

# Digital Divide in Taiwan 2007

## Summary

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# Summary of Digital Divide in Taiwan 2007

## I. Introduction

According to “World Information Society Report 2007” published by the International Telecommunication Union (ITU), Taiwan was ranked 7th out of 181 countries included in the Digital Opportunity Index (DOI), an index comprising of three sub-indexes (infrastructure, opportunity and application) used to analyze the development status and trends of an information society, moving up from its 10th ranking in 2006.

However, despite its outstanding performance in the IT industry, Taiwan encounters a similar problem as other advanced countries in the widespread of information technology – the digital divide. The digital divide inevitably resulted from different community groups having different capability in using information technology equipment and the Internet due to inconsistent accessibility to computers and their use of the Internet at different periods of time.

To bridge the domestic digital divide and to realize the dream of equal e-opportunities, the government has incorporated the “Program for Bridging the Digital Divide” into the “e-Taiwan Project” since 2004 and listed it as a key focus in policy implementation. Each year, the Research, Development, and Evaluation Commission (RDEC) conducts a digital divide survey, to evaluate the status of information infrastructure implementation and the result of digital divide reduction, hoping to understand the current situation of Taiwan’s digital divide through survey and research methodology consistent with modern social science standards. The results can be adopted not only as reference for the government in formulating the digital divide policy accordingly, but also in evaluating the progress and benefits of the implementation of the digital divide policy. At the same time, the results also help to sustain achievements from the digital divide research in previous years to further understand the changes in domestic digital divide trends, as well as connecting and conducting dialogue with international studies.

## II. Study Methodology

In line with the purpose and spirit of its past studies, the 2007 Digital Divide Survey was contracted to the Survey Research Center of the UDN Group. The survey

was conducted using computer assisted telephone interviews (CATI) from August to September 2007. Random sampling interview was used to interview population of Taiwan nationality at or over the age of 12 in the two major metropolitan cities in Taiwan (Taipei and Kaohsiung), and 23 other counties and cities.

The survey was conducted after 6pm from Monday through Sunday. The survey collected 15,007 valid random samples in Taiwan, with a response rate of 72.4% (non-response rate is 27.6%). The estimated and actual distribution of random samples completed in counties and cities are shown in Table 1.

Table1 Distribution and Actual Number of Samples Interviewed for Individual/Household Telephone Survey

County/City	Number of residents aged 12 and above	Estimated Error	Sample Size	Actual Valid Samples
Total	19,800,850	±0.8%	15,000	15,007
Taipei City	2,303,191	±4%	600	602
Taipei County	3,286,656	±4%	600	601
Keelung City	341,443	±4%	600	600
Yilan County	399,117	±4%	600	600
Taoyuan County	1,618,412	±4%	600	600
Hsinchu County	411,897	±4%	600	600
Hsinchu City	332,772	±4%	600	600
Miaoli County	482,837	±4%	600	600
Taichung County	1,318,665	±4%	600	600
Taichung City	890,814	±4%	600	601
Changhua County	1,128,181	±4%	600	600
Nantou County	463,739	±4%	600	600
Yunlin County	629,871	±4%	600	601
Chiayi County	481,508	±4%	600	600
Chiayi City	232,669	±4%	600	600
Tainan County	970,385	±4%	600	600
Tainan City	662,650	±4%	600	601
Kaohsiung City	1,322,140	±4%	600	600
Kaohsiung County	1,086,632	±4%	600	600
Pingtung County	775,654	±4%	600	600
Penghu County	80,756	±4%	600	600
Taitung County	203,095	±4%	600	600
Hualien County	298,795	±4%	600	601
Kinmen County	70,263	±4%	600	600
Leinchang County	8,708	±4%	600	600

In order to infer the opinions of the whole population over the age of 12 in our country from the survey, sample data need to be fitted with weight to be in compliance with the population data. The sample composition of this survey has been fitted with weights according to the proportion of sex and age in the population over the age of 12 of each county/city in Taiwan as released by the Ministry of the Interior in July 2007.

Apart from fitting the sample composition of each county/city with weights, we have carried out a second stage weighted reduction on them according to the proportion of the population over the age of 12 of each county/city in that of the whole country. This is because that the sampling design of this survey is based on that the allotments of samples for each individual county/city are so assigned that the sampling errors never exceed  $\pm 4\%$  so as to ensure that those counties/cities with little population which might not gather enough samples for inference through random sampling can still produce enough samples for inference. Despite such practice has the advantage of offering basically uniform opportunity to all counties/cities, however, it also give rise to a shortcoming due to this advantage: the overrepresentation of samples from some of the counties/cities. Thus, it is hard to directly infer the overall opinion of the population over the age of 12 of our country. Therefore, samples from those counties/cities that have inflated sample sizes must be fitted with weights according to the proportion of the population over the age of 12 of each county/city in that of the whole country to ensure the correctness of the survey results in the following comparisons and analysis of the overall digital divide except for those simple comparisons between counties/cities. The sex/age distribution of samples before and after weighted are as shown in Table 2.

Table 2. The Sex/Age Distribution of Samples in The Individual/ Household Telephone Survey

<u>Items</u>	<u>Actual Samples</u>	<u>Percentage before Weighted</u>	<u>Percentage after Weighted</u>
<u>Genre</u>			
<u>Male</u>	<u>7,093</u>	<u>47.3</u>	<u>50.4</u>
<u>Female</u>	<u>7,914</u>	<u>52.7</u>	<u>49.6</u>
<u>Age</u>			
<u>12-14</u>	<u>706</u>	<u>4.7</u>	<u>4.9</u>
<u>15-20</u>	<u>1,643</u>	<u>10.9</u>	<u>9.7</u>

Items	<u>Actual Samples</u>	<u>Percentage before Weighted</u>	<u>Percentage after Weighted</u>
<u>21-30</u>	<u>2,224</u>	<u>14.8</u>	<u>19.4</u>
<u>31-40</u>	<u>2,889</u>	<u>19.3</u>	<u>18.5</u>
<u>41-50</u>	<u>2,815</u>	<u>18.8</u>	<u>18.9</u>
<u>51-60</u>	<u>2,246</u>	<u>15.0</u>	<u>14.0</u>
<u>61-64</u>	<u>542</u>	<u>3.6</u>	<u>3.0</u>
<u>65 and above</u>	<u>1,942</u>	<u>12.9</u>	<u>11.7</u>

### III. Study Framework and Survey Items

Succeeding the essence of the previous surveys, the 2007 Digital Divide Survey explores the digital divide status of various population in Taiwan area from three aspects, i.e. access to information technology, information literacy and information application.

In order to find out digital divide measuring indicators that are most representative of the state quo of the development of information technology and to keep pace with international trends, the indicators used in the 2007 Digital Divide Survey are determined in two stages. In the first stage, the research unit reviewed the newest relevant research documentation of domestic and abroad, made revision to existing investigation indicators, and drafted the first draft of the indicator framework. After two symposia, scholars and experts adopted a resolution which confirmed that the framework and investigation indicators for the 2007 Digital Divide Survey are as shown in Table 3.

The questionnaire consisted of four main parts: overview of individual use of the computer and Internet, overview of household use of the computer and Internet, basic individual information, and basic household information. Furthermore, the 2007 Digital Divide Survey also planned for differentiation investigations with emphasis on the employed/the physically and mentally disabled/ the indigenous people, aiming to find out the information needs of disadvantaged groups or specific groups.

Table 3. The Study Framework and Major Investigation Items of the Individual and Household Digital Divide Survey 2007

Primary Dimension	Secondary Dimension	Tertiary Dimension	Indicators(The Coverage of Each Dimension)	Remarks
Individual Digital Status(Degree)	Access to Information Technology	Access to information equipment	1. History of computer usage 2. Ownership of Information Equipments other than Computer	Used to measure the usage of computer and other information equipments
		Access to the Internet	1. Used the Internet before 2. Number of daily Internet usage hours 3. Access the Internet using mobile phone	Used to measure the usage and frequency of the Internet
	Information Literacy	Information Technology Literacy	1. Ability to install/maintain/fix computer hardware and software 2. Ability go use email	Used to measure the basic skills of using a computer and the ability to shoot troubles
		Information Security Literacy	1. Install antivirus software 2. Set up personal password 3. Back up data periodically	Used to measure one's idea on information security and protection
	Information Application	Application at work (or school)	1. Search for information at work(or school) 2. Online Learning	Used to measure the application of computer at work and in study
		Citizenship behavior	1. Know government agencies' websites 2. Used the Internet to search for public notices 3. Submitted online applications through government websites 4. Participated in Internet public citizen issues	Used to measure the status of e-government and the participation of people in discussions on political and social issues through the Internet
		Daily life applications	1. Sell or buy products on the Internet 2. E-banking 3. Information search 4. Use the Internet for recreation purposes 5. Use online instant messaging services(such as MSN, etc)	Used to measure one's acceptance of e-business and using the Internet for information-searching, communication and recreation
		Web2.0	1. Browse Blogs 2. Share Knowledge and Experiences	Used to measure the status of Web 2.0 application
		Information collection	1. Ability to read English Web pages 2. Ability to search for specific information	Used to measure one's ability to collect information
	Household Digital Status(Degree)	Household Information Environment	Household information equipment	1. Household ownership of computer
Internet environment			1. Does the household have access to the Internet 2. Type of Internet connection for computers in the household	Used to measure the status of household access to the Internet and the Internet connection type

Primary Dimension	Secondary Dimension	Tertiary Dimension	Indicators(The Coverage of Each Dimension)	Remarks
	Household Information Literacy		1. Percentage of computer users in the household 2. Percentage of Internet users in the household	Used to measure the percentage of family members using digital equipments or the percentage of family members using the Internet in a household

The development trend of information technology has been taken as the main consideration, and trend comparison as supplementary consideration, in the design of the 2007 Individual/Household Digital Divide Questionnaire. Comparing the frameworks of questionnaires used in 2006 and 2007, the major differences reside in the following:

1. Questions relevant to information technology literacy have been scaled down substantially, whereas questions relevant to “information security literacy”, “application at work”, “Internet citizen participation”, “Web 2.0: using blogs” and “online learning” have been intensified.
2. The coverage of the notion of “information equipments” has been expanded, so as to find out the ownership of information equipments other than computer in residents.
3. Question groups have been specifically planned for the physically and mentally disabled and the indigenous people, so as to find out the learning needs and obstacles on information technology, and to find out how Information and Communication Technology(ICT) has been applied at work by the employed.

