सत्यमेव जयते

Thailand's IT Market

Photo credit: Asia Development Bank

November 2016

A Study Commissioned by the Embassy of India, Bangkok on “Thailand’s IT Market”

Table of Contents

Table of Figures

List of Acronym

AEC	ASEAN Economic Community
ASEAN	Association of Southeast Asian Nations
CAGR	Compound Annual Growth Rate
GDP	Gross Domestic Product
ICT	Information, Communications and Technology
IT	Information and Technology
ITU	International Telecommunications Union
NBTC	National Broadcasting and Telecommunications Commission

Note on Exchange Rates

Throughout this report, the following exchange rates (measured at November 6th, 2015) are used when required: 1 US $ = 35 Thai baht.

Source: www.xe.com

Executive Summary

Driven by the increasing use of technology in all aspects of society, the information and technology industry (IT) has been growing rapidly in Thailand, disposing of a vast business potential for innovative firms, meeting sophisticated users and demanding customers. The Thai IT market in 2015, including the sales of hardware, software and services, was worth about US$18.6 billion, accounting for 4.8% of the Gross Domestic Product (GDP). The market will reach US$25 billion by 2020 with compound annual growth rate (CAGR) of 6.8%.

With a long tradition in international business relations and a generally open and curious attitude among its people, Thailand offers an ideal environment for the development and early commercialization of new products and services, especially in the IT sector. Interesting opportunities also arise from the fact that many small companies in Thailand are in need of capital and other growth triggers.

The Thai IT market is particularly interesting for Indian firms that are active in one of the following areas, which have been identified as "pockets of growth" and important general market drivers within the sector:

- IT security - IT security is a major concern across all sectors of Thai societal and business life. Potential segments include digitally connected and controlled devices for burglar prevention and other security issues; motion sensors, door locks, security cameras (with or without facial recognition); surveillance services with connection to a broader smart home; hazard prevention devices like flood, smoke or gas sensors.

- Industrial IT - Industrial IT is a focus area in Thailand. The manufacturing industry is the main driver of the Thai economy and the pressure to compete with lower-cost countries is high. Flexibility, time to market, decentralized manufacturing; those are key words that are changing the nature of manufacturing at the moment. For Indian companies, it is vital to be in a front position in this development.

- Ehealth - The Thai market for ehealth is fragmented, consisting of many systems and players. The potential for cost-savings and more concentrated efforts on innovation and development is considerable. Potential segments include connected medical devices for use at home; Pay-to-use apps (paid app downloads, premium versions and in-app purchases); Paid-to-use desktop versions that additionally provide an app; Telemedical services relating to remote patient monitoring

- Internet of Things- Potential segments include smart and wireless sensors; wearable devices such as smart watches and bands; and embedded systems programming.

- IT entertainment - This segment includes games for smartphones and web-users, streaming of music and video, TV on demand.

1 Thailand's IT Market Overview

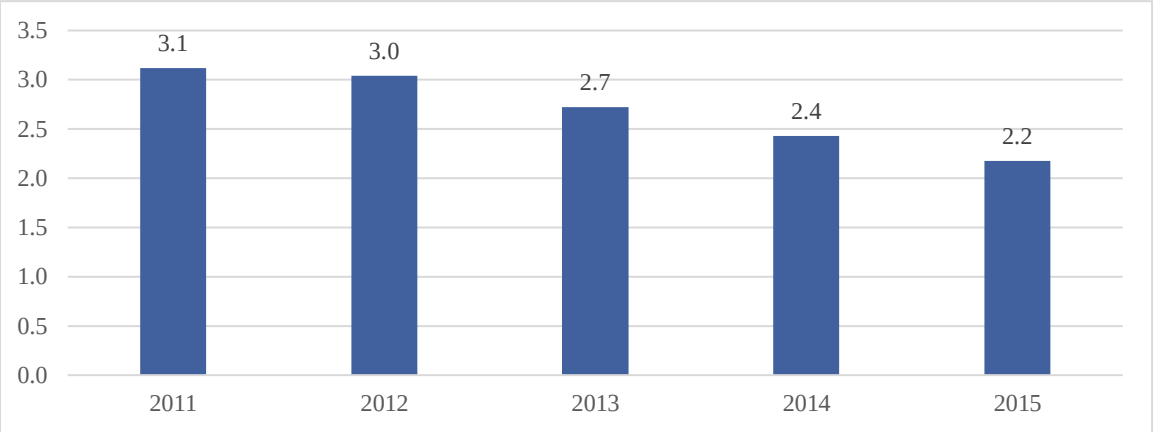
Thailand is one of the most vibrant economies in the Association of Southeast Asian Nations (ASEAN) region. Thailand's Information and Technology (IT) industry is growing rapidly and becoming increasingly attractive to foreign investors. Businesses, government agencies and households are going digital, and more Thai consumers have become tech-savvy, with the latest IT gadgets flying off the shelves of local stores. Broadband Internet is readily available in major cities and towns. All have made the country the second largest buyer of IT products and services in the ASEAN region, despite having to overcome serious economic and political problems in the past years.

The Thai IT market in 2015, including the sales of hardware, software and services, was worth about US$18.6 billion, accounting for 4.8% of the Gross Domestic Product (GDP). Year 2015 was a relatively rough year for the market as the total revenue including export revenues dropped by 7.2%. Many factors were having an impact on the sales of IT products and services. These included the availability of cheaper smartphones, lower prices of voice packages of telecom operators, delayed government projects, lower exports, politics, and lower GDP growth. However, the market will bounce back in the coming years driven by the adoption of 'third platform' technologies like cloud, mobility and big-data analytics. It predicts a bounce back to a 6.8% growth on average between 2016 and 2020.

1.1 Hardware

After the strong growth witnessed in recent years, the Thailand computer hardware market is decelerating. The total revenue of the market in 2015 was US$2.2 billion, dropping from US$2.4 billion in 2014 (*see Table 1*). The slump in the market is blamed on the economic slowdown and housing debt, which is stopping consumers from spending on IT.

Figure 1 Computer Hardware Market Value: 2013-2015 (US$ billion)



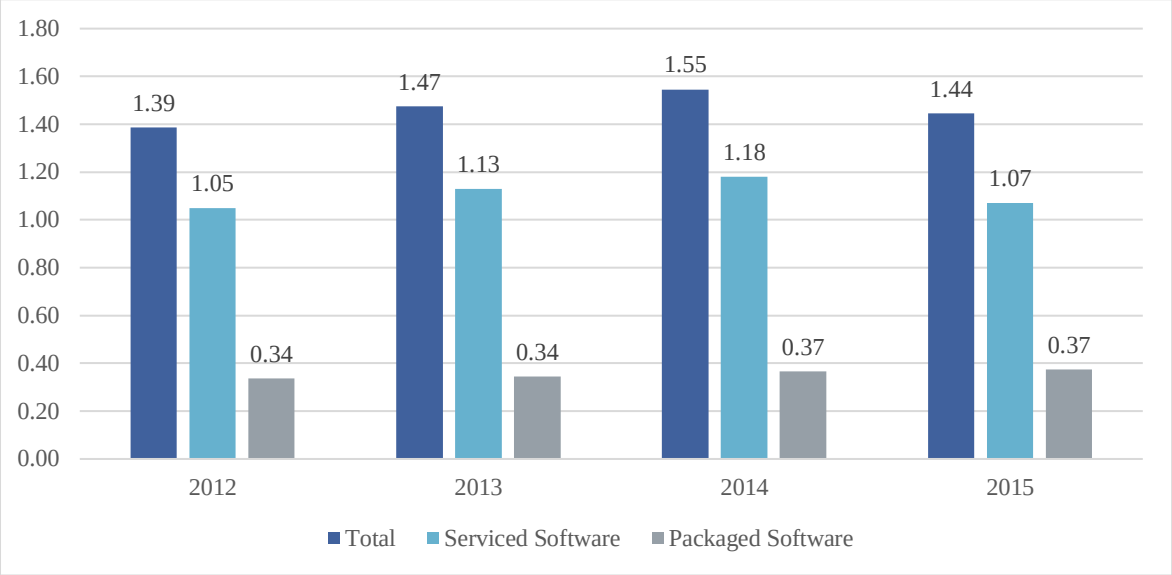
Source: National Science and Technology Development Agency, 2016.

The decline of the computer hardware market in Thailand also indicates a shift in user habits, with more consumers forgoing personal computers to directly purchase mobile devices. In 2015, mobile devices sales in Thailand grew by 11% to reach 11.8 million units, with the Northeast is the fastest growing smartphone region.

1.2 Software

Thailand's software market has shown steady progression, except the light hump in 2015 (*see Figure 1*). In 2015, the total value of the software industry reached US$1.44 billion, of which US$1.07 billion from serviced software and US$0.37 billion from packaged software. Software-enabled services, cloud computing, the Internet of Things (IoT), big data and analytics are the main factors driving software-market growth.

