Information and Communication Technology

Statistics in Thailand

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Contents

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Abstract

Thailand has developed ICT under the ICT Master plan. The plan is consistent with the development objectives set forth in the National Economics and Social Development Plan, which is the key national development framework. ICT Statistics which were surveyed by the National Statistical Office since 2004 indicated that the readiness of the information and communication infrastructure is still not widely available and accessible. This has constrained the efficiency and effectiveness of developing and using ICT for building up knowledge, developing enterprises, and serving the government.

In terms of ICT human resources, there has been a continuous expansion alongside the expansion of ICT usage. Presently, Thailand has a growing skilled workforce both in the public and private sectors. The number of graduates in related fields at the tertiary and vocational level is also increasing. Nonetheless, there is still a major shortage of ICT human resources, both in term of quantity as well as quality, particularly highly-skilled personnel and specialized personnel in various sub-sectors. For the general public, the usage of ICT is still low and limited in coverage. The majority of the Thai public access information through traditional media such as television and radio , more so than through computer technology. The group of ICT user is smaller than other groups, such as those in remote area, the disabled persons and the elderly.

In summary, Thailand's ICT development and usage has continuously increased. The area which requires further attention is the ICT personnel both in terms of quantity as well as quality, along with the improvement of national ICT governance. Otherwise, these will become obstacle for the development of other activities, since these two issues are fundamental factors for development.

1. Introduction

Information and Communication Technology (ICT) has rapidly developed. Accordingly, new knowledge and innovation have been created resulting in the continual development in the economy and society. In order to support the change of Information and Communication Technology and telecommunication to develop and promote the ICT capacity of Thailand in the global market, the Information and Communication Technology policy (2001 -2010) of Thailand or IT 2010 was created to be used as a framework for conducting the 1st Thailand Information and Communication Technology Master Plan (2002 – 2006) and the 2nd Thailand Information and Communication Technology Master Plan (2009 – 2013).

The National Statistical Office under the Ministry of Information and Communication Technology has conducted the direct Information and Communication Technology survey since 2001 to support and create policies and plans, as well as to monitor and evaluate the development of Information and Communication Technology from the 1st Information and Communication Technology and the 2nd Information and Communication Technology Master Plan. The survey shows the accessibility of ICT in households, the use of ICT of populations, the use of ICT in establishments and e-Commerce business and the use of ICT in educational institution.

2. ICT Statistics and Policy making

The IT 2010 framework, and the 1st Information and Communication Technology Master Plan (2002 – 2006) determined the strategy to develop Thailand to become the knowledge and innovation-based society consisting of 5 areas: e-Industry, e-Commerce e-Government e-Education and e-Society. Previously, the 2nd Information and Communication Technology Master Plan (2009-2013) was developed to continue of the policy under IT 2010 framework and also to accelerate and fix the drawbacks that caused the 1st Information and Communication Technology Master Plan to not be able to achieve. The strategies can be described as follows:

Strategy 1: Develop ICT professionals and general population to be information literate

The aim of this strategy is to accelerate the development of personnel of adequate quantity and quality to support the development of Thailand into a knowledge and innovation-based society. Both ICT professionals as well as personnel in other fields, along with youth, the disadvantaged, the people with disabilities and citizens at all levels should have the knowledge and skills to be information literate. More specifically, they should have the knowledge and skills to create, produce, and use ICT in an efficient, effective, ethical and considerate manner.

Strategy 2: Strengthen National ICT governance

This strategy aims to improve mechanisms and processes of ICT management and monitoring to achieve good governance framework by emphasizing on ensuring operational unity, efficient use of resources and participation from all sectors.

Strategy 3: Develop ICT infrastructure

This strategy aims to develop and manage ICT infrastructure in order to provide universal access to businesses and citizens around the country, including the disadvantaged and people with disabilities. It will encourage businesses to put in place infrastructure that can keep up with technological evolution, in order to meet increasing consumer demand. The infrastructure should support multimedia services, e-Commerce and other services that are useful for modern lifestyles in a knowledge-based society. At the same time, this strategy also focuses on reducing the digital divide which will then lead to a peaceful and happy society where people enjoy a better quality of life.

Strategy 4: Use of ICT to support good governance in public administration and services

Government agencies should use ICT to improve governance in administration and services. A citizen-centric approach should be adopted to provide services in an efficient, effective, transparent and just manner. Participation from all relevant sectors should be encouraged.

Strategy 5: Upgrade competitive capacity of the ICT industry to add value and increase earnings

This strategy seeks to upgrade competitiveness of Thai ICT businesses by promoting research, development and innovation by the public sector, academic sector and private sector to upgrade technological capability of the Thai ICT businesses to more upstream technology. Technology transfer of research outputs to businesses should be encouraged. The businesses environment should also be improved. The priority sectors are software industry and digital content production industry, with the aim to increase the sector's contribution to national economy and earnings. For other industries that have potential, such as the electronics industry (embedded systems or advanced electronic design) and the telecommunications equipment industry, the focus will be on research and development to build upstream capacity. This will allow them to be developed into income generating industries in the future.

Strategy 6: Use ICT to build sustainable competitiveness for Thai industries

This strategy aims to promote access and use of ICT in the production of goods and services in all sectors to enhance competitiveness by increasing domestic value-added and at the same time being environmentally friendly. This will help prepare businesses to compete under global free trade regimes in the future. Special emphasis will be given to sectors in which Thailand has comparative advantage and potential to compete, such as agriculture, health services and tourism. Small and medium enterprises (SMEs) as well as community enterprises will also be targeted for development.

