# ICT PROMOTION FOR KNOWLEDGE-BASED ECONOMY
# : A COMPARATIVE STUDY OF CYBER KOREA 21 AND THAILAND INFORMATION AND COMMUNICATION TECHNOLOGY(ICT) MASTER PLAN

Miss Lalitda Makasira



A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts Program in Korean Studies
(Interdisciplinary Program)
Graduate School
Chulalongkorn University
Academic Year 2015

# แนวทางการพัฒนาเทคโนโลยีสารสนเทศและการสื่อสารเพื่อสร้างเศรษฐกิจฐานความรู้ : กรณีศึกษาแผนแม่บท CYBER KOREA 21 และแผนแม่บทเทคโนโลยีสารสนเทศและการสื่อสารของประเทศไทย

นางสาวลลิตดา มาคะสิระ



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาเกาหลีศึกษา (สหสาขาวิชา)
บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2558

| | |
|---|---|
| Thesis Title | ICT PROMOTION FOR KNOWLEDGE-BASED ECONOMY : A COMPARATIVE STUDY OF CYBER KOREA 21 AND THAILAND INFORMATION AND COMMUNICATION TECHNOLOGY(ICT) MASTER PLAN |
| By | Miss Lalitda Makasira |
| Field of Study | Korean Studies |
| Thesis Advisor | Assistant Professor Piti Srisangnam, Ph.D. |

Accepted by the Graduate School, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master's Degree

.....Dean of the Graduate School
(Associate Professor Sunait Chutintaranond, Ph.D.)

THESIS COMMITTEE

.....Chairman
(Associate Professor Buddhagarn Rutchatorn, Ph.D.)

.....Thesis Advisor
(Assistant Professor Piti Srisangnam, Ph.D.)

.....Examiner
(Professor Tae Gyun Park, Ph.D.)

.....Examiner
(Assistant Professor Pataporn Sukontamarn, Ph.D.)

.....External Examiner
(Assistant Professor Wichian Intasi, Ph.D.)

ลลิตดา มาคะสิระ : แนวทางการพัฒนาเทคโนโลยีสารสนเทศและการสื่อสารเพื่อสร้างเศรษฐกิจฐานความรู้ : กรณีศึกษาแผนแม่บท CYBER KOREA 21 และแผนแม่บทเทคโนโลยีสารสนเทศและการสื่อสารของประเทศไทย (ICT PROMOTION FOR KNOWLEDGE-BASED ECONOMY : A COMPARATIVE STUDY OF CYBER KOREA 21 AND THAILAND INFORMATION AND COMMUNICATION TECHNOLOGY(ICT) MASTER PLAN) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. ดร. ปิติ ศรีแสงนาม, 199 หน้า.

งานวิจัยเรื่องนี้มีวัตถุประสงค์ที่จะศึกษาถึงทิศทางของนโยบายที่เหมาะสมสำหรับการพัฒนาเทคโนโลยีสารสนเทศและการสื่อสารอันมีจุดมุ่งหมายในการสนับสนุนการพัฒนาเศรษฐกิจฐานความรู้ของประเทศไทยโดยศึกษาแผนแม่บทCyber Korea 21ของประเทศเกาหลีซึ่งเป็นพิมพ์เขียวสำหรับสังคมสารสนเทศที่ใช้ในการแก้ปัญหาวิกฤตการเงินในเอเชีย ค.ศ.1997 และเปลี่ยนรูปแบบระบบเศรษฐกิจให้เป็นเศรษฐกิจฐานความรู้และเปรียบเทียบกับแผนแม่บทเทคโนโลยีสารสนเทศและการสื่อสารของประเทศไทย ค.ศ.2002-2006 ซึ่งมุ่งเน้นพัฒนาประเทศให้เป็นสังคมของภูมิปัญญาและการเรียนรู้ วิทยานิพนธ์ฉบับนี้จัดทำขึ้นโดยใช้การเก็บข้อมูลจากเอกสารทางวิชาการต่างๆและการสัมภาษณ์ผู้เชี่ยวชาญด้านICTในประเทศไทย จากผลการศึกษาพบว่าแผนแม่บท Cyber Korea 21 เป็นตัวขับเคลื่อนยุทธศาสตร์ด้านเทคโนโลยีสารสนเทศและการสื่อสารที่สำคัญประเทศเกาหลีพัฒนาคนให้พร้อมที่ใช้ICTจึงทำให้เกิดประโยชน์สูงสุดในการใช้งาน เทคโนโลยีสารสนเทศและการสื่อสารของประเทศไทยนั้นยังขาดคุณภาพและงบประมาณที่ใช้ในการสนับสนุนทั้งด้านการศึกษาวิจัยและโครงสร้างพื้นฐาน รวมไปถึงการขาดแคลนบุคลากรที่มีความสามารถด้านเทคโนโลยีสารสนเทศเข้ามาช่วยในการพัฒนา รูปแบบการพัฒนาเศรษฐกิจฐานความรู้เป็นการพัฒนาที่ยั่งยืนและสามารถต่อยอดความรู้ให้กับประชาชนสามารถนำไปใช้ในสาขาวิชาต่างๆได้มากมายรวมไปถึงภาคเทคโนโลยีสารสนเทศและการสื่อสารด้วย การพัฒนาICTและเศรษฐกิจฐานความรู้ให้สัมฤทธิ์ผลนั้นต้องดำเนินการไปพร้อมๆกัน ประเทศไทยยังมีจุดที่ต้องปรับปรุงแก้ไขและพัฒนาปัจจัยพื้นฐานในการส่งเสริมความรู้ของคนให้ถูกต้องและทั่วถึงเพราะหากไม่มีความรู้ก็ไม่สามารถนำเครื่องมือด้านICTไปใช้ให้เกิดประโยชน์ได้และในมุมกลับกัน หากไม่มีICTการกระจายความรู้จึงเป็นไปได้ยากและเชื่องช้า ซึ่งปัจจัยเหล่านี้เกื้อหนุนกันและสามารถพัฒนาให้มีประสิทธิภาพได้ด้วยการสนับสนุนจากรัฐบาลที่ทำหน้าที่เป็นแกนนำและสนับสนุนอย่างจริงจังและต่อเนื่องจึงจะสามารถพัฒนาประเทศไทยให้มีศักยภาพทัดเทียมนานาประเทศที่พัฒนาแล้วได้

สาขาวิชา เกาหลีศึกษา ลายมือชื่อนิสิต .....

ปีการศึกษา 2558 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

# # 5587601420 : MAJOR KOREAN STUDIES
KEYWORDS: INFORMATION COMMUNICATION TECHNOLOGY / KNOWLEDGE-BASED ECONOMY / MASTER PLAN

LALITDA MAKASIRA: ICT PROMOTION FOR KNOWLEDGE-BASED ECONOMY : A COMPARATIVE STUDY OF CYBER KOREA 21 AND THAILAND INFORMATION AND COMMUNICATION TECHNOLOGY(ICT) MASTER PLAN. ADVISOR: ASST. PROF. PITI SRISANGNAM, Ph.D., 199 pp.

Objectives of this research are to study the proper policy directions for ICT development aiming in promoting knowledge-based economy of Thailand using Cyber Korea 21 - a blueprint for information society used to solve 1997 financial crisis in Asia that changed economic system to be a knowledge-based economy and to compare to the ICT model of Thailand (2002-2006) which aims to develop the country to be the society of wisdom and learning. This thesis was conducted by collecting academic documents and interviewing ICT informants in Thailand. According to the results, it was found that Cyber Korea 21 model is an important ICT strategic driver. Korea improved their citizens to get ready for maximizing ICT utilization. However, ICT in Thailand still lacks of quality and budget for research and fundamental structure as well as lacking of ICT expertise. Knowledge-based economy is a sustainable development that can extend people's knowledge for various fields of study, including information and communication technology. ICT development and knowledge-based economy must be concurrent and Thailand still has many points for proper changes and development. If knowledge base is still insufficient, ICT tools cannot be used for benefits. In contrary, knowledge distribution is difficult and slow if there is no ICT. These factors support each other and they can be developed towards effectiveness through government promotion as government acts as the center that seriously and continuously gives the support so that Thailand can obtain full potential at the same level of other developed countries.

Field of Study: Korean Studies Student's Signature .....

Academic Year: 2015 Advisor's Signature .....

# ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my advisor, Professor Piti Srisangnam, Ph.D. for his continuous support in all the time of writing thesis. His expertise, encouragement and valuable suggestion supported me to complete my thesis successfully.

Besides, my thanks and appreciation go to my thesis committee members, Associate Professor Buddhagarn Rutchatorn, Ph.D., Professor Park, Tae-Gyun, Ph.D., Pataporn Sukontamarn, Ph.D. and Associate Professor Wichian Intasi, Ph.D. who gave insightful comment and reviewed my work with valuable guidance.

Let me also say thank you to ICT experts who devoted their time and knowledge for the precious interview. Also, I would like to say thank you to my family for the understanding, supporting and encouraging as well as many of my friends in Korean Studies Program and Miss Nongluck Boonthiem, a Korean Studies program coordinator for providing me helps and encouragement all the time. Last but not least, I would like to give credit from this thesis's worth to my parents, thesis advisor, thesis committee members, lecturers, and all of my supporters.

**CONTENTS**

Page

THAI ABSTRACT ..... iv

ENGLISH ABSTRACT ..... v

ACKNOWLEDGEMENTS ..... vi

CONTENTS ..... vii

LIST OF TABLES ..... ix

LIST OF FIGURES ..... x

CHAPTER I INTRODUCTION ..... 1

1.1 Research Background ..... 1

1.2 Research Objectives: ..... 13

1.3 Research Questions: ..... 13

1.4 Scope of the Study: ..... 13

1.5 Research Benefits: ..... 14

1.6 Methodology: ..... 14

CHAPTER II LITERATURE REVIEW ..... 17

2.1 Concepts of information and communication technology ..... 17

2.2 Concept of the Knowledge Economy ..... 19

2.3 Related Research ..... 23

CHAPTER III SOUTH KOREA AND THAILAND MASTER PLANS FOR A KNOWLEDGE-BASED ECONOMY ..... 43

3.1 Cyber Korea 21 ..... 43

3.2 Thailand Information and Communication Technology (ICT) Master Plan (2002-2006) ..... 57

Page

3.3 Different Plans and Activities of Cyber Korea 21 and the Thailand Information and Communication Technology (ICT) Master Plan (2002-2006) ... 73

CHAPTER IV COMPETITIVE ENVIRONMENT ANALYSIS ... 78

4.1 Korean and Thai ICT Context ... 78

4.2 PEST analysis of ICT development in South Korea and Thailand ... 91

CHAPTER V ANALYSIS OF RESEARCH ... 114

5.1 Key Informant Interviews ... 114

5.2 SWOT analysis of Information and Communication Technology Development in Korea ... 127

5.3 SWOT analysis of Information and Communication Technology Development in Thailand ... 146

5.4 TOWS Matrix analysis of South Korea ICT Development Promotion ... 158

5.5 TOWS Matrix analysis of Thailand ICT Development Promotion ... 170

CHAPTER VI CONCLUSION AND SUGGESTIONS ... 179

6.1 Conclusion ... 179

6.2 Suggestions for Thailand Information and Communication Technology (ICT) Master Plan ... 185

6.3 Suggestion for further research ... 189

REFERENCES ... 190

VITA ... 199

# LIST OF TABLES

Page

Table 1: Status of telecommunications in Thailand 2003 – 2008 ..... 10

Table 2: Status of telecommunications in Korea 2003 – 2008..... 10

Table 3: ICT goods imports and exports ..... 90

Table 4: SWOT analysis of Information and Communication Technology Development in Korea ..... 127

Table 5: SWOT analysis of Information and Communication Technology Development in Thailand ..... 146

Table 6: South Korea ICT Development Promotion TOWS Matrix analysis ..... 158

Table 7: Thailand ICT Development Promotion TOWS Matrix analysis..... 170

# LIST OF FIGURES

Page

Figure 1: GDP Per Capita: Korea, Sub-Saharan Africa, and the OECD (constant 2000 US$).... 3

Figure 2: ICT Development Index, selected economies, 2012 ..... 7

Figure 3: ICT Development Index of Selected Asian Economies, 2012 ..... 8

Figure 4: Telephone subscribers per 100 inhabitants (2000)..... 88

Figure 5: Revisions of Korea's Copyright Act ..... 93

Figure 6: Royalty and license fees, receipt (BoP) ..... 98

Figure 7: Entry rates into tertiary education: University-level education (%)..... 100

Figure 8: Population with tertiary education (2010) ..... 100

Figure 9: GERD/GDP and proportion of business enterprise and other sectors expenditure on R&D of selected countries in Asia-Pacific Region for Y 2009 or latest available year..... 102

# CHAPTER I
# INTRODUCTION

## 1.1 Research Background

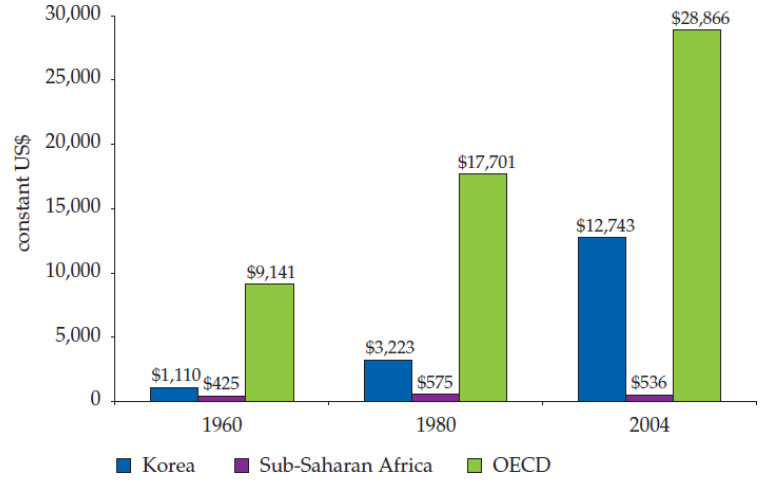
Nowadays, ICT plays a significant role in human life. It is added to the basic factors of daily life and contributes to life becoming much easier and more efficient. Information and Communication Technology concerns technology-related news, information, and communication from its creation, analysis, processing, data storage, and application in new tasks. These technologies are often related to computer equipment which includes hardware, software, and data and communication systems. ICT is a similar term to Information Technology (IT). IT focuses on the display, public relations, and the use of a suitable form to be applied in performing tasks. The term 'IT' was used before ICT because the communication aspect was not convenient in the past, but nowadays communication is a vital part of life, through receiving information from television, radio, newspapers and the internet. Using ICT also provides benefits in various fields such as finding information on the internet, sending messages, applying for jobs, buying goods online, or using the ATM to withdraw money whenever it is needed. Management systems in organizations use ICT for convenience, rapidity, accuracy and efficiency. These examples are parts of the advanced technology which creates the tools or methods to facilitate the various tasks in pushing forward the globalization trend.

The term ‘globalization’ has been in use since about 30 years ago, and refers to the spread of information around the world, so that all locations can stay in touch and be affected by up-to-date situations due to the extensive development of information systems. The influence of globalization has expanded throughout the world. The use of telecommunications is now much simpler, easier, and faster. The exchange of the data has transmitted similar patterns around the world, accelerating the spread of culture, ideas, information and perceptions. The arrival of the new era of globalization is renowned for its Information Age boundlessness which has changed the ICT development in many countries dramatically. ICT allows countries to come closer together and allows the overlap of values, information, news, knowledge, science and technology to progress the economies and societies. Economic growth in rich countries has resulted from constant investment in research and development. These matters have brought about a new economic regimen which has the ability to support globalization, known as the knowledge-based economy. “The term knowledge-based economy results from a fuller recognition of the role of knowledge and technology in economic growth”(OECD, 1996). Knowledge and technology are the important drivers to raise economic growth, especially in countries which have fewer natural resources.

South Korea is making a successful transitions towards becoming a knowledge-based economy and leads in innovation and technology as the world’s most advanced ICT economy from the group of the poorest countries following World War 2 and the

Korean War(The World Bank Washington, 2006). In the postwar period, Korea's GDP per capita was comparable to levels in the poorer countries in Africa (Figure 1)(World Bank, 2006) .

Figure 1: GDP Per Capita: Korea, Sub-Saharan Africa, and the OECD (constant 2000 US$)




*Source:* World Bank SIMA database.



During the Korean War, South Korea suffered many casualties; 150,000 people died in the civil war and millions of people were made homeless. It damaged industrial areas and the infrastructure system and roads severely. South Korea then accelerated its economic development by using a grant from the United Nations for investment and development of the infrastructure to support education. As a result, Korea was able to create a high quality, highly skilled labor force. Korea's economy developed respectably until the country was able to join the OECD Group in 1996. In the era of globalization, the diffusion of news and information, and the melting together into one

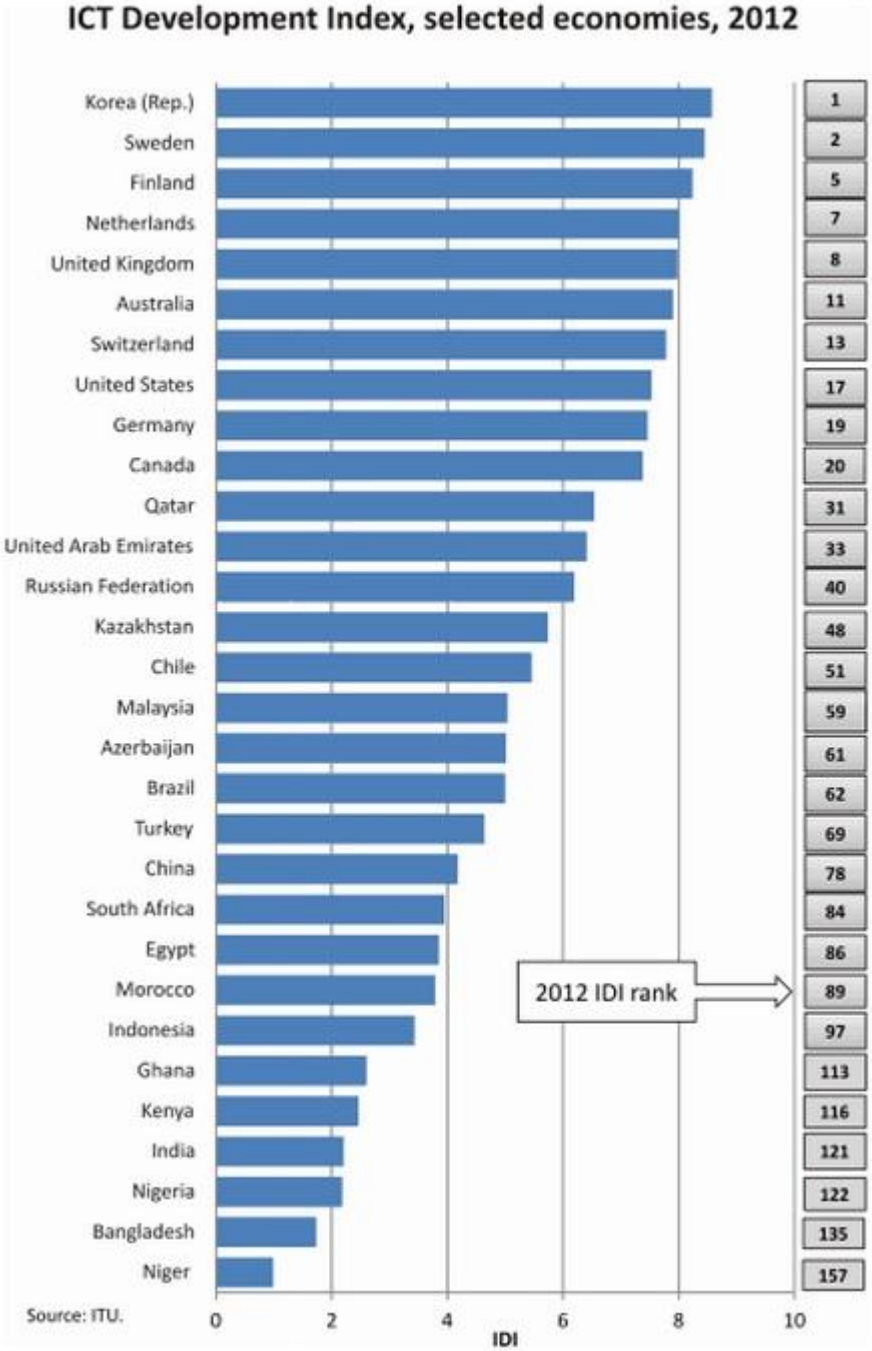
world leads us to become ever closer. Therefore, Korea has seen its opportunity to take advantage of ICT in the areas of industrial development, education, and social development including cultural exports to various countries by using ICT as a tool to bring success. Korea started its ICT development much earlier than other countries. The South Korean government established the "Framework Act on Informatization Promotion" of 1987 to promote the deployment of information technology in the public and private sectors and created the Korean National Information Society Agency (NIA), which established the Korean Information Infrastructure Initiative (KII) in 1994 to construct a nationwide optical fiber network(Pham, 2013). Korea laid the foundation for its first phase of human development in 1984-1989 to introduce social information technology which focused on stimulating awareness about using ICT in various forms, as well as creating the appropriate environment suitable for its use. Since the beginning of the 1990s, Korea has trained over 1,500 ICT talents of developing nations as a part of the effort to share Korean experience and to develop the standards of telecommunications experts in these nations. In the later stages, Korea's first national computerization project was initiated in 1987, and named the National Basic Information System (NBIS). "NBIS initially focused on public sector computerization, with the objective of creating a smaller and more efficient government and laying the foundation for the development of IT industries by stimulating initial markets" (Ogbah, 2012). This strategy was designed to attract the attention of the private sector and to stimulate business in the country. This project arose because the Korean government

saw the importance of IT and its application as the tool to build a new national infrastructure. Thereafter, the South Korean government announced the Informatization Promotion Act (1995) followed by the First Master Plan for Information Promotion 1996. In this plan, Koreans put considerable effort into building Information Infrastructure, the backbone of informatization. The Korean government also set up a national organization for planning and implementation. In 1999, the Korean Government established the second informatization master plan named "Cyber Korea 21" as the blueprint for a new information society in the 21st century, which implemented the steps of recovering from the Asian Financial Crisis in 1997 and transforming the economic regime into a creative knowledge-based economy. Cyber Korea 21 had 3 objectives as follows: early completion of the Korean information infrastructure; enhancing national productivity by using Korean information infrastructure, and promoting new businesses related to information infrastructure. From 1993 to 2002, the Korean Government utilized funds of US $7.78 billion to support the Informatization Promotion (MIC, 1999a). This fund received endorsement from many sectors, including 40% from government budgetary contributions, 46% from private enterprises, and 14% from miscellaneous profits and interest. Moreover, the government also improved the relevant laws and regulations to support and improve the information society. During 1995-2003, approximately 180 ICT related laws were enacted or updated; 86 laws including the Basic Act on Informatization Promotion, were enacted or revised for informatization promotion in the public sector; 101 laws,

including the Electronic Signature Act and the Online Digital Contents Industry Promotion Act, were enacted or revised for the development of the IT industry and the informatization of the private sector (ICT, software, contents, games, etc.) (Chang-Bun Yoon, 2003).

The Korean government has played an important role in supporting and promoting the use of ICT to maximize the benefits of sustainable development. The Korean government transformed internet development to another level through Cyber Korea 21. In 1999, Korea's internet user rate surpassed the developed nation average and by the end of 2002 the country was the world's fifth largest internet market with 26 million users. The number of internet users in South Korea as of 2007 was over 34 million (Internet World Stats Online, 2007). In addition, the expansion rate of the IT industry had grown by 41.4 percent in 1999 alone and has contributed to 38.3 percent of the GDP increase today. The internet has become a driving force reorganizing the overall economic environment. South Korea has emerged as an economic leader by using ICT as an important factor that makes accomplishment and sustainable development a reality. The International Telecommunication Union (ITU) declared a number of statistics and rankings in the year 2013 for the growth of ICT in various countries around the world, and Korean ICT was ranked at the top for 3 years consecutively, while Thai ICT was ranked 95$^{th}$.

Figure 2: ICT Development Index, selected economies, 2012




The ICT Development Index (IDI) of the International Telecommunication Union (ITU) has ranked a total of 157 countries by measuring three aspects: access index, use index, and skills index, and comparing the scores between 2011 and 2012 in a format which is widely accepted by government agencies, the United Nations

and the industrial sector. The data are considered reliable and thus offer a valid approach to measuring the growth of ICT in the country (MGR Online, 2013).

Figure 3: ICT Development Index of Selected Asian Economies, 2012

**ICT Development Index of Selected Asian Economies, 2012**

| No. | Country | Rank 2012 (Rank 2011) | IDI 2012 |
|---|---|---|---|
| 1 | South Korea | 1 (1) | 8.57 |
| 2 | Hong Kong, China | 10 (10) | 7.92 |
| 3 | Japan | 12 (8) | 7.82 |
| 4 | Macao, China | 14 (13) | 7.65 |
| 5 | Singapore | 15 (14) | 7.65 |
| 6 | Brunei Darussalam | 58 (56) | 5.06 |
| 7 | Malaysia | 59 (57) | 5.04 |
| 8 | China | 78 (79) | 4.18 |
| 9 | Mongolia | 85 (90) | 3.92 |
| 10 | Viet Nam | 88 (86) | 3.80 |
| 11 | Thailand | 95 (94) | 3.54 |
| 12 | Indonesia | 97 (97) | 3.43 |

Thailand proclaimed its first information technology policy (IT2000) in 1996. During the period of 5 years under the policy, the National Information Technology Committee undertook to promote and encourage the development of information technology with a focus on infrastructure aspects, human resources, and information

to strengthen the administration of the government. IT2000 was still at a standstill, while many leftover programs were still not achieved, due to the Asian Financial Crisis in 1997. Thailand was confronted by a severe economic crisis, as were all the countries in Asia, even though Thailand's economic recovery seemed to be stronger. However, if there are insufficient development factors and mechanisms to ensure the efficiency and productivity of the country promptly, the recovery might be delayed and the country might be unable to compete with neighboring countries that are developing more rapidly. In 2002, the cabinet endorsed the later policy called IT2010, which was a ten-year National IT policy for the period 2001-2010 as a policy framework for Thailand's ICT development in the first decade of the twenty-first century. IT2010 set the key development objectives to exploit the benefits of information and communication technology to move Thailand to the "Knowledge-Based Society and Economy" (KBS, KBE). In addition, the Thailand Information and Communication Technology (ICT) Master Plan for 2002-2006 adopted IT2010's policies and important principles within its objective plan (N. NECTEC, MOST, 2003). Due to the rapid changes in technology which occurred in the era of globalization, the dynamic plan required medium-term adjustments.

Table 1: Status of telecommunications in Thailand 2003 – 2008

| | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | CAGR% |
|---|---|---|---|---|---|---|---|---|
| Mobile | Total subscribers | 21,828 | 27,378 | 31,136 | 40,723 | 53,000 | 62,000 | 23.2% |
| | Penetration rate | 33.8 | 41.9 | 47.2 | 61.2 | 79.1 | 92.0 | |
| Internet | Total subscribers | 6,000 | 6,970 | 9,909 | 11,413 | 13,416 | 12,130 | 15.0% |
| | Penetration rate | 9.30 | 10.68 | 15.0 | 17.2 | 20.0 | 18.0 | |
| Broadband | Total subscribers | 45.0 | 75.0 | 105 | 105 | 913 | 913 | 82.6% |
| | Penetration rate | 0.07 | 0.1 | 0.2 | 0.2 | 1.4 | 1.4 | |

(Source: ITU, ICT STATISTICS database (http:www.itu.int/ITUD/ICTEYE/Indicators.aspx)

Penetration rate: per 100 inhabitants

Table 2: Status of telecommunications in Korea 2003 – 2008

| | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | CAGR% |
|---|---|---|---|---|---|---|---|---|
| Mobile | Total subscribers | 33,592 | 36,586 | 38,342 | 40,197 | 43,498 | 45,607 | 6.3% |
| | Penetration rate | 70.8 | 76.8 | 80.2 | 83.8 | 90.2 | 94.7 | |
| Internet | Total subscribers | 31,089 | 33,447 | 34,811 | 35,891 | 36,975 | 37,476 | 3.89% |
| | Penetration rate | 65.5 | 70.2 | 72.8 | 74.8 | 76.3 | 77.8 | |
| Broadband | Total subscribers | 11,541 | 11,921 | 12,190 | 14,942 | 14,710 | 15,475 | 6.0% |
| | Penetration rate | 24.3 | 25.0 | 25.5 | 29.3 | 30.5 | 32.1 | |

(Source: ITU, ICT STATISTICS database (http:www.itu.int/ITUD/ICTEYE/Indicators.aspx)

Penetration rate: per 100 inhabitants

From the Tables 1 and 2, it can be clearly seen that in 2008, the percentages of mobile phone users in Thailand and in Korea were very close to each other, but the penetration rate of internet users in Korea was 77.8% while in Thailand it was only

18%. In terms of broadband use it is clear that Thailand obviously has a smaller number of users (National Broadcasting and Telecommunications Commission). If the results are compared for the use of internet and broadband after the completion of Cyber Korea 21 and the Thailand Information and Communication Technology (ICT) Master Plan of 2007, it is clear that the ratio of internet users remains a smaller number in Thailand. Moreover, the South Korean government has ensured benefits from the spread of internet usage in every aspect of life including the passing of knowledge and information. This project has become a part of Korean culture that has made Korean people love speed, up-to-date information, and new technology.

