Survey on ICT Use and Digital Opportunity in Taiwan: Executive Summary

(November 2015)

National Development Council, Taiwan

I Objectives of Survey

Caring for the disadvantaged groups and fulfilling digital opportunity equity have been listed by the government on top of its administrative program of promoting information communication construction and popularizing governmental service. Ever since 2004, policy-based programs including the "Digital Divide Reduction Program", "Creating Equal Digital Opportunity" and "Outreach Digital Care" have been consecutively initiated nationwide, with the objectives of offering equal digital opportunity to all regions, groups and industries and enabling them to share quality network community benefits by utilizing governmental and civil resources.

In order to fully understand the digital development in the nation, the National Development Council have been annually conducting individual and household digital opportunity surveys regularly. Through point-cuts of Enabling, Integrating and Renouncing, the Council comprehends digital opportunity and crisis brought on by the information community, and on the basis of such formulates policies on caring for the disadvantaged groups and digital care innovation.

II Methods adopted

1. Scope of survey

The *Individual & Household Digital Opportunity Survey (2015)* covers home phone users in the Taiwan Province, Taipei City, New Taipei City, Tainan City, Kaohsiung City, Kinmen County and Lienchiang County, among others, and takes as interviewees native Taiwan citizens 12 years old or above residing in ordinary households.

2. Survey structure

Subjects involved in the *Individual & Household Digital Opportunity Survey (2015)* are contemplated and proposed in accordance with the digital opportunity index system as suggested by the National Development Council in its *Research on Constructing the Index System of Digital Opportunity Development in Taiwan*, with significant trends in social network growth in recent years taken as reference.

The *Individual & Household Digital Opportunity Survey (2015)* is constituted with three parts: Enabling, Integrating and Renouncing. Part one is dedicated to discussing the access to and use of information facilities (Information access) as well as elementary language skills (Basic skills and attainment) among the Taiwan people. Part two focuses on understanding how the netizens use information widely in their life, including learning, social activities, economy, politics and health, with discussions participated by the citizens included in this year's survey as a highlighted point. Part three, taking individual crisis and infringed rights and interests as its point-cut, observes adverse influences brought on by the information society. Specifically, the questionnaire consists of four sections: Enabling, Integrating, Renouncing and Basic Information. The index structure thereof is presented respectively in Tables 1, 2 and 3.

Table 1 "Enabling" Index Structure for the Individual & Household Digital Opportunity Survey (2015)

Primary Dimension	Secondary Dimension	Index dimension	Index
Enabling	Information access	Possession of Facilities	Possession of computer/access facility
			Person to computer ratio in the household
			Portable device possession rate
			Smart phone possession rate
		Quality of network access	Use of broadband
			Use of wireless broadband
			Household satisfaction with access speed
		Outline of information facility access	Use of computers
			Use of network
			Use of wireless/mobile networks
		Level of Information access	Years of network usage
	Basic skills and attainment	Language skills in website browsing	Foreign language websites browsing
		Basic information attainment	(not included in survey (2015))
	Accessibility and availability	Affordability of access charges	Mobile network charges

Table 2 "Integrating" Index Structure for the Individual/ Household Digital Opportunity Survey (2015)

Primary Dimension	Secondary Dimension	Index dimension	Index
Integrating	Participation in learning activities	Bilateral interactive learning behaviors	Remote interactive teaching and learning
		Unilateral learning behaviors	Set of Online classes
			Information inquiry through networks
	Participation in social activities	Web 2.0 interactive sharing	Use of real-time communication
			Use of social community websites
		Application to artist activities	Artist information searching
		Application to recreation activities	Participation in recreation activities
		Application to daily life	Daily life information searching
	Participation in economic activities	E-commerce	Online price inquiry
			Cyber financial service
			Online shopping experience
			Online shopping amount of money
		Employment/Entrepreneurship behaviors	Employment information inquiry through networks
			Entrepreneurship experience through networks
	Health promotion	Health education knowledge searching	Online health education knowledge searching
			Online health counselling service
		Medical information searching	Online doctor information searching
	Civic participation	E-government service	Governmental public information inquiry
			E-government service request
			E-government forum use
		Participation by netizens	Participation in network public topics
			Participation in network voting
			Representativeness of netizen opinions

Table 3 "Renouncing" Index Structure for the Individual/ Household Digital Opportunity Survey (2015)

Primary Dimension	Secondary Dimension	Index Level	Index
Renouncing	Personal crisis	Cyber anxiety	Degree of anxiety without network access
		Deteriorated physiological abilities	Situation of affected physical condition
		Deteriorated social skills	Deteriorated practical social skills
		Affected sense of trust	Lowered interpersonal trust
	Infringed rights and interests	Individual information disclosure	Personal information leakage
			Cyber fraud damage
		Cyber bullying	Suffering from cyber verbal attacks or public insults by others

3. Methods of survey and sampling

Computer Assisted Telephone Interview (CATI) was adopted in the survey. To obtain samples which were structurally rational, the interview was conducted after 18:00pm on Monday through to Friday and from 14:00 till 22:00pm on Saturday and Sunday.

Sampling was conducted on a random basis among the parent population covering home phone users in twenty-two cities and counties in Taiwan. Those randomly selected telephone numbers were modified by their last two digits into a random combination so that unregistered numbers could be included.

The quantity of samples for each city/county was computed according to the population of residents aged 12 and above in such city/county as released by the office of census, Ministry of the Interior in July 2015, allocated on the precondition of satisfying a confidence level of 95% and a sampling error not exceeding plus/minus four percentage points in any city/county. Table 4 shows the valid samples finished in each of the cities and countries for Stage 1.

Table 4 Sample Allocation and Validly Interviewed Samples for Stage 1, CATI

City/County	Population of aged 12 above	Estimated error	Samples allocated	Samples validly finished
Total	21,000,976	±0.9%	8,448	8,493
New Taipei City	3,562,689	±5.0%	384	386
Taipei City	2,402,724	±5.0%	384	387
Taoyuan City	1,840,382	±5.0%	384	384
Taichung City	2,417,692	±5.0%	384	385
Tainan City	1,699,416	±5.0%	384	386
Kaohsiung City	2,509,565	±5.0%	384	387
Yilan County	414,089	±5.0%	384	386
Hsinchu County	467,352	±5.0%	384	386
Miaoli County	503,270	±5.0%	384	387
Changhua	1,152,453	±5.0%	384	385
Nantou County	465,379	±5.0%	384	388
Yunlin County	635,233	±5.0%	384	386
Chiayi County	479,846	±5.0%	384	389
Pingtung County	770,717	±5.0%	384	384
Penghu County	92,752	±5.0%	384	384
Hualien County	300,074	±5.0%	384	386
Taitung County	201,566	±5.0%	384	384
Keelung City	341,862	±5.0%	384	384
Hsinchu City	372,341	±5.0%	384	386
Chiayi City	241,154	±5.0%	384	384
Kinmen County	119,188	±5.0%	384	394
Lienchiang	11,232	±5.0%	384	385

Note: Data of parent population was sourced from the office of census, Ministry of the Interior.

With the conclusion of Stage 1 sampling, an additional 915 people were sampled from the digital development class-5 regions so as to ensure sufficient samples from remote villages and towns were available for analysis and deduction. In total, there were valid samples 9,403 people, with a confidence level of 95% and sampling error not exceeding plus/minus one percentage point.

4. Period of survey and contact results

The survey was conducted by telephone interview during the evening from July 20 until August 29, 2015. A total of 97,489 calls were made, and 56,253 were taken as valid for computation (the difference between the two numbers referred to redialed calls and appointment calls).Excluding dials with non-manmade reasons, such as fax machines, non-home users, telephone recording devices, telephone malfunction, unavailable number, suspended number and non-qualified interviewees, valid samples of 9,403 people in total were obtained. The success rate was 67.2%, and the refusal rate was 32.8%.

