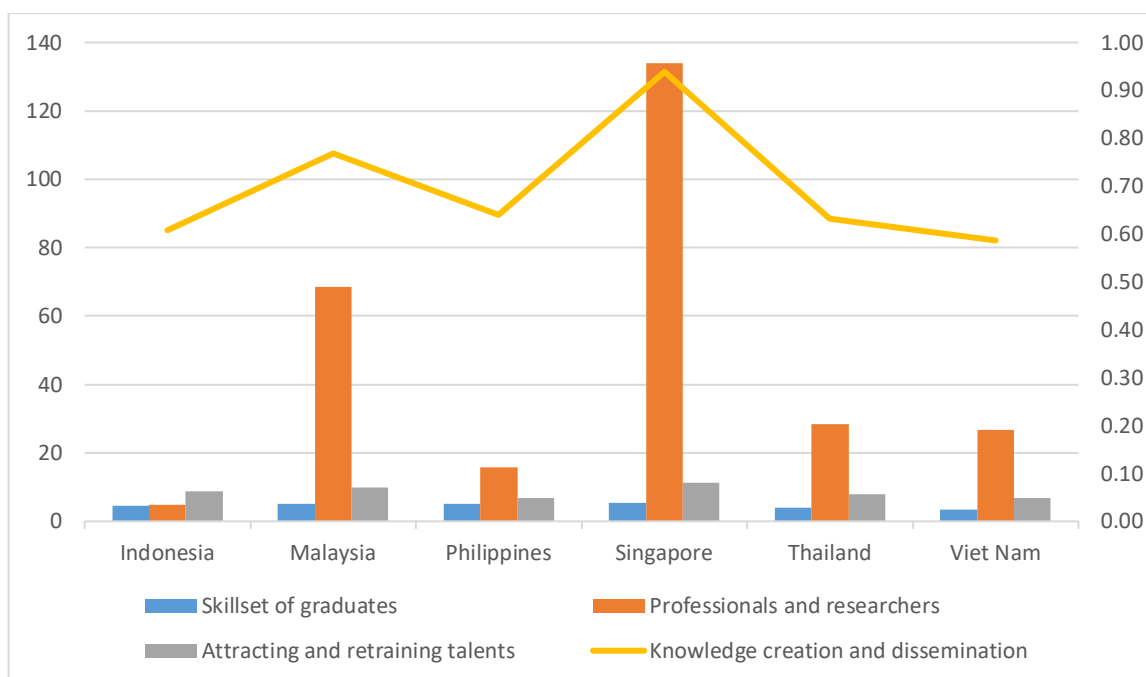
education and training. According to a study of Luong and Nham (2014) conducted among Vietnamese individuals, the percentage of respondents who thought they have entrepreneurial skills was much higher than the percentage of respondents who actually had intention for starting businesses. In addition, the rate of business discontinuation was quite high at 28%, mostly caused by unprofitability. In fact, both entrepreneurial skills and intention increased proportionally with level of education (Liñán et al. 2011 and Zhang et al. 2014).

To overcome this limitation, Viet Nam is implementing a scheme for curriculum improvement mostly at the undergraduate level. Enhancing the participation of entrepreneurial community into business education program is a new trend in Vietnamese universities. For technological education, students are provided longer-time practice in the manufacturing sector under the national theme of technical and vocational education and training.

Investments for research and development (R&D) activities in Viet Nam are at the bottom group in ASEAN countries, which was only 0.52% in 2017 according to World Bank data. However, the recent wave in boosting research activates led by universities helps in rapidly increasing the proportion of professionals and researchers. The last 5 years witnessed the flourishing of scientific publications for Vietnamese researchers across various fields, from biological technology, medical, computer sciences to economic and business management. Research is now becoming an important task of lecturers in universities that is enhanced by both key performance indicators and financial incentives. Although there are still questions regarding the quality and academic ethics, the positive effects on research skills and research intention are undeniable.

Regarding attracting and retaining talents, Viet Nam trails behind most of its Southeast Asian peers and is at the bottom half of global ranking in attracting talent, according to The Global Competitiveness Report 2019. Recently, Viet Nam has started to realize the importance of human capital in promoting a knowledge-based economy. Accordingly, various schemes have been implemented in which the most noticeable was the National Strategy for Attracting and Retaining Talents 2021–2025. For the first time, attracting and utilizing talents have been considered systematically by the government. According to this theme, Viet Nam's emphasis is on regulatory framework for talent recognition and, accordingly, attracting policies, especially for public sector. The strategy acknowledged talents in high-tech industries, education, and data analytic as some of indispensable sectors for promoting knowledge-based economy.

Figure 6: Knowledge creation and dissemination



Sources: World Economic Forum and INSEAD.

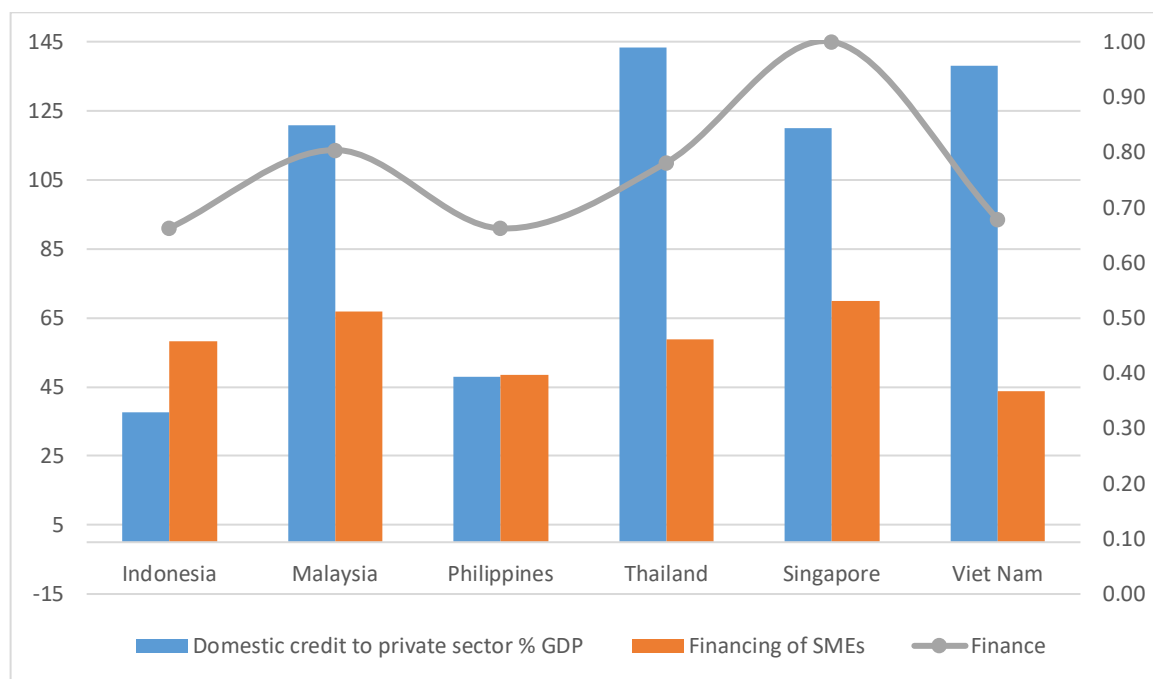
G. Pillar 7: Finance

Among many determinants for successful entrepreneurship, capital is the most important not only for the success but also for a start. Because of the nature of uncertainty associated with new businesses, it is not easy for entrepreneurs to mobilize capital. Regarding this pillar, AIDES preferred the role of the finance sector in which banking system plays a major contribution. However, a network of venture capitalists and angel investors are, in fact, the key sponsor for new-born enterprises, as what has been considered in SMEE.

Regarding the financial support of banking system for businesses, Thailand and Viet Nam are leaders in terms of credit to private sector. Rather than relying on financial markets and other sources in raising capital, Vietnamese enterprises preferred debt in their capital structure. However, contradict to a high level of private sector credit, only a small fraction in these flows to SMEs, leading to the lowest score referring finance to SMEs. Vietnamese SMEs, especially new enterprises, have to face with series of strict requirements for loan applications. Without a long history of profitable operations associated with audited financial information, entrepreneurs usually have to mortgage their owned assets which is not always available. In Viet Nam, although there are some banks providing loans for entrepreneurs, it is not on an ongoing basis and favorable.

In addition to financial institutions, venture capitalists and angel investors play a more proactive role in financing entrepreneurship, especially digital start-ups. Along with the attractiveness of Viet Nam's business environment, Viet Nam now has more than 100 venture capitalists and 1 community of angel investors (Angels 4 Us), after only Indonesia and Singapore in ASEAN. In 2019, total invested capital reached a peak of US\$874 million and was reduced only because of the coronavirus disease (COVID-19). Among sectors, payment services and retail are leading in total raised capital, followed by financial services and real estates. The flourishing of venture funds and investors strongly contribute to the rapid booming of digital start-ups in Viet Nam. Regarding government involvement, related government authorities are currently accomplishing regulatory framework for the operation and protection of venture investors as well as the cooperation between them and local start-ups.

Figure 7: Finance



GDP = gross domestic product, SMEs = small and medium-sized enterprises.
Sources: World Bank and World Economic Forum.

H. Pillar 8: Support and Networking

Entrepreneurs require a network, and cannot be created and developed by themselves. This pillar refers to the social capital of entrepreneurs as well as the infrastructure in which entrepreneurs can communicate and make transactions. According to GEI score, although the score for Vietnamese entrepreneur's social capital was high (89%), an underdeveloped

infrastructure (22%) made the overall score for this pillar in Viet Nam lower than that of others in ASEAN-6, except the Philippines.

Social capital is a strength of Vietnamese entrepreneurs. 89% of respondents have mature entrepreneurs in their close network, which is highest in ASEAN-6. The high score can be explained by the rapid growth of numbers of new businesses which enrich start-up communities. According to Viet Nam's General Statistic Office, new registered enterprises have increased continuously in the recent 5 years, especially in 2021. This explained why it was much likely that someone can have a relationship with entrepreneurs. However, according to SMEE, the high number of entrepreneurs per se is insufficient in reflecting the breadth and quality of start-up communities. Related to this aspect, SMEE proposed the concept of community richness, considering not only new business amount but also the survival and serial entrepreneurs. Although Vietnamese start-ups amount has grown rapidly recently, the number of high-quality and innovative start-ups is still limited, reflected through the high proportion of discontinuation within 5 years as well as the low contribution of SMEs entrepreneurs into the country's innovation (OECD 2017). Moreover, there are few examples of serial entrepreneurs. Carbonara et al. (2020), in a study examining 4,000 Vietnamese enterprises, found a low proportion of Vietnamese serial entrepreneurs because of the lack of three elements: great endowment of human capital, high entrepreneur skills, and high quality of new business.

Not only based on own social networking for entrepreneurs to do business, it also requires a community in which entrepreneurs can communicate, exchange knowledge, and raise capital. This is exactly where the government is dedicating efforts to improve through conducting the following tasks:

First, enhance capital flows to start-ups. On the one hand, organize training courses that emphasize financial management skills and capital-raising skills. Thus far, 12 courses on financial and investment skills with more than 300 learners have been organized. In the market of online education, courses about investment and finance are booming, thanks to high market demand. On the other hand, government agencies cooperate with funds and investors to support entrepreneurs in mobilizing capital.

Second, promote entrepreneurship training. Besides the arrangement of events and courses, Program 844 promotes the collaboration among universities and institutions for bringing entrepreneurship into undergraduate curriculum. As of 2019, there were 244 courses being held for more than 230,000 learners, including both entrepreneurs and government officers. University-based Accelerator Program was established targeting to be a high-quality entrepreneurship training program for students. Important publications related to investment, entrepreneurship, and regulatory issues were handed to more than 1,000 entrepreneurs all over the country. However,

because of difficulties in human resources and budget constraints, training on lean start-up remains limited.

Third, tighten the connection among entrepreneurs, mentors, accelerators, established businesses, and government agencies. To widen the network for entrepreneurs, the government supports the organization of events and competitions that encourage the participation of both domestic and international start-ups; for example, Startup Day, Tech Festival, Vietchallenge, and Vietnam Frontier Summit, to connect Vietnamese entrepreneurs with international fellows. More than 1,400 accelerators are set up all over the country, concentrating on big cities that supports entrepreneurs in information, working spaces, tools, and networking. These accelerators are also in charge of constructing a system of mentors and corporations that can support new businesses in terms of improving business model, product innovation, capital, and customers. Moreover, Vietnam Startup Mentors Alliance has just been established in 2020, emphasizing on mentoring activities. Unfortunately, the efficiency of this scheme is still finite because of the short time of implementation. Results from interviewing Vietnamese entrepreneurs showed that entrepreneurs rarely exchanges ideas and experiences with each other and with accelerators. The knowledge spillover, if any, is motivated by competition rather than experience exchange. However, Viet Nam has put some very first steps on accelerating entrepreneurship, starting from a solid regulatory framework that, thanks to it, the potential improvement is definitely promising.

