Truong Phuoc Thanh and Ha Minh Duc

INFORMATION SOCIETY OF VIETNAM: CURRENT STATE AND PERSPECTIVE

Thesis

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PREFACE

We would like to thank all the people who have guided and inspired us during our Bachelor of Information Technology studies. The Department of Information Technology and Business, the Central Ostrobothnia University of Applied Sciences has been an ideal place where we could obtain and improve our knowledge and experience.

We would like to express our high appreciation to Grzegory Sczewcyk, our thesis supervisor, for his encouragement and guidance. He had supported us a lot for our thesis process. His supervisions were very useful for us to complete and improve our thesis in better way.

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ABBREVIATIONS and ACRONYMS

IS	Information Society
IT	Information Technology
SWOT	Strength, Weakness, Opportunities and Threats
USSR	Union of Soviet Socialist Republics
UNDP	United Nations Development Programme
VINASA	Vietnam Software Association
WITSA	World Information Technology and Services Alliances
ICT	Information and Communication Technology
ISI	Information Society Index
NRI	Networked Readiness Index
IACS	Intra Asia Cable System
ISP	Internet Service Provider
PPP	Purchasing Power Parity
ITU	International Telecommunication Union

THESIS ABSTRACT

<table>
<tr><td>Department

Technology and Business, Kokkola</td><td>Date

10.05.2012</td><td>Authors

Truong Phuoc Thanh and

Ha Minh Duc</td></tr>
<tr><td colspan="3">Degree programme

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Grzegorz Szewczyk</td><td>Pages

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<tr><td colspan="3">Supervisor

Grzegorz Szewczyk</td></tr>
<tr><td colspan="3">The purpose of this thesis is to explore the development of the Information Technology in Vietnam’s society compared to the global situation, and prospects of Vietnam information society in the future by analyzing the current state and policies by the government of the Information Society in Vietnam through statistics of its consisted fields.

This report offers an overview of the information society of Vietnam instead of incoherent information from websites, newspapers, magazines and other sources. As future engineers in the field of Information Technology, we expect this knowledge will be very essential in our study and future career.</td></tr>
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1 INTRODUCTION

The term Information Society (IS) has been defined in several ways according to different approaches. Generally, IS is defined as a society in which every activity of processing information is an important activity in the fields of culture, politic and economy. Information society is also considered the next stage in the evolution of the society after Industrial Society. However, as to the limitation of this thesis, we would like to mention that the IS as a society which is built up based on the development of Information Technology (IT) including infrastructure, education and accessibilities.

In this thesis, we are going to analyze the current state and policies by the government of the Information Society in Vietnam through statistics of related fields in order to clarify the development of the Information Technology in Vietnam's society compared to the global situation, and its prospects in the future. We are going to collect data from official publications released by Vietnamese government, especially the Vietnam Information and Communication Technology 2011, and The World Economic Forum and INSEAD, The Global Information Technology Report 2010-2011. Our idea on this thesis came from the topic that we were recommended to choose on the course Information System Seminar by our lecturer, which is named "Information Society in Vietnam". We are very interested in this topic because our intention is to build up an overview of information technology in Vietnam instead of incoherent information from websites, newspapers, magazines and other sources. As future engineers in the field of Information Technology, we expect this knowledge will be very essential in our study and future career.

The research questions of our thesis are as follows:

- What was the foundation and development of Information and Communication Technology, which led to Information Society in Vietnam?
- How is the current state of Vietnam's Information Society?
    - What has been available in the infrastructure?
    - How easy is it to access ICT?
    - How are people educated about ICT?
- What are the strengths, weaknesses, opportunities, and threats of Vietnam's Information Society?
- How is Vietnam's Information Society expected to be through government's policies and visions?

The first chapter after the introduction describes briefly our country's history since 1858 and the development of the information society. The 3rd chapter covers the current state of the IS including infrastructure, education and accessiblity. The strengths, weaknesses, opportunities and threats (SWOT) will be discussed in chapter 4. Chapter 5 describes prospects of the IS through government policies, strategies and visions. The final chapter concludes how the IS of Vietnam has been developing and how it is expected to be in the future.

2 HISTORY OF VIETNAM AND VIETNAM'S INFORMATION SOCIETY

2.1 Summary of Vietnam's history

In this chapter, we summarize Vietnam's history from the first invasion of the French until now. During this period, Vietnam suffered many fierce wars against some countries including France, Japan, US, China and Cambodia. After these wars, Vietnam was in a very difficult situation and was forced to implement Renovation in order to integrate with the world.

The French attacked Vietnam the first time in 1858 during the Nguyen dynasty. Step by step, Vietnam became a French protectorate during 90 years. In 1940, the Empire of Japan took control over Indochina from the French. When the Japanese surrendered to the Allies in 1945, the August Revolution, which was led by the Communist Party, freed and brought independence to the Vietnamese people. On 2nd September 1945, Ho Chi Minh read the Proclamation of Independence of the Democratic Republic of Vietnam to the public at Ba Dinh square. (Nguyen dynasty 2003.)

However, Vietnam had not actually been independent. Soon after that, the French came back to reclaim Indochina and the First Indochina War erupted. After nine years of fighting, the French were defeated in the battle of Dien Bien Phu. Due to the Geneva Conference, the French were forced to retreat and Vietnam was temporarily divided into two parts in two years until the national election. The North was under the Communist control and the South was still under the French supported Government. However, leaders of the Southern part of Vietnam with the American support rejected the election and proclaimed themselves the government of the Republic of Vietnam.

Then the Southern government arrested and killed the communists, as a consequence, local communist gathered and fought against the government. Since 1960, the North Vietnam Government officially supported guerilla activities of the communists in the South, which resulted in the Vietnam War, or the Second Indochina War. (Minh 2006.)

In the first period of the Vietnam War 1960-1965, the North, strongly supported by China and USSR, started to send troops to support the Communist activities in the South, while on the opponent's side, the first president of the Republic of Vietnam could not control corruption inside the government. The consequence was a coup against him in which he was killed and replaced by Nguyen Van Thieu. (Minh 2006.)

After that, 1965- 1968 periods were the fiercest time of the Vietnam War. USA started an armed intervention in the south and bombing in the north of Vietnam. In January 1968, there was a shocking event called the Tet Offensive in which the North Vietnam army launched surprise attacks into over 100 cities in the south. This event ended up with the military failure to the North but led to peace talks between the USA and the Democratic Republic of Vietnam. (Minh 2006.)

In 1969-1972, the Americans began to withdraw their forces from the South of Vietnam. Meanwhile, they focused on building up the Southern Vietnam Army. During this time, the American casualty and increasing antiwar activities led the US government to leaving the Vietnam War. Then the Paris Peace Accords was signed in 1973 which aimed to end the war and restored peace in Vietnam. Provisions of the accords included:

- Foreign forces had to completely retreat from Vietnam. The People's Army of Vietnam, the Army of Republic of Vietnam and the Liberation Army of the Southern Vietnam had to hold their location and ceasefire.

- The South Vietnam had two governments with separated armies and territories.
- Keep going on peace talk among parties in order to reunite Vietnam

… (Minh 2006.)

In fact, Vietnam was just in peace for two months after the Paris Peace Accords were signed. With two small campaigns in 1974, the North concluded the army of the Republic of Vietnam was weakened without supports from the USA and decided to have a final attack to end the war as well as unite the whole country. During 55 days of Ho Chi Minh campaign, the Liberation Army of South Vietnam defeated the whole of the army of the Republic of Vietnam. Finally, Saigon was captured and peace was completely restored on 30th April 1975. (Minh 2006.)

However, Vietnam was damaged seriously in economy and infrastructure because of consequences of the Vietnam War, natural disasters and embargo from the US. In addition, prolonged border conflicts with Cambodia and China as well as irrational economic policies caused the entire economy to sink into difficulties. These reasons, led Vietnam to implement the Renovation (Đổi mới) in which the economy has been converted from closed to open and world integrated. (Minh 2006.)

2.2 History of Information Society

As it was shown in the introduction, the IS that we are going to identify is the society developed based on IT. Therefore, the history of foundation and development of the IS in Vietnam is also the history of foundation and development of IT. The history could be divided into three periods: The war period (1960-1975), The period of unification-the period before Renovation (1965-1986), and the period after Renovation (1986-2011). In the two first periods, IT was just forming and the IS had

not been officially created. Since the Renovation started, the impressive jump of the economy has led to the increasing in consumption of IT together with the growth of the IS. This makes Vietnam become a modernized and highly competitive country.

2.2.1 The period on Vietnam War (1960-1975)

Since 1954, as the result of the Geneva Conference, Vietnam was divided into two parts: the South and the North with two separate governments and armies. Therefore in this period, the foundation of IT in the two territories was also different from each other.

In September 1962, the first group of Vietnamese students, led by late professor Ta Quang Buu, was sent to the Soviet Union with the purpose of studying computing science. Members of this group had different professional backgrounds including Electronics, Mathematics, Construction and Mechanical engineering. At that time, although Vietnam was at war and faced a lot of difficulties, Professor Ta had a vision and recognized that researching and applying computing science would be very important in the process of economic, social, security and defense development in the future. He was considered the person who had the first contributions to IT development. (Hoàng 2006.)

Until 1964, part of the first student group returned and served the country while the others stayed and kept researching for further purposes in the Soviet Union. Meanwhile, North Vietnam was under air raids from the USA, but the development of computing science was still in prior order. Thus, the government negotiated with the USSR to get equipment for computing science in Vietnam. The result of this negotiation was that the USSR decided to support North Vietnam with the Minsk-22,

which was one of the most modern computers in the USSR at that time, in some following years. (Hoàng 2006.)

Since then, a cellar had been built and equipped with all required infrastructure to be ready for the Minsk-22. The cellar was completed in 1967 and became the place for the machine which arrived in 1968. In order to prepare for operating the first computer, another group of students was sent to a computer factory in Minsk, Belorussia for training. In addtion, people from the previous group came back and disseminated knowledge and experience on computers. (Hoàng 2006.)

In addition, a Department of Calculus and Computing was established in order to promote computing science, and it was also the first organization of IT in Vietnam. Staff was organized into two groups to be responsible for software and hardware. Functions and responsibilities of this team included:

- Researching and applying computers for manufacture, security and defense.
- Educating staff for computing science. (Hoàng 2006.)

In 1974 after the negotiation between Vietnam and USSR and other Communist East European countries, Vietnam received an ODRA-1304 from Poland and two Minsk-32s from Bulgaria. (Hoàng 2006.)

In short, at the end of the period 1968-1975, the Department of Calculus and Computing finally accomplished the missions of building up infrastructure and developing computing science in Vietnam as well as contributing in serving the economy, manufacture, security and defense. (Hoàng 2006.)

Also in this period, the computing science of South Vietnam was built up and developed in the early 1960s, but the growing speed was faster than in North Vietnam because there was an investment by the IBM company in America. This company was also responsible for the warranty, repair and education of computing staff with more than 30 IBM systems. (Hoàng 2006.) These IBM systems were managed by the Electro-mechanic and Accounting Center. The Center was then renamed the Electronic Management Center. At first, the Center was equipped with IBM360/20. Until the end of 1972, IBM360/40 was implemented, and the best system available was IBM360/50. Functionality of the Center was computerizing wages, allowance, budget and human resource. Moreover, there were some other IBM systems used in organizations of the Vietnamese and American governments. (Tuấn and Duy 2008.)

In the 1970s, Department of Examination belonging to the Ministry of National Education signed a contract with IBM to computerize the whole process of examining and marking of exam papers. Specific IBMs were used for specific steps, for instances: exam papers were marked by the IBM 1230, the IBM 534 was responsible for making holes which then were proceeded to read marks with the IBM 360. (Giáo dục Việt Nam Cộng Hòa 2009.)

2.2.2 The period after unification and before Renovation (1975-1986)

Right after the fall of Saigon, all of the IBM 360 systems were taken over by the Center of Mathematics and Computer belonging to the Academy of Military Engineering. These IBM systems were used effectively in some specific activities such as oil and gas exploration, human resources management. Additionally, there were different Computing Centers established, for example: the Vietnam Science Academy in 1975, the Department of Computer belonging to the State Science and Technology Commission in 1976. In 1977, some primary ministries set up calculus

centers or computing departments which were all equipped with small computer systems from Germany. (Lãm 2010.)

According to report number 136-81/CMT on 15 December 1981, there were totally 33 multipurpose computer systems: 1 Minsk-22 (Academy of Calculus and Controls), 3 Minsk-32 (Center of Mathematics and Computer, Head Department of Statistic, State Science Commission), 1 EC-1022 (Hanoi University of Technology), 1 M-6000 (Ministry of Domestic Affairs), 1 ODRA (Academy of Calculus and Controls), 1 CM-3, 1 CTD-300/10, 18 IBM 360 systems, 1 Raytheon system and 5 IBM-system3/Model 10. (Lãm 2010.)

Meanwhile, the Academy of Calculus and Controls-an Academy of the State Science and Technology Commission, which was established in 27 December 1976 reached outstanding activities and achievements in this period by focusing on primary target as researching computer applications. This was considered right and significant step at the beginning. One of the most considerable activities was that a group of staff from the Academy was sent to developed capitalist countries such as the US, France, the UK, to get knowledge on software as well as hardware of computer systems. Therefore, the Academy of Calculus and Controls played an important role in developing the Vietnam's computing science in this period. Moreover in 1975-1985, the Academy became a unit which presided national major programs related to Calculus and Controls Science. (Hoàng 2006.)

In addition to importing computer systems, Vietnamese engineers also designed and assembled computers on their own. Thus, two French experts Alain Teissonnière and Hoàng Thành Đào were invited to Vietnam in order to support the project of making the first microcomputer VT80. This microcomputer was also the first one ever made in

Asia which contained Intel chipset 8080A and was capable of running at 2 MHz. (Công 2007.)

After the first model VT80 was successfully built, the Vietnamese engineers continued to do research and make new models of microcomputers called VT8X having keyboard and monitor. In 1979, the third microcomputer was released with floppy disk drive and CP/M80 operating system in order to support programming using a language similar to Basic-"Basic Đồi Thông" created by the group of Vietnamese engineers. This programming language was used to develop material management software-ĐT82 for Sinco factory. (Công 2007.)

2.2.3 The years after Renovation (1986-Now)

In a few years after the Renovation, there were important changes in policies in order to encourage the development of the country. These changes had very positive effects on the entire economy and society in general, and on science and technology in particular. According to the VI resolution of the Communist Party's assembly in 1986, "structure of economic management, science and technology management should require and encourage creating and applying the technical and scientific achievements which lead to significant results". (Ministry of Science and Technology.)

On 30 March 1991, the 26/NQ-TW resolution about "Science and Technology in the Renovation" of the Politic Ministry was promulgated including:

- Policy of quality
- Policy of finance for Science and Technology.
- Policy of encouraging research and execution activities.
- Policy of employment for Science and Technology.

- Policy of information for Science and Technology. (Ministry of Science and Technology.)

During 1986-1992, professional informatics staff increased in numbers and was improved in quality by being educated about methods of creating electronic databases, computing techniques, micro CDS/ISIS software, distant access via database from France, CD_ROM techniques, etc. Also in this period, Vietnam agreed and cooperated with Communist countries to join the “Program of synthetizing science and technology progresses until 2000” which targeted in gaining high levels of science and technology as well as manufacture. The main directions included digitalizing, synchronous automatizing, atomic energy, new materials, bio-technology. Unfortunately, this Communist Organization was disbanded in 1991 because of the Dissolution of the Soviet Union. (Ministry of Science and Technology.)

After the change in authorities of the Soviet Union as well as East European countries, Vietnam had a lot of difficulties. However, Vietnam’s government decided to use more flexible diplomatic and economic policies by cooperating with Western countries. As an effect of this move, in 1991, an internet connections was tested in the scope of UNDP’s program. On 1 December 1997, the project of internet connections was successful and Vietnam officially participated in the global network. It can be said that this was the time for the beginning of the information society in Vietnam. (Tùng 2011.)

In 1995, after Vietnam became the 7th member of ASEAN, Vietnam cooperated tightly on investment and development of Science and Technology in general, and Information Technology in particular.

In 2002, the Ministry of Postal Service and Telecommunications was established and was made responsible for managing the whole Information Technology in Vietnam. Four main tasks of this ministry consisted of:

- Investing and developing, so that the Information Technology would be well applied in both economy and society.
- Actively executing and creating a breakthrough on internet development.
- Organizing to carry out strategies to 2010 and orienting visions for 2020.
- Reducing postal and telecommunications service fees to be as equal as or lower than neighboring countries'. (VnExpress 2002.)

In the same year 2002, the Vietnam Software Association (VINASA) was established and supported domestic companies to exchange information, experiences, and technology; cooperate in education, production, application and software export. In addition, another important task of the VINASA was to set up relationship between the government and foreign software associations. In October of the same year, VINASA was acknowledged as a member of the World Information Technology and Services Alliances (WITSA). (VnExpress 2002.)

Another important event in this year was the decision of common use of digitalized Vietnamese alphabet based on Unicode in exchanging information among governmental organizations started on 1 January 2003. Furthermore, the government also decided to begin applying and popularizing the use of open source software in several fields including education, commerce and health. (VnExpress 2002.)

Following the success of 2002, the year of 2003 was a special year with many important changes. In the development of Information and Communication Technology (ICT), Vietnam was the second fastest after China with the rate of 29%, meanwhile the two previous years' were 13% and 17.6%, respectively. Another

remarkable point during this time was that Vietnam was the first time ranked in the Information Society Index (ISI) together with other 52 countries all over the world, but only got the last position. In the Digital Access Index (DAI) ranking, Vietnam was the 122nd over 178 countries with the rate of 0.31 although it was just the almost last among 58 countries in medium list. In the Networked Readiness Index (NRI), Vietnam was the 68th among 102 countries with the rate of 3.13 and had higher points and rank compared to the two previous years. However, in the field of building up E-government, Vietnam's rank decreased by 7 from 90th (2001) to 97th/173 countries (2003). It showed that Vietnam was still slower than other countries in E-government. Though, internet usage had impressive increase from 126th to 82nd due to the "boom" of internet users, which was tripled in one year. (PC World Việt Nam 2004.)

Moreover, this year was also considered a very successful year of Vietnam's software industry, in which the total income was 120 million USD including 30 million USD from export. Hardware export reached 700 million USD, while total import was 448 million USD which increased 62% compared to 2002. (PC World Việt Nam 2004.)

As good news for the year of 2004, Vietnam was the 60th country over 64 ranked in Economy Readiness Index proclaimed by the Economist magazine, the UK in April 2004. Also in this month, Vietnam was named in the list of 25 countries having the best attraction on outsourcing service by the corporation of international advisory-Kearney. However, Vietnam still had to compete with some higher-position countries, for examples: India, China, Malaysia, Singapore, and Philippine. (PC World Việt Nam 2004). In addition, an Information Technology Seminar was opened in Ho Chi Minh City for the event Vietnam Computer World 2004, which mentioned to the development of the Information Technology in 2006-2010. This event was supported by the Intel Corporation with the provision of millions of computers in order to create more opportunities for teenagers to be able to use the internet. After few years, the internet became popular among Vietnamese people, there was an obvious

improvement in the number of internet users in the whole country, which increased 300% and the Information Technology reached the rate of growth at 35-40%. (Việt Báo 2006.)

The year of 2005 started with some important changes related to IT and Telecommunications. Firstly, Laws of digital trading and Laws of Information Technology were approved by the National Assembly, which guaranteed the legal values of digital trading, digital messages, and digital signatures. These laws were expected to create a legal environment encouraging the use of digital trading. Although online games have already been in Vietnam since 2004, it really became a concern to the government as well as the society because its negative impacts on the youth. Moreover, in the field of mobile communication and internet connections, a considerable point was the increasing of mobile and internet subscribers. To be more exact, the number of subscriptions for mobile communication in 2005 was doubled compared to 2004 with 4.5 million new subscriptions, and for internet connections, the number increased 4 times, but the quality of both services was not satisfactory. In this year, threats to network security increased in both danger level and commonalities. (Tuổi trẻ 2005.)

In 2006, Vietnam's information technology still kept a high rate of developing, especially in internet services. In detail, the number of internet subscribers increased by 86% while the rate was 80% for internet users. The percentage of internet users over total population had just passed the Asian average of 8.4% one year before (2005) and it reached 16% in June 2006, leaving behind the global average at 15.7%. In this year, the value of Vietnam's information technology market reached one billion USD for the first time in its history, and grew 22.6% compared to the year before, three times faster than the world's average. However, according to the report Overview of Information Technology in Vietnam, the country's global rank was not

well improved compared to previous years and it eventually went down in indexes like ISI or NIR. (Nguyên 2006.)

One of the most important changes in this year was the arrival of billionaire Bill Gates, which attracted a very high attention of the society as well as the businessmen. In the same year, Vietnam became one of the few countries in the world applied WiMax technology at that time, which was expected to help Vietnam bring more information to mountain areas where the terrain made it too difficult to deploy cable connections. The year of 2006 also marked considerable trends in Vietnamese internet users who were also called “network citizens” by the Vietnamese press. One of those was the rapid expansion in the use of blogs, especially Yahoo 360^0, right after the service was established. This Yahoo success seemed to come from the widespread of Yahoo! Messenger, which had been the favorite chatting application for Vietnamese Internet users, especially the youth who were highly flexible and always keen on learning anything new. However, the popularity of online communication also had negative effects, of which the most dangerous might be security threats. The year 2006 could be considered the year of “threat boom” for Vietnam’s network environment, mostly virus, including some “made-in-Vietnam”, which infected variety of PCs through e-mail and Yahoo! Messenger. (VnExpress 2006.)

The year 2007 marked Vietnam’s 10^{th} year since the first connection with the global network Internet in 1997. After 10 years, Vietnam had 5 million internet subscribers and 18 million users, covering 21.6% of the population, which overcame the world’s average. It could be said that internet had played an important role in the lives of many Vietnamese people. On 2 August 2007, the National Assembly approved the establishment of Ministry of Information and Communication based on the merger of the former Ministry of Postal and Telecommunication Service and a part of the former Ministry of Culture and Information. Another remarkable event of this year was the government’s decision to end Project 112 and replace a new decree of applying

information technology in governmental offices and organizations. The reason for this move was the project's failure in which some government employees were arrested for their acts of corruption and irresponsibility. As an effort to prevent the inflation, the government supported domestic telecommunications companies to improve the quality of their business and reduce service fees, channel rent, international calls and mobile communications. Moreover, the service quality of the providers was examined and opened to the public for the first time. (Tin247 2007.)

The growth of Information Technology and Telecommunications in Vietnam society kept going on not only in 2007 but also in 2008. One of the most remarkable events was that the Vinasat-1 satellite was officially launched on 19 April 2008. This was also the first Vietnamese satellite entering service after 13 years of preparation, which gave more positive chance to Vietnam in telecommunications infrastructure in order to serve economic and social targets as well as have a position in the list of countries of the world having its own satellite. On 4 January 2008, an agreement was signed between the Department of Information Technology, the Ministry of Education and Training and Viettel Group in order to speed up applying IT into education including providing infrastructure and telecommunications services for education with special cost, supporting internet connections for poor regions. In addition, the use of e-mails among government agencies was also strengthened for improvement. (PC World VN 2009.)

In the previous paragraph, we dealt with the growing of the Information Society of Vietnam in 2008 through the improvement of infrastructure and education, whereas in this paragraph we are going to discuss especially the rising of telecommunications in 2009. First of all, the incredible rise in the number of mobile subscriptions caused many obstacles to management because of virtual subscribes and resources wasted. Thus, each person only had a right to register 3 SIM-cards for each mobile network. Then in July, the close of the Yahoo!360 blog was also the beginning of a rise in

Vietnamese social networks including Zing Me, Facebook. In August, the digital signature scheme was encouraged to apply in digital commerce among organizations, individuals, and financial agencies. Another new step of telecommunications was the appearance of 3G networks after 6 years of investment. The first 3G network was operated by Vinaphone Group on 12 October and the second was brought by Mobilephone Group on 15 December. The year of 2009 ended with the opening of the Intra Asia Cable System (IACS) operated by the EVNTelecom Group, which connected Singapore, Vietnam, Philippines, Hong Kong and Japan with the total length of 6800 km. (Ngọc 2009.)

Recently in 2010, there were some important changes, especially the government started to manage closely mobile promotion and online game which affected the whole society, especially on mobile business and teenager's education. First of all, the wide spread and negative impacts of online games affected seriously on teenagers' knowledge and awareness. Thus, all internet connections suppliers had to temporarily cut the internet connections to all Internet agencies after 23:00. In the field of mobile communication, there had been a "boom" in raising the number of mobile subscriptions through a larger number of mobile promotions from mobile agencies. Therefore, the government promulgated rule which disallowed all mobile network suppliers to promote more than 50% of product's value. In fact, the year of 2010 was also the year of difficulties to almost telecommunications suppliers with changes in rules and business cooperation. (Tinmoi 2010.)