5. Weighted processing of data

To make it possible to infer opinions among the entire population of people aged 12 and above nationwide through this survey, the samples were first processed within city/county weighting according to the gender structure and age structure of the above-12 population in various cities and counties as released by the Ministry of Interior, with an aim to facilitate horizontal analysis among cities and counties. For inferring the overall development nationwide, Stage 2 weighting was conducted according to the above-12 population ratio of the cities/counties respectively to the nation and that of the digital development regions respectively to the nation so as to ensure correct survey results. Table 5 displays the samples allocated by gender, age, city/county and region before and after weighting.

Table 5 Sample Structure in Comparison before and after Weighting for Individual/Household Survey

Item	Valid interviews	Percentage before weighting	Percentage after weighting
1.Gender			
Male	4354	46.3	49.6
Female	5054	53.7	50.4
2.Age			
12-14 years old	317	3.4	3.6
15-19 years old	831	8.8	7.2
20-29 years old	1054	11.2	15.2
30-39 years old	1314	14.0	18.8
40-49 years old	1766	18.8	17.3
50-59 years old	2041	21.7	17.1
60-64 years old	596	6.3	7.1
65 and above years old	1486	15.8	13.7
3.City/county			
New Taipei City	515	5.5	17.0
Taipei City	387	4.1	11.4
Taichung City	387	4.1	8.8
Tainan City	389	4.1	11.5
Kaohsiung City	447	4.8	8.0
Yilan County	414	4.4	11.9
Keelung City	388	4.1	2.0
Taoyuan County	392	4.2	2.2
Hsinchu County	504	5.4	2.4
Hsinchu City	418	4.4	5.5
Miaoli County	508	5.4	2.2
Changhua County	535	5.7	3.0
Nantou County	421	4.5	2.2
Yunlin County	587	6.2	3.7
Chiayi County	384	4.1	0.4
Chiayi City	386	4.1	1.4
Pingtung County	413	4.4	1.0
Penghu County	384	4.1	1.6
Hualien County	386	4.1	1.8
Taitung County	384	4.1	1.2
Kinmen County	394	4.2	0.5
Lienchiang County	385	4.1	0.1
4.Digital development region			
Class-1 region	1551	16.5	34.3
Class-2 region	2830	30.1	40.1
Class-3 region	1872	19.9	19.3
Class-4 region	1927	20.5	3.6
Class-5 region	1228	13.1	2.7

6. Specifications of how the regions are defined

This survey conducted a comparison of the degree of digital development among geographical regions categorized into classes. The most important comparison aims to observe whether digital development in Taiwan is witnessing convergence or an expanding gap among the digital development class-1 region, digital development class-2 region, digital development class-3 region, digital development class-4 region and digital development class-5 region.

Such regions are classified according to the research conclusions stated in the *Report on the Research of Villages and Towns Classification by Digital Development (2011)* issued by the National Development Council (the former RDEC, Executive Yuan) and according to an assessment of various cities, counties or urban districts comprehensively covering six dimension 25 indexes involving human resources, social economy, education and culture progress, traffic and power development, living environment evolution, and information infrastructure construction. The digital development class-1 region covers 32 villages/towns/urban districts; digital development class-2 region has 93 villages/towns/urban districts; class-3 region takes 127 villages/towns/urban districts; and class-4 and class-5 regions include respectively 49 and 67 villages/towns/urban districts. The class-1 region features the highest degree of digital development among all regions.

III Summary of Survey Results

1. Overall profile

1.1 Enabling

"Enabling" is located at the first level of the Digital Opportunity Index structure of Taiwan. Only if the public is enabled to access information and offered the opportunity to access facilities could they enter the information society, and thus could the discussion of subsequent opportunity creation and risk assumption become possible.

First, we observe "Information access", the primary dimension of "Enabling". As the survey shows, of the above-12 population in Taiwan, 85.3% have computer devices at home, 82.0% have access to a network; in households having computer devices, there are 2.5 pieces in average (including desktops, notebooks and tablets), presenting a ratio of computer to person as 0.73 device per person. This means a considerably high level of opportunity for the Taiwanese to access information facilities and networks. (see Figure 1)

Moreover, of the households equipped with access to networks, 77.3% go online through broadband fixed networks, and those having access to 3G and/or 4G mobile Internet have grown to account for 75.7%, and 68.8% have installed a wireless data-sharing device. This shows that both the quality and facility of the household network connection in Taiwan have reached a certain standard. (see Figure 2)
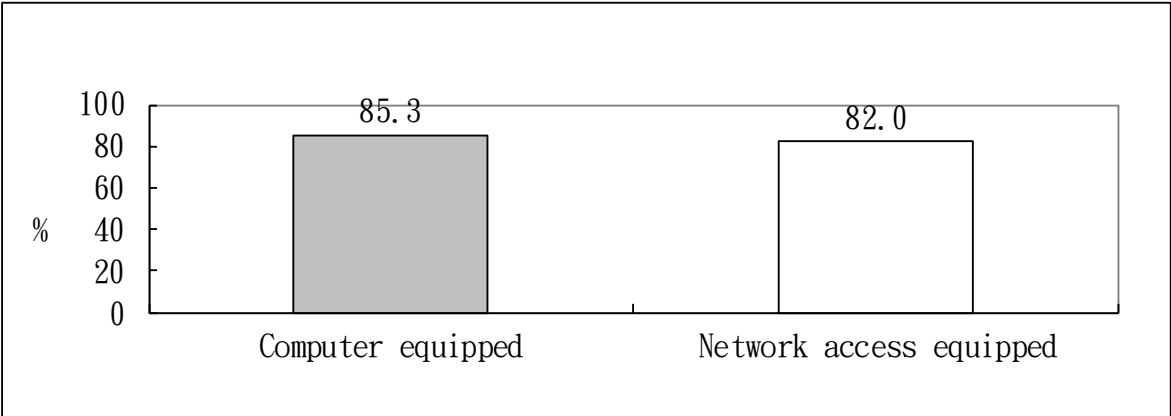

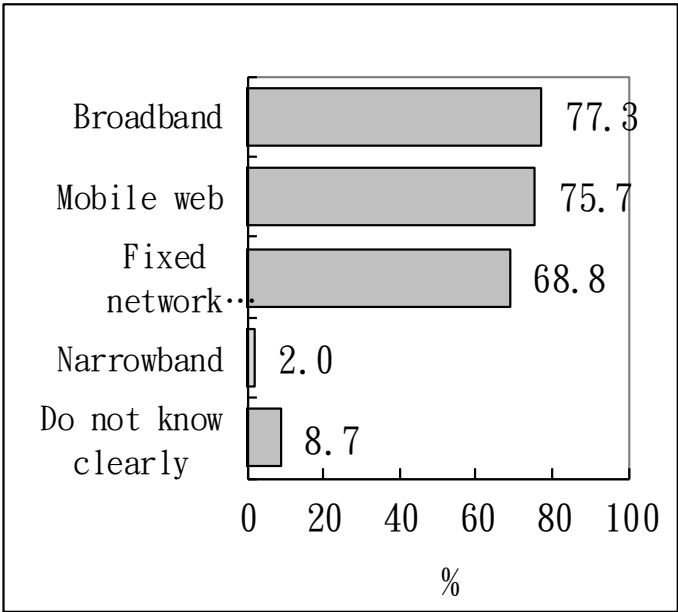Figure 1 Information Facilities Equipped in Households in Taiwan

Figure 2 Ways of Network Connection in Households in Taiwan

As a response to the comprehensive household information condition, the information access rate among Taiwanese is high. Of the above-12 population, 78.3% once used a computer device, and 78.0% once accessed networks (hereafter referred to as "netizens"), having been exposed to networks for 10.5 years on average. (see Figure 3)
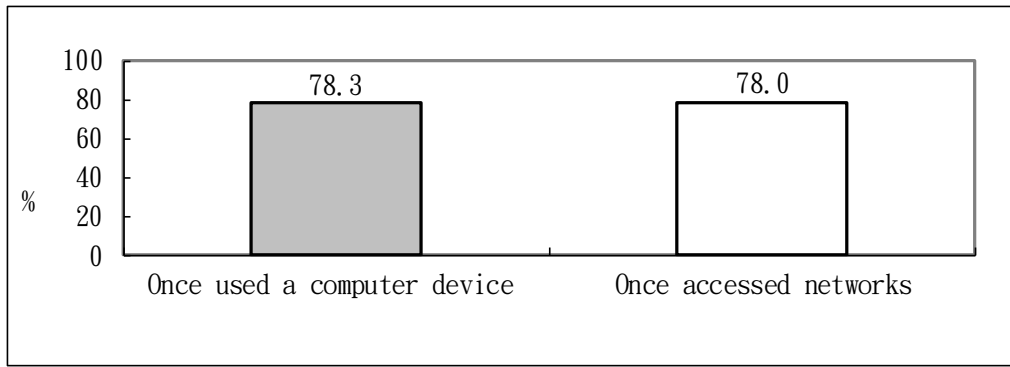
Figure 3 Information Facility Access among Above-12 Population in Taiwan