In conclusion, although the importance of an entrepreneurship ecosystem has been acknowledged and promoted in Viet Nam recently, the development is still in the very first steps. Entrepreneurship ecosystem in Viet Nam got the lowest AIDES score compared with other ASEAN countries. Among pillars, informal institutions and human capital are the two factors that need the most efforts dedicated for the improvement. Despite an underdeveloped ecosystem, Vietnamese cultural elements encourage entrepreneurial spirit and make the major contribution to the flourishing of entrepreneurs. However, only a small proportion of new businesses becomes mature and sustainably develops which indicates that Viet Nam requires a systematic reform of education and training to improve entrepreneurial skills.

III. DIGITAL ECOSYSTEM IN VIET NAM: COMPARISON AMONG ASEAN-6

According to the definition of Van Welsum (2016), digital entrepreneurship refers to the creation of new business that allows internet-based delivery of products and services, regardless of whether it is a start-up or the digital transformation of existing enterprise. For economies with young population where unemployment is a heavy pressure such as Viet Nam, the growth of digital entrepreneurship appears as a welcome trend. After the outbreak of COVID-19, digital

economy is raising its relevance as a weapon for economic recovery and development in the context of social distancing and travelling restrictions. The crucial components of a digital ecosystem will be described in this section regarding the current status of Viet Nam. In addition, the interview results, subject to digitalization, innovation, and performance of Vietnamese enterprises, will be discussed in association with the comparison across ASEAN countries.

According to AIDES, country's digital entrepreneur system consists of seven pillars. The first one—Culture, Informal Institutions—considers the internet usage of the country's citizens. Viet Nam's AIDES score (0.29) is above Indonesia and the Philippines but below Singapore, Malaysia, and Thailand. Viet Nam officially connected to internet since 1997. Acknowledging the importance of internet connectivity with national development, since 2001, the Government of Viet Nam, under the lead of the Ministry of Information and Communication, accelerated the development of high-speed service, national connectivity, and a competitive online environment. As of 2021, Viet Nam's internet penetration rates reached 70%, mobile subscriptions reached 154.4 million for 97 million of population. In terms of social media account, 73.7% of Vietnamese people now are social media users. 62% of internet users participate in online shopping in which the highest amount of spending was for travel, fashion, and furniture (Hootsuite and WeAreSocial 2021). Digital economy is booming in Viet Nam recently, thanks to both the easy access to internet and the changes in shopping culture. However, although internet access has been promoted widely in Viet Nam, the speed and stability are still needed to be boosted. Also, households in rural and promote areas are under bad conditions of computer coverage and internet access.

Besides cultural support, digital economy needs a regulatory framework in controlling the involvement of all stakeholders with encouragement from government policies. Compared with other ASEAN countries, Vietnamese institutional conditions for digital entrepreneurship have just been developed recently. Until June 2020, Viet Nam has an official scheme for digitalization which is under Decision No.749/QĐ-TTg. Accordingly, the Ministry of Information and Communication is now managing the National Program for Digitalization targeting on digital government, digital economy, and digital society. Within this program, digital start-ups are acknowledged as the major force for the success of national objectives. Decision 749 acknowledged six pillars for the development of a digital society in Viet Nam: (i) recognition transformation, (ii) institutional improvement, (iii) digital infrastructure development, (iv) digital platform development, (v) network security, and (vi) R&D. In concert with National Program 844, the interrelations among entrepreneurship, digital start-ups, and digitalization has been well-recognized and coordinated in Viet Nam, although they are still under the management of two different policy-making agencies.

Market conditions are another pillar that AIDES takes into account for assessing national digital entrepreneurship ecosystem. Concurring to the report of Google and Temasek, in 2018, the measure of the digital economy in Southeast Asia came to US\$72 billion; Viet Nam is sixth after Indonesia, Malaysia, the Philippines, Singapore, and Thailand. By 2025, it is estimated that market value in Southeast Asia will increment to US\$240 billion, and Viet Nam will account for about 18% of the estimate. In truth, within the past 10 years, Viet Nam's digital economy has quickly created both its framework and market conditions. With more than 96 million individuals, Viet Nam is considered to be one of the countries with a great digital economy growth rate within ASEAN. For the development of ICT infrastructure, the government issued the Decision 149/QĐ-TTg approving the national program for ICT broadband development.

Viet Nam has recorded the rise of digitalization waves in numerous areas and financial segments, from commerce, payment to transportation, education, and health care. According to the report Southeast Asian Digital Economy 2019, Viet Nam's digital economy in 2019 was worth US\$12 billion (contributing 5% of national GDP in 2019), which is four times higher than the estimate of 2015 and is anticipated to reach US\$43 billion by 2025 in the areas of e-commerce, online travel, online communication, and ride-hailing.

Viet Nam's digital economy, beside Indonesia, is growth leaders in Southeast Asia (averaging 38% a year compared to regional average of 33% since 2015). Ho Chi Minh City and Ha Noi are two of the seven major cities fostering the digital economy in ASEAN (Viet Nam ASEAN Portal - ASEAN National Communication Desk 2022). Indeed, AIDES score for market conditions in Viet Nam ranked #3, the same with Malaysia and only after Singapore.

The fourth pillar in AIDES digital ecosystem relates to the development of physical infrastructure. The digital infrastructure has been focused on investment and construction in Viet Nam in recent years, leading to the high rank in AIDES score for physical infrastructure (ranked #2 after Singapore). First, national information technology (IT) and telecommunications infrastructure is strongly developed and widely covered. By 2020, the national telecommunications infrastructure will cover the whole country, including in remote, border and island areas with more than 800,000 km of fiber optic cables and transceiver stations. The quality is also increasingly improved. Broadband system is strongly developed. Vietnam Comprehensive Internet Index 2018 ranked 43rd out of 86 countries, higher than some countries in the region (Indonesia ranked 49th, the Philippines ranked 54th); average download speeds achieved on 6.9 megabits per second (Mbps) 2018, ranking 75th out of 200 countries ranked (higher than Indonesia at 5.8 Mbps, and the Philippines at 5.2 Mbps). The number of fixed broadband subscribers reached more than 13.58 million, of which more than 12 million subscribers used FTTx fiber optic cable with access speed of more than 10 Mbps. Total international bandwidth

reaches more than 8.1 Tbps with 06 undersea cable routes connecting to the world. Internet service charges in Viet Nam are moderate. Fixed broadband internet service charges in Viet Nam are among the lowest in the Asia and Pacific region (converted according to purchasing power parity). Second, mobile network in Viet Nam is developing strongly. The coverage rate reaches 99.7%. 3G and 4G mobile networks have been widely covered. 5G mobile network has also been licensed for testing and initial success. The number of subscribers increased at a very high rate of 30%–40% per year, and so far there are more than 100 million landlines and mobile phone subscribers, and tens of millions of internet subscribers. The rate of internet users in Viet Nam has exceeded the average of the region and the world. Third, Viet Nam is also gradually developing satellite technology. By the beginning of 2019, Viet Nam had launched a number of satellites, including satellites aimed at providing internet for remote areas.

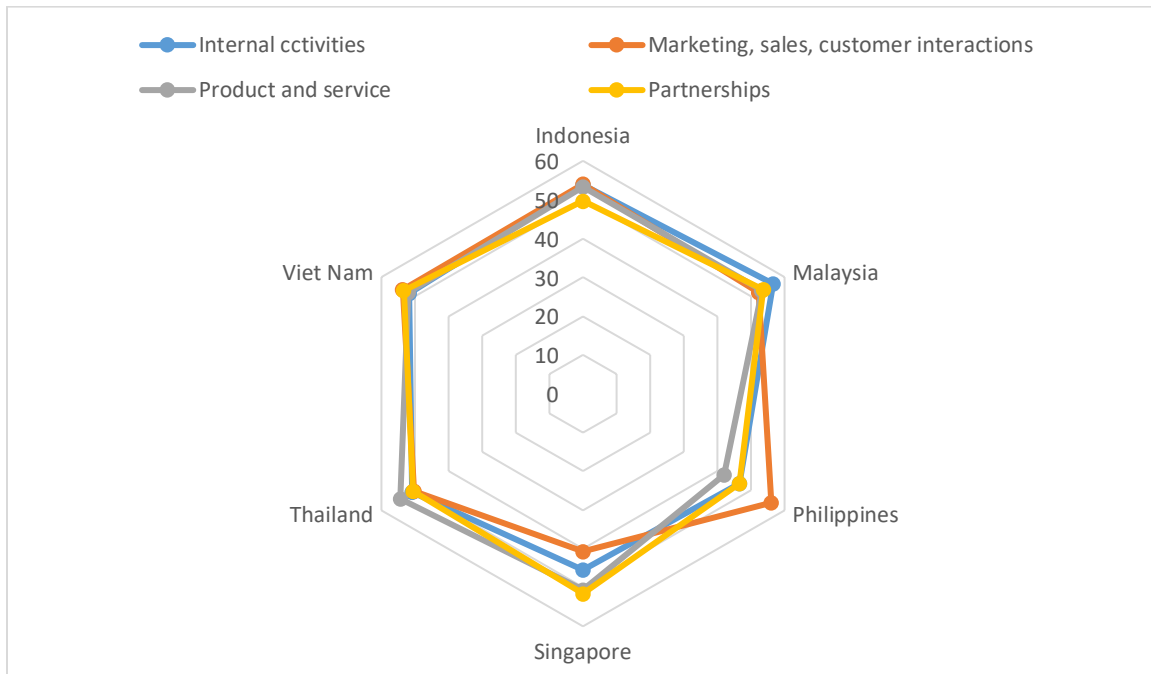
Box 1: Viet Nam Information and Communication Technology Facts: 20 Years On

- Annual revenue growth rate: 37% on average.
- Productivity: 7.6 times to average national productivity
- Contribution to gross domestic product: 14.3%. Ranked #1 across industries
- Export values: US\$89.2 billion in 2019. Ranked #1 across industries
- Total foreign direct investment: More than US\$20 billion
- Mathematical skills: Ranked #1 in the Association of Southeast Asian Nations
- Telecommunication, internet broadband charges: Lowest in Asia and the Pacific

Source(s): Digital Entrepreneurship across the APEC region, RMIT University

Regarding the digitalization level in Vietnamese organizations, leading agencies of the party, state, ministries, central agencies, localities, agencies, units, and enterprises mostly have internal information networks and use IT in their operations. Many organizations have their own websites. There are more and more electronic newspapers and electronic information sites. E-commerce is growing at a fast pace. National data infrastructure is increasingly developed in both the public and private sectors. On the national scale, national-scale databases have been formed and promoted effectively in providing online services such as the national database on population and on business registration; and database of households participating in insurance, of tax, and of customs. In the business sector, along with promoting the application and development of digital technology, large databases to serve customers and business are being developed. According to results from interviews, Vietnamese enterprises are leading in applying digital technology into different aspects of their operations.

Figure 8: Digitalization Level in Vietnamese Enterprises



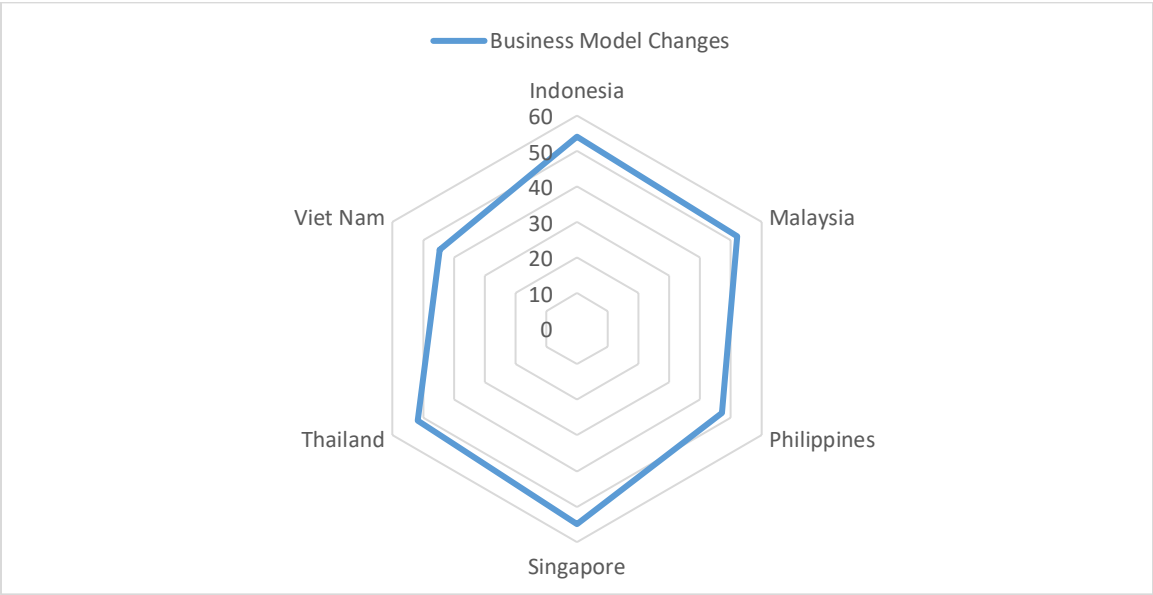
Source: Interview results.