A development strategy based on the creation of a knowledge-based economy has a critical role. Thus, Thailand needs to adjust its economic structure to achieve a knowledge base and to make more investments in ICT including the acceleration of human capital development with the capacity to access knowledge resources. For example, in the agricultural sector, Thailand has many natural resources which are comparable to those of other countries. It was believed that this could enhance the quality of life for the better, and Thailand could apply this to any sector. If used in combination with the additional knowledge by using ICT to enhance the quality of life, this approach can be applied to all disciplines. The leading industrial countries, especially members of the OECD (Organization for Economic Cooperation and Development), have been exporting products by using knowledge as a factor of primary production which accounts for more than 50 percent of all exports. From this it can

be seen that people should accumulate knowledge throughout their lives. This intellectual capital is a significant base of the knowledge economy leading to the competitive advantage of the economy. However, it is necessary first to have the basic infrastructure which is conducive to learning. Looking back at our neighbors in Southeast Asia, Malaysia is currently in the process of changing its social and economic system to a knowledge base by prioritizing human resource development and building the necessary information infrastructure to develop information networks. The Malaysian government has initiated a plan to support the Information Society as the key to creating an environment that encourages research and development, and innovative development of the information technology industry for the future success of that information technology. Thailand is still behind Malaysia in the field of new technologies according to the rankings of the World Economic Forum. Moreover, Malaysia also supports research and development (R&D) at a rate of 0.63% of GDP, while Thailand's investment is just 0.25% of GDP. Thus the policy is an important factor in determining the success of the country. The benefits of education policy during the foundation will help us to see the value in the discovery and retrieval of information linked to the past and present. These studies will help us to learn lessons from the past to apply to the present. Knowledge gained from the study will help in understanding the problem, the cause of the problem, the impact of the problem, and also lead to cognitive diversity. This can bring about the knowledge which can be

used to specify the strategies in terms of policy strategy development to benefit the present and future.

**1.2 Research Objectives:**

To study the Cyber Korea 21 blueprint, the important national development strategy that pushed Korea forward to become a knowledge-based economy, and the Thailand Information and Communication Technology (ICT) Master Plan.

To compare the Cyber Korea 21 blueprint with the Thailand Information and Communication Technology (ICT) Master Plan to find a policy for Thailand's ICT development.

**1.3 Research Questions:**

In the case of Korea, what policies of ICT do they have, and how did their Government lay the basis of ICT in order to enable the rise of the knowledge-based economy?

Which aspects of Korea's experience in ICT development might be applicable for Thailand?

**1.4 Scope of the Study:**

This study focuses on Korea's development of ICT application by its promotion in the early phase during 1999-2002 when the Cyber Korea 21 blueprint was employed. The study also focuses on the Thailand Information and Communication Technology

(ICT) Master Plan during 2002-2006 when this promotion was applied. These two promotions had the same aim of transitioning both countries to become knowledge-based economies.

**1.5 Research Benefits:**

Be able to know and understand the ICT foundation in Korea through the Cyber Korea 21 blueprint.

Be able to understand the advantages of Cyber Korea 21's development in the context of a knowledge-based economy.

Be able to find a suitable policy for Thailand's ICT institutional development to become a knowledge-based economy learning from Korea.

**1.6 Methodology:**

A descriptive research methodology using interviews was used for this study. The purpose of this study is to examine how an ICT structure model and ICT development can be used together to create a basic economic knowledge system adapting the successful ICT development of Korea to improve the ICT structure in Thailand. All activities in research methodology will be applied to reach a solution and achieve the research objectives

.

- **Data Collection**

The research was conducted using both secondary data and primary data.

1. Secondary data are data that have been already collected and are readily available from other sources. The researcher analyzed all secondary data from documents, textbooks, research, articles and related ICT documents.

2. Primary data are data that have been directly collected from the interviews about finding a solution to develop the ICT platform in Thailand. The researcher collected the data from informants who answered the questionnaire.

- **Research Instruments**

The research instruments for collecting and gathering data were the interview and the use of documentary sources. The researcher conducted a semi-structured interview by focusing on education, ideas, theories, and other related research studies. The structure and characteristics of the research instrument have to cover all aspects of the research.



- **Informants**

The target informants were executives or ICT specialists. The researcher interviewed various different dominant ICT influencers such as the staff of Information and Communication Technology, the staff of the National Electronics and Computer Technology Center Executive, the staff of the Electronic Transactions Development

Agency and a professor of a Faculty of Information and Communication Technology. The researcher gathered all information from the informants in order to analyze their contents, ideas, theories and other related research studies.

- **Data Analysis**

The researcher collected all data from documents and other related research studies both in Thailand and in foreign countries, and also gained useful data from the semi-structured interviews. These interviews took place during June 2015 to August 2015 and each interview was of about 60 minutes' duration. Later, the researcher used all the information to create SWOT and TOWS before reaching conclusions and formulating suggestions for the development of the ICT platform in Thailand.

# CHAPTER II
# LITERATURE REVIEW

The study of ICT for the knowledge-based economy in South Korea: The researcher has studied and reviewed some of the literature in terms of content, concepts, principles and theories as the basis of the guidelines for this study, with the details as follows:

## 2.1 Concepts of information and communication technology

Youngyuth Chomchai summarized the meaning of ICT as follows.

Technology refers to the development of equipment, devices and methods of operation or solution by the application of scientific knowledge.

Information refers to the results from data analysis and data processing by changing and updating data to be systematic data and providing an outcome of useful content and appropriate format (Chomchai, 2011).

Information technology refers to the creation or management of data to be systematic by using scientific methods and computer technology so that the information becomes useful for everyone. Information technology cannot, however, deliver itself from one place to another, but needs communication technology and telecommunications to exchange or release information quickly through various communication devices.

Information technology and communication technology means technology used for creating information and then analyzing, processing or transmitting this information, as well as data storage and reuse (Master Plan of Technology by Thailand's Information and Communications: 2002-2006).

Kanchit Malaiwong gave the definition of information technology as computer technology that is used for data processing and disseminating information which can be used in various applications such as data collection, storage, processing, data display, copy and transfer, and information through telecommunication systems (Malaivongs, 1997).

Suriya Nateesirikul described the importance of information technology that can help to organize or manage large quantities of data to be systematic and to increase the capacity for production of information. Moreover, IT can store and retrieve data and can process information automatically. Users can access information more quickly and efficiently with faster interaction than ever (Nateesirikul, 2003).

Margaret Rouse defined ICT as having a broad meaning involving the use of communication devices and applications in various forms of services and applications which are differentiated according to their environment. For example, this includes ICT in education, health care, and other fields (Rouse, 2005).

Megha Gokhe stated that ICT is a leading form of information technology used in various activities by collecting, processing, storing, and displaying information. All activities need to be integrated in term of communications. Therefore, Information

Technology became Information and Communication Technology. ICT which has been customized and well-managed can be used uniquely and properly in local culture using varied concepts, objectives and methods (Gokhe).

It can be concluded that information and communication technology (ICT) has been widely used for information and communication management and that computer devices are important tools in sourcing, creating, processing, storing and transmitting data which will be accurate, effective and useful for the recipient. Later, such information will be disseminated to various media such as television, radio, online media (very popular media) and so forth. ICT use is not difficult since we understand the objectives of its use and can find the appropriate form of ICT that matches our objectives or type of work. Therefore, we can extract the complete benefits of ICT.

**2.2 Concept of the Knowledge Economy**

Jirattha Wichienpanya concluded that knowledge is what makes us understand, and is gained from experience and education. Information and data can help us to work effectively. The integration of experience, value, information and expertise will form a new experience and knowledge (Wichienpanya, 2006).

Knowledge is the result of study and research or learning from experience, both in terms of practices and skills (Dictionary of the Royal Academy, 1999). Knowledge is a key factor since when stepping into the era of the knowledge economy, organizations that can learn faster will have an advantage over the others.

Attawit Pinitnai defined the meaning of economic knowledge as the knowledge used in an economy to create, modify, and disseminate in order to support economic and social growth efficiency in terms of 4 basic factors as follows (Pinitnai, 2009):

1. Innovation System and Technological Adoption: with effectiveness at all levels and segments by those who are competent to supply, disseminate, share and take the appropriate knowledge to be functionally applied and to develop new technologies.

2. Educated, Creative, and Skilled Labor Force: are the main factors of an economic and social system that are necessary for the development of quality human resources able to construct, use, and disseminate knowledge by focusing on the infrastructure of education for the sound understanding and practical skills which need to be developed constantly.

3. Information and Communication Technologies: can help to disseminate technology so that anyone can access data and information from around the world and synthesize that data to become knowledge which can be applied to use for the benefit of society and the economy.

4. Economic and Institutional Regime: an environment that promotes the social acceptance of new ideas and encourages people to invent something new or to change and develop useful practices under the intervention of state policies.

OECD (1996) gives the meaning of “knowledge-based economy” as an economy that focuses heavily on knowledge applications in activities from production to product distribution. The economic model results from the awareness that

knowledge and technology are important to promote economic growth. Knowledge is the human capital and technology which has been used as the hub of economic development (OECD, 1996).

Pathumrat Jongkoonklang and Sirinat Osarn (2005) noted that the implementation and development of a learning society need readiness in two aspects (Pathumrat Jongkoonklang, 2005):

1. Development of an Information Society with the potential to support large quantities of information.

2. Development of a Knowledge-Based Society focused on human capacity and increased learning opportunities.

The development in both aspects mentioned above needs the physical infrastructure and technology, information and knowledge, personnel, and systematic management as the key factors in an information and knowledge-based society.

Phubeth Samuthjak (2009) stated that “learning societies lead to knowledge-based economies, which means the era of economic progress based on a manufacturing industry associated with the production and distribution of knowledge”. From the past, knowledge was only a peripheral factor, but in the knowledge-based economy, knowledge is the key factor for economic growth in the long term. Human capital has become the focus among economists because the knowledge that has been applied has been made by mankind (Samutachak, 2009).

Husain Nazish Irshad described the knowledge economy as focusing on knowledge creation and management. On the other hand, knowledge can be used for the benefit of business. The knowledge-based economy is the result of implementing change in the economic system through the integration of new technologies and knowledge which can be applied to the economic activities that are driven by IT and the emergence of globalization (Irshad, 2007).

The increasing globalization has been driven by flexibility of rules and radical changes in ICT. Many analysts describe economies which are becoming knowledge-based economies in terms of the expansion of IT as well. Researchers have summarized the key characteristics of the globalized knowledge economy as the advanced development of data processing by using networks and information which lead to the change and shortages of tacit knowledge as well as the changes in the organization and structure of production. Knowledge has distinct advantages and is unique in comparison with other factors. Knowledge is an inexhaustible resource and can be renewed for all time. The more knowledge is obtained, the greater the benefit for business. ICT used for information dissemination can be useful for reducing costs.

We can conclude that the knowledge-based economy is one form of economy that uses knowledge in the process to achieve the maximum benefit and creates innovation leading to the development of organizations to move forward with stability. The main mechanism driving such an economy is ICT because it is the medium that connects everything and helps recipients to use information effectively.

## 2.3 Related Research

From the literature, in a piece of work titled “Knowledge-based economies and information and communication technologies” by W. Edward Steinmueller, it is stated that knowledge-based societies have unique features from their outlines and paths of growth, with the key being the economic progress caused by activities or experiences used for innovative creation with value as well as knowledge transfer. The activities are integrated between modern and existing industries resulting from economic, technological, and social development (Kuznets, 1966). Knowledge-based economies reflect the quality of the organization and the living principles that led to the modernization and show the success of each country’s business and economic development by using such knowledge (Lundvall, 1992), Therefore the good performance of the economy is caused by the application of science and the insights from new technologies related to organizational knowledge and economic management. Moreover, knowledge can support and improve production efficiency, produce new industries, and grow and change the business models and structures of organizations as the most effective ways to build the greater economy. The key factor to support the economic development and production is ICT. The direction and rate of economic development is uneven, complicated, and can sometimes fail, but ICT acts as the driver of new industrial creation and development, especially in the field of information technology. ICT can be used for determining and controlling organizational structures and business models in order to develop better and more

accurate processes and develop the ability of information transmission within the organization caused by the thorough access to information. This has been a major component of social control in terms of remote communications since the past to the present. ICT also supports and develops public access by setting up points of public communication for the public to search for data, information, and knowledge. Besides using ICT to connect and exchange culture, knowledge, and other components, concern should also arise for the subsequent issues from using ICT such as the appropriate technical standards to promote new tools and techniques for economic development as well as the measurement of such consequences from government investment. This can be both useful and progressive, but it may also bring about social inequality from the access to information and knowledge as well as societal gaps and the separation of individual opinions within society. However, the state authorities should consider and emphasize the issue of public access policy in terms of education, culture and research in order to create international standards. This article pointed out that in many countries there is still a lack of research that focuses on the development of knowledge-based societies and this causes a lack of sufficient ability and experience to use ICT effectively. The major issues are funding to build learning centers and the lack of experts who have expertise in this field (Steinmueller, 2002).

Mohamed Neffati (2012) analyzed ICT in terms of informational innovation and the knowledge-based economy. In the era of globalization, IT is one of the key factors which leads to competitive advantages in businesses that focus on knowledge

development which is suitable for the organization instead of using low-cost labor to reduce the production cost. Therefore, we use limited human resources but more profitability, which can be counted as the international advantage. Information is an important factor for the process of social and economic development as well as information technology. Information can change the financial operations and other services and also lead to more effective human resources recruitment. For globalization, the transmission of information is a key factor for economic development and can stimulate the exchange of products and services including economic interdependency. The construction of the communication and information technology environment can build up the competitive advantage internationally. Knowledge creation can determine the survival of business organizations over the longer term and prevent them from being left behind. The process of knowledge creation causes innovations which add value as well as being the key to the success of international marketing. The innovations can develop a new model for which organizations or governments should provide support in order to promote the maximum utility from knowledge sharing. ICT is an important mechanism for driving the innovative process, with innovative technology having the highest number of patents and causing the dramatic changes in the IT industry, both in hardware and software, while ICT and the innovative process can support other economic sectors as well (OECD, 2000). ICT can block the process of market exclusivity and promote market mechanisms to be more efficient. ICT can grow and reduce the operation period. ICT

connects this world by its networks and results in greater and faster knowledge transmission than ever. Moreover, ICT combines science and its applications to show the potential and effective results. Economic development and growth require both innovative processes and ICT (Neffati, 2012).

The analysis of Chandra Debnath Sajit's "Key Determinants of Information and Communications Technology to Promote Knowledge-based Economy in East Asia", claimed that the knowledge-based economy involves knowledge creation and distribution to various economic sectors, and that knowledge has been created by innovative processes while technology progress can make the economy grow in the long term. The author showed the cost of the ICT sector both in urban and suburban areas of nations in East Asia. The appropriate factors of ICT can support the environmental development and create readiness for business competition. The analysis of this document found the "the relationship between ICT and the number of main telephone lines per 1000 population / the number of computers per 1000 population and the number of internet users per 1000 population" had statistical significance meaning that all three factors are important in promoting the knowledge-based economy to the countries in East Asia. There are also other factors that should be taken into consideration. The foundations of the knowledge-based economy are online security, the quality of the technology for providing services, individuals' skills and expertise, cooperation and mutual support between organizations in terms of technology and appropriated environment, and legitimate technology development.

The knowledge base is the utility of the know-how coupled with the use of the ICT infrastructure in appropriate ways; many governments in East Asia have developed excellent models for building knowledge-base economies (Chandra, 2013).

According to Alexandre Y. Mansourov, Korea took only 20 years to transform the country in the field of remote communication and the consumption patterns of their population. Korea started a new era with the reforms to become an industrial country which resulted in huge success, but at the same time many facilities lacked development. Therefore Korean people had to improve both their quality of life and the effectiveness of their communication, coupled with investment in education in a substantial way. This was the beginning of telecommunications development since the 1986 Asian Games and the 1988 Seoul Olympic Games. The Korean government responded to the local requirements and pressure from the international markets in allowing private companies to invest in this industry as well as foreign investors. In 1996, the Korean government issued the first master plan for promoting the emergence of information technology. In 1999, the government issued the second master plan called "Cyber Korea 21" which was designed to build the knowledge-based society. The results of the implementation of the second master plan were that "68% of the population had connection to the internet, 68% of all Koreans had mobile phones, and 70% of all households were broadband internet subscribers by the end of 2002. South Korea thus became the leading country in terms of IT infrastructure. Moreover, there are important variables within the IT industry that made the rapid growth of

South Korea's economy possible and contributed to the country's GDP increasing by 16% and exports increasing by 37.1% in 2003. In late 2002, the Korean government implemented e-government which had 11 projects under the scheme "Government for citizens or G4C" and an electronic procurement system called GePS-G2B. These systems made government operations more transparent and made it possible to check information in the databases of the government via the internet. The effects of these projects were the rapid growth of businesses that operated by electronic media, as well as to help foster financial transactions as it became easier and more convenient than before. IT has infiltrated every activity of the Korean people resulting in the rapid emergence of the knowledge-based society which has been very successful (Mansourov, 2005).

Ittipol Pretiprasong, Araya Chinworakomol, Weera Yooram, Suratsawadee Rakdee, Sirinart Rakdee, Pornchai Jiarawanich and Pamornsri Paibunruamsil are the research team who visited Korea and consulted experts in South Korea. The research team stated that South Korea has focused on promotion and support in terms of laws and policies, which is the vision of the South Korean government in driving the ICT strategy in terms of man, the economy, and social development. The "Master Plan" is related to ICT, which is in the initial phase that focuses on human development by cultivating awareness of the benefits of ICT among Korean people while promoting a learning culture among their youth. Later, the government provided the development of infrastructure to support the use of information technology within all areas of South

Korea to make ICT widely and easily accessible. Since the rapid growth of technology development, some social problems have been created in South Korea. Therefore, the South Korean government developed a better environment for users than ever. From these basic concepts, the South Korean government has promoted and developed its Master Plan for the development of Information and Communication Technology. During 1998-2001, South Korea created the Master Plan titled "Cyber Korea 21" to promote accessibility to the internet as well as administration to reduce the gap of internet accessibility among those who have low opportunities such as women, the elderly, and disabled people. A greater opportunity was provided uniformly and evenly to everyone under the operation of the Korean Agency for Digital Opportunity and Promotion (KADO). Since humanware and infrastructure are ready to use ICT effectively, the government began to focus on the use of ICT in terms of business as well as the stability and protection of internet users in all aspects (Ittipol Pretiprasong).

The research team summarized 5 fundamental factors in terms of ICT use as follows:

1. Promote opportunities for everyone for gaining knowledge development fairly from the government policies.

2. Contribute through a long term Master Plan with clear, systematic and continued details as well as linkage between agencies; although there will be political changes these should not affect the Master Plan. The Master Plan focuses on infrastructure of ICT using the humanware and culture of ICT, especially the ability to create and inspire creative ideas and thinking.

3. The government has seriously and effectively administered and managed the structure of government organization by linking all functions between various agencies to implement their operation under the Master Plan by dividing their responsibilities and functions according to the organization and by integrating their outcomes later with no redundant work.

4. The Korean government encourages people of all ages, and even disabled, elderly, or poor people to use the opportunity to take the benefits in the lives afforded by ICT. The government has continuously developed all areas and provided training as well as equipment to all parts of the country.

5. South Korea has grown the mutual belief and created the national culture for this way of living, and has generated the participation of the public in society. Everyone has perceived that ICT is a great opportunity which is relevant to them. The government has established an exhibition center to show public work, basic knowledge and the applications of ICT in various fields.

The exhibition center known as “Korea Content Fair” aims to create inspiration and encourage the development of ICT for the people of Korea. It has been established under a partnership with the Korean Game Industry Agency (KOGA), the Korean Culture and Content Agency (KOCCA), the Ministry of Culture, Tourism and Sports, and the Commercial Technology Agency.

The academic writings, “ICTs for a Knowledge-Based Economy” of Dongpyo Hong, Sangwonko and Alexey Volynets cover the whole development process from

the initiation to the results of ICT development. Moreover, the authors also discuss the importance of ICT development towards South Korea's knowledge-based economy, which performs as the solution to economic recession and the medium to propel industrial ICT growth. South Korea has set up innovative ICT platforms to effectively develop, apply and share information with all users through the developed telecommunications market. South Korea has used privatization, liberalization, and facility-based competition to enlarge and enroot the ICT platform in society in order to get high quality services at lower prices with increasing numbers of internet users. This country chooses facility-based competition as the major mechanism to push the national economy forward. For this economic competition, businessmen have to create their own facilities so that they are able to provide services. This mechanism is very effective for encouraging the growth of the local market. Even though the competition has to use a very high budget, it is possible to develop as a content sector because of the stable and effective foundation. The South Korean government supports their citizens with broadband internet access anytime, anywhere. Therefore, the broadband internet services tend to continuously grow as a result of these reasons. Firstly, there are various battles among technology industries that have served to transform the old system into a new quality system with attractive promotion. Secondly, the topography of South Korea is suitable for setting up broadband internet connections. Thirdly, the South Korean government focuses on the importance of planning and making agreements so that the huge and trendy ICT can be developed

more quickly than in other countries. Lastly, an advanced telecommunications network is very useful for the country's development. The South Korean government supports their people nationwide to learn and educate themselves through the basic ICT education program. There are various activities and projects which are created for their citizens, especially disadvantaged people in the agricultural sector. In terms of the education sector, the government lets 10,064 schools access and install the internet at school and also trains teachers how to apply ICT in daily life in order to become specialists who are able to pass on this knowledge to their students. Moreover, another important sector that propels the successful development of ICT is the ICT industry. The factors that help the industrial sector rapidly progress are R&D, Human Resources and ICT, Venture Enterprises, and Venture Capital. Korea continuously and heavily invests in R&D since it expects to change its position from follower to leader of ICT in the world. As the private sector has invested heavily in R&D for ICT, the government can place more emphasis on strategic ICT areas that lead to social returns. In 2003, the South Korean government established ICT development programs covering 3 aspects as follows: first, the strategic R&D project requires long-term investment and encourages cooperative research with private enterprises and universities in the Leading Technology Development Program. The second program is the Industrial ICT Development Program which performs as a financial assistant to private ICT by focusing on technology applications. The third and final program is the New Technology Support Program which is created especially to support new SMEs in the ICT sector

and also takes care of management systems and the search for partnerships who want to bring products into the market. The government facilitates the development of ICT research at many universities and offers international scholarships at well-known colleges to their own students and researchers. Even though South Korea had been through the financial recession in 2001 which reduced the numbers of certified venture businesses, Korea still possesses overall venture market growth in South Korea. In Korea, companies are separated into two types in the venture capital industry: start-up investment companies (SICs), and new technology financing companies (NTFCs). IT-based firms mentioned that there was investment of up to 70% of total venture capital investment during 1999-2000. Even though the investment in venture capital funds was very high, there were still problems. Firstly, since 2001, the turnover of start-up investment companies had been continuously declining because the business environment was not supported. Therefore, it resulted in start-up companies having lesser funding. However, during 2004-2005 the government chose to give more funds to start-up investment companies. Secondly, the industrial policies did not cover every kind of industry and the development of each company was not at the same level. Lastly, the venture capital funds are only provided for start–up companies but they are not used for improving or changing existing companies to become better. Furthermore, South Korea also promotes the business competition policy in order to extend and develop the basic structure of ICT by focusing on developing the local market to be the foundation (Dongpyo Hong, 2007).

"A development Strategy for Korea's Information Society" was written by Chang-Bun Yoon and Sang-Young Sonn, and is about the analysis of the social change accomplishment. This change mainly focuses on the genre of information that is the main factor to create a better quality of life and work for Korean citizens (Chang-Bun Yoon, 2003) . In 1977, there was an economic recession in Asia that affected all the countries in this zone. Therefore, the Korean government sought an urgent solution to solve this recession by trying to create a sustainable information society in order to support growing globalization. Hence, the Korean government decided to launch the platform project for becoming an information society named "Cyber Korea 21". Firstly, this project aimed to progress the Korean basic structure by starting from developing data communication and the networks. Cyber Korea 21 used the 1999 white paper plan as the key method to achieve its main objectives. Then, it pushed society to be much more competitive to motivate the strong communications market. Resulting from the strong competition, there are more internet users in the network and also lower internet expenses. The Korean government intends to set the knowledge and ability of computer use for Korean people and disadvantaged people because the government realizes that the internet is the infrastructure of society nowadays. Moreover, the government has developed and changed some laws and regulations in order to change the old-fashioned society to be a new information society. One more important thing is that Cyber Korea 21 provides safety in using data and also establishes morality in using telecommunications to create creditability and safety in the national

information system. Secondly, the government intends to make use of IT effectively in adjusting Korean infrastructure in order to change the old-fashioned society into a digital society by planning the process to achieve that goal. Moreover, the Korean government has to quickly generate knowledge management to increase the effectiveness of using information. The IT knowledge management will lead and connect all Koreans to use services from the government via public websites or public institutes. It makes the administration of government easier and can reach people and meet their needs directly. Also, this plan steadily builds a stable IT foundation for e-government which reduces the cost and period of shipping which can thus boost the level of production and productivity. In terms of industrial business, IT is applied to be a key aid to production, often as part of an e-commerce system. IT can reduce the cost of production and also reinforce the effectiveness of working processes; however, the use of IT in social development might also bring about negative effects. These effects are the lack of information sharing and the delay of information exposure in online administration in government networks such as ministries, government organizations, and government officers. Thirdly, Cyber Korea 21 is concerned about creating new online businesses. Therefore, it aims to develop the information infrastructure and IT industry since these are the foundation of online business. If the online industry is growing from a safe and steady internet base, there will be more opportunity to hire more workers and increase the capacity to compete in the business network. The growth of online business has helped the Korean economy to increase

by around 18.8% since 1997. Accordingly, the IT industry in Korea has become the main factor used to conquer the recession and restore economic growth since 1997.

Lastly, this program plans to build up the ability of IT use to compete with other businesses in the global market. For instance, preparing digital TV to support the international trend in the convergence era can stimulate domestic spending on IT products. Moreover, the Korean government had set about 174 technologies for the technology development campaign in 2000 in order to obtain a competitive advantage and focus on long-term development.

According to all the objectives of Chang and Sang, it can be concluded that setting and providing a high speed communication network is the main factor behind Korea's accomplishment of society development. Technology can increase the capability of production and provide a guarantee against corruption. Nevertheless, the developed technology results in an incomplete society along with business development. Therefore, the policy about information in the future has to rely on the importance of laws and regulations. Also, the government needs to persuade people to use IT as a tool to develop businesses and the economy. As a national IT plan, Cyber Korea 21 intentionally aims to create IT infrastructure and to act as an important tool to manage IT in order to develop the Korean economy.

The World Bank suggests that firms with high rates of ICT utilization have higher business growth rates than others in terms of management and employment. (The conclusion of a World Bank Survey which surveyed more than 20,000 companies

among developing countries)(World Bank). The perfect integration of ICT and the operation of each company is a very important process including the flexibility of rules and regulations that allows the private sector to invest and drive the telecoms industry. The statement has been used for the measurement of the ICT circumstances in Thailand. Thailand has lagged behind other countries in the region despite Thailand having reasonable ICT cost prices. However, there is a low number of fixed telephone line users in Thailand, and since 2005 a high number of mobile phone users. Thailand had a low number of broadband internet users in both fixed and mobile variants. Thailand has developed many plans relating to ICT and can still benefit in the long term. Thailand needs the development of educational quality, especially in using IT because IT will provide good results by integrating with learning and teaching in the classroom by teachers who are trained to use these tools well.