#### **IV. Current Status of the Individual Digital Divide**

This study was conducted to understand the computer and Internet usage of population over the age of 12 in Taiwan from the three primary dimensions: “access to information technology,” “information literacy” and “information application.” The results are as follows:

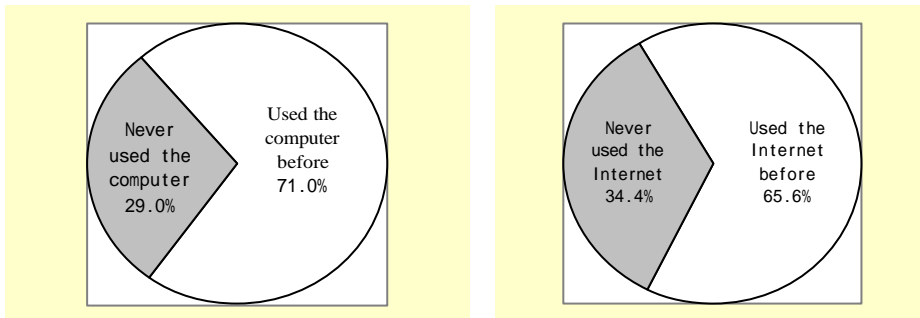
##### **1. Individual Digital Divide**

###### **1.1 Access to information technology**

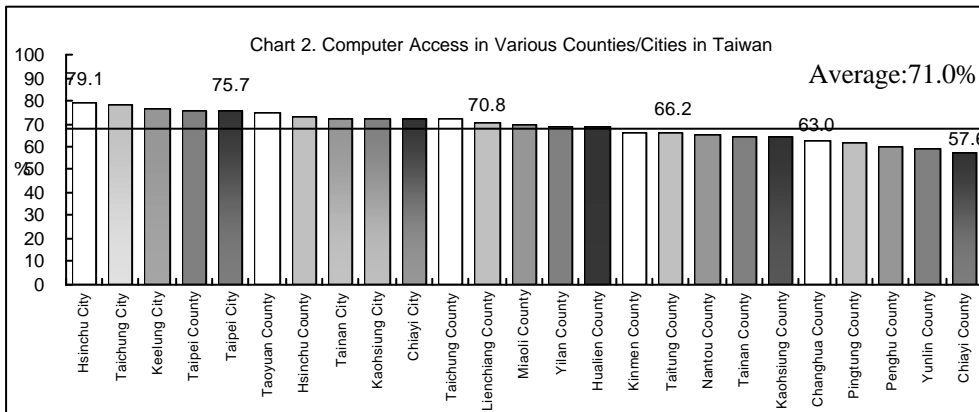


1.1.1 The survey shows that 71.0 % of population over the age of 12 in Taiwan has used the computer before, and 65.6% of the population over that age has used the Internet before. Based on this figure, it is estimated that there are 14.07 million computer users and 13.00 million Internet users. The population of computer user and Internet user increased almost 400 thousand than 2006.[Chart 1]

Chart 1. The Utilization Ratio of Computer and the Internet in the Population over the age of 12 in Taiwan



1.1.2 The computer is most popular in six counties/cities, i.e. Hsichu City(79.1%), Taichung City(78.6%), Keelung City(76.6%), Taipei County(75.9%), Taipei City(75.7%), and Taoyuan County(75.3%). More than 75% people in these counties/cities have used computer before. In contrast, the computer usage rates in Yunlin County(59.2%) and Chiayi County(57.6%) are lower, less than 60%.[Chart 2]



1.1.3 The status of public access to information technology shows distinctive differences according to different level of urbanization in their residential areas. Regions with higher level of urbanization have a higher rate of computer and Internet usage. For example, the computer usage rate of people living in highly

remote towns and villages is 55.6%, whereas the computer usage rate of people living in moderately remote towns and villages is higher(57.4%), as regards to the computer usage rate of people living non-remote towns and villages is 73.4%, the digital divide is quite large; indigenous towns and villages in mountainous regions is the area where the usage of computer is least common(59.1%), indigenous towns and villages in plain regions come next(67.1%), whereas in non-indigenous towns and villages, 71.6% of the people know how to use the computer.

1.1.4 The computer usage rate and the Internet usage rate of people in Taiwan also present significant differences with the differences of sex, education background, work status, employment status and ethnic groups. The basic model is: the usage rates in male are higher than that in female; the usage rates in well-educated people are superior to that of poor-educated people, for example, 96.9% of the people with a college degree or above use the computer, the percentage is 8 times of that of people with an education background of primary school or lower; the young generation are far more electronized than senior people, and the digital divide in the Internet access rate can be as high as 20 times. The computer usage rates in professionals working in office, technicians, clerks and soldiers in active service exceed 90%, much higher than manual workers or workers engaged in agricultural industry, forestry, fishery and animal husbandry; in government sector, as high as 96.2% of employers have used the computer before, higher than that of private sectors. The computer usage rate in the indigenous people is 67.2%, whereas those of the Hakka group and ethnic groups other than the indigenous people and the Hakka group are higher than 70%.

1.1.5 Internet users in Taiwan spend approximately 2.7 hours/day using the Internet; of which female users spend 2.5 hours/day using the Internet, significantly fewer than that of male users.

1.1.6 In total, 9.4 % of the population over age of 12 in Taiwan has used mobile Internet services before, mainly used mobile phone to access the Internet [Chart 3]. It is noteworthy that despite the Internet usage rates in people living in remote towns/villages and indigenous towns/villages are relatively low, however, their opportunities to use mobile Internet services are relatively more. Furthermore, male, well-educated, young Internet users are more willing to try new technology, therefore, their usage rates of mobile Internet services are also relatively higher.

1.1.7 There are quite a lot 3C(Computer, Communications and Consumer Electronics) commodities that Internet users in Taiwan may encounter or use in their daily life. Ranked by the ownership rates of these products, they are mobile phone(91.5%),

desktop computer(86.9%), digital camera(73.4%), portable disk player(68.7%) and MP3(61.9%). In contrast, the ownership rates of laptop computer(37.7%) and PDA(13.8%) are relatively lower. [Chart 4]

Chart 3. The experiences of using mobile Internet services among Internet users in Taiwan area

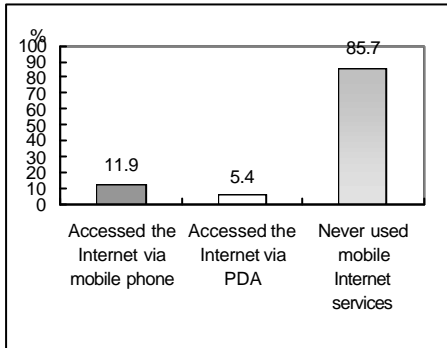
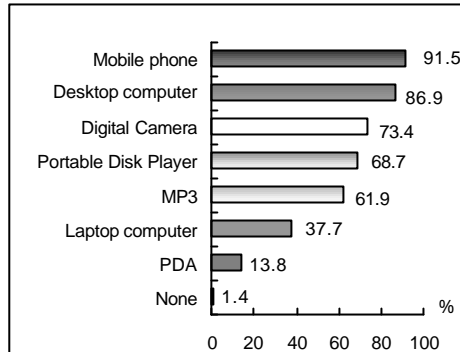


Chart 4. The ownership status of information equipments in Internet users in Taiwan area



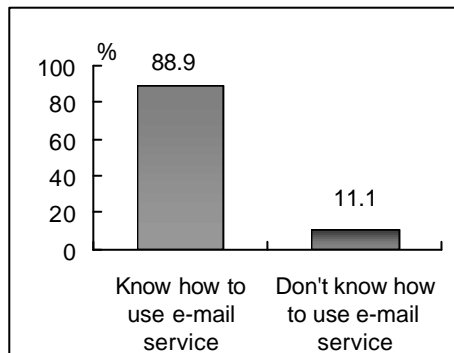
## 1.2 Information literacy

1.2.1 In terms of computer literacy skills, 51.0% of the population of Internet users totally depends on others for computer maintenance; 34.7% will perform simple computer maintenance themselves first and will seek professional maintenance service only if it's beyond their ability. Only 13.9% can carry out maintenance tasks independently. 88.9% knows how to use email service, only 11.1% doesn't know. [Chart 5 and Chart 6]

Chart 5 Ability of Internet Users in Taiwan to Shoot Troubles



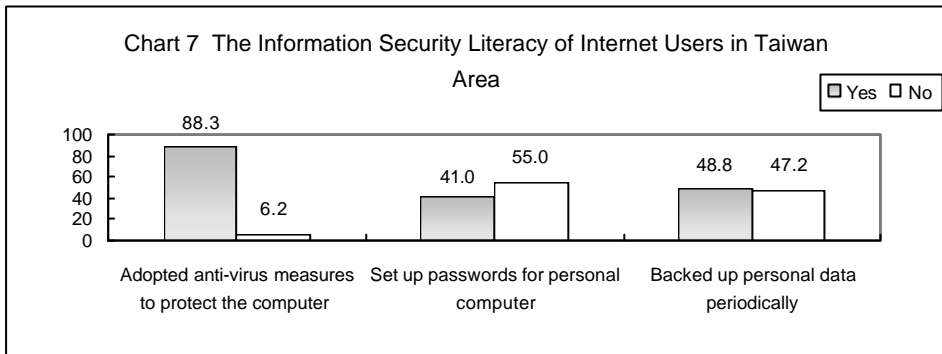
Chart 6. Ability of Internet Users in Taiwan to Use E-mail Service



1.2.2 Among all 25 Counties/Cities, people in Hsinchu City and Taipei City has the highest information technology literacy: nearly 95% of them know how to use email service; the ratio of people who can perform simple maintenance tasks or can

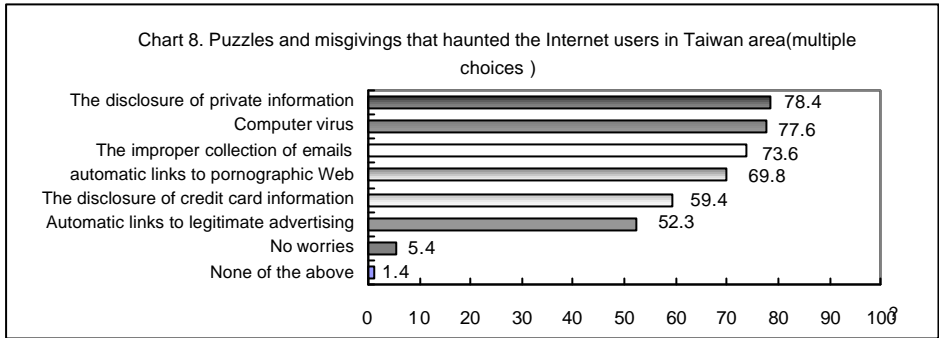
carry out maintenance tasks independently also exceeds 50%.

1.2.3 The information security of computer has become an important issue for contemporary information society and individuals who use computer, the Internet and information technology. The survey discovered that among people in Taiwan who used the Internet, 88.3% of the respondents indicated that their personal computers in daily use had installed antivirus software or had configured computer firewalls. However, only 41.0% of the respondents have set up passwords, 48.8% of the respondents backup personal data periodically. [Chart 7]



1.2.4 High-level managers and professionals pay much attention to the information security issue. More than 90% of them have adopted antivirus measure for computers, more than 50% of them have set up personal password in their computers, and more than 60% of these people will back up their personal data periodically. They have the highest technology literacy among workers of all kinds.

