

ICT Human Resource Development within Thailand ICT Policies Context

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1. Overview on Thailand

Thailand is located at the heart of Southeast Asia region, covering an area of 513,115 square kilometers and extends about 1,620 kilometers from North to South and 775 kilometers from East to West, at its broadest point. Thailand is divided into four natural regions: North, Northeastern, Central and Southern. Bangkok, the capital city is situated in the central region.

In 2002, Thailand population reached 62.2 millions. According to the national statistics, around 31 per cent of the population live in municipal area whereas the majority of population distributed across the country¹.

With regard to general economy, Thailand has made significant progress in resolving economic and financial problems after the financial crisis in 1997. After experiencing the economic recession of 1.4 and 10.5 per cent in 1997 and 1998 respectively, the Thai economy has been rising gradually, with the growth rate of 4.4 per cent in 1999. This growth sailed through 2000 while the world economy picked up and significantly benefiting Thai exports. Hence Thailand witnessed the growth of 4.6 per cent in 2000².

Nevertheless, there is disparity in the quality of life among Thais across different regions, as reflected by the uneven distribution of household income earned in different locations. For instance, the GDP per capita of those residing in Bangkok was around US\$ 5,417, compared to around US\$ 609, for those in for the northeastern region. Furthermore, the mean years of schooling in population aged over 15 years in Bangkok are generally higher than those population in rural area as illustrated in Table 1 below.

Table 1 Mean years of schooling of population aged over 15 years

Region	2000
Municipal	9.4
Rural	6.8
Bangkok and Vicinity	9.9
Central	7.6

¹ <http://www.nso.go.th/pop2000>

² National Economics and Social Development Board (2003), Thailand in Brief 2003.

Northern	6.8
Northeastern	7.1
South	7.7
Kingdom	7.8

Source: Population and Housing Census 2000

2. ICT Development in Thailand

This section provides basic information on the current stage of ICT development in Thailand in three related aspects: ICT diffusion within the Thai society; the size and growth of ICT market, and the ICT industry.

2.1. ICT Diffusion

The extent of ICT penetration in the country has been rather low for most types of technology, except traditional broadcasting (Table 2). For general public, access to personal computer and telephone, which are essential components required for internet access, is not widespread. In terms of computer, the penetration rate is only 2.67 computers per 100 population, or 5.04 computers per household. In terms of telephone, at present, the number of telephone lines per 100 population only reaches 12.87 per cent. Nevertheless, the number of mobile phone users has increased exponentially in recent years. Its penetration has surpassed fixed line and reached the penetration rate of 26 per cent in 2002. Consequently, the use of Internet is still limited. In 2001, Internet users only represented 5.64 per cent of the entire population. Among these, only about 3.04 per cent of household had internet access from home.

Table 2 Information Infrastructure in Thailand

Information Infrastructure	Percent Penetration	Year
Households with television	90.6	2000
Household with radio	81.3	2000
PC penetration (per 100 inhabitants)	2.67	2001
Percentage of household with computer possession	5.04	2001
Teledensity (main telephone lines per 100 inhabitants)	12.87	2003
Mobile density (mobile subscribers per 100 inhabitants)	26.04	2002
Internet users per 100 inhabitants	5.64	2001
Percentage of household having internet access from home	3.04	2001

Source: TOT Corporation PLC. (<http://www.tot.co.th>)

The National Statistical Office (<http://www.nso.go.th>)

Furthermore, there is also a digital divide within the country between urban and rural area. For instance, while Bangkok and vicinity enjoyed the benefit of having 52.4 telephone lines per 100 inhabitants, the average teledensity in other parts of the country was merely 6.7% (2003). Besides, Internet users are concentrated within the urban area. In 2001, there were around 16 internet users for every 100 population in Bangkok, while the rest of the country had an average of 4.2 users per 100 population.

The situation of low PC penetration and access is expected to change significantly as a result of recent government measures to introduce low cost products/services as well as the rising competition in the telecommunication sector. This will allow users to be able to buy ICT for use. Since the launch of the Ministry of ICT's low cost PC (US\$ 250 per a desktop PC, and US\$ 500 for a laptop) four months ago, there were more than 150,000 orders received by the ministry of ICT. Furthermore, advances in technologies will also open new channels of access, such as, mobile internet. As such, we had anticipated that the internet users would be increased to around 8 millions this year.

