

Competitiveness of Vietnamese Offshore Software Outsourcing Companies in the Japanese Market

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Abstract

Vietnamese IT sector is a young and promising sector. Software outsourcing makes a critical contribution to the IT sector where domestic firms offer outsourcing services as a major part of their business model. Considering assessment criteria from the Porter's Diamond Model, the author examines Vietnam's competitiveness in the Japanese software outsourcing market, identifying how the country could become more competitive compared to other major and potential players in the global market. A qualitative approach is proposed for this study. In order to find out the current situation of the Vietnamese offshore software outsourcing industry and the Japanese market, the author collected data and information from articles, publications and studies of professional institutions. In order to process the data and extract the relevant information regarding the competitive advantage of Vietnamese offshore software outsourcing sector, methods of comparison and critical analysis are also utilized. The paper finds that the practice of software outsourcing is a critical motivation for development enterprises in the Vietnamese IT sector and is driven by quality and availability of human resources, followed by costs, favourable international linkages, related and supporting countries and lastly, firms' competitive structure and strategies. This paper is useful for practitioners considering Vietnam as an offshore software outsourcing location, for the Vietnamese administration as a guide to policies and regulations for fostering its competitiveness, as well as for IT researchers, who could complement the study with primary data and further develop the conceptual approaches applied in this paper, whether in Vietnam or other developing countries.

Research purpose:

The paper aims at determining the competitiveness of Vietnamese offshore software outsourcing enterprises and providing suggestions to enhance their competitiveness in the Japanese market. Due to the limitation of access data time duration, the data will be collected and analysed in the five-year period, from 2015 to 2020

Research motivation:

With the aim of determining the competitiveness of Vietnamese offshore software outsourcing enterprises, the study tries to address the following questions:

- (1) What is the current situation of Vietnamese offshore software outsourcing enterprises and the Japanese market?*
- (2) What is the competitiveness of Vietnamese offshore software outsourcing enterprises according to Porter's Diamond Model?*
- (3) How to enhance the competitiveness of Vietnamese offshore software outsourcing enterprises in the Japanese market?*

Research design, approach and method:

A qualitative approach is proposed for this study. In order to find out the current situation of the Vietnamese offshore software outsourcing industry and the Japanese market, the author collected data and information from articles, publications and studies of professional institutions. In order to process the data and extract relevant information regarding the competitive advantage of Vietnamese offshore software outsourcing sector, methods of comparison and critical analysis are also utilized.

More specifically, this study summarizes and evaluates information and data published in articles, publications and studies from World Bank, Statista, and METI, using a combination of the following keywords: offshore outsourcing, offshore software development, information technology outsourcing destination, IT industry in Vietnam, key success factors of IT industry in developing countries, advantages of Vietnamese software outsourcing service providers, challenges of Vietnamese software outsourcing service providers, Vietnam as an offshore outsourcing destination, the Japanese IT market, to name a few. Abstracts and conclusions were briefly reviewed; unrelated findings to the research

objectives and questions were omitted. The author finds that a large number of previous studies have been conducted on offshore outsourcing in general, or the success of the IT outsourcing of China and India – the two world's leading countries in the industry; but very few papers have been researched on the competitive advantages of the Vietnamese software outsourcing companies, especially those operate in a demanding market like Japan.

Main findings:

While applying the Porter's theory of competitive advantage, utilizing the diamond of "determinants" as a framework for analysis, the author identifies that Vietnam's offshore software outsourcing sector has competitive advantages in terms of superior and available talents, domestic rivalry, favourable supporting infrastructure and industries as well as preferential external events, government policy and vision. On the other hand, the study outlines some obstacles that should be resolved to consolidate the competitiveness of Vietnamese enterprises, including the improvements of soft skills and track records of doing business, and the tackling of the shortage of innovation process and international standards.

Practical/managerial implications:

The paper presents an analysis with suggestions to enhance the competitiveness of Vietnamese offshore outsourcing companies in a demanding market like Japan; thus helping Vietnamese software companies in particular and the industry in general to mitigate limitations and become the top priority for major players in choice of an offshore software outsourcing location.

Keywords: Vietnam, Japan, National competitiveness, Competitiveness diamond, IT outsourcing destination, software export success factors.

1. INTRODUCTION

The rivalry among countries to be recognized as an appealing IT outsourcing (ITO) sites is becoming fiercer than it has ever been. Several articles examine the appeal of specific nations, such as the United Kingdom (Ashri & Ravishanka, 2014), India (Javalgi, Benoy & gross, 2013), Malaysia (Ramli & Syed, 2015), Bulgaria (Troev, Theodor & Petrov, 2015), and Uganda (Overby, 2015). Even for the outsourcing of the same IT-related activity, what is deemed the optimum location varies by company and may change as IT outsourcing practices evolve. However, a combination of low cost (Fischer, 2018), focus on key competencies and access to expertise and related skills are frequently referred as the most common criteria (Lacity, Khan & Willcocks, 2009).

Along with India and China, the two world's leading outsourcing countries, the majority of the Association of Southeast Asia Nations (ASEAN) member countries are regarded as main destinations for ITO (Marriott, 2014), and many cities have been ranked on top locations for this sector (Tholons, 2015). Vietnam is not an exception. Being a member of ASEAN and surrounded with numerous major IT outsourcing destinations, Vietnam faces a growingly cut-throat competition from neighbouring countries for its small ITO sector with the implementation of the ASEAN Economic Community (AEC). In this paper, the author studies the potential of Vietnam emerging as a competitive IT outsourcing location.

The main purpose of this paper is to investigate the competitiveness of Vietnamese offshore software outsourcing companies in Japan and to identify some suggestions that could enhance their competitiveness in the international market. The paper starts with relevant

background information about Vietnam, followed by the consideration of the chosen conceptual framework to evaluate the country's competitiveness as an emerging IT outsourcing location, application of these frameworks and presentation of preliminary findings relating to the feasibility of Vietnam becoming a major IT outsourcing location and policy suggestions for improving its capacity for a greater role in this sector. Lastly, the author underlines the preliminary nature of findings and conclude with suggestions for further study.

2. LITERATURE REVIEW

2.1. Related works

Several studies have been carried out on the subject of the software outsourcing industry in general and Vietnamese software outsourcing in particular, especially in the context of international integration from different approaches.

A study conducted in 2007 by Gan Weihua and Gan Xiaoqing about "*Empirical Analysis on Supply Chain of Offshore Software Outsourcing from China Perspective*". For over a decade, there has been a growing interest in using supply chain methods to improve performance across the entire business enterprise. In addition to individual companies, numerous industries have also recognized the importance of supply chain integration. International software outsourcing involves subcontracting software development and related activities to third parties abroad. This paper firstly presents the difference among three concepts, namely IT outsourcing, software outsourcing and international service outsourcing. Secondly, this paper proponent the supply chain of

international software outsourcing and analyses such a supply chain structure. Thirdly, this paper underlines the supply chain of software outsourcing China engaged. Lastly, this paper makes an empirical analysis on the structure and capabilities of the supply chain where China is a member.