An electronic authentication system is also being invested in and developed. Currently, there are 12 licensed enterprises nationwide to provide public digital signature authentication services for people and businesses, helping to make online transactions convenient and safe, especially for businesses. Enterprises now can use online public services at a high level (levels 3 and 4) in the fields of tax, customs, and insurance. For agencies in the political system, including party and state agencies, countries, governments, and political organizations have been provided also with digital signature authentication services by the Government Cipher Board.

Human capital and knowledge creation remain as Viet Nam's weakness in the aggregate digital entrepreneurship ecosystem. Digital skills among pupils and students are limited because most of them use digital tools only for entertainment. When faced with online teaching and studying because of COVID-19, up to 70% of learners cannot catch up with the changes, especially low-income groups and provinces. Regarding human resources in science and technology, the quantity is not accompanied by high-quality researchers. According to the Journal of Vietnam Academy of Social Sciences, 53% of the total Vietnamese researchers belong to natural science and technology. However, only 12% of them is under 50 years of age and 25% is fluent in English. Registered patents and property rights are mostly lowest in ASEAN countries despite a large population. Also, the practical implications of inventions were finite. Among respondents in the interview, Vietnamese enterprises have the lowest level of business model

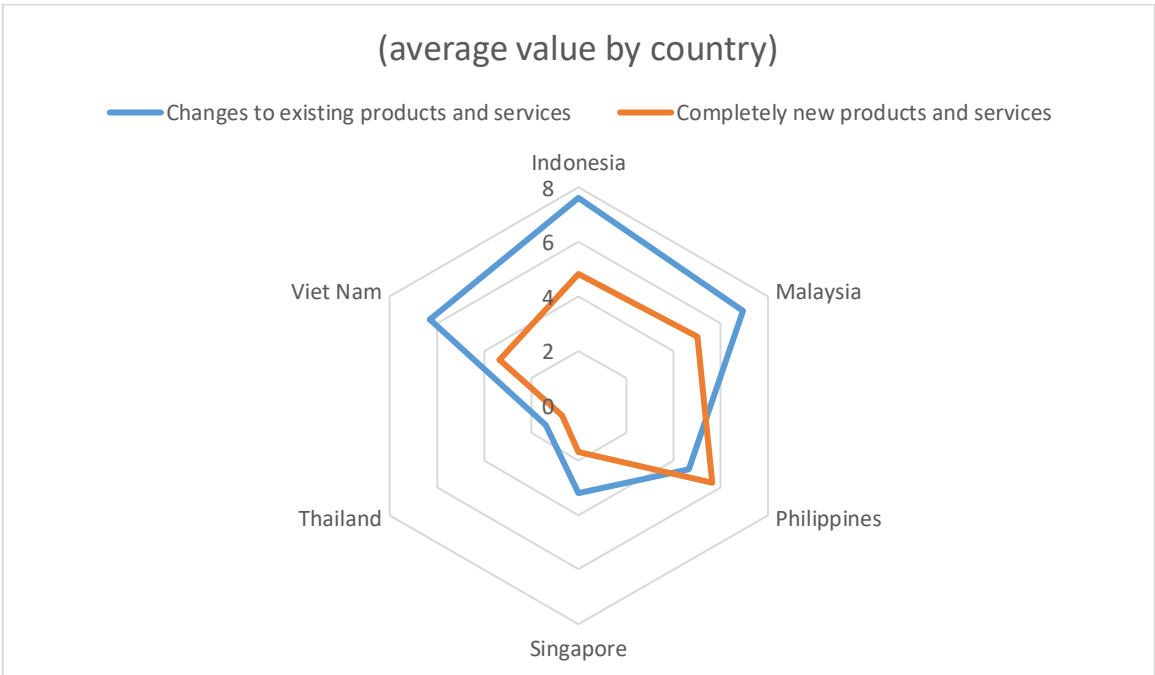
innovation and low number of new products, services, or business ideas compared to other peers in ASEAN. Education and training could be considered as Viet Nam’s biggest weakness in accelerating a knowledge-based and digital economy.

Figure 9: Business Model Changes



Source: Interview results.

Figure 10: New Products, Services, and Business Ideas



Source: Interview results.

The next pillar in AIDES digital ecosystem refers to financial aspect. Specifically, it is more focused on customers of digital start-ups whose participation in online shopping and payment promotes the interests of digital entrepreneurs. According to Vietnam IT Landscape 2020 of TopDev, internet transactions and mobile transactions have increased 238% in value in 2020 with 78 internet payment providers and 45 mobile payment providers. However, cash-off payments in Viet Nam were not that popular with only 20% of total transaction value because only 30% of Vietnamese people has bank accounts, ranked #5 in ASEAN-6 and only higher than the Philippines in AIDES's pillar score. To encourage electronic payment as a pillar for digital economy development, the government in 2016 issued the Decision No. 2545/QĐ-TTg for accelerating noncash payment. Accordingly, until 2020, Viet Nam has below 10% as the proportion of cash in total payment methods, the number of Point of Sale (POS) reaches above 300,000 with 200 million transactions per year, and at least 70% of people above the age of 15 has bank account. Currently, the biggest barriers for Vietnamese people making online shopping and payment are low trust, personal information leakage, and non-account problem.

Box 2: Mobile Money

As a solution for enhancing noncash payment, and because of only having a small proportion of its population with bank accounts, Viet Nam issued Decision 316/QĐ-TTg which approved the pilot utility of telecommunication accounts for small value payments. According to this, Mobile Money refers to the service provided by e-wallets providers and telecommunication network providers. To use the service, consumers have to open Mobile Money account and deposit into it by using their telecommunication accounts. Mobile Money providers must deposit their overall Mobile Money balance to a bank account and use it only for making intermediate payments for customers. Payment limit should not exceed D10 million per month per account. A set of regulatory conditions has been put in place to make sure that service providers have no intervention to total money supply. Priority is given to rural areas, highland, promote areas, border regions, and islands.

Source(s): Authors

In conclusion, although the completion of digital ecosystem in Viet Nam is still at initial phases, which is in the half bottom cluster of the ASEAN region, Viet Nam has good prerequisites for the growth of digital economy. Market conditions, physical infrastructure, and the recognition by the government are constructive elements that are fostering digital entrepreneurship in Viet Nam. However, to improve digital skills and technology, the insufficiency of human resources must be overcome by the reforms in national education and training strategy.

IV. DIGITALIZATION IN EDUCATION SECTOR

A. Education Technology Market Overview

E-learning was introduced in Viet Nam in 2007. Until 2013–2014, cross-platform e-learning content appeared for personal computers, smartphones, and tablets. As a result, online English training is starting to receive a lot of attention. Some of the major providers now include Dream Viet Education, Kyna, and Rockit Online. During 2015–2019, massive open online courses grew rapidly into a new market segment. Today, awareness about teaching and learning remotely is booming. As a result, the market is willing to spend significant sums on online training. Currently, education technology (EdTech) and e-learning have gained even greater traction, with more people adopting and using distance learning and teaching platforms because of the COVID-19 pandemic. Recently, EdTech has witnessed the launch of several new large EdTech projects as the sector continues to expand exponentially.

Over the past year, the COVID-19 pandemic has accelerated the growth of online training. According to the Organisation for Economic Co-operation and Development (2020), nearly 80% of Vietnamese students are studying online, which is higher than the international average of 67.5%. Viet Nam was ranked 17th out of 200 countries for the timely application of IT in response to the pandemic. According report of Ken Research (2019), the EdTech market in Viet Nam is worth US\$2 billion, with a compound annual growth rate predicted to reach 23.4% in the period 2019–2023. Viet Nam also became a potential EdTech startup and investment hotspot when it entered the top 10 countries with the largest e-learning growth in 2019 (44.3%).

Since the second decade of the 2000s, to promote the development of digital education as an indispensable sector of digital economy, the government has implemented EdTech development projects. Accordingly, Decision 117/QĐ-TTg dated 25 January 2017, approved the national project for the education sector to strengthen ICT application in teaching, learning, and scientific research. Following, Circular No. 32/2020/TT-BGDĐT allows students to use phones during class hours for learning purposes and Circular No. 09/2021/TT-BGDĐT adjusts online teaching in general education institutions and continuing education institutions.

As a newly sector in Vietnamese digital entrepreneurship ecosystem, difficulties and limitations are inevitable for digital education. For example, because of its ambiguous legal definition, investors in EdTech often registered for other business activities such as education services, IT services, e-commerce and then apply for additional sub-licenses specific to their business model (i.e., license to establish English teaching center, information technology, certificate of vocational education. Moreover, network infrastructure and IT equipment for schools, teachers, and students in remote areas are still lacking, outdated, or not synchronized; and many places have not met the requirements for digital transformation (both in terms of education

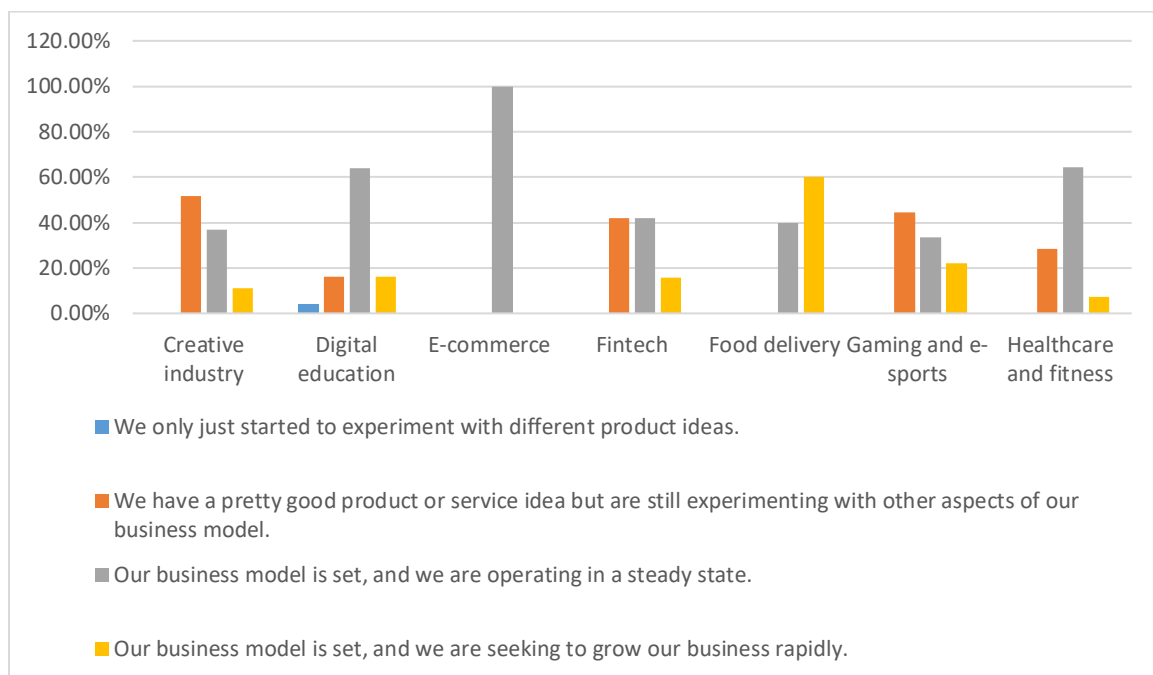
management and teaching). Digitalization in education and training requires a large investment in human resources (including management and implementation personnel) as well as digital infrastructure. Currently, digital learning materials (such as e-books, e-libraries, multiple-choice question banks, e-lectures, e-learning software, and simulation application software) are still being developed ad hoc. Nor is the development systematic, so managing the quality and content of learning is fraught with difficulties. Meanwhile, collecting, sharing, and exploiting educational management data and digital learning materials need tighter legal oversight of copyright, intellectual property, information security, and electronic transactions.

B. Digitalization of Vietnamese Enterprises: EDTECH in Focus

1. Business Model

Most businesses in the digital education industry have already determined a business model (Figure 11), and growing rapidly (74%). Compared to other sectors with similar years of operation, digital education businesses tend to formulate business models much sooner and grow faster.