3. The Status of ICT Development in Thailand

According to the statistics related to the development of ICT human resources, ICT infrastructure, the development of ICT in term of economy and society from the information of the National Statistical Office, they can be summarized as follows:

3.1 Status of the Development of ICT Human Resources

ICT professionals

According to the Labor Force Survey 2009, the total number of ICT employed persons was 416,862 from 37.71 million persons or 1.11%. The proportion of ICT employed persons increased very slightly from 0.88% in 2001 to 1.11% in 2009. However, the proportion of ICT employed persons is likely to continually increase because of various reasons; for example, people are more aware of and emphasize the ICT Professional, there are vivid policies to encourage ICT professional as mentioned in strategy 1 of the 2nd ICT Master Plan.

Table 1 Proportion of ICT personnel per total employed persons; 2001 - 2009

Proportion	2001	2002	2003	2004	2005	2006	2007	2008	2009
ICT Personnel	282,599	303,068	320,048	339,615	348,081	359,328	365,253	403,842	416,862
Total Employed Persons (thousands persons)	32,104.2	33,060.9	33,841.0	34,728.8	35,257.2	35,685.5	36,249.5	37,016.6	37,706.3
Proportion of ICT Personnel per Total Employed Persons **(%)**	0.88	0.92	0.95	0.98	0.99	1.01	1.01	1.09	1.11

Source: Labor Force Survey, National Statistical Office

However, when classifying employed persons according to OECD into 2 groups; in 2009, there were 119,959 persons in high skill group or 28.8% and 296,903 persons in low skill group or 71.2%. Most of ICT employed persons did not had a direct degree in ICT; only 39.6% had a direct degree in ICT. The major concern is that there were only 43.2% of high-skill ICT employed persons who had a direct degree in ICT.

Comparing the proportion of personnel in enterprise possessing degree in ICT from the ICT business survey in 2009, the highest group is system operation 30.7%, followed by programmer 10.3%, and system technician 10.3%

Table 2 Number and Percentage of ICT Personnel; 2007 - 2009

Unit : Person

Occupation	2007		2008		2009	
	Number	%	Number	%	Number	%
Total	**365,253**	**100.0**	**403,842**	**100.0**	**416,862**	**100.0**
Higher Skill Worker	**107,961**	**29.6**	**115,531**	**28.6**	**119,959**	**28.8**
Computing Professionals	32,637	8.9	35,052	8.7	34,239	8.2
Computer systems designers and analysts	7,326	2.0	8,627	2.1	8,787	2.1
Computer programmers	21,308	5.8	21,042	5.2	17,519	4.2
Computing professionals not elsewhere classified	4,003	1.1	5,383	1.3	7,932	1.9
Computer Associate Professionals	**33,627**	**9.2**	**37,410**	**9.3**	**41,473**	**9.9**
Computer assistants	11,072	3.0	9,625	2.4	10,797	2.6
Computer equipment operators	22,342	6.1	27,461	6.8	30,662	7.4
Industrial robot controllers	213	0.1	324	0.1	14	0.0
Optical and Electronic Equipment Operators	41,697	11.4	43,068	10.7	44,248	10.6
Photographers and image and sound recording equipment operators	22,255	6.1	25,428	6.3	24,309	5.8
Broadcasting and telecommunications equipment operators	15,307		13,039	3.2	14,855	3.6
Medical equipment operators	4,084	1.1	4,602	1.1	5,083	1.2
Optical and electronic equipment operators not elsewhere classified	51	0.0	-	-	-	-
Lower Skill Worker	**257,292**	**70.4**	**288,311**	**71.4**	**296,903**	**71.2**
Electrical and Electronic Equipment Mechanics and Fitters	257,292	70.4	288,311	71.4	296,903	71.2
Electrical mechanics and fitters	170,839	46.8	182,885	45.3	194,863	46.7
Electronics fitters	1,355	0.4	1,629	0.4	3,579	0.9
Electronics mechanics and services	49,732	13.6	63,030	15.6	68,717	16.5
Telegraph and telephone installers and services	15,518	4.2	14,011	3.5	10,944	2.6
Electrical line installers, repairs and cable jointers	19,848	5.4	26,756	6.6	18,800	4.5
Total Employed Persons (thousands persons	**36,249.5**		**37 016.6**		**37,706.3**	
Percentage of Employed Persons of ICT per Total Employed Persons	**1.007**		**1.091**		**1.105**	

Source: Labor Force Survey, National Statistical Office

Table 3 Number and proportion of ICT personnel by degree in ICT; 2007 - 2009

Degree	2007		2008		2009	
	Number	%	Number	%	Number	%
Total	**365,253**	**100.0**	**403,842**	**100.0**	**416,862**	**100.0**
Degree in ICT	148,790	40.7	155,616	38.5	164,997	39.6
Other Degree	216,464	59.3	248,226	61.5	251,865	60.4
High skill worker	**107,961**	**100.0**	**115,531**	**100.0**	**119,959**	**100.0**
Degree in ICT	50,811	47.1	52,606	45.5	51,775	43.2
Other Degree	57,150	52.9	62,925	54.5	68,184	56.8
Lower skill worker	**257,293**	**100.0**	**288,311**	**100.0**	**296,903**	**100.0**
Degree in ICT	97,978	38.1	103,010	35.7	113,221	38.1
Other Degree	159,314	61.9	185,301	64.3	183,682	61.9

Source: Labor Force Survey, National Statistical Office

Person using ICT in business

Every production area (Business trade and services) relies on ICT to increase efficiency in the working process in term of decreasing production cost and helping create market for products and services. Therefore, the development of ICT users capacity in both manufacturing and business is mandatory. The public sector has supported and promoted the usage of ICT to strengthen the business. According to the ICT Business Survey in 2009 (See Annex 3), Hospital business is the one that the proportion of employees using computers and internet at work is the highest (100% and 90%, respectively). The next are manufacturing, other land transportation and activities of travel agencies, construction, and business trade and services, respectively. Moreover, establishments with 1-15 persons use ICT at the lowest proportion, while large establishment with 200 persons or more use ICT at the highest proportion.