2.2 ICT Market

The growth of ICT market in Thailand has been continuously flourishing. This is due to the increase in ICT usage in the Society, which in turn influenced by the rapid change and impressive development of technology.

Table 3 Thai ICT Hardware & Information Services (Value in Million Bahts)

Segment	1999	2000	2001	2002	2003 (est.)	Growth Rate (%)
Hardware	20,110	31,275	35,819	46,063	50,331	27.0
Software	6,289	8,378	10,141	12,530	14,129	22.6
IT Services	8,738	9,486	10,993	12,560	15,260	15.0
Total	35,137	49,139	56,953	71,153	79,720	23.2

Source: Calculated from ATCI/ATSI/INA, IT Market Outlook 2003

Regarding IT, hardware represented the largest shares, in terms of values, as well as highest growth market. Year 2002 witnessed the boom of Thai PC Brand, due to "Buy Thai Products" Policy and NECTEC PC Certified Program. Therefore, according to ATCI estimates, Thai PC captured 75% market share of total PC market. Software also represents a promising sector. Apart from the domestic market growth for 2002, which was as high as 23%, the Thai software industry also aims to extend their coverage into regional market.

The market for both hardware and software are expected to grow substantially this year as the result of the "low cost ICT" project initiated by the Ministry of ICT which was mentioned earlier. This project was started in May 2003. Other activities such as low cost internet charge (1 Baht per call), called "CleanNet" followed suit.

2.3 ICT Industry

Software development receives high priority within the government agenda. The National ICT Master Plan (2002-2006) put emphasis on the development of indigenous software industry. With strong government support, the Thai software industry market size is set to reach 90 billion baht by 2006.

In 1999, Software Park Thailand was set up with the aim to stimulate the development of the Thai software industry by attracting local and international partners to establish a critical mass of software-related business, which are to be supported by world-class infrastructure, tools and consultancy services. As a result, it is hoped that Thailand will benefit from the growth of its software industry and strengthening of its technology base. Furthermore, partners and investors in Thailand Software Park will benefit from low development costs, convenient location to regional markets, access to advanced telecommunication infrastructure and support facilities, attractive investment incentives, and a pool of talented and adaptable employees.

Presently, the MICT is in the process of setting up the Software Industry Promotion Agency (SIPA), which has the main functions to promote the software industry by developing and implementing strategies and measures for the sector development as well as providing one-stop service to software developer.

3. Thailand National ICT Policy/Plan

3.1 Institutional Framework

Over the past decade, *Information and Communications Technology* (ICT) has been recognized as a potential enabler for national economic and social development and for strengthening competitiveness for Thailand. The government, then, started the initiative in 1992 to set up the *National IT Committee*, or NITC, which is a high-level policy body chaired by the Prime Minister. Its members comprise of executives from relevant public and private sector. The mandates of NITC are to develop policies and plans to promote ICT development and utilization in the country. The *National Electronics and Computer Technology Center* (NECTEC), a semi-autonomous government agency under the Ministry of Science, Technology and Environment, has been assigned to host the secretariat office and to conduct supporting work for the committee.

Ten years later, *the Ministry of Information and Communications Technology* (MICT) was established in October 2002 as part of the bureaucratic reform. The MICT is now in charge of national ICT planning, promotion, development and implementation.

3.2 National IT Policies

(a) IT 2000

In February 1996, the first National IT Policy, called IT2000, was announced by the NITC and later endorsed by the Cabinet. IT2000 put forward the vision for the country to properly exploit IT to achieve economic prosperity and social equity. To this end, the policy emphasized three main development agendas, i.e., (i) to build an equitable national information infrastructure (NII), (ii) to invest in people to accelerate the supply of IT manpower and to develop an IT-literate workforce, and (iii) to achieve good governance through the use of IT in delivering public services and in government administration.

Through the course of IT2000 implementation, it was found that many development programs were achieved as planned, while many others were still far from the target, especially those concerning human resources and government sector. This was mainly due to the economic recession that caused the decline in government investment in ICT.