Figure 11: Business Model



Source: Interview results.

EdTech business models in Viet Nam can be divided into three main groups:

- (i) **Support type.** Provides management and operating systems, adaptive learning tools for educational institutions.

- (ii) **Platform type.** Provides platforms for programs and learning content for learners in various disciplines (general education courses, vocational education, language courses and arts for instance). This model has thrived well in developed countries and continues to do so.
- (iii) **Integrated type.** Produces and develops video lessons and learning content and distributes it via websites and smartphone apps.

Based on the above three models, the EdTech market can also be divided into different segments; namely, early childhood education, learning management systems, next-gen study tools, broad online learning platforms, tech learning, language learning, online to offline, test preparation, and school administration.

- (i) **Early childhood education.** This is a model developed specifically for young children. This model is creative and offers bright, age-appropriate content. This content includes educational games and intellectual development exercises suitable for children. Companies in this segment include Sunbow, Kidup, Monkey Junior, Kyna for Kids.
- (ii) **Learning management systems (LMS).** LMS is a digital platform system that plays an important role in managing courses and classes. LMS helps students learn easily, access shared lessons, and simplifies teachers and parent management. Successful companies in this segment include Wewiin, Ai Vietnam, Huong Viet.
- (iii) **Next-gen study tools.** Provide learning support tools and games to support learning, including some outstanding startups such as Edunet, Edu2Review, Lumosity.
- (iv) **Broad online learning platforms.** These online course delivery platforms offer various courses in many different fields spanning various subjects (math, literature, chemistry, physics, language, life skills and soft skills for instance). Companies in this segment include Kyna.vn, Unica, Edumall, Brands Vietnam, Wikilady, Adabook, Testbank, Alada.
- (v) **Tech learning.** Platforms to support learning IT and programming. In addition, users of tech learning can also learn many other basic to advanced technology skills. The prominent tech learning "schools" in this segment are Code4Startup, CoderSchool, and MClass.
- (vi) **Language learning.** Foreign language learning platforms support users in improving their foreign language skills. Language learning platform makes the mastery of foreign language simple and more convenient than traditional means.

Many language centers combine traditional teaching and a foreign language platform, such as Wall Street English. In addition, there are also a few companies that deploy language learning platforms, such as Akira, Antoree, VOOA, Tienganh123, hellochao, TFlat, Leerit, Dekiru.vn.

- (vii) **Enterprise learning.** Enterprise education platforms provide learning tools and assist organizations in designing instructional content. Companies in this segment include Nexedu, OMT, DES.
- (viii) **Online to offline.** This blended education model connects students or learners with professors and experts via smartphones. The experts receive questions from users, then assist them with the answers. Usually, receiving help from experts takes 10 minutes or more, depending on the need. Companies in this segment include Topica, Tanaka, AiTalk.
- (ix) **Test preparation.** Test preparation models specialize in providing college exam preparation courses. The test preparation market in Viet Nam is very strong and diversified. The foremost training models in the test preparation sector include Hoc Mai, Moon, Enrollment 247, Zuni, ViettelStudy.
- (x) **School administration.** The school administration system has a key role in assisting schools in managing teaching and learning. Currently, there are two prominent companies in this segment, which are VNPT school and SMAS.

Regarding the application of technology, Vietnamese digital education currently is witnessing the following trends:

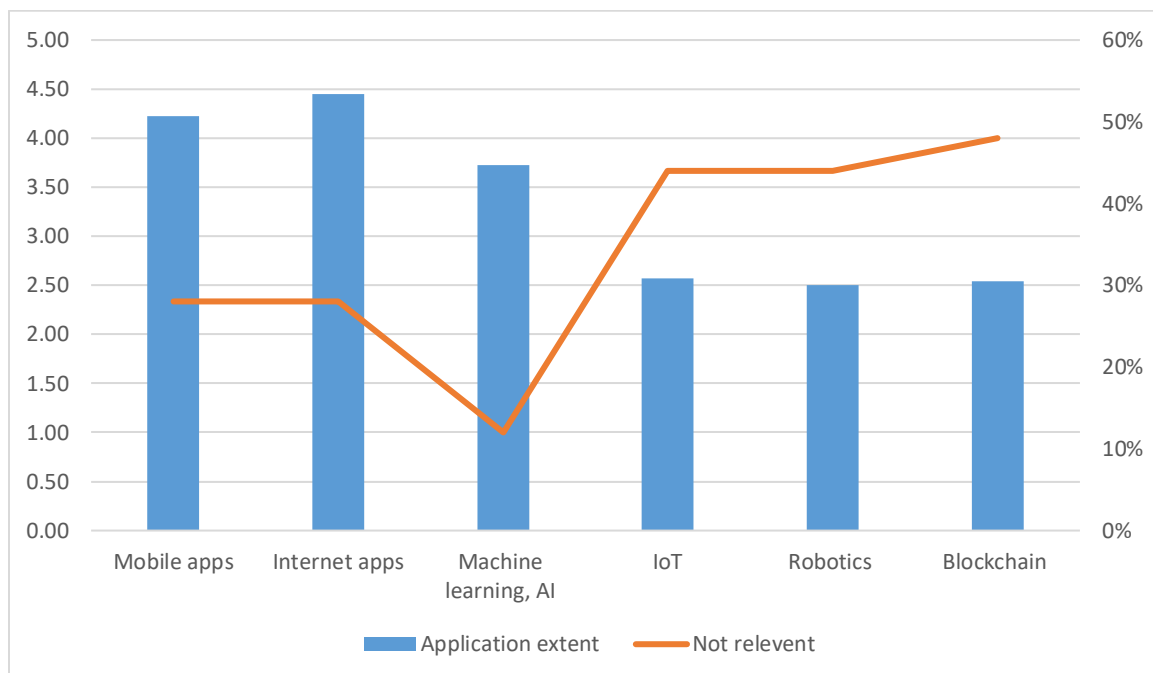
- (i) **Mobile education.** Instead of being delivered solely to a personal computer, the training program is accessed via smartphone or tablet.
- (ii) **Adaptive learning model.** Online platforms are deployed to provide a flexible learning environment, helping students gain knowledge at their own pace. For example, adaptive learning technology collects information about student behavior, which is then used to provide instant feedback and adjust learning content accordingly.
- (iii) **STEAM and STEM.** STEM stands for science, technology, engineering, and math incorporated in creative experiential activities. STEAM is made up of the terms "STEM" and "art." Arts education helps develop creativity, so innovation from STEM to STEAM is essential for the education industry. Accordingly, students conduct simple science experiments, making handmade products or participating in dramatic performances to improve teamwork skills and independent thinking.

- (iv) **Cloud-based EdTech platform.** Cloud technology provides teachers, learners, and educational institutions a shared storage tool
- (v) **Artificial intelligence teacher.** Learners can have the support of one-on-one tutors using the intelligent tutoring system, available 24/7.
- (vi) **Virtual reality and augmented reality.** Virtual reality helps simulate the experience of being in a classroom, while augmented reality allows learners to experience virtual elements within their real environment with just a tablet or smartphone.

2. Digitalization

As shown in Figure 12, EdTech businesses mainly rely on a mix of technologies ,including fixed line internet (cable, optical cable, mobile phones, and smartphones; company homepage and website; cloud computing and cloud services; internet resources such as bit.ly, Trello, Slack; Facebook business suite; Creator studio, Discord, Xero, Google Analytics. Most of the respondents agreed that block chain technology is not relevant for their businesses, while mobile apps, Internet apps, and artificial intelligence are the most frequently used technologies. However, because of Viet Nam’s underdeveloped IT infrastructure, the technologies available to EdTech companies are somewhat limited.

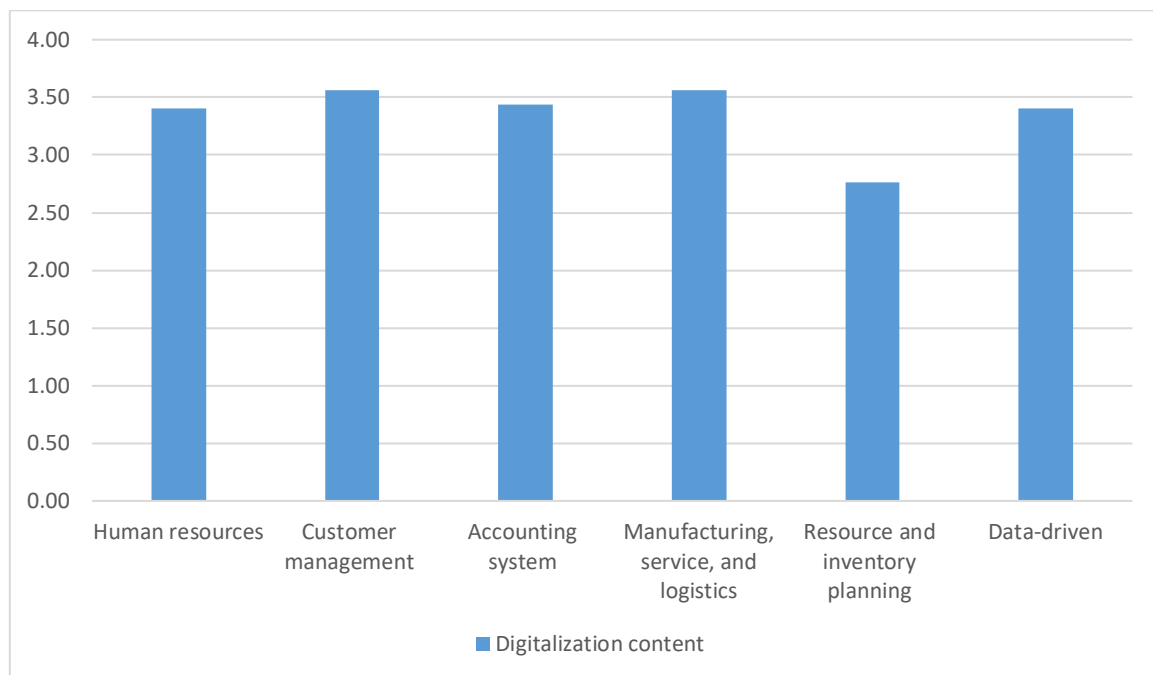
Figure 12: Digital Technologies in Education Technology



AI = artificial intelligence, IoT = Internet of Things.
Source: Interview results.

Regarding internal activities of the EdTech sector (Figure 13), surveyed businesses confirm that they use digital technologies equally in most of their business activities. According to respondents, digitalization helps save time, improve operational efficiency and productivity, and fasten responses to market changes. Technology also promotes an innovative culture within the organization. Most notably, digital technologies helped EdTech businesses overcome operational difficulties brought by the COVID-19 pandemic. Specifically, digital technologies had enabled employees to work from home, ensured communication between employees, and the remote accessing of data systems via cloud computing.

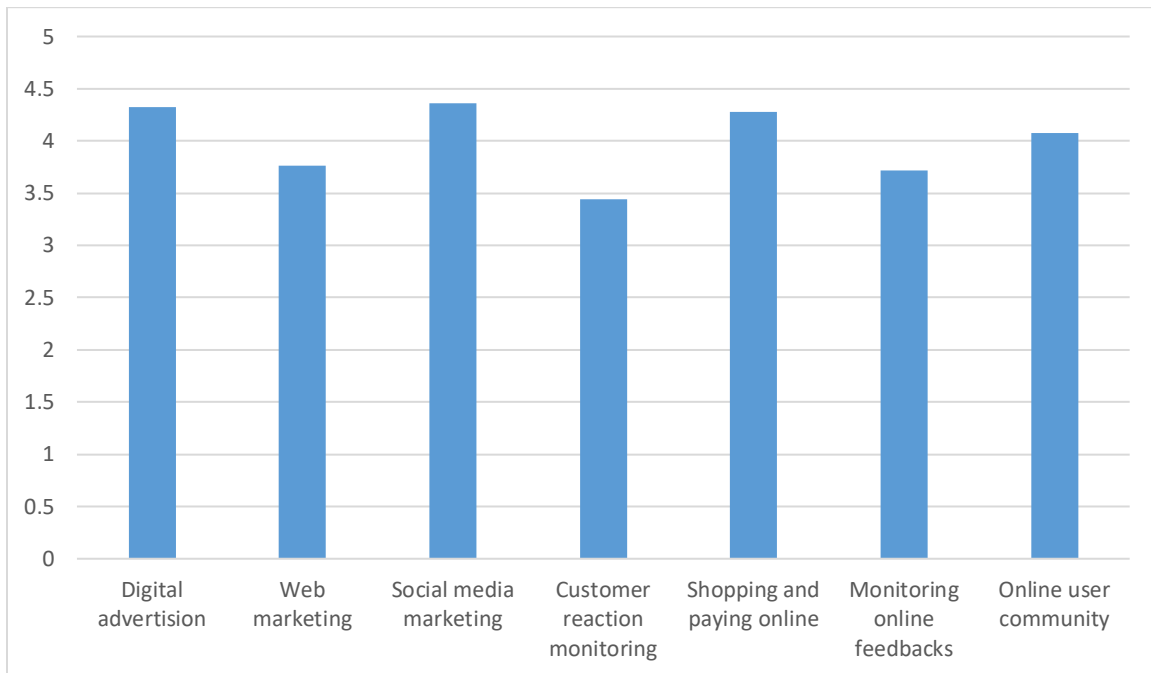
Figure 13: Digitalization in Internal Activities



Source: Interview results.