It is also discovered through this survey that among all personal information facilities accessible to netizens in Taiwan, smart phones account for the largest share (91.6%), followed one after another by desktops (78.8%), notebooks (53.3%), tablets (48.7%) and smart TVs at home (24.0%), leaving merely 0.8% having no any of such facilities. (see Figure 4)
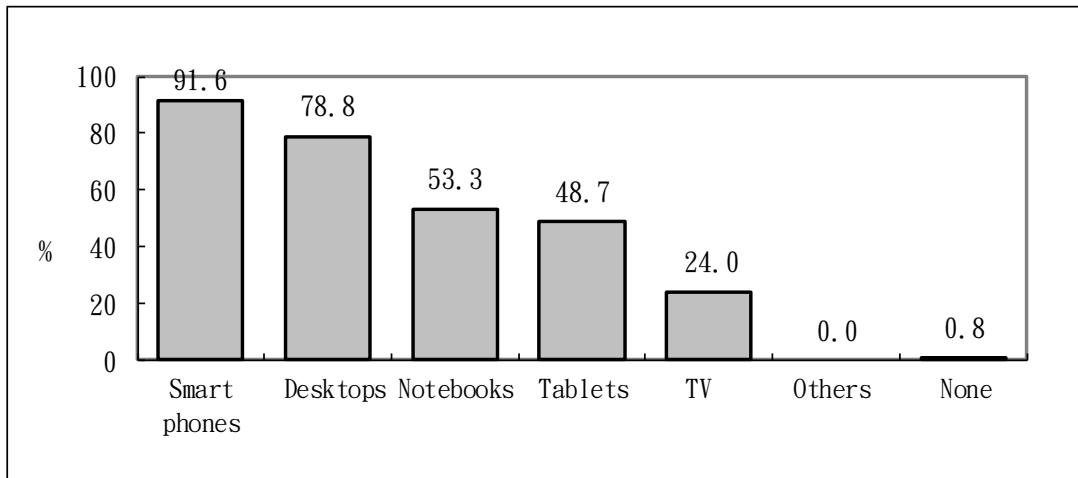

Figure 4 Possession of Connectable Information Facilities among Taiwan Netizens

In addition, mobile network accessing has dominated network development in recent years. 90.2% of the netizens once accessed wireless networks or connected to mobile networks. Among them, 29.7% once used free-of-charge wireless access offered by the government. If taking the entire above-12 population as the denominator, the mobile network-accessing rate in Taiwan is computed to be as high as 70.4%. (see Figure 5)

On a multiple-choice basis, among mobile devices employed by netizens once used a wireless or mobile access, smart phones enjoy the largest percentage (95.9%), followed by tablets (46.3%) and notebooks (40.2%).
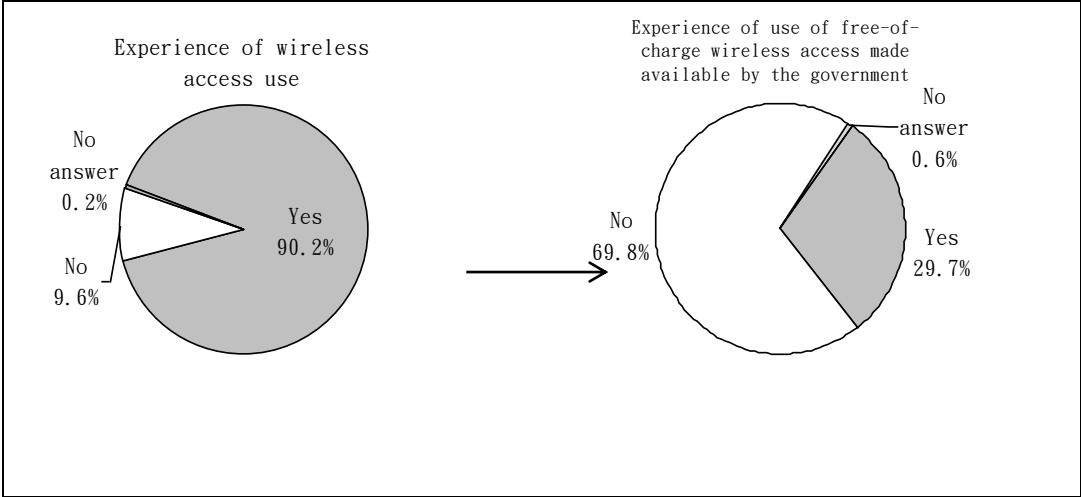

Figure 5 Wireless/mobile Network Usage among Taiwan Netizens

"Basic skills and attainments", another secondary dimension of "Enabling", serves for evaluating literacy of the netizens. As shown by the survey, only 40.9% of them would browse websites in foreign languages, which implies that netizens in Taiwan absorb information and knowledge mainly from domestic sources.

1.2 Integrating

"Integrating" is located at the second level of the Digital Opportunity Index structure of Taiwan. It focuses on observing possible roles that ICT access play in improving the well-being of people through participation of the netizens in applications covering five major aspects: learning, social life, economy, civic engagement and health promotion.

First, **Participation in learning activities**: as the survey shows, netizens in Taiwan take unilateral information searching as the leading learning activities. 49.0% of them once found class-related information through cyber sources in the previous year, 23.4% took online courses available in the internet networks, 14.4% conducted bilateral interactive learning activities through homework cyber discussions, and 47.3% didn't use networks to carry out any of the above-mentioned learning activities in the previous year.
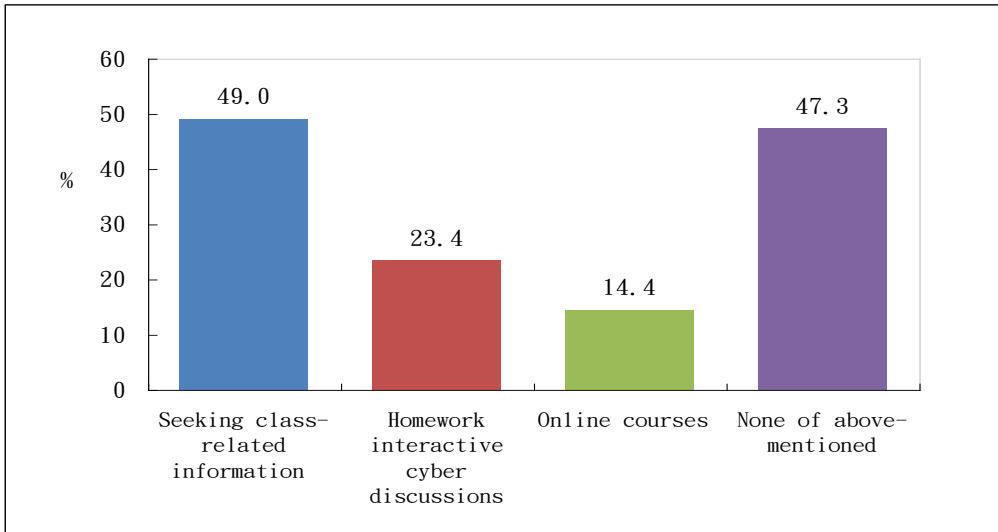
Figure 6   Participation in Online Learning Activities among Taiwan Netizens