Sirirat Jampeerieung and Amon Wattanathorn stated that Thai society has a wide range of knowledge but it lacks proper management; therefore people cannot understand and integrate their existing knowledge with new knowledge in terms of information technology to develop innovation and the key components of the knowledge management process (Sirirat Jampeerieung, 2010) . The integration needs to be a balance of “people, technology, and knowledge processing”. The improvement of humanware is absolutely essential in the creation and development of educational programs that can make people gain a greater knowledge base, especially in terms of knowledge of technology and the ability to think critically and

synthesize knowledge from both inside and outside the classroom. Moreover, the internet is another channel that is important for knowledge learning and research. The author illustrated knowledge management processing in the knowledge-based economy among Thai communities on the website “Thaitambol.com”. This website used information technology in its design, manufacturing, and product distribution, while the website helps the public to trade gold online easily and conveniently; therefore, the provision of knowledge of information systems, information and technology use is essential in making trades, but it should be possible also to develop other knowledge at the same time. In the knowledge-based economy, this was a major factor to bring out the utility of self-capacity as well as other resources such as natural resources, the environment, society, culture, and the traditions of the nation which can bring sustainability concurrently through means beyond the concern with the Thai identity.



Trairat Chatkaew mentioned the importance of knowledge that can be derived from perceptions. Both are the fundamentals for the life of ever profession. This is the era of globalization, in which everything is connected, with the result that everyone can gain knowledge and develop themselves to build up competitiveness. The knowledge-based economy is a very important factor behind the development of countries and organizations. Everyone has knowledge but it depends on how they use this knowledge to their benefit and how they manage this knowledge for its sustainability. Thailand has rich natural resources such as Thai rice, herbs, tourism,

famous athletes, and so forth, which have unique identities in comparison with other countries. Thailand needs to improve its knowledge-based economy through knowledge management for Thai people; therefore Thailand can gain the development and sustainability of its knowledge-based economy. Researchers have raised the case study of Singapore because Singapore has a small area without any agricultural sector. Singaporean leaders had seen human resources as the most precious resource of their country. They believed that "humans can create everything" and "knowledge is the important driver". The education in Singapore is a very important factor for success. In 2002, Singapore invested more than 24,000 million baht in information technology for more than 300 schools and it was also very successful for competition. F1 could earn enormous income for Singapore. For Thailand, we need to understand our strengths and weaknesses as well as the knowledge-based economy which does not need the investment of much capital but can be done immediately. Nevertheless, it must be based on leadership as well (Chartkaew, 2008).

From an article questioning whether Thailand has a knowledge-based economy or not, by Taechasith Sethcheu, it was stated that since 1997, Thailand has faced a severe economic crisis and could not compete with the rapid improvement in neighboring countries. IT is an important factor for national improvement. It is the major driver for the New Economy. Thailand has rich natural resources as well as human resources potential that can be developed further. Thailand's human resources

represent another factor that will make rapid national improvement, but Thailand needs serious development of these human resources to become a knowledge-based economy. This can change tacit knowledge to become explicit knowledge by the process of knowledge management (Setcheu, 2007).

Taechasith Sethcheu has analyzed 4 main factors that contribute to a national knowledge-based economy as follows:

1. Development of innovation, creativity, and technological adoption to be effective at all levels and in all segments to improve existing activities and pursue new technologies, while Thailand has fallen behind other countries.

2. Development of infrastructure for education in both formal and informal aspects. The population can gain ability for creativity and knowledge utilization as well as knowledge diffusion into the economy and society.

3. The compatibility of technologies in various areas such as ICT will cause knowledge diffusion, utilization and easy access to information for everyone and from everywhere. Therefore, data can be synthesized and applied. ICT is an integral part for supporting a country moving to become a knowledge-based economy, so the Thai population can improve their capabilities and generate income.

4. Encourage people in society to be open and accepting and to invent new ideas by using circumstances and economic institutions coupled with state policies to create partnerships for knowledge creation and sharing.

While Thailand has also faced strong competition in terms of cheap labor wage rates, it can no longer rely on its own cheap labor as its strength. Therefore, increasing the intellectual capital in the development of human resources is the most important factor. ICT is the major tool and it needs economic restructuring and educational reform in order to accelerate the Thai people toward ICT implementation.

From the aforementioned literature, ICT and the knowledge-based economy are mutually supportive. ICT acts as a tool for knowledge diffusion among knowledge-based economies to the public, private sector, government and organizations to gain the benefits. Therefore, the foundation of infrastructure and environment for ICT coupled with the development of human resources drives the knowledge-based economy for success within ASEAN. ICT can allow various operations to be transparent because it can be checked, save time, and can be effectively applied to all sectors. A study of the literature related to the use of ICT to develop the knowledge-based economy permits the conclusion that Korea has been highly successful in the development of ICT policies which have received serious support from the Korean government starting from human improvement. In terms of quality of life improvement, ICT potential and the updating of legislation to support the rigid improvement of human resources brought success. Moreover, the management that connected various functions among working units and departments to follow the same Master Plan as well as the division of the responsible organizations to avoid the duplication of work were key factors. For Thailand, some may raise the question of

why Thailand is still lagging behind other countries in terms of ICT and the knowledge-based economy. Thailand lacked ICT knowledge diffusion coupled with a low number of fixed telephone lines, which resulted in the absence of key factors to promote the knowledge-based economy. Moreover, Thailand still has a shortage of ICT professionals. Therefore, it is necessary to develop human resources and provide ICT readiness to maximize the benefits for the improvement of the knowledge-based economy. As a result, I will study the Information Communication Technology (ICT) policies among South Korea, Malaysia, and Thailand to analyze and compare in order that Thailand can take these two countries as examples to develop its own knowledge-based economy.

# CHAPTER III
# SOUTH KOREA AND THAILAND MASTER PLANS FOR A KNOWLEDGE-BASED ECONOMY

## 3.1 Cyber Korea 21

### 3.1.1 Establishment

The world is changing from the industrial world into the world of knowledge economy, which has information and knowledge as valuable resources that are able to increase the value of the products. It is reported that knowledge-based industries of OECD countries has the average at 34% of the total GDP. According to the report of 1998 World Development by World Bank, it was revealed that the main factors developing economy to be successful depends on creation, diffusion & utilization of knowledge.



Since the year of 1960, Korea has been using industrial technology to develop the country, which leads the country to be one of the members of OECD and known as a country with rapid development. Between the year of 1990 and 1999, Korea had been facing underdeveloped technology crisis causing the country to the beginning era of economic crisis with gaps of knowledge and skilled citizens with knowledge management. Even though there was a fact that Korea had been investing in the business field continuously, the business was not successful and the country was not developed due to this problem. Nonetheless, the problem pushed Korea forward to

develop its potential in order to have knowledge-based economy. The process started with the establishment of the strong information infrastructure through the better and faster communication systems. Later on, Korea has been developing itself in terms of telecommunications network & information technology. The procedure helps improve the effectiveness and the faithfulness of the government, private companies, and society, and develop the industrial sectors into knowledge-based industries.

### 3.1.2 The Vision

The Ministry of Information and Communication or MIC of the South Korean government established an organization that was responsible for establishing the creative knowledge-based nation, including the establishment of the equality and the improvement of quality of life among citizens. The model scheme were able to increase the GDP share of the domestic knowledge-based industries to be even with the developed countries and take a step forward to be one of the advanced informatization countries before turning 2002.

### 3.1.3 Basic Objectives

1. During the beginning of the MIC, there was a plan of bringing broadband system that was more efficient in order to offer the faster internet services within the year of 2002. Korea focused on being the leader of computer knowledge by supporting the informatization education broadly. The Council of Ministers had been expanding and

improving the laws and regulations with the purpose of the transformation into knowledge-based society.

2. Organizations, such as government, private companies, and business sectors, indicated their reliability and enhanced their effectiveness by adopting the effective Broadband Telecommunications Network and information technology in the ministries. The process turned the prior industrial state into the knowledge-based and applied the knowledge-based management skills with other various industries such as agriculture, fishery, forestry, manufacturing and services. Moreover, the Council of Ministers supported the advanced learning of the brand-new knowledge of the workers throughout the course.

3. The government supported the recent business by enabling them to apply the information infrastructure with the purpose of generating more benefits and creating more job opportunities.

4. The government specified the information technology products and services with the capacity to compete in the world market, as well as economically supported the products and services in order to apply with the improvement of related technology.

### 3.1.4 Strategies

This part is divided into 3 clear aims which are detailed below.

Chapter 1 : Establishment of an Information Infrastructure for constructing a creative, knowledge-Based Nation

1. MIC aimed to expand its telecommunication networks to be able to comfortably get accessed the high-speed communication services anywhere with the process of establishing Korean Information Infrastructure (KII) with the budget at 10.4 trillion won which was finished by 2002. The project constructed the accessible environment for citizens, thus they were able to approach various multimedia services without restriction of time and places. The Ministry also stimulated the private sectors to invest in establishing the information infrastructure swiftly through generating the environment that was appropriate for the competition and having the ability to facilitate the telecommunication service providers. Moreover, the Ministry constructed the neutral competitive markets, and stimulated and support the basement construction of the recent buildings, including the commercial buildings and residential buildings, thus they had a capacity to offer the high-speed network services. Test-bed network would be continuously upgraded to facilitate productive R&D in university & research institutes in various fields for the next-generation internet.

2. The MIC would like to support the Globalization of Operating Systems through the creation of the environment that was able to swiftly exchange the knowledge and date with anybody without the restriction of places, which would be supported by various internet-based systems through the Informatization Support Project. Additionally, the global open standard was systemically and broadly adopted by the MIC through the management, origin, the delivery of the data, and the proper and efficient connection of each project. Also, the new laws & regulations would be

employed with the focus on the delivery of the data into the public, and the environmental development that would be in favor of the use of the internet of primary schools, secondary schools, high schools. These schools also received complimentary satellite dishes with the purpose of improving the internet services. Police and soldiers also had the ability to get accessed to the advanced telecommunications services through the satellite dishes. The practice of the internet services swiftly expanded in the country due to the continuous development of the pricing strategy, which offered a number of forms with reasonable costs that would suitable with the practice of the consumers. Another project was the base generation of the national information and data administration, which would be approached by collecting all the knowledge and information of the general public use. The data would be transformed into digital data and preserved as digitized information and knowledge, which would be able to share and forward on the internet.

3 .Korea aimed to be the leader in the field of computer knowledge by establishing the environment for the citizens to be able to get accessed the informatization education with the purpose of the transformation into the knowledge-based society. Thousands of teachers from various schools would be trained to be the leaders of informatization education programs within 2002. All the school would get to participate the informatization training course, which would increase the multimedia data consumers in the fields of schooling, multimedia technology purposes, training process that were different from the previous basic computer courses. Moreover, the Computer

Literacy Certification System was recommended to be applied in terms of government evaluation and university entrance as it was reliable and neutral. The procurement of a computer for each citizen, including the maids, businessmen, and students, as well as the public computers in the post offices were also adopted with the purpose of decreasing the gaps of obtaining the information. Additionally, the Ministry facilitates the informatization education for disabled people, housewives, and independent businessman in various organizations.

4. In terms of environment, laws and regulations, MIC renewed the regulations concerning the protection and support of the privacy for each person and consumer, and aimed to expand the popularity of the online shopping malls by adjusting the complex regulations and launching new laws. Also, MIC supported the "Act on the Contract in which the nation is the Contracting Party" in order to transform the form into digital, as well as support all the processes of the purchase of the government in terms of digital devices and data.

5. Creating a Safe Information Utilization System and a Sound Information Culture

The MIC has already accomplished a plan that would be enforced for protecting personal information and maintaining its security following to the law. The plan includes the protection of inappropriate information with the purpose of citizens possessing abilities to make use of the data safely. Thus, the ministry supports the CONCERT terms (Consortium of Computer Emergency Response Teams) to be enforced in order to counter against the computer hacking incidents and computer viruses. The

crucial law and regulations were also established in order to set up a trans-governmental council body. The MIC has been pushing forward the development of the Information Security Technology to be able to be adapted with the industrial and education sectors, as well as research communities. The process would be fulfilled by supporting the R&D establishment, and supporting the addition of specialists by encouraging them to take a writing program course concerning information security. In terms of e-commerce section, the encryption system is considered as a crucial part helping the section to be more reliable and more secure. In order to achieve the objectives, the ministry has overhauled the laws and regulations to support the development and benefits of the system. Moreover, the ministry has developed the technology related to the establishment of the Digital Signature Certification System with the purpose of making the online transaction to be more reliable and more secure.



Chapter2 Increasing National Productivity by Facilitating Knowledge Information Infrastructure

1 Building a Small but Efficient Digital Government

In order to increase the efficiency of IT for making the most beneficial out of it, the administrative procedure needs to be revised as it would support the information age. The very first process that needs to be done is to prosper the laws and regulations. The MIC also transfers from using paper driven document management system into paperless digital documentation system, which could be adopted to prepare digital

authorization and distribution of digital documents. Senior government officials would get the right to apply the system with the Information Resource Management first. There is also a creation of information concerning resident, real estate, and automobile databases, which would be divided following to each agency and their function during the process of establishing this master plan. Nonetheless, these items would be slowly united after a while, and that would form a broad national network based on ATM switching technology. The MIC will be promoting financial informatization in order to enhance its efficiency, transparency, and accountability of financial activities, as well as establishing scientific financial management and operation system. In the year of 1999, a financial information system would be generated with the purpose of arranging the nation's financial affairs. Then, the audit system, which connects to the financial information system, would be manufactured.

The ministry develops the Civil Administrative Services through the process of providing various services at a spot. Besides, on-line services catered through Administrative Information System in cities, countries, and districts would be launched. The ministry is planning to develop and expand the KIOSKs providing various certificate issuance services to the general public anywhere at any time.

In order to facilitate the digitization of government information, the MIC will be setting up index databases of all government documents to be available on the internet. The public institutions and government ministries and departments will be obligated to disclose such information to the general public.

In terms of law enforcement and judicial informatization, the ministry is planning to create a Digitized National Assembly by setting up an effective Legislative Information Support Service System in order to assist judicial activities, and to provide legislative information on the internet.

In terms of environment and disaster, an Environmental Information Management System would be established by facilitating the shared usage of environmental information, and establishing a comprehensive environment-related database and an information system. The Welfare Administrative Services would be advanced by sharing medical information and expanding medical insurance EDI, promoting medical supply distribution EDI, and establishing an integrated information system for the major types of social insurance.

2. Improving the Productivity of Existing Industries by Creating a Knowledge Management System

The MIC intends to revamp the agriculture, fisheries, manufacturing, service industry, and other existing industries as knowledge-based industries by IT strategies to raise productivity and create high added value.

The process starts from the assistance in business informatization through helping the Comprehensive Digitization of Government Procurement achieve its objectives, which would help with the transparency and efficiency of the system. The Ministry will draw up a Public Corporation Informatization Plan to lead informatization in the private sector and to achieve managerial innovation in the public sector. One

part of the plan will be to establish and operate a “Public Corporation Informatization Promotion Council” Which will be composed of experts from the MIC and Planning and Budget Commission. In addition, the “Public Corporation Informatization Assistance Group” will provide professional evaluation and consultation for public corporations. The MIC will also be building networks that link companies in the same industry or sector, and promoting network standardization in these industries to reduce sales and inventory costs. Industry, universities, and research institutes will all join in to develop and promote a standard Enterprise Resource Plan (ERP) suitable for Korea which the MIC will support this research with the necessary funds, technology, and expert guidance.

The MIC will use informatization to strengthen Korea’s Industrial Base by supporting the restructuring of the domestic financial sector with informatization to strengthen international competitiveness and to expand customer-oriented marketing, expanding the Industrial Information Database and Establishing a Common Network, creating an Industrial Human Resource Information Distribution System, digitizing supply, order, and shipping management in production organizations to improve the distribution system of agricultural and fishery products by using EDI and Internet shopping malls including expanding “electronic bidding” in the wholesale market for real-time analysis and collection of distribution information to reduce distribution costs for the benefit of both producers and customers as well as establish fair pricing and remove the skepticism of farmers.

A shared distribution information utilization system can track distribution processes and the flow of goods by using databases that contain information from separately established rails, ports, and road networks including enlarge and link to other immigration-related agency systems to create a one-stop service system that covers all administrative work related to the distribution of imports and exports. Basic information on buildings, roads, rivers, information on forests, land, other geographical features, and urban underground facilities, such as waterworks, gas, and telecommunications, will also be gradually digitized. The MIC will also be establishing an Intelligent Transportation Information System by using wired and wireless telecommunications networks, and providing a wide range of transportation data services through the Internet, wireless handsets, and digital maps for efficient traffic management.

3. Strengthening Individual's Capabilities through New Knowledge Worker Drive

The MIC will be encouraging "New Knowledge Workers", who increase productivity and to create added value by using information and knowledge in each individual's work environment.

The government would support through searching for these workers with modern knowledge by setting up a contest by a newspaper and broadcasting agencies, developing the curriculum to focus on factual knowledge, descriptive knowledge, and working knowledge, as well as supporting the formation of environment to be appropriate with the education system. Besides, the establishment of a Life-Long

Education System would be achieved as well. At the same time, the government will be creating a legal basis for cyber universities by legislating the tentatively-named "Regulations on Establishing and Managing Cyber Universities" by 2002. It will also develop a large range of educational programs that link education institutes with labor markets to increase flexibility in the labor market and competitiveness in the professional work force.

Chapter3 Creating New Jobs by Using Information Infrastructure

1. Fostering New Internet-Based Industries

In terms of facilitating electronic commerce, the first step is to help expand the reliability and security of e-commerce. The MIC would protect personal information and rights of consumers, and establish the effective system that is able to perform each work rapidly. Then, the organization of English on-line shopping malls would be in process to facilitate the export of regional goods and products for high-growth Korean SMEs for hundred thousands of customers around the world. Another step is that the creation of new jobs which would be fulfilled by supporting IP and ISP industry to generate environment that would be comfortable for everyone to be able to develop ideas for business, as well as supporting content development for accumulating information in cyber space. Facilitating the software industry is considered as another way that the government could apply with business sector in order to help the business exceedingly develop itself through environment and

infrastructure such as the procurement of high-speed networks, low IT user fees, and low leasing fees.

The MIC will be working to enlarge the domestic software market by linking companies with various informatization projects, exploiting Overseas Market, and diversifying Channels for Software distribution through e-commerce by increasing the number of cyber shopping malls and export web sites, including the setting up of cyber markets in the Korean Institute of Multimedia Contents and Software.

In terms of capital, government has supported the IT Venture Companies by creating a Base for IT Venture Businesses in Universities and Research Institutes, facilitating Investments in SMEs and Venture Companies in the IT Industry, and supporting Technological Development in SMEs and Venture Companies in the IT Industry. Regarding Cultural Industry, the MIC will be establishing a video-game industry information database. In addition, it is planning to expand the amount of venture capital funds available to video game and animation start-ups by opening investment roadshows and establishing professional IT investment associations. The Ministry will be promoting the construction of permanent exhibition halls and distributions centers to increase the number of distribution channels.

2. Facilitating IT Industries

There are two factors pushing forward the objectives to be achieved. The first factor is fostering IT R&D and Related Human Resources by supporting high-tech equipment availability in vocational schools, colleges, universities, and graduate

schools, reinforcing job training in software and professional multimedia content areas for jobless university graduates, and improving IT Expert Certification System to increase the efficiency of Korea's labor market for fostering new industries. The second factor is fostering IT equipment industries and increasing overseas entrance which would be done by energizing the IT equipment industry, promoting IT exports, and broadcasting of Digital TV early. The Ministry will be pushing for the early broadcasting of digital TV to cope technically with the international trend of convergence between telecommunications and broadcasting in major advanced nations.

### 3.2 Thailand Information and Communication Technology (ICT) Master Plan (2002-2006)

The Master Plan is considered as the national one that would reflect the policies and the principle keys of "information technology policies in Thailand between 2001 and 2010", in order to be used as visions, obligations, principle purposes, strategies, and plans during the first five years. This is because IT 2010 would take a long time to proceed, as well as the rapid changes in technology nowadays. This scheme reveals SWOT analysis of the information and communication technologies in Thailand, with the purposes of having an excellent model scheme, which would lead to the specification of visions, obligations, principle purposes, and main strategies of model scheme of information technology policies. These policies are expected to develop the country in terms of intellect and learning. During the year of 2001 until 2010, the policies are as follows;

- The investment of generating human resources with appropriate knowledge in time
- The encouragement of having an innovation that is appropriate for the changes of economic and social systems
- The investment and encouragement of having a basic structure of technology and related industries seriously and continually

The status of research, and information technology and communication development in Thailand is reported to have the costs for research and development

with the rank of 46, comparing to the overall products of the country, out of 49 countries in 2001, and all the costs for the research and science and technology development was approximately 0.01 percent of gross domestic products in the country. The costs for research and development of the information technology and communication was only 0.062 percent out of the total, which is considered to be very low and that it is a weak point that would affect the development of information technology and communication in Thailand in the following period of time. This is because of the lack of upstream industries, and the development added from the specific products of information technology and communication. According to this situation, Thailand has to depend on technology from overseas. During the usage of the policy of IT 2000, governmental markets do not have information technology and communication expenses as much, which responds to the purposes stated on the policy. This causes the development of information technology and communication for the government's administration and services not successful as much as it is supposed to be. In terms of information, it is found that the investment and collection are duplicated such as personal data that is collected by the government with the usage of different codes depending on the office and the way they exchange the data through hard copy documents. In terms of the administration, government offices are still lack of staff with sufficient knowledge concerning data management. Even though there is a chief information officer at each office, it is still considered that the resource management and proper work structure for chief information officer is needed.

Moreover, the problem of shorting of governmental staff with information technology knowledge is one of the factors holding back the development of information and communication technologies.

### 3.2.1 Vision

Thailand becomes the regional center for ICT development and business, in particular for software technology. Entrepreneurs and citizens have an equitable access to information. Direct benefits of ICT are manifested throughout the Thai economy, adding value to products and services of every sector, including ICT sector, as well as strengthening their competitiveness in the global market. ICT becomes instrumental in the enhancement of Thai quality of life as country moves towards a Knowledge-based Society.



### 3.2.2 Missions

Enhancing the collaboration of the public and private sectors to form a development network of information systems and infrastructure, including the reform of ICT management as well as planning for research, education and training.

### 3.2.3 Objectives

1. Application of ICT to increase the country's economic competitiveness.

2. Application of ICT to develop Knowledge-based Society.

3. Application of ICT for sustainable development through equitable access to all.

4. Development of ICT business and industry to reach its full potential.

### 3.2.4 Goals

1. Development and upgrading of the economy by using ICT.

2. Enhancement of the competitiveness of the ICT industry.

3. Development of human resources by increasing the application of ICT in education and training.

4. Strengthening the rural community for sustainable development.

### 3.2.5 Strategies

The first strategy: the development of information and communication technology industries in order to be the leader of the region

1.1 develop the information and communication technology industries that focuses on the industries that are more potential in Thailand, such as Software Industry. There would be an organization that is run by the government and public sectors in terms of Software Industry Promotion Board or SIPB, encouraging the software industry development in order to found Software Industry Promotion Agency or SIPA that is flexible with changes, able to appoint methods and measures that are needed to be used to achieve the software industry development, including the research and software development.

1.2 encourage SIPA to create methods to stimulate the development of information and communication technologies as follows;

1. find an investment that would come in terms of seed money from the government and other sectors such as venture capital, matching fund, and soft loan.

2. specify rules and regulations in order to manage the stated capital professionally.

3. In some cases, use the policies to support the investment in order to convince successful foreign software companies and to get some privileges with the condition of mainly broadcasting the technology to Thai entrepreneurs.

1.3 stimulate the government and private sectors work on developing and encouraging the sales of products together or consume software developed by entrepreneurs in the country to support them to be successful and be able to expand markets in overseas.

1.4 develop the tracking system of process evaluation of the Software Industry Promotion Agency or SIPA and effects toward economy and society of the country with the appropriate indicators.

1.5 publish a model scheme with the purpose of developing staff in the information and communication technology sector quantitatively and qualitatively for the ongoing development in 10 years, which has main principles as follows;

1. form a commitee which would work on the policies with the government, industries, educational sectors that are universities and vocational colleges. They would study

and set up a model scheme developing human resources that would fit the demand of software industry.

2. expand the amount of teaching staff and the developing software reseachers, the ones that are already officers and the new ones, to be twice as much in 5 years.

3. establish professional training in order to generate staff for software industry rapidly and professtionally

4. survey the type and the number of staff that would be instructures, researchers, and performers in the software business and ask foreign specialists to participate in the process of education, training and practice.

5. make a connection between the educational sector and the industry sector, which would help the students to be able to get the internship with the private companies or get the job after the courses are finished, as well as the exchange of staff in the information and communication technology sector in other businesses, including institutions.

6. provide capital to be used with the staff development in the information and communication technology sector, especially the software industry and the adjustment of staff in other sectors to be appropriate with this field. The process would be engaged with the financial institutions for the loan with less expensive interest.

1.6 develop the skills of enterprenuers and Thai software developers in terms of applying coding programs, as well as other advanced software systems such as mobile

internet application and web service. The developing process would depend on art skills and meticulousness of Thai people.

1.7 develop software products' quality and services to get the international standards.

1.8 encourage the related industries to set up the testing center for investigating information and communication technology products' standards in order to advance its quality among the international markets.

1.9 encourage the private companies to invest in the hardware industry, which is related to the software industry, in order to expand the border of the information and communication technology industry and turned to be strong and varied clusters.

1.10 rush the process of setting up new regulations concerning information technology that Ministry of Science and Technology has not finished into the legislative procedure and make it become effective in 1-2 years ahead. These regulations include National Information Infrastructure Law, Data Protection Law, Computer Crime Law, and Electronic Transaction. This process would help the information and communication technology development fulfilled.

The second strategy: the usage of information and communication technology with the purpose of advancing the quality of Thai people's life and the society

2.1 develop the fundamental structure of communication system by improving and expanding the one that is monopolized by the government. Thus, the system becomes independent business, and be able to offer consumers reasonable price and get

accessed at any areas. Also, to get these two regulations concerning communication system effective as soon as possible in order to achieve the purposes.

2.2 gain advantages of regulations concerning basic structure of governmental information technology that is released on the 78th sector of Constitution of the Kingdom of Thailand 1997.

2.3 encourage private sector, institutions, and officers in the local institutions to produce electronic media, educationally train staff to be able to produce the kind of media effectively, and stimulate the government to found a data center in order to store educational course-ware and let institutions upload online documents with no further costs.

2.4 encourage translators to translate books, documents, information from foreign languages into Thai, and from Thai into other languages in order to help citizens to get accessed to the information that is in other languages and to expand the information into other languages easily.

2.5 use the benefits of information and communication technologies to be one of the factors supporting economic development policies in order to developing information and knowledge that would support the way and quality of life.2.6 publish the correct and secure practice of information and communication technologies for citizens.

2.7 encourage local organizations to gain the advantages of technology basic structure and other electronic media, and adjust it with the administration within the office and services for citizens.

2.8 prepare human resource to have a good command of using computer and other technologies, able to research information technology and think critically, have a consideration toward things, and able to learn permanently with creativity skills.

2.9 strengthen basic structures with the purpose of creating reliability of electronic business in terms of economy, agriculture, industries, and services.

The third strategy: the reform and creation of potential of information and communication technology research and development

3.1 let the government set up policies concerning educational reform for the vocational institutions and universities with the action of Minister of Education and government and private institutions developing the curriculum, and methods of teaching and learning sciences and English language in order to generate human resource with research skills and information and communication technology development and other technologies.

3.2 let the government encourage the officers with the interest of working as a researcher and give them high salary, honor among the society, and the advancement as other occupations are received.

3.3 let the government allocate the budget in terms of seed money in order to support and encourage for research, and information and communication technology investment. This might be the national budget that is received through the long-term donation and able to get the tax exemption.

3.4 let the government and the private sectors collect the lists of the demand of electronic and information and communication technology products in order to set up the structure of supporting the research and information communication technology development. The procedure would be the strategy coordinating between electronic industry, communication, and hardware and software devices.