Digital technology is used widely also for marketing, sales, and customer interaction activities. From the survey results (Figure 14), marketing and sales activities frequently are carried out online and through social networks. In-depth interviews show that social networks are key channel to reach out to customers. Thanks to Facebook, Instagram, Zalo, Twitter, marketing activities have become frictionless and more effective. Vietnamese EdTech businesses currently use search engine and social media advertising, mainly display advertising or banner and video advertising, depending on the platform. Some EdTech companies also use other marketing methods, such as “school marketing” to target parents. Meanwhile, other marketing strategies are specifically aimed at universities, colleges, and middle schools. This multifaceted marketing approach enhances their brand and drives student enrollment.

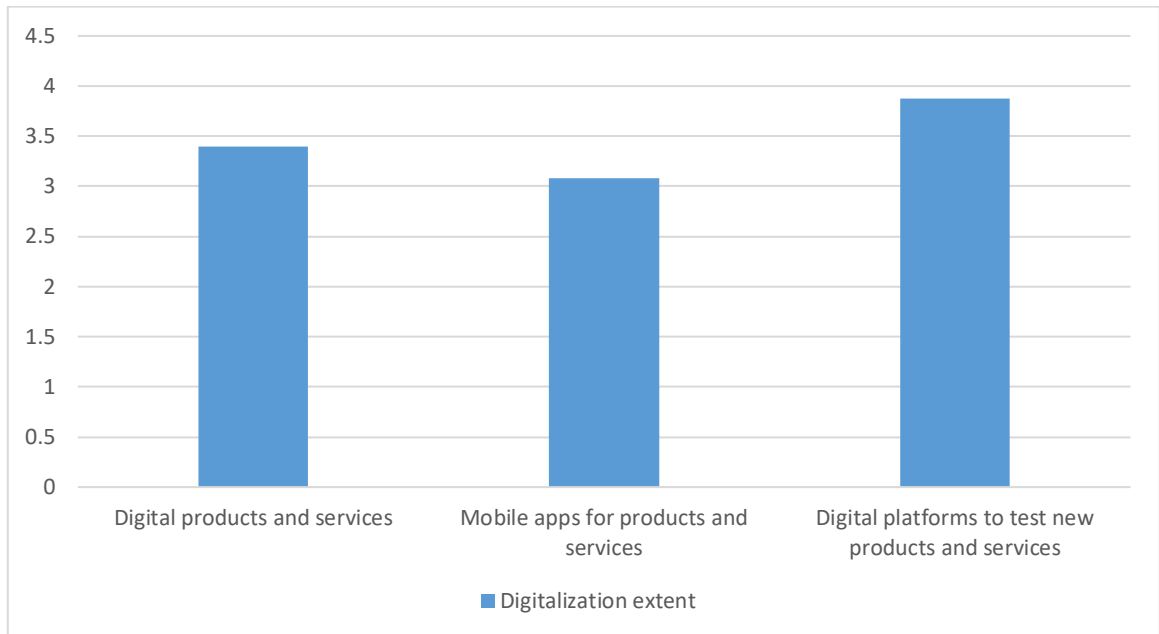
Figure 14: Digitalization in Marketing, Sales, and Customer Interactions



Source: Interview results.

As shown in Figure 15, because of the characteristics of the online learning environment, most EdTech companies surveyed (over 50%) say they use digital platforms to test new products and services and get user feedback. As a result, products and services are well digitalized. However, although mobile device-based EdTech applications are trending among EdTech firms, a shortage of iOS and Android developers to create and maintain a mobile application means apps are cost-intensive and are not frequently used in EdTech business.

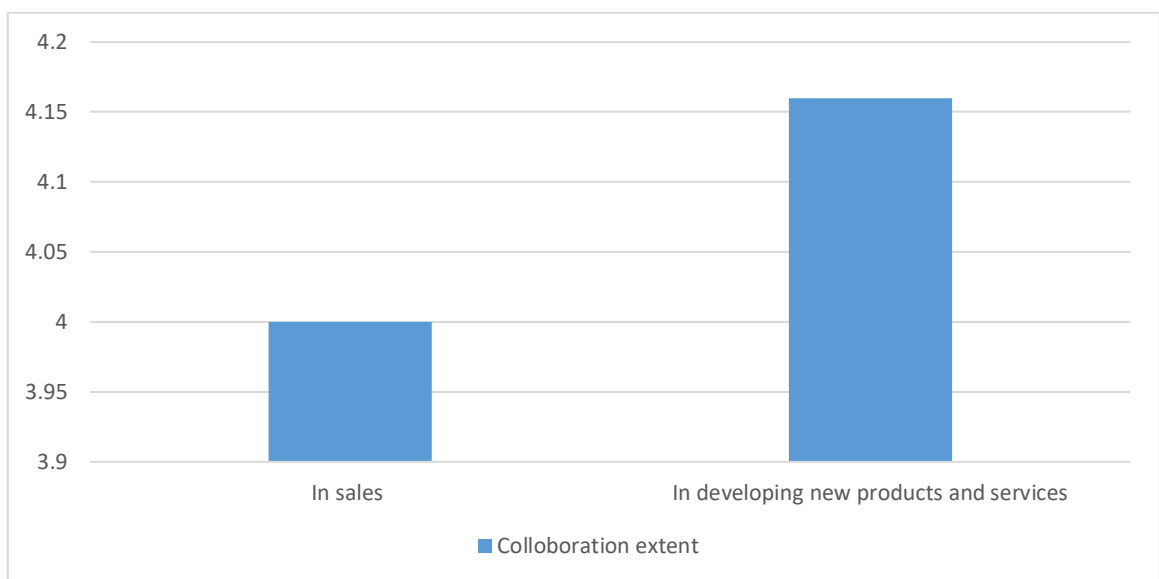
Figure 15: Digitalization in Products and Services



Source: Interview results.

As shown in Figure 16, online platform helps strengthen business relationships. The collaboration usually happens in developing new products and services, but less likely in sales activities. EdTech businesses admitted that they rarely or never shared customer data with partners. They attributed this reluctance to the weak security capabilities of the EdTech sector and the lack of trust among stakeholders.

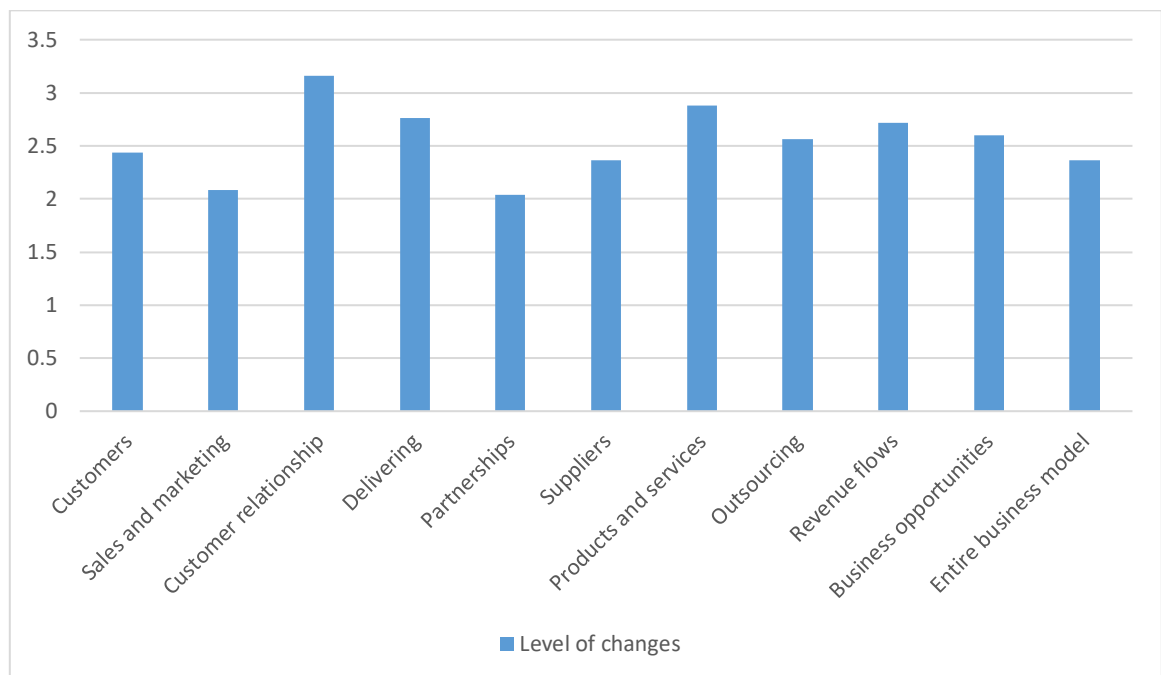
Figure 16: Partnerships



Source: Interview results.

As shown in Figure 17, most surveyed EdTech businesses reported that they made only minor or moderate changes to their business activities during the past 12 months. In-depth interviews show that these changes are mainly when companies detect gaps in the industry and achieve greater cost-efficiency. Similarly, changes would occur if they receive customer requests to personalize products or services, or fine-tune the business model to attract investors. Another reason relates to the increasing uncertainty in COVID-19. The outbreak of COVID-19 restricts enterprises from making any big change in their operations to avoid risks.

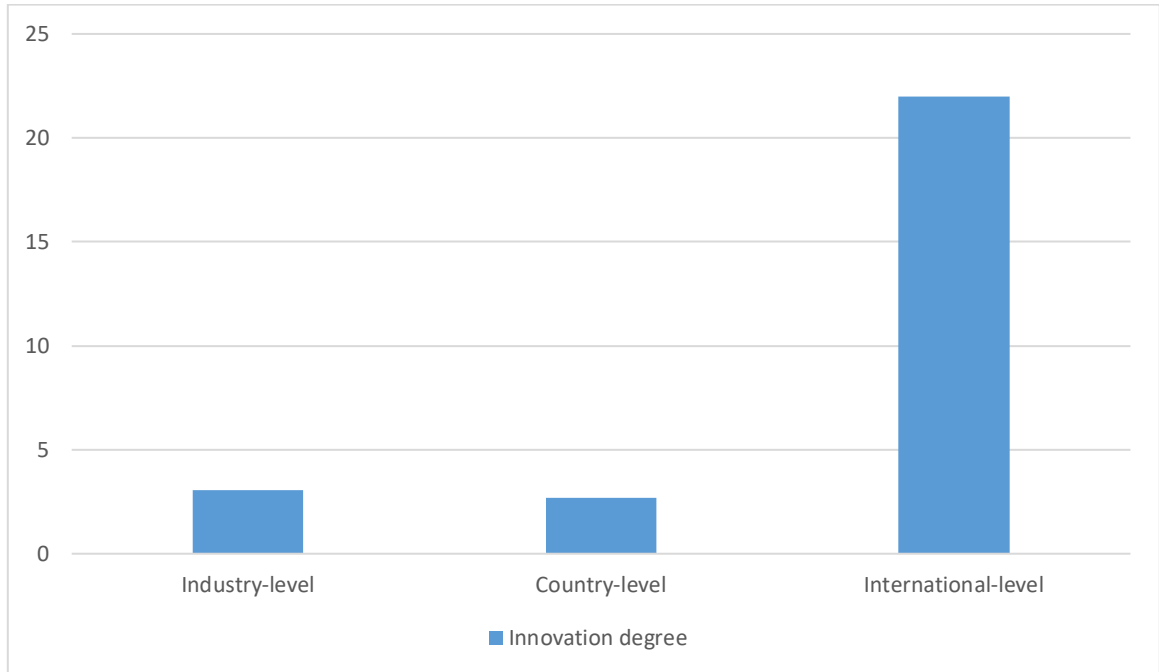
Figure 17: Business Model Changes



Source: Interview results.

Regarding the degree of innovation, EdTech enterprises showed low level of innovativeness relative to their competitors, other industries, or at global scale (Figure 18). This consists of minor changes in all aspects of business activities. Not only EdTech enterprises, but Vietnamese businesses generally have low level of innovativeness because of the lack of investments in R&D activities as well as the insufficiency of human resources. Vietnamese entrepreneurs are sensitive to changes and adjust themselves quickly, but not the ones who are pioneers in providing new ideas.