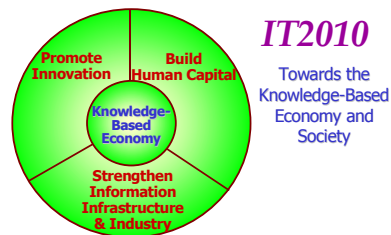
(b) IT 2010 Policy to bring Thailand towards the Knowledge-Based Economy

In 2001, though the principle of the three pillars of IT2000 still prevailed to a certain extent, the NITC realized that there was a need for a second phase of national IT policy, to give a thrust for Thailand to move forward into the next wave of digital economy. Consequently, IT 2010, the new policy framework, was formulated and later approved by the Cabinet on March 19, 2002.

IT2010 has set the key development objectives to exploit the benefits of information and communications technology to move Thailand to the “Knowledge-Based Society and Economy (KBS/KBE)”. The development is therefore not on focusing on “technology” *per se*, but rather, on the good use of ICT that would drive overall national economic and social development.

To this end, IT2010 identifies three cross-cutting principles to support the “ICT for KBE/KBS” framework as follows:

- Building human capital,
- Promote innovation, and
- Invest in information infrastructure and promote the information industry.



Under this framework, three specific development goals based on “technological and social indicators” were identified. These are:

- (1) To raise the technological capability of the country, as classified by the UNDP Technological Achievement Index from being in the “Dynamic Adopters” group”, to the “Potential Leader” group, by 2010,
- (2) To increase proportion of “Knowledge Workers” in the country from 12% (in 2001) to 30%, by 2010,
- (3) To increase the share of “Knowledge-Based Industries” within the overall economy to 50% by 2010.

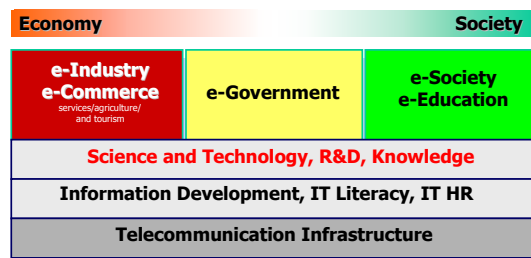
To achieve the goals, IT 2010 identified five main flagships that have to be developed as follows:

- *e-Society*, which focus on the endeavour to use IT for quality of life improvement, knowledge-based society development and bridging the digital divide.
- *e-Education*, which aims to develop and strengthen human capital in all levels to move the country towards knowledge-based society. This flagship includes

issues of life-long learning, computer literacy, human resource development, virtual education, etc.;

- *e-Government*, which emphasizes on the utilization of IT within the public sector, including central, provincial and local government agencies. This is to develop good governance which, in turn, will boost overall competitiveness of the country. The plan entails both front and back office development.
- *e-Commerce*, which aims to strengthen Thai industries competitiveness. The three respective focus are: e-commerce for export, e-commerce for trade and services provision, and e-commerce for domestic consumption.
- *e-Industry*, which is to promote the utilization and development of IT within the private sector, focusing on e-manufacturing and IT-related industries.

ICT Development Program: Flagships and Infrastructures in IT2010



Development of each of the above mentioned sector must be synchronized and harmonized with all the other sectors. Furthermore, the development schemes in each sector must be hinged to strategies that are essential to knowledge-based economy and society. In other words, the schemes must comply with the three guiding principles: enhancing human capital, creating innovation, and strengthening the information infrastructure.

(C) ICT Master Plan (2002-2006): From Policy to Implementation

Upon the approval of IT 2010 policy framework in March 2002, the Cabinet has designated NECTEC and the National Economic and Social Development Board (NESDB) to jointly develop the first National ICT Master Plan for the year 2002-2006. This master plan is developed in accordance with the IT 2010 policy framework as well as the 9th National Economic and Social Development Plan (2002-2006).

The ICT Master Plan not only outlined the direction of ICT development during its five-years period, but also stimulated ICT activities and investment in the public sector. Each government agency has to formulate their organizational ICT master plan as well as action plan in accordance with strategies and activities set out in the national master plan.