1.2.5 As regards to puzzles and misgivings that haunted the Internet users, if multiple choices are available, the disclosure of private information worry the Internet users most(78.4%), followed by the invasion of computer virus(77.6%), the abuse of emails or the harassment of junk mails, advertising mails(73.6%), automatic links to pornographic Web pages or illegal Web pages(69.8%), the disclosure of credit card information(59.4%) and automatic links to legitimate advertising Web pages(52.3%), etc.[Chart 8]

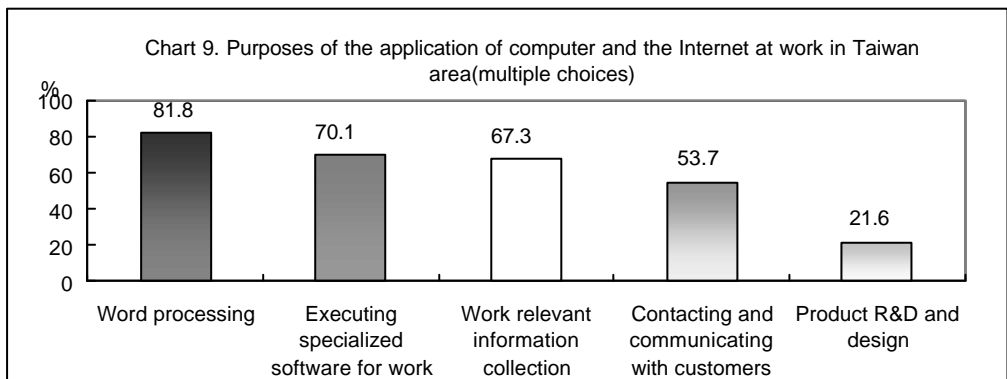


### 1.3 Information Technology Applications

#### 1.3.1 Application at work

1.3.1.1 Of people employed in Taiwan, 53.4% must use computer at work, 42.9% needs Internet access.

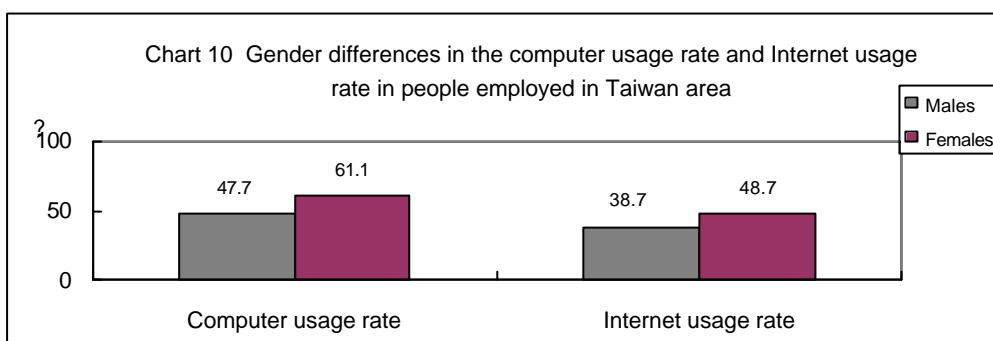
1.3.1.2 The purposes of the application of computer and the Internet at work have been analyzed. The survey discovered that, if multiple choices are available, the major purpose of the application of computer and the Internet at work is word processing(81.8%), followed by executing specialized software for work(70.1%), collecting work relevant information(67.3%), contacting and communicating with customers(53.7%). Only 21.6% of the application involved products R&D and design.[Chart 9]



1.3.1.3 Taipei City(72.6%), Hsinchu City(70.3%) and Lienchiang County(62.3%) have the highest level of digitalization at work. In contrast, agricultural Counties/Cities such as Pingtung County(36.5%), Chiayi County(33.5%) and

Yunlin County(32.0%) have the lowest level of digitalization at work, the usage rates of computer at work in these Counties/cities are lower than 40%.

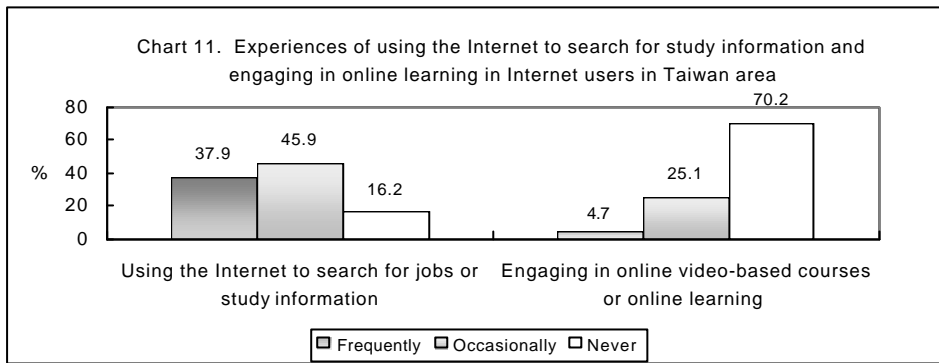
1.3.1.4. Due to that females took up a relatively high percentage in affairs handling and service sector, the usage rate of computer(61.1%) and the usage rate of the Internet(48.7%) of them are higher than that of males(47.7%, 38.7%) at least 10 percentage points; in terms of categories of job professions, professionals and affairs handling workers are the two categories with the highest digitalization with more than 90% of them require computer for work and the rate of Internet usage at work is more than 70%. With regard to the differentiation of the extent of digitalization among various sectors, government sector has the highest digitalization degree: 86.4% of people employed in government sector need to use computer at work, 76.0% need to use the Internet at work.[Chart 10]



### 1.3.2 Online learning

1.3.2.1 Among Internet users over the age of 12 in Taiwan, more than 80 percent(83.3%) used the Internet to hunt for job or to search for study information frequently or occasionally.[Chart 11]

1.3.2.2 However, the percentage of user engaging in online learning is not high, only hits 29.8%. Among the 25 Counties/Cities in Taiwan, Lienchiang County(40.6%), Kaohsiung City(35.0%) and Kinmen County(34.7%) have relatively high percentage of users engaging in online learning via the Internet. In respect of the performance of people employed in various sectors, those employed in government sectors have the highest percentage engaging in online learning, 90.1% of them need to use the Internet to search for work information, 44.2% of them have experience of online learning.[Chart 11]



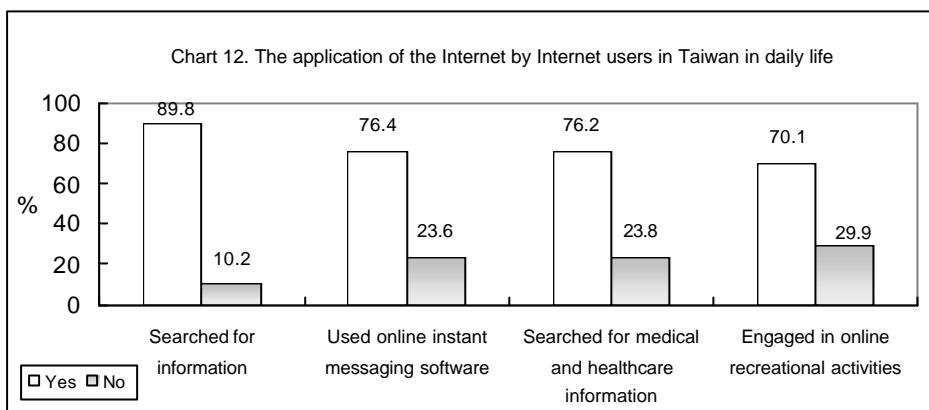
### 1.3.3 Internet citizen participation

1.3.3.1 Among the Internet users in Taiwan, 74.2% knew that there are websites established by government agencies; 35.1% had used the Internet to access government policies or public notices in the past one year, 28.0% had filed online applications through government websites; as regards to the participation in discussions of public citizen issues, a total of 6.3% Internet users have expressed their opinions on contemporary politics, social events or public policies.

1.3.3.2 Among the 25 Counties/Cities in Taiwan, people in Kinmen County(45.1%) and Taipei City(42.1%) present the highest rates in searching for government policies or public notices through the Internet; whereas Taipei City(41.5%), Hsinchu City(35.6%) and Lienchiang County(35.1%) present the highest rates in carrying out operations such as online applications through government Internet websites.

### 1.3.4 Daily life applications and the ability to search for information

1.3.4.1 89.8% of the Internet users in Taiwan knew how to search for information; 76.4% have used Internet instant messaging software; 76.2% have used the Internet to search for medical and healthcare information; 70.1% have engaged in recreational activities online. All of these indicate that the application of the Internet by people in daily life has become quite common.[Chart 12]



1.3.4.2 As regards to online recreational activities, Lienchiang County(79.1%), Kaohsiung City(74.5%), Kinmen County(74.4%) and Chiayi County(73.5%) have the highest participation rates. The participation rate of online recreational activities in people of Taipei City, however, is the lowest among all Counties/Cities, lower than that of the above-mentioned Counties/Cities for at least 8 percentage points, and this can be attributed to the prosperous recreational industry of the city. Nevertheless, Taipei City(84.7%) and Hsinchu City(81.5%) have the highest rates in searching for healthcare information, whereas Internet users of Penghu County(69.7%), Hualien County(68.9%) and Taichung County(68.5%) care least about healthcare information, the searching rates of them are below 70%.

1.3.4.3 The participation rate of male Internet users in online recreational activities(72.3%) is 4.5 percentage points higher than that of females.

The percentage of females using the Internet to search for medical and healthcare information is 10 percentage points higher than that of males. In terms of job professions, there is significant differences on the Internet application modes between professionals and other job professions: The percentage of professionals engaging in online recreational activities is lower than 70%(65.4%); however, more than 90% of them used the Internet to search living, medical and healthcare information; nearly 80% of them had used online instant messaging software.