Figure 18: Degree of Innovation



Source: Survey and interviews.

The general assessment of digitalization within Vietnamese EdTech enterprises can be divided into three levels:

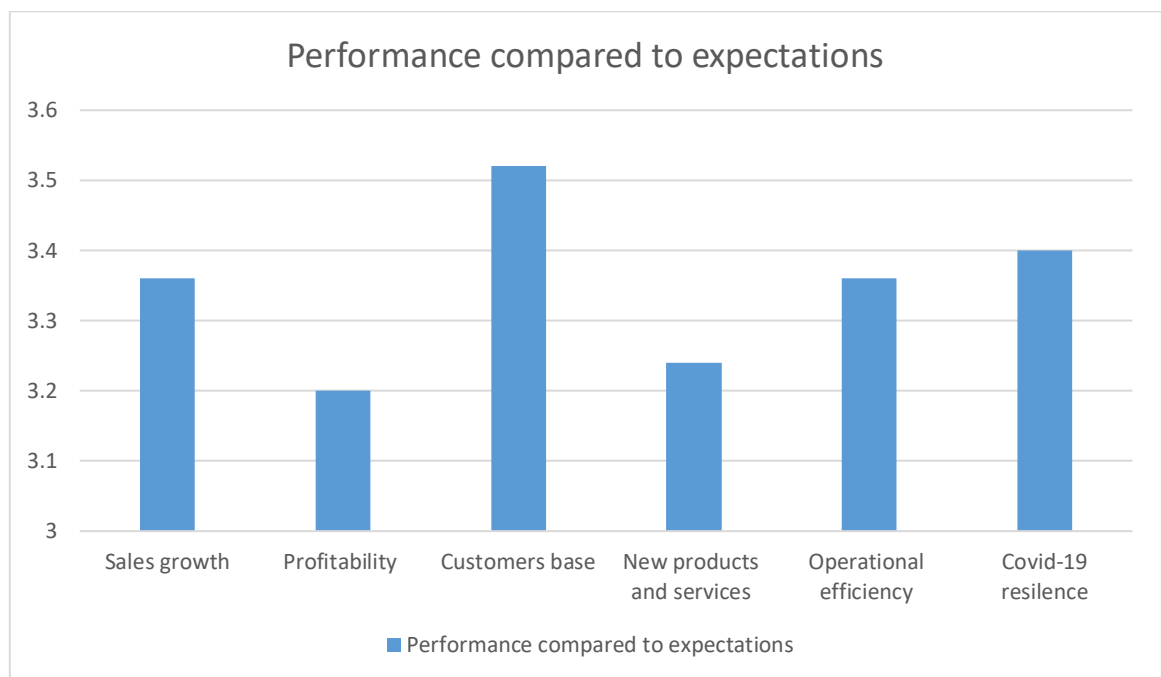
- (i) **Doing digital.** This level includes small businesses in the EdTech industry or start-ups with similar products/services to others in the market. Enterprises mainly take advantage of simple technology solutions, such as website platforms and mobile applications to transform business models and improve customer experience. Although not many modern technologies have been deployed so far, the continuous development of online learning holds the prospect of boom times for SMEs.
- (ii) **Becoming digital.** The majority of EdTech businesses in Viet Nam is still in the early stages of this level. Enterprises focus on applying digital technology in a large scale, forging connections between business functions to transform governance and optimize efficiency. To run their business sustainably and promote sustained growth, enterprises at this level begin to construct an overarching management reporting system. This more holistic approach makes data easy to mine and uses technology to optimize production, service, or resource plans.
- (iii) **Being digital.** This top tier of digital adoption applies to a small number of large and established EdTech players. These businesses have completely digitized and

adopted a 360-degree approach that connects and integrates all their business and management systems to share data across departments and in real-time. Enterprise-wide connectivity solutions are deployed at this stage to streamline the business structure and existing systems and optimize the enterprise's capabilities. These businesses are fully data-driven. EdTech businesses at this level begin to invest heavily in initiatives to promote innovation and creativity, create new values for the businesses, and be the driving force that allows an enterprise to narrow the gap between them and larger competitors.

3. Performance

As shown in Figure 19, most EdTech firms revealed that their business performance during the past 12 months was better than expected. More than 60% of EdTech firms said sales growth and profitability are both above expected targets. In addition, up to 76% of EdTech companies surveyed have increased their customer base. Because of the COVID-19 pandemic, more than 20 million pupils and students and nearly 2 million teachers at all levels have been unable to use in-person teaching and switched to online learning. There is a little doubt on the inevitability of digital education adoption. Moreover, digitalizing general education opens up new opportunities for EdTech businesses.

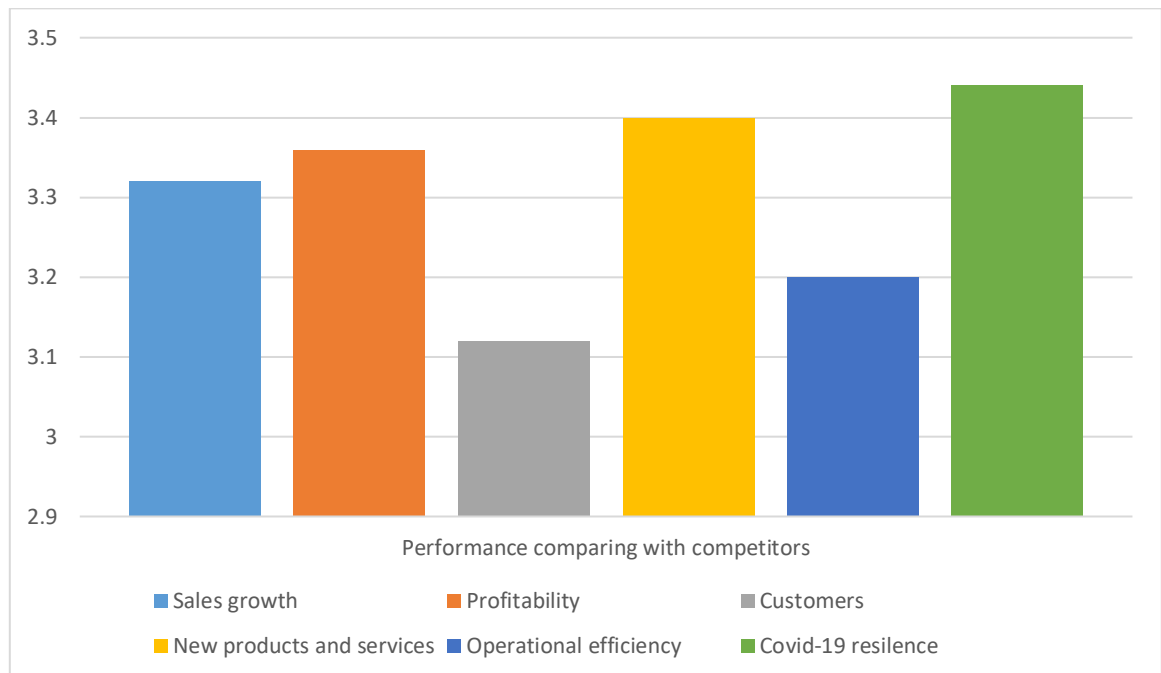
Figure 19: Performance Compared to Expectations



COVID-19 = coronavirus disease.
Source: Survey and interviews.

As shown in Figure 20, EdTech entrepreneurs assumed that they are slightly outperforming their counterparts in multi-perspectives from business efficiency, new offered services to the ability in coping with COVID-19. This perception has its cultural origin relating to the optimism nature of Vietnamese people. In a study conducted on Vietnamese enterprises, Ozgen and Minsky (2015) found the similar pattern in which their respondents express the confidence about their performance over competitors, and this perception partly hinders the motivation for innovation.

Figure 20: Performance Compared with Competitors



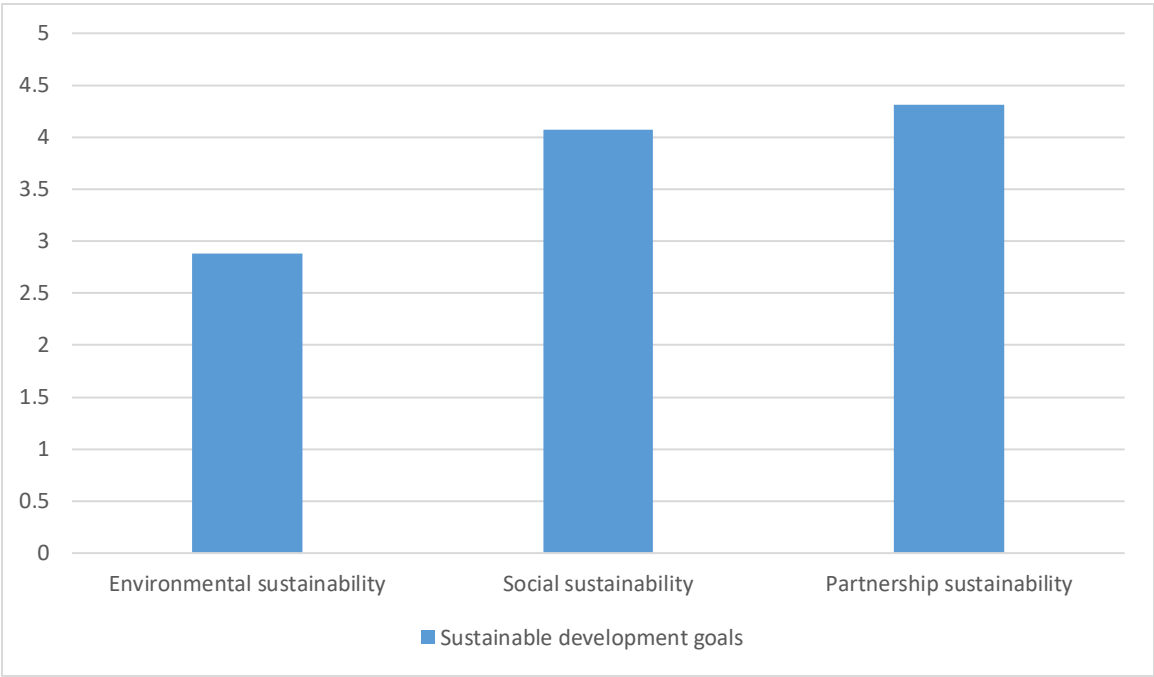
COVID-19 = coronavirus disease.
Source: Survey and interviews.

4. Sustainability

Regarding Sustainable Development Goals, they are divided into environmental sustainability, social sustainability, and partnerships sustainability. In each category, entrepreneurs express their perception on how well they are performing actions for a sustainable development. For Vietnamese EdTech companies, most of the respondents believe that they are contributing well to the community where the business is located as well as to their stakeholders. However, the confidence is no longer that strong when environmental concerns are being raised. In-depth interviews with EdTech entrepreneurs provided explanations. Social responsibilities and stakeholder relations are perceived as the compulsory for a successful business. These actions help attract long-term investors, increase access to new capital, strengthen relationships with both

internal and external stakeholders, and enhance the reputation and image of the business. On the other hand, environmental concerns are not attracting much attention from both the government and entrepreneurial community in Viet Nam.

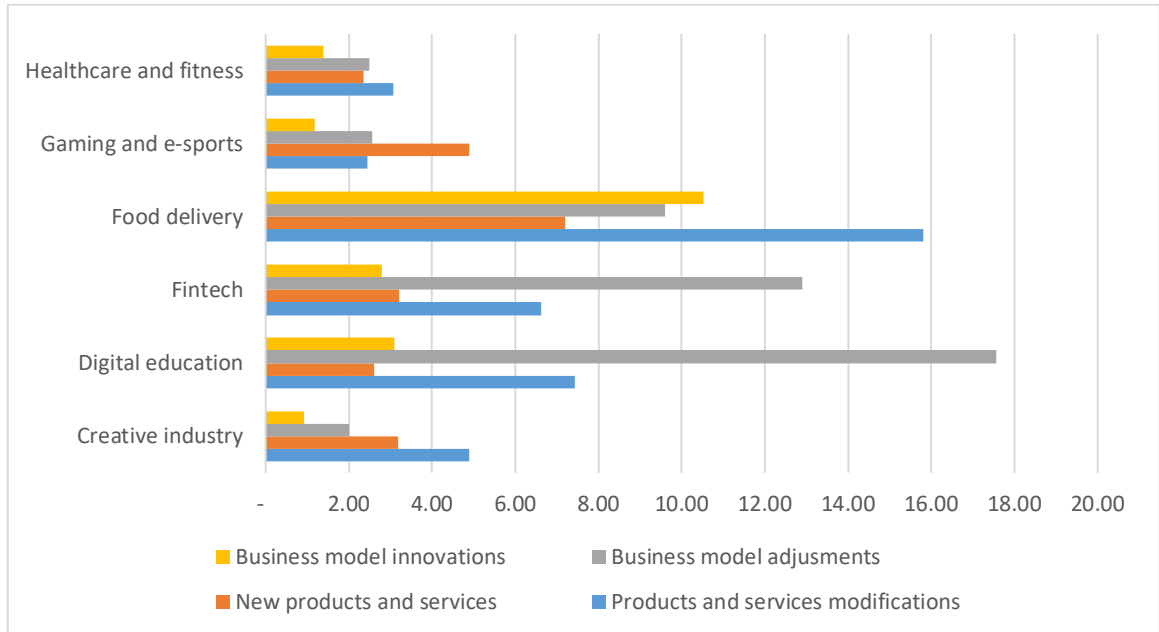
Figure 21: Sustainable Development Goals



Source: Survey and interviews.