Table 4 Number of employees using computer, internet in establishment; 2009

Economic Activity	Number of establishment using computer	Employees using computer		Number of establishment using Internet	Employees using Internet	
		Number	Average per Establishment		Number	Average per Establishment
Total	507,447	2,664,335	(5.25)	339,452	1,421,779	(4.19)
Business Trade and Services	417,350	1,740,720	(4.17)	276,192	910,059	(3.30)
Manufacturing	63,311	632,220	(9.99)	41,952	321,542	(7.66)
Construction	11,178	51,649	(4.62)	9,047	36,614	(4.05)
Other Land Transport and Activities of Travel Agencies	14,419	67,918	(4.71)	11,082	45,863	(4.14)
Hospital	1,234	171,827	(139.24)	1,179	107,701	(91.35)

Source: ICT Business Survey, National Statistical Office.(see Annex 3)

Table 5 Number and proportion of personnel in enterprise who have degree in ICT by position; 2009

Position	Number	%
Total	**73,247**	**100.0**
Chief Information Officer (CIO)	5,785	7.9
Project Manager	3,196	4.4
System Manager	3,838	5.2
System Analyst	4,057	5.5
Application Software Specialist	2,018	2.8
Multimedia Software Specialist	3,112	4.2
Data Communication Specialist	2,191	3.0
Database Specialist	1,277	1.7
IT Security Specialist	1,443	2.0
IT Quality Assurance Specialist	587	0.8
Software Engineer	1,749	2.4
CAD&CAM Specialist	1,097	1.5
Programmer	7,576	10.3
Web Master	1,067	1.5
Computer Trainer	1,668	2.3
System Technician	7,571	10.3
System Operation	22,466	30.7
Telecommunication Engineer	1,288	1.8
Others	1,261	1.7

Source: ICT Business Survey, National Statistical Office.

Note: Personals who have degree in ICT in establishments in form of company limited or public company limited only.

ICT users in society

The popularity of mobile phone among Thai population has rapidly increased from 28.2% in 2004 to 56.8% in 2009. However, the use of computer and internet increase slightly; from 2004-2009 the proportion of computer use increased from 21.4% to 29.3% and internet from 11.9% to 20.1%, because of the expansion in ICT infrastructure of the country. Moreover, internet access of household increased at the low proportion from 5.7% in 2004 to 9.5% in 2009, broadband internet access increased from 52.8% in 2006 to 55.1 in 2009 and fixed line telephone decreased from 23.4% in 2004 to 21.4% in 2009

Table 6 Penetration and usage on ICT Devices; 2004 – 2009 (Population age 6 years and over)

Using ICT	2004	2005	2006	2007	2008	2009
Proportion of individuals who used a mobile phone	28.2	36.7	41.6	47.3	52.8	56.8
Proportion of individuals who used a computer	21.4	24.5	25.9	26.8	28.2	29.3
Proportion of individuals who used the Internet	11.9	12.0	14.2	15.5	18.2	20.1
Proportion of households with Internet access	5.7	6.2	7.2	7.6	8.6	9.5
Proportion of households with access to the Internet by type of access						
Narrowband	-	-	26.3	21.7	22.8	24.0
Fixed broadband	-	-	52.8	58.0	48.7	55.8
Mobile broadband	-	-	-	-	4.6	7.7
Proportion of fixed line telephone per 100 households	-	26.8	24.8	24.3	23.5	22.1

Source: ICT Household Survey, National Statistical Office.

ICT using in business

Establishments in Thailand with size less than 16 persons slightly use ICT: using computer at 21.9%, internet at 14.2% and website at 6.2%. Establishments in Thailand with size 16 persons or more use ICT at the high proportion: more than 81.1% of establishments use computers.

Table 7 Indicator on ICT usage of establishments by size of persons; 2009

Indicator[1/]	Total	Size of Establishment (No. of persons)	
		Less than 16 persons	16 persons or more
Proportion of establishments using computers	23.5	21.9	81.1
Proportion of employees using computers	22.9	23.4	22.5
Proportion of establishments using the Internet	15.7	14.2	68.5
Proportion of employees using the Internet	12.2	13.1	11.4
Proportion of establishments with a web site	7.0	6.2	37.9
Proportion of establishments placing orders over the Internet	2.7	2.5	11.1
Proportion of establishments receiving orders over the Internet	1.8	1.6	9.6

Table 7 Indicators on ICT usage of establishments by size of persons; 2009 (Continued)

Indicator[1/]	Total	Size of Establishment (No. of persons)	
		Less than 16 persons	16 persons or more
Proportion of establishments accessing the Internet by the following modes of access[2/]			
Analogue modem	4.0	3.7	16.7
ISDN	1.1	1.0	5.5
xDSL (ADSL,SDSL,VDSL)	9.5	8.6	41.1
Cable Modem	0.7	0.6	4.0
Leased Line	0.8	0.6	8.1
Other fixed connection, e.g. Frame Relay or VPN	0.4	0.4	1.8
Wireless connection	0.9	0.8	3.9
Proportion of establishments using other network communication except the Internet[2/]			
Proportion of establishments with WAN	0.3	0.2	3.4
Proportion of establishments with LAN	5.1	4.3	33.0
Proportion of establishments with EDI	0.2	0.2	1.0
Proportion of establishments with an Extranet	0.1	0.1	1.0
Proportion of establishments with WLAN	1.5	1.3	11.1
Proportion of establishments with an Intranet	0.9	0.7	8.4
Proportion of establishments using the Internet by objectives[2/]			
Information searches	13.6	12.2	63.6
Electronic - mail	11.2	9.9	57.1
Interacting with government organization	2.5	2.0	18.1
Customer service	6.6	5.9	28.8
Delivering products online	1.5	1.4	4.2
Banking and financial service	2.2	1.9	14.4

Source: ICT Business Survey, National Statistical Office.

Notes: 1/ Indicator to compute from total establishment.

2/ More than one characteristic can be done by an establishment.