Khan, Niazi and Ahmad (2011) carried out a research with the topic *“Factors influencing clients in the selection of offshore software outsourcing vendors: An exploratory study using a systematic literature review”* with a view of identifying and analysing factors that are critical in terms of the competitiveness of vendor organizations in attracting outsourcing projects. In the study, these academicians have figured out that cost reduction, skilled human resources, appropriate infrastructure, quality of product and service, efficient outsourcing relationships management, and an organizations’ track record of successful projects that are generally considered fundamental by outsourcing clients. Their findings show that across three continents, including Asia, North America, and Europe, proper infrastructure, cost-saving and skilled personnel are common. Meanwhile, they also identified that appropriate infrastructure, cost-cutting, and product and service quality as prevalent across three large, medium and small enterprises. Besides, four elements – appropriate infrastructure, cost-saving, product and service quality, and skilled human resources as common in the two decades (from 1990 to 1999 and 2000 to mid-2008).

Meanwhile, Jain & Khurana (2013), in their research on “Need for sustainable global business model in software outsourcing: The Indian perspective”, studied the sustainability of the global business model of software outsourcing with the perspective of Indian vendors. This paper analyses the current trends in the global software outsourcing business and identifies the benefits and drawbacks of the models used by Indian vendors. It demonstrates the need for a long-term global business model for software outsourcing; if the need is met, India will gain value as a software sourcing destination and generate more revenue, ultimately leading to a large-scale and long-term economic and social impact.

Another research in 2009 by Kuivanen and Nahar on the subject: *“Vietnam as an emerging destination for offshore outsourcing of software development for Finnish companies: A conceptual perspective”* published in Portland International Conference on Management of Engineering and Technology. This study investigates Vietnam as an offshore outsourcing destination for Finnish companies for developing their software products and related services. The research was undertaken by reviewing the literature of (1) offshore outsourcing, (2) offshore software production; (3) information technology industry in developing countries, especially in Vietnam, and (4) approach for outsourcing to developing countries and especially Vietnam. A conceptual model of software development through offshore outsourcing was developed. The study

found impending challenges as well as potential in the Vietnamese software outsourcing industry. Additionally, it provides valuable information to practitioners fascinated with outsourcing to Vietnam and further research within the area.

All of the above-mentioned researches have indicated noteworthy findings of offshore software outsourcing in the globe. However, most of these studies concentrate on the two leading offshore software development countries, namely India and China. Moreover, some other studies were conducted about Vietnam, but very few have mentioned Vietnam in the Japanese market, especially in context that Vietnam has constantly been the most favoured partner of Japanese businesses, according to the latest Technology Promotion Agency report, while this giant client is facing a “digital cliff” and a shortage of talented IT human resources. Accordingly, it is a huge opportunity for Vietnamese firms to join hands with Japanese counterparts to solve inadequate human resources in this field. Hence, it is pivotal to conduct research on this topic to identify which competitive advantages Vietnamese companies are possessing and limitations limiting their opportunities to win Japanese customers’ trust, from which Vietnamese software outsourcing firms could find solutions to enhance their competitiveness.

2.2. Analytical framework for assessing the competitiveness

The main purpose if this paper is to explore and evaluate the competitiveness of Vietnamese offshore software outsourcing companies in the Japanese market and provide possible suggestions that could improve its ability to compete in the international arena. In the paper, the Porter’s Diamond Model is chosen for analysing the national competitiveness. This framework is chosen for a number of reasons: First, it is well-known and fairly well-established, especially in the application to the software sector in developing countries. Second, the core of the theory is accessible with the “diamond model”. Third, while A.T.Kearney Model and the Software Export Success Model could help explain the success factors for the leading software export nations like India, Ireland and Isarel (Heeks & Nicholson, 2004), these two models are not a rigorous theoretical model and all of the factors included in these models are covered in Porter’s Diamond Model.

When discussing the competitiveness of countries, Porter mainly focused on productivity as “the only meaningful concept of competitiveness at the national level is national productivity” (Porter, 1990, p6). However, when operationalizing his ideas to given country case studies, he recognizes that it is not nations that compete but firms, more particularly firms within “specific industries and industry segments” (Porter, 1990, p.9). For those reasons, Porter’s Diamond Model has become the most appropriate model to be applied in the paper.

In this model, the four major attributes that emphasize conditions for determining the national competitive advantage are “Factor conditions”, “Demand conditions”, “Related and supporting industries”, and “Firm strategy, structure and rivalry”. Porter (1990) also proposed the government’s policies and chances as supporting factors contributing to the national competitiveness, along with the four main attributes.

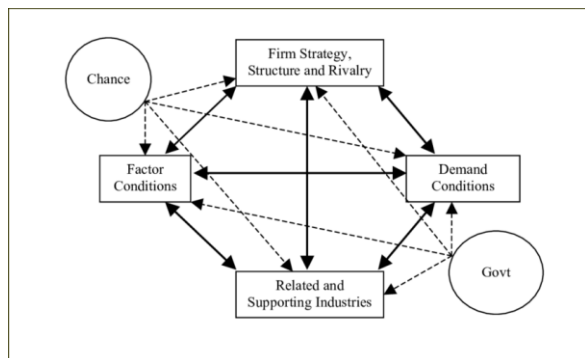


Fig. 1: Determinants of competitiveness under the framework of Porter’s Diamond.

(Source: Porter, 1990)

Each of these factors in the software outsourcing industry will be discussed below in further detail.

2.3. Relevant information of the software industry in Vietnam

The information technology industry has played a critical role in the socio-economic development of Vietnam with an accelerating growth rate of 30 percent annually. By 2020, Vietnamese software companies receive 50,000 IT personnel from 153 institutions (TopDev, 2020). Also, in the same year, there were 45,000 companies operating in the ICT industries, including foreign-invested ones grossing a total revenue of US\$126 billion, according to the Ministry of Information and Communications (TopDev, 2020). Especially, there are more than 1,000 software companies engaged in outsourcing software and software-related services to the Japanese market. The revenue of the IT industry was witnessing an upsurge from US\$ 67 billion in 2016 to more than US\$100 million in 2019, which is equivalent to one third of Vietnam’s GDP. In which, the software and IT services sector was US\$11 billion.

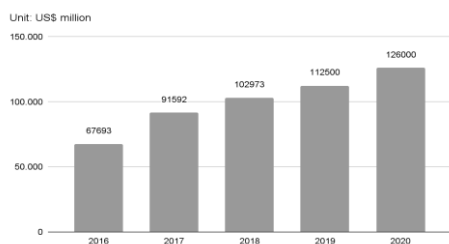


Fig. 2: The revenue of Vietnam IT industry from 2016 to 2020.

(Source: MIC, 2020)

Although the software sector has grown significantly, its total value relative to the hardware industry is still modest. In 2020, of the IT industry’s total revenue of US\$126 billion, the hardware industry gained a revenue of over US\$107 billion, while revenues gained from the software industry reached over US\$5 billion.