Participation in social activities: The survey results show that netizens are very familiar with both unilateral and bilateral participation in cyber social life. The activity enjoying the largest percentage of netizens to participate in is using real-time communication software or social community websites (92.5%), followed by searching for lifestyle information or reading news (81.1%), watching online movies (69.4%), listening to online music (66.7%), searching for artists and cultural information or events (59.8%) and playing online games (46.3%). Relatively speaking, participation in open cyber discussions remains at a low level, and only 18.5% of the netizens took part in such an activity in the previous year.
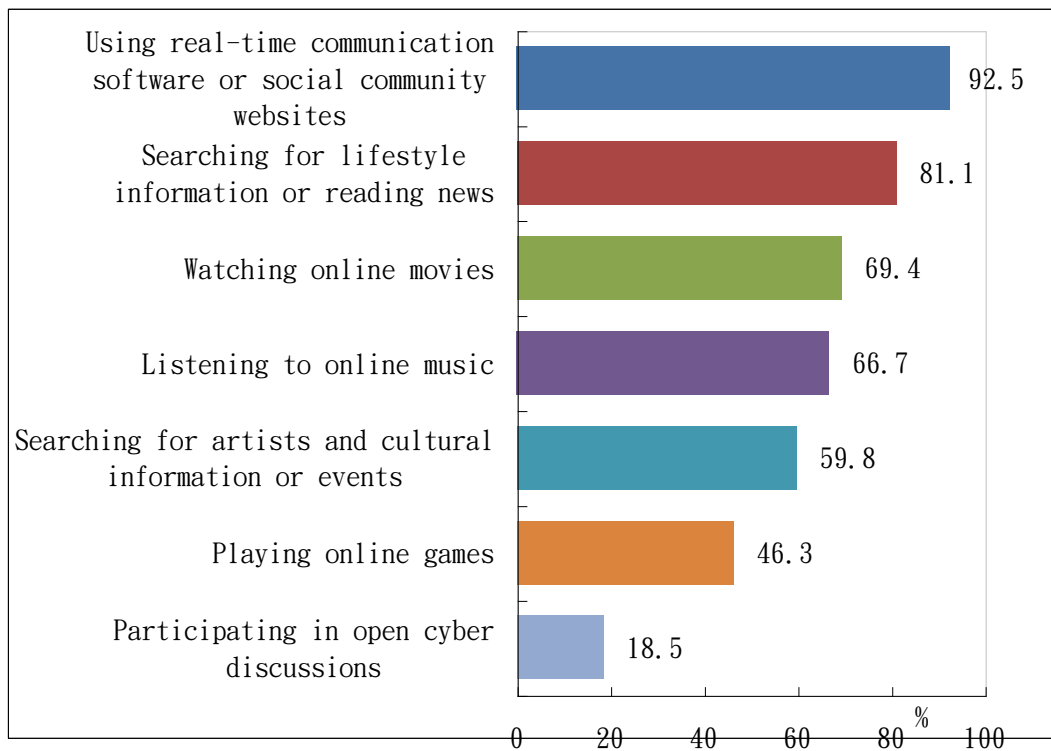

Figure 7   Participation in Cyber Social Life among Taiwan Netizens

Netizens who have engaged in real-time communication or social community websites in the previous year mainly used Line (96.0%) and Facebook (88.8%). Concerning adhesion degree, 33.8% of the users used real-time communication software or social community websites almost all the time (once at least every hour), those engaged in once every one hour to less than three hours account for 24.5%, therefore a total of nearly 60% of netizens paid attention to real-time communication or social website information (oncein every less than three hour period).
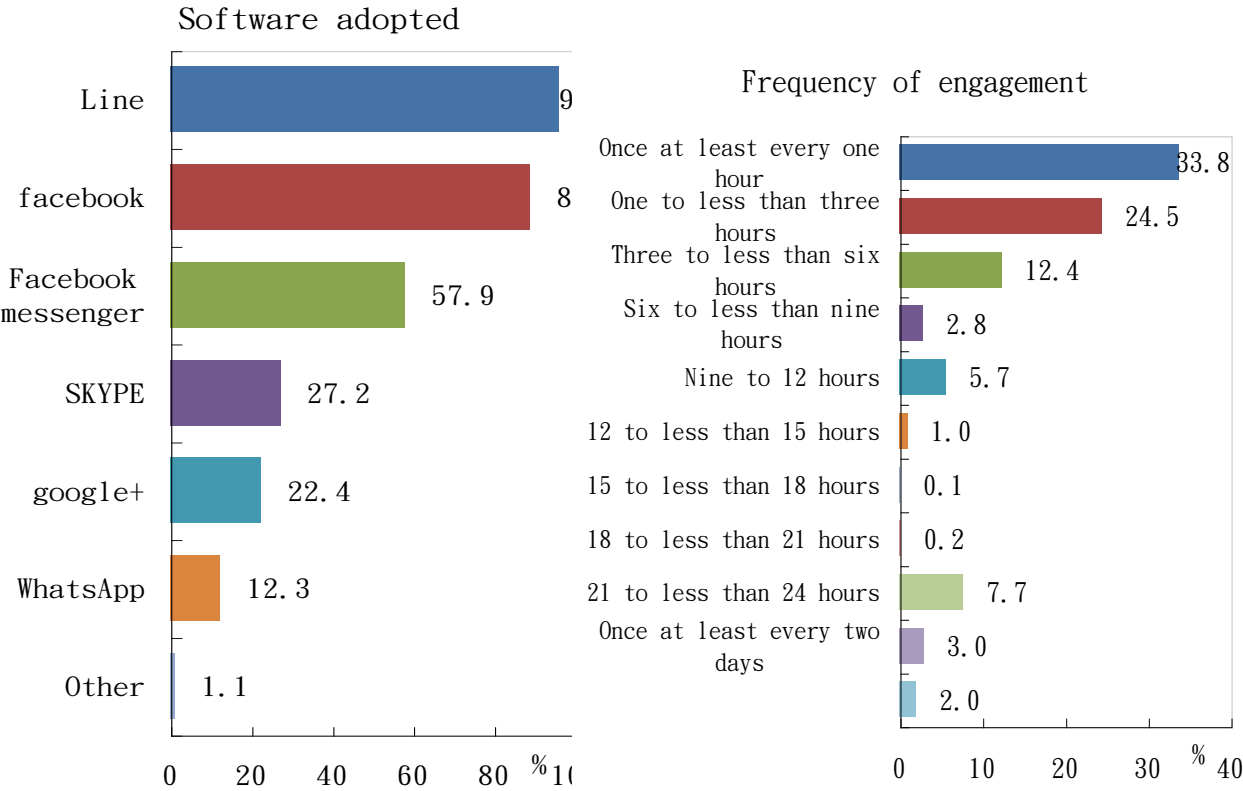

Figure 8   Software Adopted and Frequency of Engagement among Cyber Social Community Participants in Taiwan

Participation in economic development: inquiring about commodity information and prices (65.0%) and online shopping (65.0%) became the most popular in the previous year. From the perspective of purchase frequency and expense amounts, cyber shoppers shopped for 15 times on average in the previous year, creating an annual consumption amount of NT$26,142. 91.7% and the purchases were for domestic consumption, 28.2% was attributed to group buying.