3.5 let the government support the research in order to get the results applied with the commercial industries such as the valuable parts and finished goods. The process would compensate the import activities or the country would be able to export goods and be beneficial for other industries.

3.6 set up the excellent center in terms of academic skills in order to create the potential of knowledge and wisdom of Thai people, including information and communication technology experts.

3.7 let the government follow, collect, and analyse the information and communication technology advancement, including the study of technology forecasting in order to specify methods of supporting the research and development and production of information and communication technology in the country.

The forth strategy: the upgrade of the basic potential of Thai society in order to get into the competition in the future

4.1 let the government and private sector engage in the creation of the perceptions concerning advantages of information and communication technologies in terms of services. For the procedure, the institutions, including primary schools, secondary

schools, high schools, vocational schools, and universities in every region would be organizations that help create the perceptions of information and communication technology benefits toward the citizens.

4.2 let the government encourage the private sector to rush their production of effective information and communication technology devices and software with the reasonable price.

4.3 stimulate the a number of citizens to get to know and passionate in information and communication technology and electronic commerce.

4.4 develop staff with other occupations related to the information and communication technology development in order to get them understood and skilled about the technology, and be able to apply it in their future work life.

The fifth strategy: the development of entrepreneurs' potential in order to get into foreign markets



5.1 review and improve the regulations concerning the protection of intellectual property at the time such as copyright law, patent, and trademark. However, try to cover all the things related to Thai wisdom and enforce the regulations seriously.

5.2 encourage the industry sectors to apply information and communication technologies in their production in order to increase the value of the products which would cause from product differentiation, the adjustment of the products following the demand of consumers or mass customization, the usage of information and communication technologies in order to relate to the entrepreneurs inside and outside

of the country which would cause supply chain and clustering, value chain, and the creation of Thai products' popularity.

5.3 encourage Thai entrepreneurs to apply electronic commerce with their business in order to decrease the costs for expanding the market of information and communication technology products and services outside of the country, as well as to increase the interest among the entrepreneurs in the regional markets.

5.4 encourage the entrepreneurs to adopt broadband Internet with the network of other industries such as materials, production, management, shipping, commerce, both local, regional, and international levels. The encouragement of the application through the basic structure with the purpose of exploring knowledge, perceptions, and following the changes in order to develop the business to be able to get in to the competitive markets.

The sixth strategy: the encouragement of the application of information and communication technologies among medium-sized and small-sized enterprises

6.1 set up the mechanism, transfer methods, absorption of advanced and appropriate technology, which fit the medium-sized and small-sized enterprises. Thus, they would be able to produce their own products with the low costs of expenses.

6.2 set up the inspiration that would cause SME working groups in order to bring information and communication technologies in terms of hardware and software together to obtain benefits in terms of administration and management with the

purpose of improve the products, decrease the costs of the business, and help the administration to be more reliable.

6.3 hastily support and develop electronic business, especially the facility in terms of tax, communication services, the contact with the government, development administration, production, and shipping products and materials.

6.4 apply the information and communication technologies with the administration, business, communication, especially the application of supply chain management in the industry field in order to decrease the costs and increase the management efficiency, including the procedure of the production and the costumer services.

6.5 improve the entrepreneurs to be more understood about benefits of the application of software and hardware that are produced by the companies inside of the country in order to decrease the expenses.

6.6 provide the database in order to be beneficial for planning and business, industry, and customer services with the use of information and communication technologies as a principle method to collect, analyze, and expand the information to related institutes.

6.7 let the institutes that support small and medium-sized enterprises work on developing the SME Portal together in order to give services to the entrepreneurs who would like to contact with the government. The procedure would be the management of the information such as regulations, rules, law, knowledge of the government, and

policies or privileges, including license and registration in terms of one-stop service, which would be convenient to the entrepreneurs.

6.8 ask for collaboration from the private sectors in order to have an employment creation and the support for beginning entrepreneurs.

The seventh strategy: the application of the information and communication technologies with the administration and government services

7.1 reform the overall structure of government administration to be appropriate following to the changes of the global society that adjusts due to the effects of the information and communication technologies in order to suit with the modern economy.

7.2 let the chief information officer of each ministry have some assistants being responsible for the information and communication technology system and working on methods and plans of chief information officer's duties in the local level, including the duties that would be applied with the information and communication technologies in order to be beneficial with the government and local people, improve regulations and methods of administration, collaboration, budget plan and the operation of the government administration with the use of the information and communication technologies in order to have the reliability, efficiency, and effectiveness in the system. Moreover, to be responsible for allocating the government budget in order to develop the information and communication technologies, especially the internet system with the purpose of electronic learning would be

adopted with the administration and services related to the model scheme of information and communication technologies that is not developed and invested duplicately, and able to work with the private sector.

7.3 develop the government database by specifying the standard concerning the information and data communications with the purpose of every institution exchanging information unitedly. The main activities are as follows;

1. connect and exchange the information between different ministries by establishing the government information exchange center, and using the same government data exchange on government intranet high speed services with the access control systems.

2. support the development of information exchange gateway between the government and the private sectors on electronic media.

3. develop the related information system within the ministry that supports the management information systems, the administration of back office, and the services of front office.

4. develop the software system that is easy to understand and to use by investing the software system supporting institutions' duties. For example, in the case of buying software packages, there should be the sale of copyright with the package, or if possible use Thai software that is produced by Thai entrepreneurs.

5. offer information services for citizens, which would help them feel close and understand the process of government's duties.

6. let the government and private sectors work together on developing the citizens' information systems. Thus, all the citizens are able to own smart ID card in order to contact with and get services from the government, as well as to get privileges of government administration. However, the process need to be worked on efficiently, economically, and be able to support industries in the country at the same time.

7.4 let the government set up the modern Geographic Information System or GIS amd apply it with the specification of strategies and methods of economic and social development, including the resource management and disaster control plan.

7.5 let the government institutions, such as ministries, administrate the application of information technology system efficiently and constantly without the double investment.

7.6 develop the government officers, who are considered to be the main resources of information system administration to be most beneficial. The process would be involved with the motivation, compensation, and job opportunities. The job recruitment would be given to the candidates with the knowledge of information and communication technologies as they would get to take the test in the specific field. The process would also be involved with the establishment of electronic government institutions for improving the staff.

7.7 develop the follow-up evaluation with the index indicated by global standard in order to be able to evaluate the results and analyze the problems of the information and communication technology development following to the model scheme.

7.8 develop the digital nervous system of the country. Thus, the government is able to administrate and manage the information technology, and efficiently operate government services in the local and central levels by establishing the National Operation Center that would be able to provide some information which would help with the decision making to be accurate, fast, cognizant and understandable, setting up Ministerial Operation Center at every ministry with the purpose of collecting information technology of institutions, support the administration of information technology and the electronic administration, and develop the information technology center and electronic government portal. So, the citizens are able to access to the government services comfortably and rapidly.

## 3.3 Different Plans and Activities of Cyber Korea 21 and the Thailand Information and Communication Technology (ICT) Master Plan (2002-2006)



### 3.3.1 Cyber Korea 21

- The Ministry of Information and Communication (MIC) aimed to expand its telecommunication networks to be able to comfortably access high-speed communication services anywhere with the process of establishing the Korean Information Infrastructure (KII) with a budget of 10.4 trillion won which was finished by 2002.
- The Ministry constructed neutral competitive markets, and stimulated and supported the basement construction of the recent buildings, including the

commercial buildings and residential buildings, thus they had the capacity to offer high-speed network services.

- The test-bed network would be continuously upgraded to facilitate productive R&D in universities and research institutes in various fields for the next-generation internet.
- The global open standard was systemically and broadly adopted by the MIC through the management, origin, and delivery of the data, and the proper and efficient connection of each project.
- The procurement of a computer for each citizen, including maids, businessmen, and students.
- MIC supported the "Act on the Contract in which the nation is the Contracting Party" in order to transform the form into digital, as well as support all the processes of the purchases of the government in terms of digital devices and data.
- Supporting the R&D establishment, and supporting the addition of specialists by encouraging them to take a program writing course concerning information security. In terms of the e-commerce sector, the encryption system is considered as a crucial aspect of helping the sector to be more reliable and more secure.

- The MIC is also changing from using a paper driven document management system into a paperless digital documentation system, which could be adopted to prepare for digital authorization and distribution of digital documents. Senior government officials would get the right to apply the system with the Information Resource Management first.
- Creation of information concerning residents, real estate, and automobile databases, which would be divided according to each agency and their function during the process of establishing this Master Plan. Nonetheless, these items would be slowly united over time, and that would form a broad national network based on ATM switching technology.
- In the year 1999, a financial information system would be generated with the purpose of arranging the nation's financial affairs. Then, the audit system, which connects to the financial information system, would be manufactured.
- In terms of law enforcement and judicial informatization, the ministry is planning to create a Digitized National Assembly by setting up an effective Legislative Information Support Service System in order to assist judicial activities, and to provide legislative information on the internet.
- Supporting the restructuring of the domestic financial sector with informatization to strengthen international competitiveness and to expand

customer-oriented marketing, expanding the Industrial Information Database and Establishing a Common Network, creating an Industrial Human Resource Information Distribution System, digitizing supply, orders, and shipping management in production organizations to improve the distribution system of agricultural and fishery products by using EDI and internet shopping malls, including expanding “electronic bidding” in the wholesale market for real-time analysis and collection of distribution information to reduce distribution costs for the benefit of both producers and customers as well as establish fair pricing and removing the skepticism of farmers.

- Organizing the English on-line shopping malls would be in progress to facilitate the export of regional goods and products for high-growth Korean SMEs for hundreds of thousands of customers around the world.
- Regarding cultural industry, the MIC will be establishing a video-game industry information database.

**3.3.2 Thailand Information and Communication Technology (ICT) Master Plan (2002-2006)**

1. Providing incentives to set up SME alliances in each business sector in which the whole ranges of ICT system integration are used in administration and

management in order to boost efficiency and reduce costs among alliance members, as well as enhancing administrative transparency.

2. Employ the chief information officer of each ministry with some assistants being responsible for the information and communication technology system and working on methods and plans of the chief information officer's duties at the local level, including the duties that would be applied with the information and communication technologies in order to be beneficial to the government and local people, to improve regulations and methods of administration, collaboration, budget planning and the operation of the government administration with the use of the information and communication technologies in order to be reliable, efficient and effective in the system.
3. The government and private sectors work together on developing the citizens' information systems. Thus, all the citizens are able to own a smart ID card in order to contact with and receive services from the government, as well as to obtain the privileges of government administration.
4. Offering appropriate incentives, compensation and career paths to ICT personnel in order to retain the existing staff.

# CHAPTER IV
# COMPETITIVE ENVIRONMENT ANALYSIS

## 4.1 Korean and Thai ICT Context

### 4.1.1 Korean ICT Context

Following the end of World War II, the Korean economy faced a number of obstacles. For instance, more than a half of Japanese industries and technologies investing in the country were closed down due to the lack of engineers, raw materials, and marketing channels, contributing to the division of Korea, with 79 percent of heavy industries being located in North Korea, and 70 percent of light industries in South Korea. Later, in 1950, the Korean War broke out, leading to much loss of life and property within the country. In terms of economic development, South Korea determined to embark upon a capitalist course and, along with the financial assistance of the United States of America, the economy underwent swift growth(The Association of Korean History Teachers, 2010).

In terms of the Korean media, the first program, which was in black and white, was transmitted on May 12th, 1956(Wikipedia, 2015b). The television programs launched during the time were series, historical series, variety game shows, new stories, and documentary films. The very beginning of television broadcasting in Korea had its origins in the second-hand black & white television sets of the Radio Corporation of America. However, during 1972, President Park Chung-Hee ordered that all media be

investigated in order to shut down any inappropriate content through the Martial Law Decree, as well as refining the law enforcing the broadcasts. Thus, through the guise of the quality development of television programs the law and regulations were under effective control. After the law amendment was enforced, media content had to be passed through the government.

During 1981, color television broadcasts were transmitted for the very first time, contributing to fiercer competition among the providers. Later, in 2005, provisions for color television broadcasts were launched throughout Korea, along with the establishment of the mobile digital television standards called Digital Multimedia Broadcasting, which was influenced by the European Technology of Digital Audio Broadcasting.

During the 1960s, the first Five-Year Economic Development Plan and the second Economic Development Plan were adopted with the administration with the purpose of ushering the country into an industrialized era. Most of the products contributed and exported in the country during the time were those of light industries such as textiles, shoes, and plywood. Nonetheless, these products required raw materials from other countries. During the middle of the 1960s, steel and petrochemical industries initiated and played a vital role in the development process substantially expanding the country into an industrialized nation. Moreover, the third and the fourth Economic Development Plans were continuously advanced and launched with the main focus on exporting products until 1981.

Meanwhile, the Korean government continued to drive the country's economy forward, particularly the private sector, through the consumption of cultural industries, as well as support of export-led industrial development. Most of the cultural products traded in the market took the forms of traditional music, television dramas, and television broadcasts, and were also used as tools to encourage its citizens to follow the military government's demands to sacrifice themselves in the public interest such as distracted working hours exchanged with the low wage among workers. It was strongly believed that this would assist in developing the country, along with the cultural industries that would propel Korea's electronic sector, as well as the information and communications technology industries to move forward. In terms of the media and cultural business conglomerates – the Chaebol – during the 1980s, these were enhanced in other business areas from computer software, music, telecommunications networks, newspaper publishing, cable distribution, and television programming to those such as film production and providing services. Thus, the Chaebol family business was considered to be administered as though a family with business being passed on to the next generations. Eventually, greater investment was made in the film industry as a distributor(Seung-Ho Kwon, 2013).

The National Basic Information System Project was approved for adoption in developing the governmental organizations, contributing to the demand for using modern appliances from the IT industry. Therefore, the government established the Framework Plan for Computerizing Administrative Process during the period between

1978 and 1987, and the Framework Plan for the National Basic Information System Network during the period between 1987 and 1996 in order to satisfy the demand. In this period, network infrastructure was successfully constructed and adopted in the government administration, finance, education and research, defense, and national security sectors, including the infrastructure for inter-department network. Besides, the Self-Sufficient Information Technology Development Project with the capacity to set up Time Division Switching System (TDX), considered as a switching technology that was essential to communication, computers, and semiconductors, was a prominent invention of Korea, leading the country to the beginning of a digital revolution (Young-Ro Lee, 2009).

Then, during the 1990s, the IT industry expanded greatly with potential in production technology that could be used for successful product development with the management of Research and Development (R&D), and high-technology innovation.

In 1994, the Broadband Planning Division was used to assist in arranging the plan to develop high-speed communication networking infrastructure, which was fully accomplished in 1995. Then, the high-speed national network was applied by the government and others in the public sector. During the same period, the National Innovation Agency (NIA) founded the Korean Information Infrastructure initiative (KII) with the purpose of organizing the fiber-optic communication that would be used as transmission media throughout the country.

In 1993, the Korean government agreed to participate in the Uruguay Round of Trade Liberalization Talks, leading to marketing competition in the international market(Woo, 2010).

On September 12th, 1996, Korea consented to be a member of the Organization of Economic Cooperation and Development (OECD), which was an organization playing a crucial role in strengthening the economic, social and governance challenges of the member states.

In terms of ICT policy, the first Master Plan for Informatization Promotion under the Basic Informatization Promotion Plan was implemented between 1996 and 2000. The plan was inaugurated with the following vision: “attain world-class informatization levels by 2010”. Later model schemes were as follows; Cyber Korea 21 (1999-2002), e-Korea Vision (2002-2006), U-Korea (2006-2010), and Smart Korea (2010-2014).

In 1998, the average household internet speed was extremely slow; while the speed rate provided by the private sector reached 2Mbps, the price was unaffordable, contributing to the obstacles of personal marketing. Therefore, in order to tackle the issue, Cyber Korea 21 provided a plan to decrease the monthly rate for high-speed internet services to be lower than 40,000 KRW within the year of 2002. The plan focused on gaining greater popularity among users. It eventually assisted in getting the country out of the Asian financial crisis in 1997, and making the way for a sustainable information society in order to heal, seize the opportunities when the globalization era arrived, and encourage extensive usage of the internet consumption for those lacking

the advantages, including women, the elderly, and the disabled. The results of the policy during the final period of the year 2002 were as follows: “68 percent of the citizens were able to have access to the internet, 68 percent of Koreans got to use cell phones, and 70 percent of the households were members of broadband internet services”(Mansourov, 2005). These influences led Korea to be one of the global first-class countries in terms of the IT infrastructure. In addition, the IT industry was reported to be a vital factor in stimulating the South Korean economy. To illustrate, the GDP expanded to 16 percent and the rate of exports increased to 37.1 percent.

### 4.1.2 Thai ICT Context

It can be seen that a number of factors were involved in the IT industry development and context during the previous years before the enforcement of the Thailand Information and Communication Technology (ICT) Master Plan (2002-2006). These were as follows.

An attempt to establish television programs in Thailand was made in 1932, but the political revolution had begun even before the process was initiated. Then, another attempt was made during World War II by Plaek Pibulsonggram, the prime minister of the country, whose vision it was that television programs should be organized within the country like those in developed nations. Thus, the very first black-and-white television channel, currently known as Channel 9 MCOT, was transmitted on June 24th, 1955. The programs launched during the beginning were considered light

entertainment, such as live Thai traditional dramatic performances, talk shows, game shows, and dramas, through analog transmission with monochrome receivers. The system operated until 1974. Then, color television broadcasts were transmitted. In 1985, the Council of Ministers of Thailand resolved to have the Public Relations Department set up the National Broadcasting Services of Thailand in order to transmit governmental information and programs to the public for educational purposes, including strengthening the common understanding between the government and the public. Digital transmission was adopted in broadcasting from 2013 onwards(Udomkalayalux, 2013; Wikipedia, 2015c).

In 1960, the implementation of the Encouragement of Investment Act was declared in order to encourage local production in replacing imported products from other countries. Most of the electronics manufacturing businesses in the country were Thai-Japanese venture capital partnerships, producing electrical prefabricated components. The implementation focused on the local industry replacing the imported components of the products(THAILAND BOARD OF INVESTMENT, 1960).

During 1981 and 1985, the government continued the policy to encourage the export of products. The act, however, was refined in order to tackle the issues of the imbalance of trade and unemployment that had already influenced a number of great electronics manufacturers to move their bases to Thailand. In terms of the business of Thai investors, there was no relationship between the Thai manufacturers and supporting industries since the main goal of the business was to export the products.

These enterprises included printed circuit boards and integrated circuits, and the supporting industries included plastic and metal components, or piece molds. Most of the products only met local market demand(Department of Trade Nogotiations, 2004).

Between 1986 and 1992, the electronics industry underwent immense expansion arising from political and economic stability within the country, along with the currency strength of the Japanese Yen and other newly industrialized countries (NICs). This contributed to the capital movement from the specific countries mentioned above into Thailand; therefore, the investment rate from other countries during the time was further enhanced than the previous years. At the same time, production in Thailand began to shift from the production of low value-added products to distribute within the country to complicated and high value-added products to export to other countries. Nonetheless, most of the successful supporting industries were foreign-owned enterprises or international joint ventures due to the lack of technologies among Thai supporting industries.



In 1993, the offshoring of foreign-owned enterprises started to appear due to the higher wages. Many enterprises that focused on exporting their products to other countries started to provide their products to companies within the country for the consumption of forming the new products.

In 1994, the Council of Ministers of Thailand resolved to approve local projects proposed by the Department of Industrial Promotion in order to prosper the villagers' quality of life. The process included the advancement of local industrial production

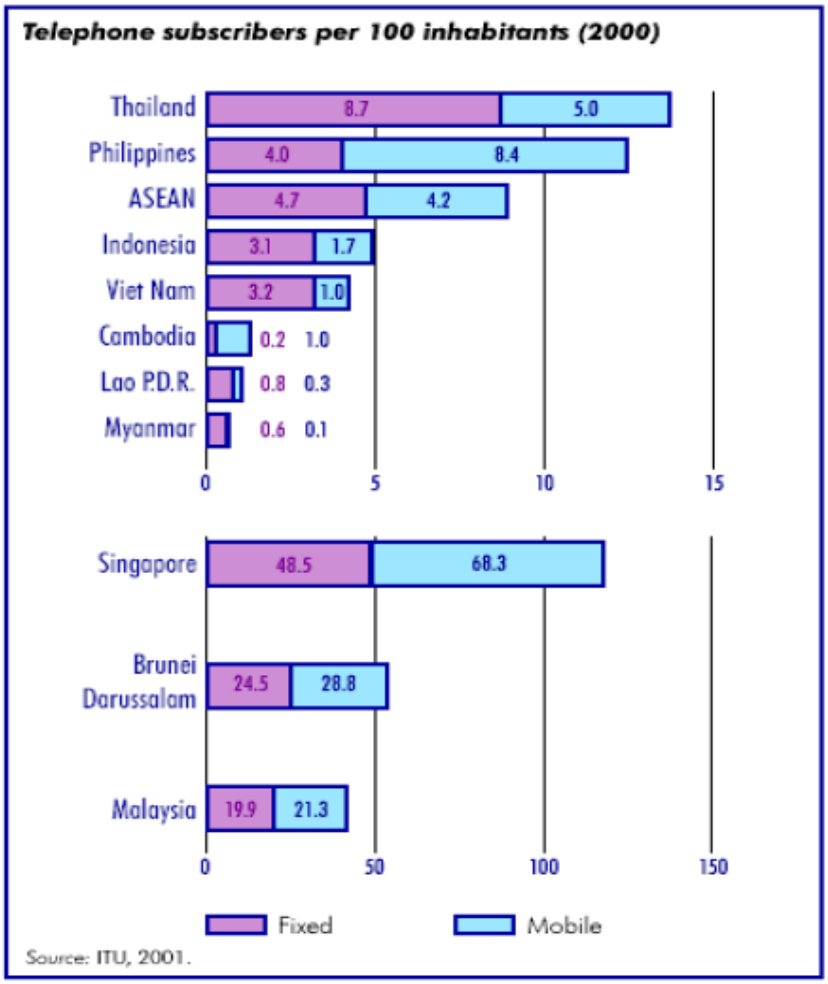
systems, as well as the development of the administration system that would be enforced among the targeted groups. The purposes of the project were to enhance the industries thoroughly, as well as organize the economy and income among the local people systemically. Later, in 1996, the government launched another project to encourage industrial promotion with the supporting subsidies at 27.5 million baht. The project persuaded 42 private enterprises to invest in local areas within 6 months, and the participation of 6 private organizations with the purpose of the promotion of investment, employment and development in the local industrial areas. The main purpose of the project was to widen both small and medium enterprises in the rural areas, contributing to sustainable businesses(Department of Industrial Promotion, 1991-2002).

In 1997, Thailand encountered the financial crisis that greatly impacted regions of Asia and had effects throughout the world. The swift advances in computer technology and equipment and related appliances further intensified competition among each industry. Besides, most importantly, the participation of China in the World Trade Organization (WTO) tended to further intensify competition in the international market. Thus, the Thai government adjusted transaction taxes on components and raw materials for the benefits of the broadcasting and fibre-optic industries, which assisted in some foreign-owned industries holding their bases in the country. Moreover, small and medium enterprises, were promoted with firm relationships between each industry organized, especially between the operations of the Office of Industrial

Economics, the Board of Investment of Thailand (BOI), and Electrical and Electronics Institution. This led to the transfer of the companies' research and development branches into the country due to the inaccessible capital of overseas. Therefore, local enterprises tended to place precedence on the distribution of products with their own trademarks, as well as research and development.

In 1999, Thailand concentrated on improving the efficiency of small and medium enterprises through providing business advisory teams with expertize in industrial business, and local institutions to advise selected entrepreneurs in terms of detailed guidance. The businesses involved in the projects were food, leather, metal, textile, readymade-cloth, ceramics, crafts design, plastic, jewel, and rubber production industries throughout the country in order to strengthen enterprises and enhance their potential in terms of production-process development plan, standard development plan, research and development plan, financial and accounting development plan, and marketing development plan. This was because after the financial crisis, the so-called Tom Yum Kung Crisis, and resulting recession, a large number of enterprises closed down, and the initiation of New Entrepreneurs Creation (NEC) was forced to start in 2002. Therefore, new enterprises could assist in economic recovery.

Figure 4: Telephone subscribers per 100 inhabitants (2000)




In terms of the status of information and communications technology in Thailand, the country had been developing the information technology infrastructure in various aspects that were considered to be close to the ground, according to figures from ITU, 2001. Even though the country was reported to have a higher ratio of cellphone consumption per person than other countries in Southeast Asia, if compared with Singapore, Brunei, and Malaysia, the ratio of Thailand could be regarded as much lower(N. NECTEC, MOST, 2003).

Information and communications technology research and development constituted 0.1 percent of total gross domestic product (GDP) for scientific and technological research and development. It was revealed that within the scientific and technological research and development costs, 0.062 percent was information technological and communication research and development costs, reflecting the fact that Thailand set aside a low budget for development compared with other countries. Also, the expenditures of research and development in Thailand were ranked 46th from 49 countries, according to the National Economics and Social Development Plan. One distinct is that Thailand was considered to be an important IT manufacturing base of a variety of products. To illustrate, Thailand was ranked second in hard-disk drive production in the world. Nonetheless, a lack of research and development in the country persisted, contributing to the lack of important opportunities in potential promotion. Also evident was a lack of upstream industry, and a lack of expanding products related to information technology and communication. This contributed to increased dependency on other countries, as evident from the figures for exporting and importing computer equipment and other components into the country. According to Table 4, information and communications technology industries in Thailand currently depend on the import of products from other countries at higher ratios, which reveals that Thailand still lacks the promotion of component consumption from enterprises within the country in order to produce and increase the consumption of products produced in the country.

Table 3: ICT goods imports and exports

| Item | 2000 | 2001 | Unit |
|---|---|---|---|
| Export Value | 344,049 | 346,589 | Million THB |
| - Growth Rate | 12.8 | 0.7 | % |
| - Ratio of Total Exports | 12.4 | 12.0 | % |
| Import Value | 147,612 | 167,705 | Million THB |
| - Growth Rate | 59.7 | 13.6 | % |
| - Ratio of Total Imports | 5.9 | 6.1 | % |
| Ratio of Imports/Exports | 42.9 | 48.4 | % |

(Source: Department of Business Economics)

There were a number of information technology graduates in Thailand every year; nonetheless, a lack of quality IT personnel and expertise still persisted due to the lack of the potential of the graduates and the production of personnel that does not match the demands of the labor market. The main reason was that IT changes so swiftly that institutions were unable to adjust the curriculum to meet the demands of personnel among the private sector and that the government had to promote IT personnel production from vocational colleges.

In 2001, the Thailand Information and Communication Technology (ICT) Master Plan (2002-2006) was drawn up by the National Electronics and Computer Technology Center (NECTEC), National Science and Technology Development Agency (NSTDA), and Ministry of Science and Technology as the National Information Technology Committee (NITC). The plan was transferred from the Information and Communication Technology policy (2001-2010) in terms of the vision, obligations, main purposes, strategies, and

main operation plan during the first five years of the particular policy. The main reason why the plan was launched was that Thailand attempted to develop from a dynamic adopter to one of the potential leaders. Moreover, the increase in the skilled workforce from 12 percent to 30 percent of the total equaled the average of skilled laborers in the Organisation for Economic Co-operation and Development countries (OECD). The plan would also develop the economy of the country in order to further the value proposition of the industry that would be based on the knowledge up to 50 percent of the GDP.

**4.2 PEST analysis of ICT development in South Korea and Thailand**

Analysis of surrounding situations (external factors) to set directions to develop information technology and communication for both Thai and Korea's knowledge-based economies.Setting the direction to develop information technology and communication for a knowledge-based economy involves analysis that uses information from the study of the review of policies, plans, strategies, measures and factors related to information technology and communication development in Thailand and in Korea. This information is analyzed to indicate the ways to develop information technology and communication overall by using PEST analysis to analyze the following external factors: 1) Political analysis (Politics: P) both national policies and regional cooperation policies 2) Economical analysis (Economics: E) 3)

Sociocultural analysis (Social: S) and 4) Technology analysis (Technology: T). The analysis is detailed below.