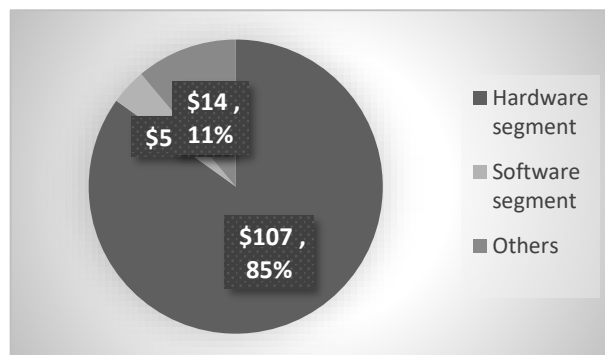


Fig. 3: Revenue of Vietnam IT industry by segments in 2020 (US\$ billion).

(Source: MIC, 2020)

Besides, not only does the IT industry contribute to economic progress, but it also promotes the social development. The software industry has a potential to boost the value of national resources, promote people’s intellect and spirit, speed up the process of industrialization and modernization, and help the country to improve its competitiveness.

The Vietnamese government is paying attention to the development of the software industry, which is regarded as one of the pivotal sectors to assist the country in achieving its national objectives and adding prosperity to the national economy. Hence, the State has issued policies to stimulate the development of this industry, such as investing in human resources, strengthening telecommunications infrastructure systems, or issuing relevant regulations and policies to protect and encourage future investors. On the other hand, the government implements tax incentives for the software industry. Even though these policies and regulations were insufficient, they still served as the foundation for the development of the software industry.

3. ASSESSMENT OF THE COMPETITIVENESS OF VIETNAMESE SOFTWARE OUTSOURCING COMPANIES

3.1 Determinants of competitive advantage

Determinants of competitive advantage, or independent variables must be taken into consideration at industry or even segment level, which are suitable for the study at the level of software sector. These drivers are summarized by a “diamond” of four major variables (Porter, 1990, p.72)

3.1.1. Factor conditions

Factor conditions are the “inputs necessary to complete

in any industry” (Nguyen, 2009), including human resources, physical resources (natural resources, location and time zone), knowledge resources, capital resources and infrastructure (Porter, 1990).

Skills and availability of human resources

Staffing is a fundamental organizational decision variable in software development, especially in the offshoring environment because, unlike other service and manufacturing contexts, these activities are fully reliant on the availability of qualified and competent employees (Pressman, 2005).

Vietnam has a strong foundation for the development of the IT industry. Looking at the Vietnamese population, there are 97 million as of February of 2020, with the life expectancy being 75 years old (World Bank, 2019). The average working age is 30.5 and the literacy rate is 95.8% among the working-aged adults and there is no sign for decline (TopDev, 2020). This means that Vietnam’s software industry is possessing a tech-savvy young dynamic generation that is driving its innovation system.

The initial basis for growth is a large supply of workforce, 50,000 graduates from 153 technical and scientific institutions annually (TopDev, 2020). Although this factor source is a developed rather than inherited source of competitive advantage, Vietnam has made continuing efforts to further enhance this factor. The growing demand of the workforce in this sector has received an immediate response by the government through a substantial development in both general technical education and software-specific training at the university level (TopDev, 2020). Besides, the high quality in technical tertiary education is attributable to the solid foundation since early education. With the S.T.E.M (science, technology, engineering and mathematics) being emphasized, Vietnamese students, along with the Chinese, have always been among the finest academic performers in reading comprehension, maths and science, even though they were coming from the second-lowest economic quintile in their countries (Nikkei Asia, 2018), and in 2020, Vietnam even placed itself in the top 8 of the evaluation by the Program for the International Student Assessment (PISA), surpassing learners from industrialized countries outside the regions (TopDev, 2020) (Figure 4). The solid foundation to facilitate the high literacy level, in general, and digital literacy, in specific, helps build a competitive outsourcing sector. More importantly, mainly thanks to learning-by-doing, Vietnam software industry has witnessed an increase in the number of advanced and more specialised skills: 8.8% of the coders start to code before 20 and the number of developers in Vietnam accounts for the majority with 53% aged 20-29 years old, a growth in staff in developing software for niche market of particular markets (Fintech, Business Processing Outsourcing, Edtech, etc.); a rise in young but experienced developers at the Senior/ Lead expertise (TopDev, 2020).

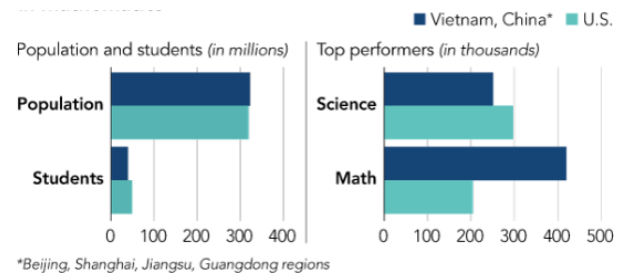


Figure 4: The number of top performers in Vietnam, China under OECD’s PISA assessment.

(Source: Roughteen, 2018)

Affordable labour costs

From the economic perspective, labour cost is a critical source of Vietnamese advantage: the annual salary for highly skilled engineers is US\$10,000, which is a half less than the average amount in Malaysia. Alternative, with the same capability level, they may even earn around US\$30,000 in Thailand (Stack Overflow, 2020). According to a survey by Stack Overflow (2020), Vietnam only ranks 7th bottom-up in terms of median salaries for developers (Figure 5). This is a definite competitive advantage of Vietnamese offshore outsourcing companies, since the number of businesses in the software industry prioritizing cost reduction has increased dramatically, especially in the face of the pandemic-induced global recession, according to Deloitte survey (2020).

Language Proficiency

Another skill-related source of competencies that must be acknowledged is the language proficiency. When partner firms have different native languages, these might raise the transaction costs, while transaction costs have been mentioned as being important in determining whether a firm will choose to outsource its projects or not (And & Straub, 1998; Qu & Brocklehaust, 2003). In case of software industry, the pervasive of English – the global language is widely used in software education and business. Although English is brought into education since primary school, Vietnamese proficiency in using English has been recorded low in two consecutive years, 2019 – 2020, being categorized in the list of low-proficiency countries (EF Education First, 2020).