Moreover, in the previous year, 33.4% of the netizens enjoyed cyber financial services, 13.0% submitted personal resumes or looked for a job vacancy through networks, and 5.8% sold goods by networks or started a network business.
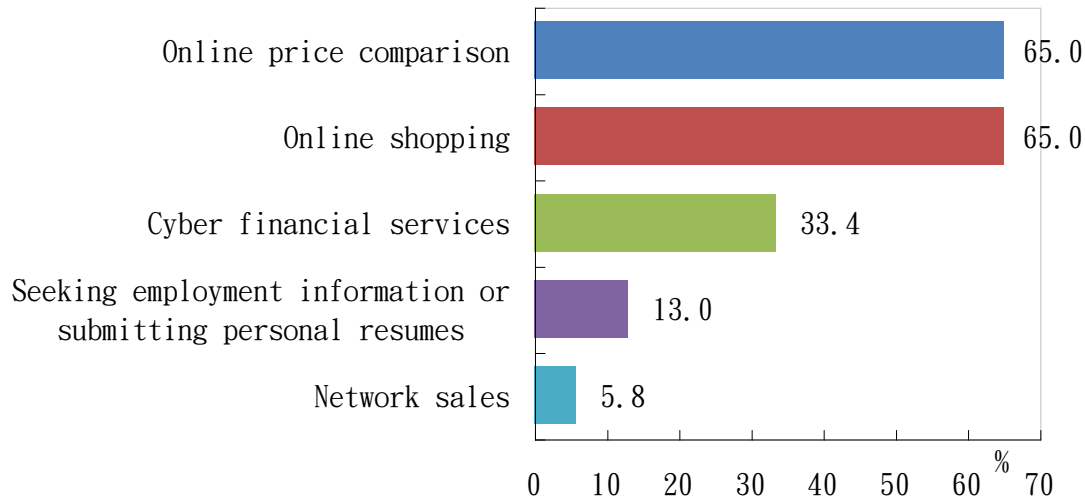

Figure 9   Participation in Cyber Economic Activities among Taiwan Netizens

Participation in health promotions: as the survey shows, 69.8% of the netizens searched for information in relation to hygiene education, and health or food safety through the Internet in the previous year, 38.5% went online to register for medical visits, 28.0% searched for comments on a specific doctor as referential information before seeing the doctor, and 16.6% searched the Internet for doctors to obtain health advice.
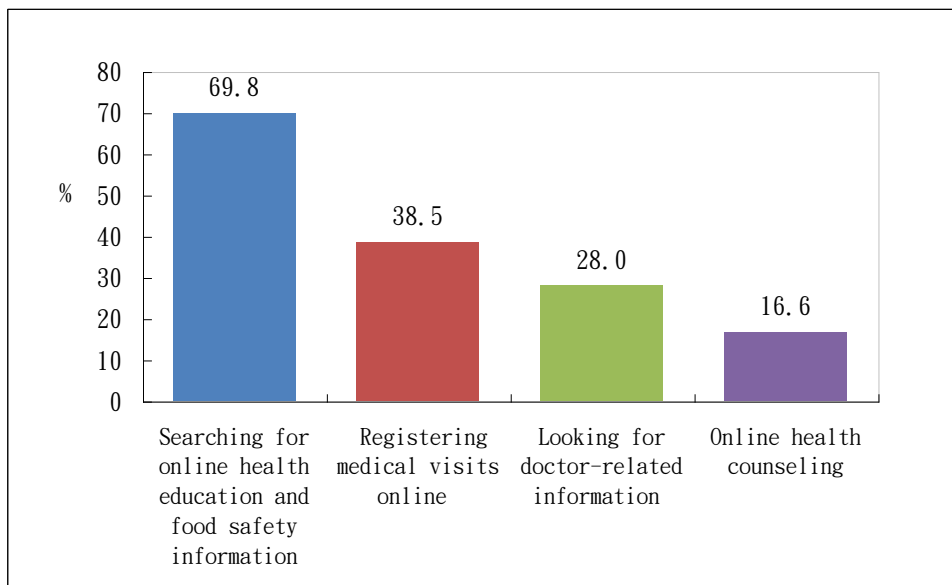

Figure 10   Participation in Cyber Health Promotion among Taiwan Netizens

Civic participation: this concerns the use of E-government. In the previous year, 37.3% of the netizens once inquired for governmental public information, 32.0% adopted online request services including tax declaration, and 0.8% left personal opinions and comments on governmental organ websites or forums.
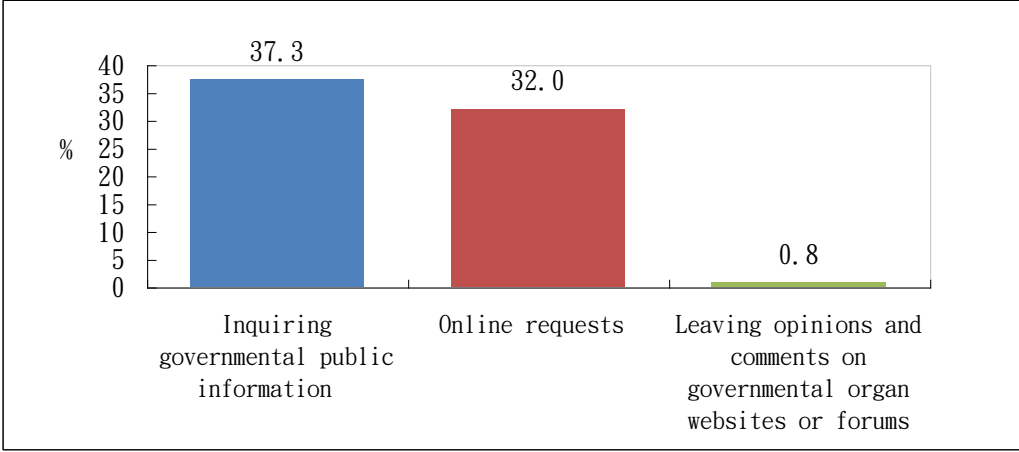
Figure 11 Use of E-government among Taiwan Netizens

Looking into the netizens' exposure to political, social and policy-related topics by accessing the Internet, the survey shows that in the previous year, over half (54.7%) of the netizens were exposed to others' comments on current public issues, 17.0% once forwarded others' ideas on current public issues, yet only less than ten percent (7.5%) posted their own personal views on such issues.

Moreover, when seeing others' comments on public issues different from their own, nearly ninety percent of the netizens remained silent, leaving only 10.9% who left messages to give different views. Not many participated in the range of online voting, who accounted for 14.4%.

Figure 12 Exposure to Public Issues by Accessing Internet among Taiwan Netizens

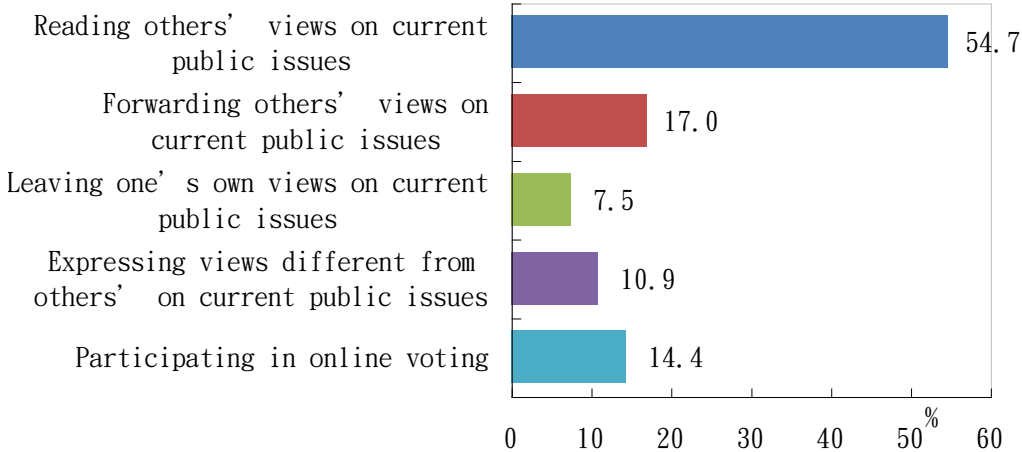Since a majority of the netizens would not leave their personal views on public policies and nearly half of them were not exposed to others' comments on public issues, only 26.2% of the netizens agreed that opinions posted on the Internet may represent those of most people. 41.5% agreed that such opinions may mirror those of younger generations, and less than one-fifth (18.5%) agreed that opinions left on the Internet may reflect in whole or in part of their own thinking.
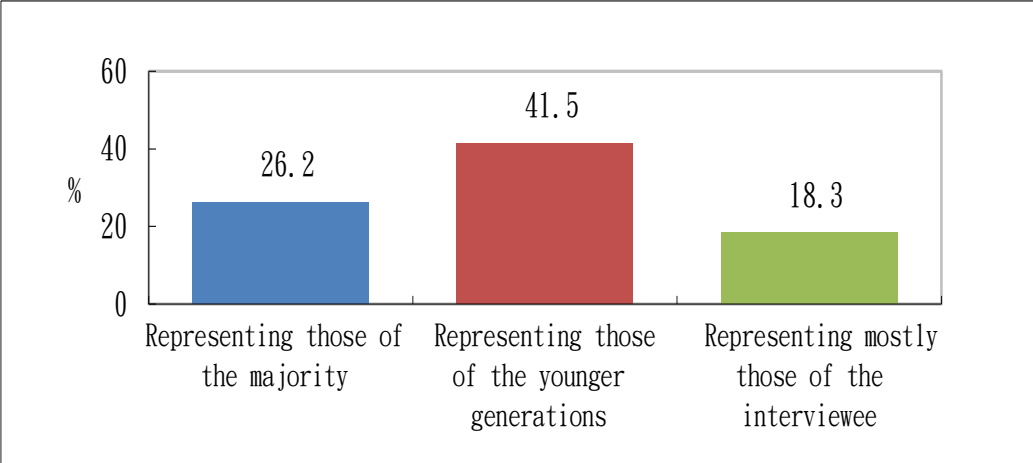
Figure 13 Representativeness of Opinions on the Internet as Viewed among Taiwan Netizens

1.3 Renouncing

"Renouncing" is located in the third level of the Digital Opportunity Index structure, which mainly focused on discussing whether using ICT would cause individuals to suffer personal crisis or infringed on their rights and interests.