### 4.2.1 PEST analysis of ICT development in South Korea

**1) Political factors (Politics)**

- The South Korean government established the Korea Fair Trade Commission (KFTC) in 1981 by setting regulations to create free competition among enterprises, people's recognition about fairness in managing and spreading the information through a social campaign. Following its strong drive, the Korea Fair Trade Commission (KFTC) has become one of the top six fair competition enforcement agencies in 2011 as ranked by the leading law journal Global Competition Review(Unit, 2012).
- Significant amendments were made to Korea's Copyright Act in 1986 to protect rights and to create connections in the public interest. Major adjustments at that time included the following.

Figure 5: Revisions of Korea's Copyright Act

Revisions of Korea's Copyright Act

| Year of Revision | Revision Description |
|---|---|
| 1994 | *With the inauguration of the WTO regime, rental right for phonograms was granted to abide by TRIPS Agreement as one of the WTO regime's regulations.<br>*Protection period of neighboring rights was extended from 20 years to 50 years in the Copyright Act revision in 1994.<br>*Although TRIPS recognized 20-year protection period for broadcasting service providers, Korea's Copyright Act revised in 1994 extended the protection period to 50 years due to equity with other neighboring right holders. |
| 1995 | *Substance provisions in the Berne Convention were accommodated and retroactive protection principles in the Berne Convention were stipulated.<br>*Protection period of copyrighted works in group names and cinematographic works were brought in line with the provisions of the Berne Convention<br>*Previously, only phonograms of foreigners had been protected in accordance with the previous phonogram convention (The Convention for the Protection of Producers of Phonograms against Unauthorized Duplication of Their Phonograms). However, the revision included protection of performances and broadcasting of citizens of signatory countries of TRIPS Agreement. |
| 2000 | *With the conclusion of the Internet Treaties (WCT and WPPT) in 1996, the so-called "Digital agenda" became an international norm.<br>*The revision covers copyright protection measures involving Internet environment, such as granting a new right called interactive transmission right to copyright holders. . |
| 2003 | *Legislative improvements were made to reflect technological protection measures corresponding to the Internet Treaties and right management information protection, exemption provisions for online service providers presented in the DMCA of the United States and EC Electronic Commerce Guidelines, as well as the importance of database. |
| 2006 | *In order to reflect provisions of WPPT, moral rights corresponding to copyright moral rights, as well as right of performance and right of distribution were granted to performers. |
| 2011 | *In order to reflect the provisions of the Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite, provisions on the protection of pre-broadcast signals were introduced. |

Source: Korean IT Achievement in 2012



In 2011, South Korea was assessed by Britain's The Economist to have the strictest copyright protection and considered a successful case.

- The strategies involved in 'Government leads and Chaebol follows' constituted an obstacle for market mechanisms occurring from the political pattern that enabled politicians and entrepreneurs to be corrupt and act in their own interests and benefits. As a result, large enterprises were reformed and restructured under Kim Daejung. He invited owners of Chaebol to a meeting

with an economics advisory team to solve the problem together(Thandee, 2001).

- There is a law related to administrative restructuring that empowers the president to have power and be able to control the planning section and national finance. In the past, the finances and economy were independent of the government and control through separation into the two sections of Planning and Budgeting Committee and Budget Office with the president only able to control the former
- Foreign Investment Promotion Act was launched for the first time in 1998 and there were amendments up until 2012. These emphasized the creation of foreign investment by focusing on FTA (free trade agreement) and the Korea-EU FTA and the Korea-US FTA to be successful as quickly as possible. So, South Korea can be considered as the most active country in signing FTAs with other countries for trade benefits.
- The e-Signature Act was launched in 1999 and there was an adjustment in the section of media neutrality, expanding the concept of electronic signatures and certified keys as well as the creation of a wide variety of legislation to secure the safety and reliability of public certifications issued by relevant government agencies as part of the government's broader e-Signature policy in 2001. There

was one more adjustment in 2005 that was to be used in 2006 for a better safety and security system.

- The Framework Act on Intellectual Property was launched in 2011 and aimed to create a policy and operation system about the creation, protection and utilization of intellectual property and lay foundations that emphasize the value of intellectual property within society.
- The Ministry of Knowledge Economy was established from a combination of the Ministry of Commerce, Industry, and Energy (MOCIE), elements of the Ministry of Information and Communications, the Ministry of Science and Technology, and the Ministry of Finance and Economy in 2008. The missions are to create economical infrastructure and to create an inductive environment to attract investors both inside the country and foreign investors.
- During Lee Myung-bak's presidency, a "low carbon, and green growth" strategy was used for changes in innovations and green growth issues. So, the government established the National Strategy for Green Growth and Five-Year Plan to solve the energy shortage problem and climate change, and to create a new growth drive. This led to investment in R&D related to green technology at KRW 1.46 trillion in 2008 increasing to KRW 2.55 trillion in 2011. This project also led to many new technologies such as electric car batteries, LED devices, smart grids, and completion of the world's largest tidal power plant.

- In terms of corruption management, the Corruption Perceptions Index (CPI) was instituted by Transparency International. The management was accomplished based on the levels of perception among the targeted group towards corruption in a particular country. The data used for the Corruption Perceptions Index was based on surveys such as opinion poll centers, famous research organizations, and international independent organizations that are globally well-accepted. The findings are different each year, and the CPI value varies from 0, which means the country has the most corruption, to 100, which means the country has the least corruption. Korea was ranked 43rd out of 175 countries with a score of 55(Transparency International, 2014).

**2) Economic factors (Economics)**

- At the beginning of President Kim Daejung's term the economy recovered from being in debt to the IMF to the amount of 57,000 million US$ on December 3rd 1997. South Korea had to accept many conditions from the IMF. As a result, the government had to allow U.S. Wall-Street capitalism and support all products from the US. This kind of management used the theory of business administration developed from the software industry and Silicon Valley University by emphasizing monetary matters management with support from

modern technology experts and financial experts to transfer and manage the money to earn profits.

- In 1999, the Korean wave occurred with the spread of Korean popular culture led by Japanese popular culture at that time. The Korean wave has spread to many countries in Asia, South East Asia, and other countries around the world. So, South Korea is known as the origin of K-Pop, Korean TV dramas and Korean food. Moreover, one of the most famous music videos watched on the Youtube website was from Korean rapper Psy launched on July 15th 2012. That video had over 2,400 million views until December 7th 2015.
- In 2005, Digital TV could be used all over South Korea with the creation of mobile TV standards called Digital Multimedia Broadcasting from the European technology of Digital Audio Broadcasting(Wikipedia, 2015b).
- According to the World Investment Report 2012 of UNCTAD, South Korea had the flow of money from Foreign Direct Investment (FDI) worth US$7.5 billion in 2009, US$8.51 billion in 2010, and US$11.87 billion in 2011 – which were mostly from European countries, USA, and Japan.
- According to the World Bank, South Korea had income from royalty and license fees of around US$4,320,500,000 in 2011, which was ranked 8th in the world.

Figure 6: Royalty and license fees, receipt (BoP)

Royalty and license fees, receipt (BoP)

(Unit: US$ 1,000)

| Rank | Country name | Fees (receipt) in 2011 (US$) |
|---|---|---|
| 1 | United States | 120,619,000 |
| 2 | Japan | 28,989,253 |
| 3 | France | 15,701,663 |
| 4 | Germany | 14,296,662 |
| 5 | United Kingdom | 14,174,437 |
| 6 | Sweden | 5,855,011 |
| 7 | Netherlands | 5,356,311 |
| 8 | Korea, Rep. | 4,320,500 |
| 9 | Canada | 3,946,355 |
| 10 | Italy | 3,633,112 |

Source: http://data.worldbank.org/indicator/BX.GSR.ROYL.CD/countries

- In 2013, the export of advanced technology appliances, defined as products with high use of R&D, such as aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery, was valued at 130,460,427,536 US dollars,. ICT goods exports were calculated as 19.1 percent of the total goods exported. These goods included telecommunications, audios and videos, computers and related equipment, which were electronic components; and other information and communications technology goods; however, these products did not include software. In terms of the import of the ICT products, this was calculated as 10.4 percent of the total goods import. It is evident that the percentage of the goods exported almost doubled thise imported(World Bank, 2013).

**3) Social factors (Social)**

- President Kim Daejung solved the conflict among citizens in different areas by forgiving people from the western part of the country who were against him and absolved ex-President Chun Doohwan and President Roh Taewoo who were imprisoned following the coup d'état and corruption charges.
- In 1998, Higher Education in South Korea grew rapidly as the Organization for Economic Co-operation and Development (OECD) stated that students in Higher Education in South Korea in 1995 stood at 40.7% and this increased to 71.1% in 2010. In the same year, up to 65% of citizens in the 25-34 years old age group graduated from colleges, universities and in masters and Ph.D programs, which was ranked as first in Organization for Economic Co-operation and Development (OECD) countries. Higher Education in South Korea plays an important role in creating science and technological power. The number of undergraduate and graduate students in science major were 287,386 from all of the students attending higher education (3,269,509) in 2010.

Figure 7: Entry rates into tertiary education: University-level education (%)

Entry rates into tertiary education: University-level education (%)

| Year G20 Country | 1995 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | m | 59.0 | 64.6 | 76.7 | 67.7 | 69.8 | 82.3 | 84.0 | 85.7 | 87.0 | 93.9 | 96.5 |
| Germany | 25.8 | 30.2 | 32.4 | 35.1 | 35.7 | 37.5 | 36.1 | 35.3 | 34.4 | 36.2 | 39.7 | 42.5 |
| Italy | m | 39.2 | 43.9 | 50.4 | 53.6 | 55.4 | 56.1 | 55.8 | 52.9 | 51.4 | 49.7 | 49.1 |
| Japan | 31.4 | 39.6 | 41.4 | 42.0 | 42.6 | 42.3 | 43.4 | 45.1 | 46.1 | 48.2 | 49.1 | 50.7 |
| Korea | 40.7 | 45.2 | 46.1 | 45.7 | 46.7 | 49.0 | 54.1 | 58.9 | 61.2 | 71.1 | 70.7 | 71.1 |
| Mexico | m | 26.8 | 26.6 | 34.9 | 28.6 | 29.8 | 30.1 | 31.1 | 32.2 | 33.7 | 34.6 | 32.6 |
| Russia | m | m | m | 65.0 | 63.2 | 67.7 | 68.4 | 65.5 | 65.8 | 67.7 | 71.8 | 66.2 |
| Turkey | 17.6 | 21.1 | 20.8 | 22.9 | 23.8 | 25.6 | 27.0 | 31.0 | 29.0 | 30.0 | 39.9 | 40.1 |
| United Kingdom | m | 47.1 | 46.2 | 47.7 | 47.7 | 52.3 | 51.5 | 57.2 | 55.4 | 57.2 | 60.5 | 63.5 |
| United States | m | 41.7 | 41.2 | 61.5 | 62.9 | 63.4 | 63.8 | 64.1 | 64.6 | 64.5 | 69.8 | 74.3 |

Source: OECD, Education at a Glance (respective year)/ m : Data is not available

Figure 8: Population with tertiary education (2010)

Population with tertiary education (2010)

(Unit: %)

| Category | | 25~64 | 25~34 | 35~44 | 45~54 | 55~64 |
|---|---|---|---|---|---|---|
| Tertiary Education | Korea | 40 | 65 | 47 | 27 | 13 |
| | OECD average | 31 | 38 | 33 | 28 | 23 |

Notes: 1) Tertiary education includes colleges, universities, masters and Ph.D programs
2) The percentages are ratio of graduates of tertiary education by age group.

Source: Korean IT Achievements in 2012

- South Korea was ranked 4th in Mathematics and 6th in Science out of 74 countries of the OECD's Program for International Student Assessment (PISA) in 2009. The findings of the Program for International Student Assessment in 2012 were that Korea was ranked 5th in Mathematics and 7th in Science out of 65 countries(Wikipedia, 2015a).
- According to the Organization for Economic Co-operation and Development in 2008, South Korea was ranked first as the country where people had the longest working hours in the world.

- South Korean people are open-minded in accepting different cultures, unlike in the past, and this has created a more multicultural atmosphere in the country. According to the Ministry of Justice in 2011, there were over 45 million foreigners both inbound and outbound and the number of foreign residents stood at 1,395,077, which increased 2.5 times with registered foreigners accounting for 1,117,481 people, an increase of 4.6 times than in 2001.

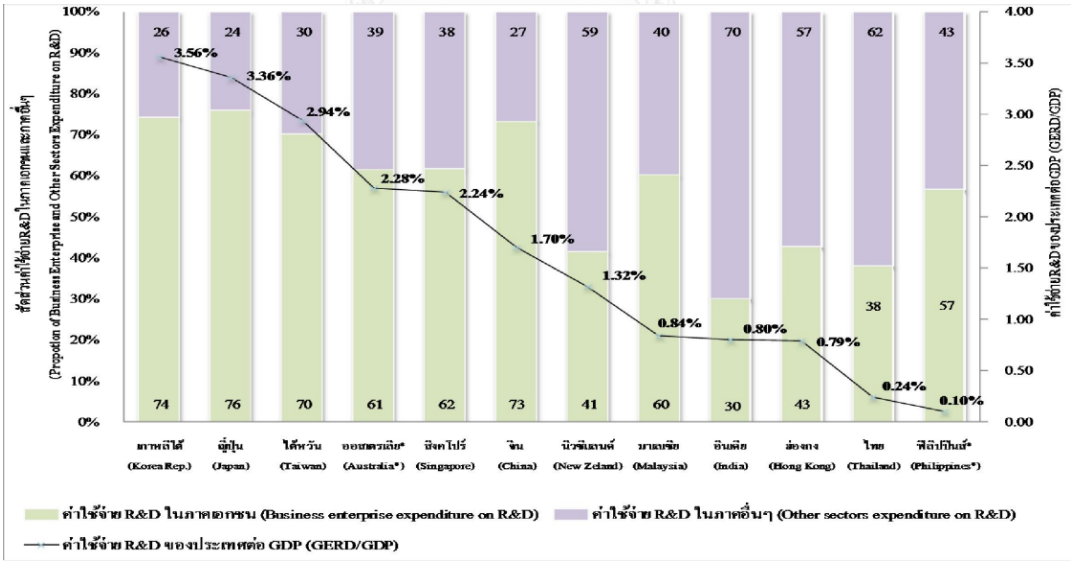
**4) Technological factors (Technology)**

- The first internet connection in Korea was initiated in 1982, and it was considered to be one of the first countries with the connection.
- From 1993 to 2002, there was investment of around US$7.78 billion from both the government and business sectors. Benefits from the investments were separated and used in activities related to ICT. 38% was used to develop technological programs, known as CDMA wireless technology, 18% was used to develop human resources and 44% was used in the making of infrastructure, disseminating information and making the system more standard.
- Internet services for commercial purposes were first provided in 1994.
- After the IMF crisis, many people became unemployed. So, the Ministry of Science and Technology planned to create around 5,000 jobs for engineering major graduates and scientists who were unemployed to be trained as research

assistants or trainees at government research institutes and education institutes.

- According to the World Competitiveness Yearbook 2012 of IMD (International Institute for Management Development) pointed out that South Korea had the highest GERD (Gross Expenditures on R&D) and GDP (Gross Domestic Product) in 2009, which was at 3.56 percent. It was 15 times higher than Thailand and was the first year it was higher than Japan.

Figure 9: GERD/GDP and proportion of business enterprise and other sectors expenditure on R&D of selected countries in Asia-Pacific Region for Y 2009 or latest available year




Source: IMD, World Competitiveness Yearbook 2012

The National Science and Technology Commission of Korea conducted the “2011 R&D Activity Survey” related to R&D activities in the public and private sectors in Korea in

2011. The result was that South Korea was ranked 6th globally for its investments in R&D. This stood at KRW49.8904 trillion (US$45 billion), an increase from the previous year by 13.8% (KRW 6.0356 trillion).

- According to Korea Internet and Security Agency (KISA) in 2010, Korea's personal computer penetration rate increased to 75.4% of the number of users. This meant there were 3 computers per 4 users.
- According to 2012 statistics form the World Bank, Korea was ranked 6th for the number of secure internet servers in 2011 with 2,496 secure servers per 1,000,000 people. The server was able to protect personal information from illegal activities through the use of the encryption technology.
- On July 12nd 2012, The Korea Communications Commission (KCC) announced a plan that would be used to solve the Active X problem that operated effectively only on the Windows operation system and Internet Explorer and usually there were malicious codes and viruses inside this technology. The plan was to spread the usage of the next-generation Web standard HTML5 which could operate effectively with every web browsers and help decrease special plugins. Furthermore, the Korea Communications Commission (KCC) has another 15 plans to develop HTML5 continuously.

- 4G LTE was first provided in 2011, and eventually widened to other areas throughout the country in 2012 and 2013, contributing to the LTE data traffic to achieve 95 percent of the traffic, including the mobile network(Brian, 2012).
- Korea was ranked 1st in the United Nations E-Government Ranking in 2012. The factors taken into consideration consisted of the Online Service Index, Telecommunication Infrastructure Index, and Human Capital Index. The survey by the United Nations led a number of countries to be interested in learning the system; while some countries even adopted the system for their countries, leading to more income for the country from e-government exports, which was 235.66 million dollars in 2011.
- The internet connection speed lists were collected by the Akamai Technologies, Inc., in the Akamai 2014 rankings. According to the statistics, Korea is still first with the highest average internet speed at 24.6Mbps (megabits per second)(Akami, 2014).
- According to the United Nation Broadband Commission's 2015 report on the ratio of the households that can access the internet, South Korea is 98.5% of all the nation's households. This meant South Korea was ranked first in the world.

### 4.2.2 PEST analysis of ICT development in Thailand

**1) Policy Factors**

- The National Electronics and Computer Technology Center(NECTEC) was founded through the resolution of the Council of Ministers in the year of 1986. The center was considered a project under the control of the Cooperative Technology Transfer Center of the Office of the Permanent Secretary during the first period. Later in 1991, NECTEC was designed to be the national center for specific purposes. Moreover, the reform of the organization was enforced in order to assist in the ability of the administration, following the Science and Technology Development Act (1991). The act aimed to merge four organizations, which were the Science and Technology Development Board (STDB), National Center for Genetic Engineering and Biotechnology (BIOTEC), National Metal and Materials Technology Center (MTEC), and National Science and Technology Development Agency (NSTDA), which were supervised by the Ministry Of Science Technology And Environment (MOSTE).
- The first Free Trade Agreement, (FTA), was the ASEAN Free Trade Area, also known as AFTA. Presently, Thailand has already made agreements with 8 countries, – China, New Zealand, Bahrain, Japan, Peru, the United States, India, and Australia, as well as the Bay of Bengal Initiative for Multi-Sectoral Technical

and Economic Cooperation (BIMSTEC). The main purposes of the agreement are to maintain the status and potential of Thailand's exporting activities and to enhance the ability of the competition on Thai pricing strategies in the current markets(FTA Department of Trade Negotiations, 2010).

- The first Copyright Law in Thailand was enforced in 1994, and the second and third refinements were made in 2015(Office of the Electronic Transactions Commission). The main content that was added in the law was Digital Right Management (DRM).

**2) Economic Factors**

- In 1996, Thailand was involved in the financial crisis that was caused by a number of factors, including capital markets, stock markets, and product and service markets. Rapid globalization without appropriate support contributed to the high pricing of products, services, and shares due to the unbalanced demand and supply in the markets, including the issue of pricing strategies among the share investors. All of these factors pushed products' and services' prices exceptionally high, and burst the economic bubble and its artificial demand in 1997. All foreign capital was withdrawn from the country, eventually. Therefore, Thailand had to ask for a loan from the International

Monetary Fund (IMF) for the fifth time for 5.1 billion baht. Thailand had previously received loans in 1978, 1981, 1982, and 1985(Durongkaveroj, 2012).

- The first Electronic Transactions Act of Thailand was passed in 2001 with further amendment in 2008. The act was especially enforced for the electronic transactions in terms of civil and commercial laws, except for the transaction under the royal decree that does not allow the use of the act, which might be partly or thoroughly depending on the decree. Electronic transactions performed by the government were included in the enforcement(ETDA, 2015).
- The Ministry of Information and Communication Technology was established on October 3, 2002, with the responsibilities of planning, promoting, developing, and operating information and communication technology. The Department of Meteorology, Statistical Standards, and other national offices were specified to be under the control of the Ministry of Information and Communication Technology.
- The Electronic Transactions Development Agency (ETDA) is a public organization established in 2011 in order to promote and support electronic transactions within the country in following the preferences, and arranging the technology infrastructure to conform to the electronic transactions and services of the electronic transactions. Therefore, the information and communications technology meets the standard contributing to security and trustworthiness.

- In terms of corruption management, the Corruption Perceptions Index (CPI) was instituted by Transparency International. The management was accomplished based on the levels of perception among the targeted group in the particular country towards the corruption. The data used for the Corruption Perceptions Index was based on surveys, such as opinion poll centers, famous research organizations, and international independent organizations that were globally well-accepted. The findings are different each year, and the CPI value varies from 0, which means the country is the most corrupt, to 100, which means the country is the least corrupt. Korea was ranked 85th out of 175 countries with the score of 38, similar to the economic score.
- Thailand had Foreign Direct Investment (FDI) net inflows in 2014 of 12,565.73 million US dollars, and Foreign Direct Investment (FDI) outflows equal to 7,691.53 million US dollars, which were less than the previous year(UNCTAD, 2015).
- In 2013, the export of advanced technology appliances, defined as products with the high use of R&D, such as aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery, was at 33,901,233,425 US dollars. ICT goods exports were calculated as 15.6 percent of the total goods exports. These goods included telecommunications, audio and video, computers and related equipment, which are electronic components; and

other information and communications technology goods; however, these products did not include software. In terms of the import of the ICT products, this was calculated as 11.3 percent of the total goods imported(World Bank, 2013).

- Thailand is going to be a part of the Asean Economics Community (AEC), which comprises 10 countries in Asean, including Thailand, Laos, Vietnam, Malaysia, Singapore, Indonesia, the Phillippines, Cambodia, and Brunei. This economic bloc aims for mutual economic benefits among the member states; therefore, it is considered to be similar to the Eurozone. The AEC is expected to commence on December 31, 2015(Sawettanan, 2013).

**3) Social Factors**

- In 2000, the Labour Organization (ILO) revealed its survey called Working Time around the World: Trends in Working Hours, Laws, and Policies in a Global Comparative Perspectives. This reveled that the average of 22 percent of the total laborers throughout the world worked more than 48 hours per week. The survey also reported that Thai workers were ranked 3rd for workers with the longest hours with 46.7 percent working more than 48 hours per week. Korean workers were ranked 2nd with 49.5 percent working more than 48 hours per week(Sangheon Lee, 2007).

- According to the Immigration Bureau, the arrival and departure of foreigners in Thailand in 2011 was reported to be more than 40 million. In 2010, travellers in Thailand were reported as increasing to 15.9 million and 18.7 million in 2011, and the number was expected to increase in the following years. The huge amount number of travellers travelling in Thailand contributed to national income, which was calculated as 592,794.09 million baht or 5.9 percent of the GDP(National Statistical Office).
- The OECD's Program for International Student Assessment (PISA) in 2009 declared that Thailand was ranked 52nd in Mathematics and 51st in Science out of 74 countries in total. The findings of the Program for International Student Assessment in 2012 show that Thailand was ranked 50th in Mathematics and 48th in Science out of 74 countries in total(OECD, 2014; Wikipedia, 2015a).



**4) Technological Factors**

- In 1987, the campus network was initiated before the introduction of electronic mail in Thailand in the following year. This was the very first time that Thailand was assisted by Australia. The use of the campus network and the electronic mail was first consumed at the Prince of Songkla University and Asian Institute of Technology through the connection of the phone to the modem.

- The use of internet in the commercial section was first introduced in 1995, and the first private organization to consume the internet connection at the speed of 64kbps was the Siam Commercial Bank (SCB).
- Internet banking in Thailand was first introduced in 1999 by the Siam Commercial Bank (SCB); nonetheless, major commercial banks currently set up their own internet banking websites.
- From 2001 to 2009, investment ratios in terms of the research and development or GERD (Gross Expenditures on R&D) per Thailand's GDP were considered to be depressed with no tendency of growing as it was reported at an average of 0.24% of GDP.
- According to the survey of the National Statistical Office, between 2010 and 2014, the ratio of computer users in Thailand had increased from 30.9 percent, 19.1 million people, to 38.2 percent, 23.8 million people. Internet users grew from 22.4 percent, 13.8 million people, to 34.9 percent, 21.7 million people. The number of cell-phone users expanded from 61.8 percent, 32.8 million people, to 77.2 percent, 48.1 million people.
- Secure servers are servers using encryption technology in Internet transactions. In Thailand, there were only 17 servers per 1 million people in 2011(World Bank, 2011).

- Digital television in Thailand was first published in 2014 through horizontal transmission, contributing to the ability to broadcast greater variety of channels with better quality images and audio signals without noise.
- In Akamai rankings concerning the average connection speed in 2014, Thailand was globally ranked 47th with the average connection of 6.3Mbps (megabits per second).
- According to the United Nations Broadband Commission's 2015 report, for the ratios of households with access to the internet, Thailand was ranked 49th, or 33.8 percent of total households. The amount of Thai people consuming broadband internet services was ranked 26th or at the rate of 79.9 percent of the population.
- On December 15, 2015, the Office of the National Broadcasting and Telecommunications Commission (NBTC) supported the 4G auction at the meeting of the National Telecommunications Commission (NBTC). The meeting came out with the resolution supporting radio frequency for transportation activities with 1800 megahertz. The first radio frequency was considered to be the frequency of 1710-1725 megahertz with 1805-1820 megahertz. True Move H Universal Communication Company Limited was the organization that won the auction with the final proposed price at 39,792 million baht. The second radio frequency was considered to be the frequency of 1725-1740 megahertz

with 1820-1835 megahertz. Advanced Wireless Network Company Limited was the organization that won the auction with the final proposed price at 40,986 million baht(Mthai News Reporter, 2015).

# CHAPTER V
# ANALYSIS OF RESEARCH

## 5.1 Key Informant Interviews

This study used qualitative methods to determine the essential policies and attitudes of four Information Communications Technology (ICT) specialists with direct experience in environmental research. ICT stresses the role of unified communications and the integration of telecommunications enterprises which enable users to access, store, transmit and manipulate information. The interview questions covered issues regarding methods for ICT model scheme development in Thailand to build economic infrastructure. The interviewees were invited to thoroughly explain these methods, drawing on their knowledge and experience. The interviewees remained anonymous; they were asked about their opinions and suggestions independently. The interview results were used as a guideline and applied to collect thorough information covering all aspects of environmental research. A neutral data analysis was then conducted on the various responsibilities of the organisations. Data was assembled through interviews and note-taking and also from the four specialists' voice recordings. This was transcribed and summarised as dialogue for subsequent processing. Descriptive methods were used to obtain accurate and clear information to reach the objective conclusions. The researcher then applied the theory frame to explain the phenomena noted by the interviewees to reach the stated conclusions.

All four ICT specialists agreed that Thailand is currently at the middle to low level regarding ICT usage. Recognition of the benefits of ICT usage and application are also at a very low level. One major obstacle for ICT development in Thailand is the lack of population knowledge and understanding of its benefits. ICT is therefore not used effectively in daily life and career fields. Another obstacle is the lack of development of ICT infrastructure.

**5.1.1 Perspective of 1st ICT Specialist**

Thailand has limited ICT infrastructure compared to other Asian countries. ICT appliances and services are reasonably well-prepared, but the population remains unaware of their utility and usability. Building state agency awareness is the main factor for success of ICT development while following The Thai Government Master Plan. The recent rapid advances in technology have affected many people; high market competition has resulted in decreasing costs of appliances. However, the main obstacle remains the ignorance of the population regarding usability and lack of understanding. Few Thai people are technically competent in ICT usage; this has an effect on the organisational level in applying ICT. There is a widespread lack of understanding and knowledge of ICT in Thailand which results in a lack of application development of new products to digitise the industrial sector. Therefore, the most crucial factor regarding ICT is the development of a sound knowledge base and population ability and intention to realise the progress and understand the usage of modern technologies. Human assets are significant regardless of technology. However,

if the human asset does not have ability, then it becomes valueless. Therefore, a knowledge-based economy can only be achieved by generating knowledge in personnel. The pattern of access, or ICT usability, must be individually understood through information promotion to all groups of people to enable them to access and use ICT. If people comprehend the nature of ICT usability, then they can easily gain access to it. The advantages of ICT must be presented to build educational guidelines and they must be relevant to the demands of each region. Therefore, appropriate services must be designed. ICT specialists are required for this task; users must be taught the value of ICT. In South Korea, ICT industrial development now covers all aspects of life. However in Thailand, apart from policy planning, ICT implementation must be followed conscientiously to develop and build strong industry. ICT policy in Thailand must focus on personnel and provide stable structure and security. An ICT service must be built up as a value added to the service sector in all forms of business and reinforce a prototype business pattern. The solutions for the inequalities in technology consist of two factors. Firstly, knowledge in technological usability must be accessible to generate potential economic development. Secondly, the government should support basic technology for everyday life. The private sector has decided not to invest in this since it does not have the necessary monetary resources. USO (Universal Service Obligation) in Thailand was founded by the NBTC (National Broadcasting and Telecommunications Commission) to promote the building of infrastructure to educate Thai people regarding ICT accessibility. The funding of the

USO is covered by a 3% levy on the income of internet users and the money generated is used by operational or service providers to finance basic telecommunication projects and increase ICT accessibility.