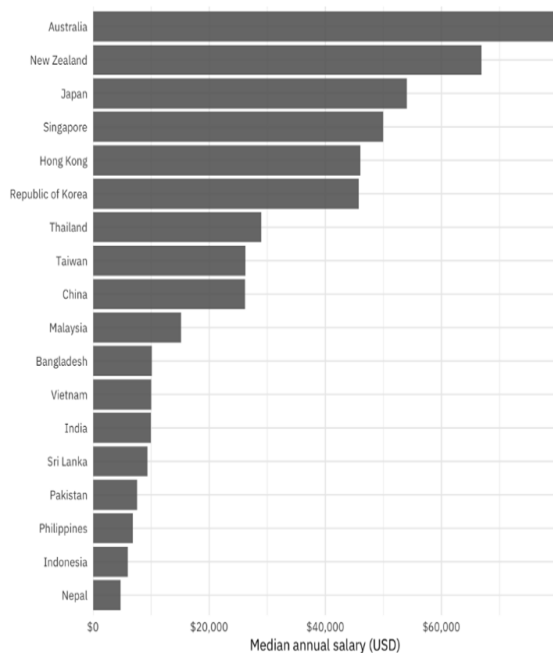


Fig. 5: The median salary range for developers in Asia Pacific in 2020.

(Source: Stack Overflow, 2020)

According to the 2020 English Proficiency Index conducted by the global education firm Education First (EF), Vietnam only attained 473 out of 800 points in the survey with the ranking of 13th out of 24 Asian countries and territories, 65th among 100 countries and territories in the world, plummeting 13 levels against 2019. Although the proficiency of the Vietnamese is much higher compared to other Asian countries (Indonesia – 74th, Thailand – 89th and Myanmar – 93th), its position is far lower than the two leading countries in the outsourcing software industry, namely China (38th) and India (50th). The reason for such a low proficiency level is that students in public schools are mainly taught using the traditional methods of grammar exercises and vocabulary cramming rather than engage in fluent talk with colleagues or understand emails from fellows (Nguyen, 2020).

When a firm works with potentially international clients, it is essential to speak their language, especially with the Japanese (Evans, 2018). However, although Vietnamese engineers are highly appreciated in Japan thanks to their intelligence competency and hard work, at least fifty percent of Japanese firms want N2 skills, which makes a low rate of Japanese unproficiency an obstacle for the industry to grow (Vietnam Times, 2021). It is obvious that the number of software developers in Japanese-market outsourcing firms who can speak the language fluently, is relatively low, only around 20% - 50% of the total employees (VINASA, 2020) (Table 1). This has marked a modest proportion when comparing to the figure for staff having a good command of English.

Table 1: Number of Japanese-proficient employees in large and medium Vietnamese offshore software outsourcing companies in 2020

Company	Total employees	Employees have Japanese proficiency
Fujinet Systems JSC.	750	500
GMO-Z.com Runsystem JSC.	600	560
Nashtech Vietnam	1582	50
Amela Technology	202	100
Luvina Software	710	323
VNEXT Holdings	420	180
Rikkei Software	1030	530

(Source: VINASA, 2020)

Hence, despite being competitive in the labour costs with highly competent IT skills, Vietnamese companies cannot profoundly win the competition against the industry leaders due to the risks of being unable to completely understand the customers' requirements, which might lead to unpredicted misunderstandings in accomplishing required jobs.

International linkages

In order for a business to successfully export software and attract outsourcing customers, it is of importance to establish strong relationships with countries where software services are in great demand. The most successful IT export player, India, with a record of a huge number of IT specialist working in IT customer countries, such as US or the Philippines, has stimulated its citizens to work abroad so that they could retain strong attachments to their home country and help companies there (Heeks & Nicholson, 2004). In case of Vietnamese software companies, their international linkages with customer countries, especially Japanese clients are characterized as follows:

Time zone proximity: Given the need for frequent communication and problem solving in terms of software issues, clients prefer partners near their time zone, especially the Japanese (Owada, 2014). The time difference between Vietnam and other Asian nations ranges from one to a few hours, which has minimal impacts on daily communication effectiveness. Furthermore, travel throughout Asia is relatively handy, with most Asian technological centres accessible within hours of Hanoi. Hence, daily information synchronization and flexible working hours might enable IT employees operate more efficiently.

Cultural similarities: Along with the traditional culture, Vietnam has lots of cultural similarities with other nations such as Japan or China. The Vietnamese have far more in common with people from Korea and Japan than with those from Thailand or the Philippines in terms of culture, linguistics and ethnicity (Hofstede, n.d.). This offers an underlying ability, as evidenced by Vietnamese qualities such as intelligence, hard work, structure, discipline, determination and attention, as well as a significant focus on communities and families.

These linkages are regarded as trust and foster familiarity between clients and contractors. Such linkages help facilitate trade to take place and continue timely and successfully (Davenport, 1998; Larsson & Venkatesh, 2010).

3.1.2. Demand conditions

Porter (1990, p.258) opines that domestic demand affects the level of competitiveness of a nation on the global scale. This suggests that if the Vietnamese demand for ICT, especially the software industry is raising and so does the trend in the international market, domestic producers will become globally competitive. Table 2 shows the breakdown of Vietnam's ICT revenues over the period 2015 to 2018.

Demand has increased rapidly from 2.6 billion in 2015 to 4.3 in 2018 (Table 2), showing an increasing demand in the local market. Furthermore, according to a survey by US-based software vendor BetterCloud, 73 percent of organizations will resort to software outsourcing (Samuel, 2019).

Table 2: ICT industry revenue in Vietnam by sector.
Source: Ministry of Information and Communication.

Unit: US\$ billions

	2015	2016	2017	2018
Hardware	53	58.8	81.6	88
Software	2.6	3	3.8	4.3
Digital content	0.6	0.7	0.8	0.9
Services	4.5	5	5.4	5.7
Total	60.7	67.7	91.6	98.9

(Source: MIC, 2020)

3.1.3. Related and supporting industries

Related and supporting industries are fundamental for an industry's capacity to win the competition in the international marketplace, as competitive advantages of the supporting industries could make great contributions to the thrive of an industry (Sardy & Fetcherin, 2009). Following Porter (1990), the presence or lack of internationally competitive associated industries and suppliers in a country is referred to the attribute of related and supporting industries, including the value chain's upstream and downstream companies as well as supporting infrastructure such as transportation and communication.

Since the most critical input for the software industry is well-educated labour, the educational institutions as indicated in the section of factor conditions would be the most significant "industry supply" for Vietnam. Along with the solid foundation for the future IT workforce supply, the cooperations between the government, businesses and education providers are being enhanced. An increased attention to opening more

short-term training courses, offering part-time jobs or internships would improve students' ability to approach real-life requirements, catch up with innovative technologies, and accumulating soft skills (TopDev, 2020).

Scientific and development investments

Cybercrime: The Covid-19 has heightened the need of cybersecurity. With so many firms focusing on digital transformation, it is not unusual for some to regard cybersecurity as an "extra" benefit (Scalerandi, 2020). However, Vietnam, an emerging destination for software outsourcing, is on the verge of becoming a mid-tier cybercrime hotspot (Vietnam Insider, 2019). The rise of cybercrime rate places Vietnam in the top ten nations that have been victims of targeted assaults (Internet Security Threat Report, 2018). This might decrease the attractiveness of Vietnam in the eyes of client countries.