Currently, Vietnam is still being affected by the Global Financial Crisis since 2008. Therefore in a few recent years, there have not been many important changes or activities in the economy in general, and in the field of Information Technology and Communication in particular. Although Information Technology and Communication met difficulties, the Information Society is still speeding up.

In summary, although the information society is still quite a new concept in Vietnam, its history began for about five decades. With the first computers imported in the 1960s, when the war was still ongoing, the first bricks of Vietnam's information technology were set. Because an information society is based on technology, these advances could also be considered the first steps in the development of the information society of Vietnam. However, the information society did not really exist until early 1990s when the effects of the Renovation became obvious. Since then the information society has been growing rapidly with several remarkable changes in every year, which have been attracting very high public attention. If Vietnam can keep up its current development rate, the information society will have a very promising future ahead.

3 CURRENT STATE OF INFORMATION SOCIETY

In this chapter, we are going to present the current state of the information society in Vietnam by showing the newest statistics (2010) according the official report by the Ministry of Information and Communication of the Socialist Republic of Vietnam published in 2011. Besides, the statistics of previous years are also going to be shown in order to analyze clearly the development of the information society over the recent years. These statistics will be classified into three fields: infrastructure including network infrastructure and devices, current situation of education and accessibility to information and communication technology to show how easy it is to get access. Furthermore, comparisons on these fields are going to be made among Vietnam and other neighboring countries, so the position of Vietnam in the Asia Pacific will be clarified.

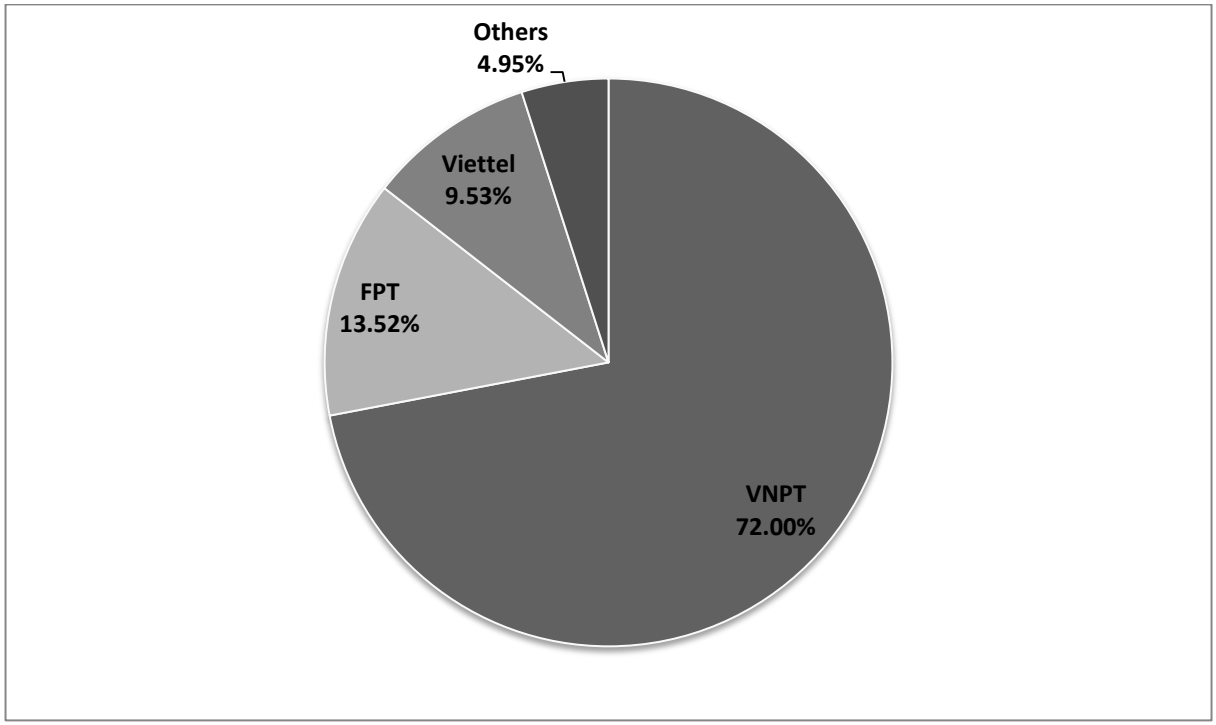
3.1 Infrastructure of information society

As we mentioned in the introduction of this chapter, infrastructure is an important factor in forming an information society. Elements of an infrastructure include network infrastructure and devices. A very important turning-point in the evolution of the information and communication technology in Vietnam was the successful launch of Vinasat-1 in 2008, which was the first Vietnamese satellite. By having this satellite, Vietnam had opportunities in applying 3G technology into the society as well as saving money from channel rent for other services.

3.1.1 Internet providers, infrastructure and transfer rate

As mentioned above, Vietnam officially participated in the global internet connections in 1997. Since then, the number of internet users and internet service providers (ISP)

has been increasing gradually. Especially, the number of internet users has covered over a third of the total population. Moreover according the government's decree, internet connections have improved and provided to cover more areas of the country. Until the end of 2011, there were totally up to 91 internet service providers licensed. The three biggest providers among them are VNPT, Viettel and FPT, which cover totally 94.03% of the whole market (VNNIC 2011). Currently there are three different ways used by ISPs to provide cabled internet connections to their household customers: via telephone connections, via separate internet cables and via television cables.



GRAPH 1. Market share of ISPs (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 50)

As shown in Graph 1, each of the three main ISPs has its own market share much larger than the sum of the rest. VNPT has the biggest share among them with a rate

of 68%because the company was originally the only provider of fixed telephone services and then internet using dial-up connections. FPT is providing internet connections with higher service fees than most of the ISPs in Vietnam's market, though it gains the second rank with the share of 13.52% as it is one of the best providers. The third position currently belongs to Viettel with 9.53%, well known for its good quality and price of services. Many among the other ISPs are newcomers in the market or just local providers, so they have not gained much reputation yet.

The period from 2003 to 2010 in Vietnam was considered the period of ADSL with its rapid development. However, the increasing demand of internet use made the transfer rate of ADSL become more unsatisfying. Therefore, the internet service using fiber optics, which is called FTTH (Fiber To The Home), has been becoming more popular with its reasonable price. One of the most important advantages of FTTH compared to ADSL is more stable quality, regardless of distance. Moreover, it is also especially appropriate to provide for areas with high density of subscribers such as office buildings, apartments, and industrial zones. It is believed that ADSL is going to be overwhelmed by FTTH in the market share. (Duyên 2012)

Although the internet connections in Vietnam have been developing quite fast, the transfer rate is still lower than the average rate of the world. To be more exact, the rate of Vietnam is at 1.7 Mbps while the average of the world is at 2.6 Mbps according a study of 50 countries' internet transfer rate from Akamai, a famous American company in internet investigation. In the 50 countries listed, Vietnam ranked at 32nd position. (NTH 2011.)

3.1.2 Number of providers and subscribers on mobile and fixed telephone

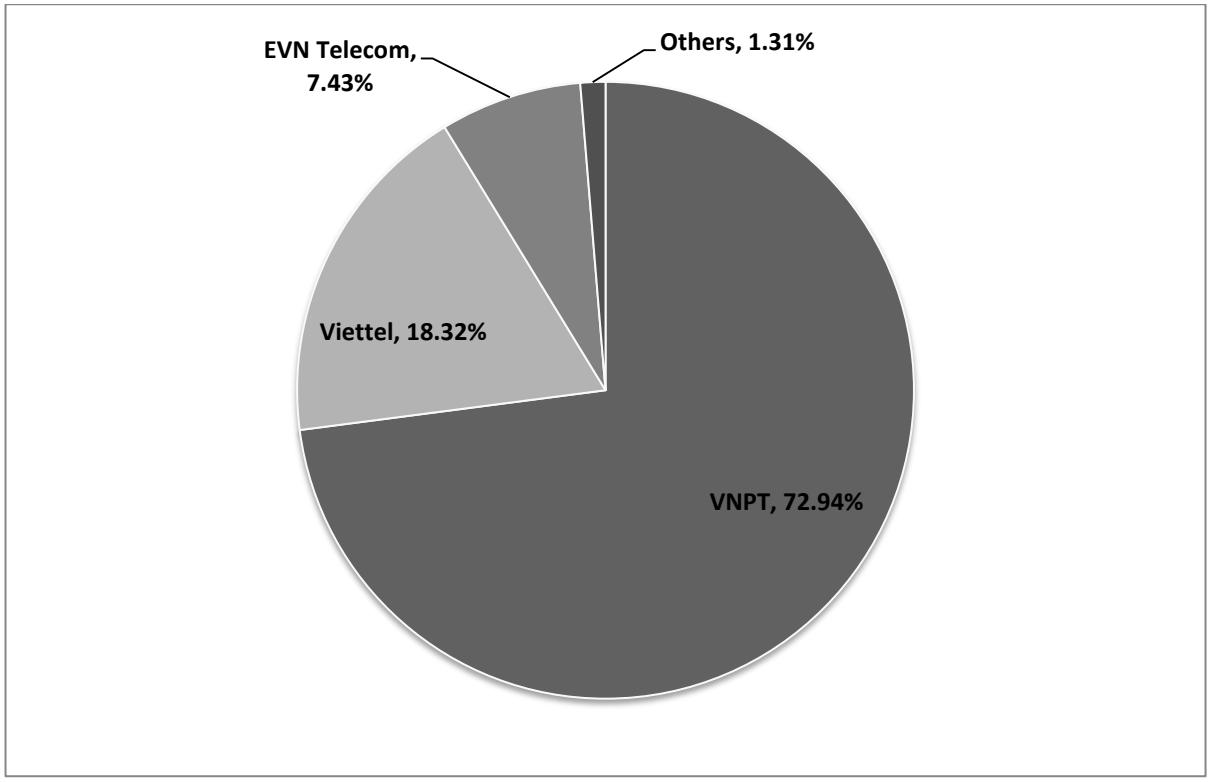
In the field of telephone communication, there are four kinds of services: fixed telephone and mobile communication services in 2G and 3G and mobile virtual network. Table 1 displays the number of companies working in these fields during the period of two years from 2009 to 2010.

TABLE 1. Number of telecom service providers in 2009 and 2010 (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 49)

	3/2009	12/2010	
Number of fixed telephone service operators	8	10	VNPT, Viettel, EVNTelecom, SPT, FPT, VTC. Đông Dương, CMC TI, HanoiTelecom, Gtel.
Number of mobile communication service operators (2G)	7	7	VNP, VMS, Viettel, Gtel Mobile, EVNTelecom, SPT, HanoiTelecom
Number of mobile communication service operators (3G)	5	5	04 licenses: VNP, VMS, Viettel, EVN Telecom + Hanoi Telecom
Number of mobile virtual network operator (MVNO)	2	2	Dong Duong Telecom, VTC

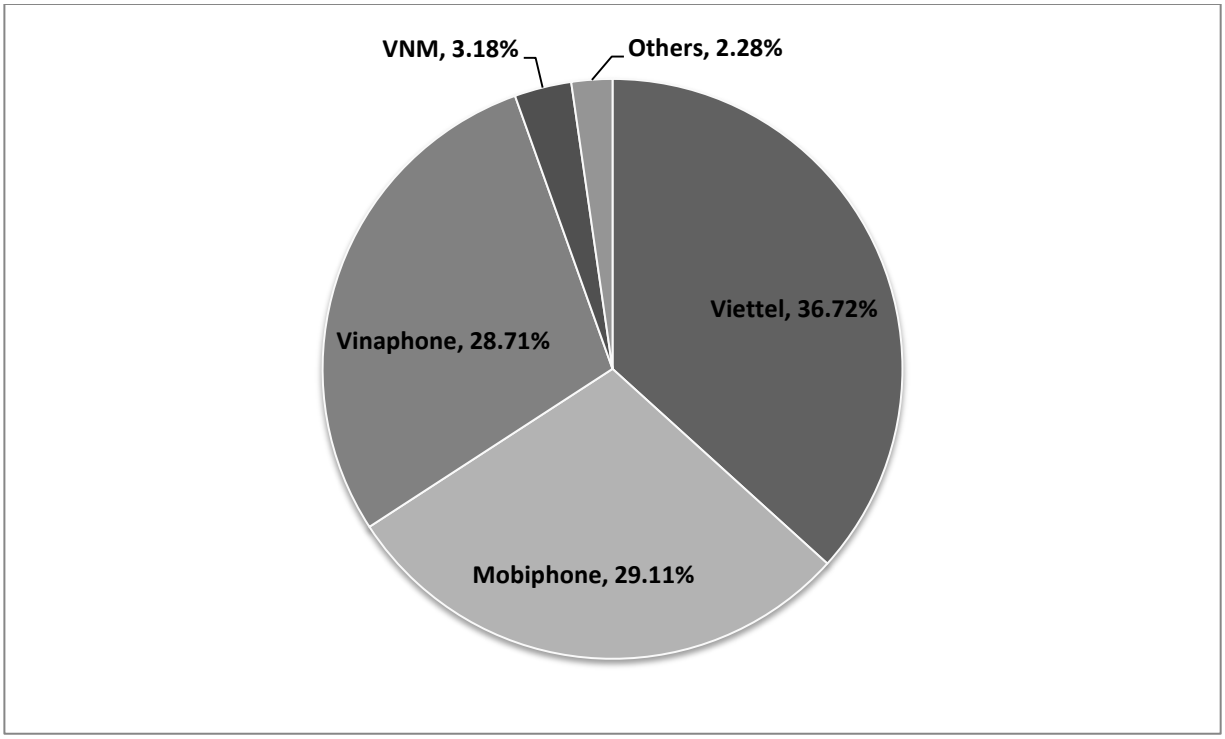
Fixed telephone technology has been in used in Vietnam since the country became the French protectorate in late 19th century. Since then it has developed continuously

and become an important method of communication for the major part of Vietnamese people. However, with the uprising of mobile communication in recent years, fixed telephone technology is facing a true competitor.



GRAPH 2. Market shares (subscribers) of fix telephone service providers (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 51)

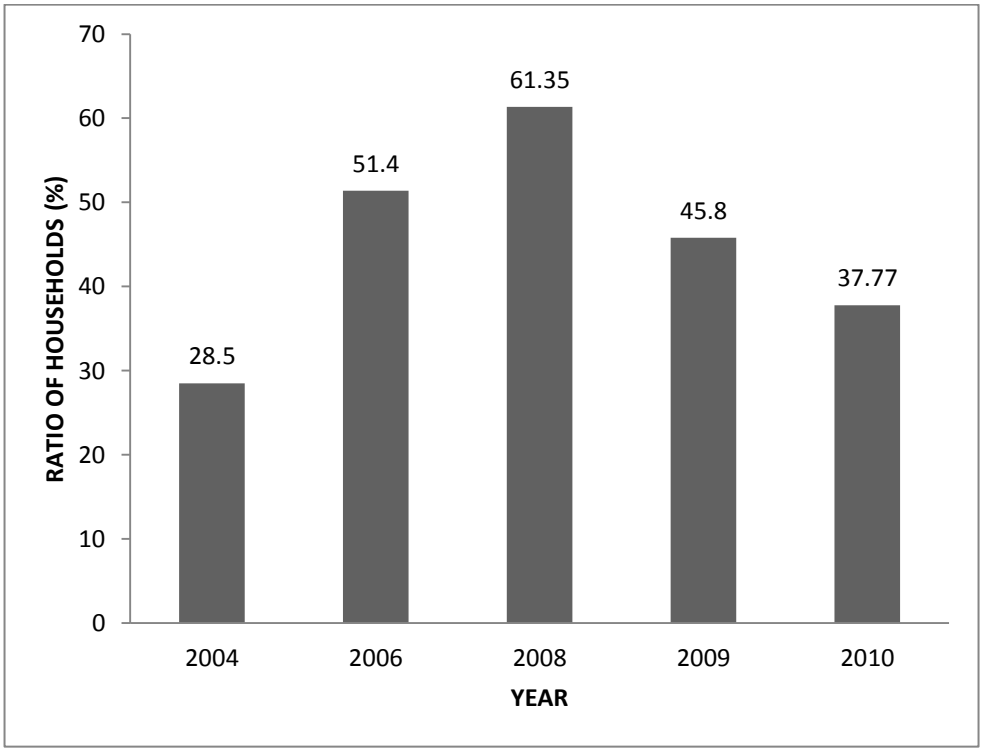
Graph 2 shows the percentage of share in Vietnam's fixed telephone market. As seen, VNPT was obviously the major provider, covering 72.94% of the market. Standing at the second position with 18.32% share was Viettel, followed by EVN Telecom, a quite newcomer of the market, who had less than a half of Viettel's share at 7.43%. Minor providers including SPT, VTC and FPT Telecom, who had just started their business for a few years, gained a total of only 1.31% of market share.



GRAPH 3. Market shares (subscribers) of mobile phone service providers (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 51)

Graph 3 shows the market shares of current mobile phone service providers based on their subscribers in 2010. In general, Viettel Group had the largest share in the whole market with the rate of 36.72%, the second largest number was 29.11% belonged to Mobiphone and 28.71% of Vinaphone as the third place. VNM, which was a new provider in the market, covered only 3.18% of the market and the rest is belonged to other providers. However, Mobiphone and Vinaphone are currently owned by the VNPT Group. It means VNPT still covers the most shares in the whole market both in fixed and mobile communication.

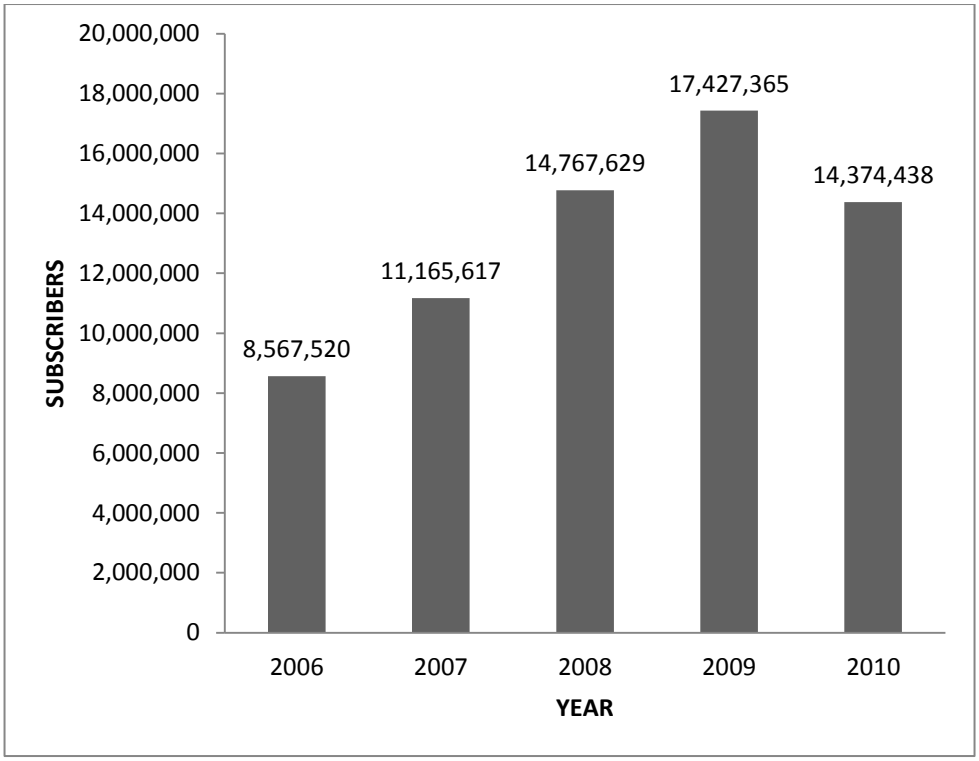
We can take a look at the whole scope of the telephone market with different providers by analyzing their market shares according to the number of subscribers. With these strong and competitive service providers, people have many choices to purchase for their own subscriptions. Now we will see how the number of fixed telephone and mobile phone subscribers had changed over years until 2010.



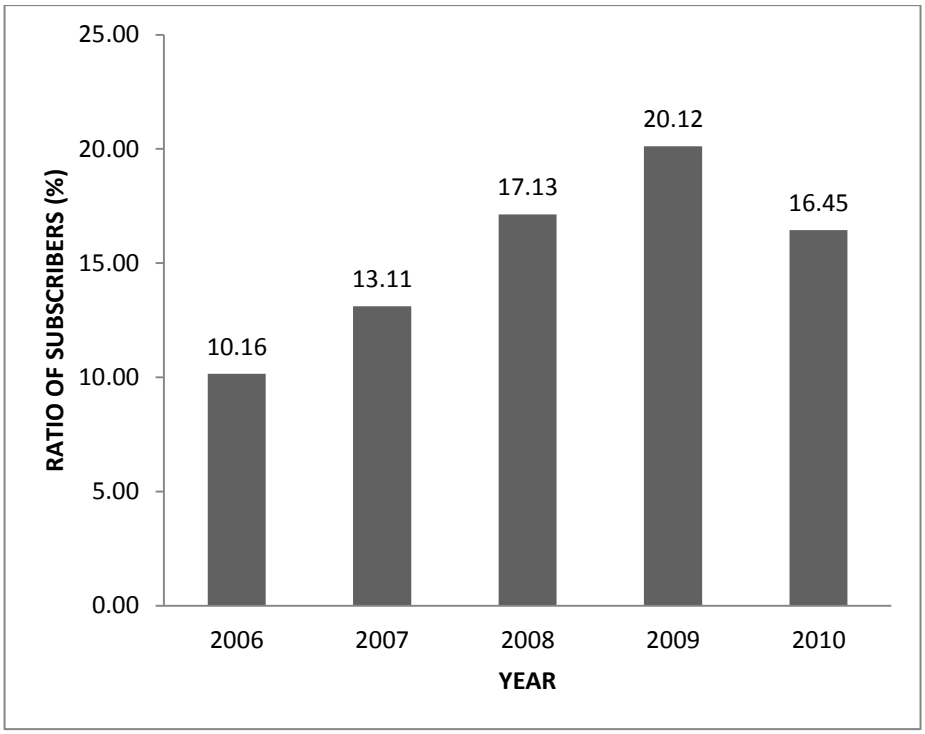
GRAPH 4. Households with a fixed telephone line per 100 households over years (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 33)

As it is shown in Graph 4, the percentage of households owning fixed telephone lines grew rapidly in the period of four years from 2004 to 2008. From 28.50% in December 2004, the rate increased more than doubled and reached its maximum of 61.35% at the end of 2008. However, since the year of 2009, the ratio over 100 households has started to fall. The reason probably came from the development of mobile

communications, which is becoming much more convenient and eventually cheaper due to very active promoting programs from mobile service providers.