3.2 The Status of Information and Communication Technology infrastructure Disparity of Information Access Problem

According to the study of current status of ICT infrastructure in form of broadcasting, Thai households have accessed to public television and radio thoroughly. In 2009, 96.3% of all households in Thailand had televisions and 58.0% had radios. Moreover, it was also observed that all regions had quite the same rate.

For the fixed-line telephone in Thailand, the service was primarily in the city and not thoroughly distributed to rural areas. In 2009, the proportion of fixed line telephones of households in Bangkok and suburb was at 56 telephones per 100 households, while other provinces had only 6-40 telephones per 100 households. In the present, the use of fixed line telephone is likely to continuously decrease: the total number of fixed line telephone in 2005 was 27 telephones per 100 households and decreased to 22 telephones per 100 households in 2009. Since population prefers to use mobile phones rather than fixed line telephones.

For the use of mobile phone in Thailand, the disparity between urban and rural areas was not obvious. The service is likely to grow continuously. In 2009, the proportion of mobile phone users of the country was 56.8%; Bangkok and suburb had the highest proportion of 75.5% and regional area had the proportion of 50-62%.

However, while the proportion of mobile phone use is quite high, the computer and internet users in Thailand are not at a good rate. In 2009, the proportion of computer use was 29.3% and internet use at only 20.1%. Also, the disparity of Information and Communication Technology use between Bangkok and suburb and regional area is quite high. Although, helping people in every level and region of the country to have computer and internet extensively in a short period of time is difficult, the government has tried to fix the disparity of these computer and internet uses by conducting projects and creating strategies to support educational units as well as community and district units to have computer and internet.

Considering household in rural area, it was found that almost all households had electricity. However, only 10% had computer. It is possible that the price of computer is still high, as well as people in rural area did not learn much about how to utilize computer. In contrast, the proportion of household connecting internet was not so low (30.3% of households with computer).

Table 8 Proportion of households with television, radio, and proportion of individuals who used computer, internet and mobile phone; 2009

Region	Proportion of households with[1/]		proportion of individuals who used[2/]		
	television	radio	computer	internet	mobile phone
Whole Kingdom	96.3	58.0	29.3	20.1	56.8
Bangkok	97.8	67.3	45.8	38.0	75.5
Central	96.5	54.3	29.8	19.3	62.3
Northern	95.7	64.4	27.8	19.5	54.8
Northeastern	96.2	56.6	25.3	16.7	50.2
Southern	95.5	47.2	27.6	17.5	52.6

Source: 1/ Household Socio-Economic Survey, National Statistical Office.

2/ ICT Household Survey, National Statistical Office..(see Annex 1)

Table 9 Proportion of households in rural area with electricity, computers and an internet connection; 2008

Region	Proportion of households in rural area		
	With Electricity	With Computer	Connect Internet
Whole Kingdom	**98.1**	**9.2**	**30.3**
Central	98.7	12.7	40.7
Northern	96.6	10.2	29.2
Northeastern	98.8	6.4	18.4
Southern	97.5	8.5	29.8

Source: Fundamental Telecommunication Services in Local Area Survey, National Statistical Office.

4. Measuring the Information Society

Measuring household ICT access and individual use

Data from the ICT Household Survey in 2009 revealed that population aged 6 years and over (in the last 12 month) used internet at 20.1%. The proportions of internet use of male and female were 19.8% and 20.4%, respectively. The proportion of internet users in urban area was higher than that in rural area. (32.7% and 14.5%, respectively) Educational institution was the location that people use internet the most at 46.8%, home at 33.4% and office at 29.0%. For the activity, the majority of people used internet to search for information or read news at 80.6%, secondly playing game at 23.8% and sending and receiving email at 18.6%. For frequency of internet use, more than a half of internet users used internet quite frequently(1-4 days per week) at 59.8% and secondly used frequently(5-7 days per week) at 25.4%. Among internet users, only 3.3% reserve or purchase goods or services via internet and primarily they were in 25-34 age group at 38.2%. Type of goods or services purchased via internet was e-Ticket at 17.4%, fashion/jewelry at 14.7%, books at 14.5%, and entertainment goods/sport utilities/stationeries at 13.7%. The main payment method was debit/credit card at 36.3%, bank transfer at 29.2%, deducting from saving account at 13.0% and cash at 8.9%.

Table 10 Proportion of population aged 6 years and over who used internet by area, sex, age; 2004 - 2009

Area, sex and age group	2004	2005	2006	2007	2008	2009
Area	**11.9**	**12.0**	**14.2**	**15.5**	**18.2**	**20.1**
Urban	21.4	21.2	23.4	24.8	29.0	32.7
Rural	7.2	8.0	10.2	11.4	13.4	14.5
Sex	**11.9**	**12.0**	**14.2**	**15.5**	**18.2**	**20.1**
Male	11.3	11.8	13.9	15.2	17.9	19.8
Female	12.4	12.2	14.6	15.9	18.5	20.4
Age group	**11.9**	**12.0**	**14.2**	**15.5**	**18.2**	**20.1**
6 - 14	7.2	11.8	15.5	19.3	23.6	29.0
15 - 24	32.1	31.0	36.5	39.7	44.6	47.3
25 - 34	12.2	12.4	15.2	15.9	19.4	21.5
35 - 49	7.4	7.1	8.0	8.4	10.3	11.9
50 year & over	1.9	2.0	2.5	2.9	3.4	4.0

Source: ICT Household Survey, National Statistical Office.