1.3.4.4 There is still quite a room for the development of ebusiness activities in Taiwan area: only 27.8% of the Internet users have using the Internet to handle their personal banking issues; however, the percentage of online shoppers has increased to 49.6%. Of which, the percentage of female Internet users who have experienced online transaction is higher than that of males; however, there is no significant differences between their experiences in using Internet banking services. Among various job professions, professionals present the highest acceptance of



e-business: 50.5% of them have used the Internet banking services, 66.7% of them have carried out commodities transaction on the Internet; both of these percentages are higher than that of other job professions. [Chart 13 and Chart 14]

Chart 13. The usage of ebanking among Internet users in Taiwan area

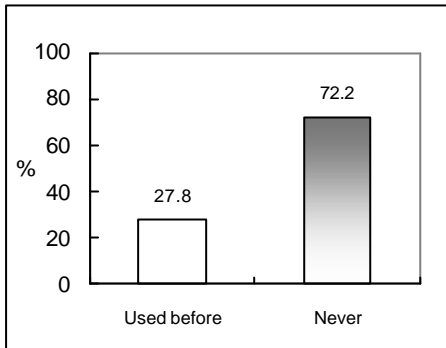
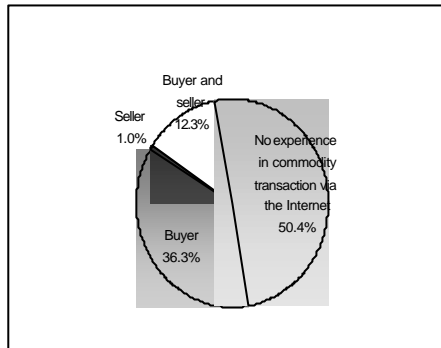


Chart 14. The usage of Internet transaction among Internet users in Taiwan area



1.3.4.5 The application of Web 2.0 among Internet users in Taiwan has been analyzed from their experiences in browsing blogs. The survey indicated that 24.0% of the Internet users frequently use the Internet to browse blogs, 50.0% occasionally use the Internet to browse blogs. In total, 74.0% of the Internet users have browsed blogs before. Among those Internet users who have used the Internet to browse blogs, nearly half of them(48.2%) simply browse for browsing's sake; however, quite a few people do express their opinions and interact with others through the Internet; and the percentage of such people exceeds 40%. [Chart 15 and Chart 16]

Chart 15. The experience of browsing blogs of the Internet users in Taiwan area

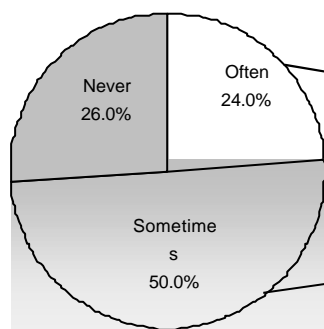
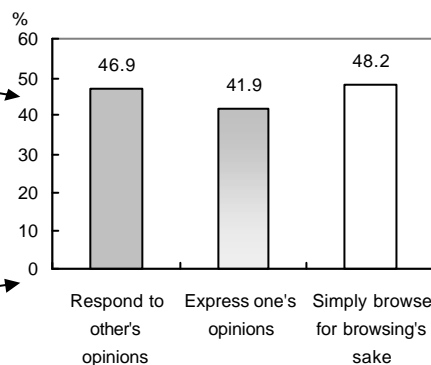


Chart 16. Different styles in the usage of blogs in Internet users in Taiwan area



1.3.4.6 Among the Internet population in Taiwan, 25.4% of the Internet users have their own blogs, 27.2% of them will share their knowledge and experiences online. Of which, Internet users below the age of 30 have participated in the construction of the Internet and have presented the characteristics of their generation: more than 30% of these people have their personal blogs, more than 60% will express their own opinion or respond to other's opinions.

1.3.4.7 Despite that 69.8% of the Internet population are confident on their ability to search for information, however, only 34.5% of them are sure that they can read English web pages.

#### 1.3.5 Miscellaneous

1.3.5.1 In respect of the demand of computer or Internet access in public places, a total of 27.5% of Internet population expressed such demand.

1.3.5.2 People have been asked to poll for places to set up free computer and Internet access in this survey, with a discovery that the most preferred places are convenience stores(25.3%), libraries(22.1%), railway stations, Metro stations or airports(20.1%).

## V. Current Status of the Household Digital Divide

### 1. Household information environment

1.1 As high as 82.6% of households in Taiwan have computers.(Chart 17)

1.2 Among 25 Counties/Cities of Taiwan, Taichung City(88.4%), Hsichu City(88.2%), Taipei County(88.0%) and Taipei City(87.8%) present the highest computer ownership rates, all of which are closing to 90%. In contrast, Yunlin County(68.3%), Penghu County(67.8%) and Chiayi County(65.9%) are relatively poor in the digitalization level, the computer ownership rates of them are lower than 70%.

1.3. In terms of (the relationship between the household information environment and) the remoteness of where the household resides, the computer ownership rate in highly-remote towns and villages is 62.2%; the computer ownership rate in moderate-remote towns and villages increases to 69.4%, however, there is still a wide divide between this figure and that of the non-remote towns and villages, which is 84.9%.

1.4. The indigenous towns and villages present a model that is similar to that of remote towns and villages: computer equipments are least popular in indigenous towns and regions in mountainous regions(60.0%), followed by indigenous towns and villages in plain regions(74.7%); whereas 83.2% of households in non-indigenous towns and villages have computers.

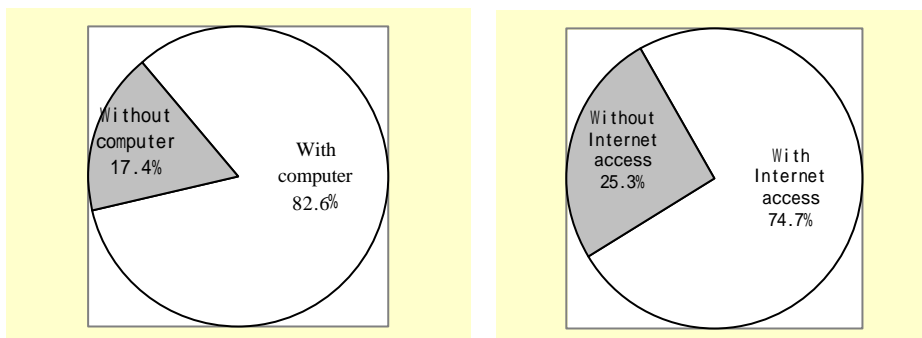
1.5. With regard to the employment status of the breadwinner of the household, if the breadwinner of a household is a white collar, such as a manager, a professional, a technician, or other affair handling worker, he/she can significantly increase the opportunity for the family to possess computer(more than 90%); whereas the popularity of computer in labor class households in agriculture, forestry, fishery and husbandry sectors is relatively low( approximately 60%).

1.6. Judging from the monthly family income, for those households with a monthly income less than NT\$20,000, the computer ownership rate is only 27.2%; for those households with a monthly income of NT\$20,000-30,000, the computer ownership rate increases substantially to 66.4%; however, such a figure is still far below

80% of the country's average level

- 1.7. Every 3 out of 4 families of our country have access to the Internet(74.7%).87.3% of these Internet accessible households access the Internet through broadbands.[Chart 17]
- 1.8. There is a great disparity in the Internet access rates among the 25 Counties/Cities in Taiwan: Taichung City(82.2%), Hsinchu City(82.1%), Taipei City(81.9%), Taipei County(81.6%) and Taoyuan County(80.7%) have a household Internet access rate higher than 80%; In contrast to the high Internet access rates of the above-mentioned Counties/Cities, only less than 60% of households in Chiayi County(58.1%) and Yunlin County(58.9%) can access the Internet.
- 1.9. Judging from the remoteness of the households residential area, we can also come to the conclusion that “the Internet access rate decreases with the increase of the remoteness of the area where the household resides” .The Internet access rate of households in non-remote towns and villages is 77.4%, however, the Internet access rate of households in highly-remote towns and villages is only 51.2%. In moderate-remote towns and villages, the Internet access rate is also only 59.6%.
- 1.10. The indigenous towns and villages present a model that is similar to that of remote towns and villages: Internet equipments are least popular in indigenous towns and regions in mountainous regions(54.4%), followed by indigenous towns and villages in plain regions(66.5%); whereas 75.4% of households in non-indigenous towns and villages can access the Internet.
- 1.11. In households with a monthly income less than NT\$20,000, the Internet access rate is only 19.0%. The Internet access rate of households with a monthly income of NT\$20,000-30,000 increases to 54.9%. For households with a monthly income above NT\$70,000, more than 90% of the households can access the Internet. More than 90% of the households whose monthly income exceeds NT\$40,000 access the Internet through broadband.
- 1.12. The Internet access rate in households with foreign spouse(s) is 57.3%, much lower than that of households without foreign spouse(s), which is 75.4%.

Chart 17. The household ownership of information equipments in Taiwan



## 2. Information literacy of family members

2.1. In households in Taiwan area, an average of more than 60% family members in the household have the ability to use computer(63.2%); there are also nearly an average of 60% of family members within a household having the ability to use the Internet(60.2%).

2.2. Households with enrolled student(s) are most likely to have computer equipments: as high as 93.1% of households with enrolled student(s) have computer equipments, and the Internet access rate of these households also reach 86.1%.

2.3. 51.6% of all households in Taiwan have senior family member(s) that do not know how to use computer. The average number of such senior family member(s) in a household is 1.6.

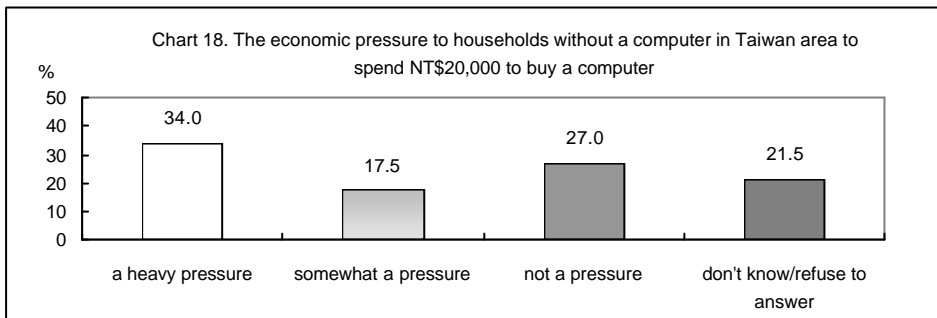
2.4. As regards to the percentage of computer users in households, Taichung City(72.2%), Taipei City(71.5%) and Hsinchu City(70.6%) still rank highest among the 25 Counties/Cities in the Taiwan, family members of households in these Cities have the highest computer literacy and skills: more than 70% of the family members know how to use computer, approximately 69% of them know how to access the Internet. On the other hand, less than 50% of family members of households in Yunlin County(49.6%), Chiayi County(47.4%) and Penghu County(49.8%) know how to use computer; the percentage of households in Yunlin County, Chiayi County and Pingtung County and Penghu County that know how to use the Internet is also below 50%. These counties rank at the bottom of the list of the degree of informationization of Taiwan.

刪除：-Fuchien Region

2.5. In terms of the percentage of Internet access rate in households with student(s), Taipei County, Taipei City and Keelung City rank highest with a percentage over 90%; in contrast, the Internet access rate in households with student(s) is relatively low in Yilan County, Changhua County, Yunlin County, Chiayi County, which is approximately 77%.

### 3. Miscellaneous

3.1 Of those households without a computer(17.2%), approximately 1/3 of them are unable to buy a computer due to economic pressure. [Chart 18]



3.2. Of those households with computer(s) but without application for Internet service, 34.4% expressed that the Internet fee can be a heavy burden to them(12.2% of them felt it will be a heavy pressure, 22.2% took it as somewhat a pressure ).