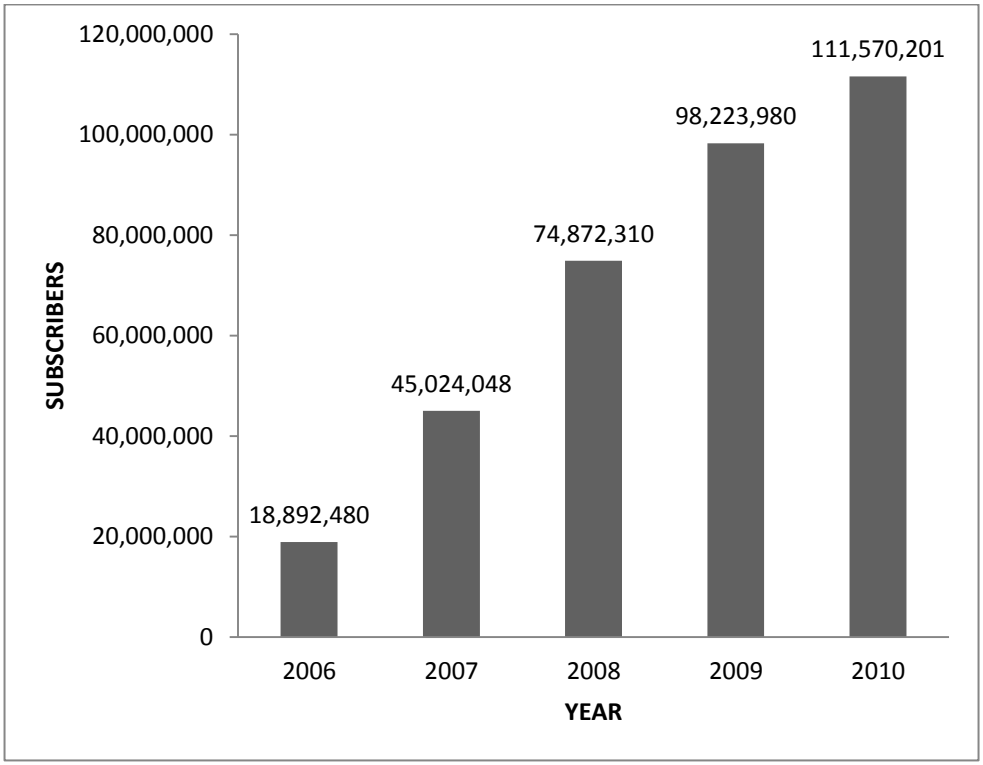
GRAPH 5. Number of fixed telephone subscribers from 2006 to 2010 (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 33)



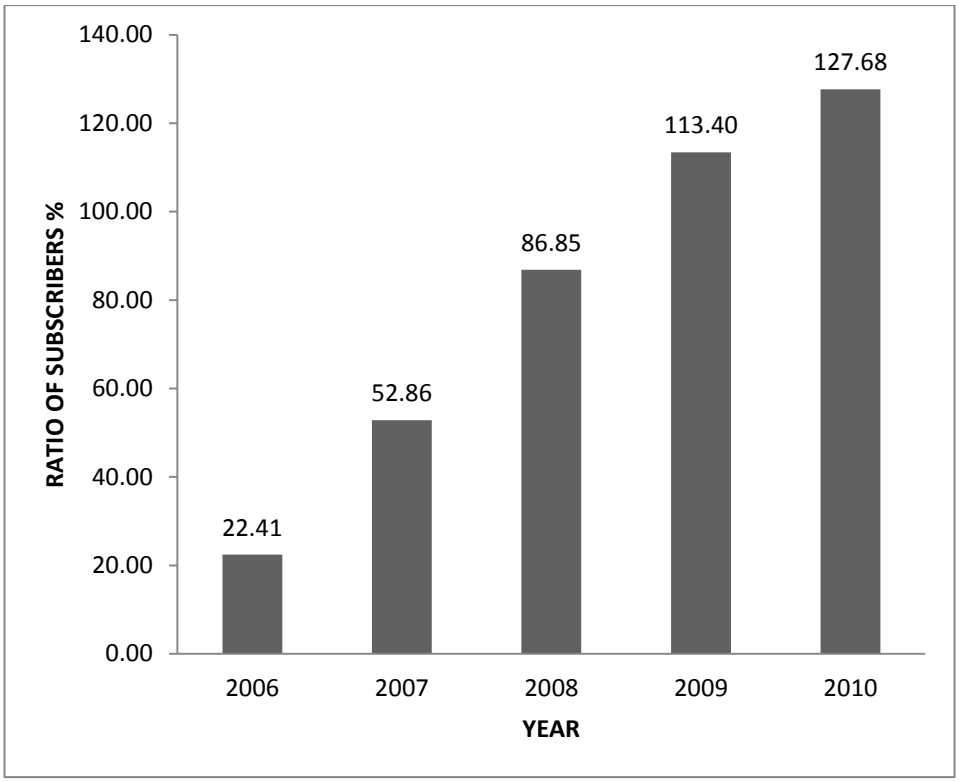
GRAPH 6. Fixed telephone subscribers per 100 inhabitants from 2006 to 2010 (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 33)

Graph 5 and Graph 6 respectively show the changes in the number of fixed telephone subscribers in total and among every 100 inhabitants between the years 2006 and 2010. As seen, the two numbers constantly rose in the period from 2006 to 2009. The total amount of subscribers in 2009 was about twice its starting point at almost 8.6 million for years before, while its percentage in the population grew with about the same rate and reached the highest point of 20.12% at the end of 2009. However, the number of fixed telephone subscribers recorded remarkably decreased in 2010, to the point even lower than the amount achieved in 2008. Therefore its rate over the population lost 3.47% and the new rate in 2010 was also lower than in 2008. This subscriber decline came from the same reason which was mentioned above, the competition from mobile phone. As it was shown in Graph 4, percentage of household owning fixed telephone line failed rapidly from 2009. However, the total number of

subscriber was the still rising at that time, most likely because of the increasing consumption of government and firms. The decrease of usage in households finally led to reducing in total number in 2010 and the trend was predicted to continue in the future.



GRAPH 7. Number of mobile phone subscribers from 2006 to 2010 (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 33)



GRAPH 8. Mobile phone subscribers per 100 inhabitants from 2006 to 2010 (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 33)

As it is shown in Graph 7 and Graph 8, the number of mobile phone subscribers in 2006-2010 increased considerably. Especially, the number of subscribers increased more than doubled from over 18 million in 2006 to around 45 million in 2007. This number actually rose strongly for some reasons. Firstly, mobile phones in this period were very popular and convenient for people to communicate. Secondly, for competition among mobile service providers, there were a lot of promotions. Therefore, people could buy several pre-paid SIM cards with reasonable price and larger amount of reload balance compared to its value. Thus, pre-paid mobile services are always preferable in Vietnam. It also made some troubles in managing mobile subscription in Vietnam few years ago. Therefore, the government released new law to limit the number of subscriptions for each person by three for each

provider in 2009. Additionally, the mobile market was considered to be saturated enough when almost all people already had their own. Thus, in 2008-2010, this number slightly decreased. However, the total number of subscriptions was still at an impressive level when the ratio of subscribers in 2009 reached 113.40% of the total population (as information shown in Graph 8) while the ratio counted to 2010 was at 127.68%. The rate of total mobile subscriptions in Vietnam in 2009 was slightly lower than the EU-27 average, which was about 125% (Eurostat 2011).

In the field of mobile communications in 3G, Vietnam has officially been operating since 2009. Until now, there are totally five firms having plan in operating 3G service and four of them already had licenses from the government. However at this time, there was just only one company operating this service in the whole country, which is Viettel Telecom. Although the number of 3G providers is just one, the number of subscribers is quite high. At the end of 2010, according to the report from the Ministry of Information and Communication Technology in Vietnam, the total number of subscribers in 3G mobile communication reached 7,669,544 although there had been only two years running the service and with only one provider. (Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 33.)

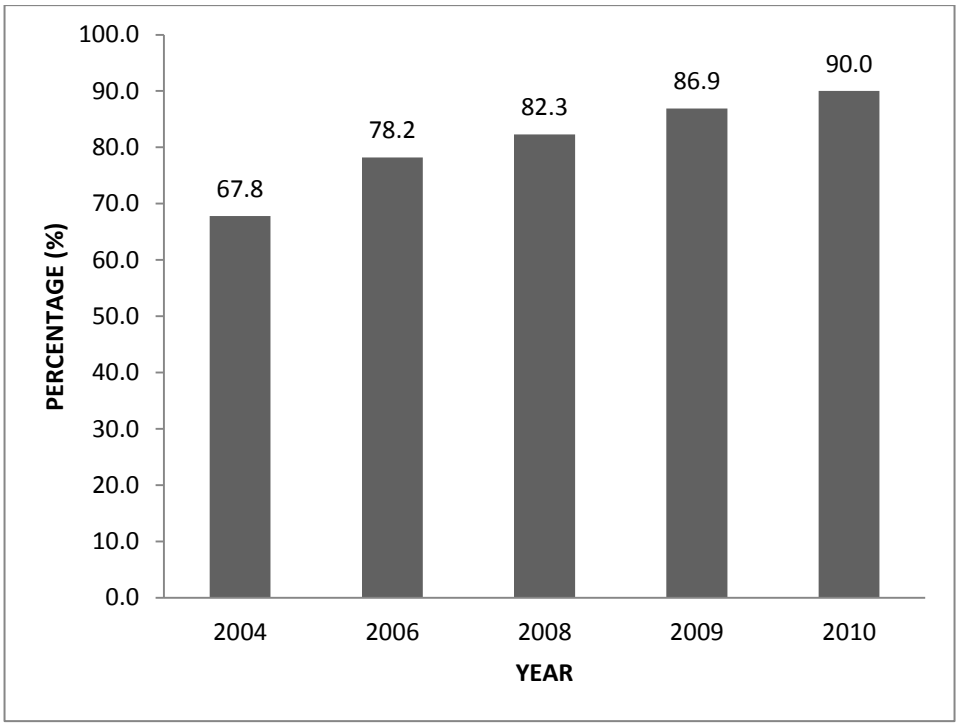
In summary, the field of telecommunications in Vietnam is developing fast and strongly in general and mobile communication in particular. Moreover, this also attracts the government’s attention, especially about the range of signal cover. However, the telephone network is usually in congestion in specially occasions like Christmas, New Year’s Eve. Hopefully, it will be better with higher quality in the future.

3.1.3 Number of households with television and development of television services

TABLE 2. Households with cable/digital/satellite TV in 2010 (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 35)

No	Classification	2010
1	Number of households with radio	2,157,664
2	Number of households with television	18,167,483
2.1	Number of households with parabol antenna	3,272,416
2.2	Number of households with antenna	12,565,723
2.3	Number of households with cable TV	2,565,309

Table 2 shows the number of households with cable, digital or satellite televisions in 2010. It can be seen from the table that the major part of households were still using traditional antennas to receive free analog signals. Nowadays Vietnam has at least one TV station in every province which is capable of transmitting signals from the national station to all regions and broadcasting its own local channel using analog technology with some self-produced programs. In addition, together with the impressive economic development, the number of households can afford pay television using the cable or parabola antenna is increasing considerably in recent years.



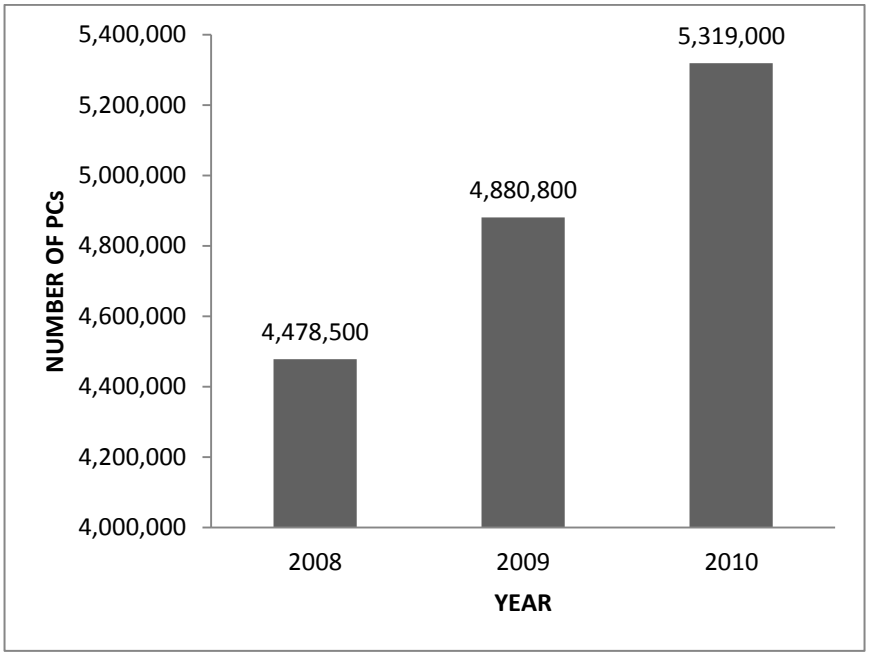
GRAPH 9. Households with television per 100 households over years (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 35)

Graph 9 shows the number of households having television per 100 households in percentage from 2004 to 2010. Generally, the number of television owners was increasing but the rate was not so high. The total percentage from 2004 to 2010 increased more than 20% from 67.8% in 2004 to 90% in 2010.

To conclude, the number of televisions in Vietnam is increasing year by year. Moreover, the pay television is an increasingly popular service in the society with variety of providers. Thus this kind of market is becoming very competitive in both price and number of exclusive channels, but the quality is not satisfactory. It is expected to continue its good development in the future with higher quality and a better price.

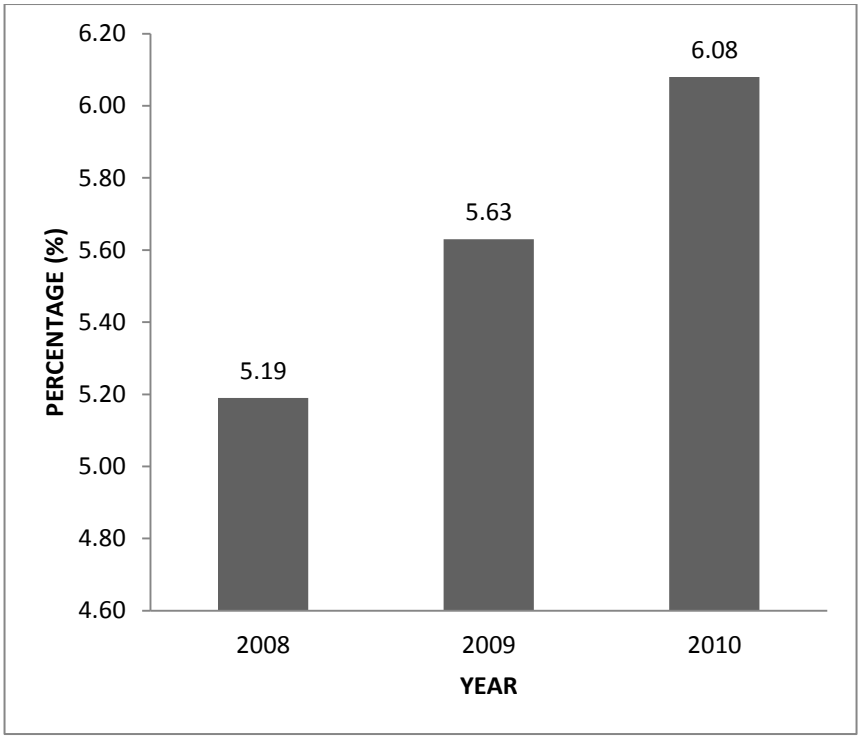
3.1.4 Computer density in total population

According to a report by the Ministry of Information and Communications, the popularity of personal computers including desktops and laptops has been rising with a good rate in recent years. Beside the increasing household usage, application of computers is strongly supported by the government in its offices to save time and cost as well as to improve the quality of services. Computer networks are also built up in schools and universities for the purpose of educating and managing data. It could be said that the usage of computers is increasing in all fields of daily life in Vietnam, together with the popularity of information technology application. However, the rate of computers over total population is still very low because the price of a computer, even with its reducing in these years, is still too high for a major part of inhabitants to purchase.



GRAPH 10. Number of desktops, laptop computers from 2008 to 2010 (estimated) (adapted from Ministry of

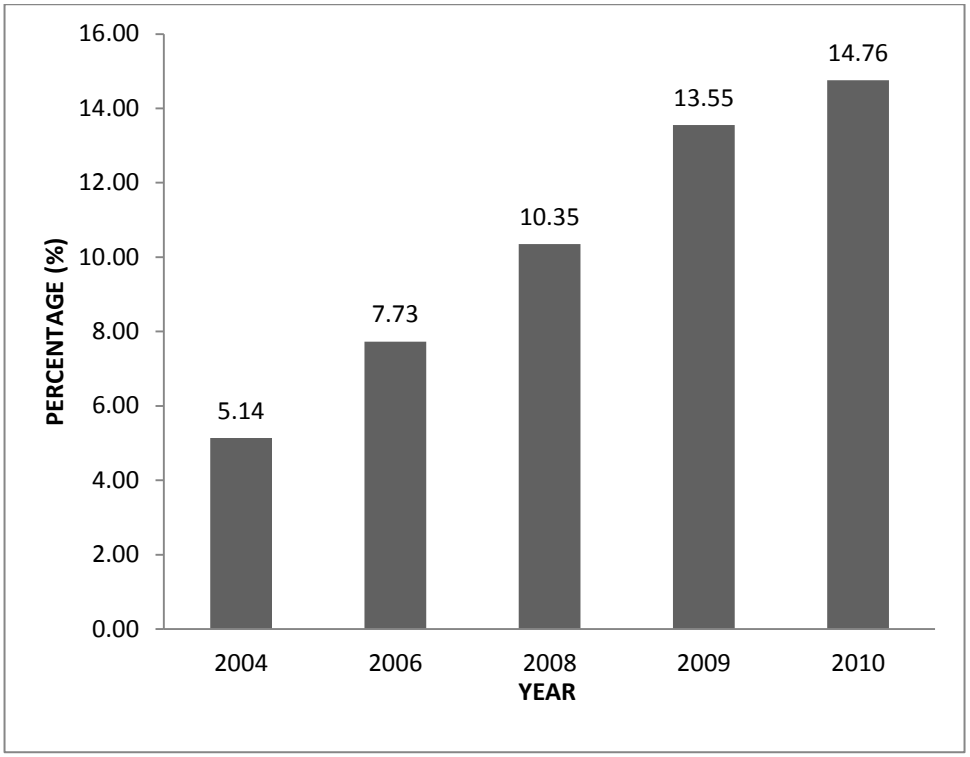
Information and Communication of the Socialist Republic of Vietnam 2011, 35)



GRAPH 11. Personal computers per 100 inhabitants from 2008 to 2010 (estimated) (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 35)

Graph 10 shows the estimated total number of desktops, laptop computers from 2008 to 2010. Graph 11 also presents the estimated number of personal computers per 100 inhabitants year by year. As we see in Graph 11, the number of computers per 100 inhabitants generally increased but the rate was still very low. To be more exact, in December 2010, the rate was just 6.08%. Compared to the average among European Union countries (EU-27) which was 71% in 2010, Vietnam's rate is just about one tenth (Eurostat 2011). However, if we look at Graph 10, we can see that

the total number of computer over years also increased. If we compared the total numbers between 2008 and 2009; and between 2009 and 2010, the increasing rate was approximately 9%.



GRAPH 12. Households with computers per 100 households (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 35)

Graph 12 displays the rising in number of households with computer per 100 households. Generally from 2004 to 2010, the number of households having computers increased slightly. To be more exact, the increasing rate was about 1.5 to 3% per year. However, if we compare the total percentage in 2010 to the percentage in 2004, it rose almost triple with 5.14% in 2004 and 14.76% in 2010. Although this rate still seems to be low at a general level, it proves that more and more people can

afford computer for their own with the raised of salary following with the development of the economy.

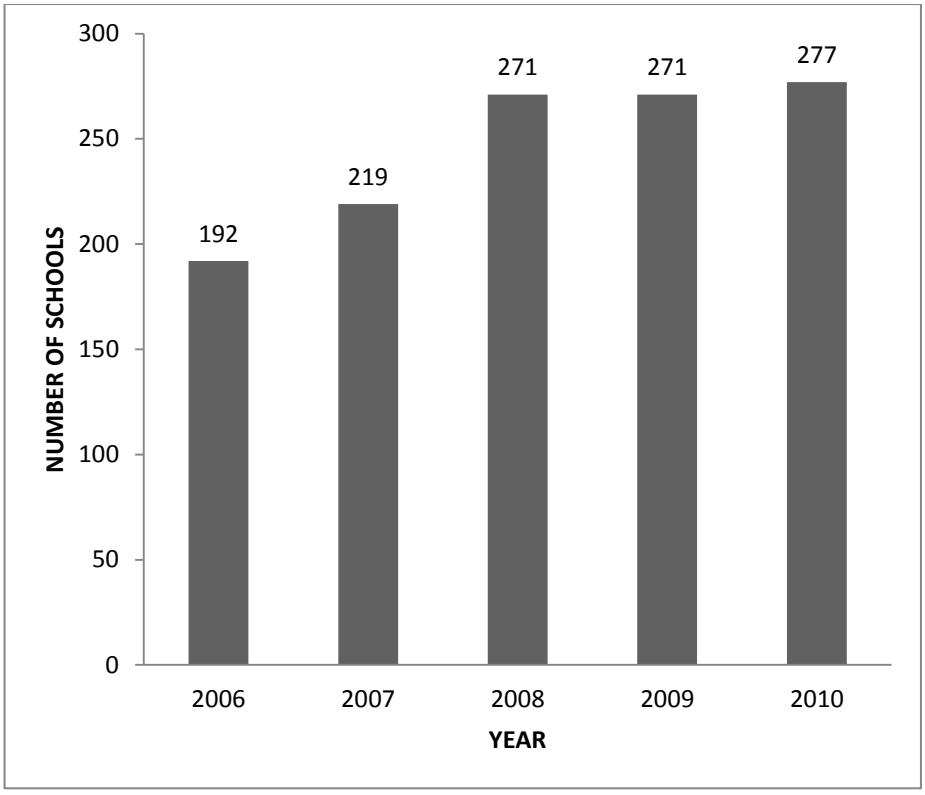
In short, the number of personal computers in Vietnam is increasing but not too high. The rate is still low compared to the number of population. However, the whole scope of the economy in Vietnam is developing, and computer products of many branches are being assembled or produced inside Vietnam, it made the price of computer reduce. Thus, more people can obtain computers more easily and it is expected the number of personal computers in Vietnam will be increased strongly in next few years.

3.2 Education of Information Technology

In this sub-chapter, we are going to discuss the education in the field of information technology in Vietnam. A few years ago, there were only high schools and some secondary schools had computing in their teaching programs. Nowadays, it has eventually become very popular in primary schools, especially in cities and surrounding areas.

> *"Regarding human resources development, in the period 2000-2010 the number of IT training institutions has been increased considerably, such as five times for universities, from 42 to 206, and six times for colleges, from 36 to 205. Till the end of 2010, there were 277 universities and colleges which train IT (accounting for 73% of cases) with 70 different IT professional groups, computer science research; and 59 faculties train electronics and telecommunications. There are 220 professional secondary and vocational schools of IT technician training, and 62 institutions of electronics and telecommunications. Having Internet connections in all primary schools is an essential condition for the national plan of IT human resources development."*

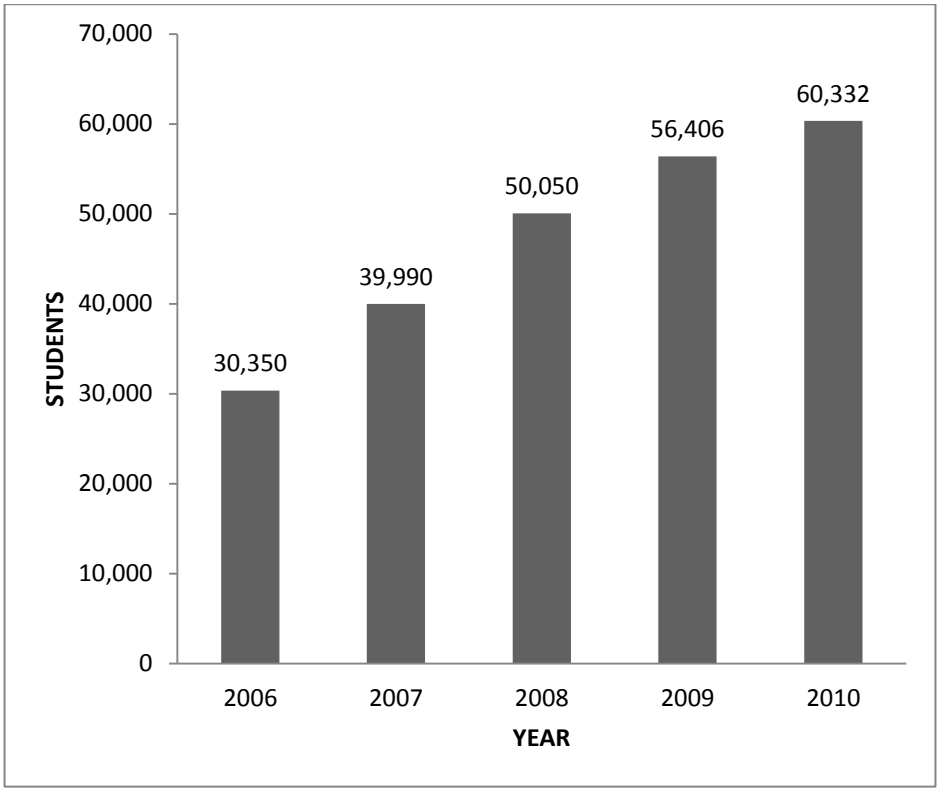
(Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 15-17)



GRAPH 13. Number of universities and colleges offering ICT training (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 75)

Graph 13 shows the total number of universities and colleges training Information Technology from 2006 to 2010. Generally, Information and Communication Technology is becoming more popular and attracts a lot of young people. Thus, the number of students applying in Information Technology degree program as well as the number of universities and colleges providing IT training is increasing rapidly. Especially, it jumped around 50 units from 219 in 2007 to 271 in 2008. This number still remained in 2009 and rose slightly in 2010 with the total units of 277. In fact, if

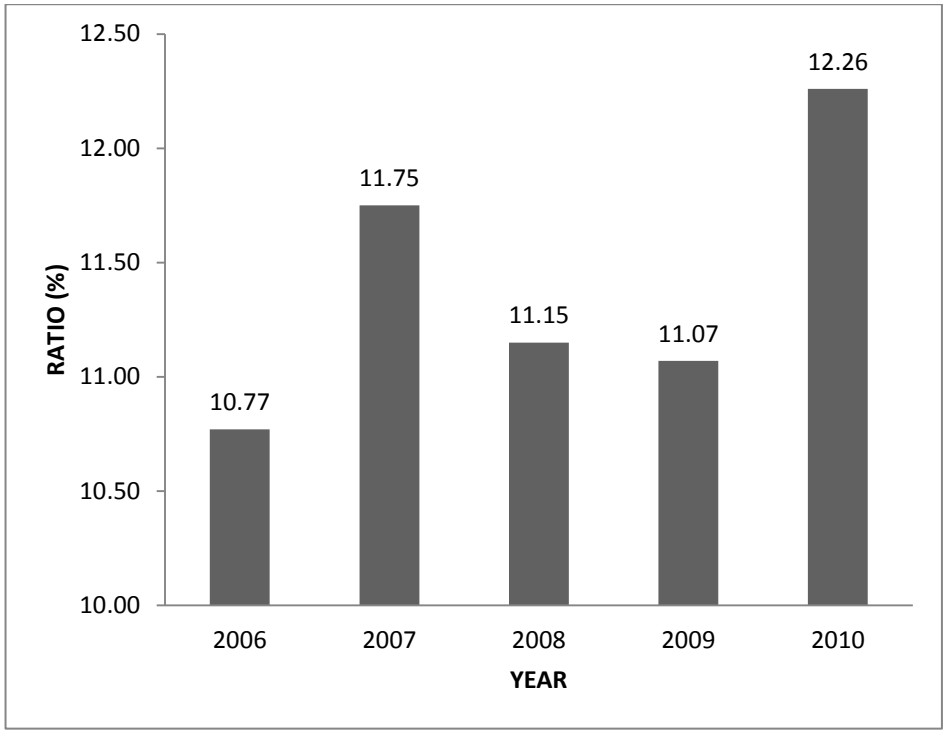
we compare this number (277) to the total number of universities and colleges in the whole country, it is also considerable and proving that ICT is being regarded as an interesting subject of study.