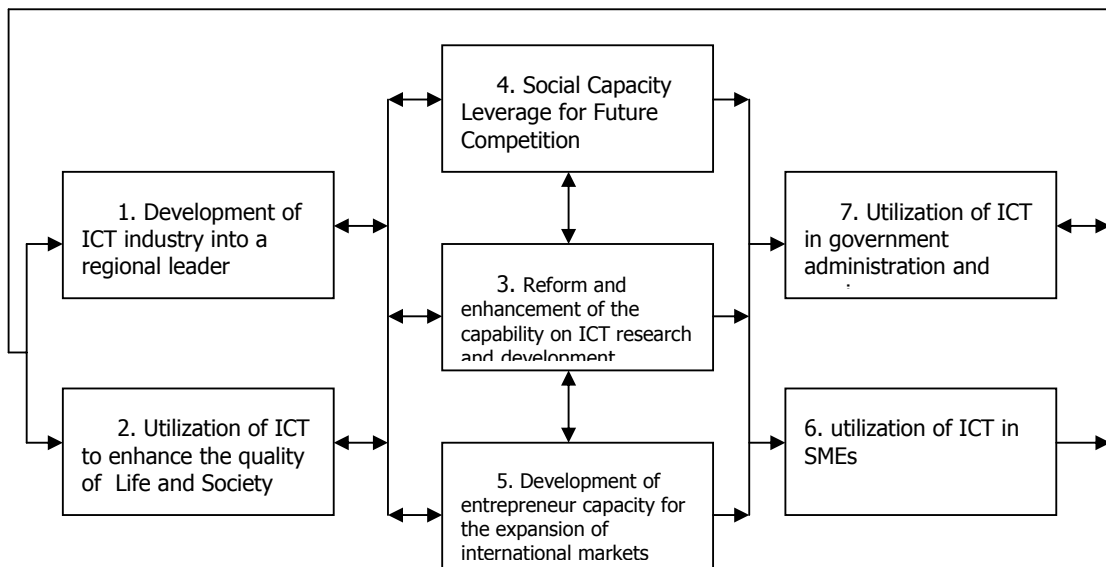
The National ICT Master Plan identifies four goals of development to be accomplished:

- Development and upgrading of the economy by using ICT.
- Enhancement of the competitiveness of the ICT industry.

- Development of human resources by increasing the application of ICT in education and training.
- Strengthening the rural community in terms of sustainable development.

To materialize these goals, the Master Plan devises seven strategies as follows:

- Strategy 1: The development of the ICT industry into a regional leader, with the focus on the development of software industry and the IT human resources.
- Strategy 2: The utilization of ICT to enhance the quality of life and society, emphasising on the development and application of the equitable information infrastructure for areas such as education, rural community.
- Strategy 3: Reform and enhancement of the capacity on ICT research and development, which public and private sectors as well as educational join force to restructure the direction of R&D.
- Strategy 4: Social Capacity Leverage for Future Competition, focusing on awareness creation and understanding of ICT within the society.
- Strategy 5: Development of entrepreneur capacity for the expansion of international markets, which targets at the manufacturing sectors
- Strategy 6: The utilization of ICT in SMEs, aiming to encourage the SMEs to employ ICT in their business so as to boost their competitiveness.
- Strategy 7: The utilization of ICT in government administration and services, so as to drive government administration efficiency as well as to transform government services to the citizen, moving towards the e-Government.



Under this plan, three prime-movers are identified as short-term goals to be accomplished within the first two years: (i) promotion of the software industry, (ii)

development of various e-government applications, and (iii) promotion of ICT usage in Small-Medium sized Enterprises (SMEs).

4. Regulatory Environment

4.1 IT Laws

The NITC has identified six ICT-related laws and given the mandates that these laws be developed in order to facilitate ICT development in Thailand. These are: electronic transaction law, electronic signature law, national information infrastructure law, data protection law, computer crime law, and electronic funds transfer law. During the parliamentary process, the first two law, i.e., electronic transaction and electronic signature law, were merged into one, called electronic transaction act, B.E. 2544. The purposes and stages of development of these laws are as follows:

- Electronic Transactions Law : To recognize the legal effect of data messages by treating them as the functional equivalent of a writing or evidence in writing with a view to promote electronic transactions to achieve reliability; as well as to enable reliability of the use of electronic signatures;
- Electronic Fund Transfers Law : To facilitate the electronic fund transfers;
- Computer Crime Law : To criminalise the new type of the offences in the borderless virtual world;
- Data Protection Law : To protect rights of privacy in the information society by laying down the general rule to protect personal data of individuals;
- National Information Infrastructure Law (By the Constitution Law Section 78) : To devise an equitable and thorough information infrastructure; enable universal access by promoting more equitable and affordable rights and opportunities to access information and communication services. The purpose of NII law focuses on reducing Thailand's digital divide.