Figure 2 Total Value of Software Market: 2011-2015 (US$ billion)

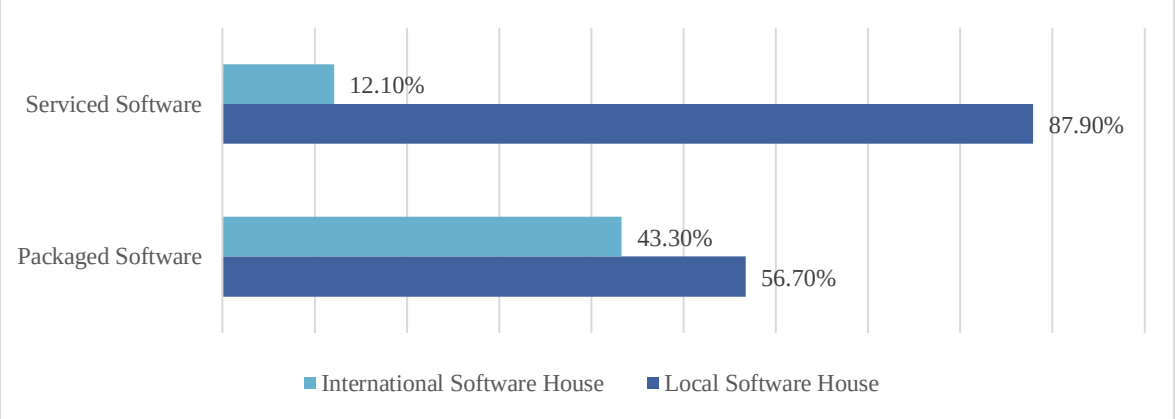


Source: National Science and Technology Development Agency, 2016.

The government accounted for a third of domestic software consumption, while the private sector made up the rest. The financial industry was the biggest spender on software.

The software sector comprises of 870 firms (Software House), employing upwards of 40,000 qualified software engineers from Phuket to Bangkok to Chiang Mai. DST, Microsoft Thailand, Reuters Software and SAS Software, together with Thai players (Geomove, Neo Invention, Larn Gear, Phuket Software Factory and ThaiQuest) are leading the Thai software market. Thai companies have a strong market share in the serviced software segment 87.9% (*see Figure 2*).

Figure 3 Market Share of Software Production and Software Services



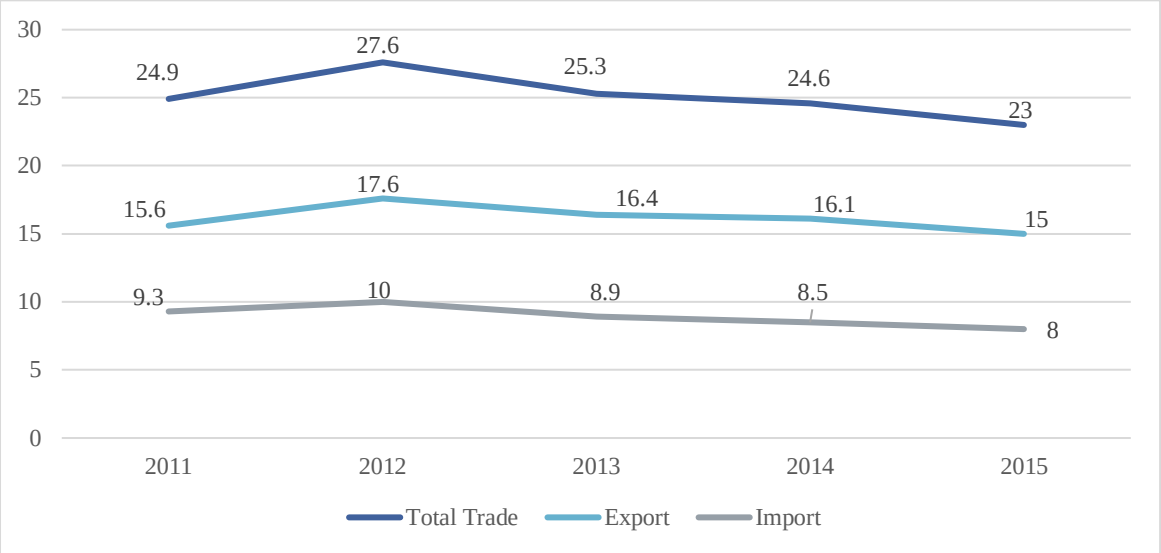
Source: National Science and Technology Development Agency, 2016.

1.3 Key Trade Figures

1.3.1 Trade with the World

As an export oriented country, Thailand is highly exposed to external economic shocks, which lower demand for Thai products, thus affecting the trade balance. In 2015, Thailand posted a US$7 billion trade surplus in IT products, narrowing from a US$7.6 billion surplus a year earlier. Year-on-year, sales of IT products sharply dropped by 6.8% to US$16.1 billion in 2015. Similarly, purchases fell by 5.9% to US$8 billion (*see Figure 3*).

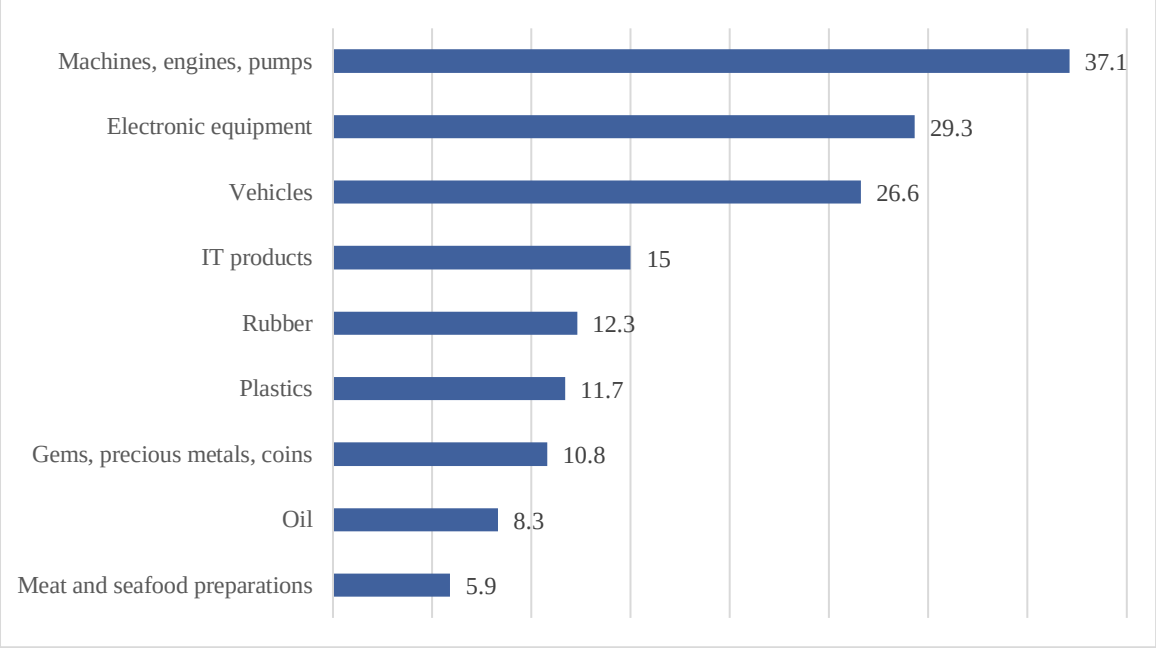
Figure 4 Total Trade Value with the World: 2011-2015 (US$ billion)



Source: UN Comtrade, 2016.

However, IT products maintains its position at the top of the list of highest value Thai export products for 2015 with a total revenue of US$15 billion (*see Figure 4*).

Figure 5 Highest Value Thai Export Products-2015 (US$ billion)

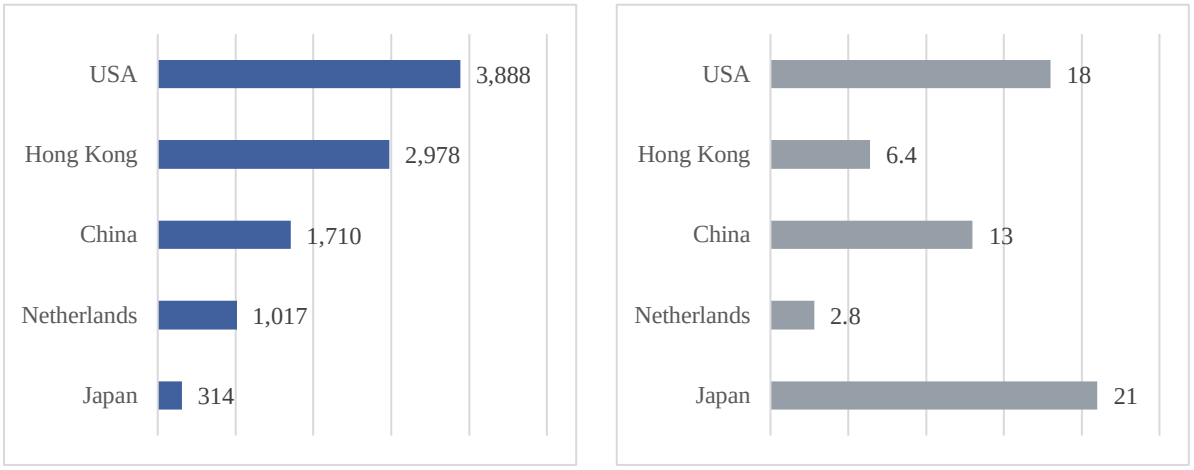


Source: Thailand Custom Department, 2016.