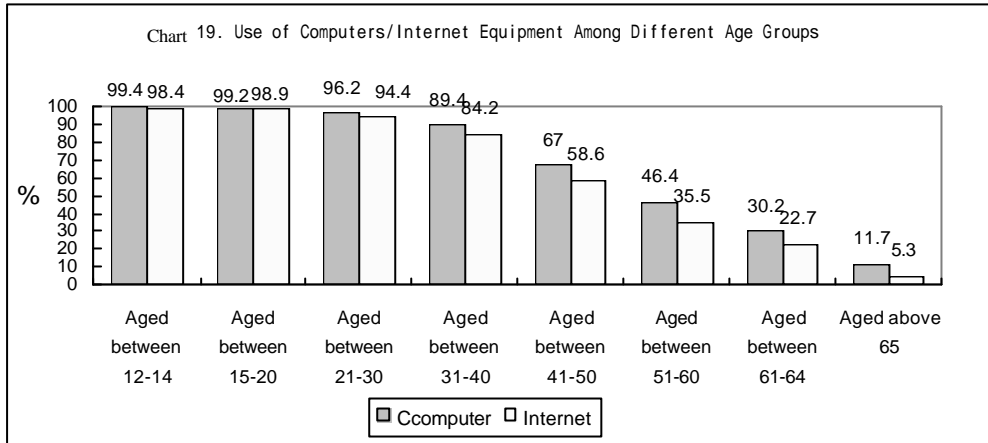
3.3. 25 Among different counties and cities, households in Taichung County ( 42.5% ) and Nantou County ( 41.3% ) face the highest level of pressure in terms of acquiring information-related equipment. More than 40% of the households in these two counties that have no computers would face serious financial burdens if they wanted to acquire new computers. The households in Chiayi County that have computers but no Internet services face the highest level of cost for acquiring Internet access. 33.9% of these households feel the pressure is very heavy.

3.4. In terms of the level of remoteness, a NT\$20,000 computer set is a greater burden for a household in a more remote area than a one in a less remote area (39.5% : 28.2%). As for the indigenous area, 49.9% of the indigenous households living in mountains believe that spending NT\$20,000 on a computer set is a serious pressure. This percentage is higher than the counterparts in prairies (35.7%) and non-indigenous towns (33.5%).

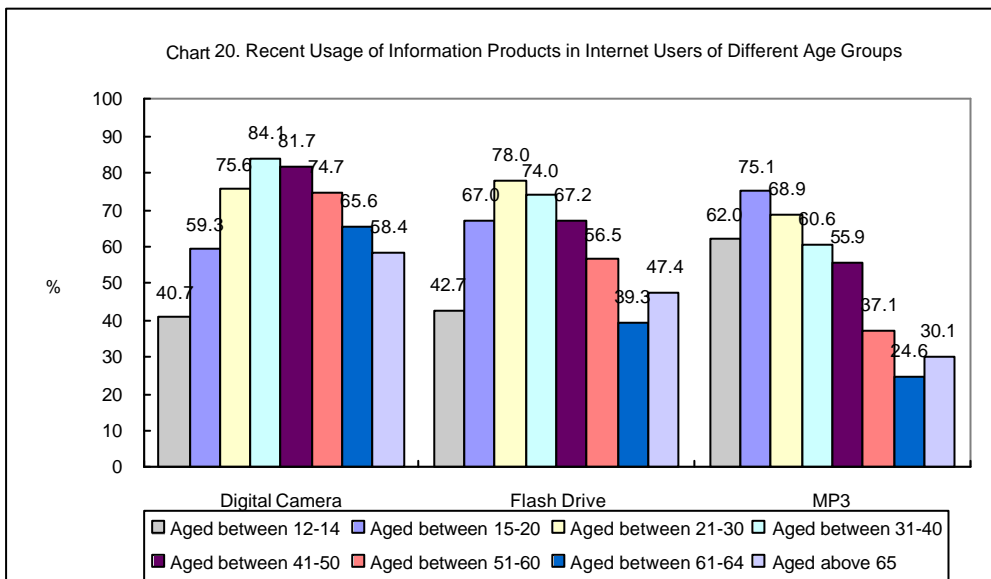
3.5. For the households whose monthly income is less than NT\$20,000, 47.5% of them feel pressure in spending NT\$20,000 on a computer. In comparison, more than 60% of the households that make more than NT\$50,000 per month do not feel the same way.

## **VI. Reasons for Not Using the Internet and the Digital Wall**

1. 29.0% of people in Taiwan do not know how to use the computer, and 5.4% have used computers but do not know how to go online. Surveys show that the three major reasons why some people do not go online are “not having the need (42.7%),” “no time (26.8%),” and “don’t know how to (26.0%).”
2. Not going online does not mean one cannot enjoy the conveniences made possible by the digital life. Among those in Taiwan who do not go online or do not know how to, 15.5% of them ask male family members to help them look for information online, and 15.8% enjoy the convenience made possible by digitization through female family members. In total, one in every four people acquire online information through family members.
3. “Information Agents” are most effective in Taipei City (42.8%), Kaohsiung City (44.4%), and Hsinchu County (39.0%). One in three enjoys the benefits of digital life through Information Agents. The “agent effect” in the unit of “household” is less ideal in places such as Nantou County (15.9%), Yunlin County (17.1%), Hualien County (18.3%), and Chiayi County (18.4%).
4. Whether it is computers, Internet access, or digital capabilities, the overall pattern is that older people are less likely to use computers and have less Internet-related skills. In terms of percentage, more than 89% of those who are below the age of 40 use computers. Those between the age of 41 and 50 are the transition group of the Information Society, and 67% of them have used computers. As for those above the age of 50, the percentage of computer uses has significantly dropped to below 46%, forming the “digital wall” based on age. The generation-gap in terms of Internet-use is even greater. Compared to the fact that more than 90% of those below the age of 30 ever go online, only 35.5% of those between the ages of 51 and 60 have used the Internet. Only 22.7% of those between the ages of 61 and 64 have accessed the Internet, and only 5.3% of those above the age of 65 have done so.



5. The percentage of owning information equipment such as laptops, cell phones, digital cameras, and PDAs rises along with ages. After reaching the peak (31-40 years old), the rate of ownership actually drops as the age rises. In terms of the experience of using MP3, flash drives, and digital cameras, there is a clear gap between the middle-aged/seniors and the younger generations as the former are less familiar with these digital products.

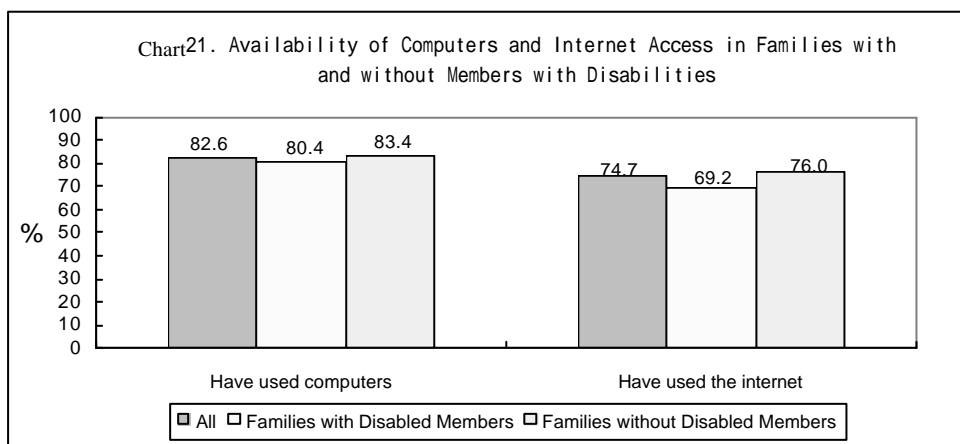




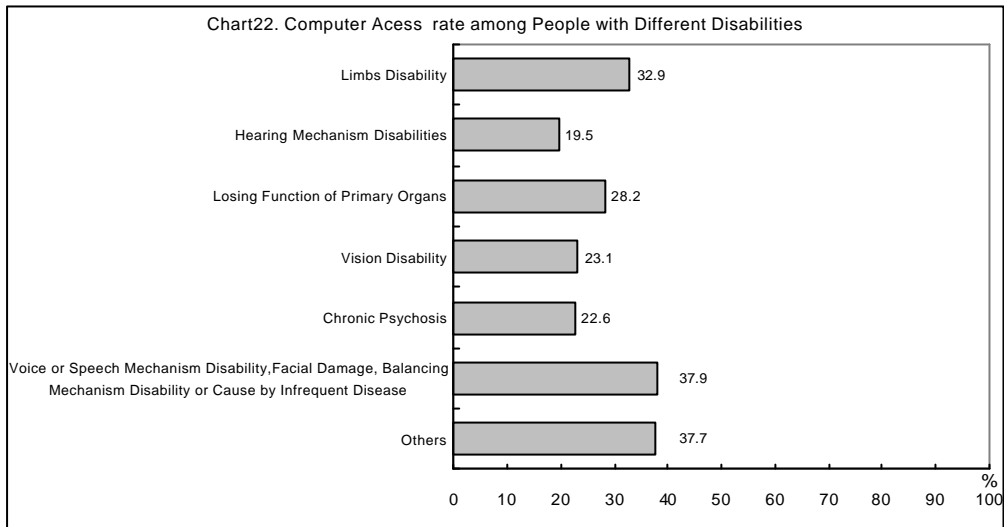
6. Middle-aged/senior groups are less familiar with the concept of cyber safety. Among the computer users who are above the age of 60, only less than 70% use anti-virus programs, and less than 40% regularly back up their files.
7. The age group of 31-60 among Internet users is the most active one. The percentage of those who use the Internet to check official announcements or submit online applications is around 40%.
8. More than 90% of Internet users who are below the age of 20 use the Internet for entertainment purposes, and this percentage is twice as much as that in middle-aged/senior groups. However, in terms of using the Internet to search for medical information, the useage rate in middled-aged/seniors is higher or close to the counterpart in those who are 20 years old or younger. 81% in the 41-50 age group also uses the Internet to look for medical information. More than 60% of those who are 60 years old or older also do the same thing.
9. The new web 2.0 online participation mode is very popular among the Internet users who are below the age of 30, and is most popular among the age group of 15-20. 53.8% regularly go online to browse others' or their own blogs, and 52% have their personal blogs.

## VII. Analysis of the Digital Demands of the Physical-mental Disabilities and the Indigenous Peoples

1. Among the families that have members with disabilities, 80.4% have computers and 69.2% have Internet access, which is respectively 3% and 6.8% lower than the counterparts in families that have no members with disabilities.



2. 29.9% among people with disabilities have used computers. As for the types of disabilities, the computer-usage rate is higher (37.9%) in those who have vocal disabilities, facial damage, hindered balancing and motor skills, or rare condition. The counterpart is lowest among those with hearing disabilities – only 19.5%.



3. When checking the survey results with those in “2005 Digital Divide in People with Disabilities”<sup>1</sup>, we can see that information-access in those with disabilities has been improved. The overall computer-usage rate has increased by 4.4%, from 25.5% to 29.9%.

4. Most people with disabilities are not motivated to learn. Only 10.1% are willing to participate in computer courses dedicated to people with disabilities, 83.6% are not willing to go to class, and 6.3% refused to answer the survey. As for the types of disabilities, people who have limbs disabilities (12.9%), vision disabilities (12.4%), voice or speech mechanism disabilities, suffering facial damage, balancing mechanism disabilities, or Caused by Infrequent Disease (10.7%) are more motivated. More than 10% of them would participate in information courses.