Presently, the Electronic Transactions Law was enacted and had come into enforcement since April 3, 2002. The National Information Infrastructure Law, the Computer Crime Law, and the Data Protection Law, is awaiting Cabinet's approval, before submitting to the parliament. The Electronic Funds Transfer Law is in the drafting stage.

4.2 Telecommunication and Broadcasting Laws

The Constitution of Thailand 1997 has stated clearly the need for and the role of the independent regulatory body in broadcasting and telecommunication areas. There are further related laws as follows:

- The Frequency Allocation Act B.E. 2545 (2002): which specifies the establishment of two independent regulatory bodies namely:
 - National Broadcasting Commission (NBC), responsible for regulating the radio and television broadcast sectors
 - National Telecommunications Commission (NTC) responsible for licensing, spectrum management, and supervision of telecommunications operators

Presently, the process of forming both commissions is on-going and is hoped to be completed by the end of this year (2003).

- Telecommunication Business Operation Act B.E. 2544 (2001): which is designed to reform telecom sector and to ensure fair and free competition.

5. Human Resource Development

5.1 Human Capital

According to the national statistics, Thais are fairly equipped with basic education and skills. Firstly, the literacy rate (population aged 15 and over who can read and write) is around 92.6%³, Secondly, 74.1 per cent of people aged 3-21 years old (the student age group) participated in formal education.⁴ The highest participation was at the primary education level (103.8 per cent)⁵ since previously this was the compulsory education.

Thailand education is under transformation following the promulgation of the National Education Act 1999. According to the Act, 12 years of quality basic education is to be provided free of charge equally to all Thai people. Besides, the Act has expanded the focus of learning to include formal, non-formal and informal education. This forms the basis of "life-long learning" principle, and has become instrumental to build up human capacity.

For ICT-related, there is no study on the level of ICT skills/knowledge, *IT Literacy*, of the population. However, from the low level of ICT diffusion within the country, coupled with the average years of schooling of less than 8 years, Thailand has faced with the problem of shortage of both IT manpower and general workforce with sufficient IT skills and knowledge.

5.2 ICT Human Resources

According to the study conducted by the NITC secretariat, there were around 77,816 ICT employees in Thailand in the year 2001.⁶ This represents 350 per cent increase from 22,450 ICT workers found in 1993. Regarding the breakdown of ICT personnel by job classification, the majority of ICT professionals are software personnel, reflecting the rapid growth in the software industry. An industrial source estimated, however, that there were around 20,000 software personnel in 2001 which NITC and the private sector had set as a target to increase the software personnel to 50,000 by 2006. In terms of their employer, a large number of ICT personnel work in the services sector (34.2 per cent), while public sector employs 25.2 percent of the total ICT workers. ICT firms hire one fifth of them.

Furthermore, most of the ICT workforce holds a university Bachelor's degree. The increase of Bachelor's degree graduates went from 56.31 per cent in 1993 to 70.87 per cent in 2001. This is a result of increasing availability of academic institutions offering IT courses with Bachelor's degree. However, the same survey also indicated that majority of ICT personnel had a limited work experience of one to three years.

5.3 Thailand approach towards building up human resources

Human resource development has always received high priority in Thailand's ICT policies. For instance, in IT 2010, human capital is one of the main principles to strengthen ICT development within the country, and to support the application of ICT in major sectors (5 e's). This emphasis on building human resource reflects the policy continuation from IT 2000, the first IT policy of Thailand.

The approach to strengthen human resources in relation to ICT can be classified into two distinctive areas: (i) to build up ICT workforce both in quantitative and qualitative

³ www.nso.go.th/pop2000

⁴ Office of National Education Commission (2002), *Statistics on Thailand Education 2001*.

⁵ The figure here represent Gross Enrollment, therefore the percentage might be over 100 per cent since it includes all students in primary level regardless of their age.