This specialist supplied useful suggestions related to the study of methods for ICT development in the Thai economic context. Connection and cooperation between government sectors is necessary, since each organisation is responsible for different areas. For example, the information of organisation B is required by organisation A to analyse organisation C. Some organisations collect data through manual systems which causes delays in problem solving. Therefore, corporations must forecast their production and forward this information systematically to other ministries. Cross-organisational integration will considerably benefit the country. Thailand has a potential government master plan, however the operation of putting this plan into practice must be taken seriously. The government must take control and follow the necessary steps to improve the availability and knowledge of ICT in Thailand.

**5.1.2 Perspective of 2nd ICT Specialist**

The preparedness of ICT in Thailand has entered the middle stage and is now efficiency driven. Further advancement requires input from government or the private sector. Developed countries such as the United States and Singapore are at the innovative driven stage, with ICT prepared and available for the population to use and apply. In Bangkok, the numbers of Facebook and Line users rank among the highest in the world. Consequently, Thais are attentive to new technology and understand how

to use the social media. The question is, how to educate these people to expand their ICT usage to business and work aspects, instead of merely lifestyle and entertainment functions.

The factors for success and the obstacles in Thai ICT development can be split into five aspects. Firstly, to discover whether the hard infrastructure and internet network connection is sufficient and the price is reasonable. Secondly, soft IT infrastructure is an abstract concept described in law with standards and cyber security. Thirdly, digital services, online messenger and service infrastructure such as online payments are subject to tax invoices. Fourthly, the government or private sector is required to support digital promotions and suggestions to software developers by providing international markets and supporting investment funds. Finally, society needs to understand digital usability and its application to different occupations. Thai ICT knowledge is at an average level; the physical basics are not yet ready to apply ICT as a general foundation for resource development. Two factors must be considered. If the physical factors are developed, this will lead to increased possession and curiosity of the users; physical acknowledgement will follow. An important factor is the methods which influence Thai people to apply technology to their occupation. According to recent research, most Thais use the internet as a lifestyle for social media, online video and listening to music. The use of IT for work is not considered. The government must be responsible for supporting and expanding network accessibility and encourage internet use for occupations and self-development. Digital barriers must

be reduced and eliminated through investment in countrywide network coverage. ICT knowledge must be expanded throughout Thai society. In South Korea, human resource management has been a significant factor in ICT expansion and development. South Korea has developed other aspects as well as ICT such as entertainment, opening drama schools to teach acting, direction and post production as well as supporting students through reduced fees or free tuition. ICT has developed constantly with basic educational expansion. Education in South Korea is rated at the good to very good level. It is supported by responsible organisations. Both the South Korean music and film industries have developed as successful businesses. They influence cultural transmission and have international renown which benefits the sale of products. Thai people are naturally creative and artistic. The Chinese watch Thai films, while Burmese and Laos nationals listen to Thai music. These factors should encourage software developers in Thailand to compete with other countries and mobile phone manufacturers. However, developers seem more interested in content to meet local market demand and look inwards instead of outwards.

The future ICT policy of Thailand should focus on critical infrastructure, both hard and soft. The network of hard infrastructure must be stable and reasonably priced, suitable soft infrastructure can follow. Correct network licensing must be applied for in advance.

A useful method in ICT development to build a cultured society with economic benefit is cyber law transformation. This can increase development of e-commerce. It

is imperative to safeguard online shopping to avoid identify theft and cyber fraud. No channels currently exist for complaints of this nature. Laws must be passed to strengthen the rights of internet shoppers. Another factor is ICT education; this should be set as the fifth basic living need to influence Thai nationals to use the internet professionally and not only socially.

**5.1.3 Perspective of 3rd ICT Specialist**

Thai ICT usage is increasing in the business sector as more people gain access to computers and mobile phones. The new users as the young generation are familiar with ICT.

The National Broadcasting and Telecommunications Commission (NBTC) recently reported that Thai mobile phone users are increasing constantly. The number of mobile phone numbers now exceeds the population by 45.8%. According to the National Statistical Office, 40.3% of Thai households had high-speed internet connection and 3G mobile phones in 2014. Mobile phones are an important communication channel using internet access in Thailand. National Statistical Office figures for information technology and household communication show that Thais from 6 years old and above show increased computer usage from 2010–2014. The usage ratio in 2010 was 30.9%, increasing to 38.2% in 2014. Computer usage has increased, but usage ratio to population is still considered at a low level. A survey of 2,210,451 enterprises in 2013 conducted by the National Statistical Office revealed that only 24.8% used computer technology. Enterprises employing 1–9 persons, 95.5% of

the total, recorded a 22.3% computer usage ratio. The larger enterprises were more likely to use computers. The National Electronics and Computer Technology Center (NECTEC) reported that the number of internet users in Thailand has increased constantly. In 2013 there were 26.1 million users, representing 40.3% of the population. Over the past decade (2003–2013) the compound annual growth rate (CAGR) was 15.9%. The Office of the National Broadcasting and Telecommunications Commission measured broadband registrations at 2,072,799 users in 2008, 10.9% of households. By 2014 this had increased to 5,336,194 users or 26.6% of households.

There is a tendency for increasing ICT usage and the increasing of mobile phone number. However, internet usage in Thailand is considerably low for households and small businesses. The internet is a crucial factor for influencing development and increasing international competition by driving trade, services, education and other transactions.



Two factors obstruct ICT development:

1) The lack of qualified ICT personnel to apply their skills, and

2) The lack of basic ICT infrastructure to meet usage demand and requirements.

The Thai Government set a policy framework to direct ICT development, ICT2020 (2011–2020). New model schemes were created to encourage ICT development. The latest model was issue No 2 (2009–2013) which expired in 2013. In mid-2013, the Ministry of ICT prepared model scheme issue No. 3. This applied after

the expiry of model scheme issue No. 2. However, notice for using model scheme issue No. 3 was postponed as a result of the political unrest during 2013–2014.

Following this unrest, Gen. Prayuth Chan-ocha took control and initiated a policy of building the economic potential of Thailand, promoting the digital economy in the economic sector to increase international competition. The role and mission of the Ministry if ICT was adjusted to improve the quality of life. In addition, a National Committee was set up. However, ICT is crucial for a digital economy to drive production reform, business operation, services, education, public health and government administration, including other economic and social activities to improve the quality of life and increase employment opportunities.

In July 2015 the Ministry of ICT introduced a digital committee for economy and society. The Prime Minister acted as the chairman to consider policies and the National Plan for the digital development of the economy and society. This was applied instead of the new issue ICT model scheme. Policy framework for ICT2020 states, “ICT is a crucial power driving knowledge and intellect of Thai people to grow permanently and equally.” Thailand has prioritised ICT as important for the development of the country. The ICT2020 policy framework was set up to educate human assets with the creativity and ability to use ICT and also to develop ICT specialists to meet international standards. The Ministry of ICT and related organisations promoted the expansion of ICT knowledge and new skills development to meet industrial demand and promote the learning activities of children and youths.

ICT accessibility and usability was also encouraged for disadvantaged people, the elderly and the disabled. ICT must be available for everyone and basic infrastructure must be developed. Internet access must be expanded to cover all regions of the country with learning centres, massive open online courses (MOOC), e-services and mobile devices. Apart from the development of basic infrastructure and channels to access information and other services, another important factor is to apply ICT knowledge in everyday life and careers. To gain the benefits of ICT, people must use it carefully and thoroughly and not become victims of the cyber world. The government should support educational institutes to develop ICT personnel to meet the demands of the labour markets. In the future, ICT specialists will be sought after in the private business sector, ICT and digital industry. As a result, the government must develop the digital economy and focus on promoting the private business sector as a leader in economic and social development. The government must encourage economic activity, creating a digital ecosystem which supports invention, exploration, research and development (R&D) to encourage new digital entrepreneurs. New digital Thai entrepreneurs will adapt to competitive pricing and competitive value of products and services. ICT now plays a much more important role than in the past. ICT in Thailand is still at an average level and lags behind other countries in the region. Basic lack of infrastructure hampers Thai competitive ability in international markets. Poor network coverage of many rural regions is also a disadvantage. In addition, government has insufficient capacity to supply electricity countrywide. Hard infrastructure must be

developed as priority to speed up basic broadband cover and expand the network connection to all regions with stability and at reasonable prices. This will create equal ICT accessibility for everyone. Fiber optic networks must be provided to support hi-speed connections with access to all villages. The government must consider the availability of fiber optic networks for government and private sectors to increase corporate efficiently. In addition, fiber optic cable should be available in schools, tambon hospitals, subdistrict administrative organisations and police stations as a public service. The development of broadband services will allow more coverage for mobile phones both 3G and 4G, with faster connection speed. There will be increased opportunity to access ICT services in this digital economy age. Information from the Ministry of Education can be used to study the development of ICT and build a society with digital knowledge. The Ministry of Education has created an ICT model scheme for educational purposes.

**5.1.4 Perspective of 4th ICT Specialist**

ICT in Thailand is reasonably prepared in terms of basic infrastructure and human resources. The over 50's have low technology accessibility since they were not born into these inventions. ICT is understood by the under 40's and computers and mobile phones are major parts of their lives. Globalisation removes cultural barriers and Thai people are always ready to accept new ideas. Thai people may have less purchasing power, but they have time to focus on technology. Thais have never been involved in war or major crises. The government policy has little effect on human

resources since the people have the capacity to access technology. As a result, people are the main factor for success of ICT development in Thailand. However, major issues which must be solved quickly include education, traffic jams, pollution, logistics and agriculture. Most companies in Thailand only import ICT products and then sell them. Few Thai companies manufacture ICT products. ICT policy is a crucial factor for laying the foundation and human resource development. ICT is a learning technology regarding telecommunications which Thai people should apply to improve the domestic problems mentioned above. ICT generates the possibility for distance learning to solve the educational inequality in Thailand. Presently only the upper-middle class or wealthy people have the capacity to afford an international education. International school graduates invest a lot of money for education and have more critical thinking potential than others who graduated from local schools. How can we build the accessibility to the same information and environment? Sources of learning must be accessible in remote areas, regardless of the lack of education aid. Therefore, technology is an important machine which provides equal opportunities. Online learning should be supported by government at low coat to provide potential students with experience and technique in teaching particular subjects. English language skills are considered as the most crucial subject. English will be the communication language of the AEC. The curriculum of preschool should be conducted in English as it is easy to learn language at a young age. The teacher should act as the facilitator in class and give personal feedback to the students, instead of just standing in front of the

classroom. The teacher is responsible for play instruction as well as being a personal tutor for the students. Moreover, the students will be able to conduct their self-study at home when the teacher is not available. The issue of insufficient teachers must be resolved. Technology has assisted farmers to be more productive. The integration between technology and sufficiency should be applied. The farmers should focus on high quality production; the demand for organic products is high and prices are increasing. In addition, technology impacts effectively on agriculture regarding packaging. ICT should be applied to communicate and help in promoting products.

Individual interest is the main factor for accessing news information, self-development and careers. ICT accessibility is important in everyday life. However, adjustability depends on media; problem based learning must be set for the individual to solve tricky situations through knowledge and be able to compete internationally. These factors will broaden visions and stimulate ICT understanding. Successful entrepreneurs will be role models who inspire others to try again. Thailand and South Korea have set similarly policies; South Korea is extremely successful, but Thailand is still a developing country. There are two obstacles which hold back development. The first is politicians who lack potential and education. Politicians in South Korea resign when they violate the law. This is one reason why South Korea has a successful policy administration.

The second obstacle is education. Education has increased the purchasing power of the young generation with higher incomes. They have wide access to

technology. Education therefore solves the problem at the roots. The significant key in ICT development is the objective. An administrator with lack of vision is useless and cannot see the genuine usage. Technology is now used lavishly. Cyber world gaming is increasing as it is easy to access and enjoy. However, educational improvement, mentality and policy of the country remain key factors in the promotion of strong and sound ICT development.

**5.2 SWOT analysis of Information and Communication Technology Development in Korea**

Analysis of internal and external factors of Information and Communication Technology Development in Korea are strengths, weaknesses, opportunities and threats as indicated as followed.

Table 4: SWOT analysis of Information and Communication Technology Development in Korea



| | Positive | Negative |
|---|---|---|
| | Strengths | Weaknesses |
| Internal Factors | • Development of infrastructure and related ICT management systems | • Uninterrupted government policies<br>• Providing benefits for big companies<br>• Strict investment measures |

| | | |
|---|---|---|
| | • Expansion of domestic markets to benefit one another<br>• Research and Development and linkages with the educational sector<br>• Law and Regulations<br>• Continuous development of technology<br>• Use of cultural industries to boost economy<br>• Strengthening the export foundations<br>• Human resources development | |
| | Opportunities | Threats |

| | | |
|---|---|---|
| External Factors | • Cooperation with other countries on the international stage<br>• Learning new administration concepts<br>• Dissemination of Korean culture and entertainment industry worldwide<br>• Increased use of the Internet and emergence of new IT devices | • Disputes among East Asian countries<br>• Chinese industrialization in the global market |



**5.2.1 Strengths**

**Development of infrastructure and related ICT management systems**

- The Ministry of Information and Communication aimed to expand its telecommunication networks to be able to comfortably get accessed the high-speed communication services anywhere with the process of establishing Korean Information Infrastructure (KII) with the budget at 10.4 trillion won which was finished by 2002.

- The Ministry constructed the neutral competitive markets, and stimulated and support the basement construction of the recent buildings, including the commercial buildings and residential buildings, thus they had a capacity to offer the high-speed network services.
- Test-bed network would be continuously upgraded to facilitate productive R&D in university & research institutes in various fields for the next-generation internet.
- The global open standard was systemically and broadly adopted by the MIC through the management, origin, the delivery of the data, and the proper and efficient connection of each project.
- The procurement of a computer for each citizen, including the maids, businessmen, and students
- MIC supported the "Act on the Contract in which the nation is the Contracting Party" in order to transform the form into digital, as well as support all the processes of the purchase of the government in terms of digital devices and data.
- The MIC also transfers from using paper driven document management system into paperless digital documentation system, which could be adopted to prepare digital authorization and distribution of digital

documents. Senior government officials would get the right to apply the system with the Information Resource Management first.

- Regarding Cultural Industry, the MIC will be establishing a video-game industry information database.

**Expansion of domestic markets to benefit one another**

- Supporting the restructuring of the domestic financial sector with informatization to strengthen international competitiveness and to expand customer-oriented marketing, expanding the Industrial Information Database and Establishing a Common Network, creating an Industrial Human Resource Information Distribution System, digitizing supply, order, and shipping management in production organizations to improve the distribution system of agricultural and fishery products by using EDI and Internet shopping malls including expanding “electronic bidding” in the wholesale market for real-time analysis and collection of distribution information to reduce distribution costs for the benefit of both producers and customers as well as establish fair pricing and remove the skepticism of farmers.

- Organizing the English on-line shopping malls would be in process to facilitate the export of regional goods and products for high-growth Korean SMEs for hundred thousands of customers around the world.
- The South Korean government established the Korea Fair Trade Commission (KFTC) in 1981 by setting regulations to create free competition among enterprises, people's recognition about fairness in managing and spreading the information through a social campaign. Following its strong drive, the Korea Fair Trade Commission (KFTC) has become one of the top six fair competition enforcement agencies in 2011 as ranked by the leading law journal Global Competition Review.
- The Ministry of Knowledge Economy was established from a combination of the Ministry of Commerce, Industry, and Energy (MOCIE), elements of the Ministry of Information and Communications, the Ministry of Science and Technology, and the Ministry of Finance and Economy in 2008. The missions are to create economical infrastructure and to create an inductive environment to attract investors both inside the country and foreign investors.

**Research and Development and linkages with the educational sector**

- Supporting the R&D establishment, and supporting the addition of specialists by encouraging them to take a writing program course concerning information security. In terms of e-commerce section, the encryption system is considered as a crucial part helping the section to be more reliable and more secure.
- Creation of information concerning resident, real estate, and automobile databases, which would be divided following to each agency and their function during the process of establishing this master plan. Nonetheless, these items would be slowly united after a while, and that would form a broad national network based on ATM switching technology
- The National Science and Technology Commission of Korea organized "2011 R&D Activity Survey" to explore the R&D activities in the public and private sectors in Korea in 2011 and the results revealed that the amount of money Korea spent on the total R&D was KRW 49.8904 trillion (US$ 45 billion), ranked sixth globally. It increased from that of the last year (KRW 6.0356 trillion) by 13.8%. According to the World Competitiveness Yearbook 2012 issued by IMD (International Institute for Management Development), in 2009, the GERD (Gross Expenditure on R&D)/GDP (Gross Domestic Product) of South Korea peaked at 3.56%. It was fifteen times

higher than that of Thailand and this was the first year that its GERD/GDP was higher than that of Japan.

**Law and Regulations**

- In terms of law enforcement and judicial informatization, the ministry is planning to create a Digitized National Assembly by setting up an effective Legislative Information Support Service System in order to assist judicial activities, and to provide legislative information on the internet.
- Korea's Copyright Act was largely amended in 1986 to protect the rights and integrate public interests.
- The e-Signature Act was launched in 1999 and there was an adjustment in the section of media neutrality, expanding the concept of electronic signatures and certified keys as well as the creation of a wide variety of legislation to secure the safety and reliability of public certifications issued by relevant government agencies as part of the government's broader e-Signature policy in 2001. There was one more adjustment in 2005 that was to be used in 2006 for a better safety and security system.
- The Framework Act on Intellectual Property was launched in 2011 and aimed to create a policy and operation system about the creation, protection and utilization of intellectual property and lay foundations that emphasize the value of intellectual property within society.

**Continuous development of technology**

- The first black and white television broadcast was in 1956 and later in 1981 programs were televised in color. In 2005, every home had a digital television. The devices, network and systems have been developed and the Internet was first introduced in Korea in 1982. The use of Internet in Korea was considered one of the first uses in the world and later, in 1994, the Internet was used commercially.
- From 1993 to 2002, US$ 7.78 billion was obtained from the government sector, the private sector and profits from doing business activities was spent on ICT activities as follows: 38% on CDMA wireless technology, 18% on human resource development and 44% on establishment of infrastructure, broadcast and standardization.
- The Self-Sufficient Information Technology Development Project was launched. It brought about Time Division Switching System (TDX), which is essential to communications, computers and semiconductors. This system is very unique and it gave rise to the digital information revolution in Korea and the IT industries there have grown rapidly. In addition, production technology has been taught to be applied to merchandise production through R&D and high-technology innovation.
- During Lee Myung-bak's presidency, a "low carbon, and green growth" strategy was used for changes in innovations and green growth issues. So,

the government established the National Strategy for Green Growth and Five-Year Plan to solve the energy shortage problem and climate change, and to create a new growth drive. This led to investment in R&D related to green technology at KRW 1.46 trillion in 2008 increasing to KRW 2.55 trillion in 2011. This project also led to many new technologies such as electric car batteries, LED devices, smart grids, and completion of the world's largest tidal power plant.

- According to Korea Internet and Security Agency (KISA) in 2010, Korea's personal computer penetration rate increased to 75.4% of the number of users. This meant there were 3 computers per 4 users.
- According to 2012 statistics form the World Bank, Korea was ranked 6th for the number of secure internet servers in 2011 with 2,496 secure servers per 1,000,000 people. The server was able to protect personal information from illegal activities through the use of the encryption technology.
- On July 12nd 2012, The Korea Communications Commission (KCC) announced a plan that would be used to solve the Active X problem that operated effectively only on the Windows operation system and Internet Explorer and usually there were malicious codes and viruses inside this technology. The plan was to spread the usage of the next-generation Web standard HTML5 which could operate effectively with every web browsers

and help decrease special plugins. Furthermore, the Korea Communications Commission (KCC) has another 15 plans to develop HTML5 continuously.

- 4G LTE was first provided in 2011, and eventually widened to other areas throughout the country in 2012 and 2013, contributing to the LTE data traffic to achieve 95 percent of the traffic, including the mobile network.
- Korea was ranked 1st in the United Nations E-Government Ranking in 2012. The factors taken into consideration consisted of the Online Service Index, Telecommunication Infrastructure Index, and Human Capital Index. The survey by the United Nations led a number of countries to be interested in learning the system; while some countries even adopted the system for their countries, leading to more income for the country from e-government exports, which was 235.66 million dollars in 2011.
- The internet connection speed lists were collected by the Akamai Technologies, Inc., in the Akamai 2014 rankings. According to the statistics, Korea is still first with the highest average internet speed at 24.6Mbps (megabits per second).

**Use of cultural industries to boost economy**

- The Korean government employs cultural industries along with export-led industrial development to drive the economy of the private sector. The cultural products take the forms of traditional music, television dramas and

television broadcasts. They are tools to convince the citizen to adopt the ideas that sacrifices for mutual benefits, long-working hours and low wages will help improve the country; as a result, the Koreans are willing to work with the government to achieve their goals. Later, these become Korean ethics: diligence and persistence. The cultural industries also promoted the growth of Korea's electronics and information and communication technology industries.

**Strengthening the export foundations**

- Korea's ICT infrastructure has been strengthened according to the 2000s ICT master plans and its effective and all-in-one ICT products have been exported. Since the 1960s, the Korean government has aimed to increase its export to improve the country's economy; however, "at first, its export promotion measures were considered trial and error. Later, more measures were implemented while some were removed. The government points out that there is no perfect recipe; measures have to be adjusted according to the market and the politics." Such measures prove themselves that they can help Korea export more ICT products and services. In 2013, the export volume of advanced-technology products accounted for US$ 130,460,427,536. High-technology exports refer to products with high levels of R&D such as aerospace, computers,

pharmaceuticals, scientific instruments and electrical machinery. ICT goods exports contributed 19.1% of the total goods exports. The ICT goods exports include telecommunications, audio and video, computer and related equipment, electronic components and other information and communication technology goods, but software is excluded. The volume of ICT goods imports account for 10.4% of the total goods imports. It can be seen that the percentage of goods exported is about one time that of goods imported(World Bank, 2013).

**Human resources development**

- In 1998, Higher Education in South Korea grew rapidly as the Organization for Economic Co-operation and Development (OECD) stated that students in Higher Education in South Korea in 1995 stood at 40.7% and this increased to 71.1% in 2010. In the same year, up to 65% of citizens in the 25-34 years old age group graduated from colleges, universities and in masters and Ph.D programs, which was ranked as first in Organization for Economic Co-operation and Development (OECD) countries. Higher Education in South Korea plays an important role in creating science and technological power. The number of undergraduate and graduate students in science major were 287,386 from all of the students attending higher education (3,269,509) in 2010.

- South Korea was ranked 4th in Mathematics and 6th in Science out of 74 countries of the OECD's Program for International Student Assessment (PISA) in 2009. The findings of the Program for International Student Assessment in 2012 were that Korea was ranked 5th in Mathematics and 7th in Science out of 65 countries.

**5.2.2 Weaknesses**

**Uninterrupted government policies**

- Each president has prioritized different aspects; for example, President Lee Myung-bak put emphasis on green growth while President Pak Geun-hye on a creative economy. The green growth policy was dismissed(Mundy, 2015).



**Providing benefits for big companies**

- In the past, Korea was led by government strategy and Chaebol implemented the strategy, resulting in the obstruction of marketing mechanisms. The market arose from this strategy benefitted politicians and entrepreneurs close to the government. This relationship led to corruption. Korea's ICT policy could attract large companies that would like to invest in ICT and a creative economy center plan was mapped out. Such large

companies widely known as Chaebol included Samsung and Hyundai and they remain powerful companies in Korea.

**Strict investment measures**

- There are many limitations of cyber conditions which impact on the Internet infrastructure investment in Korea. Even though the policy will open the opportunity for foreign investment, domestic investors continue to receive superior support.

### 5.2.3 Opportunities

**Cooperation with other countries on the international stage**

- 1993 witnessed the participation of the Korean government in the Uruguay Round of Trade Liberalization Talks and this enabled Korea to open its market in the world arena. On September 12, 1996, Korea was accepted as a member of the Organization of Economic Cooperation and Development (OECD), whose major role it is to strengthen its country members' economies.
- The Foreign Investment Promotion Act was implemented in 1998 and in July 2012. This act incorporates FTA with the Korea-EUFTA and the Korea-

USFTA. Korea is very enthusiastic to sign FTAs with other countries to promote its trade.

- President Park Geun-hye launched the Northeast Asia Peace and Cooperation Initiative (NAPCI) to emphasize that economic cooperation in the South China Sea would lead to peace and the seven key soft security agenda, namely, nuclear safety, energy security, the environment, cyberspace, health, drugs and disaster management among the NAPCI members; however, it is likely that other aspects of cooperation will be included to ensure that the members are prepared for new challenges(Ministry of Foreign Affairs, 2015).

**Learning new administration concepts**

- At the beginning of President Kim Daejung's term the economy recovered from being in debt to the IMF to the amount of 57,000 million US$ on December 3rd 1997. South Korea had to accept many conditions from the IMF. As a result, the government had to allow U.S. Wall-Street capitalism and support all products from the US. This kind of management used the theory of business administration developed from the software industry and Silicon Valley University by emphasizing monetary matters management with support from modern technology experts and financial experts to transfer and manage the money to earn profits(Thandee, 2009).

**Dissemination of Korean culture and entertainment industry worldwide**

- In 1999, the Korean wave occurred with the spread of Korean popular culture led by Japanese popular culture at that time. The Korean wave has spread to many countries in Asia, South East Asia, and other countries around the world. So, South Korea is known as the origin of K-Pop, Korean TV dramas and Korean food. Moreover, one of the most famous music videos watched on the Youtube website was from Korean rapper Psy launched on July 15th 2012. That video had over 2,400 million views until December 7th 2015.

**Increased use of the Internet and emergence of new IT devices**

- According to the statistics provided on the website by the International Telecommunication Union (ITU), in 2015 more than three trillion people worldwide had access to the Internet. The use of broadband service by means of smart phones and tablets grew the most in the ICT world market. The use of ICT increased continuously while the expenses for the services of mobile phones and broadband declined continuously. The Internet has changed some people's ways of life and has become part of the economy, politics and society since people which access to the Internet can gain benefit from the information of their interest – issues related to politics, society, economy, education or career.

### 5.2.4 Threats

**Disputes among East Asian countries**

- The dispute between Japan and South Korea over the control of the islands known as Takeshima in Japan and Dokdo in South Korea and the islands known as Senkaku in Japan and Diaoyu in China. South Korea assert that its claim over Dokdo Islands is legitimate since it was liberated from the 1910-1945 Japanese colonization and South Korean security guards have been posted there since 1954. Japan infuriated South Korea and China by revising its history textbooks stating that these islands of conflict are under the jurisdiction of the Tokyo government and in its 2015 Annual White Paper, Japan pointed out that the problems about Takashima Islands and the Kuril Islands, lying further north of the Takashima Islands and under the jurisdiction of Russia, were controversial and Russia has asserted its rights over these islands for 11 years. Meanwhile, Prime Minister Shinzo Abe made a visit to the Yasukuni shrine. Both South Korea and China consider the shrine as glorification of Japan's past military aggression. They think that Japan shows no repentance for its past actions against its neighboring countries and has tried to cover up its imperialist aggression. Prime Minister Shinzo Abe confirmed that his visit to the shrine signified that Japan did not want to wage war with any country. This political issue

affects the stability and cooperation in this region as well as other aspects(Dailynews, 2015; Mcot Foreign News, 2015) .