Thailand primarily sells IT products to the United States (USA) (US$3.9 billion), Hong Kong (US$3.0 billion) and China (US$1.7 billion), with computer hardware accounting up 93% of the total shipments (*see Figure 5*).

Figure 6 Top Import Partners by Dollar Value in 2015 (US$ million)

Hardware **Software**

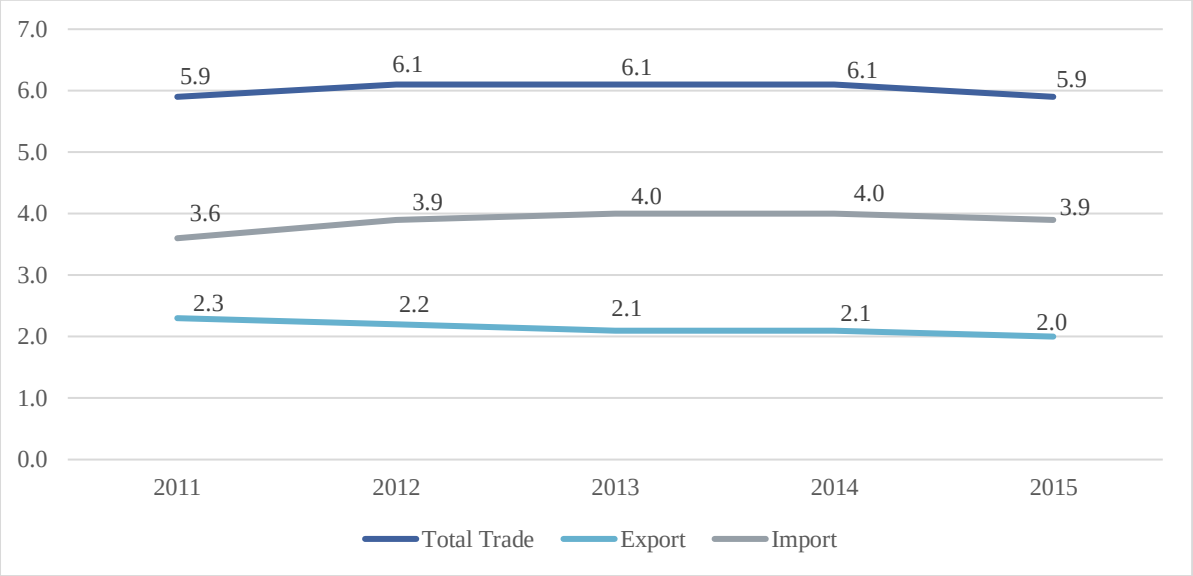


Source: UN Comtrade, 2016.

1.3.2 Trade with ASEAN

ASEAN is increasingly becoming a key trade partner to Thailand. Thailand's IT products trade with ASEAN totaled US$5.9 billion in 2015 (accounting for 26% of total IT products trade). Exports totaled US$2 billion while imports totaled US$3.9 billion. The Thailand's IT products trade deficit with ASEAN was US$1.9 billion in 2015 (*see Figure 6*).

Figure 7 Total Trade Value with ASEAN: 2011-2015 (US$ billion)

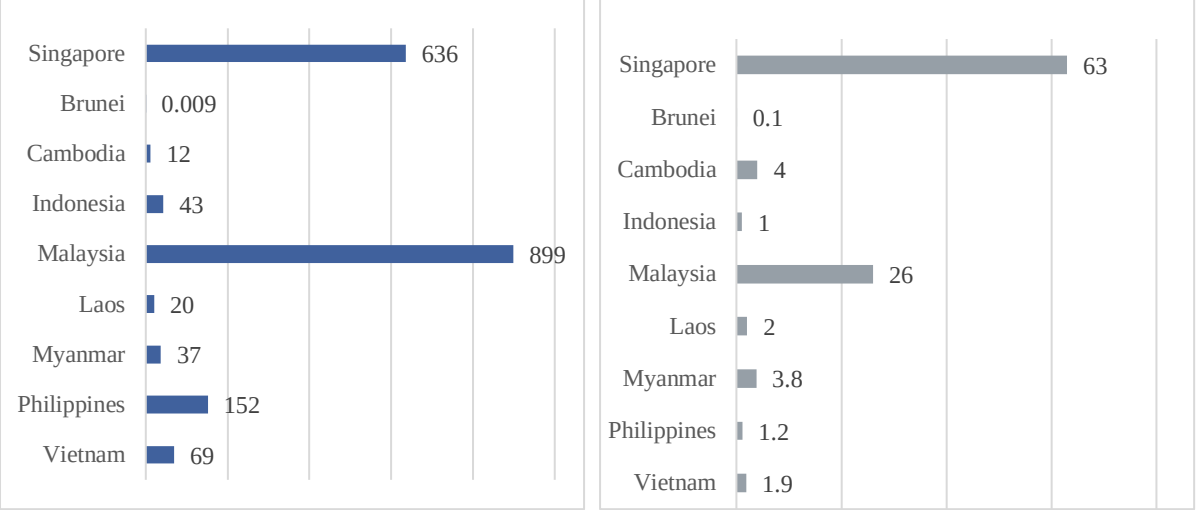


Source: UN Comtrade, 2016.

Among ASEAN partners, Malaysia and Singapore imported the most Thai shipments of IT products by dollar value during 2015, US$925 million and US$700 million, respectively. These two countries primarily purchased computer hardware, parts and accessories (*see Figure 7*).

Figure 8 ASEAN Import Partners by Dollar Value in 2015 (US$ million)

Hardware **Software**



Source: UN Comtrade, 2016.

1.3.3 Bilateral Trade between Thailand and India

India's economic and commercial relations with Thailand are rooted in history, age-old socio cultural interactions and extensive people to people contacts. In the ASEAN region, Thailand ranks as India's 4th largest trading partner after Singapore, Indonesia and Malaysia.

Figure 9 Total Trade Value with India: 2011-2015 (US$ billion)

Source: UN Comtrade, 2016.

Thailand's IT products trade with India totaled US$16.6 billion in 2015. Exports totaled US$ 16.5 billion while imports totaled US$0.1 billion. The Thailand's IT products trade surplus with India was US$16.4 billion in 2015 (*see Figure 8*).

Thailand exports of computer hardware, parts, and accessories to India totaled US$161 million in 2015 while Thailand exports of software to India were US$3.7 million.

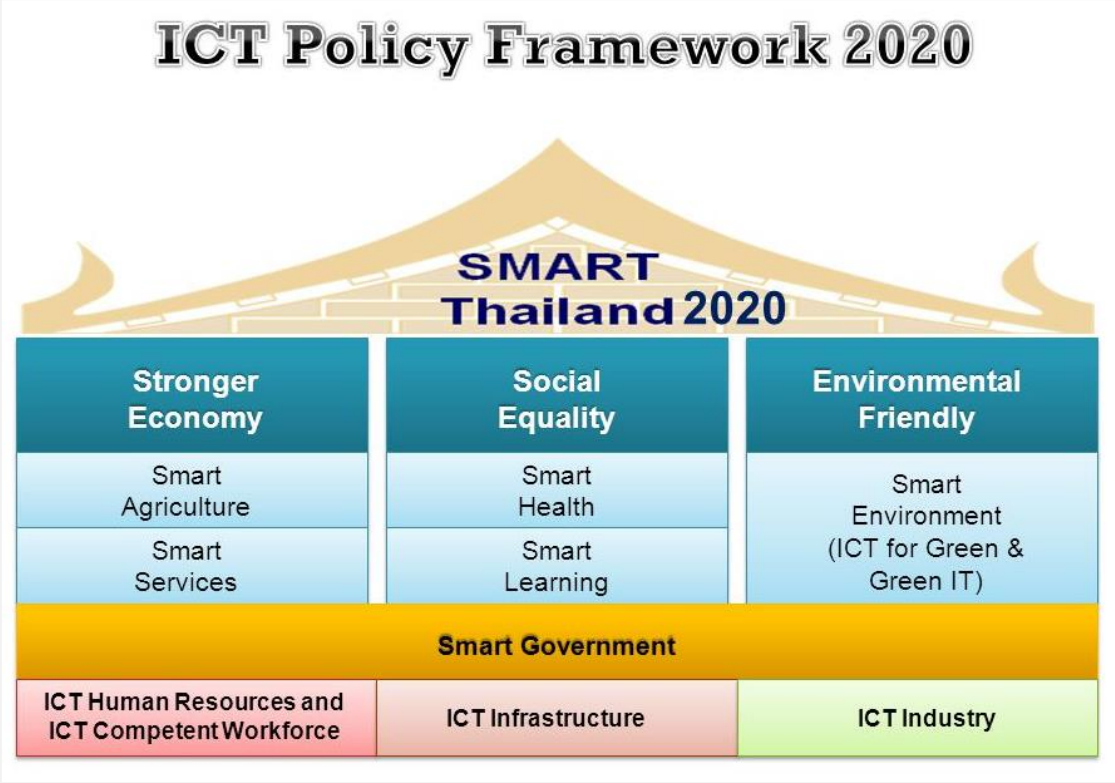
2 Environmental Scanning

Political-Legal Factors

For more than a decade, the Government of Thailand has been committed to positioning the country as a world leader in the technology industry, through infrastructure improvements, cultivating its high-tech talent pool and providing a superior business climate for multinational tech companies. With respect to the business sector, the contributions have been in the form of direct investment, privileges related to business performance and the drafting of relevant laws and regulations. The Thai IT industry is currently regulated by the following laws: the Electronic Transactions Act, the Computer Crime Act, the National Cyber Security Act and the Personal Data Protection Act.