Table 11 Proportion of population aged 6 years and over using internet by locations; 2004 - 2009

Location [1/]	2004	2005	2006	2007	2008	2009
Home	24.9	32.5	33.5	31.5	34.1	33.4
Office	22.9	28.0	28.4	28.2	29.6	29.0
Institution	31.4	42.6	45.6	48.2	46.4	46.8
Internet shop	19.0	17.8	17.3	15.8	18.8	21.8
Telecenter	[2/]	0.3	0.3	0.3	0.6	0.6
Friends or relatives' house	1.3	1.4	1.5	1.3	2.4	2.1
Mobile	0.1	0.1	0.2	0.4	0.3	[2/]

Source: ICT Household Survey, National Statistical Office.
Note: 1/ Answer only up to two choices
2/ Do not classify activities

Table 12 Number of Internet user by activity to use 2004 - 2009

Activity to use 1/	2004	2005	2006	2007	2008	2009
E-mail	8.4	19.5	19.0	18.4	22.6	18.6
Game	17.0	22.1	21.5	22.7	24.5	23.8
Search data&News	59.6	81.2	83.3	84.8	81.9	80.6
e-Commerce	9.4	2.7	2.9	1.4	2.8	2.5
Download	2.1	4.0	5.1	5.1	7.7	7.6
Chatroom& Webboard	0.3	5.2	4.2	3.2	1.8	1.7
e-Learning	2/	4.9	3.6	2/	3.2	3.1
Tel-abroad	2/	2/	2/	2/	0.2	0.2
Chat	2.3	2/	2/	2/	3.0	3.8
E-banking	2/	0.8	1.1	3.0	0.6	3.1

Source: ICT Household Survey, National Statistical Office
Note: 1/ Answer only up to two choices
2/ Do not classify activities

Table 13 Proportion of online purchaser by type of goods and services to buy; 2007 - 2009

Type of goods and services 1/	2007	2008	2009
Fashion & jewelry	10.5	18.1	14.7
Book & magazine	13.7	17.7	14.5
Technology, mobile& camera	13.0	14.0	11.3
Electric	8.8	6.7	6.1
Food, drink & health	6.8	4.2	12.6
Entertainment goods, sport utilities, stationery	11.9	11.4	13.7
Furniture & office product	5.1	7.5	5.3
e-Ticket	2/	14.5	17.4
Reserved	8.0	7.9	8.6
Toys & gift, Games	4.8	3.1	3.3
Software	4.8	6.5	6.3
Computer games	2/	2.8	3.3

Source: ICT Household Survey, National Statistical Office
Note: 1/ Answer only up to two choices
2/ Do not classify activities

According to the ICT Educational Institution Survey in 2008, the proportion of students per computer for primary education level was 14 persons per computer, vocational education level was 8 persons per computer, higher education level was 11 persons per computer and non-formal education level was 109 persons per computer

The proportion of teachers per computer at the higher education level was 3 persons per computer, the vocational education level was 5 persons per computer, primary education level was 10 persons per computer and non-formal education level was 12 persons per.

Primary educational institutions had computers at 99.7% and other level of educational institutions had computers in every institutions.

Most of educational institutions had internet access. For instance, 97.2% of primary educational institutions had internet access, vocational and non-formal education level at 99.0%, and higher education level at 100.0%.

Table 14 Usage of ICT in Educational Institution; 2008

Indicators	Total	Primary	Vocational	Higher	Non formal
Infrastructure					
Student to computer ratio 1/	14	14	8	11	109
Teacher to computer ratio	8	10	5	3	12
Proportion of schools with computer	99.7	99.7	100.0	100.0	100.0
Proportion of schools with wireless internet access	97.3	97.2	99.6	100.0	98.7
Proportion of school computers used for instructional purposes 2/	69.6	72.6	77.0	55.0	43.9
The usage of ICT for instruction					
Proportion of teachers who develop electronic media for instructional purposes	26.9	22.8	45.8	53.6	27.6
Average number of IT courses offered per school	3	2	17		2
Training					
Average number of teachers with a computer science or IT degree	1	1	5	23	1
Proportion of teachers with IT training	66.3	65.9	71.0	76.1	80.4

Source: ICT in Educational Institution Survey, National Statistical Office.(see Annex 2)

Note: 1/ Total number of students / Total number of computers

2/ Computers for instructional purposes refers to computers in computer labs and lecture room

5. Measuring the Information Economy

Measuring ICT use by business

The data from ICT Business Survey revealed that in 2009, there were totally 2.1 million establishments. They were in business trade and services at 74.5%, manufacturing at 21.1%, other land transportation and activities of travel agencies at 3.0%, construction at 1.3% and hospital at 0.1%. When classifying by the numbers of persons in establishments, establishments with 1-15 persons was at the highest proportion at 97.3% and 16-25 persons at 1.1%, 26-30 persons at 0.2%, 31-50 persons at 0.5%, 51-200 persons at 0.7% and more than 200 persons at 0.2%.

Establishments with less than 16 persons slightly use ICT: using computer at 21.9%, internet at 14.2%, and website at 6.2%.

Establishment with 16 persons or more use computers at 81.1%, internet at 68.5% and website at 37.9%. To run business, establishments bought goods/services via internet at 11% and sold goods/services via internet only at 9.6%. The internet connection type was xDSL at 41.1% and analogue modem at 16.7%. The purpose of using internet primarily was to search for information at 63.6%, sending/receiving email at 57.1% and providing services to customer at 28.8%.

Establishments with 16 persons or more in hospital business used internet the most at 97.5% and other business used internet between 83-87%.

Table 15 Percentage of Establishment by size of establishment and economic activity; 2009

Size of Establishment / Economic Activity	Percentage
Economic Activity	
Business Trade and Services	74.5
Manufacturing	21.1
Construction	1.3
Other Land Transport and Activities of Travel Agencies	3.0
Hospital	0.1
Size of Establishment	
1 - 15 persons	97.3
16 - 25 persons	1.1
26 - 30 persons	0.2
31 - 50 persons	0.5
51 - 200 persons	0.7
More than 200 persons	0.2

Source: ICT Business Survey, National Statistical Office.