IP licensing: Development of the software product is involved in patent filings, and integration with third-party software components. The protection of intellectual property through patent registration indicates the current and future foundation for businesses to grasp core technologies, integrate into the global market, and compete with multinational organizations (Vietnam Economic News, 2021). When compared to foreign applicants, the number of patent filings by the Vietnamese lags behind, with a mere proportion of 5%. Government measures fostering R&D in the ICT sectors, on the other hand, have obviously boosted the patent filings. Universities and research institutes account for a quarter of the total applications. Main technical fields in which Vietnamese businesses have patented are Human Interface (20%), high Speed Computing (11%), and Large-capacity Information Analysis (11%).

Technological infrastructure

Carmel (2003) identifies that technological infrastructure, referring to the availability and reliability of telecommunication technology, is one of the most important determinants on the development of software companies since such businesses require affordable and reliable telephone and internet connections. In areas relevant to the development offshore software industry, Vietnam is leading the world.

Bandwidth costs: Vietnam is one of the countries having the cheapest broadband price per month for the same fixed-line subscription in the world (US\$ 11.27) compared to other competing countries in software outsourcing industry in the region (China – USD 12.26, India – US\$ 13.58, Thailand – US\$ 23.30, or Indonesia – US\$ 29.06) (Cable UK, 2021a). Coupled with the reasonable subscription price, the speed of internet connection in Vietnam ranks at 102th and it is also outweighing its rivals in the region, with India and China being at 101th and 200th, while other Southeast Asian countries only rank at 120th and more (Cable UK, 2021b).

Hi-tech parks: The outsourcing industry is anticipated to benefit from a developing network of technology parks with advanced infrastructure (Oxford Business Group, 2021). Vietnam is now having four main high-tech parks located in major cities with favourable transport links. In addition to having comprehensive infrastructure and convenient transportation, these tech-parks have obtained advantageous governmental policies aimed at luring investors in high-tech projects. However, a major issue is the high factory leasing costs. Since high-tech parks have a larger size and more systematic investment, their costs are even double those in industrial parks. Consequently, one of the problems for investors is pricing issues (Anh, 2020).

Table 3 shows a regional comparison of performance in digital infrastructure between Vietnam and some leading Asian countries in the offshore software outsourcing countries. Although Thailand is leading the pack in most aspects, Vietnam proves to be strong in high technology exports and performance on the Global Innovation Index.

In general, although Vietnam's indexes are relatively competitive with regional countries, its digital infrastructure is still at a basic level with regards to data and transmission speed. Huge investments are required to establish future boosts in offshore software industry.

3.1.3. Firm strategy, structure and rivalry

Porter (1990, p.71) states that firm strategy, structure and rivalry consider "the conditions in the nation governing how companies are created, organized, and managed, and the nature of domestic rivalry". Meanwhile, Anand Rangchary (Managing director – Southeast Asia & Middle East, Frost & Sullivan, Chennai) indicates that "the interplay between the various stakeholders ... played a critical role in the success of the IT industry globally".

Industry structure

The local software industry is expanding gradually and starting to draw the international notice as a major regional hub (Vietnamnet, 2016). Local firms, which provide low-cost software, make up the majority of the market. In mid 2018, a total of 9,500 Vietnamese firms had developed digital software for industries such as banking, telecommunications, smart agriculture and government. IT outsourcing services brought in about US\$3 billion in 2016 and Vietnam has surpassed India as the second-largest software outsourcing destination in Japan, only after China (Marvin, 2015). With that huge potential, the software industry has witnessed an upsurge in the number of software enterprises over the years, with an average growth of 1,000 firms – equivalent to around 30 percent each year (MIC, 2016). The competition is unique in the sense that while big players offer packaged solutions and even become the R&D hub for international tech giants (VCCI, 2021), small and developing businesses excel in specific services/ verticals in order to avoid competition from industry giants. This is due to their limited labour force.

Currently, there are only 200 firms with the scale of 150-200 employees and 10 enterprises with 1,000 staff, it is challenging for such companies to meet large orders (VEN, 2018). The presence of a significant number of companies of all sizes, each offering a variety of services that span the whole value chain, has made the sector internationally competitive, and it continues to be the most sought-after location for outsourcing projects and contracts.

Competitive strategies

According to Flinders (2016), the worldwide demand for software outsourcing remains high even when the global economy is experiencing a downturn, especially amid the breakout of coronavirus where firms are under the pressure of cutting costs, prompting them to seek out cheaper outsourcing destinations.

Focus on innovation: Since "innovation has always been and will always be the essential differentiating factor" (Manoj Chugh, Global Head, Business Development at Mahindra Satyam), technological advancements are critical to maintaining a competitive advantage, especially in a knowledge-intensive business, namely IT. However, Vietnam's innovation capacity still has much room for improvement. According to the Global Competitiveness Index (2019), Vietnam ranks 67th out of 141 economies, behind Singapore (1st), Malaysia (27th), China (28th), Thailand (40th), Indonesia (50th), and only above India (68th). While the country's exports have effectively expanded and diversified, the structural change towards high-technology and knowledge-intensive industry has been sluggish in comparison with its counterparts. According to the Global Competitiveness Index report (2019), Vietnamese companies demonstrated lower levels of innovation than expectation, given the country's level of development. While Vietnamese firms innovate more than those in Malaysian, Indonesian, Thailand or Turkey companies, they still lag behind those in China, Singapore and the Philippines in terms of radical product innovation (Nhan Dan, 2021). Accordingly, compared with product inventors in Malaysia (75%), the Philippines (62%), and Thailand (63%), fewer Vietnamese companies (53%) report that their major innovation is new to the market. This is owing to the Vietnamese education system being focusing on training students to work for software services businesses where clients assign tasks to them, rather than encouraging them to be innovative or think out of the box (Vietnamnet, 2016). Furthermore, although Vietnam pay more attention to R&D, the number of IP filing is much lower than other countries in the region as mentioned.

Adoption of quality certifications: An obstacle posed on the competitive edge of software outsourcing in Vietnam is the widespread adoption of international quality certifications. There are two reasons for this adoption. First, such certifications are used as a signalling mechanism to inform potential clients that the company is following a well-defined and documented

software development process (Arora & Asundi, 1999). Second, quality certifications help companies anticipate the amount of time and resources needed to execute a project. This allows them to compete for more difficult and larger projects, expanding their business prospects (Parthasarathy, 2006). Two of the most commonly used international standards are CMMI (Capability Maturity Model Integration) and ISO (Worldwide Standards Organization) (Coward, 2002). The CMMI, which contains five maturity levels ranging from 1 to 5, is used as an industry benchmark for assessing performance. Software processes are ad hoc and chaotic at level 1, whereas software processes at level 5 attain the greatest levels of quality and self-improvement capabilities. Receiving a level 3 and above indicates that the company has invested sufficient time and money in acquiring the certification (White, 2021; Coward, 2002; Dutta, 2001). In case of Vietnam, although some firms reached Level 5 of CMMI standards (eg. Nashtech, TMA, Global Cybersoft, FPT Software, etc...), merely 25 out of hundreds of IT firms in Vietnam acquired CMMI certification at level 3 (MIC, 2019). With a low number of companies acquiring CMMI level from level 3 and above, the majority of Vietnamese software companies have yet to totally understand their shortcomings and how to address them; which is a disadvantage for the country to overcome other rivals and gain confidence from international clients.