To further boost the country's competitiveness ranking in the world Thailand is pushing, Thailand has recently introduced the ICT Policy Framework 2020. The framework involves a number of development strategies and goals, which include universal broadband, a competent ICT workforce, a competitive ICT industry, and digital government, ICT to make the country more competitive, ICT to improve society and ICT for the environment. In terms of the national broadband policy, the precise targets laid out are 80% of the population connected by 2015 and 95% by 2020, with cities and major centers linked with 100 Mbps-minimum connections by 2020. Sub-district schools should be connected by 2015 and all schools by 2020.

Figure 10 Thailand ICT Policy Framework 2020



Source: National Science and Technology Development Agency, 2016.

There are several key organizations dealing with the Thai ICT industry. The Ministry of Information and Communication Technology (MICT), established in 2002, coordinates all ICT development according to the ICT Master Plan and the ICT 2020 Policy Framework. Other focal government offices actively involved in supporting ICT in Thailand are SIPA, the National Telecommunications

Commission (NTC), and the National Electronics and Computer Technology Center (NECTEC), an exclusively ICT research institution.

MICT has 24 projects planned in the effort to create the Digital Thailand program. The total value of these projects is US$113.2 million and the list includes the upgrading of 2280 community ICT learning centers, the building of 10,000 public digital access spots throughout the country, assisting smaller companies with e-commerce, the use of ICT to improve public services and the development of Phuket as a smart city. Other efforts include a CAT Telecom innovation park, the electronic trading of rice and sugar and a Thai Post logistics site. CAT and Telecom of Thailand (TOT) might cooperate on some projects, such as the upgrading of submarine cables.

According to the Committee on Preparations for Digital Economy and Society, Digital Thailand will be rolled out over 20 years in four phases. The plan is to use ICT in tourism, to develop digital health records and to make training available to the elderly and underprivileged. The hope is to undertake significant economic reforms so that the country can best utilize its digital assets. It is believed that the program will help overall development and prepare Thailand for the competition that will come with the integration of the ASEAN Economic Community.

Economic-Demographic Factors

The Thai economy has grown on average 2.1% from 2013-2015. The growth benefited from a relatively stable political environment (which boosted tourism revenues), weaker global commodity prices (which boosted household's purchasing power), and a much-awaited revival in public investment. The consumption may get a strong boost from prolonged weak oil prices and aggressive public investment plans, especially mega-projects to transform Thailand into the region's digital hub. This will result in high demand for IT and IT services in the country.

Web-based applications and mobile platforms have transformed the Thai people into a tech-savvy population with 39 million mobile internet users, 92 million mobile subscribers (pre-paid and post-paid), 49 million broadband subscribers. Smartphone penetration is at 63.4% (30 million smartphone users), higher than Indonesia's 38.1% and Malaysia's 61.4%.

Social-Cultural Factors

Presently, Thais mostly use their handsets for communications and games. According to survey by Digital Life, it was suggested that the average person in the study used their device 176 times per day, the second-highest level of usage in the region. This is compared to the 187 minutes in Malaysia, 140 minutes in the Philippines and 129 minutes in Indonesia spent per day on smartphones. Thais spent 261 minutes a day online, 113 minutes on Facebook and 48 minutes playing games.

Thai consumers are born social. They are yearning for relationships, rapport and chemistry. In this sense, social commerce is undergoing a makeover to match this demand for socializing, while Line, Instagram and Facebook are becoming storefronts for interaction and conversation. As of December, 2015, the number of Facebook users was 37 million (more than half of the Thai population), Line-33 million and Instagram-2 million. Bangkok is the number one city of Facebook users in the world with over 104% penetration, according to Social Bakers. According to TNS, 74% of Thais also use instant messaging daily, well above the 55% worldwide figure.

Technological Factors

The end of 2015 saw the conclusion of a long-delayed, but keenly fought, auction of 4G licenses. This is considered a major step in supporting the government's digital economy policy, which is expected to receive US$6.42 billion.

Thais have a high self-esteem concerning the level of ICT in their country. This is also supported by numerous ranking lists. One example is the Networked Readiness Index (NRI). NRI measures, on a scale from 1 (worst) to 7 (best), the performance of 148 economies in leveraging information and communications technologies to boost competitiveness and well-being. This index is a core part of the Global Information Technology Report 2015, the 14th in the series, published by the World Economic Forum. Table 1 shows NRI of ASEAN countries and Thailand ranked 3rd after Singapore and Malaysia.

Figure 11 ASEAN Network Readiness Index 2015

Rank	Country	Score
1	Singapore	6.0
32	Malaysia	4.9
67	Thailand	4.0
76	Philippines	4.0
79	Indonesia	3.9
85	Vietnam	3.9
97	Lao PDR	3.6
110	Cambodia	3.3
139	Myanmar	2.5

Source: World Economic Forum, 2015.

Thailand was also ranked 74th in the International Telecommunications Union's (ITU's) 2015 "ICT Development Index", ahead of China, Mongolia and South Africa. Thailand's ranking is up from 92 in 2010, and expectations are that its ranking will continue to improve. The National Broadcasting and Telecommunications Commission (NBTC), the sector's regulator, believes that the country will reach 60th place by 2017, based largely on the widespread introduction of 4G in 2016.

In 2015, Thailand was ranked as having the eighth-fastest broadband in the region and the 52nd-fastest globally. The average speed over a 30-day trial was 19.9 Mbps, while Singapore was at 121.7 Mbps and Cambodia was at 9 Mbps.

3 Competitive Analysis-Five Force Analysis

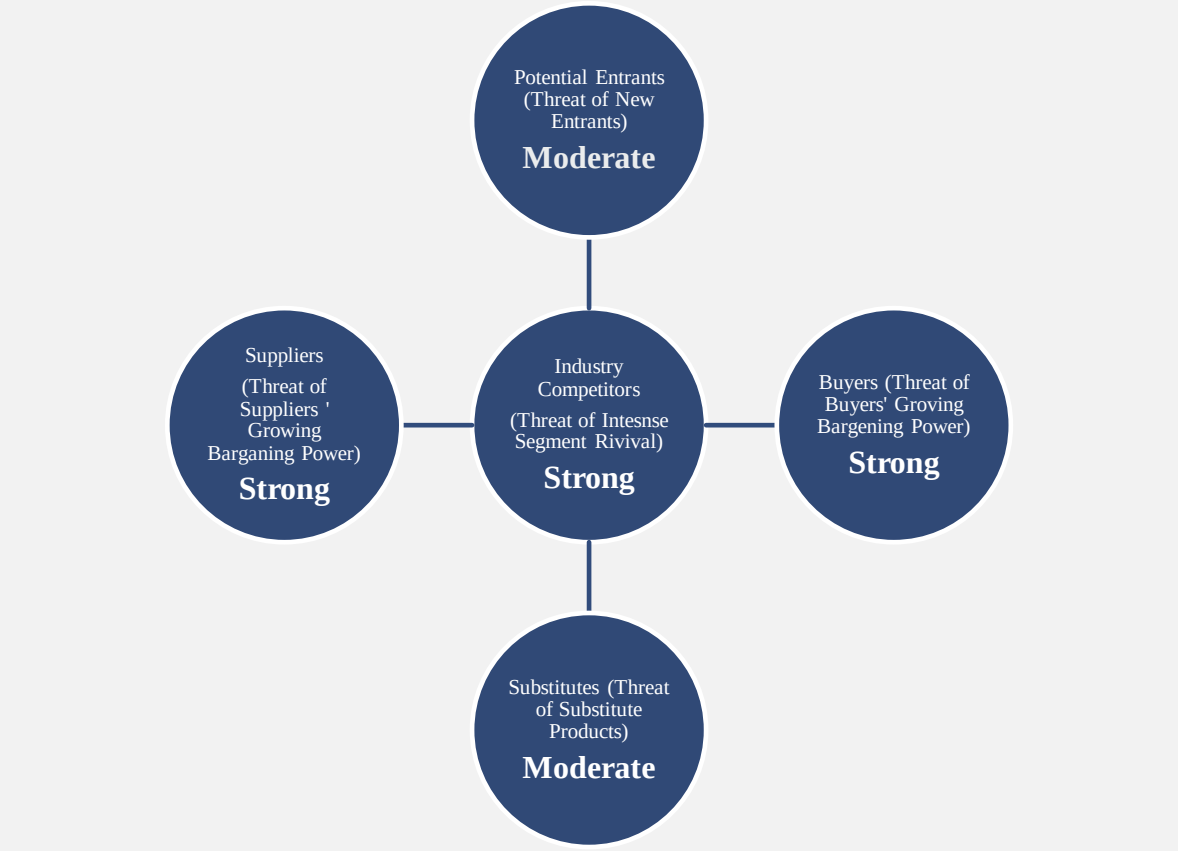
Thailand's IT market will be analyzed taking hardware retailers, software publishers and providers of IT services as players. The key buyers will be taken as individual consumers, businesses and government agencies while skilled employees as well as providers of hardware and software are considered as the key suppliers.