Table 16 Proportion of Establishment (with one person or more) with using computer, internet, web presence by Economic Activity and Size of Establishment; 2009

Size of Establishment / Economic Activity	Using Computer	Using the Internet	With a Web
Economic Activity			
Business Trade and Services			
Manufacturing			
Construction			
Other Land Transport and Activities of Travel Agencies			
Hospital			
Size of Establishment			
1 - 15 persons	21.9		
16 - 25 persons			
26 - 30 persons			
31 - 50 persons			
51 - 200 persons			
More than 200 persons			73.2

Source: ICT Business Survey, National Statistical Office.

Table 17 Proportion of Establishment (with size 16 persons or more) with using computer, using the Internet, with a Web presence by economic activity; 2009

Economic Activity	Using Computer	Using the Internet	With a Web presence
Total	**81.1**	**68.5**	**37.9**
Business Trade and Services	83.2	68.8	40.2
Manufacturing	76.8	65.3	35.0
Construction	89.4	76.9	26.3
Other Land Transport and Activities of Travel Agencies	85.2	74.2	41.4
Hospital	100.0	97.5	68.1

Source: ICT Business Survey, National Statistical Office.

Table 18 Comparison on ICT usage of establishments (with 16 persons or more) in municipal areas; 2004-2009

Items	Year					
	2004 1/	2005 1/	2006 1/	2007 1/	2008 2/	2009 2/
Number of establishments (places)	**29,442**	**30,746**	**28,980**	**28,108**	**59,736**	**58,393**
Proportion of establishments using computers	85.4	86.8	88.4	89.3	79.9	81.1
Proportion of establishments using the Internet	58.4	64.1	69.6	73.2	65.3	68.5
Proportion of establishments with a web presence	30.1	32.7	35.1	36.3	33.0	37.9
Proportion of establishments placing orders over the Internet	8.6	8.7	9.7	10.7	10.5	11.1
Proportion of establishments receiving orders over the Internet	7.4	7.2	7.7	8.1	9.5	9.6

Source: ICT Business Survey, National Statistical Office.
Notes: 1/ 2004 - 2007 ICT Business Survey in municipal areas.
2/ 2008 - 2009 ICT Business Survey in municipal areas and non - municipal areas.

According to the e-Commerce Survey in 2007 - 2009, establishments running e-Commerce business has the revenue via internet in 2008 (in the last 12 months) at 527,538 million baht. The revenue increased from 2007, which was 427,460 million baht or 23.4% increase. Considering the revenue by type of e-Commerce, it found that the revenue of B2B has increased 49.8% while the revenue of B2C has decreased 27.6% and the revenue of B2G has increased 22.9%.

The primary industry group selling via internet was fashion industry, clothes/jewelry/accessory at 42.1% among all business. Secondly, the computer industry group, electronic and internet device was at 17.7%.

When comparing between 2007 and 2008, industry groups that had increasing proportion in 2009 was fashion group, clothes/jewelry/accessory from 18.0% in 2007 to 29.4% in 2008 and increased to 42.1% in 2009.

Table 19 Total sales and services revenue from e-Commerce; 2006 - 2008

Type Operators	e-Commerce				
	Revenue (Million Baht)			Rate Changes	
	2006	2007	2008	2006 - 2007	2007 - 2008
Total	**305,159**	**427,460**	**527,538**	**40.1**	**23.4**
B2B	79,726	127,325	190,751	59.7	49.8
B2C	47,501	63,425	45,951	33.5	-27.6
B2G 1/	177,932	236,710	290,836	33.0	22.9

Source: e-Commerce Survey, National Statistical Office.(see Annex 4)
Note: 1/ Including revenue of government e-Auction from the Comptroller General's Department; in 2006, amount 176,683 million baht, in 2007 amount 233,982 million baht and in 2008 amount 288,749 million baht

Table 20 Percentage of e-Commerce by industry; 2007 - 2009

Industry	e-Commerce		
	2007	2008	2009
Computer, Electronic devices and Internet	18.6	21.1	17.7
Fashion, Wearing apparel, Gem and Jewelry	18.0	29.4	42.1
Travel, Hotel, Resort	7.6	11.0	7.8
Motor vehicles and Products	6.0	3.5	3.2
Publication and Office equipment	4.8	3.9	4.1
Service Business	9.4	11.1	10.0
Goods and Others	35.6	20.0	15.1

Source: e-Commerce Survey, National Statistical Office

6. Data Limitations

1. Reliability

Because the National Statistical Office has many establishment surveys in every year, it is required to reduce establishments burden by using 'Rotation Sampling' and selecting unrepeated establishments in each survey (except large-scale establishments which are entirely selected). Accordingly, the results are possibly slightly incorrect due to sampling error and non-sampling error; for example, interviewees do not give real data, questionnaires are not complete, and there are errors in coding, or recording. However, the National Statistical office has tried to control data quality in order to have the least mistake.

2. Comparability

Although the National Statistical Office has carried out the Labor Force Survey including ICT personal worker, it utilizes the concept of ICT skill referring to ISCO-1988. However, ISCO-1988 had been developed to the new version, namely, ISCO-2008. It is likely to induce a difficulty in comparison. Hence, NSO plans to use this new version in the population censuses to be conducted from 2010 onwards.

3. Completeness

At the level of international comparison, it was found that some indicators were not collected or double collected. As a result, the Ministry of ICT has arranged many conferences to make an agreement among public and private agencies for their responsibility in collecting ICT data.

7. Conclusion

ICT Statistics are necessary for planning, monitoring and evaluating ICT Master Plan. At present, there are many agencies collecting ICT statistics in Thailand. As a result, some duplicated indicators were collected. National Statistical Office has carried out the ICT survey for measuring the information society and economy. For measuring the information society, National Statistical Office has collected the annually ICT household survey since 2001 and ad hoc survey of ICT educational institution in 2008. For measuring the information economy, National Statistical Office has collected the annually ICT business survey since 2004 and e-Commerce survey since 2007. Moreover, the questions on ICT will be included in the next round of national population census in 2010 which will be benefit for directing ICT development both in national and local levels.