Indeed, with lots of competitive advantages, Vietnamese software companies are open to opportunities in the international arena. However, the problem is that they have to prove the sufficient availability of resources to meet requirements of demanding clients. Entering the international market requires software companies to build a complete software development process in accordance with international standards, a sound track record and infrastructure to attract international customers; thereby creating reputation and winning trust of potential international customers.

Inexperienced management style

The strong rivalry aside, in the areas of firm strategy and structure, the influence of management style has a more direct effect on the national competitive advantage in the industry (Quintin, 1993). Most offshore software firms in Vietnam are SMEs and many of them lack experienced managers at all levels, from top management to junior project managers. Besides, many Vietnamese software enterprises tend to promote technical experts to become managers but do not consider their business knowledge and vision.

Lack of soft skills

In spite of efforts to strengthen the national educational system, Vietnam still lags behind in soft skills and practical education (Unicef, 2020). While IT skills are

frequently considered as the lowest technical capabilities among young personnel, management and communication skills are evaluated as the worst transferable skills.

The rapid proliferation of technology allows machines to take over technical and repetitive operations; however, in the sector of software outsourcing, the involvement and quality of human resources is high and undeniable, the ability to survive in uncertain and poorly defined situations is crucial for the employability of human resources, as they are talents that machines cannot replicate, especially in the software outsourcing industry (Unicef, 2020).

Table 3: Benchmarking Vietnam's digital infrastructure with comparable ASEAN nations

Indicators	Date year	Viet nam	Indone sia	Thaila nd	Philip pines
Global Innovation Index	2018	45 th	85 th	44 th	73 rd
ICT Development Index (out of 176 nations) (Measures ICT access, ICT skills and ICT adoption)	2017	108 th	111 th	78 th	101 st
Global Cybersecurity Index (193 nations) (Measures commitments and progress in cybersecurity across five areas – legal, technical, organizational, capacity building and cooperation)	2017	101 st	70 th	20 th	37 th
Average download speeds (out of 200 nations; Mbps)	2018	75 th 6.7 Mbps	83 rd 5.8Mbps	40 th 17.1 Mbps	89 th 5.2 Mbps
Inclusive internet index (out of 86 th) (Measures inclusiveness of the internet based on infrastructure, affordability, capability and relevance of content to users)	2018	43 rd	49 th	31 st	54 th

(Source: Cameron et al., 2019)

3.2. Influences on competitive advantage

3.2.1. Chance

The main factor in the Porter Diamond Model is Chance, defined as “unexpected events that just happen” (Javalgi, Benoy & Gross, 2013, p.481). The government plays a crucial role in this field, especially when it comes to negative chances, and may help this fledgling industry by strengthening business continuity and disaster management skills and practices.

Chance might happen at different levels. Porter emphasized “political decisions by foreign governments” (Porter, 1990, p.124). The US-China trade war is a typical example. Businesses were rethinking their investment and development plan as a result of the US-China trade war and Vietnam has been beneficiary as a manufacturer so that businesses could relocate capacity out of China in short term to avoid hefty US tariffs associated with a “Made in China” label (KPMG, 2021).

Then comes the Covid-19 outbreak. The global economy has been wreaked havoc, making investors rethink how they conduct businesses as consumer demand and preferences change (Samuel, 2020). Investors will regard nations which are able to manage the epidemic and create a rapid economic recovery as a safe bet to do business with, and they will benefit from more investments. In light of this, Vietnam is better positioned to take advantage of a transformative shift in consumer behaviour, shifting supply chains, and a new normal as a result of Covid-19. Being regarded as the top three nations that evoke early and robust response to the pandemic, Vietnam has been left unaffected by a recession in 2020 (Statista, 2020; AFP, 2020). While many Western countries are shouldering a burden of high infection and mortality rates, Vietnam, with a rigorous policy of mass quarantines, extensive contact tracking and tight movement limitations, enables manufacturing sites and industrial parks to reopen sooner and employees to return to work quickly. Vietnamese IT companies no longer have to rely on working from home; which exerts a huge positive impact on employee motivation and communication.

In Asia, outsourcing to Vietnam is gaining attention as a safe, low-cost, outstanding quality software development option. When comparing with software development in Western countries, namely the USA. Vietnam helps save up to 90% of expenditures (CIO, 2020). Even compared to giants like India, software development in Vietnam ranges from a third to a seventh of the price. In addition to the financial reasons, India is among the top 15 economies which is heavily impacted by the coronavirus epidemic (United Nations, 2020) and over 50% of firms located in India did not have enough technical resources to convert to remote work as a result of the Covid-19 scenario (Hindustan Times, 2020). These are compelling numbers for businesses to consider moving their offshore activities to Vietnam.

3.1.2. Government intervention

Favourable decree for IT sector

Carmel (2003) affirmed that “governments can play a proactive or facilitating role” in other economic fundamentals of the software industry.

The Vietnamese State has recognized the potential to become a worldwide software development leader; thereby setting an aim of focusing on creating strong foundations for technological success rather than on “workshop of the world” capacity through suitable policies and regulations to promote the growth of software enterprises. The first national policy for the software industry, called Resolution No.49/CP, was announced in 1993, focusing on the promotion of the national educational system for IT, followed by the Government’s promulgation of No.07/2000/NQ-CP, which prioritized the development of talent training and the creation of a good investment environment related to tax exemption. Since the signing of the decree, financial incentive packages have been offered. The State has maintained low import tariffs on IT items and has given IT companies a set of tax and other advantages. Local and foreign-invested software development and services businesses enjoy an exemption from corporate income tax for four years from the date of taxable income generation. Software products will be subject to a zero percent VAT and also free from export taxes.

Over the years, the Vietnamese government has enacted numerous regulations to develop the IT, especially the software industry. The regulatory framework is further bolstered by free trade agreements (such as AEC and CPTPP) as well as bilateral agreements with Korea and Japan. Vietnam’s commitment to digitalization is recognized through policies, master plans and directives with the main guiding document being Directive 16/CT-TTg. In which, technological modernization of the software industry is believed to be supported through:

- Focusing on developing new digital infrastructure and networks
- Prioritising the development of the Vietnamese ICT industry in government policy and reform, and promoting the take-up of smart technologies across all industries
- Building the innovation ecosystem through further funding for scientific and research infrastructure and institutions, creating international relationships and promoting tech start-ups
- Building technological skills through a focus on STEM education and training from early childhood through to adult education

For the most parts, development programmes related to infrastructure were achieved. However, achievements on well-rounded human resources and effective legislations on R&D activities, especially intellectual property (IP) protections have yet to be incomplete.