Regarding innovation, the digital education sector has had relatively few new products or major changes in business models in the past 12 months (Figure 22). This is because businesses are focusing on the current business model and existing products to serve the increased demand of learners during the COVID-19 pandemic. However, these businesses have restricted themselves to making only minor business model changes and improving existing products/services to meet customer needs better.

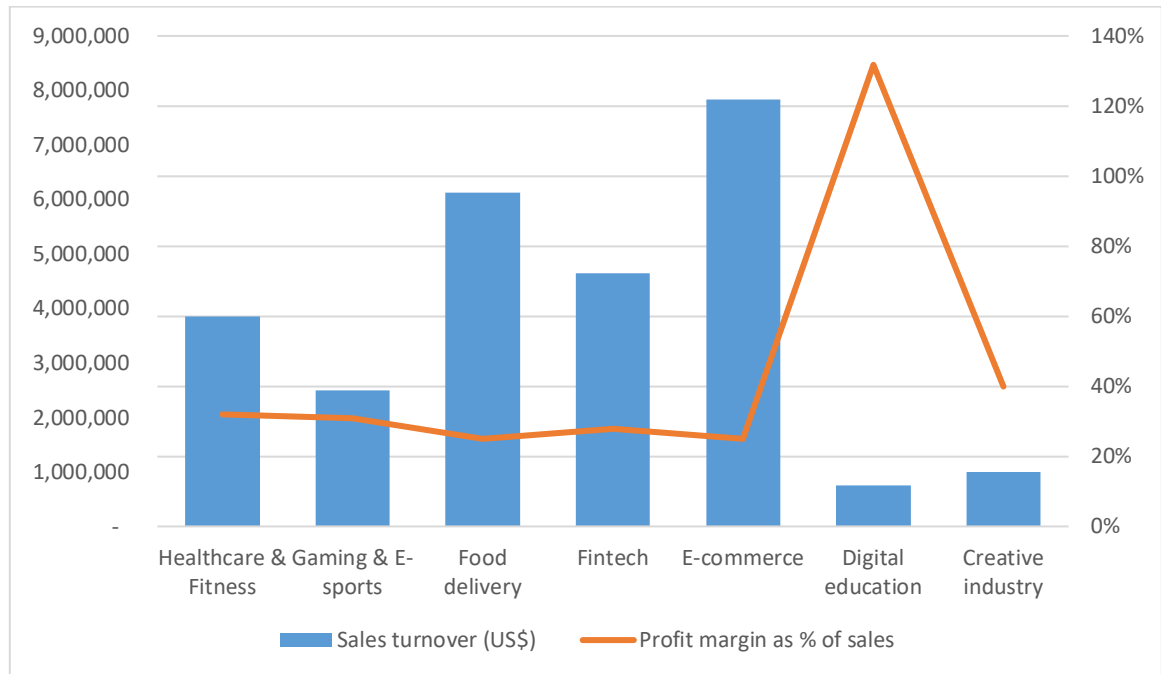
Figure 22: Innovation in the Education Technology Sector



Source: Survey and interviews.

As shown in Figure 23, e-commerce is the field with the highest average revenue in the past year, with nearly US\$8 million, followed by food delivery (~\$6 million) and Fintech (~\$4.6 million). Digital education ranks last with only US\$750,000. However, digital education is in the top three industries with the highest profit margin. The creative industry, gaming, and e-sports had profit margin rates ranging from 30% to 33% in the past year.

Figure 23: Financial Performance



Source: Survey and interviews.

C. Innovation in Digital Education: Successful Cases

1. ELSA Speak

Founded in 2016, ELSA is a popular name on the rollcall of online English learning applications. ELSA was founded by a young Vietnamese woman, Van Dinh Hong Vu, and Portuguese doctor Xavier Anguera, an artificial intelligence and speech recognition expert.

ELSA Speak is an English learning application based on artificial intelligence technology. One of the outstanding technologies that ELSA applies to teaching is speech recognition technology that renders speech accurately. While the market already has applications similar to FluentU or Say It, ELSA's competitive advantage is artificial intelligence speech recognition technology.

AI has enabled ELSA Speak to collect and analyze a large volume of English language voice data from millions of users over many years. As a result, this helps ELSA Speak better recognize users' voices worldwide and help them "standardize" their pronunciation. It is the only software on the market with proprietary voice technology that detects and corrects. ELSA Speak is continuously voted one of the top artificial intelligence applications by Forbes, Research Snipers, Product Hunt.

Indeed, Forbes listed ELSA Speak and co-founder Van Dinh Hong Vu in the top four companies using artificial intelligence to change the world. In addition, ELSA Speak was voted as

one of the top five artificial intelligence applications alongside Microsoft's Cortana and Google's Google Allo.

Following these outstanding achievements, Vu was honored as one of the Top 10 Young Vietnamese Faces of 2018. Most recently, Fast Company recognized ELSA Speak as one of the Ideas to Change the World in 2020.

In 2019, this start-up successfully raised US\$7 million from a series A round in Silicon Valley. In 2021, ELSA has officially successfully raised series B capital of up to US\$15 million.

ELSA received great attention from investors in Asia, with the participation of VI (Vietnam Investments) Group as a strategic investor, along with SIG. Besides ELSA's investment funds from the previous round, such as Monk's Hill Ventures, SOSV, more recently, Gradient Ventures (a venture fund specializing in Google artificial intelligence investment) also continued to pour in capital. In addition, Endeavor Catalyst and Globant Ventures are two new investors in this series B round, which will support ELSA in its plan to explore the American market. ELSA now has more than 13 million users globally, and the company's revenue grew by nearly 300% in 2020. With the new funding, ELSA plans to enter the Americas and accelerate expansion throughout Asia in 2021.

The ELSA Speak application helps students recognize mistakes and accurately correct pronunciation errors immediately. Specifically, ELSA records learners' voices, analyzes errors, and marks mispronounced words with different colors. Then, ELSA will guide learners who click on the red or yellow highlighted words to correct their pronunciation errors like a "home tutor." This method helps learners understand where they are doing wrong and correct their pronunciation in order for them to make fast progress, gain confidence in speaking, and master English. In addition, learners are further assisted with guidance on mouth shape and tongue placement.

The app also asks the learner a series of questions about why they wish to improve their English. Based on the learner's motivations, ELSA Speak tailors lessons accordingly. These motivations could be from wishing to find more attractive job opportunities to continuing their studies, traveling around North America, wishing to live or work abroad, to enjoying the English language culture and entertainment.

The ELSA Speak learning path is specifically designed so that each user can study at their own pace. The system contains more than 6,000 exercises and 29 intuitive and fun real-life topics.

To penetrate the corporate and school market, ELSA Speak has a custom-built teacher dashboard. This dashboard allows teachers to manage all the artificial intelligence features, design lesson plans, and monitor system usage at home by students. For schools and language, this central control panel helps to improve the quality of teaching and save time and money for

learners. In addition, ELSA allows businesses to bolster their staff's English language skills when communicating with foreign business partners.

2. GotIt!

What do users usually do when they encounter difficult problems? Today, most internet users either use a search engine (Google, Bing, Yahoo, Baidu, YouTube) or post questions on knowledge-sharing communities (Quora, Reddit, Stackoverflow, Yahoo Answers). The first method may be quick, but only helps you answer relatively short and direct questions. It is not effective for complex problems, large volumes of data, and it is difficult to verify the reliability of the results. The second method can be suitable for complex and data-rich problems, but the response time is unknown. Your question could go unanswered, and there are no guarantees about confidentiality or the accuracy of information if you receive an answer.

GotIt! was founded in 2011 by Vietnamese student Tran Viet Hung. GotIt! is an app that connects users with relevant experts to find answers within seconds or through a 10-minute chat session. To use the application, all that is required is to upload a picture of the math question or other problem. Then, within seconds you are connected to a qualified expert and interact in a chat window. If you need further help, users can ask for more time with the expert. Each chat session is guaranteed by GotIt! for quality and security. GotIt! is believed to be the first company to launch an on-demand knowledge-as-a-service platform that uses artificial intelligence to leverage resources.

GotIt! solves all three aspects of problem-solving, including immediacy, accuracy, and confidentiality of information. A short time after launching, up to four million exchanges took place on the GotIt! platform, of which 90% were rated as 4–5 stars quality by users.

The platform is the foundation for all GotIt!'s infinitely scalable products. They have rolled out numerous products to meet knowledge-sharing needs in different fields. Specific products built on the GotIt! platform include PhotoStudy, ExcelChat, and Conversational AI.

3. PhotoStudy

PhotoStudy helps learners instantly understand STEM lectures and exercises using artificial intelligence or by connecting with experts. It takes seconds to upload a picture of text or diagrams that learners do not understand to PhotoStudy. Learners can use the tool to complement traditional teaching. Schools can grant students access to PhotoStudy by purchasing a subscription package and track their learning on the app. GotIt! also provides an extra spare time income for STEM tutors and professionals wishing to share their knowledge. Based on an algorithm developed for Google PageRank, GotIt!'s ExpertRank™ algorithm analyzes images, and then selects, appraises, and ranks experts.

4. ExcelChat

Developed in 2018, ExcelChat helps users solve spreadsheet problems on Microsoft Excel and Google Sheets. ExcelChat is thought to be the world's first artificial intelligence-based knowledge-as-a-service. Currently, ExcelChat is being used by users from more than 2,000 large and small companies in the United States. ExcelChat is also partnering with one of the largest technology companies in the world to provide services to their users.

5. Conversational Artificial Intelligence

Conversational Artificial Intelligence (CAI), formerly known as QuerychatAI, was created in mid-2019. After many product development stages, innovation and improvement, QuerychatAI was rebranded as CAI. The product helps businesses solve problems related to customer service. Instead of spending hundreds of thousands of dollars and thousands of hours building a customer care system and hiring staff to handle customer requests, CAI helps businesses more economically serve customers.

GotIt! has built the world's largest on-demand expert cloud service with more than 10,000 experts from 79 countries, generating millions of expert conversations on the GotIt! platform for products like Microsoft Excel and Google Sheets. Data warehouses are stored as columns. GotIt! aims to help any business connect with experts within 30 seconds for a 1:1 exchange at the lowest possible cost. Moreover, users can also use conversations with experts to train proprietary artificial intelligence models for their own companies. After 10 years of operation, changing its name from Tutor Universe to GotIt!, the startup founded by Hung Tran, has raised more than \$25 million in capital from famous investment funds.

V. POLICY RECOMMENDATIONS

A. Entrepreneurship

Based on the AIDES framework and SMEE for entrepreneurship ecosystem, this chapter makes the analysis for Vietnamese ecosystem through which strengths are recognized but limitations are outweighed. Considering the characteristics of entrepreneurship ecosystem in Viet Nam, the following are recommendations for policy-makers:

First, strengthen the current entrepreneurial culture with the highlight on business ethics and trust. Rather than honoring successful businessmen as usual, public events should direct attentions to entrepreneurs who are generating not only economic values but also humanistic values for the society. Corruption should be eliminated more aggressively for a legitimate business environment.

Second, enhance the effectiveness of regulatory framework. Although Viet Nam has already set up a solid scheme for entrepreneurship development, the implementation is finite. It is not that

many entrepreneurs are getting benefits from policies either in financial or nonfinancial supports. Barriers for applications must be minimized and simplified, while activities should be directed to actual impacts. The key is in the hands of human resources.

Third, continue the development of infrastructure. Although the current speed of urbanization and transportation upgrade in Viet Nam is quite satisfactory, transportation costs are still at high level because of the lack of regional integration and economic clusters. Each city follows its own objectives and urban planning strategy without taking into account the mutual connection within a region. Satellite urban areas are underdeveloped, leading to the heavy density of transportation in big cities. Entrepreneurship ecosystem is, therefore, unequally developed among different country's regions.