GRAPH 14. Quota of ICT-related student enrolments (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 77)

Graph 14 displays the increase of ICT-related student enrolments in the period between December 2006 and December 2010. As it is shown in Graph 13, the number of universities and colleges offering ICT training grew rapidly from 2006 to 2008. Therefore the number of ICT enrolments also increased very quickly in the first period of two years between 2006 and 2008 with about ten thousand each year. The number of institutes offering ICT training was almost constant after 2008, even though

the number of enrolments in this period still increased with the rate about a half of the previous years. Until the end of 2010, ICT-related student enrolments reached 60.332, about twice larger than the number of five years before.



GRAPH 15. Ratio of ICT-related student enrolments quota over total student enrolments quota (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 77)

Graph 15 presents the ratio of students in ICT enrolments quota compared to the total number of student enrolments quota from 2006 to 2010. As shown in this bar chart, the ratio of student enrolment quota in ICT was over 10% of the total enrolments quota. The ratio fluctuated over years, but basically it was still increasing. The rate increased from 10.77% in 2006 to 11.75% in 2007, then decreased slightly from 2007 to 2009 but this drop did not affect too much. Later in 2010, it rose again strongly from

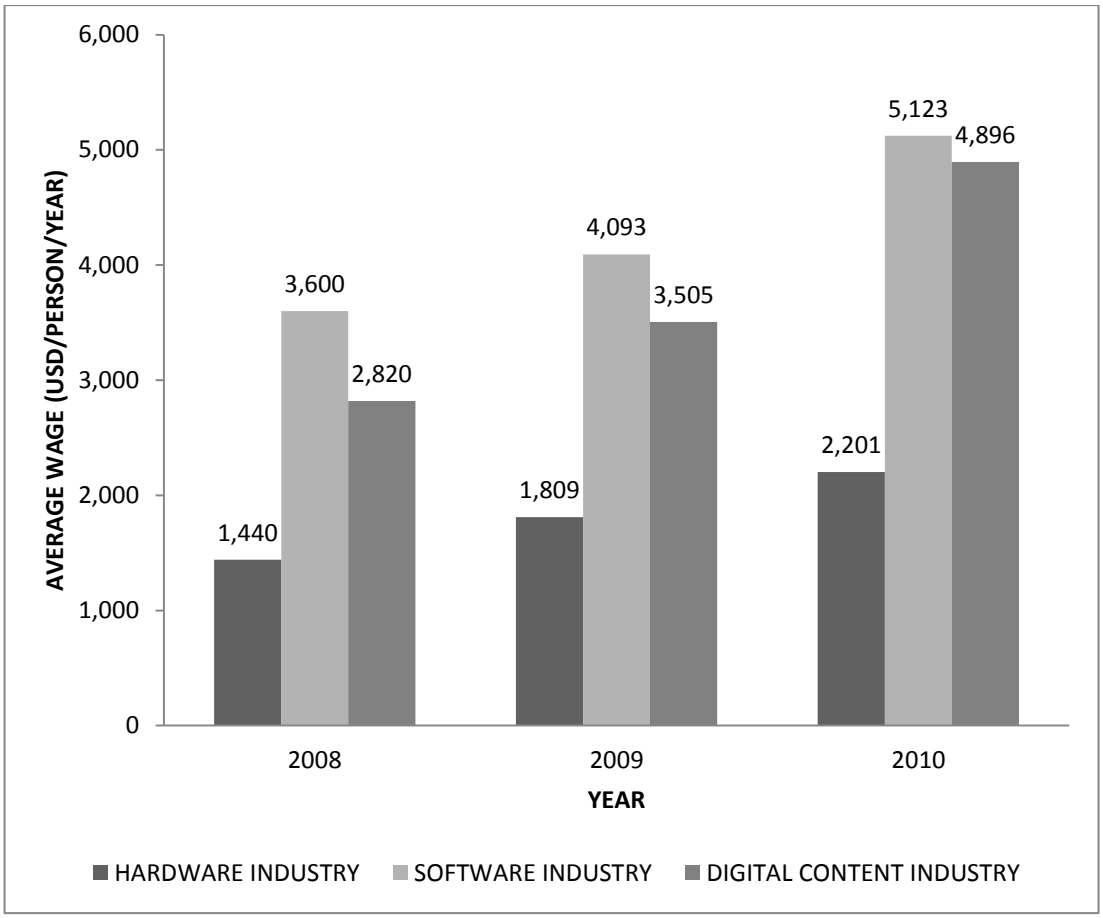
11.07% in 2009 to 12.26% in 2010. This ratio was also the highest rate during the period 2006-2010 and it is expected to be higher in next few years.

TABLE 3. Number of ICT-related students in 2010

	Year 2010
Actual number of ICT- related students enrolled	56,338
Number of ICT- related students studying until 31/12/2010	169,156
Number of ICT- related graduates	34,498

Table 3 shows the number of students applying, studying and graduating in ICT degree program in 2010. As we can see, the actual number of students admitted in ICT in 2010 was 56,338. This almost reached the ICT enrolment target in this year as shown in Graph 14 (60,332) and it was quite acceptable. The total number of students taking ICT degree programs in 2010 was around 169 million and the number of students graduated was about 34 million. This number of students would be a diversified human resource for Information and Communication Technology.

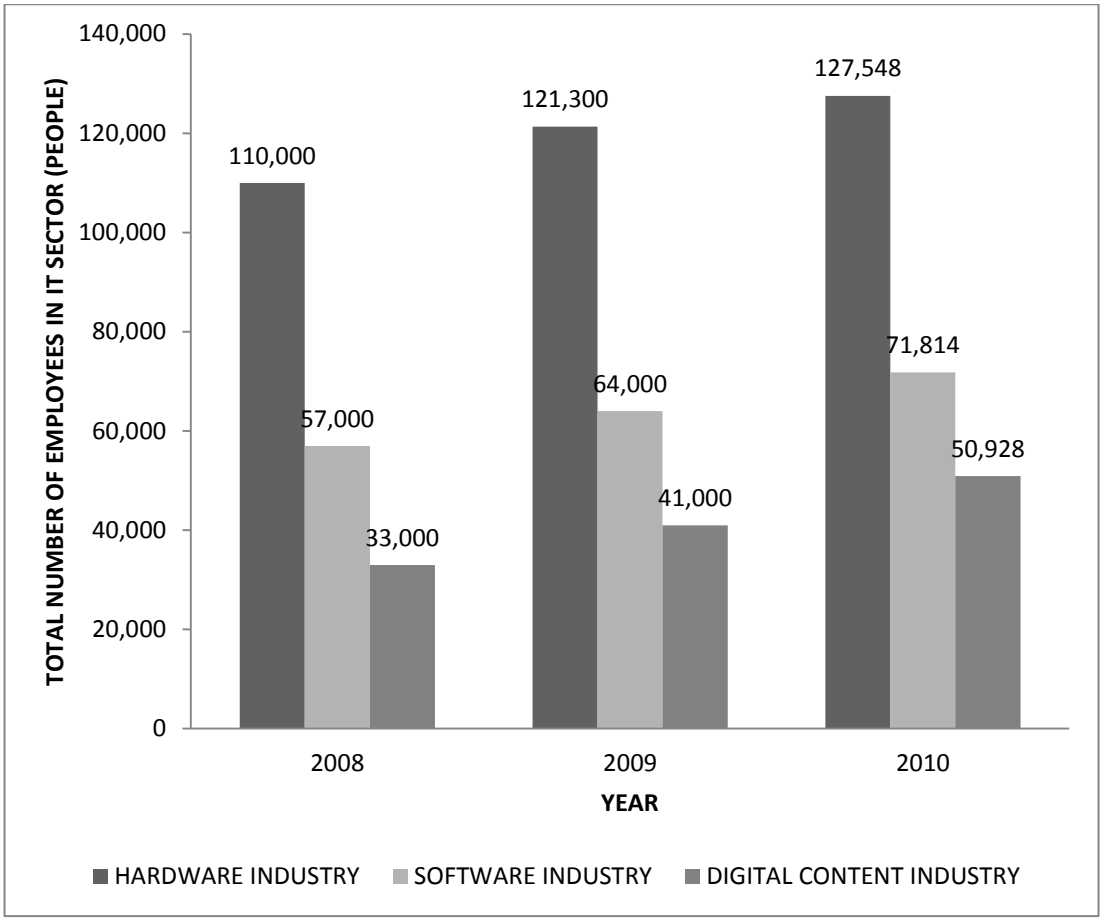
Among the factors attracting an increasing number of students to apply for the field of IT, career opportunities as well as good salaries, especially in software industry, are the most important. The development of average wage for one employee in three main fields of information technology in the period of three years from 2008 to 2010 will be clarified with Graph 15.



GRAPH 16. Average of wage in IT sector (USD/person/year) (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 47)

It can be seen from Graph 16 that employees of the software industry have always earned the best salaries, while the lowest have always been paid for the hardware industry's employees. The average wage paid for an employee in the hardware industry is eventually not as much as a half of that for either the software or the digital content industry's employees. These huge gaps might come from the basic of each industry consisted in information technology. Most of the employees in the hardware industry are just common workers in component or assembly factories, whose jobs do not require much knowledge and skill, while it would need years of higher education to gain a job in the other two fields. Compared to the software industry, employees in

the field of digital content are paid with a bit lower salary, but it can be seen that the gap is being narrowed and the salaries of the two fields may be equal in next few years.



GRAPH 17. Total number of employees in an IT sector (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 47)

Graph 17 displays the total number of employees in the field of IT including the hardware, the software and the digital content industries. Altogether, the total amount of employees in three these fields increased gradually every year. Among them, the number of hardware industry employees was the highest; the second position

belonged to the software and the digital content industries had the lowest number of employees. In fact, the hardware industry owned the highest number of employees is absolute. The software industry had higher number than the digital content industry because market demands as well as salaries of the software industry are quite higher.

In short, ICT development in Vietnam is becoming more important, number of student applying for ICT and university as well as colleges providing ICT degree program are increasing rapidly, and number of ICT companies is also rising. Therefore, a required number of ICT employees is much higher. At that time, although the available employees reach a very high number, there is still a lack of fully skilled and qualified candidates. One of the reasons is low quality and unprofessional method of education in universities. Thus, the government is paying much attention on quality and technical issues in order to improve and raise the professional levels of ICT human resources.

3.3 Accessibilities

The word “Accessibilities” in this sub-chapter means how easy it is to access information and information technology in the society. Its content will be presented in three fields: internet connections and computers, television and telephone servces via three factors of each field including availabilities, price and censorship.

3.3.1 Internet connections and Computer: availabilities, price and censorship

In Vietnam, the internet connections can be setup for free by ISPs. Customers just need to pay a deposit, which will be returned to them completely after a few months

of use. Tables 4, 5, 6 show the service fee per month of the three main ISPs in the domestic market.

TABLE 4. Price of different internet service packages of VNPT (adapted from VNPT, 2012)

	Mega Basic	Mega Easy	Mega Family	Mega Maxi	Mega Pro
Download Speed (Kbps)	1,536	3,072	4,096	6,144	8,192
Upload Speed (Kbps)	512	512	640	640	640
Price (USD)/month	7.5	12.5	17.5	45	70

TABLE 5. Price of different internet service packages of FPT (adapted from FPT Telecom, 2012)

	Mega Save	Mega You	Mega Me	Mega Net
Download Speed (Kbps)	3,072	6,144	8,192	8,192
Upload Speed (Kbps)	512	640	768	640
Price (USD)/month	10	14	19	50

TABLE 6. Price of different internet service packages of Viettel (adapted from Viettel, 2012)

	Home N+	Home E+	Office C	Net C
Download Speed (Kbps)	3,072	4,096	4,608	5,120
Upload Speed (Kbps)	512	512	640	640
Price (USD)/month	11.5	15	27.5	35

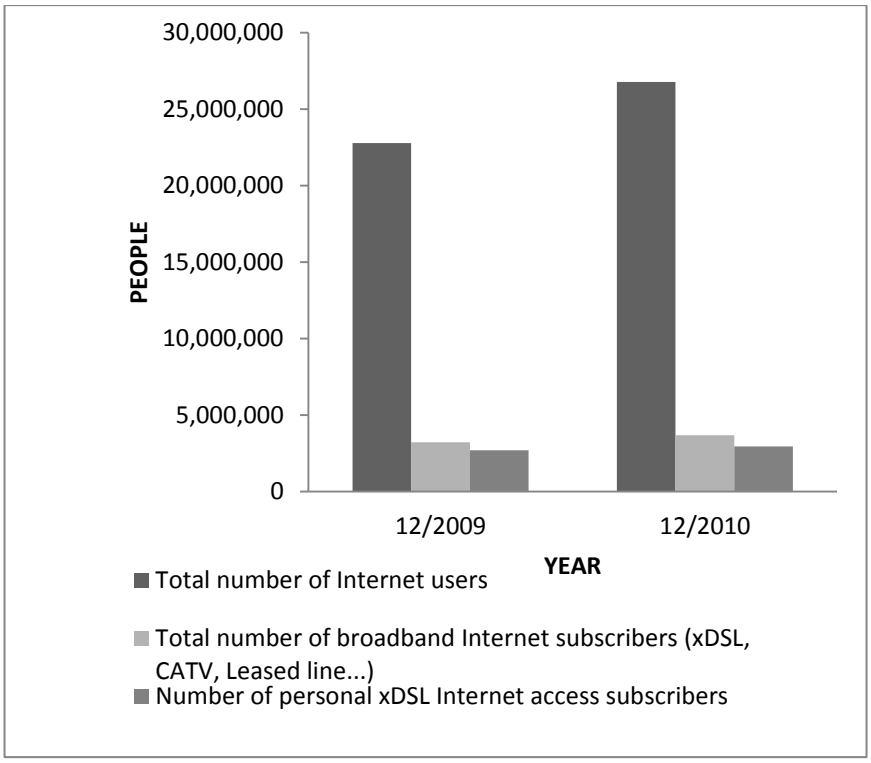
Computers for rent with internet connections are very popular in almost all Vietnamese towns and still expanding in number. The fee for this kind of service is extremely low, just about 0.25 US dollar per hour. Some service centers also serve drinks and fast food to improve customers' convenience and duration of use. This kind of service brings major Vietnamese people opportunities to approach information and information technology without paying too much for a computer or internet line. Thus, it has been gaining an amazingly increasing number of users, especially the youth. However, as the income of families in urban areas is increasing continuously, the number of households owning computers and internet connections is also increasing. This fact leads to the decrease in number of providers of "computers for rent" service, which can be seen very clearly in major cities. Though, the service is still highly necessary in poorer regions, where it is still well expanding.

On the other hand, it is widely believed that "computer for rent" is causing alarming side effects to the society because actually, this service is mostly used for gaming or chit-chatting. In addition, as mentioned above, most of its users are young people,

including school boys and girls, who have not been able to fully control their behaviors. Recorded confessions of some teenagers who committed crime confirmed that their acts were consequences of online gaming and virtual society. In 2010, with the new policy of limiting the opening time of the service up to 11p.m., it is expected that its negative effects on the youth would be reduced.

Beside “computer for rent”, students and other people can also use computer and internet in school and city libraries for free. However, the number of computers there is still limited. In the field of hospitality, free wireless internet access is provided in most of hotels and cafeteria. All these factors lead to the impressive rise in the number of internet users; this number is extremely meaningful when compared to the number of internet subscribers that will be shown in the Graphs 18, 19 below.

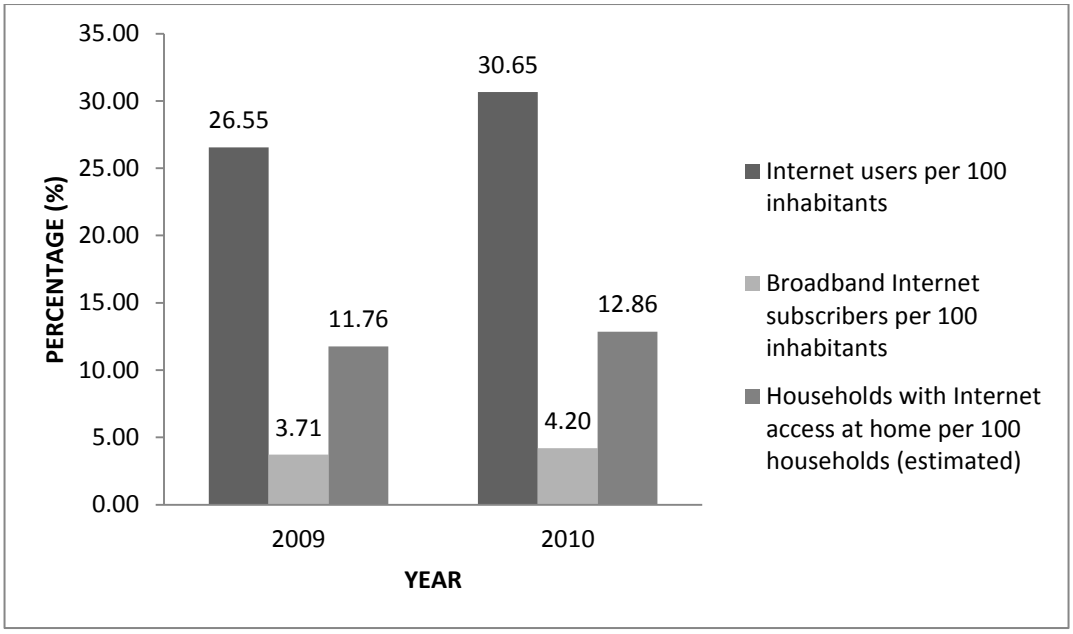
Graph 18 shows changes in the number of internet users, broadband internet subscribers as well as personal xDSL Internet access subscribers in 2009 and 2010. As a whole, the total number of users or subscribers in these three fields increased and especially the total number of internet users reached a very high number at about 26 million while there was only nearly 3 million in the number of personal internet subscribers in 2010. As we mentioned above, the “computers for rent with internet connections” service has been becoming a very popular service for people who would like to use computers or internet connections with low cost renting by hours. Therefore, a lot of people are able to use computers, especially internet services without having their own stuff. This led to the strong rise of internet users and it increased almost 4 million in one year while the number of subscribers increased just slightly.



GRAPH 18. Number of Internet users, broadband internet subscribers and personal xDSL Internet access subscribers (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 35)

Graph 19 displays the ratio of internet users and broadband internet subscribers per 100 inhabitants, and the percentage of households having internet access per 100 households. As we explained in Graph 18, the rate of internet users per 100 inhabitants was also much higher than the rate of internet subscribers. To be more exact, there were just 4.20% of 100 people who are internet subscribers and only 12.86% of 100 households had internet connections, but the percentage of people who are able to use internet per 100 inhabitants was up to 30.65% in 2010. This shows very clearly that people can still use computers and internet connections by the renting service although they do not have their own computers or they are having computers but cannot afford to have an internet connections. However, compared to

the average of EU-27 which was 69% in 2010, Vietnam's rate was just about a half of Eu-27's (Eurostat 2011).



GRAPH 19. Number of Internet users per 100 inhabitants, broadband Internet subscribers per 100 inhabitants and household with Internet access per 100 households (adapted from Ministry of Information and Communication of the Socialist Republic of Vietnam 2011, 35)

Vietnam is considered one of the countries having the strictest censorship. This can be approved by the fact that many websites, mostly politically related, are blocked by the government due to inappropriate content. Moreover, one of the most popular social networks nowadays, which is also intercepted, is Facebook. Despite of this interception, people still have several ways to access Facebook and it is still the most favorite social site of everyone in the society. Until now, the reason for blocking this kind of social site is still privatebecause the way of blocking this site is totally different on the way applied on other websites, and each ISP uses different method to block it. Sometimes, this interception is canceled totally by some ISPs and it is free to access.

Furthermore, all of the publications must be approved by the government before publishing. This has led to a high limitation in the field of freedom of expression, but this limitation currently seems to be loosened.

In summary, the number of internet users and subscribers in Vietnam in increasing, and especially the rise of internet users is very strong. In fact, there are a lot of people and households not being able to afford computers or internet connections, but the number of people who can use internet is reaching a very high rate. The reason for this is the existence and popularity of the services for renting computers with internet connections. Nowadays, these kinds of services are quite hard to find in major cities because more and more people are capable of purchasing for their own personal computers and internet connections. This number of computer and internet owners is expected to be higher not only in those major cities but also in other cities in the whole country.

3.3.2 Television: availabilities, price and censorship

It is extremely easy for anyone with a monitor to get free analog TV signals in Vietnam. Although the quality of received signals might be poor because of several reasons, this is the main way used by most Vietnamese families. Currently, Vietnam has developed a TV station system in the whole country with at least one in each province, which is responsible for transmitting signals from the national television center and broadcasting for its own channels. Additionally, signal towers at some local post offices can also be used for television signal transmitting. The number of pay television subscribers has also been rising remarkably in recent years. Beside the improvement of household's income, pay television usage is supported by low prices for both setting up and subscription. Tables 7, 8 below display the fee for services provided by two of the largest pay television providers in Vietnam. They are

VCTV and VTC, who provide cable television and digital television services respectively.

TABLE 7. Price of cable television service package of VCTV (adapted from VCTV, 2012)

	1 TV	2 TVs	3 TVs
Setup Cost (USD)	14.5	20	23.85
Monthly Fee (USD/month)	4.4	5.65	6.9

TABLE 8. Price of digital television service package of VTC (adapted from VTC, 2012)

	6 months	12 months
Setup Cost (USD)	95.5	95.5
Package Fee (USD)	20	36

As a part of communication medium, all television programs producing in Vietnam must be approved by the government before operating or publishing. Additionally, some programs from some foreign channels are also not allowed to be broadcast due to inappropriate content to Vietnam's culture and society.

In short, the television service in Vietnam is very easy to access if people have the monitor. It can be reached freely in general or by paying with a reasonable fee for

more channels and extra service. Nowadays, television services are becoming a very popular communication means which people can get up-to-date information as well as entertaining through variety of programs and channels.