Political stability and fast economic growth rate

Vietnam is among fewest Southeast Asian countries that enjoy a more politically stable context, with a score of 0.13 with respect to the political stability by the Worldwide Governance Indicators of the World Bank in 2019; much higher than India (-0.70), Thailand (-0.54) and China (-0.24) (Figure 6)

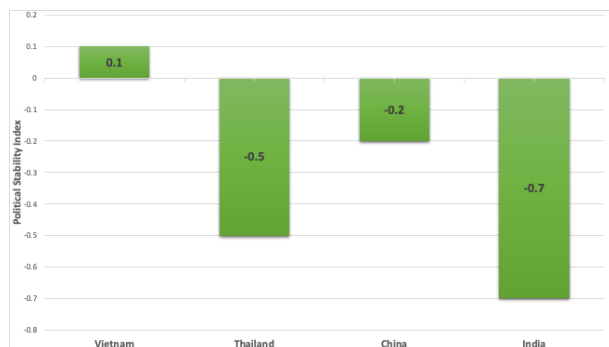


Fig. 6: Political stability index of Vietnam and other Asian countries in 2019.

(Source: World Bank, 2019).

The country pursues a standpoint of having a good term with many countries regardless of their political outlook. Vietnam is also a member of organizations, namely the United Nations (UN), World Trade Organization (WTO), Association of Southeast Asian Nations (ASEAN), Non-Aligned Movement (NAM), and many other prestigious institutions. Such stable political climate has consolidated the confidence of business entities in choosing Vietnam as a go-to destination for outsource since outsourced projects are hardly affected by any social issues.

Improvement for IT educational system

With an aim of highly attaching importance to the IT industry with software development being the core factor contributing to the economic growth, the government plans to shift their attention to quality rather than quantity (TopDev, 2020). This means that a government – business collaboration in learning will be enhanced. More part-time jobs or internships will be offered to IT students so that they could approach real-life requirements, keep up with new technologies and accumulate more experiences.

4. EVALUATING THE COMPETITIVENESS OF VIETNAMESE SOFTWARE OUTSOURCING COMPANIES IN THE JAPANESE MARKET

4.1. Japanese approach to the outsourcing software

4.1.1. The situation of the Japanese offshore software market

Japan is the world's third largest IT market, only after the United States and China. Since the early 2000s, an increasing number of Japanese firms are interested in offshore outsourcing of software development and about

one fourth of Japanese IT enterprises have outsourced parts of their operation to overseas service providers (Simeon, 2010). Offshore development in this country reached nearly 1.6 billion dollars in 2017 and most of orders were to India and China; however, since 2016, Vietnam has replaced China to be the second largest software outsourcing market for Japan, holding 20.6 percent of the Japanese market share, against 31.5 percent of India (MIC, 2016).

Unit: million yen

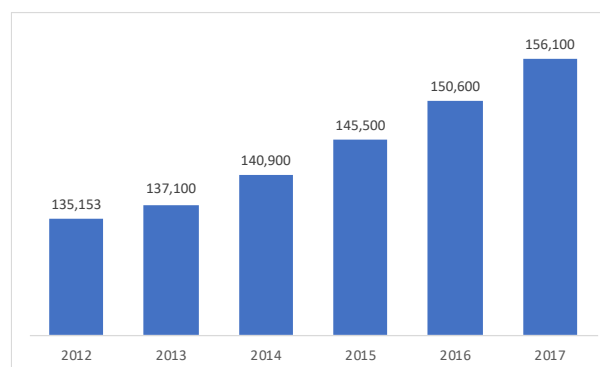


Fig. 7: Market size of Japan's information services during the period 2012 - 2017.

(Source: MIC, 2016)

The crisis of "Digital Cliff"

The "digital cliff" identified in 2018 continues to be underlined as a risk. Japanese corporate sector was under the severe situation of outdated IT systems, got closer to "2025 digital cliff". By 2025, 60 percent of mission-critical systems will be older than 20 years old, up from 20 percent in 2020 (METI, 2018). A report by METI in 2018 shows that the coming decade will be the best time for Japanese businesses to go all-out to seize the opportunities of "digital transformation". Also, by the year 2025, Japanese firms should restructure outdated systems and determine which ones should be phased out. They should also renovate essential systems and carry out a digital transformation strategy in parallel with this. This is expected to boost Japan's real GDP to around 130 trillion yen by 2030 (METI, 2018).

Constant shortage of software engineers

Japan is facing serious concerns on the aging population and declining birth rate, causing a talent shortage in the industry, while the demand is increasing rapidly. Even in 2020, when the global economy is entering a recession as it tried to mitigate the spread of Covid-19, surveys in Japan still revealed a labour shortage (BOJ, 2021).

Many companies are having difficulties recruiting fresh graduates who can support the company in the long run.

Besides, IT-related occupations are becoming less popular among young labour force, mostly due to the lengthy working hours. Some refer to it as a "3K job" – Kitsui (difficult), Kaerenai (unable to return home), and Kyuryo ga asui (low payment). When businesses are

unable to acquire enough capable workers, current employees are prompted with longer working hours than average, resulting in higher employee turnover rate.

In Japan, many opportunities are available for non-Japanese possessing sufficient skills to work in IT engineering. An April 2019 survey by the Ministry figured out that the demand for IT workers in Japan would exceed supply by 300,000 in 2020, a shortfall that is expected to swell to 450,000 by 2030 (METI, 2020). The reason is due to their aging population, which means fewer in the working age. Besides, Japanese institutions are unable to produce enough software engineers to meet an extremely high demand for software products while having to deal with a lack of the IT workforce. This has led Japanese companies to call for outsourcing services from Asian countries as an effective solution.

Another concern is that many IT firms may lose numerous project managers. Companies still utilize the “legacy” system like mainframe computers, despite the fact that most younger engineers have to service their customers’ outdated systems once the baby boomers retire (Gehrke, 2019). Older specialists are aware of how many different technologies have been combined to make the systems operate, as well as the types of relationships that have been established with their clients.

4.1.2. Requirements of the Japanese market for offshore software outsourcing companies

Decisions on the location for software offshore outsourcing made by Japanese firms generally mainly rely on four criteria: (1) Quality and availability of software engineers; (2) Japanese proficiency; (3) Cost reduction; (4) Track record of businesses with the Japanese.

4.2. Evaluation of the competitiveness of Vietnamese offshore software outsourcing companies for the Japanese market

4.2.1. Fit between Vietnamese offshore software companies and the Japanese market

Based on the analysis of the national competitive advantage through Porter’s Diamond Model, it is clear that, along with the appropriate government intervention and external events like the controlled Covid-19 situation or Japan Digital Cliff, low labour cost and ample human resources have become the push for offshoring to Vietnam.