<sup>1</sup> For the “Survey of 2005 Digital Divide in People with Disabilities,” we only interviewed people with 8 types of disabilities (hearing mechanism disability, vision disability, suffering facial damage, limbs disability, voice or speech mechanism disability, balancing mechanism disability, stubborn epilepsy, and multiple disability). This is different from the type of people we interviewed in 2007. The statistics is for comparisons only.

5. Most of the people with disabilities do not participate in information courses is due to “being too old for it” (31.6%), followed by “physical limitations” (18.4%), “being not interested” (16.1%), and “not enough time” (13.7%). Other reasons are less than 10%.
6. 67.2% of indigenous people have used computers, and this is slightly lower than Hakkas (72.1%) and non-indigenous/Hakka groups (70.5%). 60.9% of them have accessed the Internet, which is 4% and 5.6% lower than non-indigenous/Hakka groups and Hakkas respectively.
7. Most indigenous people acknowledge the convenience made possible by computers and the Internet. 47.8% of them believe these technologies are very helpful for their daily life, and 22.4% believe they are somewhat helpful. In total, 70.2% have a favorable view of these technologies.
8. 32.9% of indigenous people have the need for learning about computers and the Internet.
9. The rate of computer-ownership in indigenous families tends to be low. Surveys show that 62.2% of the indigenous families would be willing to use brand new computers provided by the government at no cost; however, only about half would be willing to pay for going online ( 53.9% ) .
10. 74.7% of indigenous people believe that their information capacity could be increased if the government provides computer information stations in their tribes or churches.

## **VIII. 2007 Individual/Household Digital Performance**

### **1. Digital Divide Index Weight**

In the 2007 digital divide survey, we used different indexes to find out the usage of computers and Internet among people who are above the age of 12 in Taiwan. After weighing the importance of each index based on the AHP analysis conducted by certain experts, we are able to calculate the scores of individual, household, and overall digital performance in Taiwan and to compare the digital capacity in different groups.

From Oct. 5<sup>th</sup> to Oct. 20<sup>th</sup> in 2007, we invited 15 representatives from the industrial and governmental circles who have participated in the policies or research regarding digital divide to participate in our project. The technical domains of the representatives include: sociology (2 representatives), information management (1 representative), public administration(1 representative), and telecommunication engineering (1 representative). Experts from the industrial circle include those from Yam Digital Technology (1 representative), Telecommunication Laboratories Chungwa Telecom (1 representative), Computer Skills Foundation (1 representative), Digital Education Institute of Institute for Information Industry (1 representative), and Taiwan Assistive Technology and Vocational Rehabilitation Association (1 representative). Representatives from governmental agencies include those from RDEC, Education and Culture Department of Council of Indigenous People, Information Center of Taipei County Government, National Information and Communications Initiative Committee, and Information Office of Yilan County Government. The result of weighing is listed on Table 4.

In order to allow clearer expression of the data, the score of a sub-dimension or main dimension is from 0 to 100. After the sub-dimension is converted into the main dimension score or the main dimension is calculated into the total score, the relative weight of each dimension is summed up. The equation for the calculation is:

$$Y = \left[ \sum a_i X_i \right] * 100$$

$a_i$  The weight of each index or dimension.

$X_i$  The index score of each index or dimension.

Table 4. The Weight of Digital Divide Indicators and Framework for Individual/Household in 2007

The weight of digital divide indicators for individual digital score(0.668)						
I			Primary Dimension I	Secondary Dimension II	Indicators III	Cross-indicator Weight
	Access to Information Technology		0.224			
	Access to information equipment			0.395		
		Use a computer			0.688	0.041
		Ownership of equipment other than computers			0.312	0.018
	Access to the Internet			0.605		
		Used the Internet before			0.307	0.028
		Number of Internet usage hours			0.551	0.050
		Access the Internet using mobile phone			0.142	0.013
	Information Literacy		0.179			
	Information technology literacy			0.542		
		Ability to install/maintain/fix computer hardware and software			0.201	0.013
		Ability to use e-mail service			0.799	0.052
	Information security literacy			0.458		
		Ability to install antivirus software			0.308	0.017
		Set PIN			0.353	0.019
		Ability to back up data periodically			0.339	0.019
	Information application		0.597			
	Applications at work (or school)			0.268		
		Use the Internet to search data for work or study			0.660	0.071
		Online Learning			0.340	0.036
	Citizenship behavior			0.130		
		Know government agencies' websites			0.099	0.005
		Used the Internet to search for public notices			0.342	0.018
		Submitted online applications through			0.378	0.020
		Participate in online discussions			0.182	0.009
	Daily life applications			0.304		
		Sell or buy products on the Internet			0.130	0.016
		E-banking			0.099	0.012
		Information search			0.421	0.051
		Use the Internet for recreational purposes			0.195	0.024
		Use online instant messaging services			0.155	0.019
	Web2.0			0.082		
		Browse blogs			0.337	0.011
		Share knowledge and experiences			0.663	0.022

I			Primary Dimension	Secondary Dimension	Indicators III	Cross-indicator or weight
	Information collection			0.216		
		Ability to read English Web pages			0.356	0.031
		Ability to search for specific information			0.644	0.055
The weight of digital divide indicators for household digital score(0.332)						
I			Primary DimensionI	Secondary DimensionII	Indicators III	Cross-indicator weight
	Household information environment			0.345		
		Household information equipments		0.362		
		With or without a computer(s)			1.000	0.041
		Internet environment		0.638		
		Does the household have access to the Internet			0.700	0.051
		Type of Internet connection for computers in the household			0.300	0.022
	Household Information Literacy			0.655		
		Percentage of computer users in the household			0.338	0.074
		Percentage of Internet users in the household			0.662	0.144

## 2. Individual Digital Score

2.1. The overall score of people above the age of 12 in Taiwan is 37.6. By analyzing the composition of the overall scores, we can see that people above the age of 12 in Taiwan show the highest score in terms of recent information access(51.5 points), followed by information literacy(44.9 points) and information application(30.3 points), indicating that people in Taiwan have many opportunities to access computers and the Internet and have reached a certain level in terms of using computers and knowing about information security. However, there is still room for improvement in terms of information application – especially in terms of e-government and job application which are too low and have not caught up with the Web2.0 trend.

2.2. The overall score of males is 39.1 points, which is 2.9 points more than that of females. Digital development decreases as the level of education decreases. The overall score in those who have complete graduate schools is 81.5 points, and the counterpart is only 0.5 points in those who are illiterate.

2.3. As for different age groups, the degree of digitization is about the same between

the 15-20 and the 21-30 group, and their overall scores are respectively 78.4 points and 76.8 points, being the top of the entire distribution. The 12-14 group's overall score is 70.1 points, the score of the 31-40 group is 65.5 points, which are quite good. On the other hand, digital divide is quite serious in those above the age of 40. The 41-50 group's score is 44.8 points, the scores of 51-60 and 61-64 groups are only 27.9 points and 17.0 points, and the score of those above the age of 65 even drops to 5.3 points

2.4. Among different businesses, the degree of digitization is best in the information and communication industry. Their score is 67.0 points and is 6 points than the first runner-up, the education service industry (61 points). Information application is still weakest in the agricultural/forest/fishery/farming industries (7.1 points) and the retired (8.3 points). Moreover, digitization is also weak in the water supply and pollution restoration industry (24.4 points) and construction (27.6 points). The overall score is less than 30 points.

2.5. In terms of the type of occupations, the overall digital score in governmental jobs is 59.1 points, which is far superior to the counterparts in private businesses (45.0 points), employers (36.1 points), self-employed (21.6 points), and unpaid-family workers (14.7 points).

2.6. The overall score is 33.4 points among indigenous people. Although it is less than the performance in Hakkas (37.8 points) and non-Hakka/indigenous (37.5 points), the gap has been reduced to 4 points.

2.7. Hsinchu City (45.7 points) is once again the area that enjoys the highest level of digitization, followed by Taipei City (44.7 points) and Taichung City (42.8 points). Taipei County, Keelung City, and Lianjiang County all performed well and got more than 40 points. In comparison, digitization in Chiayi County (27.5 points) and Yunlin County (28.7 points) is still lagging behind, and these two places are the only ones that got less than 30 points.

2.8. In terms of digital development in indigenous towns, the ones in plain regions (35.4 points) develop better than those in mountainous regions (30.8 points); however, they all perform worse than non-indigenous towns (38.0 points).

2.9. Regression analysis shows that factors such as sex, age, level of education, type of jobs, work place, and the level of urbanization in the environment are all

important variables that lead to the differences in digital capacity in people in Taiwan. Sex and education are the most influential factors( $R^2 = .69$ ).

### 3. Household Digital Scores

- 3.1. Taiwan's household digital score is 57.8 points. Among which, high scores are achieved by family breadwinners who are students(89.9 points), in information communication (74.4 points), in professional science and technical service industries (74.1 points), in education service (73.0 points), and financial and insurance (72.3 points). On the other hand, the scores are significantly lower in family breadwinners who are in agriculture/forestry/fishery/farming (36.5 points), homemakers (39.9 points), unemployed (44.2 points), or retired (44.2 points).
- 3.2. The overall score of households whose monthly income exceeds NT\$70,000 is near or higher than 70 points, making them the leading households. The second runner-up are households whose monthly income is between NT\$30,000 and NT\$70,000, and their overall score is from 54.3 to 64.0 points. The degree of digitization is significantly weak in those whose monthly income is less than NT\$30,000, and their scores are from 22.5 to 44.0 points, demonstrating that family economic status does affect family members' overall digital learning and application performance.
- 3.3. The score of information environment and members' information capacity is also much lower in families that have foreign spouses (43.8 points), which is 14.6 points less than the counterpart in families that do not have foreign spouses (58.4 points).
- 3.4. In terms of regional differences, the degree of digitization is highest in Taipei City (66.4 points), Taichung City (65.9 points), and Hsinchu City (65.1 points). On the other hand, the family information environment in Changhua County, Pingtung County, Penghu County, Yunlin County, and Chiayi County are in need of serious improvements. Their scores are from 43.8 to 48.1 points.

### 4. Individual/Household Overall Digital Performance

- 4.1. After weighing individual and household digital performance, we see that Taiwan's overall digital performance in 2007 is 44.3 points and the standard deviation is 27.5, showing great differences between different groups in terms of



digital development.