3.3.3 Telephone: availabilities, price and censorship

Arrived to the country over one hundred years ago, fixed telephone has become a very popular communicating method in recent years. Fixed telephone services provided for households, firms and other users may use either cable or wireless technology. Every post office in the entire country has been serving public telephone service with low price, so that even poor people who cannot purchase for a telephone line can get advantages from technology development. Beside phone service in post offices, public fixed telephone network in which users have to buy cards to get access used to be quite popular in Vietnamese cities. However, since the service fee of mobile communication started to fall continuously a few years ago, this kind of public phone service has lost almost all users due to its uncompetitiveness in both price and convenience. Nowadays the service is said to be used mostly by foreign travelers and many service points are inoperative after a long time without use, while the rest are being planned to be removed or reorganized.

In fact, the uprising of mobile communication brought down not only public card phone service but also the whole number of fixed telephone lines, as it was mentioned before. This incredible development lay on very low cost of both service fee and SIM card. Compared to postpaid services, unlike European and many other countries in the world, prepaid services are more favored by mobile phone users in Vietnam. One of the reasons for this unusual trend is that the loading balance of a new SIM card can be much higher than the price of a SIM card itself, which is just about 4 USD. Another reason is very active promotion programs from service providers, which may offer 100% of each reloading. The following tables show

examples of fixed and mobile telephone service price of VNPT Group and its child Vinaphone:

TABLE 9. Price of fixed telephone service of VNPT (adapted from VNPT, 2012)

	Price (USD)
Subscription Fee	$ 1/month
Fixed-To-Fixed (Inside the region)	$ 0.01/min
Fixed-To-Fixed (Outside the region)	$ 0.04/min
Fixed-To-Mobile	$ 0.07/min

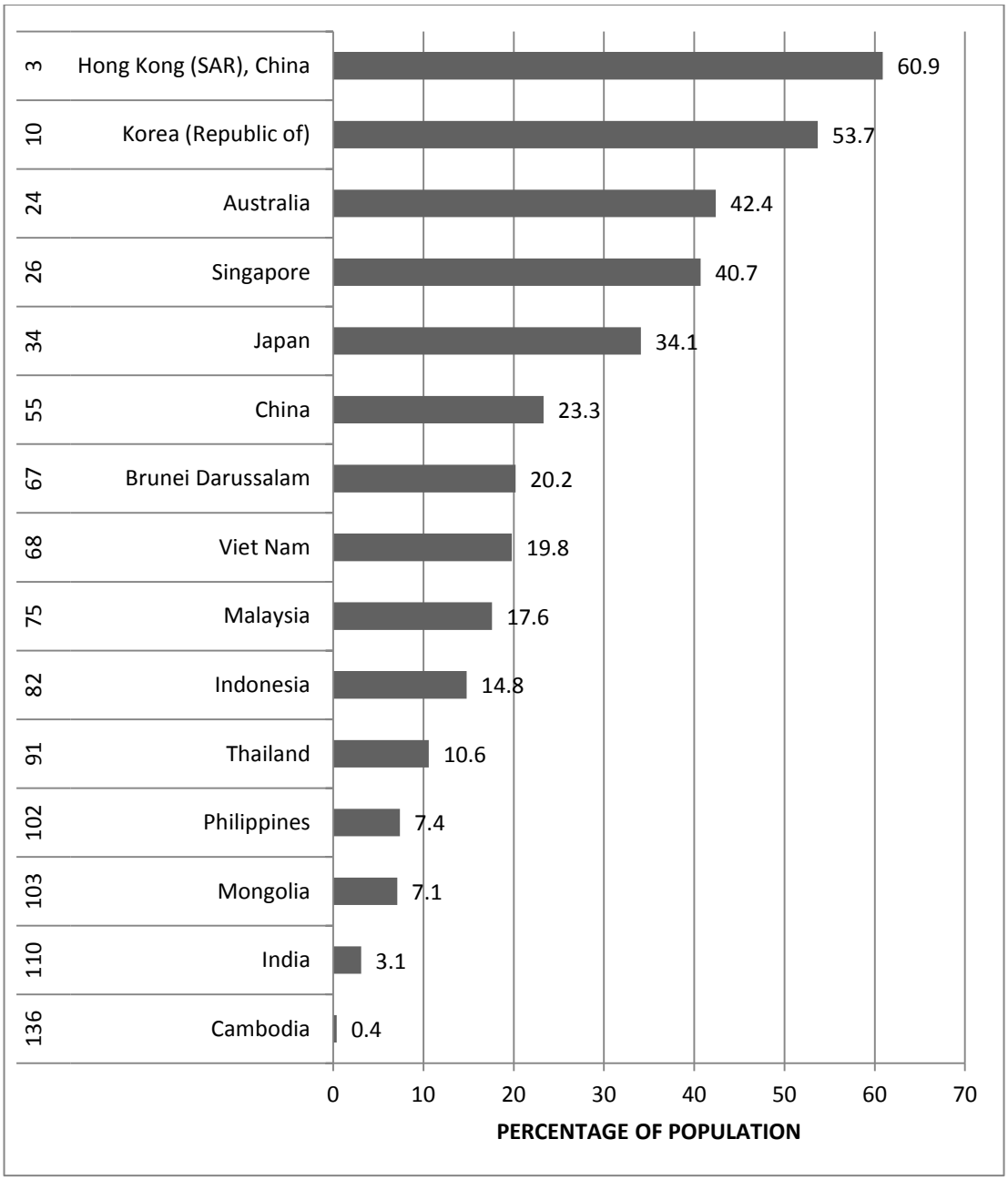
TABLE 10. Price of mobile phone service of Vinaphone (adapted from Vinaphone, 2012)

	Price (USD)
PRE-PAID	
Phone Calls	$ 0.069/min
SMS	$ 0.0175/SMS
POST-PAID	
Setup Fee	$ 2.45
Subscription Fee	$ 2.45/month
Phone Calls	$ 0.049/min
SMS	$ 0.0175/SMS

To conclude, telephone service in Vietnam is very popular on both fixed and mobile telephone. Especially mobile phone service is rising very strongly due to the increase in its subscribers year by year. It can be said that almost everyone is able to use telephone services although they have or even do not have their own phones because public telephone services can be found everywhere, especially in every post office with cheap service price. In addition, phone calls' charges are not too expensive for both fixed telephone and mobile phone. Compared to Finland, the price of fixed telephone call in Vietnam is cheaper than Finland, about 4.5 times in local call and about 3.5 times in international call (Eurostat 2011).. In addition, by using pre-paid service of mobile phone, users frequently get promotions from providers, so that they are able to make more phone calls or SMSs. In the future, telephone service is still believed to remain as one of the most convenient way for communicating.

3.4 Comparisons among Vietnam and some Asia-Pacific countries

After presenting the current state and development of the information society in Vietnam in different fields with statistics over years, we are going to make comparisons in this sub-chapter between Vietnam and other neighboring countries in the Asia-Pacific. These comparisons aim to clarify the current developing level of Vietnam's information society among these neighbors and information is adapted from The Global Information Technology Report 2010-2011. In these comparisons below, some information is collected from different period. So, there will be an extra number in a bracket next to the name of the country in all some graphs in this chapter presenting the period the data collected from. (1) presents for 2005, (2) is for 2008 and (3) is for 2010. Firstly, we would like to show comparisons on the field of ICT access including phone line, mobile phone subscriptions, broadband internet subscribers, internet users and households with computers.

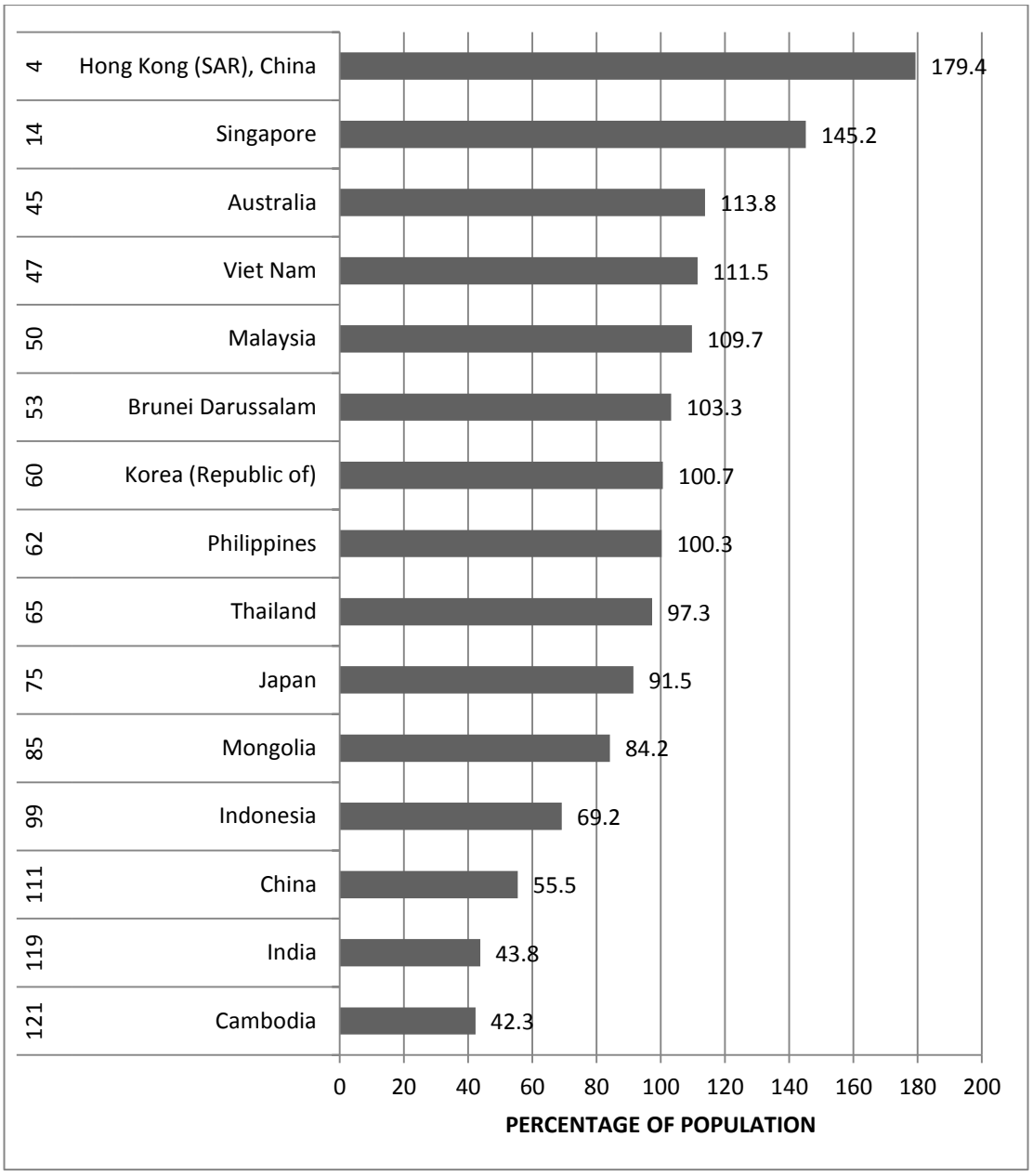


GRAPH 20. Phone lines per 100 populations among Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 332)

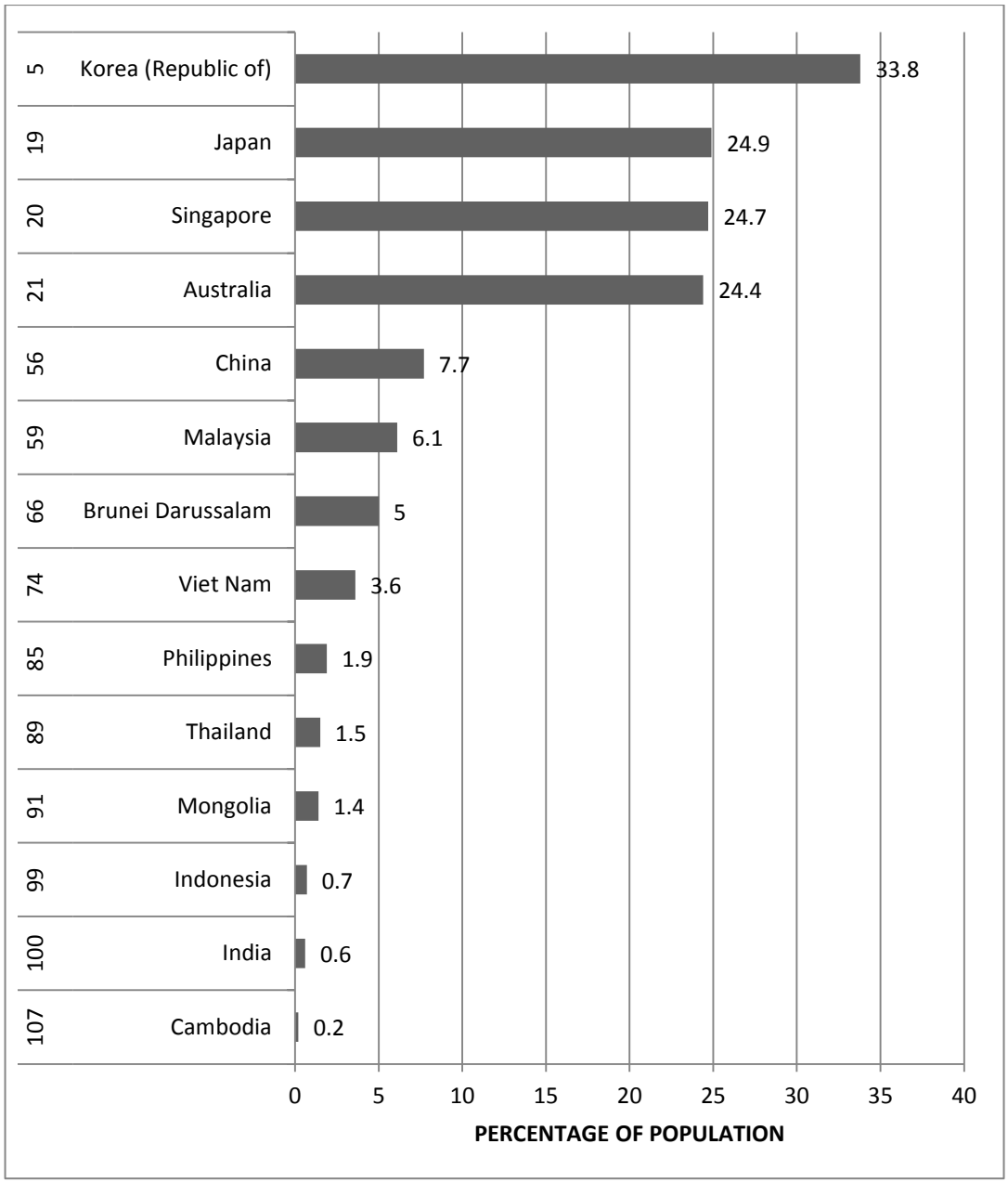
Graph 20 shows the percentage of total population having phone lines among Vietnam and other neighboring countries. As seen, Vietnam's position among countries in the region was at about the middle, the same to its global ranking, which

was the 67th over 138 countries. With 19.8%, Vietnam's percentage of telephone lines over the total population was about one third of the rate in Hong Kong, who had the best states in the Asia-Pacific and also the third state in the world in this field. Among South East Asian neighbors, although being left far behind by Singapore, Vietnam was rated higher than most of the others, including Malaysia, Indonesia, Thailand, Philippine and Cambodia, and just slightly lower than Brunei Darussalam, whose position was right above Vietnam's. Although considered one of the rising superpowers in the world, the popularity of telephone lines in India was very low and ranked the 110th worldwide, while Cambodia kept the last position in the region and also the almost last in the global list.

Graph 21 shows the number of mobile subscriptions per 100 inhabitions including post-paid and pre-paid in percentage among Asia-Pacific countries. In this field, Vietnam achieved a quite good position at the fourth place in its region after Hong Kong, Singapore and Australia. Aggressive development of mobile communications in recent years brought Vietnam to the 47th place in global ranking with the rate of 113.7 subscriptions per 100 inhabitants. This position was higher than all South East Asian countries, except for Singapore. The two new powers in both economy and technology, China and India, were not well estimated and respectively kept the positions of the 111st and 119th in the global ranking.



GRAPH 21. Mobile phone subscriptions per 100 populations among Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 368)

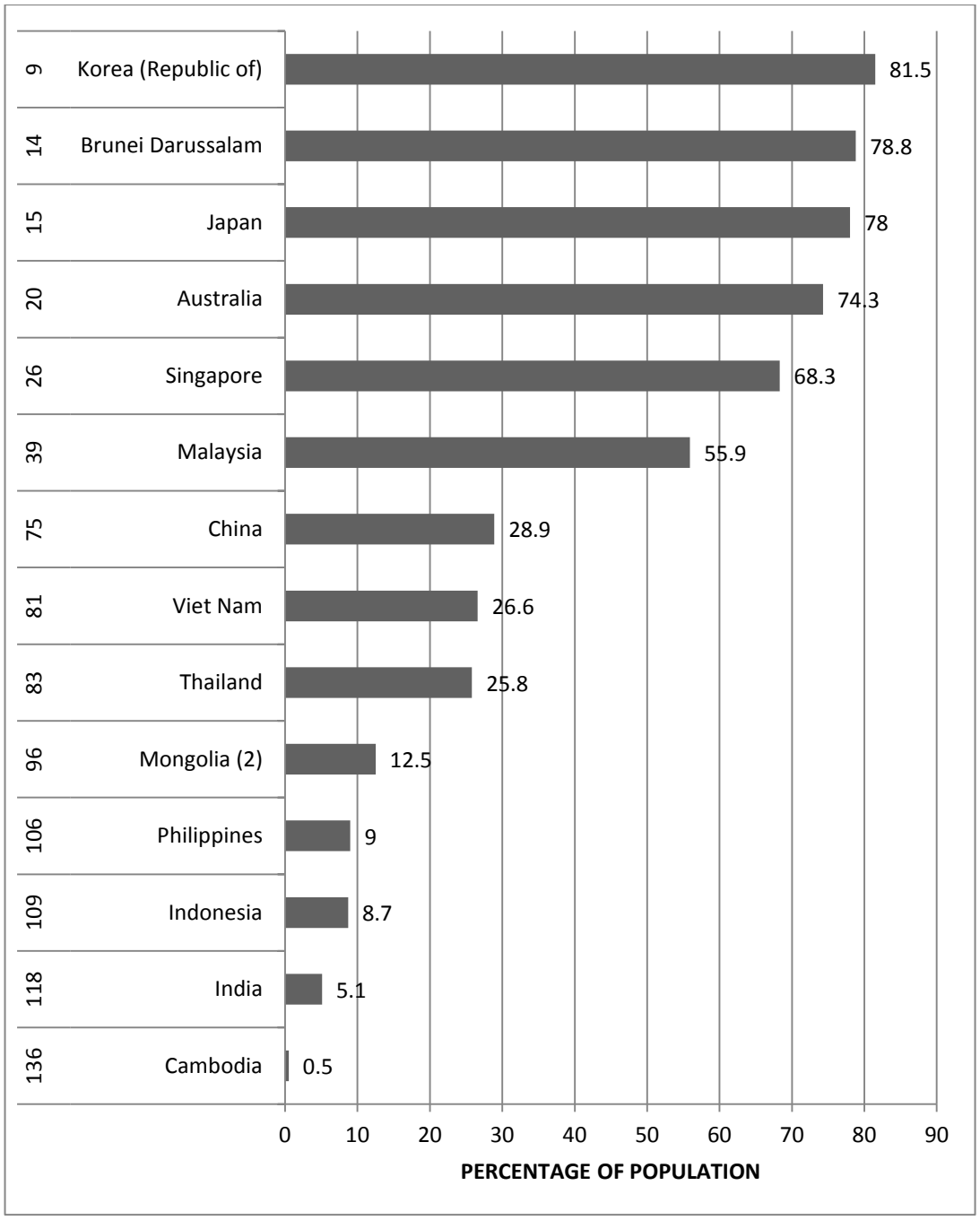


GRAPH 22. Broadband internet subscribers per 100 populations among Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 371)

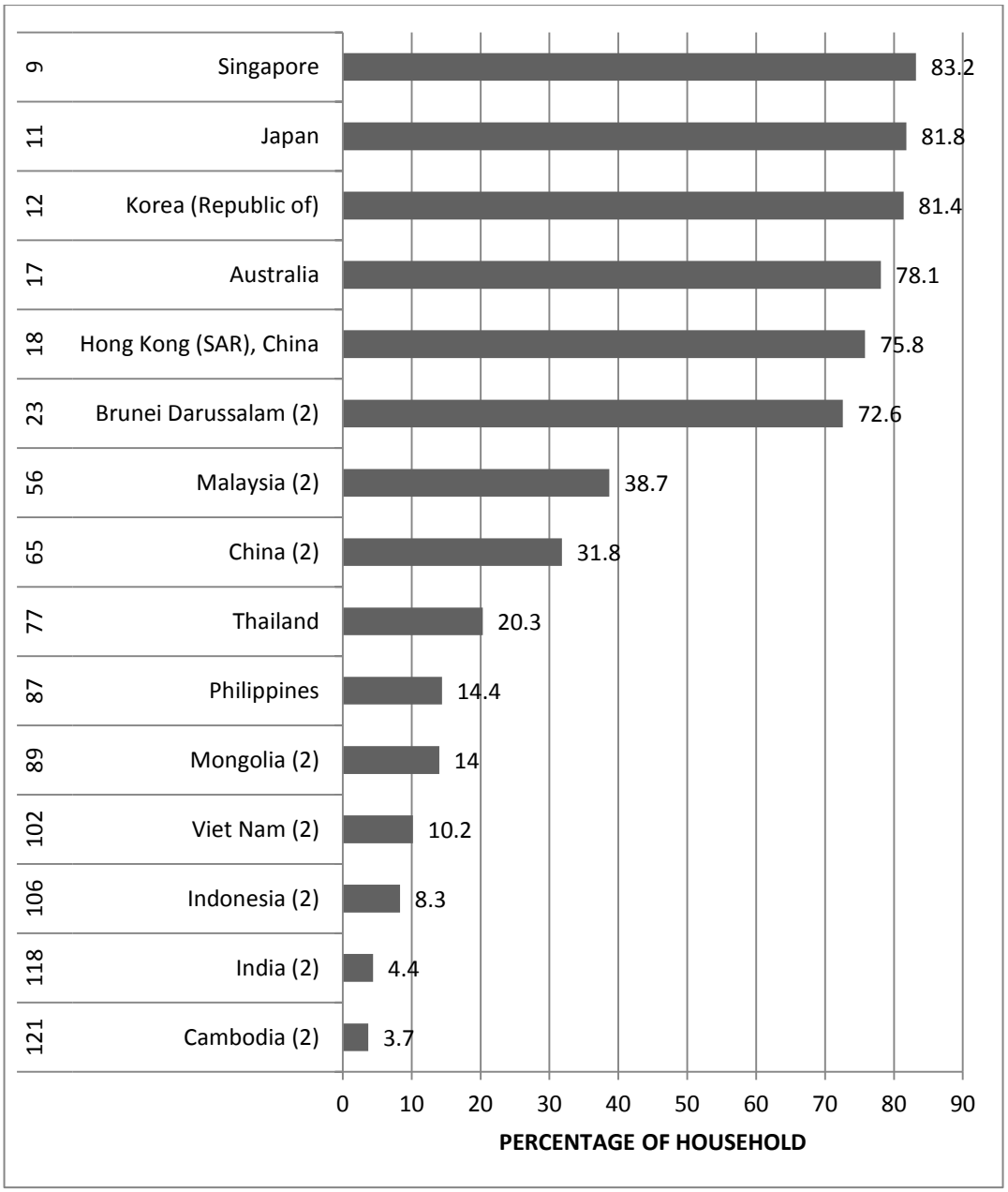
Graph 22 displays the percentage of broadband internet subscribers in total population. As it is shown, Korea reached the first place in the Asia-Pacific and the 5th position in the world with 33.8 subscribers per 100 inhabitants. Vietnam was stilled placed at the middle of both global and regional ranking, but the country's

percentage of 3.6% population was low, only about one tenth of this group's leader. The reason was from the fact that Vietnam was still among low income economies and the major part of households might be unable or find it unnecessary to purchase their own lines.

Graph 23 displays the percentage of internet users in the total population of Vietnam compared to other Asia-Pacific countries. The bar chart displays huge gaps between states in the region, especially when comparing the countries at the first and the last positions, which are respectively the Republic of Korea with 81.5%, who ranked the 9th globally and Cambodia with only 0.5%, the third from the bottom among all countries and states in the world. Countries in the region could be separated in into three groups, in which a country or state had percentage of internet users in total population at quite the same level with the others and much different from the groups beside. The first group including Korea, Brunei, Japan, Australia, Singapore and Malaysia were states with the high rates of internet users. With internet users covering 26.6% of total population, Vietnam was in the middle group, which also consisted of China and Thailand with just slight differences between these countries. The last group included Mongolia, Philippines, Indonesia, India and Cambodia, whose rates were under half of the group right above.