The availability and quality of human resources

From the aspect of human resources, a match situation is emerging. Over the past 30 years, Vietnam’s development has been nothing short of remarkable, experiencing rapid demographic and social change. By 2020, its population reach nearly 97 million, a dramatic rise from an approximate number of 60 million in 1986 when Vietnam first began its Doi Moi Policy, and this number is estimated to expand to over 120 million by

2050. With an upsurge in population and the current life expectancy of 75 years old being the highest among countries in the region with the same income level, Vietnam has shown a great availability in the human resources.

The number of graduates in Vietnam has been soaring given the increasing number of processes for training of fresh software engineers. Thanks to the vision of the Vietnamese government in terms of regarding the IT industry as one of the pillars for the economic growth, future workforce is well-equipped with a strong educational foundation with S.T.E.M mechanism and background lessons since secondary school. Furthermore, the labour force in Vietnam’s IT industry is also abundant with a few years of experience but having senior or lead expertise. This is equivalent with the shortage of labour force in Japan, especially in the context of digital cliff, not only with the level of junior or middle but also experienced specialists.

Cost reduction

As indicated earlier, Vietnam’s average salaries are cheaper compared to other countries with the same position and experience. Favourable governmental policies such as tax exemption, cutting-edge infrastructure and competitive digital infrastructure make contributions to dealing the issue of cost reduction for Japanese enterprises, especially amid the breakout of coronavirus epidemic where all production activities have to be put on halt, which affect the employees’ working enthusiasm.

Track record of businesses with the Japanese market

Along with political stability, while other countries, including outsourcing leaders like China or India, are struggling to combat with the Covid-19 epidemic, Vietnam successfully responds to enable a normal life for businesses sooner. These conditions encourage the switch of supply chain from other countries in the region to Vietnam.

As mentioned, cultural affinity is of great importance when doing business with Japanese companies. With strong linkages between Vietnam and Japan, especially with cultural similarities and little lag time, Vietnamese companies position themselves as easy for collaboration as they could comprehend their primary partners in Japan, maintain daily communication at business hours or timely help address coordination challenges.

4.2.2. Mismatch between Vietnamese offshore software companies and the Japanese market

Incompatible communication language in doing business

Although Vietnamese software industry is having numerous collaboration opportunities in the international market with their moderate English capabilities, coupled with other competencies in affordable but highly skilled workforce or favourable chances and government incentives; for a distinctive market, where the native

language is always appreciated, Japanese unproficiency has become a big challenge that makes Japanese clients hesitant to work with. Japanese contractors have to call for interpreters as a bridge for communication. However, using the intermediaries might lead to breakdowns in communication as well as a rise in operation costs, which is opposed to the purpose of Japanese companies in outsourcing software development. For this reason, the improvement on Japanese fluency should be underlined.

Lack of management and soft skills

There is a mismatch between the two partners in terms of management skills. Japanese companies are facing the lack of project managers who are familiar with novel technologies. Meanwhile, team leaders in Vietnam are often promoted inappropriate. Consequently, this might cause a misunderstanding and coordination. Moreover, fresh graduates from Vietnam's universities and colleges also lack soft skills, such as communication or teamwork, etc., which are a good support for any projects.

Lack of international standards

The number of Vietnamese companies owning the CMMI certificate from level 3 and above is still low. This poses difficulties for Vietnamese software firms in standardizing the production processes and quality management, as opposed to Japan where quality is prioritized and clients are stucked to off-the-shelf packages.

More importantly, Vietnam is among countries having low IP filings and facing the potential of becoming a mid-level cybercrime hub. Such low security might flaw into software development, opening the doors for hackers to have broad and negative impacts on businesses. Consequently, this deteriorates the global branding of Vietnamese software outsourcing in the eyes of international clients.

5. SUGGESTIONS TO IMPROVE THE COMPETITIVENESS OF VIETNAMESE OFFSHORE SOFTWARE OUTSOURCING COMPANIES IN THE JAPANESE MARKET

5.1. Continuously developing and improving the quality and quantity of the workforce

Although Vietnam is ready to provide international clients with adequate number of dynamic and quality IT human resources, a proportion of these workforce are still lacking necessary skills. First, companies need to invest in training and fostering the workforce to stay up to date with the most modern programming knowledge and skills, and at the same time, improve their Japanese language level. Also, it is necessary to invest in improving soft skills so that employees can quickly adapt to changes in the working environment.

Second, companies can spend money and time to send programmers to participate in seminars, training sessions

of some large software corporations in Vietnam such as Microsoft, IBM... then, they can share knowledge and experience with other programmers. Besides, Vietnamese companies can cooperate with foreign software enterprises to create a network and learn from their experience.

Third, Vietnamese firms should promote the right personnel. Promoting the wrong person is one of the biggest mistakes businesses make in labor management. Although it sounds counter-intuitive, the most skilled workers are not always the best to be equipped to manage others. Having technical job skills is essential, of course, but it is only one of many factors that makes a good manager or leader. In addition, the best worker may also be a person who expects others to do things the same way that he or she does. Alternatively, they may have best practices in their head but not the best communication skills. Hence, career path and criteria for specific positions, especially the managerial posts should be design carefully in order to promote the right personnel who is well-equipped with both technical and leadership skills; thereby improving the team's productivity.

5.2. Apply international standards

Certification also enables companies to improve the time to market. Competing companies are utilizing ISO and CMMI for industry best practices and reaping the benefit of them. Companies have adopted this approach to meet customer demands and stay in the competition. Due to the growing popularity of CMMI in the market, the companies that have this certification have become more trustworthy. Many small companies use CMMI as an opportunity to grow into international organizations.

5.3. Complete the legal environment for the software industry

While being in the progress of completing the legal corridor for international trade, the government should also pay attention to the enforcement of copyright laws for software products. Strict enforcement of the copyright law will not only promote the healthy development of Vietnam's software industry, but it will also change the view of foreign partners and customers about domestic software enterprises accordingly. Hence, the exchange, trade, cooperation and investment will develop more substantially.

6. CONCLUSION

The research aims to give an overview on the competitive advantages of Vietnamese offshore software outsourcing companies and propose some suggestions to enhance their competitiveness. Based on the above analysis, it can be concluded that Vietnam is a potential destination to develop the software industry to meet the outsourcing demand for the Japanese market.

This study has identified that Vietnamese software companies receive favourable conditions such as preferential policies and government support; economic

stability; dynamic population; and reasonably priced but high-quality workforce. Meanwhile, there are objective and subjective problems that limit the competitiveness of such firms; including weak leadership and management capability; poor language and soft skills; threats of cybercrime and lack of innovation.

However, enormous opportunities for development are still open for Vietnamese businesses so actions should be taken immediately: improve the quality and quantity of human resources; cope with weaknesses in language and soft skills; or further apply international standards. Besides, the government should also complete the legal environment for the software industry and develop infrastructure.

In that case, the competitive position of Vietnamese offshore software outsourcing enterprises will undoubtedly become more robust. Vietnam's software industry can achieve the National Strategy by 2030 that the Ministry of Information and Communications had developed.

To better understand the implications of these results, future studies could address the effectiveness of these above solutions and provide more long-term solutions.

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