Thailand's computer hardware market has been impacted by the allure of low-cost tablets. Consumers who do not have PCs yet are more likely buy low priced tablets. However, as tablet adoption is

reaching the saturation point, along with consumers extending the lifetime of their tablets, growth prognoses for this segment have been lowered recently.

Meanwhile, the Thailand's software and services market continues growing. The market competition is boosted by constant advances in technology, by the presence of large international incumbents and a regular supply of new entrants with alternative business models forcing players to operate more competitive pricing strategies.

Figure 12 Five Forces Analysis



Buyer Power

Thailand's IT market has many buyers: individual consumers, businesses of all sizes, and government institutions. Business buyers come from a very wide range of industries, including but not limited to banking, manufacturing, retail, logistics, telecommunications and healthcare.

Buy power is strong due to the minimal degree of differentiation between different manufacturers' products, players partnering up to deliver applications that foster interoperability, and the availability of lower-cost alternative to conventional products. For example, the vast majority of PCs sold run either Windows or Mac (OSX) operating systems; most consumer and business software is available on one or both of these platforms, and where software is exclusive to one or the other, alternative programs are usually available with only minor functional differences. Another example is SAP's business processes can be accessed by customers through Microsoft Office using 'Duet', or through IBM's Lotus Notes using 'Alloy'. That being said, consumers exhibit relatively little brand loyalty, with purchase decisions instead being based more on the technical specifications and perceived quality of individual products. This trend is less pronounced in the corporate and government markets,

where buyers value reliability and are more likely to stick with a manufacturer and a service provider they know. This is especially so for government contracts, which have heightened media scrutiny in terms of IT failures.

There is also a move to software-as-a-service (SaaS) where buyers pay through regular subscriptions or as and when they use the software. This software variant requires lower upfront costs and may be more accessible, thus also increasing buyer power.

Supplier Power
Thailand's IT market is dominated by large suppliers such as Cisco Systems, Inc. Acer Inc., Hewlett-Packard Co., IBM Corp., and Microsoft Corp. These large companies cover the full industry value chain with its own hardware, software and services capabilities, which reduces its reliance on external suppliers significantly.

Further highlighting the tight links between each segment in this industry group, suppliers of software to IT services players may begin to forwards integrate once more complex software is required to provide IT services linked to powerful computers, offering parallel processing and advanced analytical techniques, which will increase supplier power.

Supplier power in this industry is strong overall.

New entrants
Computer hardware manufacturing, software development and IT services are labor intensive. In principle, a small, independent retailer could start up with small amounts of capital, so the purely financial barriers to entry are low. However, competing successfully against major player such as Microsoft will be difficult. Lacking the brand strength, ubiquity, and scale economies of the incumbents, but facing the same level of fixed costs, new entrants will find it hard to remain profitable.

However, predicted market growth in software development and IT services may provide opportunities for new entrants and the acquisitive nature of major players acts as an incentive for entrepreneurial companies to develop innovative products. Newly developing niche markets will offer opportunities for smaller players in areas such as green IT and the 'Internet of Things'. Equally, industry specialists operating in key markets such as healthcare and finance have significant opportunities. Overall, the likelihood of new entrants is moderate.

Threat of substitutes
The substitutes for computers are smart phones and tablets, providing the more common alternative for mobile access. However, PCs are not expected to become completely obsolete in the future; consumers and businesses will most likely continue to use them as they are inexpensive and can carry out more complex tasks that a tablet is unable to handle.

Meanwhile the substitutes for software and services are open-source software products and IT services, free web-based applications, and pirated versions of existing products. These alternatives are cheap and accessible to many end-users. However, open-source products in general may present difficulties with compatibility and the expertise required to use them. The availability of applications on the Internet has also caused major piracy issues. Software security and the use of alternative

service based business models have therefore become important for players combating free substitutes.

Overall, the threat of substitutes is moderate.

Degree of rivalry
The market growth in Thailand was flat in both years, 2014 and 2015. This may boost the rivalry, because players can't increase revenues without taking market share from competitors. As IT infrastructure is not fully developed in Thailand, costs of expansion are likely to be high in certain cases, particularly where fast and reliable data processing and IT services are required.
In addition, developments in social network, mobile, analytic and cloud technologies have begun to allow players to offer more value added services, which has increased rivalry in terms of intellectual property and the need for perpetual innovation. The intense competition in the market has force some major players out of the market or change their business model. Rather than fund their business on big-ticket license contracts, open-source companies, such as Red Hat, receive revenues from services and maintenance. Or Sony decided to exit the PC business in 2014 after 17 years in the industry.

Overall, the degree of rivalry is strong.

4 SWOT Analysis

The Thai IT market has contributed significantly to the economic growth of the country. Following the widespread proliferation of the Internet, the country is transitioning into a digital economy. This has opened up new sources of revenue for several industries in Thailand, including telecommunications service providers, digital entertainment and gaming, and consumer electronics.

Thailand offers a quality, low-cost labor pool and a strong infrastructure; its financial attractiveness and business environment are strong. In addition, the Internet-savvy population of Thailand is heavily taking to social media, mobile games, emails, and online shopping, resulting in high demand for IT and IT services in the country. However, political instability, poor English capabilities, data security concerns, and piracy are bottlenecks to growth.

Strengths	Weaknesses
The Thai IT market is dynamic and growing. International business environment with full acceptance of international partnerships and ownerships Competitive local wages making Thailand very cost-competitive as an operations center. Excellent logistic systems. Thailand is a natural entry-point and hub for the ASEAN and East Asia region Attractive investment incentives.	The political climate remains precarious. Lack of skill in English among IT technicians and programmers. Lack of enforcement of copyright laws resulting in the prevalence of software piracy. Data security concerns.
Opportunities	**Threats**
Positive outlook for smartphones market. Positive outlook for software market (embedded software; mobile applications). Potential for niche markets in areas such as green IT and the 'Internet of Things'.	Fluctuations in foreign currency exchange rate might result in a fall in export revenue of IT products. Intense competition from well-established players could reduce bargaining power and strain margins. Brand preference would make it difficult for new entrants to enter the market. Technological changes would make switching cost more expensive.

5 Prospects of the Market

Despite a weak annual growth in the past two years, Thailand remains the second largest buyer of IT products and services in the ASEAN region. The factors driving market growth will be the improved political situation, while technological change, mobility, the bring-your-own-device (BYOD) trend, the digital-economic policy and social media will drive IT usage. The government's mega-projects and the goal of creating a logistics hub for Indochina and ASEAN will also drive the IT sector and economic growth of the country as a whole.

In more details, the Thai IT market in the short term will experience the following trends:

- The smartphone and tablet market, especially low-end smart phones, is expected to become the new battleground as the PC market contracts and will see continued sales decline. There are currently 32 smartphone brands available in Thailand. Around 20 million units of smartphones are sold per year on average. The number of units in use was at 20 million in 2016 and it is expected to reach 25 million by 2020. This development has already influenced the usage of digital content from business content applications to entertainment and lifestyle-related applications. Approximately 55 percent of smart device users in Thailand are downloading gaming applications, followed by social networking, music applications, navigation and photography.

- All-in-one computers, which integrate the computer case and system components into the monitor so the entire PC is contained in one unit, will soon replace traditional desktops. Two-in-one notebooks will also replace traditional clamshell notebooks. Lenovo is introducing its gaming notebook priced below US$1,117 and Lenovo Miix, a convertible tablet priced US$248. Generation C consumers, who are "always on" and connected to the internet, and professional gamers would be the two main buyer groups in Thailand.

- The growth of mobile data spending to reach 14 percent or $1.7 billion with the proliferation of smart devices being the main catalyst demand for services via wireless network.

- IT services will be one of the leading technology areas to contribute to IT spending in the Thailand market. The IT services delivery model will be converted from low level services delivery (such as maintenance and support services) - which generated low margins - to a value-based services delivery model.

- Corporates will utilize the cloud to support their operational infrastructure and utilize new technology to optimize internal workflow, collaboration and citizen services. The financial services sector continues to lead the adoption of cloud services. Meanwhile, public cloud and government cloud will emerge as drivers to increase confidence in cloud technologies. Growth will likely be moderate, but Applications-as-a-Service (AaaS) such as collaboration and productivity applications will receive the most attention.