With regard to personal crisis, as the survey results show, 12.7% of the netizens stated their deteriorated practical social skills in face-to-face interactions with others as a result of using the Internet, while 28.2% experienced worsened physical conditions for the same reason.
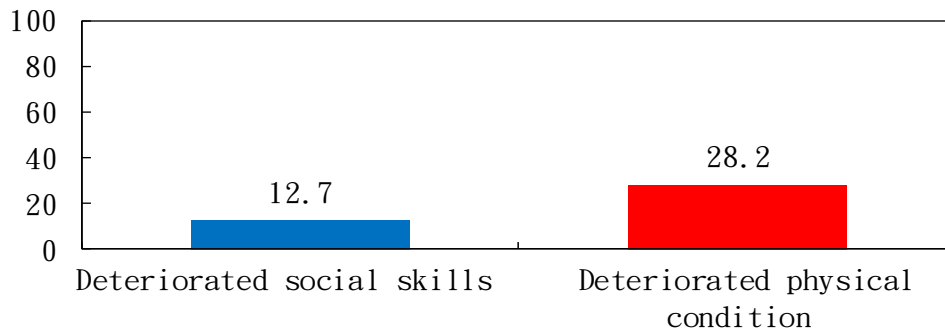
Figure 14   Self-assessment on Influence of Using Networks on Personal Social Skills
and Physiological Status among Taiwan Netizens

Concerning psychological impairment, 51.2% of the netizens admitted their anxiety after a certain number of days without accessing networks, worrying about their disconnection with the outside world. Among them, "severely addicted" users who are accustomed to constant Internet surfing accounted for 10.8% of the entire netizen population. Additionally, 69.0% of such a population considered net friends to be untrustworthy.
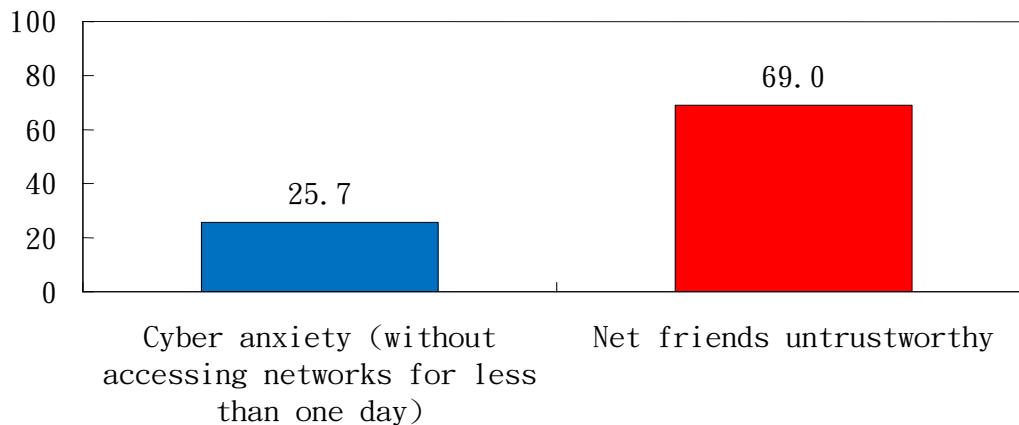
Figure 15   Self-assessment on Influence of Using Networks on Personal Psychological
Status among Taiwan Netizens

With respect to infringed rights and interests, 15.2% of the netizens expressed that they had experienced personal information disclosure as a result of using networks in the latest year, 4.9% experienced cyber fraud in the previous year, and 3.4% suffered cyber bullying

with verbal attacks in the same period of time.
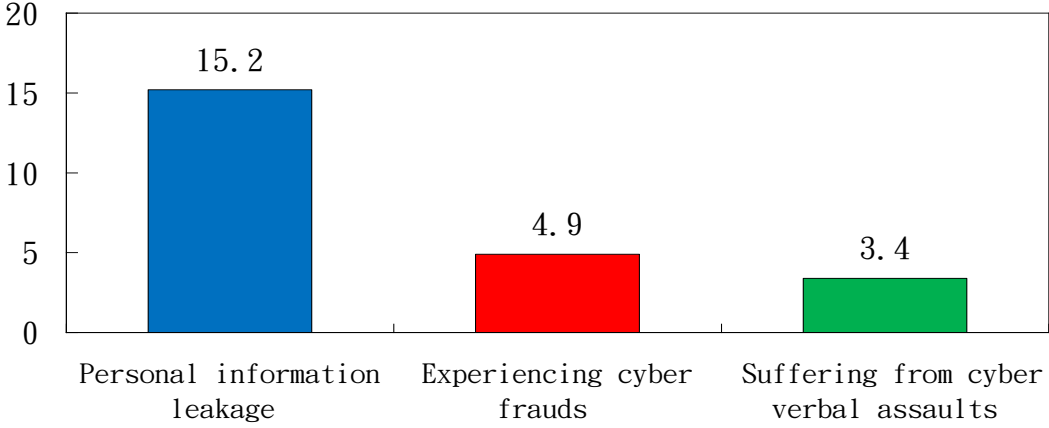
Figure 16 Infringed Rights and Interests as a Result of Using Networks among Taiwan Netizens

2 Focus Digital Opportunity Outline

2.1 Gender-related differences in digital opportunity

2.1.1 Enabling

   "Gender" has always been a leading variable taken by scholars for interpreting digital opportunity differences. As the survey for this year shows, females in Taiwan still lag behind males in terms of information utilization. For males aged above 12 years old, 80.8% once used computers, and 79.8% accessed networks, which are 5.0 and 3.5 percentage points higher than that of the females respectively.

Table 7　Summarized Gender-related Similarities and Differences in "Information Access Opportunity"

Secondary dimension	Index	Male	Female
Information access	Computer usage rate	80.8	75.8
	Network usage rate	79.8	76.3