Annexes

Annex 1

ICT Household Survey

Background

The Information and Communication Technology Survey (Household) has been undertaken since 200. Since 2003, the survey has been conducted annually by attaching the questionnaire with the Labor Force Survey. However, because the demand of using statistics about information and communication technology has significantly increased, since 2005 the questionnaire has been separated from the Labor Force Survey in order to add more questions to serve demand of users. For this year, the survey was conducted in the 1st quarter (January – March). The survey has the same sample as the Labor Force survey, consisting of private households and special household selected as sample households at the total number of 79,560 households. The data was collected by viewing heads of households and members of households 6 years old or over.

Objectives

To know the number of persons using computer and internet, mobile phone, fixed line telephone and related device, the number of household having information and communication technology device including fixed line telephone, computer, fax and internet access in household and the areas that are needed to be controlled the use by the government.

Collected data

The survey has questions for both household and individual level. The household-level data consist of the possession of Information and Communication Technology devices in various type including fixed line telephone, computers, fax and internet access in households as well as other related questions. The individual-level data consist of the use of computer, internet, mobile and the detail of computer, internet and mobile use such as location, activity, frequency, internet-use expense per month, goods and services ordered via internet, type of the goods and services bought via internet, and the payment method for goods and services bought via internet, the reason not to buy goods and services and other related questions.

Survey methodology

This survey adopted Stratified Two-Stage Sampling; province is stratum. The primary sampling units were blocks in municipal areas and villages in non-municipal areas and the secondary sampling units were private households and persons in special households. In practice, the Household ICT Survey used the sampling households as the Labor Force Survey that is conducted monthly and has the sample size of 26,520 households. For this Household ICT Survey, the survey conducted in only 1 quarter and combine data from 3 months to present results in province level.

Annex 2

ICT in Educational Institution Survey

Background

The National Statistical Office conducted the first ICT in Educational Institution Survey in 2008. The survey included primary, vocational, higher education and non-formal education level in both public and private sector. The survey conducted during May-June 2008 by interviewing executives, teachers, and instructors in primary, vocational, higher education and non-formal education in both public and private sector.

Objectives

The objective of the survey is to understand the use of information and communication technology in educational institutions. The result can be a guideline for the government to effectively plan, promote and develop an information technology policy in order to serve students, teachers and instructors to receive the benefits from ICT and access to educational service.

Sampling Plan

1. Sampling plan for executives in education institutions

The survey applied Stratified Sampling; Stratum were 4 groups of educational institutions, including primary education group, higher education group, vocational education group, and non-formal education group. Each stratum divided into 2 sub-stratums, namely educational institutions under the Ministry of Education and educational institutions under other agencies.

In each stratum and sub-stratum, educational institutions were selected by adapting Systematic Sampling and the total number of sample sizes was 1,137 education institutions in which 1,137 of high-level executives were interviewed.

2. Sampling plan for teachers/instructors

The survey applied Stratified Two-Stage Sampling; Stratum were 4 groups of educational institutions, including primary education group, higher education group, vocational education group, and non-formal education group. Each stratum divided into 2 sub-stratums, namely educational institutions under the Ministry of Education and educational institutions under other agencies, which were primary sampling units. The secondary sampling unites were teachers/instructors in education institutions.

In each stratum and sub-stratum, educational institutions were independently selected to be the primary sampling units by adapting Systematic Sampling and the total number of sample sizes was 415 education institutions distributed in stratum and sub-stratum.

In each education institutions (the primary sampling units), 10 teachers/ instructors were randomly selected from to be the secondary sampling units. The total sample size was 4,150 teachers/instructors distributed in stratum and sub-stratum.

Scope and Coverage

Coverage was education institutions and teachers/instructors under the Ministry of Education and other public agencies in both public and private sectors. Education institutions were classified into 4 groups as follow:

1. Primary education institutions include educational institutions in elementary and/or secondary(pre-school not included) in both public and private sectors under Ministry of Education and other ministries.
2. Vocational education institutions include educational institutions in vocational certificate and high vocational certificate in both public and private sectors under Ministry of Education and other ministries.
3. Higher education institutions include educational institutions in diploma and degree in both public and private sectors under Ministry of Education and other ministries.
4. Non-formal education institutions include non-formal education educational institutions under Office of the Non *Formal* Education Commission, Ministry of Education

Annex 3

ICT Business Survey (ICT in Establishment Survey)

Background

ICT Business Survey has been conducted annually since 2004. Previously, this survey was included ICT related questions in the Manufacturing Survey of 2003. In 2004 – 2007, it surveyed establishments located in municipal area with 1 person or more and there were approximately 70,000 – 80,000 sampling establishments. In 2008, it surveyed establishments with 6 persons or more and there were 31,333 sampling establishments. In 2009-2010 establishments with 1 person or more were interviewed and there were 25,000 – 35,000 sampling establishments.

The scope were establishments that run business trade and services, manufacturing, construction, other land transportation (excluding other land transportation without time tables such as hire motorcycle etc.), and activities of travel agencies, hospital (economic activity classified according to the International Standard Industrial Classification of All Economic Activities: ISIC Rev.3). In 2010, data collection period was April-June 2009. The survey interviewed establishments running business in the past 12 months. Data collected consists of use of computer and internet, use of website in establishments, purchasing goods or services via internet, selling goods or services via internet, using EDI or other computer network(except internet) and so on, problems and obstacles to use ICT, expense using for ICT goods or services and human resources in ICT professions in establishments.

Objectives

To collect data related to the use of Information and Communication Technology for business in establishments, employment in each type of industry, demand of ICT professionals. The information is used as a guideline to create policies and plans, promote, and develop capacity to effectively use ICT in establishment.