- The Internet of Things (IoT) – the networked connection of people, process, data and things – will be a key platform for years to come. The arrival of 4G wireless broadband networks as well as the proliferation and affordability of devices that are connected to internet will fuel the IoT technology adaption in Thailand. More firms will embrace IoT regardless device and platform. Over the past year, IoT connections have soared from 10.7 billion to 13.7 billion things, and by 2020 total connections will reach 50 billion, worth US$ 973.3 million. The majority of this spending takes place in manufacturing, logistics and healthcare. Thailand currently is the 17th

largest global manufacturer and number 14 in auto production. As the government plans to position itself as the center of the ASEAN Economic Community, the prominence of manufacturing is forecasted to increase, which will also increase its potential for IoT. The value of IoT in logistics is also expected to rise, as a new law by the Department of Land Transport has taken effect January 2016, which will require public buses, trailers and trucks with over 10 wheels to install GPS navigation systems, that provide real-time information to DLT service centers on the vehicles coordinates, travel speed and driving time. The National Electronics and Computer Technology Center also plans to launch Net Pie, a network platform to provide support for IoT developers.

- To further boost the country's competitiveness ranking in the world Thailand is pushing its *Smart Thailand* project, which focuses on e-commerce, e-education, e-industry and e-government. The country is actively searching for partners to collaborate with, which represents a great potential for IoT and ICT solution providers.

- Data centres have been the target of significant investments lately. In December 2015 the Board of Investment approved US$305.5 million of capital being committed to infrastructure of this sort. This includes US$90.3 million for TCC Technology and US$45.2 million for Digital Port Asia, a Thai company majority-owned by NTT Communications.

- E-commerce in Thailand is growing rapidly and is set to become a main driver of internet development. To a great extent, 4G is responsible for the transformation, as it will be bringing faster connectivity to a large, nationwide pool of consumers. Estimates place e-commerce spending growth over the next five years at 18.2%. The subsector is already quite large. The Electronic Transaction Development Agency estimates e-commerce totaled US$63.2 billion in 2015. The largest piece was generated by the accommodation and food services sector, at US$19.8 billion, followed by manufacturing at US$10.5 billion, and retail and wholesale at US$9.8 billion. Interestingly, demand for e-commerce services are coming not only from Bangkok but also from the provinces, such as Nonthaburi and Chonburi.

Table 1 Top E-commerce Site in Thailand-2015

Rank	Site
1	Lazada
2	WeLoveShopping
3	Tarad
4	Zalora
5	Cdiscount
6	J.I.B
7	Central.co.th
8	Ensogo
9	iTrueMart
10	Munkong Gadget

- The “eHealth” market in Thailand amounts to US$37 million in 2015, with “Diabetes” as the market’s largest segment. Revenue is expected to show an annual growth rate (CAGR 2016-2020) of 18.1% resulting in a market volume of US$73 million in 2020. The trend presents an unprecedented chance for IoT companies.

In addition, Thailand’s geographic position at the center of Southeast Asia serves as a launch pad to regional markets where consumer buying power for IT products and services is growing. The location of Thailand is becoming even more advantageous as ASEAN has recently launched the ASEAN Economic Community (AEC). The AEC is to be a single market and production base with zero tariffs and liberalized investment sectors. This will enable investors in Thailand to enjoy a barrier-free access to 600 million consumers, and the free flow of goods, services and capital with the regional bloc’s

other members, namely Singapore, Malaysia, Indonesia, Vietnam, Cambodia, Laos, Myanmar, Brunei and the Philippines.

6 Opportunities for Indian Companies

In general, Thailand is an open economy where companies and consumers are eager to find new products and services. This is especially valid in a dynamic sector like IT. There are no reasons why an Indian company would not be successful in this market, provided the offering is competitive. The competition is always there and in some segments it is really fierce. In general terms, it would make sense to focus on the growth segments of the Thai IT market such as:

- IT security - IT security is a major concern across all sectors of Thai societal and business life. Potential segments include digitally connected and controlled devices for burglar prevention and other security issues; motion sensors, door locks, security cameras (with or without facial recognition); surveillance services with connection to a broader smart home; hazard prevention devices like flood, smoke or gas sensors.

- Industrial IT - Industrial IT is a focus area in Thailand. The manufacturing industry is the main driver of the Thai economy and the pressure to compete with lower-cost countries is high. Flexibility, time to market, decentralized manufacturing; those are key words that are changing the nature of manufacturing at the moment. For Indian companies, it is vital to be in a front position in this development.

- Ehealth - The Thai market for ehealth is fragmented, consisting of many systems and players. The potential for cost-savings and more concentrated efforts on innovation and development is considerable. Potential segments include connected medical devices for use at home; Pay-to-use apps (paid app downloads, premium versions and in-app purchases); Paid-to-use desktop versions that additionally provide an app; Telemedical services relating to remote patient monitoring

- Internet of Things- Potential segments include smart and wireless sensors; wearable devices such as smart watches and bands; and embedded systems programming.

- IT entertainment - This segment includes games for smartphones and web-users, streaming of music and video, TV on demand.

Success Story: Raj S Joshi - President and CEO, Itorama Consulting

Breaking the trend of Indian IT talent going to the West, Raj S. Joshi of Itorama has based himself in Bangkok, Thailand with offices in New York and Bangalore. His customers hail from the US and EU, including Accor, Western Union and Michelin. Joshi thinks Thailand's creative strengths, especially in multimedia and design, are formidable and the IT outsourcing market is not yet saturated in Asia. While he admits the easier tasks have already been outsources, he claims only 8% of a possible 30% of computer tasks have been outsources, and that the fundamental nature of what is being outsourced is changing. Instead of focusing on individual tasks, Joshi aims at growing by taking over entire business processes.

When asked about competition between Thailand and India, Joshi stresses cooperation rather than competition and that international standards like CMMI and ISO are allowing large projects to be better broken up and shared. Comparing the two countries, he notes that Thailand lacks giants in the IT field like India's Wipro or Infosys and sees Itorama filling that role while he expands both his local sales and his offices abroad.

Source: Charles Runckel, 2016.

7 Trade Barriers

Certain IT products and services imported from India to Thailand will benefit from tax reduction under ASEAN-India FTA in Goods and An Early Harvest Scheme (EHS) under the proposed India-Thailand FTA. It advises interested parties consult with Thai Customs before proceeding exporting.

Imports into Thailand must be properly documented for customs purposes; customs regulations and information are available from The Customs Department – Thailand webpage at http://www.customs.go.th/. Under the e-Import system, there is no need for relevant parties to submit paper documents as all data is transmitted electronically from an importer computer system to the e-Customs system.

8 Market Entry Strategy

8.1 Importing

For Indian manufacturers and exporters that plan to import IT products and services into Thailand, the following market entry strategies are recommended:

- Appoint a local importer/agent/distributor. Selecting the right importer is one of the most important decisions for exporters developing their business in Thailand. The local importer will be a key partner in helping expand business opportunities and minimize the need for exporters to establish direct contact with multiple retail chains. A local importer familiar with market conditions and the regulatory environment can help exporters successfully market their products in this competitive market. Indian exporters should be aware that many multinational retailers in Thailand charge listing fees or a listing allowance for new products. The fee will be charged in accordance with a formula based on the number of retail outlets and stock keeping units.

- Build relationships with local operators who have existing distribution channels. Local operators have better understand the need of Thai consumers and can improve or tailor products accordingly.

8.2 Investing

The appropriate entry strategy when venturing in Thailand is highly dependent on the nature of business, objectives and resources of Indian investing companies and manufacturers. Issues such as company size, resources and product types will determine which type of entry strategy is most appropriate.

In Thailand, there are three types of businesses:

- Sole Proprietorships
- Partnerships
- Limited Companies (public and private)

Two types of limited companies are recognized: public companies and private companies. Public companies are regulated by the Public Company Act and certain other Acts. Private limited companies are regulated mainly by the Civil and Commercial Code. The majority of foreign investors form a private limited company. In this kind of organization there is unlimited capital investment. Foreigners may fully own a private limited company. Apart from instigating accounting customs,

private limited companies should have at least three promoters to act as shareholders. However, in business activities reserved for Thai nationals, foreign shareholders can only have a maximum of 49%. In this form of private limited company, it also requires the foreign companies employ a minimum number of Thai staff per foreign employee.

Under the FTA Framework Agreement, Thailand has committed to open up seven sectors to Indian firms, but they would not be able to hold more than 49% of shares in a company. This is less than Thailand allows other ASEAN members, who may hold up to a 70% share. The sectors are services, communications, construction and engineering, distribution, tourism, entertainment and transportation.

In Thailand, three types of partnerships are recognized. The tax treatment and degree of liability of the partners are the only differences between the partnerships. The BOI does not commonly encourage partnerships. Therefore, it's not ordinary for alien investors to form this type of organization. The three types of partnerships are:

- Unregistered partnerships - Partners are fully liable for all responsibilities of the partnership.
- Registered partnerships - The partnership is a legal entity, and, therefore, is disparate and distinct from the partners.
- Limited partnerships - Capital investment determines the liability of the partners. This type of business must be registered.

Starting a business in Thailand takes an average of 27.5 days (*see Appendix 10.3*), compared to the world average of 38 days. The Thai government is encouraging foreign investors to specific areas of the Thailand with attractive tax and ownership incentives. There are three different types of zones, offering varying incentives depending on the location and nature of the business. Attractions include:

- Land ownership rights for foreign investors;
- Permission to bring in foreign experts and technicians;
- Work permit & visa facilitation;
- One-Stop-Shop: Visas & Work Permits are issued in 3 hours;
- No restrictions on foreign currency remittances;
- No export requirement;
- No foreign equity restrictions in manufacturing sector;
- No local content requirement.