However, females lagging behind males in information usage rate have been always caused by a low rate of information usage among senior women. As Figure 17 shows, computer usage rate and network usage rate among females aged above 60 are 11.3 and 6.2 percentage points, respectively, lower than that of males. With regard to other age groups, the difference in the computer usage rate and network usage rate between the two genders is generally smaller than 2.2 percentage points. Among age groups under 40, young females present a usage rate higher than that of men.
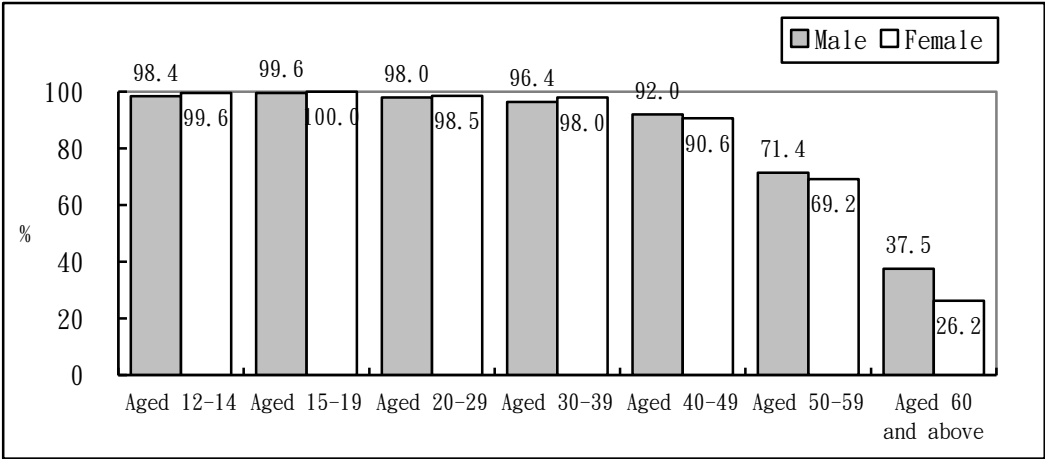
Figure 17 Computer Usage Rate Comparison between the Genders by Age Group
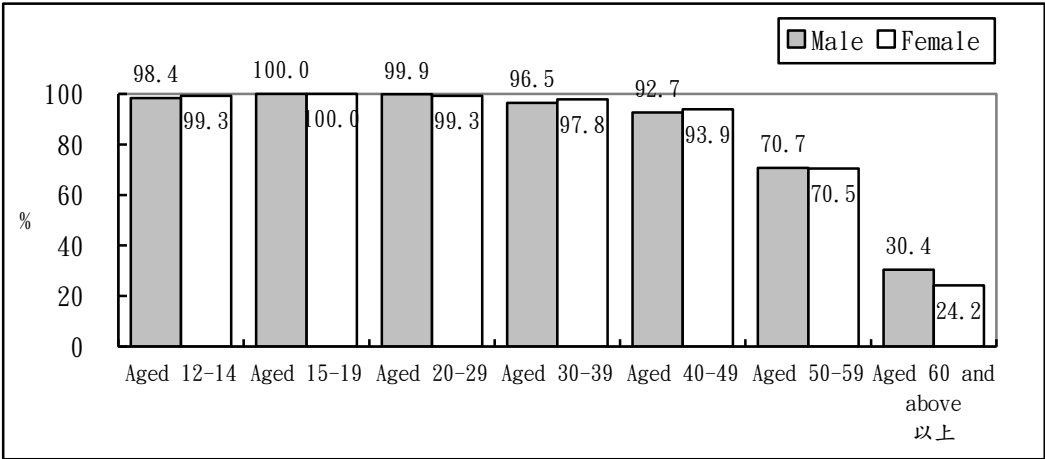
Figure 18　Network Usage Rate Comparison between the Genders by Age Group

Further speaking, once both the genders enter the cyber world, there is no significant gender-related difference in the remaining "Enabling" indexes. Concerning the mobile network accessing rate, for netizens of either gender, nearly ninety percent experienced mobile accessing, generally bearing a network age of about ten years, presenting no significant difference. Male netizens featured a higher rate (42.7%) of browsing foreign language websites than female counterparts (39.2%), yet the difference was merely 3.5

percentage points. (see Table 8)

Table 8 Summarized Gender-related Similarities and Differences in Information Access
Opportunity

Secondary dimension	Index	Male	Female
Information access	Mobile network access rate	90.6	89.8
	Network age (years)	10.9	10.2
Basic skills and attainment	Foreign language website browsing	42.7	39.2

2.1.2 Integrating

Concerning how the genders integrate themselves into the five major fields of learning, social life, economy, civic engagement and health promotion, as Table 9 shows, except for a slightly higher percentage of female netizens searching for class-related information through networks than that of male counterparts, the two genders share similar results for the remaining cyber learning activities.

From the aspect of social life, gender-related differences are mainly reflected by a higher percentage of males (53.5%) enjoying online games than that of females (38.9%), and also a higher percentage of females (66.5%) searching for artist and event information than males (53.2%). As for the other five indexes, the two genders are similar in participation.

Concerning economic development, for either male or female netizens, about 65% once inquired about commodity information and price by means of networks, and approximately 33% used cyber financial services, and about 5% sold goods online, presenting no significant difference. However, 62.1% of female netizens conducted online shopping, higher than that of male counterparts by 6.7 percentage points.

With regard to civic participation, except for a slightly higher percentage of male netizens being exposed to others' views on public issues and taking part in online voting than that of the female counterparts, the two genders present similar results for the remaining indexes.

As for health promotion, there is a slightly higher percentage of female netizens searching for health education information, looking for doctors and using networks to register medical visits than that of male counterparts.

Table 9 Summarized Gender-related Similarities and Differences in "Integrating"

Secondary dimension	Index	Male	Female
Learning	Usage rate of remote interactive teaching in the previous year	14.1	14.7
	Usage rate of online courses in the previous year	22.7	24.1
	Usage rate of searching for class-related information in the previous year	46.1	52.0
Social life	Usage rate of real-time communication software or visited social community websites in the previous year	91.5	93.5
	Usage rate of online forums in the previous year	18.8	18.2
	Searched for artist information and events through networks in the previous year	53.2	66.5
	Looked for lifestyle information or read news through networks in the previous year	79.9	82.3
	Usage rate of online movies in the previous year	69.3	69.5
	Usage rate of online music in the previous year	65.6	67.8
	Usage rate of online games in the previous year	53.5	38.9
Economic development	Inquired commodity information or compared prices through networks in the previous year	64.3	65.7
	Usage rate of cyber financial service in the previous year	34.5	32.2
	Usage rate of online shopping in the previous year	55.4	62.1
	Sought jobs or submitted resumes through networks in the previous year	12.4	13.6
	Sold or auctioned goods online in the previous year	6.4	5.2
Civic participation	Inquired information by means of E-government service in the previous year	37.1	37.6
	Submitted "Online requests" by means of E-government service in the previous year	32.7	31.2
	Participated in E-government forums in the previous year	13.0	10.2
	Left personal opinions on public issues on networks in the previous year	8.3	6.7
	Read others' opinions on public issues on networks in the previous year	58.3	51.1
	Forwarded others' opinions on public issues on networks in the previous year	16.8	17.2
	Participated in online voting in the previous year	16.1	12.7
Health promotion	Searched for health education information through networks in the previous year	65.5	74.2
	Took online health counseling in the previous year	16.0	17.1
	Looked for doctor information on networks in the previous year	24.1	31.9
	Conducted online registration of medical visits in the previous year	35.0	42.0

2.1.3 Renouncing

This dimension serves for evaluating gender-related difference in risks resulting from network usage. As the results show, there is a higher percentage of female netizens stated deteriorated physical condition as a result of using networks than that of male counterparts, but a slightly higher percentage of males suffered from cyber verbal assaults by others as compared to females.

Table 10   Summarized Gender-related Similarities and Differences in "Renouncing"

Secondary dimension	Index	Male	Female
Personal crisis	Deteriorated face-to-face interaction ability as a result of network usage	12.5	12.8
	Deteriorated physical condition as a result of network usage	23.7	32.9
	Percentage thereof thought net friends trustworthy	11.4	9.7
Infringed rights and interests	Experienced personal information leakage as a result of network usage in the previous year	15.2	15.2
	Experienced cyber frauds as a result of network usage in the previous year	5.1	4.6
	Suffered from cyber verbal assaults from others as a result of network usage in the previous year	4.9	1.8

2.2 Generation-related difference in digital opportunity

2.2.1 Enabling

As the survey (2015) shows, significant differences still exist in network access among generations. For the under-40 population, over 97% accessed networks, the percentage of 40-49 age group reached 93.3%, but it drops to 70.2% among 50-59 netizens, 50.1% among 60-64 netizens, and 21.7% of those aged above 65 accessed networks.

Concerning experience of mobile network accessing, of the population aged 15-49, over 90% have used a smart phone to access networks, higher than in the case of notebooks. The percentage of above-60 netizens who have experienced mobile network accessing is also high to exceed 64%.

Additionally, among all age groups, the segment with netizens aged 20-29 has the

highest percentage to visit foreign websites.