**Chinese industrialization in the global market**

- 1997 witnessed the economic crisis in Southeast Asia and the rapid development of computer technology and its related devices, resulting in fierce industrial competition. In addition, as China is a member of the World Trade Organization, the competition has become tougher. This is evidenced by the website alibaba.com, focusing on wholesaling and the website Aliexpress.com, focusing on retailing. These two big Chinese e-commerce companies, along with other e-commerce companies in China, facilitate access to Chinese products. Their members are from 240 countries, accounting for the largest number of customers. The smartphone of Huawei, well-equipped with ICT equipment and services, came third as the largest smartphone vendor in the 'Smartphone Vendor in 2015 Q2' while Apple came second and Samsung first(International Data Corporation, 2015).

### 5.3 SWOT analysis of Information and Communication Technology Development in Thailand

Table 5: SWOT analysis of Information and Communication Technology Development in Thailand

| | Positive | Negative |
|---|---|---|
| | Strengths | Weaknesses |
| Internal Factors | • People are eager to use ICT and new technologies.<br>• The government continuously supports the use of ICT.<br>• The working situations of the citizen<br>• The stability of ICT service providers | • The investment in equipment that has not been fully exploited<br>• The development of infrastructure and new technologies<br>• R&D<br>• FDI and exports |
| | Opportunities | Threats |
| External Factors | • International cooperation<br>• Increased use of the Internet worldwide<br>• Industrialization of China in the global market | • A lack of high-skilled labor<br>• Outdated laws<br>• Corruption<br>• Education<br>• Social inequality |

### 5.3.1 Strengths

**People are eager to use ICT and new technologies**

- According to http://www.statista.com, the total registered users of Line in Thailand were 33 million, ranked second in the world in 2014 and Zocial Inc. revealed that about 28 million Thai people or 42% of the total population had Facebook accounts, ranked ninth in the world and third in ASEAN (Zocial Inc, 2015). The first in ASEAN was Indonesia, followed by the Philippines. The Facebook users in ASEAN accounted for 170,740,000. The Thais also welcome new mobile phones with advanced technology. The Digital Advertising Association (Thailand) (DAAT) stated that more than 50% of Thai people own a smartphone. Twenty-three million people use a smartphone service provided by AIS, followed by 14.9 million provided by DTAC and 10.3 million provided by Truemove according to a survey of the mobile market at the end of Q2 2015. As a result, it can be seen that Thai people are enthusiastic about ICT. In addition to providing entertainment and a changing lifestyle, social media serves as a marketing channel for everyone who would like to promote or sell a product(Digital Advertising Association (Thailand), 2015).

**The government continuously supports the use of ICT**

- The government has supported such projects as “ICT Free WIFI”, implemented by the Ministry of Information Technology and Communication(IT News, 2014). The capacity of WIFI is 3Mbps/512 bps and there are 20,000 hotspots throughout the country. The main objective of this project is to provide the public with free Wi-Fi through high-speed wireless internet so that anyone can gain access to information that can improve their quality of life. It can also be used as an educational tool. An Internet community center (Wi-Fi community) was established to enhance community education and promote Thailand to be a knowledge-based society. “Thailand ICT Youth Challenge 2015”, co-hosted by the Ministry of ICT, the Association of Thai ICT Industry (ATCI) and the Office of the Basic Education Commission of Thailand, is another project that organizes a youth camp based on the concept of “ICT for 21st Century Learning”. The project has been launched for 2 years, aiming to provide youths, teachers and educational staff with creative use of digital media so that they can pass on this knowledge to their community and society as a whole(National News Bureau of Thailand, 2015). There are many other ICT projects that have been supported by the government. Furthermore, the government employs the chief information officer and some assistants to be responsible for the information and communication technology system of each ministry. The government is also working on the methods and plans of the

chief information officer's duties at the local level, including the duties that would be applied to the information and communication technologies in order to be beneficial for the government and the locals. The regulations and methods of administration, collaboration, budget plan and the operation of the government administration have been improved with the use of information and communication technologies, resulting in the reliability, efficiency and effectiveness of the system.

**The working situations of the citizen**

- In 2000, the International Labour Organization (ILO) presented its survey results on Working Time around the World: Trends in Working Hours, Laws and Policies in a Global Comparative Perspective. It was found that about 22% of the labor worldwide worked more than 48 hours a week. In terms of the longest working hours (hour/week), the working hours of Thai workers was ranked third. 46.7% of them worked more than 48 hours a week (the second was South Korea at 49.5%)(Sangheon Lee, 2007).

**The stability of ICT service providers**

- The turnover of the ICT companies was ranked top of all companies in Thailand. TerraBKK Research ranked the average net margin of each industry during the past nine months of 2014 and revealed that the average net margin

of information and communication technology industry was ranked fifth. Its average net margin was at 11.41% while that of the banking industry came first. TerraBKK Research also ranked the first 50 public companies in the Securities Exchange of Thailand based on their net profit margin. Among the ICT companies, INTOUCH group had the highest net profit margin. This group, ranked fourth, manages investment in telecommunication, media, information technology and digital content. It can be said that the ICT industry in Thailand has high potential to grow further(TerraBKK Research, 2014).

**5.3.2 Weaknesses**

**Investment in equipment that has not been fully exploited**

- The government and the private sectors work together in developing the citizens' information system. Thus, all the citizens are able to own a smart ID card in order to contact and get services from the government, as well as to get the privileges of government administration(Chaisaad, 2015).

**The development of infrastructure and new technologies**

- According to ITU, 2001, the infrastructure related to information technology and communication in Thailand had not been improved much although the ratio of mobile phone use per population was higher than the total ratio in

ASEAN. When compared to the ration of mobile phone use in Singapore, Brunei and Malaysia, the ratio of mobile phone use in Thailand was still lower.

**R&D**

- About 0.1% of the gross domestic product (GDP) was spent on the research and development of information technology and communication, 0.062 % of which was spent on the research and development of equipment related to this industry. This percentage of investment was quite low compared to that of some countries. According to the data provided by the Office of the National Economic and Social Development Board (NSEDB), in 2001, out of 49 countries whose value of investment in research and development was compared with the GDP, Thailand was ranked 46$^{th}$. Although Thailand is the world's second largest manufacturer of hard-disk drives, it does not have an R&D center for hard-disk drives. Thailand, therefore, has lost an opportunity to enhance its potential to become the world's largest manufacturer of hard-disk drives due to a lack of an upstream industry coupled with no further development of products related to information technology and communication. These are the reasons why Thailand has to rely on foreign technology. According to Table 3.1, Thailand's export and import of computers and computer parts, it can be clearly be seen that Thailand depends largely on imports and this implies that

a measure requiring domestic computer manufacturers to use its parts made domestically to reduce imports has not been effectively imposed.

**FDI and exports**

- Thailand's Foreign Direct Investment (FDI) inflows in 2014 were worth US$ 12,565.73 million and its Foreign Direct Investment outflows US$ 7,691.53 million. The value of both inflows and outflows were lower than those of last year(UNCTAD, 2015).
- In 2013, the value of Thailand's high-technology exports stood at US$ 33,901,233,425. The high-technology exports refer to products manufactured with advanced R&D such as aerospace, computers, pharmaceuticals, scientific instruments and electrical machinery. ICT goods exports accounted for 15.6% of the total goods exports. The ICT goods exports include telecommunications, audio and video, computer and related equipment, electronic components and other information technology goods but do not include software. The ICT goods imports contributed 11.3% to total goods imports(World Bank, 2013).

### 5.3.3 Opportunities

**International cooperation**

- The first Free Trade Agreement, (FTA), was the ASEAN Free Trade Area, also known as AFTA. Presently, Thailand has already made agreements with 8 countries, – China, New Zealand, Bahrain, Japan, Peru, the United States, India, and Australia, as well as the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC). The main purposes of the agreement are to maintain the status and potential of Thailand's exporting activities and to enhance the ability of the competition on Thai pricing strategies in the current markets. (FTA Department of Trade Negotiations, 2010)
- On December 31, 2015, Thailand will become a member of the Asean Economics Community (AEC), including Thailand, Myanmar, Laos, Vietnam, Malaysia, Singapore, Indonesia, the Philippines, Cambodia and Brunei. Like the Eurozone, the AEC aims to acquire economic benefits for its members(Sawettanan, 2013).

**Increased use of the Internet worldwide**

- The International Telecommunication Union (ITU) reported that in 2015, there were more than 3 billion internet users(ITU, 2015). The broadband services through smartphone and tablet grew the most in the ICT global market. The

higher the number of ICT users, the lower the prices of services for mobile phones and broadband. The Internet has changed some people's way of life and has become part of the economy, politics and society since people with access to the Internet can gain benefit from the information of their interest – issues related to politics, society, economy, education or career.

**Industrialization of China in the global market**

- 1997 witnessed the economic crisis in Southeast Asia and the rapid development of computer technology and its related devices, resulting in fierce industrial competition. In addition, as China is a member of the World Trade Organization, the competition has become tougher. This is evidenced by the website alibaba.com, focusing on wholesaling and the website Aliexpress.com, focusing on retailing. These two big Chinese e-commerce companies, along with other e-commerce companies in China, facilitate access to Chinese products. Their members are from 240 countries, accounting for the largest number of customers. The smartphone of Huawei, well-equipped with ICT equipment and services, came third as the largest smartphone vendor in the 'Smartphone Vendor in 2015 Q2' while Apple came second and Samsung first(International Data Corporation, 2015).

### 5.3.4 Threats

**A lack of high-skilled labor**

- There are a large number of graduates in information technology a lack of highly-skilled workers because of unqualified graduates and the production of personnel that do not meet entrepreneurs' requirements. The problems stem from a rapid change in the world of information technology. This change is so rapid that educational institutions cannot adapt their related curricula accordingly. IT-related vocational education should be promoted.

**Outdated laws**

- According to the Cambridge Dictionary, a law means "a rule, usually made by a government, that is used to order the way in which a society behaves"(Cambridge Dictionaries Online, 2015). Since Thai society keeps changing so should some laws to be relevant to the changing society. For example, the first copyright law was issued in 1994 and was amended in 2015 by adding issues related to digital rights management (DRM). Later that year, it was amended for the third time. It can be seen that it took such a long time for the law to be amended since it was issued. During that time, many changes had taken place in society.

**Corruption**

- To deal with corruption, the Corruption Perceptions Index (CPI) was proposed by an organization called the Transparency International. This organization surveys the subjects' attitudes / perceptions toward corruption in their country. This compilation of CPI was based on the data collected by polls organizations, accredited research institutions, well-known independent multi-national institutions / organizations; however, the CPI has been updated annually due to updated data. The range of CPI scores is from 0 (highest number of corrupt practices) to 100 (lowest number of corrupt practices). Of 175 countries, Thailand was ranked 85$^{th}$ with 38 points(Transparency International, 2014).

**Education**

- According to the 2012 UNESCO database, the Thai government's expenditure on education was 4.93% of the GDP or 21.4% of total government expenditure. When combined with the data obtained from the World Bank, the government expenditure on education was worth US$ 18 billion. When comparing this figure with the 2012 PISA scores, out of 65 countries, Thailand was ranked 50$^{th}$ in terms of mathematics and 48$^{th}$ in terms of science. In 2009, out of 74 countries, Thailand was ranked 52$^{nd}$ in terms of mathematics and 51$^{st}$ in terms of science. The ranks in both years were about the same when compared with the expenditure on education.

- Such indices indicate that it is far-fetched to consider Thai education excellent and immediate implementation is required at all levels. The factors that contribute to this shortcoming are personal, family, educational institutions, access to sources of knowledge and others; as a result, the provision of good education means minimizing related obstacles. In 2015, Kamnoetvidya Science Academy, a school model, was founded by the PTT Group, aiming to foster talented students in mathematics and science. Their expenses are sponsored by the Group and the school values quality rather than quantity and is equipped with modern equipment. The Group asserts that if students do not have to worry about anything and with quality teaching and state-of-the-art equipment, they can learn well. Other schools should try to follow the management of this school(49GROUP, 2015).



**Social inequality**

- The Thailand's ICT Master Plan is affected by the major problem of social inequality. It can be seen that one of the principles of Thailand's ICT aims to spread prosperity to rural society but Thailand still has no effective policy to realize this. Income can be a factor used to measure the economic gap. According to the 2012 analysis of poverty and social inequality in Thailand reported by the Office of the National Economic and Social Development Board (NESDB), during the past five years, most of the earnings clustered around a

small group of people. More than 39.3% of the total income was shared among the richest (10%) while 1.6% of the total income was shared among the poorest (10%). The income gap between the richest and the poorest was 25.2 times of the total income. Education can also determine this inequality. The Kasikorn Research Center pointed out that a country with quality education has few problems about wealth distribution(Srilert, 2014).

**5.4 TOWS Matrix analysis of South Korea ICT Development Promotion**

Table 6: South Korea ICT Development Promotion TOWS Matrix analysis

| Internal Factors | Internal Strengths:<br>● Development of infrastructure and related ICT management systems<br>● Expansion of domestic markets to benefit one another<br>● Research and Development and | Internal Weaknesses:<br>● Uninterrupted government policies<br>● Providing benefits for big companies<br>● Strict investment measures |
|---|---|---|

| | | |
|---|---|---|
| External Factors | linkages with the educational sector<br>• Law and Regulations<br>• Continuous development of technology<br>• Use of cultural industries to boost economy<br>• Strengthening the export foundations<br>• Human resources development | |
| External Opportunities:<br>• Cooperation with other countries on the international stage | SO:<br>➢ ICT product and service network sell<br>➢ Encourage the development of | WO:<br>➢ Create specific model scheme for integrating with foreign countries |

| | | |
|---|---|---|
| • Learning new administration concepts<br>• Dissemination of Korean culture and entertainment industry worldwide<br>• Increased use of the Internet and emergence of new IT devices | customers' target technology<br>➢ Creating capacity building of Human resource by cooperating with other countries<br>➢ International human resource exchange<br>➢ Building ICT infrastructure in foreign countries to support Korea investors<br>➢ Promote start-ups in foreign countries | ➢ Promote ICT application in government and private sector operation among SMEs |
| External Threats:<br>• Disputes among East Asian countries | ST:<br>➢ East Asia Focus on mutual benefits to | WT:<br>➢ The distance of Chaebol make |

| | | |
|---|---|---|
| • Chinese industrialization in the global market | solve the conflict among the countries in East Asia<br>➢ Developing ICT product and service beyond the customer's need, inventing better technology than competitors, and directly and indirectly distribute advertisement international markets | Korea far beyond from China<br>➢ East Asia Overlook the conflict in the past and look forward for benefits of countries in East Asia<br>➢ Looking for trade opportunity in competition |

**Strength- Opportunity (SO)**

- **ICT product and service network sell**

With the strong fundamental, cultural industry becomes the strength of Korea because Korean and people from throughout the world are in favor of Korean music, television dramas, and TV shows. Economic integration not only consisted of economic dimension but also political, security, social and cultural dimensions, in which to reinforce attractiveness and strengthen supportive factors for investment. Therefore, Korean focuses on knowledge as a cost to reinforce and distribute Korean culture and entertainment via internet throughout the world. Koreaness is embedded in general product, food, mobile phone, or mobile applications. All this ICT product and services is transferrable to the partner countries. With regard to ICT service, Korea shares management procedure to other countries via ICT such as e-Government, which Korea is in the first place of United Nations e-Government Ranking in 2012. As a result, many countries are interested in learning this system and some countries have already implemented the system. Consequently, Korea earned 235.66 million US dollar from e-government export in 2011(Unit, 2012). Therefore, the auction of infrastructure development and ICT system in foreign countries project is the target of investment because the strengths of Korea are technology, law & regulation related to ICT, R&D, and human resource.

- **Encourage the development of customers' target technology**

Basically, Korea has high quality of R&D and strong ICT infrastructure. When these two good points match with Human resource, there is the application of science and in-depth data of new technology. All these matters support and enhance production efficiency, create and develop the growth of new industries, and change the pattern and organizational structure by applying knowledge efficiently(Steinmueller, 2002). W. Edward Steinmueller stated in "Knowledge-based economies and information and communication technologies" that once the fundamental factors were prepared, it would be possible to set the target of the developing R&D and technology. For example, the current main target of European Union (EU) is the encouragement on Green Growth. Thus, Korea should diligently present the new green technology development and researches relevant to European investors. The direct development and having clear target are resulted in a better effectiveness and good for product sell; it attracts foreign investors to make more investment in the country.

- **Creating capacity building of Human resource by cooperating with other countries**

Korea is the country that lacks of natural resources. For this reason, they create human resource as a mechanism to build knowledge based society and steer the country forward. The aim of Korea is to become top ten countries, which has the best human resource. At present, Korea is one of organizations in the top ranks that has educational proficiency test in which leads to the rapid industrial technologies

development, particularly ICT that is the vital fundamental of Korea. However, the growth keeps developing, thus, the search and cooperation with proficient and experienced associations in ICT, such as China that is a leader of production industry, which is beneficial for all industries, because each country is specialize in different field.

- **International human resource exchange**

To steer the country forward, it is difficult to develop advanced technology. Thus, the new international cooperation by exchanging knowledge in order to procure new technology is required. However, in order to be more advance and have the newest technology, human resource exchange is an option. Human is able to create and innovate the exchange of human e.g. software engineer programmers or researchers. This causes environmental, social, and cultural change which the new software might be created and becomes the product in the future.

- **Building ICT infrastructure in foreign countries to support Korea investors**

Korea own quality and secure ICT, including relevant laws to support ICT development. Thus, Korea law should be the model of ICT development to the countries that ICT connection is underdeveloped. Further, Korea should make investment in building ICT infrastructure in those countries to provide good quality of internet to their people and Korean investors would have benefits as well. For example, there are approximately 40 Korea firms make investment in Myanmar in variety fields: agriculture, livestock and fishery, production, petroleum and natural gas

industry, and service fields. The key companies are Daewoo International, Posco, add Hyosung. These companies have good ICT system for administration. Therefore, exploring ICT market is creating new opportunity for other investors(East Asia Watch, 2011).

- **Promote start-ups in foreign countries**

"A startup is a company working to solve a problem where the solution is not obvious and success is not guaranteed," says Neil Blumenthal, cofounder and co-CEO of Warby Parker(Rbehmed, 2013). Hence, start-up business is mostly in application pattern to solve problem and assist users on a daily basis use. Korea has been created numbers of original application, so, Korea ought to invest in the countries lacking of budget but have the same idea and concept in a form of joint venture business in which helps transferring the idea to practical application.



**Strength-Threats (ST)**

- **East Asia Focus on mutual benefits to solve the conflict among the countries in East Asia**

The conflicts between China, Korea, and Japan have been emerged for a long time and still engraved in Korean and Chinese people's mind. It is hardly impossible for those people to forgive and forget what had happened. However, what it is today and what is going to be tomorrow is more important. The three countries have to focus more on mutual benefits. Recently, there was the Triple entente conference between

Li Keqiang, China Prime Minister, Shinzo Abe, Japan Prime Minister, and Park Geun-hye, President of South Korea on 1 November 2015, after the last one on 2012. This conference signaled that the three countries had the aim to develop and enhance the relationship. Variety of topics were discussed, including free trade zone, and threat from North Korea's nuclear weapon project. The three leaders agreed and emphasized on "Firm Objection" to nuclear weapon development project on Korean Peninsula. Li Keqiang, China Prime Minister also concluded that "We agreed to accept the history forthright to pass over for the future. We also are prepared for dealing with the sensitive issues in which the former historical matters are included appropriately"(ASTV MGR online, 2015). All these are the good sign of the better relationship in other perspectives and great benefits from the cooperation of the three countries.

- **Developing ICT product and service beyond the customer's need, inventing better technology than competitors, and directly and indirectly distribute advertisement international markets**

Conduct R&D on the need of customer and analyze competitors' information, and develop product to be beyond the customer's need and to be better than existing products of competitors with ICT and R&D developing from quality human resource. For example, in 2000, Korea government invested $125 million in 174 basic core technologies to obtain technological competitive edge (MIC :113). Consequently, Korea is steps ahead other countries and increases users every year by applying online channel and promoting marketing by maintaining existing customer base and exploring

new markets. The mechanism Korea uses is its strength in entertainment media that is very popular throughout the world.

**Weaknesses-Opportunities (WO)**

- **Create specific model scheme for integrating with foreign countries**

Korea has to think about creating specific model scheme for integrating with foreign countries and focus the objective on ICT and make it clear to prevent the factors from the government. International cooperation should have a mutual standard policy to apply to all government. For example, Free Trade Area (FTA) is an agreement of two or more countries aims to reduce trade barrier for the free trade among the group(Nopparat Kladcharoen, 2009). Main characteristic of FTA depends on the agreement of the parties because there is no fix criterion or standard and it will be effective during the period of agreement. Other cooperation may be different depend on the objective.



- **Promote ICT application in government and private sector operation among SMEs**

The world is now connected with internet which resulted in equality and open information and fact. The statistic of ITU in 2015 revealed that there was 3,175 million individual using the internet, in which double increase from 2008. 2,000 million individual were from the developing countries. For this reasons, ICT stops the monopoly and activate the efficiency and growth of marketing mechanism, including

reduce the operation period with the supportive network that rapidly helps distributing information(Neffati, 2012). Moreover, it promotes the development of SMEs usage in all types of business which resulted in the highest efficient usage. Thus, ICT is beneficial for creating competitive equality in order to make all government projects transparent and accountable by public.

**Weaknesses- Threats (WT)**

- **The distance of Chaebol make Korea far beyond from China**

Chaebol operates many remarkable projects are significant because it is a big company and able to operate various activities in which support the investment in large business with high risk, and support development and researches. Moreover, Chaebol is the place attracts skillful and quality resource from well-known universities which make the organization full of valuable knowledge(Kim, 2013). Additionally, it received special subsidy from the government for research to stimulate learning in organization(Lee Wan, 2014). Chaebol is the leader of research and development in industry sector, which is the main stimulation of using technology-based industry and make Korea becomes the first rank. At present, Samsung holds the most market share of Smart phone vendor, followed by Apple, and Huawei.

- **East Asia Overlook the conflict in the past and look forward for benefits of countries in East Asia**

The reaction of each Korea government toward solving conflicts between China, Korea, and Japan is uncontrolled because it directly depends on the leader of the government. To better the relationship between the three countries, it is necessary to look for the benefits in the future which should be set as the top priority of country development plan.

- **Looking for trade opportunity in competition**

China is the crucial competitor in ICT product because it is the source of technology, human resource, industrial factory with high capacity of all products. Thereby, Korea should look for the opportunity to cooperate. For example, for the same product and qualifications but those produced in China is cheaper, Korea should hire China to produce to reduce the cost of production. Similarity, China should do the same or cooperate with Korea to produce international product because China is better than Korea in production while Korea has good technology. Then, distribute the product to the third countries.

**5.5 TOWS Matrix analysis of Thailand ICT Development Promotion**

Table 7: Thailand ICT Development Promotion TOWS Matrix analysis

| Internal Factors / External Factors | Internal Strengths:<br>• People are eager to use ICT and new technologies.<br>• The government continuously supports the use of ICT.<br>• The working situations of the citizen<br>• The stability of ICT service providers | Internal Weaknesses:<br>• The investment in equipment that has not been fully exploited<br>• The development of infrastructure and new technologies<br>• R&D<br>• FDI and exports |
|---|---|---|
| External Opportunities:<br>• International cooperation<br>• Increased use of the Internet worldwide<br>• Industrialization of China in the global market | SO:<br>➢ Promote Thai culture to online market throughout the world<br>➢ ICT investment with local partnerships | WO:<br>➢ Send human resource on the study and business trip to the successful |

| | | |
|---|---|---|
| | | countries in ICT development<br>➢ Proposing package service to ICT business in Thailand<br>➢ Learn and cooperate with China to develop infrastructure and new technology |
| External Threats:<br>• A lack of high-skilled labor<br>• Outdated laws<br>• Corruption<br>• Education<br>• Social inequality | ST:<br>➢ Promote online learning with government support<br>➢ Increasing transparency through ICT | WT:<br>➢ Infrastructure Funding<br>➢ Promote R&D and educate critical thinking in school |

| | | |
|---|---|---|
| | ➢ Cooperation of communication administrators to establish social project<br>➢ ICT law amendment | |

**Strength- Opportunity (SO)**

➢ **Promote Thai culture to online market throughout the world**

Thailand has facebook users in the top ranks of the world and each of them is likely to be a channel to deliver data, knowledge, and product and culture to world through Friends, Pages, and Groups. The government should be the main supporter to promote Thai people to participate in this campaign in which encourage the Thainess to be known by foreigners. As a result, it creates more international cooperation. For example, Korea is very successful with applying ICT as a tool to create soft power.

➢ **ICT investment with local partnerships**

To make investment in aboard, the proficiency in the product we are investing is not sufficient. Doing business aboard, we may be disadvantageous to the local competitors in terms of language, cultural, law, lifestyle, and other factors. Therefore,

we have proficient administrator in ICT in Thailand, looking for local partners is important for approaching ICT market in foreign countries which is one of our advantages. This is because local partners are proficient in area, comprehend law, have the product distribution channel, including marketing which is very helpful for Thailand to understand the need of customers in the country of investment. Michael E. Porter and Mark R. Kramer stated that "In partnership with local organizations, government, and residents, the company created a communitywide coalition focused on enhancing the local economy and the environment"(Michael E. Porter, 2002).

**Strength-Threats (ST)**

- **Promote online learning with government support**

The tendency of using internet is increasing and Thailand is not an exception. Thailand, then, should establish online knowledge resource which is efficient and accessible in a simple way and suit to everyone of all age level. It is one of opportunities to distribute knowledge for self-developing and making a living. Furthermore, free quality online course should be promoted and certification certified by government or reliable organization should be presented after finishing course or qualified the standard. This approach may attract more people to study because it saves the time for travelling. Consequently, Thailand has more skillful labors and it helps decreasing social inequality in terms of education.

- **Increasing transparency through ICT**

In 2014, Corruption Perceptions Index (CPI) from Transparency International (TI) of Thailand was in rank 85 from 175 countries, accounted for 38 points (CPI score is 0, the most corruption, to 100 less corruption). The score of the country that has least corruption is 92 points which is quite different from those of Thailand. The ratio of using mobile phone and internet in the world has increased and Thailand is the case. Thus, we should take this opportunity to use ICT as a tool to make the transparency in operation and increase efficiency. Importantly, we have to deliberately use it. According to Åke Grönlund, he stated that "ICT can indeed bring a positive difference but only in combination with skilful and determineduse"(Grönlund, 2010) and "ICT has a greater positive effect than the traditional anticorruption factors (e.g. administrative reform without the development of technological support systems, free press)"(Andersen, 2009; Shim, 2009). Dieter Zinnbauer concluded the benefits of ICTs that "Make transactions with public officials and the performance of the latter more transparent, documentable and auditable, deterring corrupt behavior"(Zinnbauer, 2012). Therefore, to eliminate all corruption, it is the burden of all sectors: government, private, and public to cooperate and take benefits of ICT to clean and sustainably develop Thailand.

- **Cooperation of communication administrators to establish social project**

To offer the equality to the underprivileged to access ICT, Universal Services Obligation (USO) collect the earnings from those with the permit for

telecommunication service and allocate the percentage to the funds. Then the fund manage the earnings to run the projects to develop society. If all the service providers organize the projects directly, it becomes a grand project and has professional management system. Importantly, it will have media to publicize the projects to public. As a results, it is recognized and becomes the practical effective project

- **ICT law amendment**

Government gathers ICT personnel to amend ICT law and other relevant laws to be up-to-date and more secure to users. The security is one of the factors for public to make decision on using ICT in financial transaction, which lead to the business flow.

**Weaknesses-Opportunities (WO)**

- **Send human resource on the study and business trip to the successful countries in ICT development**

Thailand has been using Smart ID card for many years. However, to contact with government sector, Thai people still need to use the copy of ID card. The main reason for not using Smart ID card efficiently is the computer system cannot support the development and the government system which still based on manual operation system (Wichian Chitchanoknat, Director of The Bureau of Registration Administration, Department of Provincial Administration, Ministry of Interior 2015). The government should bring this issue to attention urgently(Chaisaad, 2015). The shortcut course is to study and learn in the countries which successfully use Smart ID card. For example,

Hong Kong uses the smart ID card in immigration system. Hong Kong Smart Identity Card is not only an ID card but also a passport and other card for access other services. Hong Kong Post utilizes this Smart Card system to increase “e-Cert” service by using Smart Identity Card instead of digital signature which is legal. With regard to immigration, it facilitates transportation in terms of safety and saving time(The Hong Kong Immigration Department, 2011). With this great benefits, Thailand should seriously give an importance to this service and build learning cooperation to the successful countries so that Thailand Smart ID Card will become useful with the highest efficiency for infrastructure and new technology. Likewise, R&D and ICT should support students and ICT personnel to further study in aboard to accumulate new source of knowledge to develop Thailand in the future.