⁶ National Electronics and Computer Technology Center (2001), *The Demand for IT manpower in Thailand* (in Thai)

aspects and (ii) to instill basic ICT knowledge and skills in general public for further use of ICT.

(i) Building up ICT workforce

IT 2010 focuses on the developing indigenous knowledge workers as well as encouraging the free flow of knowledge workers from other countries. ICT Master plan put forwards plans and activities to build up ICT personnel in strategy One and Three such as:

- Establishing a joint policy committee comprising the government, industry and academic to develop a master plan for human resource development in response to the demand from the software industry;
- Developing and increasing the highly skilled software instructors and researchers;
- Setting up professional training institute to train software personnel, with emphasis on professional certifications. Two approaches of training should be organised, one is to improve the skills of existing software personnel, the other is to enhance and convert non-ICT graduates to work in the software industry.
- Building up a collaborative industry-academic network which encourages knowledge and experiences sharing.
- Providing ICT funds for human resource development for the software industry.
- Setting up the education reform for policy to enhance student skills in science and English.
- Providing incentives to attract people to join the research profession.
- Allocating funds to support ICT R&D by academic, public and private organisation.

(ii) Enhancing ICT Literacy

While promoting awareness among general public, Thailand focuses on equipping the youth with IT skills and knowledge within the educational establishments. One of the prominent effort in this area is the school informatisation programme, *SchoolNet*, which was initiated in 1995, and run by the National Electronics and Computer Technology Center under the Ministry of Science, Technology, and Environment. SchoolNet objective was to provide internet access for school throughout Thailand, and more importantly, to provide opportunities for teachers and students to have access to the world's information and knowledge resources, in order to achieve good quality education. At the end of its 5-year pilot project, SchoolNet has connected approximately 5,000 schools nationwide, and is now merging into the National Education Network (EdNet), to be operated by the Ministry of Education.

Besides, the National Education Act 1999 explicitly addresses the issue of ICT for Education within its framework. This covers issues such as infrastructure, the curriculum and software. Meanwhile, the IT 2010 as well as the ICT Master Plan stated strongly the link between ICT and educational development. In particular, the National ICT master plan put forward the goals in relating to ICT skills enhancement within education sector, in various strategies, for examples:

- Having at least 300,000 teachers who can use ICT effectively by 2006, of which 70% are located outside Bangkok.

- At least 90% of new graduates from formal educational programs can use ICT by 2006.

Beyond educational arena, the ICT Master Plan also outlines the plans/activities to enhance ICT skills for the public at large as follows:

- To develop and prepare human resources to fully utilise ICT in support of the move towards the Knowledge-based Society/Economy. The preparation includes: fundamental knowledge of and skills in computer application; skills to search, analyse and utilise information.
- To collaborate between public and private sector to build the public knowledge on ICT through academic institutes at all levels in all regions and communities. This can be accomplished by having computer and communication courses at every education levels; setting up high-quality libraries within educational institutes which are open to general public to access basic IT and learning materials.
- To set up public facilities whereby children can play and learn about ICT.
- To encourage every community to have a community telecenter to facilitate the application of ICT for individual and community.
- To support citizens, especially the young, in acquiring knowledge and understanding of language.
- To encourage public awareness and interest in ICT and e-Commerce by organising activities such as community website contest, meetings, seminars.
- To develop human resource in related fields such as lawyers, economists, engineers, so that these professionals have wider ICT knowledge and skills.

These plans are to be accomplished through the joint effort between government agencies, private sectors, and educational institutes. Presently, there are many projects that have been developed and/or implemented by various ministries in accordance with the ICT Master Plan, for example, the EdNet Project of the Ministry of Education-to serve ICT development in the education sector, the Living Library Project of the Ministry of ICT-to provide an innovative learning environment for children at all ages, and some other projects by the Ministry of Labour which aim to serve the development of skilled workforce. In the public sector, in order to move towards e-government, IT skills has been identified as important to all levels of government officials. To this end, the ICT Master Plan has indicated that the e-government institute be set up by the Ministry of ICT, with the main function to train necessary ICT skills and knowledge to government officials at all levels. It is hoped that, with these projects in place and on their way to implementation, Thailand would receive higher scores on "e-readiness" and confidently move forward to the knowledge-based society.