9 Conclusions

Thailand is one of the promising countries in the Asia Pacific region, which has transformed itself from being an agrarian to an industrial economy. The IT market has contributed significantly to the economic growth of the country. Following the widespread proliferation of the Internet, the country is transitioning into a digital economy. This has opened up new sources of revenue for several industries in Thailand, including telecommunications service providers, digital entertainment and gaming, and consumer electronics. In addition, the Internet-savvy population of Thailand is heavily taking to social media, mobile games, emails, and online shopping, resulting in high demand for IT and IT services in the country.

In general, the Thai market is open and used to international suppliers. With a quality, low-cost labor pool and a strong infrastructure; its financial attractiveness and business environment, Thailand is emerging as a serious choice for IT investors and entrepreneurs. There are no obvious reasons why Indian IT companies would not be successful, provided their offering is competitive.

10 Appendix

10.1 Key Facts and Demographics

Area	513,115 sp km
Language	Thai
Religion	Theravada Buddhist
Time zone	GMT +7
Population	67.9 million people
Neighbors	Cambodia, Laos, Myanmar and Malaysia
Capital city	Bangkok (Krung Thep)
Primary Port	Bangkok
Primary Airport	Bangkok International Airport (Suvarnabhumi)
Currency	Bath (THB)

Source: IHS Global Inc. 2016

10.2 Key Macro-Economic Indicators

	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP (% change)	2.7	0.8	2.8	3.1	3.0	3.1	3.0	3.4
Nominal GDP (US$ bil.)	419.9	404.3	395.3	397.3	403.0	419.6	447.0	474.4
Nominal GDP Per Capita (US$)	6,225	5,970	5,816	5,831	5,901	6,133	6,525	6,917
Consumer Price Index (% change)	2.2	1.9	-0.9	0.2	1.2	2.0	2.8	3.1
Policy Interest Rate (%)	2.3	2.0	1.5	1.5	1.5	2.0	2.6	3.0
Fiscal Balance (% of GDP)	-2.1	-2.2	-2.2	-2.3	-2.2	-2.0	0.6	0.7
Population (mil.)	67.45	67.73	67.96	68.15	68.30	68.42	68.51	67.58
Unemployment Rate (%)	0.7	0.8	0.9	1.0	0.9	0.9	0.8	0.8
BOP Exports of Goods US$bn	227.5	226.7	214.1	211.5	213.2	215.1	224.1	239.6
BOP Imports of Goods US$bn	227.4	209.4	187.2	175.8	117.5	181.5	189.7	205.9
Exchange Rate (LCU/US$, end of period)	32.81	32.96	36.09	35.61	36.58	36.76	36.83	36.98

Source: IHS Global Inc. 2016

10.3 Key Indicators-Regulations and Contracts

Doing business indicators 2015	**Thailand**	**East Asia & Pacific**	**OCED members**
Average time to clear customs* (days)	1.9	6.6	5.3
Trade facilitation, lead time (days)			
Import	1	3.5	2.65
Export	1	2.4	2.07
Enforce a contract-*Time required (days)*	440	526	543
Start a business- *Time required (days)*	27.5	23.6	8.52
Registration of property			
Time required (days)	6	74.4	22.4
Number of procedures	4	5.4	4.7
Time to resolve insolvency (years)	1.5	2.6	1.7
Taxation indicators			
Time to prepare and pay taxes (hours)	266	198	163.4
Tax payments, number	21	22.9	10.9

10.4 Major Trading Partners

Thailand: Major Trading Partners, 2014						
EXPORTS				**IMPORTS**		
Country	*US$ bil.*	*Percent Share*		*Country*	*US$ bil.*	*Percent Share*
USA	23.7	11.2		China	40.9	20.25
China	23.3	11.1		Japan	31.1	15.41
Japan	19.8	9.4		USA	13.9	6.89
Hong Kong	11.6	5.5		Malaysia	11.8	5.88
Malaysia	10.0	4.8		UAE	8.1	4.03

Source: UN Comtrade, 2015

10.5 Key Trade Data

10.5.1 Trade with World

	Hardware		Software	
	Export	Import	Export	Import
2011	15,190,787,319	6,838,694,261	435,720,215	2,412,766,337
2012	17,229,199,565	8,171,879,463	377,290,518	1,875,562,130
2013	16,123,144,921	7,034,603,779	367,916,301	1,903,717,079
2014	15,768,766,174	6,564,960,557	363,392,033	1,958,578,643
2015	14,738,629,838	6,115,904,803	293,976,457	1,929,339,953

Source: UN Comtrade, 2015

10.5.2 Trade with ASEAN

Export Unit US$

Software									
	Vietnam	**Philippines**	**Myanmar**	**Laos**	**Malaysia**	**Indonesia**	**Cambodia**	**Brunei**	**Singapore**
2011	2,807,102	1,473,178	695,831	271,530	51,755,673	1,384,018	3,619,405	596	216,529,562
2012	2,391,730	6,205,358	932,891	1,262,478	63,082,364	538,376	2,508,885	466	128,065,110
2013	1,831,141	1,779,855	1,061,873	862,492	69,171,486	238,195	1,000,718	137	78,316,348
2014	1,897,405	2,863,676	1,862,423	1,754,848	40,491,010	1,158,217	235,470	34,542	91,112,561
2015	1,938,106	1,155,536	3,769,594	1,838,557	25,959,043	1,003,334	3,963,926	107,035	63,306,620
Hardware									
	Vietnam	**Philippines**	**Myanmar**	**Laos**	**Malaysia**	**Indonesia**	**Cambodia**	**Brunei**	**Singapore**
2011	19,652,463	72,225,417	18,915,162	19,712,138	881,549,710	18,838,710	19,073,495	18,136,966	209,315,032
2012	32,116,031	134,406,758	38,045,158	34,039,659	719,721,889	32,105,030	32,680,051	30,867,399	233,770,863
2013	34,639,833	161,889,002	38,690,710	35,351,661	945,073,676	34,003,905	34,267,003	33,399,090	217,246,647
2014	46,013,321	192,123,485	34,948,122	35,964,121	834,685,270	34,633,377	35,341,962	34,290,588	152,477,091
2015	69,555,395	187,309,099	37,346,878	38,460,914	750,020,197	36,816,546	37,200,496	36,517,257	140,217,804

Import Unit US$

Software									
	Vietnam	**Philippines**	**Myanmar**	**Laos**	**Malaysia**	**Indonesia**	**Cambodia**	**Brunei**	**Singapore**
2011	888,426	12,518,074	782	329	807,361,095	806,719	3,189	439	722,001,803
2012	728,744	5,649,740	1,440	10,419	476,355,370	280,608	1,955	1,014	528,604,472
2013	602,892	1,239,955	2,458	1,809	637,681,349	567,640	2,406	504	783,672,562

2014	306,044	1,737,514	2,088	1,687	727,802,451	785,059	3,456	316	840,476,889
2015	555,305	756,741	11,348	815	579,856,416	694,361	4,374	519	861,824,185
Hardware									
	Vietnam	**Philippines**	**Myanmar**	**Laos**	**Malaysia**	**Indonesia**	**Cambodia**	**Brunei**	**Singapore**
2011	1,067,390	81,407,111	1,003,705	1,003,312	949,375,298	8,970,001	1,006,545	1,013,053	115,612,837
2012	6,855,299	155,922,981	3,155,643	3,102,796	1,149,915,498	34,144,734	3,110,139	3,113,518	351,020,700
2013	44,151,779	238,350,257	38,794,781	38,774,682	1,076,243,234	42,378,783	38,775,668	38,780,884	82,038,410
2014	69,581,271	280,501,152	63,706,959	63,676,809	1,148,685,253	64,500,383	63,686,496	63,697,829	97,713,167
2015	55,499,915	403,056,783	46,857,241	47,355,807	1,073,564,685	47,021,604	50,335,898	46,830,176	86,278,450

Source: UN Comtrade, 2015

10.5.3 Trade with India

	Hardware		**Software**	
	Export	Import	Export	Import
2011	193,367,394	3,162,221	871,409	462,495
2012	175,784,009	1,574,719	1,435,780	1,116,957
2013	154,724,386	2,548,619	3,062,963	389,814
2014	183,932,172	1,067,565	2,766,423	143,775
2015	161,097,438	971,926	3,663,448	198,773

Source: UN Comtrade, 2015.