- **Proposing package service to ICT business in Thailand**

Establish organization or agency to provide location for facilities, labors, internet services, equipment and systems for business operation, including create environment for foreign investors based on concept “with nothing you can be successful” With this services, it decreases the complication of process and promote the investors to quickly make investment in business.

- **Learn and cooperate with China to develop infrastructure and new technology**

We cannot avoid the growth of China ICT industry but we can make use of this for the benefit of Thailand. Actually, China is the vital source of knowledge since it has

potential of being a producer of technology product and of being the consumer market of technology product. Patrick Thibodeau (2010) wrote the article in http://www.computerworld.com/ and gave five reasons why China became the leader of technology: the leader of China understood the process of engineering, they needed to have better innovation than those of USA, China had lot of alternative for one who had gift in science and technology, USA had declined in Science and Mathematics education, and Chinese was obtaining almost all of technology knowledge from USA(Thibodeau, 2010). With all these reasons, Thailand should not overlook the new technology of China and should support education by sending students or ICT researchers to further study in China where the valuable resource of technology is available.

**Weaknesses- Threats (WT)**

- **Infrastructure Funding**

Allocate budget for ICT infrastructure project for the entire country and develop technology to support allocation. Once these factors are ready and people are able to access them, manage learning in various forms to allow people to understand the simple application. Then, apply e-learning to develop education and this would solve the inequality problem in society.

- **Promote R&D and educate critical thinking in school**

Thailand should promote and invest in R&D in human resources management, trading, investment, laws and regulations, and other fields. R&D tells what we are in need so that we focus on it and resolve the problems. At the same time, new generations should be mainly educated in critical thinking because “good researchers engage in critical thinking”(Paul D. Leedy, 2010). This skill is the core of human resource development and it can be developed unlimitedly. “Human beings have developed several general strategies through which they can more effectively reason about and better understand worldly phenomena.Key among these strategies are critical thinking, deductive logic, inductive reasoning, the scientific method, theory building, and collaboration with others.”(Paul D. Leedy, 2010). From these reason, Thailand will have strong cost to bring to educational advantages.

# CHAPTER VI
# CONCLUSION AND SUGGESTIONS

## 6.1 Conclusion

To accomplish the two purposes of the research, firstly was to study the blueprint of Cyber Korea 21 which is the principle national development strategy that pushed Korea to become a knowledge-based economy and secondly to study the master plan of Thailand information and Communication Technology (ICT) for the Thai ICT development policy. SWOT TOWS and semi-structured interview, therefore, were applied as analytical tools with related documents to find the answer by mainly considering on the master plan.

Regarding SWOT analysis, it can be concluded that the strong point of Cyber Korea 21 is the high investment during 1990s and the amount has been increased. The connecting equipments have been developed its efficiency to reach international standard as same as laws and regulations for individual right protection and e-commerce facility, including procurement in digitization form to present transparency of financial flow. The full promotion of human resource, by study on factors which support personal development in all ages to be the major national resources, had been continued to improve  commercial market which leads to cycle consumption and income in every region. Cultural industries become the driver of the economy. Finally, Korea has strong export foundation is because previously it had industrial products for exportation. The country has encouraged gaining knowledge to improve

R&D and innovation in order to be the export leader. In terms of weak points, it relates to the continuity of the government policy because this factor is difficult to control when it depends on the politic situation in each country. Like Korea, when the government changes, the policy is also changed. The second factor provides benefit to big companies for their state project which they cooperate with the government. In the past, Korea offered benefits to politicians and businessmen while this action has been decreased and changed according to the government at that time. One reason which is why big companies still gain superior role is because the bigger investment group has better capacity for the operation and caused trade barrier. Besides, there are some conditions limiting the action which affect to the investment of some infrastructures, though it has welcomed the foreign investment already. These factors impact to the ICT development in Korea directly. For the opportunity, Korea has received cooperation from the other countries to spread Korean culture and entertainment industry around the world, together with the high-speed internet and new IT devices. Korean also accepts the new idea of management about globalization while its ICT takes the next step every day. These are Korea's equipments to broadcast their information efficiently. It connects the government with its citizens, citizens with citizens and the country with the world, resulting in its being a wide hub which facilitates the country's operations.

The dispute among East Asia countries has continued from the past until today even though they try to compromise several times. In this present day, the relationship

among three countries is still unstable which prevents the collaboration among these three powerful countries. However, they try to make an effort. Another threat of Korea is Chinese industrialization to global market or called the big war of technology because the two countries aim to develop their technology to compete their own rival. Korea is quiet stepping on the lead thanks to its brand products but it has to look carefully when Chinese ICT products has taken a large of shares in the market of year 2015.

For the ICT development in Thailand, the strong point is Thai government unceasingly supports ICT for the Thais and arranges Chief Information Officers to take responsibility in ICT section of every government unit. People themselves also are alert to apply ICT and respond to the use of new technologies. At the same time, they have strong service providers. These three are the main elements to develop ICT so that all Thai people can access. The weak point is the lack of equipment for investment, infrastructure improvement and modern technologies. The government is not aware of the importance of R&D and FDI while its export does not remain in the good rank. This is because most expenses are not appropriate without concerning on the pros and cons of each investment. Thai government should give priority to R&D which is the infrastructure of every kind of development, particularly of ICT which requires freshness, modernity and high efficiency to produce high-technology products with high value and good qualifications to be exported and to enter the competition. Regarding its opportunity, Thailand takes advantage from the high-speed internet which

tends to be faster including new IT devices. The collaboration among the countries in international level and the industrialization from China will encourage Thailand step into the global market. It is a good opportunity for people to connect with people around the world, leading them to gain knowledge, arts, cultures, economies and the many others from other countries who have good and weak points. The collaboration will result to mutual benefit. In terms of the outer factors which limit Thailand to develop its ICT, the first one is the social inequality, lack of skill and educated workers. These two are related because the good education will enhance people's skill and guide them to have good jobs. When they have good jobs, the social inequality will be eliminated. These machines take the important role in industrial development, especially in ICT sector where the market lacks a lot of skillful personnel. Next is the out-of-date law. Of course that every life must move forward, everything changes all the time, the legal amendment will bring up benefits, owning to the fact that it is fit to the present situation and reasonable to enforce people when there are many changes in ICT sector when the technology is changed rapidly. The final is corruption. Every country does not desire to be the top rank of corrupted countries. This problem causes the delay or the cease of the national growth because some groups of people selfishly explore benefit for their own; moreover, the country's image will be negative and impact to all sections.

According to the study, although South Korea have experienced the war which brought up severe poverty, less than ten years, the country could develop itself until

the economic growing rate increases reaching to be one of the top countries. In the early period, the manufacturers focused on consumable products for export and imported raw materials from outside countries. Later, the country moved to heavy and high-technological industries. Within this point, Korea has applied knowledge to produce its own products. The support of human resources and R&D is regarded as the main factors in technology and worker quality development because the more growing, the more concern of the sustainability in the future. The word “Knowledge-based economy” primarily was created in Korea. To sustain knowledge-based economy depends on the ability to make profit from using knowledge by creation and spreading into the global system. Another key of Korea which has been used to run the knowledge-based economy with ICT is efficient tools and devices while its people are ready to learn and to use the knowledge. The last thing is the environment which provides the ambiance of learning. In consequence, CYBER KOREA 21 began. It contains policies and strategies that guide Korea to be the information society, leading to the success in increasing production capacity and transparency. This also benefits to the other dimensions and the related technologies. In addition, CYBER KOREA 21 turns to be the real lesson and its outcome is very successful. Regarding to the policy, it has been divided into 3 chapters, information infrastructure as the first chapter for learning and creative nation, secondly to increase national products by giving knowledge and instructing information infrastructure, and finally, to create new jobs and opportunity in building business. Within the aforementioned topics, they contain many methods

for country's development which aims to create full-option knowledge-based economy. Korean government encourages people to learn how to use internet via programs and arranges projects for service providers, especially for the difficulty. Another success and support is ICT industry which is composed of 3 major principles as follows: Human Resources, ICT Venture Enterprises and Venture Capital. For Korea, the government is the heart of support the operation and problem solver in every sector, including the living of people, education, industry, agriculture, commerce and the government' s administration.

According to the study on knowledge-based economy in Thailand, it is well-known in a small group only. In fact, this should be widely recognized around the country. Thailand also deprives of major basic factors to develop its infrastructure and ICT management system and of R&D support for the society where people have knowledge which can be adapted in their real lives, the real situation. Furthermore, those who create new knowledge must perform the revolution from the start thought it might be hard but needed to do for the worthy outcome. The revolution must occur in several dimensions, for example, infrastructure, people, governmental system and the others. Nowadays, we gain advantages more than the early age because we have technologies and tools to support our development to become successful faster. ICT is one of those technology and tools which can the answer for the in-depth and long term development. It depends on how the government uses it to specifically improve

the organization and the country to offer people in all ages, genders and groups the opportunities of knowledge access

According to the analysis of the master plan of Thailand Information and Communication Technology (ICT), the content is quiet perfect but there might be some topic excluded. The content emphasizes on the commerce while the educational promotion is not in-depth. The aim is not high enough so the development becomes slow and most projects do not accomplish as expected. Unfortunately, they spent a lot of budget which may cause co-integration of the policies among units. The alteration of politics leads to the non-continuity of project operations and instability to support the project in a long-term. To strictly follow the policy and non-stop operation is the key to lead Thailand to the success and the government should give priority to this issue urgently.



**6.2 Suggestions for Thailand Information and Communication Technology (ICT) Master Plan**

Korea provides ICT knowledge to all groups of people. This is the major policy with the development of information infrastructure and the communication with support an enormous data, fast, reliable and secure. The use of high-speed internet turns to be a part of Korean culture. With this reason, the use of SWOT Matrix analysis would help us understand the relationship of factors of the ICT development in Korea. There are 4 types of strategies. Type 1, Strengths-opportunities Strategy or SO is ICT

sales and services network, capacity building for human resources with the other countries, exchange of human resource among countries, building ICT infrastructure in foreign countries for the benefit of Korean investors and start-ups support in outside countries. Type 2, Weakness-opportunities Strategy or WO is to create the master plan for the integration with the other countries and to support the use of ICT in the administration of private and public sectors in SMEs projects. Type 3, Strengths-threats Strategy or ST is to concern on the mutual benefits in order to solve the conflict among East Asia countries, to develop ICT products and services to be superior to the demand of customers, to invent more efficient technology than the rivals and to broadcast advertisement to the international market directly and indirectly. Type 4, Weakness-threats Strategy or WT is to develop Chaebol in order to stand in front of China, to ignore the conflict in the past focus on the mutual benefit of East Asia countries and to find the commercial opportunity in the competition.

In TOWS Matric Analysis of Thailand ICT Development Promotion, the first strategy or Strengths-opportunities Strategy (SO) is to use Thai culture penetrate global online market, to create one campaign for all Thais and to invest in ICT cooperating with local partnerships. The second strategy or Weakness-opportunities Strategy (WO) is to send people to learn and to study the exhibition in foreign countries whose ICT are already developed, to offer full-options service to ICT business in Thailand, to cooperate with China and to learn Chinese development of infrastructure and new technologies. The third strategy or Strengths-threats Strategy is to promote online

learning supported by the state, to increase transparency through ICT, to encourage media creators together manage social projects and to amend ICT laws. The final strategy or Weaknesses-threats Strategy (WT) is find infrastructure funding, to promote R&D and to teach critical think in the Thai education system.

Thailand has not brought strategies from ICT Development Promotion TOWS Matrix Analysis of South Korea due to the country depriving of basic element factors so today it cannot apply them with ICT Development TOWS Matrix Analysis. When the country's basic elements are ready, it can apply Korean strategies for the benefit of its own country accordingly. Therefore, the additional conclusion of SWOT analysis, semi-structured interview and the other related documents helps explain Cyber Korea 21 for more understanding by adapting as guidelines for ICT development policy of Thailand. According to the information and communication infrastructure, the country should throw a high investment and long-term project because it can lead to the other projects with high return in a long run. People will have stable, efficient, equal and approachable internet service. At the same time, the development of the infrastructure should be studied the management and problems together with inspection of the state's administration. The operations of the government should be informed to people for the sake of transparency and they can access the inspection of every ministry. There should be the study on ICT policies and collaboration among ministries to avoid the complication in operation and investment. For human resources, they are the most precious resource of all countries; consequently, everyone must give

importance and invest this resource because of the center of knowledge, innovation, invention and any discovery in each branch come from human, from birth to death. It is not knowledge that we can transfer to the others but also creation, morality and ideas. The mean to spread these is the media which are interesting and attracted all genders, ages and careers so they can understand simply and access to the internet. The example is locating libraries and computer centers in the difficult and distant areas. For the school, there should be a computer specialist with quality and standard. This person will transfer the knowledge to the other teachers and student in the school. In addition, the government should provide the knowledge treasure and e-learning system which is easily to use and gathers all academic subjects for everyone. Presently, every unit has its own knowledge treasure in its website which is hard to find and perplex to use. In terms of law and regulations, we should emphasize on the security the most in order to build credibility in using internet that can protect personal information under the legal security. It includes the protection of inappropriate information so that people can learn and use the information with accuracy and safety. The government should be the facilitator for the private sector, investing the competition with transparency and fairness, including building attracted environment, preparing the investment and fully supporting new entrepreneurs to enter the market.

**6.3 Suggestion for further research**

Due to some limitation of information which does not allow the access and some belong to Korea and in Korean version, time and limited resources results to elementary study. The researcher thinks that it should be studied more in the topic of ICT realization, application and problems in the distant areas and of the difficulties, by using questionnaire to acknowledge the real problems for planning the management. With this reason, the users will receive correct information and apply the knowledge from the information in their daily lives and works.

## REFERENCES


49GROUP. (2015). NEW VISTEC & KVIS CAMPUS OFFICIALLY INAUGURATED BY HRH PRINCESS SIRINDHORN.

Akami. (2014). akamai's state of the internet.

Andersen. (2009). 'E-Government as an anti-corruption strategy. *Information Economics and Policy*, 201-210.

ASTV MGR online. (2015). China-Korea-Japan" join the meeting to protect the stability of the region.

Brian, M. (Producer). (2012, December 10,2015). KT launches 4G LTE network in South Korea, targets 4 million subscribers. Retrieved from http://thenextweb.com/asia/2012/01/03/kt-launches-4g-lte-network-in-south-korea-targets-4-million-subscribers/

Cambridge Dictionaries Online. (Ed.) (2015).

Chaisaad, W. (2015). "Smart Identity Card"...Why is it not smart?

Chandra, D. S. (2013). Key Determinants of Information and Communications Technology to Promote Knowledge-based Economy in East Asia. *4*. http://www.ritsumei.ac.jp/acd/re/k-rsc/hss/book/pdf/vol04_07.pdf

Chang-Bun Yoon, S.-Y. S. (2003). A development Strategy for Korea's Information Society. *Korea's New Economic Strategy in the Globalization Era*.

Chartkaew, T. (2008). Knowledge-based economy chapter 1. http://www.sscs.co.th/images/stories/documents/Journal/2007/knowledgebaseeco1.pdf

Chomchai, Y. (2011, 2011). Meaning of ICT. from https://sites.google.com/site/kruyutsbw/khwam-hmay

Dailynews. (2015). Japan ignores China and South Korea on the protest of Education about Disputed Islands.

Department of Industrial Promotion. (1991-2002). 72 years of Development from the past to the future

Department of Trade Nogotiations. (2004). Thailand's Electrical and Electronics Industry.

Dictionary of the Royal Academy. (Ed.) (1999).

Digital Advertising Association (Thailand). (2015). *DAAT reveals numbers of mobile users in Thailand of the first quarter of year 2015* Retrieved from: http://www.daat.in.th/index.php/daat-mobile-2015/

Dongpyo Hong, S. K., Alexey Volynets. (2007). Information and communication Technologies for a Knowledge-Based Economy *Korea as a Knowledge Economy: Evolution and Lessons Learned*. Washington, D.C.

Durongkaveroj, W. (2012). IMF conditions 1997

East Asia Watch. (2011). Statistics of South Korea's Investment in Myanmar, Lao, Cambodia and Vietnam.

ETDA. (2015). Law sharing. Retrieved December 12,2015 https://www.etda.or.th/laws-sharing.html

FTA Department of Trade Negotiations, T. (2010). *Status of FTA negotiation between Thai and the other countries* Retrieved from http://www.thaifta.com/thaifta/Home/tabid/36/ctl/Details/mid/436/ItemID/5880/Default.aspx.

Gokhe, M. CONCEPT OF INFORMATION, COMMUNICATION AND EDUCATIONAL TECHONOLGY. http://www.tscermumbai.in/resources%20_paper_%204/IV.1_information_and_communication_technology.pdf

Grönlund, Å. (2010). Using ICT to combat corruption - tools, methods and results. *SPIDER ICT4D, 3*.

International Data Corporation. (2015). Smartphone Vendor Market Share, 2015 Q2. Retrieved December 15,2015 http://www.idc.com/prodserv/smartphone-market-share.jsp

Irshad, H. N. (2007). EMERGENCE OF KNOWLEDGE ECONOMY. http://works.bepress.com/cgi/viewcontent.cgi?article=1000&context=nazish_husain

IT News (Producer). (2014). ICT Free WiFi Retrieved from http://www.itday.in.th/ict-%E0%B8%A1%E0%B8%AD%E0%B8%9A%E0%B8%82%E0%B8%AD%E0%B8%87%E0%B8%82%E0%B8%A7%E0%B8%B1%E0%B8%8D%E0%B8%9B%E0%B8%

B5%E0%B9%83%E0%B8%AB%E0%B8%A1%E0%B9%88%E0%B9%83%E0%B8%AB%E0%B9%89%E0%B8%9B%E0%B8%A3/

Ittipol Pretiprasong, A. C., Weera Yooram, Suratsawadee Rakdee, Sirinart Rakdee, Pornchai Jiarawanich, Pamornsri Paibunruamsil Korean Case study : the proposal of ICT development for social development. http://www.muwac.mahidol.ac.th/MU_services_One_minute_with_MURP_Youth.html

ITU. (2015). ICT Facts & Figures2015. Retrieved December 15,2015, from International Telecommunication Union http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf

Kim, R. (Producer). (2013, December 16,2015). For South Korea's Top Students, Chaebol Are the Place to Be. Retrieved from http://www.bloomberg.com/bw/articles/2013-09-26/for-south-koreas-top-students-chaebol-are-the-place-to-be

Kuznets, S. (1966). Modern Economic Growth: Rate, Structure, and Spread.

Lee Wan, R. Y.-g. (Producer). (2014, December 15,2015). Samsung receives more than US$155 million in government subsidies. Retrieved from http://www.hani.co.kr/arti/english_edition/e_business/622549.html

Lundvall, B.-Å. (1992). *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*: Pinter.

Malaivongs, K. (1997). *IT Attitude*. Bangkok: National Electronics and Computer Technology Center

Mansourov, A. Y. (2005). *Bytes and Bullets : Information Technology Revolution and National Security on the Korean Peninsula*: Asia-Pacific Center for Security Studies.

Mcot Foreign News. (2015). South Korea protests Japan claiming its right over the disputed islands.

MGR Online. (2013, October 8,2013). S.Korea ranks number 1 in "ICT Development Index" three years, E-Business, *Manager Online*. Retrieved from http://www.manager.co.th/Cyberbiz/ViewNews.aspx?NewsID=9560000126405

MIC. (1999a). *The 1999 White Paper: CYBER KOREA 21*. Seoul: Ministry of Information and Communication.

Michael E. Porter, M. R. K. (2002). The Competitive Advantage of Corporate Philanthropy.

Ministry of Foreign Affairs. (2015). Northeast Asia Peace and Cooperation Initiative 2015 [Press release]. Retrieved from http://www.mofa.go.kr/ENG/North_Asia/res/eng_2015_0310.pdf

Mthai News Reporter. (2015). NBCT confirm 4G auction

Mundy, S. (2015, June 24,2015). South Korea aims for creative economy to end reliance on chaebol, *FINANCIAL TIMES*. Retrieved from http://www.ft.com/cms/s/0/9203e38c-0dab-11e5-9a65-00144feabdc0.html#axzz3tzvrWmqh

Nateesirikul, S. (2003). *Conditions and Problems of Management System and Information in primary schools under Primary Educational Service Areas of Pontong District in Roiet Province.* (Thesis of Master of Education Program), Srinakharinwirot University.

National Broadcasting and Telecommunications Commission. *ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE (ETRI)*. Retrieved from http://telecompolicy.nbtc.go.th/getattachment/83613a52-0c12-4ebd-9652-a6fd0890c30b/ELECTRONICS-AND-TELECOMMUNICATIONS-RESEARCH-INSTIT.aspx.

National News Bureau of Thailand. (2015). MICT launches Thailand ICT Youth Challenge 2015.

National Statistical Office. Statics for general people

NECTEC. Background. from http://www.nectec.or.th/intro/background.php

NECTEC, N., MOST. (2003). *Thailand Information and Communication Technology(ICT) Master Plan (2002-2006)*. Thailand.

Neffati, M. (2012). ICT,INFORMATIONAL INNOVATION AND KNOWLEDGE-BASED ECONOMY. 242-251. http://oeconomica.uab.ro/upload/lucrari/1420121/21.pdf

Nopparat Kladcharoen, S. J. (2009). FREE TRADE AREA : FTA. http://www.logisticscorner.com/index.php?option=com_content&view=article&id=434:-q-free-trade-area-ftaq-&catid=39:import-export&Itemid=85

OECD. (1996). The Knowledge-Based Economy. Paris.

OECD. (2000). A New Economy? The Changing Role of Innovation and Information Technology in Growth. France.

OECD. (2014). PISA 2012 Results in Focus.

Office of the Electronic Transactions Commission. Electronic transactions law Retrieved December 10,2015 http://www.etcommission.go.th/law.html

Ogbah, E. L. (2012). ICT Policies in Developing Countries: Objectives, Issues and Influencing Factors. In I. R. M. Association (Ed.), *Regional Development: Concepts, Methodologies, Tools, and Applications* (pp. 992-1004).

Pathumrat Jongkoonklang, S. O. (2005). Knowledge Management. from http://student.nu.ac.th/learn/Lesson%201-2.htm

Paul D. Leedy, J. E. O. (2010). *Practical Research: Planning and Design* Retrieved from ftp://doc.nit.ac.ir/cee/jazayeri/Research%20Method/Book/Practical%20Research.pdf

Pham, T. L. H. (2013). *ICT Development Strategies*: Anchor Academic Publishing.

Pinitnai, A. (2009). Knowledge Economy. Retrieved from https://www.l3nr.org/posts/155687

Rbehmed, N. (Producer). (2013). What Is A Startup? Retrieved from http://www.forbes.com/sites/natalierobehmed/2013/12/16/what-is-a-startup/

Rouse, M. (2005). ICT (information and communications technology - or technologies) DEFINITION. Retrieved January 9, 2014, from http://searchcio-midmarket.techtarget.com/definition/ICT

Samutachak, B. (2009). Network-based Society: The world after Knowledge-based. http://www.dpu.ac.th/laic/upload/content/file/article_instrctor/ta57/14_81_2552.pdf

Sangheon Lee, D. M. J. C., Messenger. (2007). *Working Time Around the World* Retrieved from

http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_104895.pdf

Sawettanan, N. (2013). Postpone AEC to 31 Dec 2015. http://www.thai-aec.com/687

Setcheu, T. (2007). Does the Thai society is knowledge-based economy. Retrieved January 14, 2014, from https://www.l3nr.org/posts/46039

Seung-Ho Kwon, J. K. (2013). From censorship to active support: The Korean state and Korea's cultural industries. *ELRR*.

Shim, D. C., and Eom, T.H. (2009). 'Anticorruption effects of information communication and technology (ICT) and social capital'. *International Review of Administrative Sciences*, 99-116.

Sirirat Jampeerieung, A. W. (2010). KNOWLEDGE NECESSARY FOR KNOWLEDGE-BASED ECONOMY PEOPLE. http://www.tci-thaijo.org/index.php/edujournal_nu/article/download/9221/8342

Srilert, N. (2014). The Inequality Situation in Thai Society.

Steinmueller, W. E. (2002). Knowledge-based economies and information and communication technologies. *International Social Science Journal, 54*.

TerraBKK Research. (2014). TOP 50 Public Company in SET by Net Profit. Retrieved December 15,2015 http://www.buildernews.in.th/page.php?a=10&n=176&cno=9518

THAILAND BOARD OF INVESTMENT. (1960). BOI History.

Thandee, D. (2001). *Korean Society and Culture* Retrieved from http://e-book.ram.edu/e-book/inside/html/dlbook.asp?code=AN353

Thandee, D. (2009). *Korean Society and Culture. Books for Beginning Anthropology AN 113 (S)* Retrieved from http://e-book.ram.edu/e-book/inside/html/dlbook.asp?code=AN353

The Association of Korean History Teachers. (2010). *A Korean History for International Readers*.

The Hong Kong Immigration Department. (2011). Hong Kong Pioneers Smart ID Cards for Immigration.

The World Bank Washington, D. C. (2006). Korea as a Knowledge Economy Evolutionary Process and Lessons Learned.

Thibodeau, P. (Producer). (2010, December 15,2015). Five reasons why China will rule tech. Retrieved from http://www.computerworld.com/article/2518910/it-management/five-reasons-why-china-will-rule-tech.html?page=2

Transparency International. (2014). Corruption Perceptions Index

Udomkalayalux, P. (2013). Back to Thai television before enter Digital TV era

UNCTAD. (2015). Country Profile. Retrieved December 12,2015 http://unctadstat.unctad.org/CountryProfile/GeneralProfile/en-GB/764/index.html

Unit, E. I. (2012). Korean IT Achievements 2012.

Wichienpanya, J. (2006). *Development of efficient knowledge management composite indicators.* ( Doctor of Philosophy), Chulalongkorn University Retrieved from http://cuir.car.chula.ac.th/handle/123456789/15521

Wikipedia. (2015a). Programme for International Student Assessment.

Wikipedia. (2015b). Television in South Korea [Press release]. Retrieved from https://en.wikipedia.org/wiki/Television_in_South_Korea

Wikipedia. (2015c). Television in Thailand. Retrieved December 9,2015 https://en.wikipedia.org/wiki/Television_in_Thailand

Woo, H. Y. (2010). *A Review of Korean History*. the Republic of Korea: KYONGSAEWON Publishing Company.

World Bank. Towards a Knowledge Economy in Thailand. from http://siteresources.worldbank.org/INTTHAILAND/Resources/333200-1130224663121/2008feb-ke-thailand.pdf

World Bank. (2006). Statistical Management & Analysis(SIMA) database.

World Bank. (2011). Secure Internet servers (per 1 million people). Retrieved December 12,2015 http://data.worldbank.org/indicator/IT.NET.SECR.P6

World Bank. (2013). *High-technology exports (current US$)*. Retrieved from: http://data.worldbank.org/indicator/TX.VAL.TECH.CD/countries/1W?display=default

Young-Ro Lee, B.-C. K., Seong-Wook Na Jung-Hwae Hu. (2009). Analytic Study on Korea's IT Infrastructure Development Policies *Informatization Policy*.

Zinnbauer, D. (2012). Governments using ICTs for integrity and accountability: Some thoughts on an emergent research and advocacy agenda.

Zocial Inc (Producer). (2015). Rising up!! Thailand Social Media Growth in AEC 2015. Retrieved from http://www.zocialinc.com/blog/facebook_population_2015/

# APPENDIX

# VITA

| | |
|---|---|
| Name | Ms.Lalitda Makasira |
| Date of Birth | August 23, 1983 |
| Nationality | Thai |
| Education | Bachelor of Aviation Technology |
| | Civil Aviation Training Center, Thailand 2002-2005 |
| | High School (Science-Mathematics major) |
| | Phayaopittayakom School, Thailand 1999 - 2001 |