GRAPH 23. Internet users per 100 inhabitions among Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 372)



GRAPH 24. Percentage of households equipped with personal computers among Asia-Pacific countries (adapted from the Global Information Technology Report 2010-2011, 370)

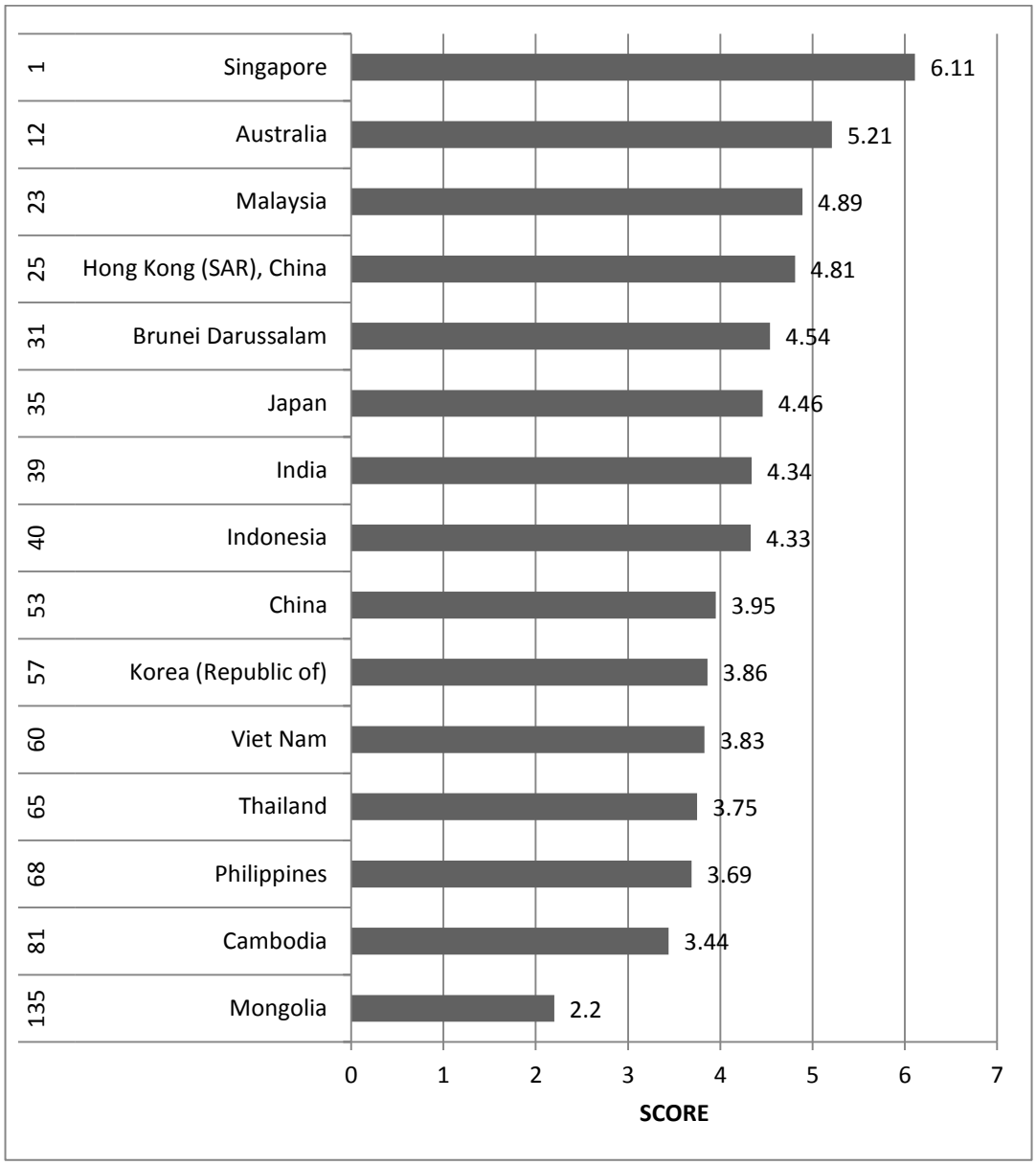
Graph 24 presents the number of household having personal computers in percentage. As seen in the chart, the number of households having person computers equipped in Vietnam is quite low. It was just around 10% of total

population and ranked 102nd over 138 countries. Comparing to other countries in the region, Vietnam was just higher than three countries including Indonesia, India and Cambodia, a little bit lower than some countries and much lower than other developing countries and states. To be more specific, the top six countries and states in this comparison were Singapore, Japan, Korea, Australia, Hong Kong and Brunei with the scores varying from 72% to 83%. Among them, Singapore was still the upper country in this field with 83.2% households having PCs. In Vietnam, although there were not so many households having their own PCs due to their own budget or condition, people can still use computers and other services, for example internet connection services at schools, libraries and computers for rent service stores. Therefore, the number of computer and internet users in Vietnam was still quite high.

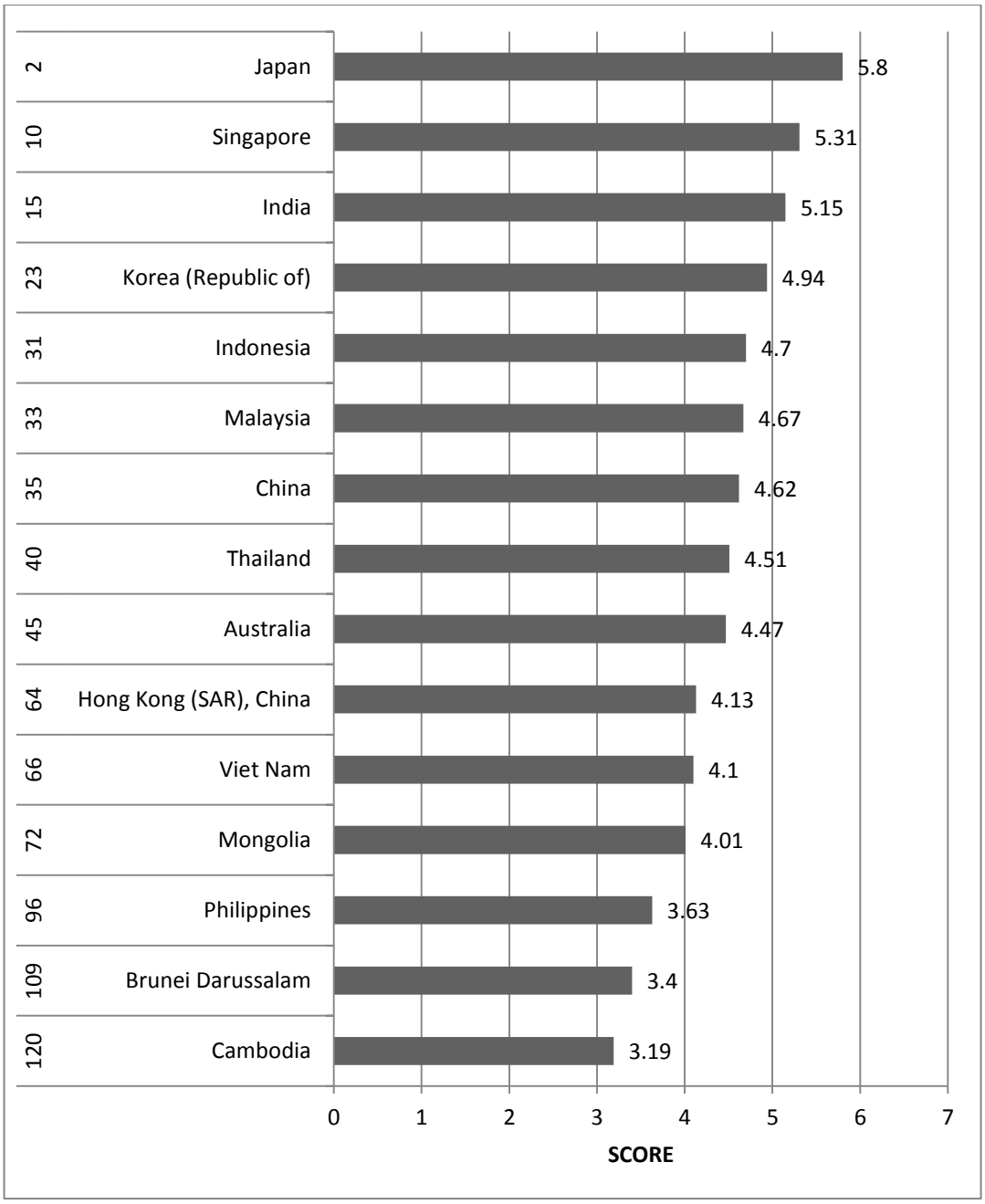
After analyzing the levels of ICT access among some Asia-Pacific countries in different fields, we are going to make some comparisons on education related to the quality of education system, the availabilities of scientists and engineers, and collaboration between universities and industries in Research and Development (RandD). Education is an important factor which directly affects the success of the development of the information society. In fact, the higher the education is, the better the society is.

Graph 25 displays points of listed countries in the field of education system quality. It describes how well the education system of a country is to meet the needs of a competitive economy. The grading scale is from 1 to 7 in which 1 is not well at all and 7 is very well. (Dutta and Mia 2011, 345.) As shown in the bar chart, Vietnam's score was not so high but not too low compared to other neighbors. The score of education quality in Vietnam was at 3.83 in the grading scale 1-7, higher than four countries in the list including Thailand, Philippines, Cambodia and Mongolia, and just slightly lower than other neighboring countries. Standing at rank 60th in the world, Vietnam was above the middle both in rank and score. This shows that the quality of education

system in Vietnam is always getting attention from the government in order to improve and build up a better education environment. Moreover, being a strong ICT developing country, Singapore was in the first place not only in other fields of ICT but also in the field of education. Mongolia was still quite low in this field with the score at 2.2 and ranked 135th/138 countries.



GRAPH 25. Quality of education system among Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 345)

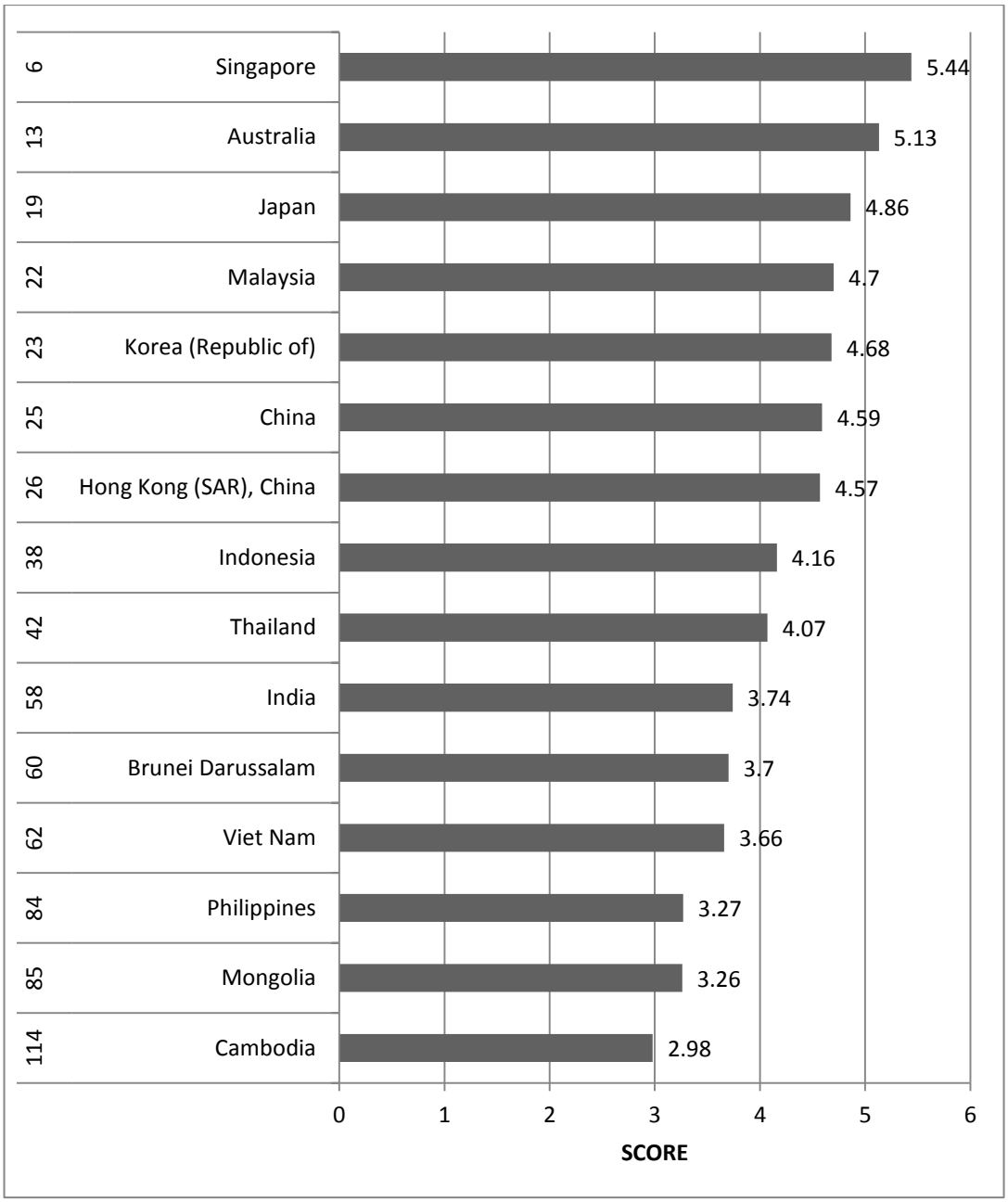


GRAPH 26. Availability of scientists and engineers among Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 339)

Graph 26 shows the availability of scientists and engineers of a country, which is evaluated from 1 to 7 as score (Dutta and Mia 2011, 339). As the quality of education is good enough and ICT is one of the most popular major objects studied in

universites, the number of enrolments on this profession is increasing rapidly. Therefore, the number of scientists and engineers in Vietnam is at a quite high level. With the score at 4.1 out of 7, Vietnam can be seen neither more nor less compared to other neighboring countries. With this over middle point, Vietnam quite confidentially took the 66th position, which was still over the middle rank in the whole world. To be more exact, other more developing countries in the region such as Hong Kong, Australia, China and Korea had the scores respectively at 4.13, 4.47, 4.62 and 4.94. In this field, Japan was the leader in this comparison and the second in the world with the score at 5.8.

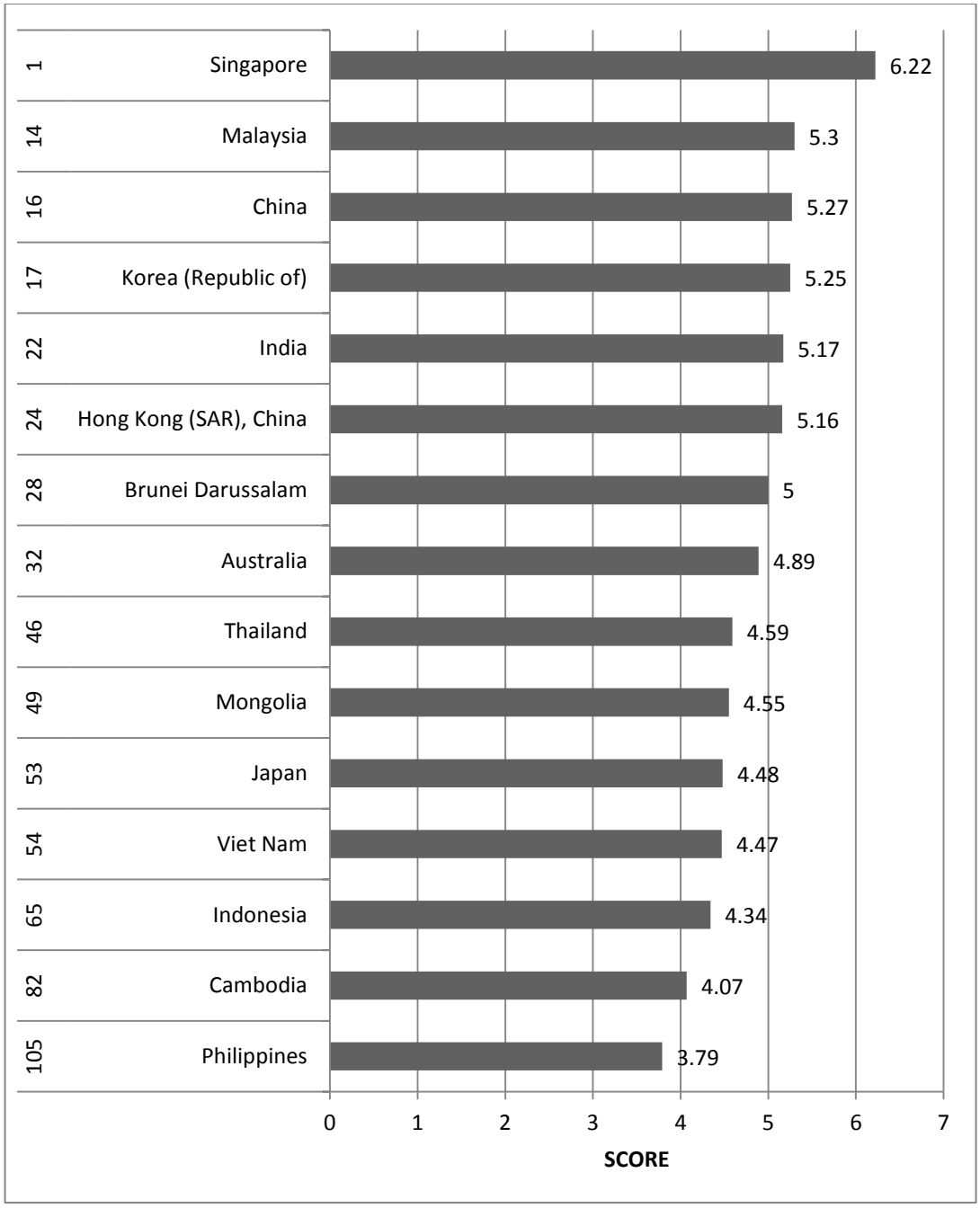
Graph 27 shows a comparison among Asia-Pacific countries in the field of collaboration in RandD between universities and industries. It describes how the collaboration between universities and business is, especially on research and development. The grading scale varies from 1-do not collaborate at all to 7-collaborate extensively. (Dutta and Mia 2011, 357). Vietnam's scores might be not so high in other fields, but Vietnam had quite good scores in the related fields of education as two above comparison. In Vietnam, collaboration between universities and industries is fairly close. There are a lot of cooperations between universities and companies, so that students are able to do their internships, practical training during or after their studies as well as full-time working after graduating. Each university has its own partners and the collaboration provides a lot of knowledge and experience to students according practical lessons and trainings. In this field, Vietnam had 3.66 out of 7 in score and took the 62nd position over 138 countries. In both score and rank, Vietnam was above the average, being higher than some neighboring countries and lower than some others but just slightly. In addition, the highest position in this comparison belonged to Singapore with the score at 5.44 and ranked 6th in the world.



GRAPH 27. Universities-industries collaboration in RandD among Asia-Pacific countries (adapted from the Global Information Technology Report 2010-2011, 357)

Although e-government was not mentioned among the statistics above, we would like to make some comparisons here because this field is quite important to evaluate the application of IT in a society. The comparisons consist of government success in ICT

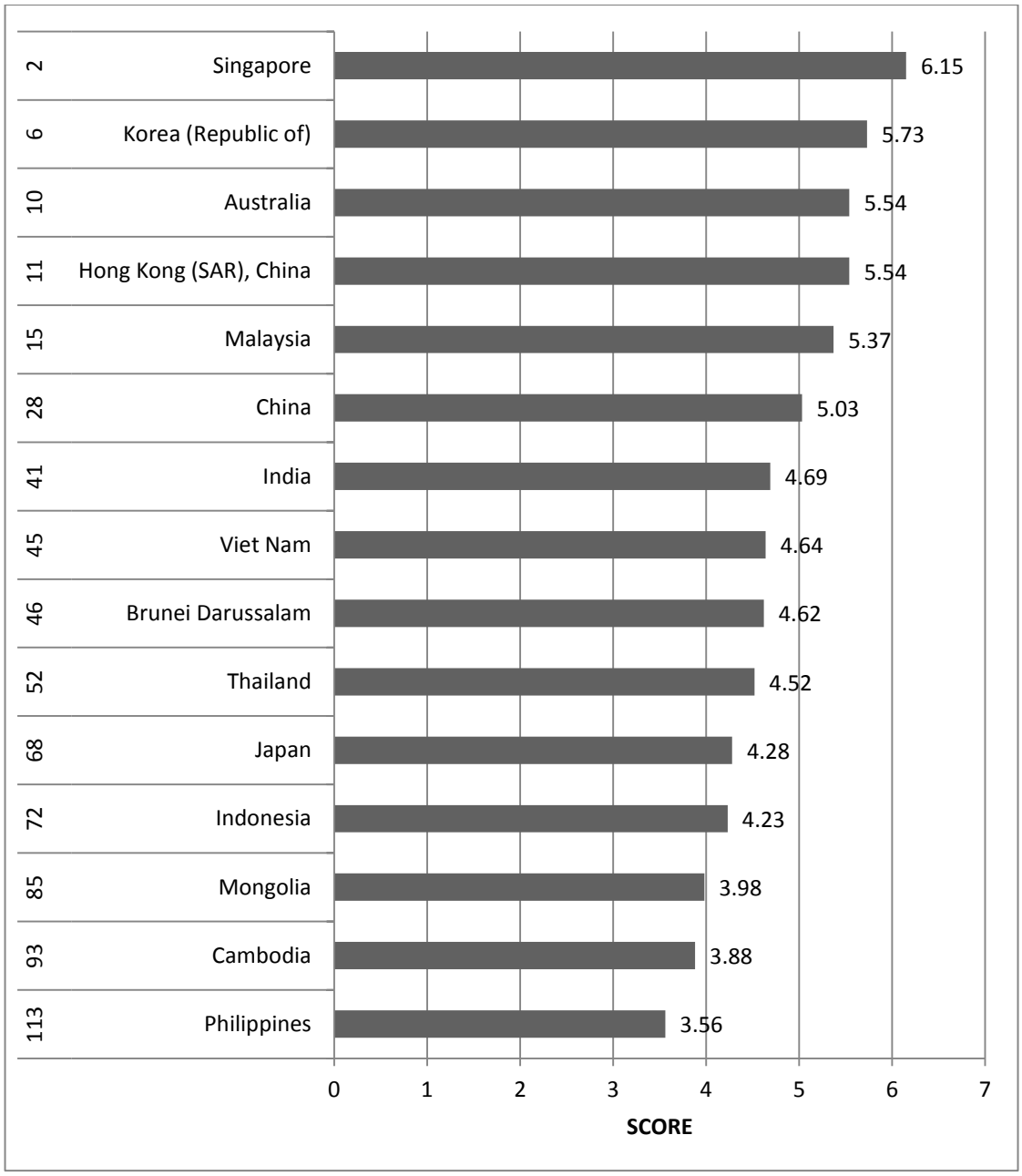
promotion, ICT use and government efficiency, government online service and E-Participation.