10.6 Useful Contacts

1. Ministry of Science and Technology Address: Rama VI Ratchathewi Bangkok 10400 Tell. +66 (0) 2 333 3700 Website: www.most.go.th	**2. Ministry of Digital Economy and Society** Address: Chaeng Watthana Government Complex, Building B, Chaeng Watthana Road, Lak Si District, Bangkok Tel. +66 (0) 2141 6747 Fax. +66 (0) 2141 3809 e-mail: pr@mict.go.th Website: http://www.mict.go.th
3. The Thai Chamber of Commerce Address: Board of Trade of Thailand 150 Rajbopit Rd, Post Box 2146 10200 Bangkok, Thailand Tel. +66 (0) 2622 1860 Fax +66 (0) 2225 3372 E-mail: tcc@thaiechamber.com Website: www.thaichamber.org/	**4. Software Industry Promotion Agency** Address: The Government, Ratthaprasasanabhakti Building, 9th Floor, 120 Moo 3, Chaengwattana Road, Laksi,Bangkok 10210, Thailand. Tel. +66 (0) 2141 7101 Fax. +66 (0)-2143-8059 e-Mail: ossc@sipa.or.th Website: www.sipa.or.th
5. The Customs Department – Thailand Tel. +66 (0) 2667 7880-4 Fax. +66 (0) 2667 7885 E-mail: customs_clinic@customs.go.th Website: http://www.customs.go.th/	**6. Software Park Thailand (SW PARK)** Address: 99/31 Moo 4 Software Park Building, Chaengwattana Road, Klong Gleua, Pakkred, Nonthaburi 11120, Thailand Tel. +66 (0) 2-583-9992 Email: ita@swpark.or.th Website: http://www.swpark.or.th
7. **Thailand Board Of Investment** Address: Head Office: 555 Vibhavadi-Rangsit Rd., Chatuchak, Bangkok 10900, Thailand Tel. +66 (0) 2553 8111 Fax: +66 (0) 2553 8222, E-Mail: head@boi.go.th Website: http://www.boi.go.th	**8. The Association of Thai ICT Industry** Address: 128 Phayathai Plaza Building, Phayathai Road, Khwang Thung Phyathai, Khet Ratcha Thewi, Bangkok 10400 Thailand Tel: +66 (0) 2 216 5991-2 E-mail: sumalee@atci.or.th/piw@atci.or.th Website: www.atci.or.th
9. Thai Software Export Promotion Association Address: 99/30 Software Park Building, 5th Floor Unit 7, Chaengwattana Road, Nonthaburi 11120, Thailand. Tel: +66 (0) 8-1921-7979 Fax: +66 (0) 2-664-6158 Email: pirasan.p@tsep.or.th Website: http://tsep.or.th	

10.7 Featured Thailand IT Products and Services Companies

Acer Computer Co Ltd	Thai Manufacturer of Desktop PC's, LCD & CRT Monitor Projector, Pocket PC, LCD TV, Servers & Storage
Business Applications Company Limited	Thai Provider of ERP Software, Corporate Performance Management, CPM solutions
Business Interface Technology Co, Ltd.	Thailand provider of IT services, system Integration, Networking solutions, Networks, Multi Service WAN, Frame Relay and ATM Solutions, Voice and Data Integrated Solutions, Multiplexer, Multi Service xDSL, Carrier Access Solutions, ISDN Solution
G.P. Solutions Co, Ltd.	Provider of Computer Software, Business Solution Software, Database Information System, Education Software, Internet Information System, Multimedia Software
I.C. Intracom Manufacturing (Thailand) Co.,Ltd	Thailand Personal Computer Manufacturer, IC-Sockets, Mat (Plastic), Adaptors, Electrical Components, Computer Hardware
I-Net Solutions Co.,Ltd	German Company in Thailand involved in the Communications and Computer Business, Computer Messaging-service, Software Development, Computer system Implementation & Maintenance, Software & Hardware Maintenance, Office Communications systems
NCR (Thailand) Ltd	An International Manufacturer of Paper Rolls, ATM Wraps, Specialty Media Labels, Thermal Transfer Ribbons, InkJet Cartridge Refill Kits, Laser Cartridges, Inking Products, Retail Office Products, NCR (Thailand) Ltd. - Paper Rolls, ATM Wraps, Specialty Media Labels, Thermal Transfer Ribbons, InkJet Cartridge Refill Kits, Laser Cartridges, Inking Products, Retail Office Products, Electronic Shelf Labels, Payment Solution Platform, PCs POS Operator Interfaces, POS Printers & Supplies, POS Scanners, POS Workstations, POS Peripherals, Self-Checkout, Self-Service Hardware, Servers, Teradata Warehouse Systems, Self-Service Kiosks
N.E.C. Infrontia Thai Ltd	POS Systems, Barcode Readers, Portable Barcode Terminals, Handheld Barcode Readers, Machine Mount Scanners, Telecommunication Equipment, IP telephony systems
R & D Computer System Co.,Ltd	A major Thai Software Developer supplying software services and computer hardware products such as , Programming, Software Protection System, Embedded Systems, CAD/CAM/CAE, Thai Driver Hardware Card, Video Capture Card, Data Security Card.

SiS Distribution (Thailand) Public Co., Ltd.	Thailand’s leading IT reseller and distributor, representing more than 70 manufacturers of computer systems, software, peripherals, networking and smart phone products.
Cisco Systems (Thailand)	A subsidiary of Cisco Systems of San Jose, California, U.S.A., provides internet networking solutions to customers in three markets: large corporate enterprises; service providers (ISP and telecommunications carriers); and small and medium businesses. Solutions cover networking, IT security, Wireless, Optical, IP Telephony and Storage.
T.C.C. Technology Company Limited	Thailand's leading data centre service provider under the T.C.C. Group provides commercial managed hosting and data center services to businesses in Thailand. It provides co-location services for the physical hosting of servers, network equipment, and applications; managed services, including managed support, system level administration, tape backup and management, availability monitoring, resource monitoring, managed hosting, SAP basis support and consultation, and hosted Microsoft Exchange solutions; and disaster recovery center services that offer second hosting space for applications and offsite functional working areas.
Fujitsu (Thailand) Co.,LTD.	A Japanese company provides laptops, desktop, PC, telecommunication equipment, and system consulting to the Thai market.

11 Reference

Asia IoT Business Platform. 2016. IoT Thailand: market to reach US$ 973.7 M in 2020. Retrieved from: https://www.linkedin.com/pulse/iot-thailand-market-reach-us-9737-m-2020-asia-iot-business-platform.

Asina Pornwasin. 2015. Software market on the rise as hardware decreases 2.3 per cent. *The Nation* August 11, 2015 Retrieved from: http://www.nationmultimedia.com/news/Startup_and_IT/30266421

Board of Investment. 2013. Software Industry. Retrieved from: http://www.boi.go.th/tir/issue/201305_23_5/42.htm.

Board of Investment. 2014. Software and Data Centers Firms-Key Players in Stable Growth. Retrieved from: http://www.boi.go.th/tir/issue/201102_21_2/42.htm.

Charles Runckel. 2015. Thailand's Software Companies' Success Stories. Retrieved from: http://www.business-in-asia.com/software_success_stories.html.

Charles Runckel. 2016. Thailand's Software Companies' Success Stories http://www.business-in-asia.com/software_success_stories.html.

eGov Innovation Editors. 2013. Thailand's ICT spending to grow 9.8% in 2013. Retrieved from: http://www.enterpriseinnovation.net/article/thailands-ict-spending-grow-9-8-2013.

Ericsson. 2016. Mobility Report Retrieved from: https://www.ericsson.com/res/docs/2016/ericsson-mobility-report-2016.pdf.

IHS Global Inc. 2016. Thailand Country Monitor.

Jenny Chan, 2016. http://www.campaignasia.com/article/thailand-consumer-trends-e-commerce-unstoppable-as-4g-rollout-goes-rural/405967.

Jirapan Boonnoon. 2014. Thai ICT market looks set to return to solid growth. *The Nation* December 25, 2014. Retrieved from: http://www.nationmultimedia.com/news/Startup_and_IT/30250655.

Jirapan Boonnoon. 2015. Software industry to grow 11.1%, TDRI. *The Nation* July 30, 2015. Retrieved from: http://www.nationmultimedia.com/news/business/corporate/30265506

Jon Fernquest. 2016. Rise of mobile phone shopping in Thailand. *Bangkok Post* 7 Jun 2016. Retrieved from: http://www.bangkokpost.com/learning/advanced/1003941/rise-of-mobile-phone-shopping-in-thailand.

Oxford Business Group. 2016. Digital infrastructure in Thailand is improving. Retrieved from: https://www.oxfordbusinessgroup.com/overview/going-digital-take-period-resulting-improved-infrastructure.

Oxford Business Group. 2016. New products, services and technology for telecoms and IT in Thailand. Retrieved from: https://www.oxfordbusinessgroup.com/overview/competition-breaks-out-new-products-services-and-technology-enter-market.

Oxford Business Group. 2016. Rapid expansion for e-commerce in Thailand. Retrieved from: https://www.oxfordbusinessgroup.com/analysis/rise-e-commerce-subsector-quickly-expanding.

Siam Commercial Bank. 2014. Insight Gen Y Thailand. https://www.scbeic.com/en/detail/file/product/276/e1y9el9c4h/Insight_Eng_GenY_2014.pdf

Statista. 2016. Thailand Ehealth. https://www.statista.com/outlook/312/126/ehealth/thailand#.

Statista. 2016. Thailand Security. Retrieved from: https://www.statista.com/outlook/281/126/security/thailand#.

Suchit Leesa-Nguansuk. 2015. Brands eye professional PCs. *Bangkok Post 6 Nov 2015*. Retrieved from: http://www.bangkokpost.com/tech/local-news/756148/brands-eye-professional-pcs.

UN Comtrade. 2016. Thailand Trade Statistics. Retrieved from: https://comtrade.un.org/data/.