Fourth and most important, improve the human capital. For strengthening entrepreneurial spirit, education system should concentrate on (i) Encouraging independent thinking. Students should be given the opportunity to solve the problems by themselves. And only when diversification and unique ideas are respected in study environment, young people would not hesitate to think and act independently. (ii) Prioritizing soft skills training. A traditional education approach which focuses on content should be replaced by the one that focuses on outcomes. Rather than concentrating on knowledge and information, students should be trained on how they can search for knowledge and information by themselves. Moreover, entrepreneurial skill sets should be paid attention to, at least in business management schools, rather than the current curricula incorporating too many but irrelevant contents. (iii) Emphasizing the importance of business ethics. For a sustainable development of entrepreneurship, business ethics are indispensable but overlooking in Vietnamese education system. Entrepreneurs should acknowledge the necessity of balancing their own benefits with that of the others in the community. (iv) Enhancing the participation of entrepreneurs. The involvement should be from curricular construction to training and assessment not only as higher education level but also some orientation contents of tertiary programs. Once again, the moderating role of government needs to be in place along with sufficient supporting policies. European countries are famous for the financial and nonfinancial supports for enterprises who participating in education.

The fifth relates to financing start-ups, especially SMEs. In the context of developing country with the limitation of raising capital through capital markets, the role of banking system should be promoted in financing new enterprises. Vietnamese regulatory framework is currently criminalizing banking legal case while it is supposed to be civil. This status restricts the risk appetite of banking system when granting loans for new businesses. Viet Nam now also has no any specialized loan program for start-ups.

Finally, the networking activities within entrepreneurial community also need to be improved. Either by the government, or industry associations, networking events are not appreciated because of lacking real values. A key element for making them more attractive is opportunity exchange and knowledge exchange. The participation of large corporations is required. National top entrepreneurs are involved as bridge for cooperation. Government authorities be active moderators to make all these activities valuable.

B. Digitalization

Unlike entrepreneurship ecosystem in Viet Nam which is ranked lowest in ASEAN-6, Vietnamese digital ecosystem is much more developed which stands #3 after Singapore and Malaysia. In order to promote digital ecosystem in Viet Nam, the following should be undertaken:

First, constructing an integrated national institutional framework for digital ecosystem. Although, currently, Viet Nam has National Strategy for Digitalization, digital start-ups encouragement, ICT infrastructure development, Noncash payment promotion, e-commerce acceleration, all these policies exist separately and are under control of different government authorities. Digital ecosystem requires the contribution of multiple components and should be considered under a unified national scheme. The Ministry of Digital Economy and Society in Thailand or Government Technology Agency in Singapore are examples of specialized government authority for digital economy enhancement.

Second, for digitalization in all socioeconomic facets and specializing on e-government, Viet Nam needs to emphasize on data management. At present, data management is being overlooked. Not only in public but in different government agencies, a wide range of data and information are not easy to find on demand. Data is scattered in pieces and under management of various units without the ability to be centralized, connected, and systematically analyzed. Data-driven decisions, therefore, are not easy to make in Viet Nam for both public and private sectors.

The third and most important one, once again, relates to human capital. In the 4.0 industrial revolution, technology education and training should have its proper position relative to other scientific subjects in general education. Although Vietnamese children now have been very familiar with internet and technology equipment, the utility is mainly for entertainment. Digital skills should be allocated more time and efforts in general education. Investment for education should be raised its proportion to total government expenditure in order to maximize the accessibility of population to computers and technology, especially in rural, poor, and remote areas. For higher education, technology students should be put under multidiscipline training in which the combination between technology and business management is in focus.

C. Digital Education

For the development of digital education sector in particular and the improvement of Viet Nam's education system in general, these are some implications for policy adjustments:

First, develop regulations on data security. Governments need to ensure clear and consistent regulations to improve the education sector's data security, data usage, and data privacy. In addition, policymakers need to create a regulatory road map for robust regulations to address data usage and privacy issues before the industry grows much larger.

Second, renovate mechanisms and policies for educational institutions. Strengthening autonomy in training activities and administration of educational institutions to create flexibility to adapt to industrial revolution 4.0. The Ministry of Education and Training and educational institutions should identify e-learning as an important strategy in education; then develop a plan to deploy, propagate, and replicate e-learning in the education sector and the wider society.

Third, build close linkages between educational institutions and enterprises. At the same time, it is necessary to promote the formation of enterprise training institutions to share common resources: facilities, finance, human resources, and, more importantly, shorten the transfer time for knowledge and skills. In addition, develop favorable conditions in terms of the legal and social environment for foreign investors to open high-quality universities (traditional and online) in Viet Nam.

Fourth, implement e-government within the industry. Complete the entire education and training sector database system to ensure a network of data sharing from the central government to the local schools, which syncs with national databases. In addition, create other specialized databases to assist the formation of open national databases; promote online public services; thoroughly digitize, using electronic documents, school records, and electronic grade books instead of paper documents; ensure the network environment is where operations, trading, meetings, and training activities mainly occur.

Finally, perfect the policy on management and use of education management databases (regulations on sharing and exploiting data; complete the legal means to promote the development of online teaching and learning, and the quality assurance of online course and management policy). Further, build and perfect a system of digital learning materials and open learning materials for the education industry, link with international partners, meet the needs of self-study and lifelong learning, continue to innovate teaching methods, test and evaluate based on the application of digital technology, and encourage and support the application of new education and training models based on digital platforms.

VI. CONCLUSION

Digitalization and entrepreneurship are acknowledged as key factors that accelerate economic resilience after COVID-19. As a member of ASEAN, Viet Nam ecosystem has its crucial position for regional economic recovery. This chapter discusses the qualitative as well as quantitative analysis for the status of Vietnamese digital entrepreneurship ecosystem based on the approach from AIDES and the SMEE in the study of Autio and Cao (2019). Moreover, because of the importance of education, this chapter focuses on the development of digital education sector in Viet Nam.

By analyzing each pillar in either entrepreneurship and digital ecosystem, the strengths and weaknesses of those in Viet Nam have been recorded. While entrepreneurship cultural support and digital infrastructure are Vietnamese advantages, economic freedom and human capital are limitations restricting entrepreneurship and digitalization.

Among digital sectors, EdTech is the newly established business in Viet Nam. However, thanks to the increasing investments of Vietnamese people on education besides the COVID-19 pandemic, Vietnamese EdTech is growing rapidly. Interview results present the satisfaction of EdTech entrepreneurs toward their operations despite the negative effects caused by COVID-19. Digitalization was proved to have significant impacts on the ability to cope with COVID-19 and profitability.

Accordingly, this chapter proposes some political implications for entrepreneurship ecosystem, digital ecosystem, and the promotion of the EdTech sector in Viet Nam. Overall, the Government of Viet Nam has completely constructed the regulatory framework for digital entrepreneurship. However, scarcity of resources does not allow us to change many objectives simultaneously. The key element for a sustainable development of entrepreneurship still belongs to human capital. Improving the quality of human resources not only helps in building strong digital entrepreneurial skills, but also in fostering the effectiveness of political supports. A thorough reform in education system either for entrepreneurial and technological skills is the most important for Viet Nam currently. A separate research should be conducted for deeper insights on education system reformation.

REFERENCES

- Acs, Z. J. and D. B. Audretsch. 1990. *Innovation and Small Firms*. Mit Press.
- Amsden, A.H. 2011. Firm Ownership and Entrepreneurship. *Entrepreneurship, Innovation, and Economic Development* 65.
- Audretsch, D. B. 2007. Entrepreneurship Capital and Economic Growth. *Oxford Review of Economic Policy* 23 (1): pp. 63–78.
- Audretsch, D.B. and A. Fiedler. 2021. The Vietnamese Entrepreneurship Paradox: How Can Entrepreneurs Thrive Without Political and Economic Freedom? *The Journal of Technology Transfer*, pp. 1–19.
- Autio, E. and Z. Cao. 2019. *Fostering Digital Start-ups: Structural Model of Entrepreneurial Ecosystems*.
- Baughn, Christopher C., Victor A. Lim, Linh Thi My Le, Kent E. Neupert, and Shelton Woods. 2014. Identification of Entrepreneurial Opportunities in Asia: A Look at the Philippines and Vietnam. In *Opportunity Identification and Entrepreneurial Behavior*, pp. 191–218. Information Age Publishing.
- Benzing, Cynthia, H.M. Chu, and Gerard Callanan. 2015. A Regional Comparison of the Motivation and Problems of Vietnamese Entrepreneurs. *Journal of Developmental Entrepreneurship* 10 (01): pp. 3–27.
- Bosma, N. and R. Sternberg. 2014. Entrepreneurship as an Urban Event? Empirical Evidence from European Cities. *Regional Studies* 48 (6): pp. 1016–1033.
- Carbonara, E., H.T. Tran, and E. Santarelli. 2020. Determinants of Novice, Portfolio, and Serial Entrepreneurship: an Occupational Choice Approach. *Small Business Economics* 55 (1): pp. 123–151.
- Carree, M. A. and A. R. Thurik. 2010. The Impact of Entrepreneurship on Economic Growth. In *Handbook of Entrepreneurship Research*, pp. 557–594). Springer, New York, NY.
- Crittenden, V.L., R.C. Hanna, and R.A. Peterson. 2009. The Cheating Culture: A Global Societal Phenomenon. *Business Horizons* 52 (4): pp. 337–346.
- DotAsia. 2018. *Youth Mobility Index Report in Asia*. New York: PR Newswire Asia. <https://login.ezproxy.lib.rmit.edu.au/login?url=https://www-proquest-com.ezproxy.lib.rmit.edu.au/wire-feeds/vietnam-experiences-tremendous-surge-startups/docview/1992134228/se-2?accountid=13552>.
- Hootsuite and WeAreSocial . 2021. *Digital 2021*.
- Le, Quyen T.D., N. Mohd-Zaharim, I. H. M. Hashim, and R. Sam. 2014. A Comparison of Youth's Value Systems: The Case of Vietnamese Ethnic Groups. *International Journal of Psychological Studies* 6 (2): p. 128.

- Liñán, F., J. Rodríguez-Cohard, and J.M Rueda-Cantuche. 2011. Factors Affecting Entrepreneurial Intention Levels: a Role for Education. *International Entrepreneurship and Management Journal* 7 (2): pp. 195–218.
- Loc, N.V. 2013. Vietnamese Entrepreneurs and Opportunity Identification. *VNU Journal of Science: Economics and Business* 29 (4).
- Luong, Huan and Tuan Nham. 2014. Understanding Entrepreneurial Perception and Business. *VNU Journal of Science: Economics and Business* 30 (2): pp. 13–27.
- Minh, Pham and Nguyen N. Mai. 2018. Analysis of the Success of Digital Start-up in Vietnam.
- Organisation for Economic Co-operation and Development. 2017. *SME and Entrepreneurship*. <https://www.oecd.org/cfe/smes/VN%20SMEE%20Policy%20highlights%20EN.pdf>.
- Ozgen, E. and B. Minsky. 2015. The Impact of Cultural Traits in Vietnamese Entrepreneurs' Innovative Attitudes. *Business Journal for Entrepreneurs*.
- Penner, L.A. and T. Anh. 1977. A Comparison of American and Vietnamese Value Systems. *The Journal of Social Psychology* 101 (2): pp. 187–204.
- Srinivasan, V. 2011. Business Ethics in the South and South East Asia. *Journal of Business Ethics* 104 (1): pp. 73–81.
- Stam, E. and A. Van Stel. 2011. Types of Entrepreneurship and Economic Growth. In *Entrepreneurship, Innovation, and Economic Development*, pp. 78–95.
- Thurik, A. R. 2009. Entreprenomics: Entrepreneurship, Economic Growth and Policy. In *Entrepreneurship, Growth and Public Policy* 10 (6): pp. 219–249.
- Transparency International. 2020. *Corruption Perception Index 2020*. https://images.transparencycdn.org/images/CPI2020_Report_EN_0802-WEB-1.pdf.
- Van Welsum, D. 2016. *Enabling Digital Entrepreneurs*. World Bank.
- Vietnam, Indonesia Lead ASEAN in Internet Economy Growth. 2022. Viet Nam Asean Portal - Asean National Communication Desk. <http://trucotanct.asean.vietnam.vn/Default.aspx?Page=NewsDetail&NewsId=168595>.
- Wennekers, S. and R. Thurik. 1999. Linking Entrepreneurship and Economic Growth. *Small Business Economics* 13 (1): pp. 27–56.
- Zhang, Y., G. Duysters, and M. Cloudt. 2014. The Role of Entrepreneurship Education as a Predictor of University Students' Entrepreneurial Intention. *International Entrepreneurship and Management Journal* 10 (3): pp. 623–641.