- 4.2. Males' overall digital performance is 45.2 points, which is 1.8 points more than the female counterpart.
- 4.3. Digital performance improves along with the level of education. The performance in those who completed graduate schools is 72.8 points, which is 11.6 times the counterpart in those who are illiterate.
- 4.4. Among different age groups, the overall digital performance in the 15-20 group and the 21-30 group is respectively 62.0 points and 61.2 points, which is the top of all groups. The score is less than 30 points in the 50+ group.
- 4.5. The degree of digitization is best in the information and communication industry, which is 69.9 points, and the weakest one is still the agriculture/forestry/fishery/farming sector (14.0 points). In terms of the type of occupation, professionals have the highest score of digitization (67.2 points). On the contrary, the degree of digitization is not ideal in physical labors and those who work in agriculture/forestry/fishery/farming since the overall score is less than 35 points. Digital divide among those working in agriculture/forestry/fishery/farming is most serious (13.4 points).
- 4.6. Governmental agencies' overall digital performance is 63.8 points, which is far superior than the counterparts in private companies (50.8 points), employers (46.7 points), self-employed (30.8 points), and unpaid family workers (22.4 points).
- 4.7. Indigenous people's overall digitization score is 38.8 points, which is slightly worse than the counterpart in Hakkas (45.0 points) and non-Hakka/indigenous groups (44.2 points).
- 4.8. Hsinchu City (52.1 points) is the city that has the best digital development in Taiwan, followed by Taipei City (51.9 points) and Taichung City (50.5 points). Penghu County, Yunlin County, and Chiayi County have the worse degree of digitization; their scores are only 35.6 points, 34.4 points, and 32.9 points.
- 4.9. The degree of digitization is highest in northern cities and counties (47.6 points). The development in central, eastern, and off-island counties and cities is similar

(from 41.0 to 41.4 points). Southern counterparts have the worse development (38.8 points).

4.10. In terms of digital development in indigenous towns, indigenous in plain regions (40.8 points) perform better than those in mountainous regions (35.4 points), but their development is still worse than that in non-indigenous towns and villiages ( 44.7 points ) .

## **IX. Comparison of the Digital Divide Trends in Taiwan over the Past Years**

### **1. Comparison of the Individual Access to Information Technology**

The 2007 survey shows that computer and Internet usage have become increasingly popular in Taiwan over the years. The percentage of population over the age of 12 who has used the computer before increased from 66.8% in 2005 and 70.1% in 2006 to 71.0% of this year. The percentage of those who have used the Internet has also increased from 61.1% in 2004 to 65.6%. (Table 5)

Table 5 Comparison of the Access to Information Technology for Population Over the age of 12 over the Years

	2004	2005	2006	2007
Computer Usage Rate	68.2	66.8	70.1	71.0
Internet Usage Rate	61.1	62.7	64.4	65.6

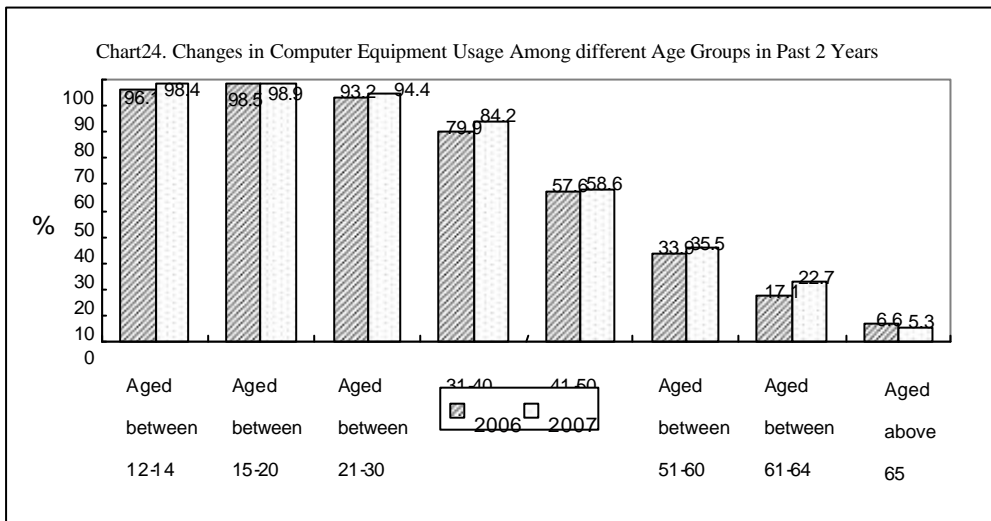
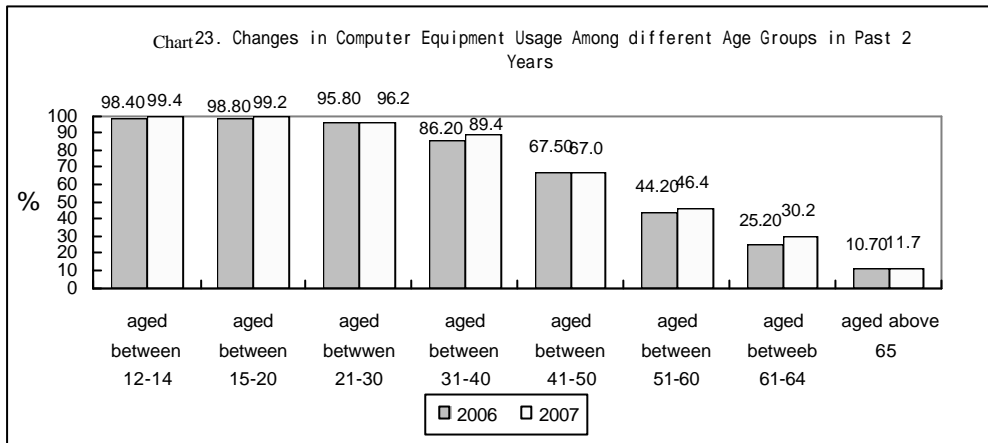
Looking at the performance of different cities and counties in the past 2 years, we see that besides Taipei City and Lianjiang County, computer-usage rate in all other counties and cities is higher than the 2006 counterpart. The growth is greatest in Keelung City, Yunlin County, Tainan County, Taitung County, and Hsinchu County (more than 3%). In terms of increasing the Internet usage rate, the performance is best in Keelung City, Yunlin County, Hsinchu County, Miaoli County, Taitung County, Tainan City, and Taichung County. The growth rate of the Internet population is greater than 3%. (Table 6).

When we look at the age groups, we see that although digital divide is still quite serious between different generations, but all generations have been improving besides the 41-50 age group. The increase of computer usage rate is most significant in the 31-40 and 61-64 age groups, which have increased by 3.2% and 5%

respectively. [chart 23 and chart 24]

Table 6. Comparison of Access to Information Technology for Residents in Various Counties/Cities in Taiwan over the Years

	Computer Usage Rate			Internet Usage Rate		
	2006	2007	Change %	2006	2007	Change %
Taipei County	75.1	75.9	+0.8	70.1	70.9	+0.8
Yilan County	66.4	68.7	+2.3	59.5	62.0	+2.5
Taoyuan County	75.4	75.3	-0.1	69.8	69.6	-0.2
Hsinchu County	70.6	73.6	+3.0	64.8	68.0	+3.2
Keelung City	71.6	76.6	+5.0	65.7	71.1	+5.4
Hsinchu City	78.4	79.1	+0.7	73.2	75.5	+2.3
Miaoli County	66.5	69.4	+2.9	59.5	64.1	+4.6
Taichung County	69.7	71.9	+2.2	63.2	66.8	+3.6
Changhua County	62.9	63.0	+0.1	56.9	56.9	+0.0
Nantou County	62.4	65.1	+2.7	56.0	58.5	+2.5
Yunlin County	54.6	59.2	+4.6	48.6	53.2	+4.6
Taichung City	77.7	78.6	+0.9	72.8	73.3	+0.5
Chiayi County	56.7	57.6	+0.9	51.0	52.2	+1.2
Tainan County	60.8	64.7	+3.9	55.1	58.0	+2.9
Kaohsiung County	64.8	64.7	-0.1	58.4	58.2	-0.2
Pingtung County	61.8	62.0	+0.2	56.1	56.0	-0.1
Penghu County	58.2	60.2	+2.0	53.7	55.4	+1.7
Chiayi City	71.8	72.2	+0.4	64.6	67.2	+2.6
Tainan City	71.3	72.5	+1.2	63.5	67.4	+3.9
Taitung County	63.1	66.2	+3.1	57.6	61.8	+4.2
Hualien County	66.1	68.5	+2.4	59.8	61.8	+2.0
Taipei City	78.2	75.7	-2.5	72.8	71.6	-1.2
Kaohsiung City	72.2	72.4	+0.2	66.9	66.3	-0.6
Kinmen County	63.9	66.5	+2.6	59.8	61.3	+1.5
Leinchiang County	72.4	70.8	-1.6	68.8	67.5	-1.3



## 2. Daily Internet Usage Time

Compare to the survey results in 2006, the time spent on using the Internet has increased from 2.40 hours to 2.72 hours for population over the age of 12.(Table 7)

After distinguishing the age groups, we see that the time younger Internet users spend online has increased, but the counterpart in those above the age of 50 remains about the same.

Table 7. Comparison of the Daily Internet Usage Time of Population over the age of 12 in Taiwan over the Years

	2004	2005	2006	2007
Daily Internet Usage Time(hours)	2.57	2.26	2.40	2.72

3. Comparison of the Information Technology Literacy of Internet Users in Taiwan over the Years

The 2006 survey showed that in case of encountering computer malfunctions, 51.7% of the Internet users can fix all or part of such malfunctions by themselves; this year, however, the ratio drops to 48.6%, indicating that people become more and more dependent on professionals for maintenance.(Table 8)

Table 8. Comparison of Information Literacy of Internet Population over the age of 12 in Taiwan over the Years

	2004	2005	2006	2007
Ability to fix all or part of computer malfunctions	50.3	54.5	51.7	48.6

4. Comparison of the Usage Rate of Various Internet Functions by the Internet Population over the years

Data on trends shows that the usage rate of email in the Internet population presents no significant change in recent 2 years. However, it becomes even more popular for people to use the Internet to search for information or for recreational purposes. The usage rates increased 2-3 percentage points over those of 2006.

The usage rate of online instant messaging software also increased year by year. A total of 76.4% of Internet users use online instant messaging software to stay in touch with family and friends, an increase of 3.4% from 2006; the percentages of e-banking and online shopping have also grown, 49.6% of the Internet users have used online transaction services and 27.8% have used online bank services, increasing approximately 5 percentage points from those of 2006.(Table 9)

Table 9. Comparison of the Internet Usage of Internet Population over the age of 12 over the Years

	2004	2005	2006	2007
E-mail	86.9	85.7	88.2	88.9
Internet Recreation Activities	67.3	67.4	68.0	70.1
Information Search	85.4	88.1	86.7	89.8
Instant Messaging Software	56.2	67.6	73.0	76.4
E-banking	18.1	18.5	22.6	27.8
Online Shopping	30.4	37.2	44.7	49.6

5. Comparison of the Individual Access to Information Technology of Indigenous and Hakka Peoples over the Years

Comparing the survey results from 2004 through 2007, the percentage of indigenous peoples over the age of 12 in Taiwan who have used the computer before has been increasing substantially year by year from 43.8% to 67.2%; the percentage of those who have used the Internet before has also increased from 37.8% to 60.9%.(Table 10)

The rate of Hakka population over the age of 12 who have used the information technology before presents no significant change. The percentage of computer users remains at about 72% in recent two years; whereas the percentage of Internet users remains at about 66%.

The survey results over the years indicate that the information usage rate in indigenous people is going to catch up with that of Hakka or external-province natives. That is really an outstanding achievement.