Survey Methodology

The survey adopted Stratified Systematic Sampling. Regions are stratum. Economic activities and size of establishments is sub-stratum and establishments were sampling units. The survey is represented in region levels: Bangkok and surroundings, Central region, Northern region, Northeastern region, Southern region and divide type of economic activities into 6 groups and classified establishments based on (International Standard Industrial Classification of All Economic Activities: ISIC Rev.3).

Annex 4

e-Commerce Survey

Background

The e-Commerce Survey has been conducted annually since 2007. The survey takes e-Commerce transactions in narrow definition from OECD, which means "an Internet transaction is the sale or purchase of goods or services, whether between business, households, individuals, governments, and other public or private organization, conducted over the Internet. The goods and services are ordered over the Internet, but the payment and the ultimate delivery of the good or service may be conducted on or off-line." The survey exempt establishments in C2C (Consumer to Consumer), which means the individual-to-individual commerce because it requires a different type of surveyed.

Objectives

The survey aims to understand status and development of e-Commerce in Thailand. The survey data consists of type of business, number of employed persons, market, revenue, payment, and goods delivery as well as problems and suggestion that the governments need to help and support. The survey can be a guideline to create plan, policies and strategies to develop and encourage capacity in e-Commerce and competitiveness in the global market. Moreover, the data can be used to evaluate the development results. In the same way, private sectors can use data as a guideline to expand market, adjust the business to reflect current environment.

Survey Methodology

Establishments and owners are establishments and owners that have e-Commerce business from 3 sources of information as follow:

1. Sampling frame from the National Statistical Office: use the same establishment samples as Establishment ICT Survey and use Stratified Systematic Sampling with 1,214 sampling establishments.
2. Sampling frame from Department of Business Development: there was no sampling (2,959 Establishments).
3. Sampling frame from Thai e-Commerce Association: there was no sampling (37,239 Establishments).

Data Collecting Methodology

For **s**ampling frame from the National Statistical Office and Department of Business Development, e-Commerce establishment owners in every type(except security public companies and mutual fund business) were interview by agents from the National Statistical Office, using questionnaires. For **s**ampling frame from Thai e-Commerce Association, establishment owners used internet to answer online questionnaire.

Annex 5

Comparison on ICT usage to establishments with 16 persons or more; 2008 and 2009

Indicator[1/]	Year	
	2008	**2009**
Proportion of Establishments Using Computers	79.9	81.1
Proportion of Employees Using Computers	17.4	22.5
Proportion of Establishments Using the Internet	65.3	68.5
Proportion of Employees Using the Internet	10.6	11.4
Proportion of Establishments with a Web site	33.0	37.9
Proportion of Establishments Placing Orders Over the Internet	10.5	11.1
Proportion of Establishments Receiving Orders Over the Internet	9.5	9.6
Proportion of Establishments Accessing the Internet by the Following Modes of Access –		
Analogue modem		
ISDN		
xDSL (ADSL,SDSL,VDSL)		
Cable Modem		
Leased Line		
Other fixed connection, e.g. Frame Relay or VPN		
Wireless connection		

Source: ICT Business Survey, National Statistical Office.

Notes: 1/ Indicator to compute from total establishment.

2/ More than one characteristic can be done by an establishment.

Comparison on ICT usage to establishments with 16 persons or more; 2008 and 2009 (Continued)

Indicator[1/]	Year	
	2008	2009
Proportion of Establishments Using Other Network Communication except the Internet [2/]		
Proportion of Establishments with WAN	-	3.4
Proportion of Establishments with LAN	-	33.0
Proportion of Establishments with EDI	-	1.0
Proportion of Establishments with an Extranet	-	1.0
Proportion of Establishments with WLAN	-	11.1
Proportion of Establishments with an Intranet	-	8.4
Proportion of Establishments Using the Internet by Objectives [2/]		
Information searches	59.5	63.6
Electronic - mail	47.6	57.1
Interacting with government organization	-	18.1
Customer service	16.1	28.8
Delivering products online	-	4.2
Banking and financial service	10.4	14.4

Source: ICT Business Survey, National Statistical Office.

Notes: 1/ Indicator to compute from total establishment.

2/ More than one characteristic can be done by an establishment.

References

1. ITU (2009). Manual for Measuring ICT Access and Use by Households and Individuals. 2009 Edition

2. ITU (2010). Partnership on Measuring ICT for Development (2010). Core ICT Indicators 2010. Geneva.

3. OECD (2005). Guide to measuring the information Society. DSTI/ICCP/IIS (2005) 6 FINAL, htpp://www.oecd.org/dataoecd/41/12/36177203.pdf.

4. Partnership on Measuring ICT for Development (2005). Core ICT Indicators. New York/Geneva.

5. Partnership on Measuring ICT for Development (2008). The Global Information Society : a Statistical View 2008. New York/Geneva.

6. Thailand, National Statistical Office. (2001 – 2009). Labor Force Survey.

7. Thailand, National Statistical Office. (2004 – 2009). ICT Business Survey (or ICT in Establishment Survey).

8. Thailand, National Statistical Office. (2004 – 2009). ICT Household Survey.

9. Thailand, National Statistical Office.(2007 – 2009). e-Commerce Survey.

10. Thailand, National Statistical Office. (2008). Fundamental Telecommunication Services in Rural Area Survey.

11. Thailand, National Statistical Office. (2008). ICT in Educational Institution Survey.

12. Thailand, National Statistical Office. (2009). Household Socio – Economic Survey.

13. Thailand, Ministry of Information and Communication Technology, National Electronics and Computer Technology Center, and National Science and Technology Development Agency (2009). The Second Thailand Information and Communication Technology (ICT) Master Plan (2009-2013).

14. UNCTAD (2007), Manual for the Production of Statistics on the Information Economy. New York/Geneva.

15. UNCTAD (2009), Information Economy Report 2009. Trends and Outlook in Turbulent Times. Switzerland.