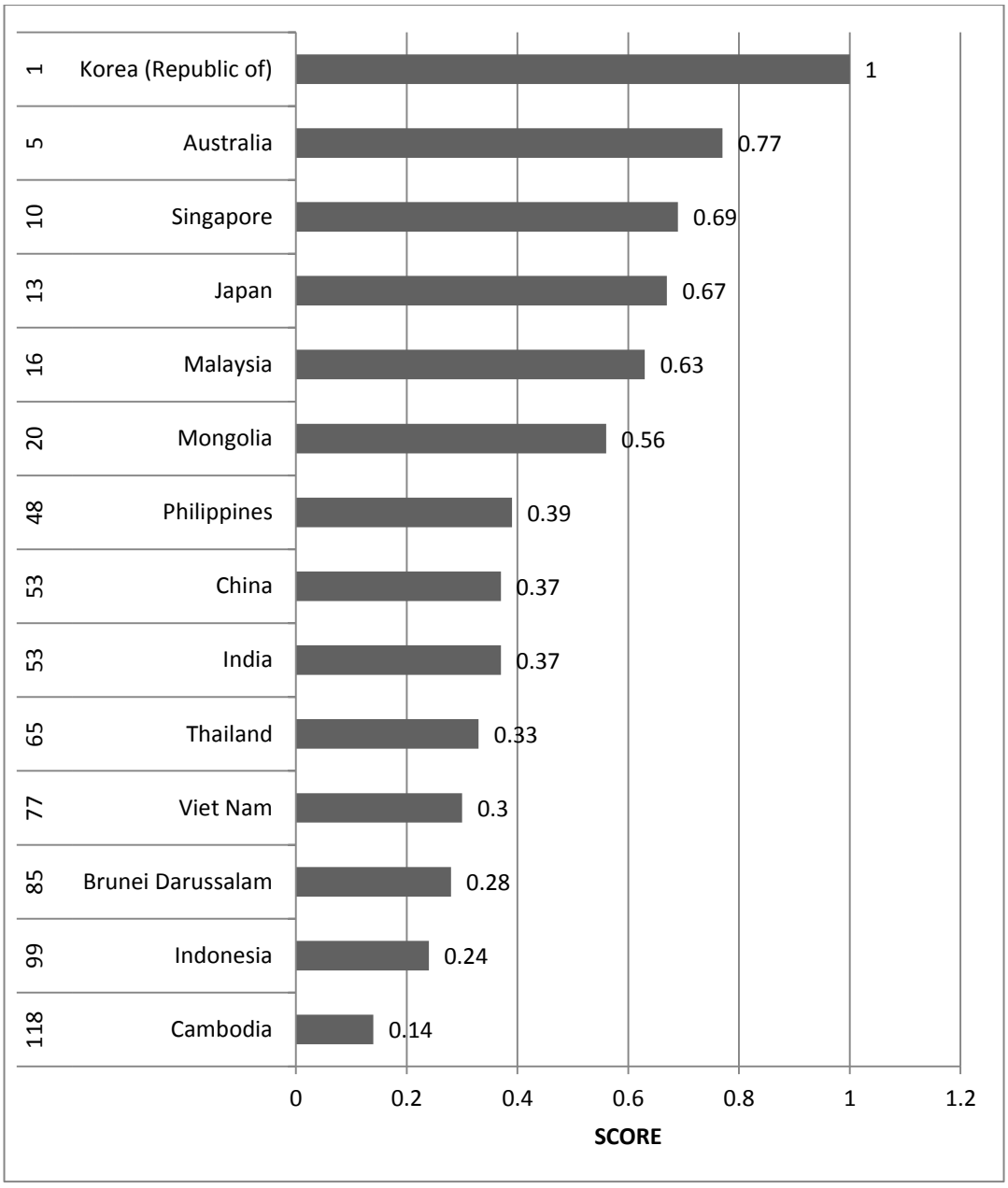
GRAPH 28. Government success on ICT promotion among Asia-Pacific countries (adapted from the Global Information Technology Report 2010-2011, 388)

Graph 28 shows a comparison among Asia-Pacific countries in the field of government success on ICT promotion. It describes successful level of the government in a country in promoting the use of information and communication technology. The grading scale is also from 1 to 7 meaning not successful at all to extremely successful. (Dutta and Mia 2011, 388). In this field, Vietnam was quite well rated at the 54th position over 138 countries and states in the world with 4.47 points. This rank could be considered a reflection of Vietnamese government's efforts in recent years to increase IT usage in the society and in the government itself. However other neighbors even had higher ranking, especially Singapore, who kept the first position worldwide, so the nation's position in the region was only better than three countries Indonesia, Cambodia and Philippines. This fact means that Vietnam's government should work more effectively to improve the country's competitive capacity.

Graph 29 presents a comparison among Asia-Pacific countries in the field of ICT use and the government efficiency on it. It describes how efficient the use of information and communication on government service of a country is. It is evaluated as 1 for no effect and 7 for has generated considerable improvement as max. (Dutta and Mia 2011, 389). In this field, Vietnam's score was fairly high and it was noticeable compared to other fields. With the score at 4.64 out of 7, Vietnam ranked 45th in the world which is in the top one third of total countries. Additionally, this score was also higher than other neighboring countries including more developing nations such as Japan and Thailand. However, Vietnam's rank was still lower than some neighbors, for instances China, Malaysia, and Korea. The first place in this comparison also belonged to Singapore with the score at 6.15 and ranked the second in the world.



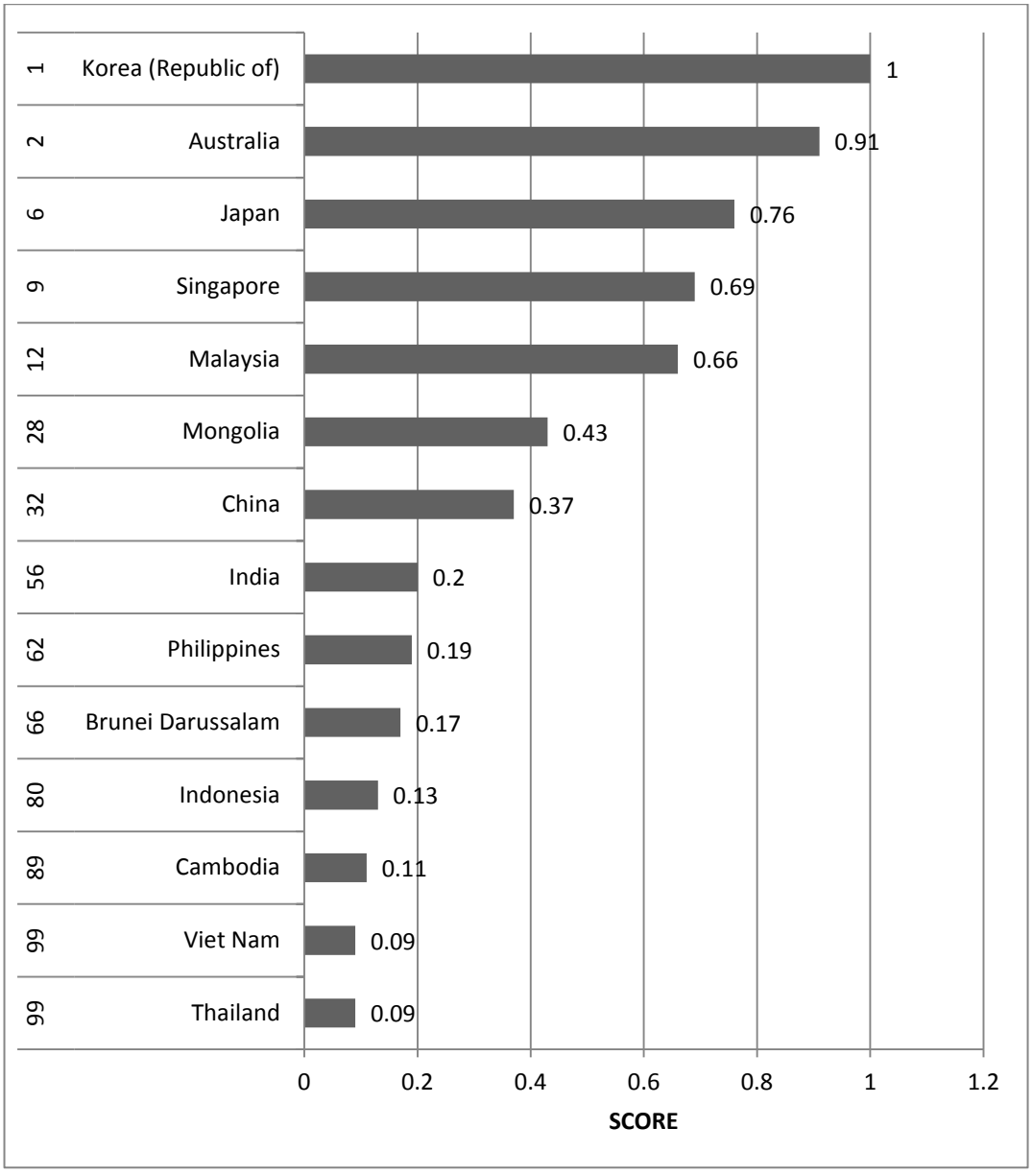
GRAPH 29. ICT use and government efficiency among Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 389)



GRAPH 30. Government Online Service score among the Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 390)

Graph 30 displays the comparison in government online services, which is scored from 0 to 1. As seen, Korea was still leading the region as well as the whole world with an absolute score. Vietnam's regional position was not high in this field, just the fourth from the bottom with 0.3 points, and higher than Brunei, Indonesia and

Cambodia. However, the country's rank compared to the world was still about the middle, the 77th/138 countries. It is considered that Vietnam's government should pay more attention to improve this field.



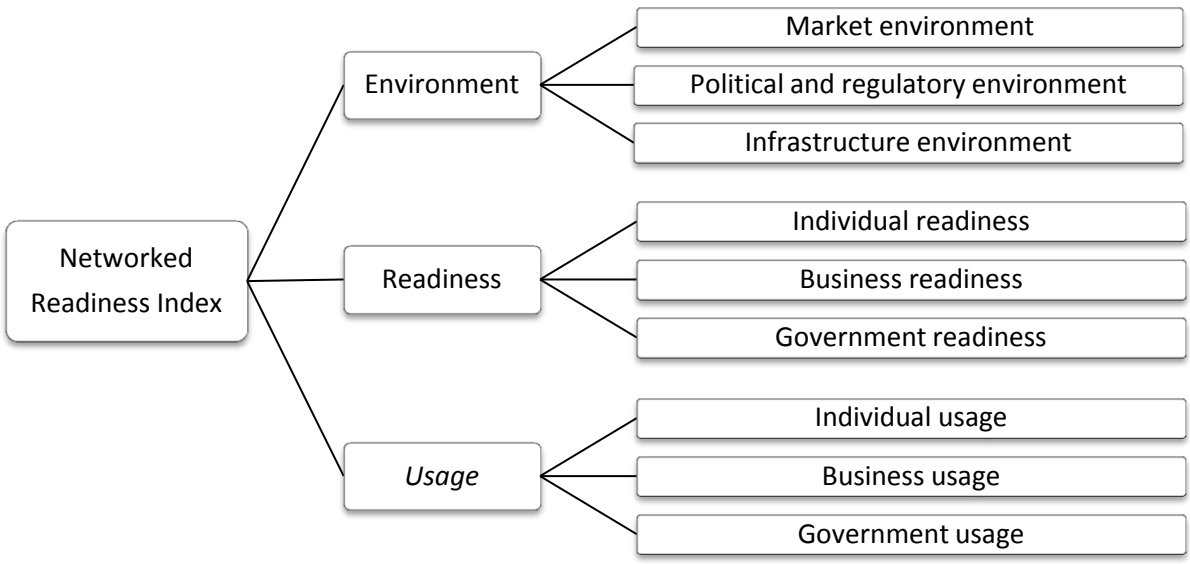
GRAPH 31. Online Participation Indexes among the Asia-Pacific countries (adapted from The Global Information Technology Report 2010-2011, 391)

Graph 31 shows different levels of development between countries in the Pacific-Asia region in the field of online participation. It assesses the quality, relevance, usefulness, and willingness of government websites in providing online information and services to citizens. It is evaluated 0 as minimum and 1 as highest score. (Dutta and Mia 2011, 391). Korea was still the best in the world with the score of 1/1. This field is one of the weak points of Vietnam's information society, whose rank was at a disappointing position. With the same score of only 0.09, Vietnam and Thailand were at the lowest position in the list and the 99th over 138 countries in the world. As a part of e-government, this field would have to improve a lot.

In short, chapter 3 presents an overview of the current state of the information society of Vietnam through statistics of infrastructure and accessibilities of internet connections, telephones, televisions and computers. Moreover, it also presented the scope of the education system related to ICT in Vietnam in order to show how it is for Vietnamese people are able to get closed with information society. Moreover, the comparisons among Vietnam and other Asia Pacific countries were made in specific fields. It can be seen that the information society of Vietnam is developing quite well with a good level of infrastructure and education system compared to other neighbors.

4 STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS OF THE INFORMATION SOCIETY OF VIETNAM (S.W.O.T.)

In this chapter, we are going to present strengths, weaknesses, opportunities and threats of the Information Society in Vietnam. According to the Global Information Technology Report 2010-2011 from the World Economic Forum and INSEAD, we are going to take top 10 factors having the highest ranks to be the strengths and 10 factors having the lowest ranks to be the weaknesses. In addition, we also would like to make comparisons among Vietnam, some Southeast Asian countries and China on these fields to clarify Vietnam's position as well as general situation of these countries.



GRAPH 32. The networked readiness framework (adapted from The Global Information Technology Report 2010-2011, 7)

Information shown in Graph 32 is the classification of factors used in the World Economy's report of global network readiness. The strengths and weaknesses of

Vietnam's information society which are going to be described below are all from the ranking of these factors.

4.1 Strengths

The ten best points of Vietnam's ICT are listed in Table 11 below:

TABLE 11. Strengths of ICT in Vietnam (adapted from The Global Information Technology Report 2010-2011, 297)

	Strengths	**Parent field**	**Point**	**Rank/ 138**
1	**Internet and telephone competition**	Political and regulatory environment	6/6	1
2	**Business monthly phone subscription (PPP $)**	Business Readiness	5.5	11
3	**Number of days to enforce a contract**	Political and regulatory environment	295	13
4	**State of cluster development**	Market environment	4.9/7	13
5	**Government procurement of advanced technology**	Government Readiness	4.4/7	17
6	**Government prioritization of ICT**	Government Readiness	5.5/7	18
7	**Residential monthly phone subscription (PPP $)**	Individual Readiness	4.4	24

(Continues)

TABLE 11. (Continues)

8	**Importance of ICT to government vision**	Government Readiness	4.7/7	26
9	**Company spending on RandD**	Business Readiness	3.6/7	33
10	**Fixed phone tariffs (PPP $)**	Individual Readiness	0.06	35

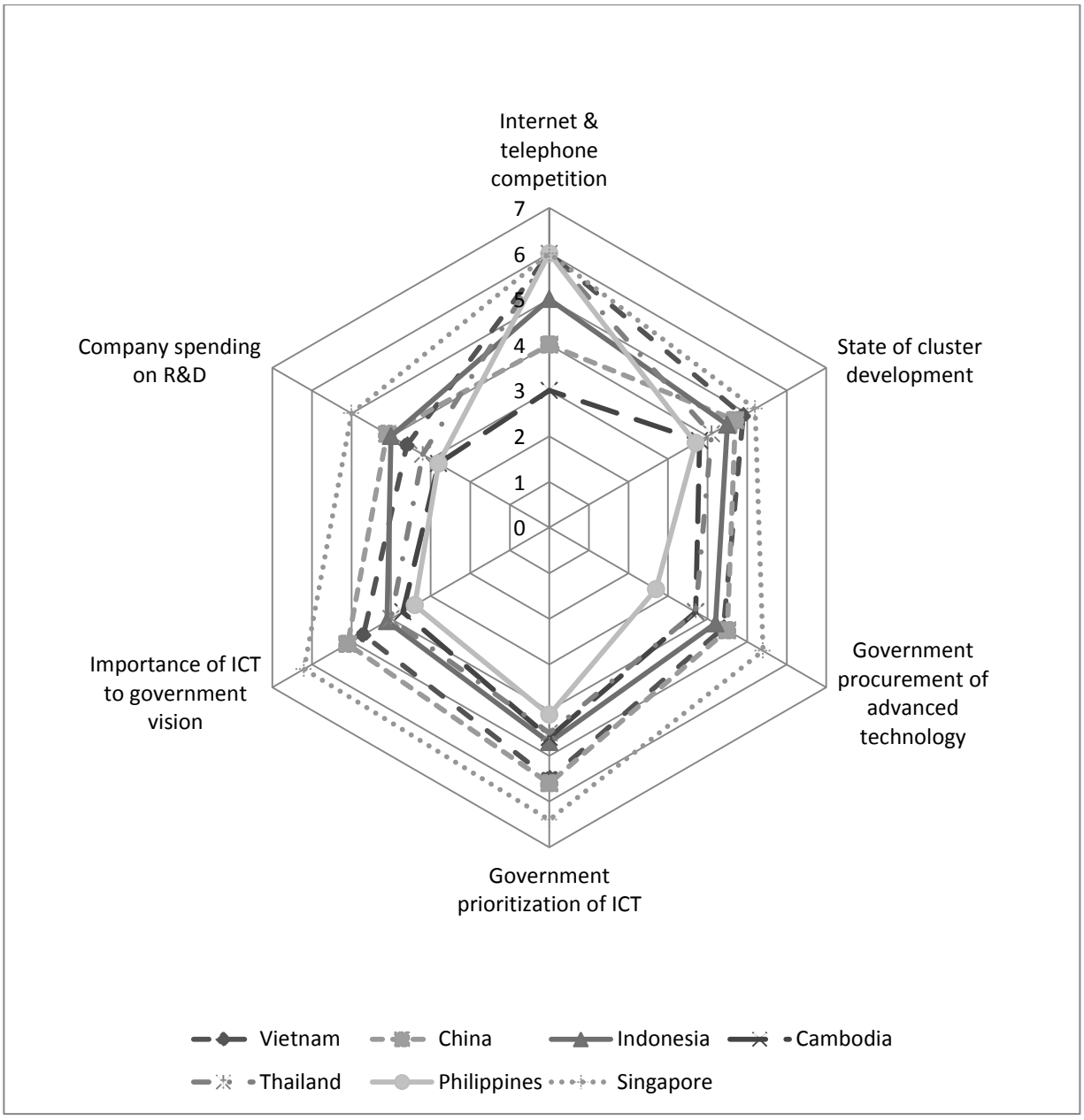
As shown in Table 11, top 10 strong points of Vietnam's ICT are the following:

- Internet and telephone competition: describes level of competition index in Internet services, international long distance services, and mobile telephone services on a scale from 0 to 6 (Dutta and Mia 2011, 330).
- Business monthly phone subscription
- Number of days to enforce a contract: means "Number of days to resolve a dispute, counted from the moment the plaintiff decides to file the lawsuit in court until payment (Dutta and Mia 2011, 329)."
- State of cluster development: is understood as how prevalent a well-developed and deep cluster is built in the economy of a country. The grading scale varies from 1 to 7 where 1 means nonexistence and 7 stands for widespread in many fields (Dutta and Mia 2011, 311).
- Government procurement of advanced technology: defines how well the government procurement decisions encourage the innovation of technology in a country, which is graded as 1 for not at all and 7 for extremely effectively (Dutta and Mia 2011, 365).
- Government prioritization of ICT: shows how much ICT in a country is prioritized by the government which varies from 1 to 7 in score (Dutta and Mia 2011, 364).
- Residential monthly phone subscription
- Importance of ICT to government vision: means how well government's strategies and plans affect the development of ICT of a country in order to improve its overall competiveness, 1 for no plan and 7 for clear plan (Dutta and Mia 2011, 366).

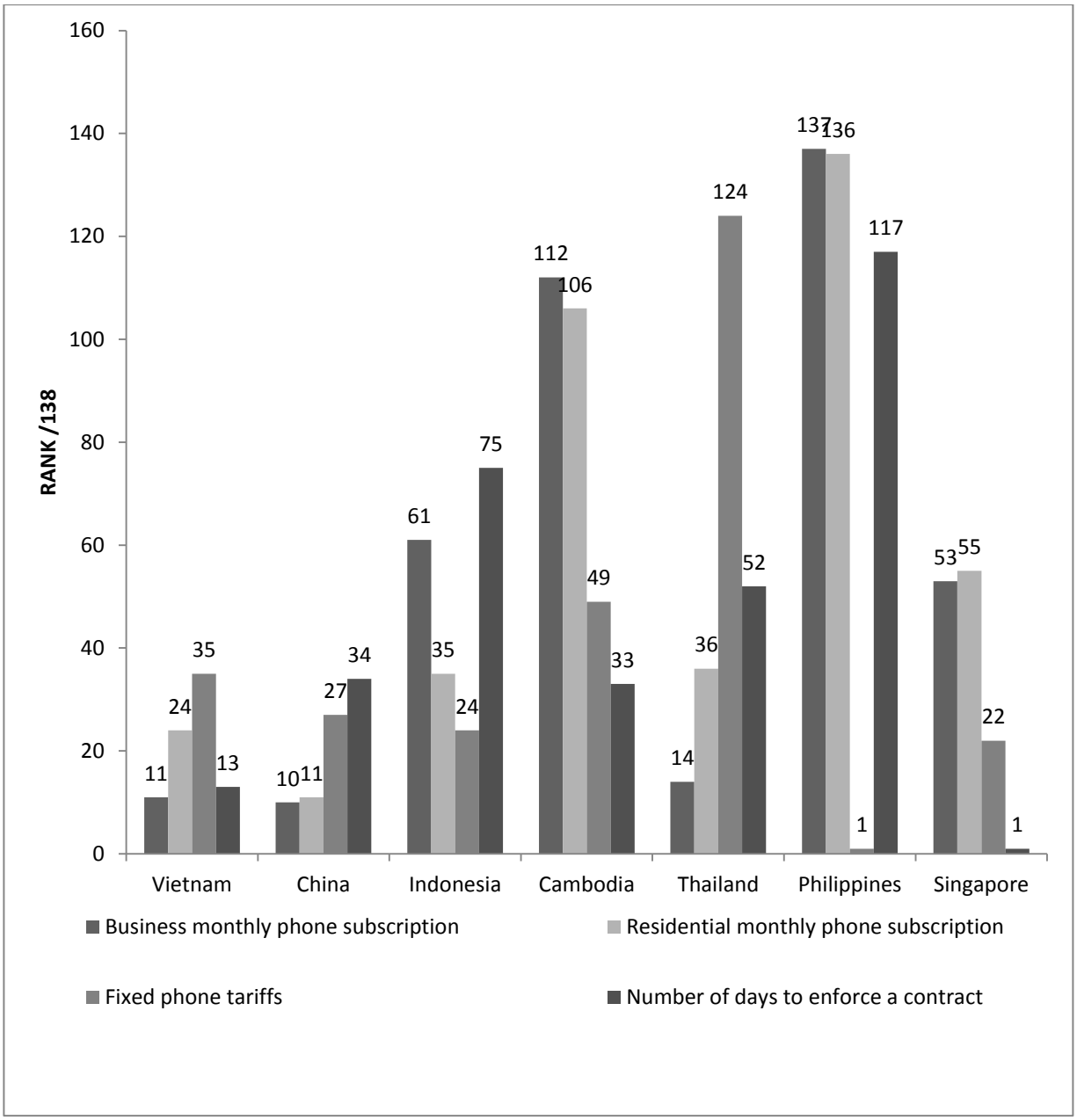
- Company spending on RandD: is explained as how much a country spend on research and development
- Fixed phone tariffs: is service price for a 3-min local call in peak hours (Dutta and Mia 2011, 349).

In general, Vietnam's strengths in ICT mostly come from the field of telecommunications, including telephone and internet, and from both providers and subscribers. Although the degree of application of IT in the government itself is still low, the role that government is playing is very important to the ICT development with its priorities for this field.

Graph 33 displays Vietnam's scores in its strongest fields compared to China and some other neighbors in the Southeast Asia. The scores were given with the grade scale from 0 to 7, except for Internet and telephony competition, which was marked from 0 to 6. In general, Singapore was the best country in the list, leaving all others far behind in most fields. The only field Vietnam and two other countries including Philippines and Thailand could match Singapore's development was internet and telephony competition, in which all of these countries gained the maximum score for high level of competition in their markets. In the other best fields of Vietnam, the country's scores were only after Singapore China's and even passed China in state of cluster development.



GRAPH 33. Vietnam's strong points in comparison with some neighboring countries (adapted from The Global Information Technology Report 2010-2011)



GRAPH 34. Vietnam's ranks in some strengths compared to some neighboring countries' (adapted from The Global Information Technology Report 2010-2011)

Graph 34 shows a comparison among Vietnam and other neighboring countries in specific points of the strengths including business monthly phone subscription, residential monthly phone subscription, fixed phone tariffs and number of days to enforce a contract. This comparison was especially done based on these fields' ranks

because the grading scales in each field are not similar to each other. It means that each column stands for the rank of a country in a comparison of total 138 countries in a specific field. Therefore, low display columns stand for better evaluation. As a whole, Vietnam was better than most of the other countries in these fields. To be more specific, Vietnam's rank was slightly lower than China's in most factors, except for number of dates to enforce a contract. Although considered one of most developed countries in the world in both economy and technology, Singapore did not have a very high rank in the field of telephone subscriptions because of its high service cost. However, the highest subscription fees belonged to Philippine and then Cambodia, with both countries' fees were several times higher than Vietnam's.