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Table 10. Comparison of the Access to Information Technology of the Indigenous and Hakka Population in Taiwan over the Years

	Personal Computer Usage Rate				Individual Internet Usage Rate			
	2004	2005	2006	2007	2004	2005	2006	2007
Indigenous Population	43.8	44.5	62.7	67.2	37.8	39.9	55.4	60.9
Hakka Population	67.4	67.6	72.2	72.1	60.5	63.1	66.9	66.5

## 6. Comparison the Household Information Environment over the Years

Comparing the 2006 and 2007 survey results, the percentage of household computer ownership increased a little from 81.6% to 82.6%; the percentage of household Internet access rate, which is 74.7% this year, has a limited change over the last year, increasing only 0.2 percentage point.

However, investments that households with enrolled students spent on computer study keep increasing continuously, and the household computer ownership of students increased a little from 92.2% to 93.1%.(Table 11)

Table 11. Comparison of the Household Information Environment in Taiwan over the Years

	2004	2005	2006	2007
Computer Ownership Rate	81.4	79.5	81.6	82.6
Household Internet Access Rate	70.7	70.6	74.5	74.7
Computer Ownership Rate of Households with Students	91.4	91.2	92.2	93.1

## 7. Comparison of the Household Information Environment in Indigenous Towns and Villages

The 2007 survey results indicate that 60.0% of indigenous households in mountain regions own computers, which is an increase of 7 percentage point from 2006. The information environment of indigenous households in plain regions has improved less significantly. The computer ownership rate has increased a little from 73.1% to 74.7%.(Table 12)

In comparison with the increase of the computer ownership rate, the Internet access environment of households in indigenous towns and villages has improved significantly. The Internet access rate of indigenous households in mountain regions increased from 42.7% of 2006 to 54.4%. Indigenous households in plain regions also saw an increase in Internet equipment ownership rate from 63.3% to 66.5%.

Table 12. Comparison of the Household Computer Ownership and Internet Access Rate of Indigenous Population in Taiwan Area over the Years

	Household Computer Ownership Rate(%)				Household Internet Access Rate(%)			
	2004	2005	2006	2007	2004	2005	2006	2007
Indigenous Towns and Villages in Mountain Regions	45.2	55.7	53.0	60.0	35.8	37.3	42.7	54.4
Indigenous Towns and Villages in Plain Regions	64.5	67.1	73.1	74.7	59.7	57.9	63.3	66.5

#### 8. Cross-year Comparison of Reasons for Not Going Online

The 2007 survey shows that the reasons why some people do not go online are “not necessary (42.7%),” “no time (26.8%),” and “don’t know how to (26.0%).” The result is similar to that of the 2006 survey.(Table 13)

Table 13. Cross-year Comparison of Reasons for Not Going Online

	2004	2005	2006	2007
No need or unwilling	55.2	46.5	43.0	42.7
Don’t know how to	33.5	30.0	23.4	26.0
No time	4.3	9.5	27.1	26.8

#### 9. Cross-year Comparison of Reasons for Having Computers but Not Going Online

As for why some families have computers but do not go online, the 2006 survey shows that 39.7% have no need to go online, and 16.6% worry about family members being addicted to the Internet. The 2007 survey shows that the percentage of not having Internet access due to not having the need to go online has increased to 46.7%, and the percentage of worrying about family members being addicted to the Internet has been slightly dropped to 14.5%. (Table 14)

Table 14. Cross-year Comparison of Reasons for Having Computers but Not Going Online

	2004	2005	2006	2007
No need or unwilling	55.3	36.5	39.7	46.7



	2004	2005	2006	2007
Worry about family members or children being addicted to the Internet	---	16.0	16.6	14.5
No time	7.3	8.8	6.8	7.5
Cannot afford Internet fees	7.1	8.6	10.1	8.7
Bad Internet content	4.4	3.1	1.1	1.7

#### 10. Cross-year Comparison of Internet Citizens' Behaviors

The government has actively promoted digitization in recent years and established governmental websites. Surveys show that the percentage of using the Internet to check governmental policies or announcements has significantly dropped from 46.3% in 2006 to 35.1% in 2007. However, the percentage of using the Internet to submit applications has slightly increased from 26.7% to 28.0%, showing that the public's pattern of using e-government services has changed from simple inquiries to actual purposes. (Table 15)

Table 15. Internet Citizen Participation of People above the Age of 12

	2004	2005	2006	2007
Know governments have websites	--	83.3	82.0	74.2
Know more about policies or announcements	45.9	46.5	46.3	35.1
Online applications	22.1	23.9	26.7	28.0

## X. Comparison of the Digital Divide Status Between Taiwan and International Countries

### 1. Taiwan's Excellent Digital Infrastructures is Ranked Second in the World and the Digital Opportunity Index is Ranked 7th in the World

Different nations focus on improving their Internet infrastructures when working on reducing "digital divide." In this respect, Taiwan has seen good results in terms of constructing the infrastructures, using market competitions to make information infrastructures more widely available, establishing evaluation and control mechanism, allocating resources rationally, and providing easy-to-access public information facilities. By looking at the 2007 World Information Society Report by ITU, the availability rate of house phones, home computers, and household Internet access, the

number of cell phones, and the number of mobile accounts in Taiwan are among the best in the world, putting Taiwan in the second place and the 7<sup>th</sup> place on DOI (Digital Opportunity Index).

2. Household information environments are far superior to those of Europe, United States, and neighboring Asian countries

Judging from household access to information technology, the household computer ownership of Taiwan was eye-catching and significantly higher than those of advanced countries, such as the EU nations, the United States, Japan and Korea; however, the household Internet access rate of Taiwan was roughly equal to that of Korea, a bit lower than that of the Netherlands.(Table 16)

Table 16. International Comparison of Household Computer Ownership Rate and Internet Access Rate

	Year	Household Computer Ownership Rate(%)	Household Internet Access Rate(%)
Taiwan	2007	82.6	74.7
Japan	2007	--	61.8
Korea	2005	78.9	74.8
Singapore	2006	78.0	71.0
The Netherlands	2007	--	83.0
EU Nations ( Average )	2004	54.0	42.0

3. Taiwan's individual access to information technology is lower than that of the United States and Korea

In terms of individual information access, although the rate of individual Internet access in Taiwan has increased from 64.4% in 2006 to 65.6% in 2007, it is still significantly lower than that of the United States, Korea and Japan. Taiwan's household information environment is better than that in other countries, but individuals' online rate is less than that in the U.S. or Korea and Japan since many middle-aged or seniors in Taiwan do not go online (Table 17).

Table 17. International Comparison of Individual Internet Access Rate

	Year	Population	Individual Internet Access Rate(%)
Taiwan	2007	Over age 12	65.6
USA	2007	Over age 12	77.6
Japan	2005	Over age 6	74.9
Korea	2006	Over age 6	74.8
Singapore	2006	Over age 15	64.0
EU Nations ( Average )	2006	Over age 16	47.0

## XI. Recommendations

We provide certain recommendations based on the results of the 2007 survey. We must first point out that since the government's resources are limited and not all digital minority groups would understand or be motivated to learn about digitization, digital divide cannot be solved within a short time. Long-term interventions are needed. Our suggestions are as follows.

### 1. Individual access to information technology has been increased. County or city support needs to be continued.

Past surveys show that the percentage of computer usage among those above the age of 12 has increased from 66.8% in 2005 and 70.1% in 2006 to 71.0% in 2007. The percentage of those who have used the Internet before has also increased from 62.7% and 64.4% to 65.6%. The features in the increased individual information access in 2007 include :

- (1) The computer usage rate in the 41-60 group increased drastically last year. The same increase was seen in the 31-40 and the 61-64 group this year.
- (2) Different from the result in the 2006 survey, the increase in computer and Internet access rate this year is mostly seen in counties and cities. The biggest growth is seen in Keelung City, Yunlin County, Tainan County, Taitung County, and Hsinchu County (grown by more than 3%). In terms of increased Internet access rate, the performance is best in Keelung City, Yunlin County, Hsinchu County, Miaoli County, Taitung County, Tainan City, and Taichung County. The Internet population has grown by more than 3%.

The counties and cities that see improvements in information usage include the digital minority cities being helped by the government, including Yunlin County, Taitung County, and Tainan County. This shows that the government's digital investments in these places are already yielding results, but more efforts are surely needed.

## **2. Significant results are seen in the reduction of indigenous people's individual digital divide. Household information environment gaps still need to be solved.**

In the past 3 years, the computer usage rate in indigenous people above the age of 12 has increased steadily (from 43.8% to 67.2%), and the rate of Internet usage has increased from 37.8% to 60.9%. Cross-group comparisons show that the information access rate in the indigenous people in Taiwan will catch about with that in Hakka, Fukien, or mainland Taiwan groups. The gap is only about 5 percentage points, showing good results in the government's effort of reducing digital divide in indigenous people.

However, although more and more indigenous people know about computers and the Internet, the information equipment in indigenous households in mountain regions is still poor. Computer ownership in these households is 23.2% lower than that in the indigenous households in plain regions. Internet connection rate is also gapped by 20 percentage points. More efforts are definitely needed.

In the future, the government should consider providing information equipment to solve the information gap in indigenous households, but the cost of Internet access must also be considered since only 62.2% of the indigenous families are willing to learn if the government would provide the needed hardware. Among these people, however, only half of them are able or willing to pay for Internet access.

## **3. Provide computers and Internet assistance for poor families**

The 2007 survey shows that the Internet connection rate in households whose monthly income is less than NT\$20,000 is only 19.0%, which is similar to that in 2006 and poses greater gaps from other families. At a time when prices keep increasing, getting the needed resources will be more difficult for low-income families. Among these families, 47.5% of them said that they cannot afford new computers, and 12.3% have pressure in doing so. Therefore, we recommend the government to give the priority to these poor families – especially those with students, for getting new computers and Internet access subsidies.

#### **4. Create the demand and habit of using e-government**

Digitization in Taiwan's government is the best in the world. However, the 2007 survey shows that although the number of people using the government's online services for online applications has slightly increased, the percentage of checking public announcements or policies was decreased by about 10 percentage points, which is the greatest change this year.

Although one reason for this result could be the fact that there are many resources for information other than government websites, another reason might also be the fact that government websites lack changes that attract users. We can also consider possible improvements.

#### **5. Value the younger generation's new Internet behaviors**

The 2007 survey shows that people or students under the age of 30 spend more time online, but their activities are mostly irrelevant to learning. Their Internet usage patterns are different from those who are above the age of 30. More than 30% of the younger people have blogs, browse blogs, and are willing to interact with others and share experience online. The government should also consider how to communicate with the younger Internet users.

#### **6. Promote the Safe Internet Environment**

This year's survey shows that Internet users have many worries. 78.4% worry about their personal information being leaked out, 77.6% worry about viruses, 73.6% are bothered by junk mails and spams, and others are troubled by being connected to porn sites or illegal sites (69.8%), having their credit card information being disclosed (59.4%), or being connected to legal advertising websites (52.3%).

Creating a safe Internet environment where people can access without any problems is the government's job as well as the global trend. We recommend having specific plans focused on fighting illegal content, hazardous content, increasing users' safety awareness, and creating secure networks.