4.2 Weaknesses

The ten negative points which affect Vietnam's ICT are listed in the table below:

TABLE 12. Weaknesses of ICT in Vietnam (adapted from The Global Information Technology Report 2010-2011, 297)

	Strengths	**Parent field**	**Point**	**Rank/ 138**
1	**Burden of government regulation**	Market environment	2.6/7	119
2	**Number of days to start a business**	Market environment	44	117
3	**Mobile network coverage, % population covered**	Infrastructure environment	70%	115
4	**Tertiary education enrollment rate, %**	Infrastructure environment	0.7%	109
5	**Cellular subscriptions with data access, % total**	Individual usage	0.1%	108

(Continues)

TABLE 12. (Continues)

6	**Intellectual property protection**	Political and regulatory environment	2.7/7	108
7	**Quality of management schools**	Business Readiness	3.5/7	106
8	**Availability research and training services**	Infrastructure environment	3.4/7	104
9	**Freedom of the press**	Market environment	4.1/7	104
10	**Secure Internet servers/million population**	Infrastructure environment	1.9	103

As shown in Table 12, the weaknesses of Vietnam's ICT include:

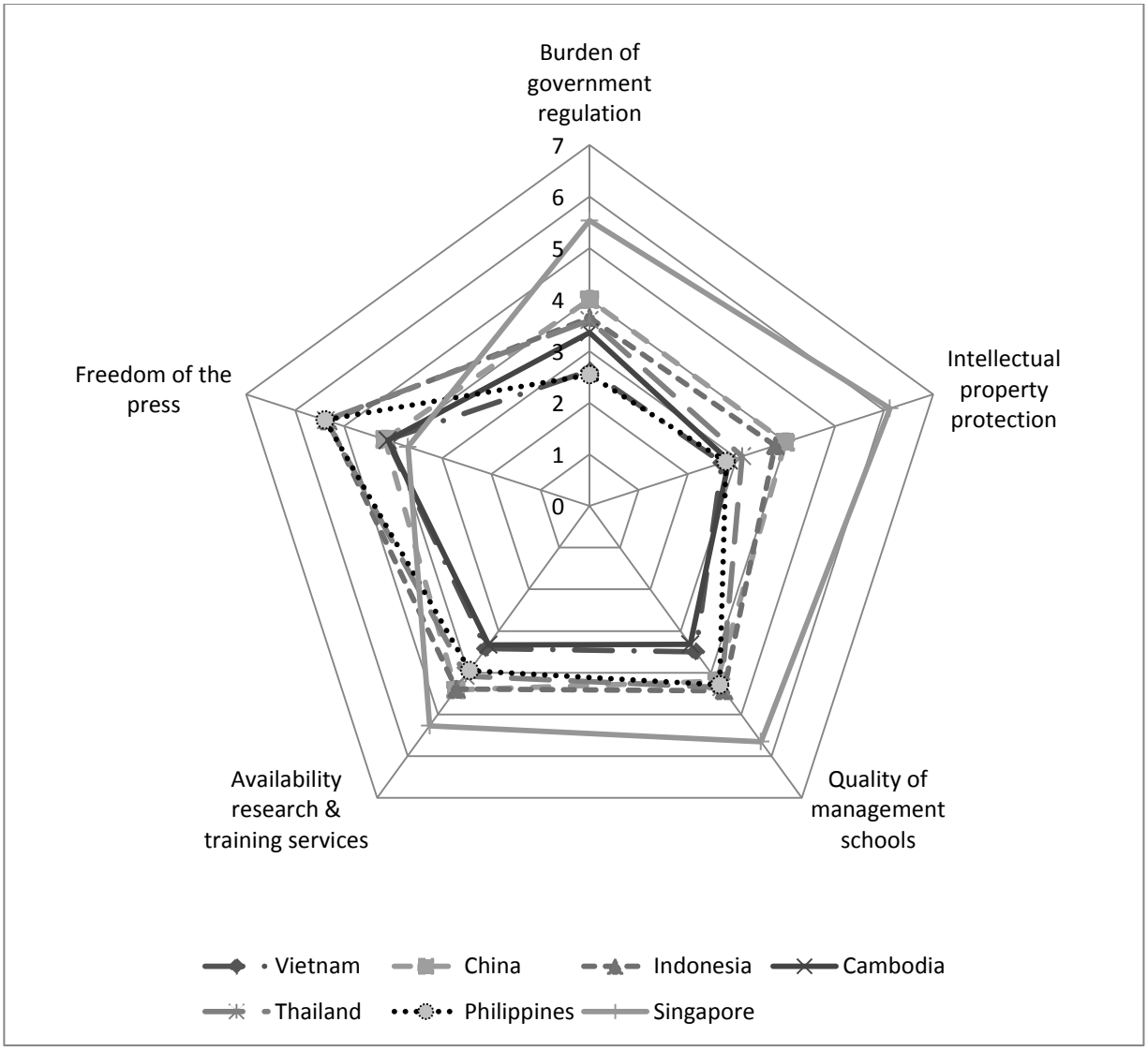
- Burden of government regulation: defines how much the government of a country manages the business in the society with permits, regulation reporting, where 1 is extremely burdensome and 7 is not burdensome at all (Dutta and Mia 2011, 312).
- Number of days to start a business: a longer time for a business starting is evaluated worse management.
- Mobile network coverage, percentage of population covered: shows mobile network signal coverage in percentage of total population (Dutta and Mia 2011, 333).
- Tertiary education enrollment rate in percentage
- Cellular subscriptions with data access: shows the number of cellular subscriptions with data access at broadband speed in percentage (Dutta and Mia 2011, 369).
- Intellectual property protection: shows the rate of intellectual property protection of a country including anti-counterfeiting measures, which is evaluated in the scale from 1 to 7 (Dutta and Mia 2011, 326).
- Quality of management schools: evaluates how good the quality of management or business schools is in a country which is also graded from 1 to 7 (Dutta and Mia 2011, 355).

- Availability research and training services: shows the availabilities of high-quality and specialized training service in a country in a scale from 1 to 7 (Dutta and Mia 2011, 340).
- Freedom of the press: how freedom and direct information can be expressed in all news, and magazine of a country, which is evaluated as 1 for totally restricted and 7 for completely free (Dutta and Mia 2011, 317).
- Secure Internet servers per million population

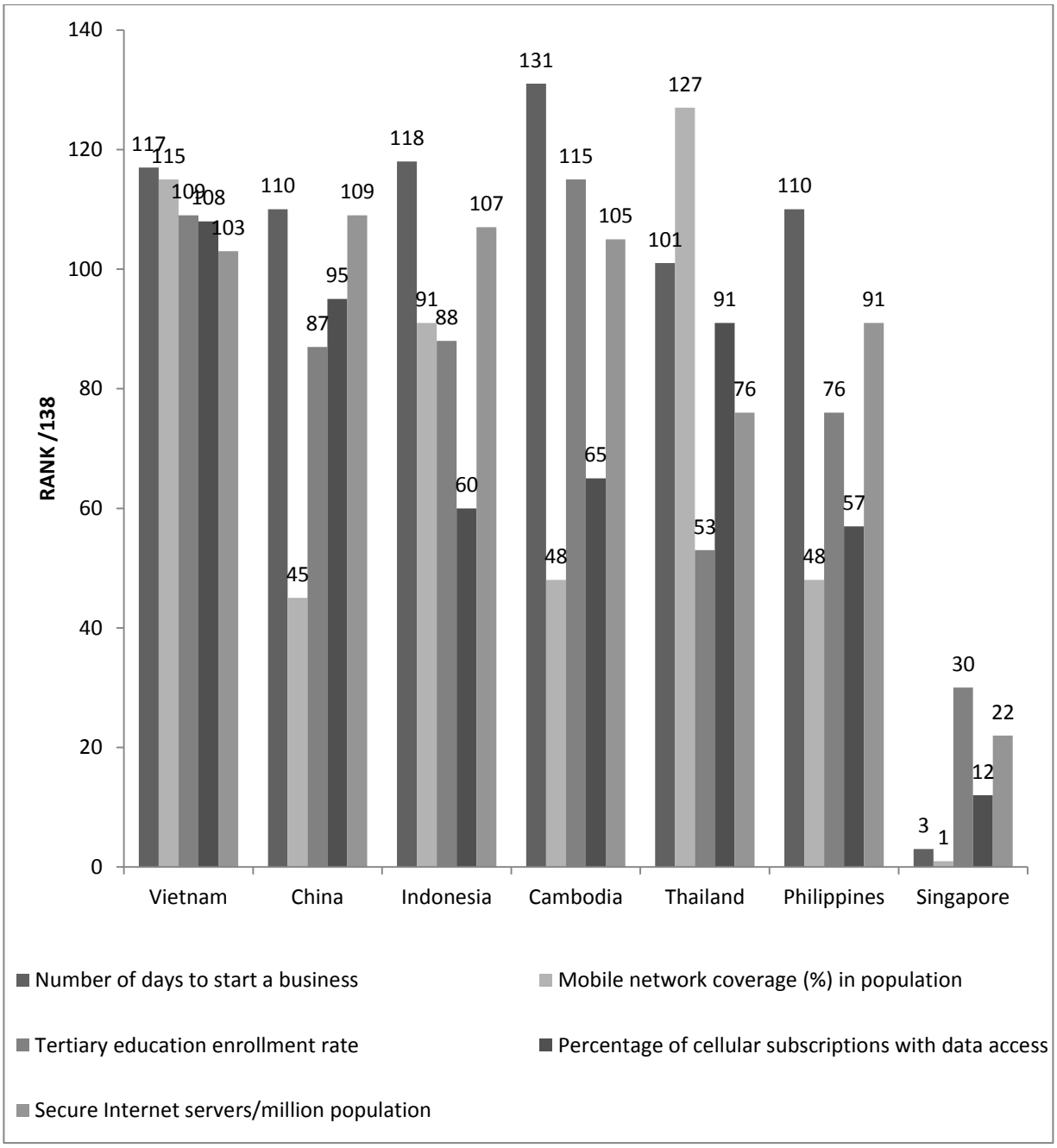
According to the table, it can be concluded that Vietnam's weakest field was the infrastructure environment, which contained four of the negative points of Vietnam's information society. Although the IT of Vietnam has had high attention from the government as well as a good rate of growing in recent years, the level of infrastructure development in the country is still not well established, as a consequence of Vietnam's very low starting point. In addition, the field of market environment was the second weakness of Vietnam's information society. The three weakest factors: burden of government regulation, number of days to start a business, freedom of the press, which were consisted in this field, were government related.

Graph 35 shows a comparison among Vietnam and neighboring countries on five weaknesses including the burden of government regulation, intellectual property protection, the quality of management schools, availability research and training services, freedom of the press, which are all evaluated in the same grading scale from 1 to 7. Generally, these five points were the weaknesses of Vietnam's information society, but they were not as negative in other countries. However, in each weak point, Vietnam's score was still higher than one or quite equal to some of it neighboring countries. Singapore has always been well-known for its very high level of development, and its general ranking in most fields were much higher than that of other countries, although its position in freedom of press was the lowest in this list,

eventually under countries normally known for strict censorship like China and Vietnam.



GRAPH 35. Vietnam's weak points in comparison with some neighboring countries (adapted from The Global Information Technology Report 2010-2011)



GRAPH 36. Vietnam's ranks in some weaknesses compared to some neighboring countries' (adapted from The Global Information Technology Report 2010-2011)

Graph 36 displays a comparison among Vietnam and other neighboring countries on other fields of weaknesses including number of days to start a business, mobile network coverage, tertiary education enrollment rate, percentage of cellular

subscriptions with data access, and secure internet servers per million populations. As in the case of comparing the strengths above, this comparison was done in the way of analyzing the countries' ranks in each field with each other because they do not have the same evaluation unit. It also means that the higher column describes the lower value of a field.

It can be seen from Graph 36 that although these fields were five of Vietnam's weakest points, there were always one or more neighboring countries with lower ranking, except for the percentage of cellular subscription with data access. To be more specific, in the number of days to start a business, Vietnam's position was higher than Indonesia's and Cambodia's. In the two fields of mobile network coverage in the population and tertiary education enrollment rates, Vietnam was respectively rated higher than Thailand and Cambodia. Vietnam was still slightly better than three of its neighbors China, Indonesia and Cambodia in the field of security internet servers per million populations. Singapore still showed its overwhelming power of information society in the entire region with high rankings in most fields and eventually had the first position in the world in mobile network coverage.

4.3 Opportunities

Currently, Vietnam already has an opened economy, so there are many opportunities for the Information Society in Vietnam to develop. These opportunities come from regional and global integration, government support and abundant human resources. Participating in globalization has been bringing the country valuable chances in adapting knowledge and experience by cooperation and investment from order country. Thus, Vietnam is able to improve the abilities of science and technology as well as satisfy consumption from society and economy development. Moreover, with supports of the government including policies and plans, Vietnam's ICT is expected to continue developing with a high rate. In addition, the volume of human resources in

the field of ICT is increasing considerably. Therefore, it is very likely that Vietnam has a chance to own an abundant labor force. These appreciated opportunities will make Vietnam to be a competitive country in ICT. (MOST 2009.)

4.4 Threats

In the background of the dynamic and unpredictable development of modern society in both science and economy, the most difficult challenge toward the development of the information society is increasing levels of IT application in order to shorten the industrialization and modernization process in Vietnam's current condition. Although there is no lack of human resources in Vietnam, it is still a threat that their professional skills are not enough to well compete with neighboring countries. Moreover, the inevitable trend of globalization brings not only high opportunities in cooperation among countries but also many challenges, especially harsh competition, to the whole economy of Vietnam in particular and other countries' in general. (MOST 2009.)

This chapter summarizes the strengths, weaknesses, opportunities and threats of the information society of Vietnam. The strong and weak points were taken based on the top 10 fields having the highest scores and the last 10 fields having the lowest scores according to the Global Information Technology Report 2010-2011 from the World Economic Forum and INSEAD. It showed that there are some advantages for Vietnam to develop the information society strongly. However, there are also some disadvantages which may affect to the development of the information society. It is expected to be improved in the near future. Thus, Vietnam is able to speed up its development to be a strong country with a strong information society.

5 PERSPECTIVE OF INFORMATION SOCIETY

In this decade, information and telecommunication technology is a key factor to an economic development. Therefore, developing the information society attracts high attention from the government. In this chapter, we are going to present government strategies and visions on the development of ICT in Vietnam by 2015-2020 through promulgated decrees.

5.1 Visions and strategies on infrastructure

Information and telecommunications infrastructure is an important basis for an economy. Therefore, developing the information and telecommunication infrastructure should be prioritized in order to create foundation for the development and application of information and telecommunication technology. Investment on information and telecommunication infrastructure is a kind of investment with depth, bringing long-term benefit to the whole society. Here is the outlook on what should be done and how it will be improved till 2015 according to government decrees on infrastructure:

- Broadband mobile communications would reach to 85% of inhabitants and Vietnam would be in the top 65 countries in ITU's ranking (International Telecommunication Union) in 2015. In 2020, the percentage of broadband mobile communication is expected to reach 95% and Vietnam would be in the top 55 countries. (Đề án "Đưa Việt Nam sớm trở thành nước mạnh về công nghệ thông tin và truyền thông" 2010.)
- Phone density is estimated to reach over 50% of inhabitants where the ratio of fixed telephones would be over 20% and the percentage of mobile phones would be over 30%.
- Internet connections and telecommunications are going to be provided with high quality, secured data, and lower or equivalent prices compared to other countries

in the ASEAN+3. Therefore, every class in the society might afford and use it. Additionally, new internet and telecommunication services providers are supported to have from 40% to 50% of market share.

- All government agencies, research institutes, universities, colleges and high schools would be equipped with broadband internet connections and telephones. Over 90% of secondary schools, and hospitals would also have internet connections. (Chiến lược phát triển công nghệ thông tin và truyền thông việt nam đến năm 2010 và định hướng đến năm 2020 2005.)
- Television signals would cover 100% of the total area, so that every household would be able to access the television services.
- Digital television would be deployed to all city centers.
- Television services are encouraged to be developed via telephone networks and the internet to satisfy demands from the huge number of telephone subscribers as well as international communications.
- By 2020:
  - Carry out the process of digitalizing the ground-based broadcasting systems to fit with different local terrain conditions. Basically, the old analog technology would be put out of service and replaced with digital broadcasting technologies. About 95% of households at that time would be able to receive television signals.
  - Stop using old technologies in cable television services and replace with newer digital technologies.
  - Almost all households in areas with difficult terrains and economic conditions would be able to own suitable devices to receive digital radio or television signals by acceptable price. (Quy hoạch truyền dẫn, phát sóng phát thanh, truyền hình đến năm 2020 2009.)

In order to reach those targets, the government created some special plans. We are now presenting examples of activities from the government in these plans.

1. A program of encouraging the application of information and communication technology, and developing digitalized Vietnam
   - Produce 1 million devices having internet access with cheap price
2. A program of developing telecommunications and internet infrastructure
   - Equipping all government agencies, research institutes, universities, colleges, vocational schools, high schools, and hospitals with broadband internet connections
   - Step by step establishing high-speed network connection between universities and institutes of scientific research
   - Establishing the post office system in smaller areas and public internet accessed areas. (Chiến lược phát triển công nghệ thông tin và truyền thông việt nam đến năm 2010 và định hướng đến năm 2020 2005.)

5.2 Visions and strategies on ICT education

In order to develop ICT as well as the information society in Vietnam, education should be the spearhead. In fact, this field, specifically computing skills improvement and professional labor force development, has been in Vietnamese government's focus for years. This high concentration could be seen through recent government decrees to 2015-2020 which are going to be shown as behind.

- Education of ICT in universities would reach a high standard of quality in the region of Southeast Asia. Thirty percent of graduated IT students from universities would be guaranteed to gain a required level of both working skills and foreign languages in order to take part in the international work market in 2015 and the percentage would increase to 80% in 2020.
- The labor force in ICT would reach 1 million in 2020. (Đề án "Đưa Việt Nam sớm trở thành nước mạnh về công nghệ thông tin và truyền thông" 2010.)
- One hundred percent of students graduating from vocational schools, colleges and universities would have enough computing skills for their works.

- One hundred percent of universities, colleges and high schools would have their own websites.
- The number of ICT lecturers in universities, colleges, and vocational schools would be increased along with quality, ensure to have 1 lecturer for every 15 students.
- Most government staff, students and citizens would be educated to be familiar with ICT applications and internet use. (Chiến lược phát triển công nghệ thông tin và truyền thông Việt Nam đến năm 2010 và định hướng đến năm 2020 2005.)

In order to reach those targets, the government created special plans. We are now presenting examples of activities from the government in these plans.

1. A program of encouraging the application of information and communication technology , developing digitalized Vietnam
   - Popularizing computing skills to 20 million inhabitants.
   - Training 30 thousands professional engineers for information and communication technology.
2. A program of human resource development for information and communication technology:
   - Improving the quality of higher education in the field of ICT.
   - Supporting cooperative training programs in the field of ICT with foreign institutes.
   - Improving employee skills of ICT for specific purposes.
   - Increasing the quality of ICT education in vocational schools.
   - Providing training and widespread ICT management in governmental staffs.
   - Teaching computing skills in high schools.
   - Developing the networks as well as education services on the internet
   - Ensuring 100% of high schools would use internet.
   - Connecting secondary schools with the internet. (Chiến lược phát triển công nghệ thông tin và truyền thông Việt Nam đến năm 2010 và định hướng đến năm 2020 2005.)

5.3 Visions and strategies on accessibilities

Application of information and telecommunications technology is encouraged strongly in every profession. The government is trying to build up and develop Vietnam to be an “E-Country” with E-Citizen, E-Government, E-Business, and E-Commerce. Therefore, Vietnam is able to reach a good level in the ASEAN, in 2015.

- E-Citizen:
  - Eighty percent of young people would be able to use internet and ICT applications, step by step bring ICT into citizen life, and restrict distance between rural and urban areas.
  - People could keep information and knowledge up-to-date via radio, television, internet and electronic pages.
  - Eighty percent of all hospitals in the country would be equipped with electronic management systems and over 70% of healthcare employees would be educated to be familiar with computing.
- E-Government:
  - Over 50% of official documents would be published online
  - All government agencies would have their own official websites with adequate contents. Therefore, people would be able to access information easily.
  - Some administrative formalities would be able to use online
  - ICT is encouraged to be applied in defend and security.
- E-Business: ICT would be strongly applied in the fields of economy with high level of integration like telecommunications, banking, customs, aviation, tourism, etc., in order to ensure these fields’ capacity of management and quality of services would reach the regional standard.
  - From 50 to 70 percent of firms would apply ICT in their business.
  - Over 50% of firms in Hanoi and Ho Chi Minh City would use government’s online services for tax administration and 40% for customs.

- E-Commerce:
  - Establishing trading floors, value added networks, supply chain management systems.
  - From 25%-30% of total economic trading would be proceeded online
  - Commercial value might be increased 10 times compared to 2002's. (Chiến lược phát triển công nghệ thông tin và truyền thông việt nam đến năm 2010 và định hướng đến năm 2020 2005.)

It is expected that from 20% to 30% of households would own computers with broadband internet connections in 2015. About the same time, 90 over each 100 households would own television, among them 80% should be able to reach digital television signals in different methods. In 2020, the percentage of household having computer should be from 50% to 60%, including 25% to 30% using fiber cable, and most of households with television could use digital television services. (Đề án "Đưa Việt Nam sớm trở thành nước mạnh về công nghệ thông tin và truyền thông" 2010.)

In order to reach those targets, the government created some special plans. We are now presenting examples of activities from the government in these plans.

1. A program of encouraging the application of information and communication technology , developing digitalized Vietnam
   - Building up 1 million websites to serve social demands
   - Concentrating on E-Government:
     + Standardizing information storage and exchange systems among government agencies.
     + Developing "common use" software and important national database.
     + Establishing safe and secure information systems.
     + Training leaders on information and network management.

+ Producing online services and purchase for government agencies. (Chiến lược phát triển công nghệ thông tin và truyền thông Việt Nam đến năm 2010 và định hướng đến năm 2020 2005.)

2. Encouraging the development of television services
   - Lowering service costs of renting domestic and international channels to be equaled or lower than other countries' in the same region. (Quy hoạch truyền dẫn, phát sóng phát thanh, truyền hình đến năm 2020 2009.)
   - Promulgating tax incentives on ICT fields in order to encourage developing including VAT, corporate tax, importing and exporting tax, etc. (Đề án "Đưa Việt Nam sớm trở thành nước mạnh về công nghệ thông tin và truyền thông" 2010.)

To conclude, this chapter shows the prospects of the information society in Vietnam through government visions to 2015 and 2020 in three fields: infrastructure, education and accessibility. In order to reach these targets, specific strategies and policies were presented. Although some of the targets could be difficult to achieve, hopefully the final results will be satisfactory enough. On the other hand, some other targets are currently predicted to be accomplished before the planned time.

6 CONCLUSION

This thesis presented the current state and perspective of the information society in Vietnam. The current state was described by showing statistics of three stages in building up an information society, which are infrastructure, education and accessibilities of ICT in the society. The perspective of Vietnam's information society was visible through government's policies and visions by 2015 and to 2020. Additionally, the strengths, weaknesses, opportunities and threats of Vietnam's information society was also presented based on Vietnam's ICT global ranking and government analysis. These data was adapted from official publications by Vietnam government, especially the Vietnam Information and Communication Technology 2011, and The World Economic Forum and INSEAD, the Global Information Technology Report 2010-2011.

The infrastructure including telephone networks, internet, television and required devices was described by specific statistics from 2006 to 2010. These data showed that Vietnam's ICT infrastructure is a major target for national investment. In the field of education, graduated ICT students are plentiful in number, but the quality of education is not good enough. As to accessibilities, Vietnamese people have many opportunities to access ICT applications, especially in the fields of telephone and television services. Although there are not so many people who can afford computers and internet access, the number of computer and internet users reaches a high level as a result of "computers for rent" services. In short, Vietnam's information society is continuously developing with the high rate in all fields including infrastructure, education and accessibility.

In addition to impressive development of the information society in Vietnam together with ICT evolutions, its weaknesses were also exposed. In order to gain higher

positions in global ICT ranking, the Vietnamese government's role in continuing the good growth rate as well as improving the society's weaknesses would be essential. With many decrees in which the visions and strategies of the government for the period from now to 2015 and 2020 were analyzed in detail, it is expected that Vietnam would "become a strong country in ICT" in the regional and international market.

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Quy hoạch truyền dẫn, phát sóng phát thanh, truyền hình đến năm 2020 decree 16.2.2009/22 (Deployment of television and radio broadcasting system to 2020)

Đề án "Đưa Việt Nam sớm trở thành nước mạnh về công nghệ thông tin và truyền thông" decree 22.9.2010 (The project of making Vietnam become a strong country in ICT)