Table 11 Summarized Generation-related Similarities and Differences in "Enabling"

Secondary dimension	Index	Aged 12-14	Aged 15-19	Aged 20-29	Aged 30-39	Aged 40-49	Aged 50-59	Aged 60-64	Aged above 65
Information access	Computer usage rate	98.9	99.8	98.2	97.2	91.3	70.2	50.1	21.7
	Network usage rate	98.8	100.0	99.6	97.2	93.3	70.6	45.9	17.2
	Mobile network access rate	77.7	92.7	96.1	94.9	92.5	84.3	74.2	64.6
	Network age (years)	3.9	6.3	10.3	13.3	12.1	10.2	8.9	7.6
Basic skills and attainments	Foreign language website browse	34.2	45.1	52.4	49.9	35.8	28.6	22.6	19.7

2.2.2 Integrating

Concerning how the generations integrate themselves into the five major fields: Learning, social life, economic development, civic engagement and health promotion, as Table 12 shows, netizens of age groups differ in integrating in networks. (see Table 12)

Relatively speaking, no matter if undergoes unilateral or bilateral learning, the 12-29 age group has a relatively higher percentage of participants.

With regard to participation in social life, there is a smaller difference in real-time communication usage between each age groups, yet the 20-39 generation has a higher percentage of participants engaged in cyber forums, searching for artists and event information, looking for lifestyle or news information and other information-related activities. On the other hand, the under-30 age groups are more enthusiastic about cyber recreation including watching online movies, listening to online music and playing online games.

Concerning about participation in economic development, the survey shows that the 20-39 age groups present a higher level of participation in online shopping and network sales, netizens aged 30-39 has the highest usage rate of cyber financial service, and, with 35.7% of them once sought jobs through networks in the previous year, the 20-29 age group features the highest level of participation in submitting resumes or seeking job vacancies.

With regard to civic participation, as similar to the case of cyber financial service, netizens aged 30-49 is the most active group in utilizing E-government resources, with 45% of them inquired government announcements and 44% submitted online requests. As for the style in which netizens spread information about public issues, netizens aged 20-39 have the highest percentage of them making personal comments or forwarding others' opinions.

As for participation in health promotion, the 40-49 age group presents the highest percentage of participants searching for health education or food safety information through networks, and online registration of medical visits is the most popular (40.0%) among netizens aged 30-49.

Table 12   Summarized Generation-related Similarities and Differences in "Integrating"

Secondary dimension	Index	Aged 12-14	Aged 15-19	Aged 20-29	Aged 30-39	Aged 40-49	Aged 50-59	Aged 60-64	Aged above 65
Learning	Usage rate of remote interactive teaching in the previous year	22.9	35.7	29.4	8.9	5.4	4.9	8.2	0.7
	Usage rate of online courses in the previous year	19.9	28.1	35.2	22.2	23.5	14.4	10.8	11.1
	Usage rate of searching for class-related information in the previous year	65.1	78.2	61.8	46.4	41.7	35.2	23.4	28.3
Social life	Usage rate of real-time communication software or visited social community websites in the previous year	89.1	97.0	98.4	95.8	93.6	86.1	76.1	69.1
	Usage rate of online forums in the previous year	6.6	17.9	28.4	26.8	15.0	8.4	3.6	6.3
	Searched for artist information and events through networks in the previous year	33.8	56.2	63.2	67.5	64.6	57.3	40.4	33.8
	Looked for lifestyle information or read news through networks in the previous year	57.4	77.5	83.5	86.9	85.7	79.6	71.4	56.4
	Usage rate of online movies in the previous year	83.8	92.4	86.9	74.0	62.6	49.5	33.1	26.9
	Usage rate of online music in the previous year	78.1	86.0	84.1	65.8	58.0	52.5	51.3	39.4
	Usage rate of online games in the previous year	82.4	70.9	61.1	50.8	36.8	22.0	19.1	14.2
Economic development	Inquired commodity information or compared prices through networks in the previous year	23.5	56.6	76.5	77.6	70.9	55.3	39.4	26.7
	Usage rate of cyber financial service in the previous year	0.3	5.7	32.8	49.0	41.4	31.4	23.6	18.8
	Usage rate of online shopping in the previous year	23.8	52.9	72.4	72.2	61.7	44.1	35.1	23.6
	Sought jobs or submitted resumes through networks in the previous year	2.3	15.1	35.7	11.5	6.0	3.5	1.2	1.6
	Sold or auctioned goods online in the previous year	0.7	5.4	9.3	9.0	4.1	2.8	0.7	1.3

Civic participation	Inquired information by means of E-government service in the previous year	11.0	22.0	40.4	45.4	43.1	37.5	27.0	15.5
	Submitted "Online requests" by means of E-government service in the previous year	0.2	4.7	25.7	44.2	43.9	35.4	26.0	18.6
	Participated in E-government forums in the previous year	4.2	9.7	6.9	12.2	15.3	19.9	14.8	12.3
	Left personal opinions on public issues on networks in the previous year	3.3	5.9	10.7	10.4	6.6	4.8	2.1	2.8
	Read others' opinions on public issues on networks in the previous year	29.7	59.5	69.2	60.2	52.7	45.8	36.2	27.7
	Forwarded others' opinions on public issues on networks in the previous year	10.6	12.8	21.0	21.2	15.7	14.7	10.7	11.5
	Participated in online voting in the previous year	7.8	9.3	14.9	20.9	12.8	15.2	5.7	4.9
Health promotion	Searched for health education information through networks in the previous year	32.4	52.9	68.6	77.2	80.8	72.1	64.4	49.3
	Took online health counseling in the previous year	4.0	13.5	17.5	18.1	16.1	19.9	16.5	13.0
	Looked for doctor information on networks in the previous year	3.1	10.6	27.4	37.7	34.4	27.2	19.9	17.8
	Conducted online registration of medical visits in the previous year	6.2	14.0	30.6	49.3	51.6	41.3	32.9	32.9

2.2.3 Renouncing

This dimension aims to measure whether using networks leads to deteriorated personal basic abilities or psychological impairment. As the results show, about 30% of 20-59 age groups stated discomfort including backache and soreness of waist as a result of network usage, and such a percentage is a little bit higher than that of the under-20 and above-60 generations. (see Table 13)

As for infringed rights and interests, the 20-29 age group features a slightly higher percentage who experienced personal information leakage and cyber fraud.

Table 13　Summarized Generation-related Similarities and Differences in "Renouncing"

Secondary dimension	Index	Aged 12-14	Aged 15-19	Aged 20-29	Aged 30-39	Aged 40-49	Aged 50-59	Aged 60-64	Aged above 65
Personal crisis	Deteriorated face-to-face interaction ability as a result of network usage	10.5	12.7	17.0	14.6	12.6	8.6	5.2	5.6
	Deteriorated physical condition as a result of network usage	18.3	21.8	28.6	29.5	32.9	29.8	20.0	22.2
	Percentage thereof thought net friends trustworthy	15.6	14.7	10.4	9.7	10.0	8.5	10.2	12.6
Infringed rights and interests	Experienced personal information leakage as a result of network usage in the previous year	2.9	10.4	24.4	18.9	13.3	10.2	8.9	7.4
	Experienced cyber frauds as a result of network usage in the previous year	2.2	4.4	7.3	5.5	3.5	4.5	2.3	4.1
	Suffered from cyber verbal assaults from others as a result of network usage in the previous year	4.4	4.3	4.5	3.1	2.6	3.4	1.4	1.6

2.3 Region-related difference in digital opportunity

2.3.1 Enabling

From the aspect of digital development region, households in Taiwan can be generally categorized by information condition into three categories: category I covers digital development class-1 and class-2 regions, where about 88% of the households have computers, and approximately 84% may connect to networks. Category II includes digital development class-3 and class-4 regions, where about 80% of the households have computers, and approximately 76% may connect to networks. As for digital development class-5 region, category III, the figures are respectively 66.9% and 63.6%, presenting a dramatic regional gap.

Observed from the perspective of individuals, except for the digital development class-4 region, which mainly consists of offshore islands, the regions present a general trend which states that the higher level of digital development is, the higher degree of personal information facility access is. In the class-1 region, the computer usage rate and the network access rate are respectively 82.3% and 82.0%, while those in the class-5 region are only

58.5% and 58.9%, presenting a drop of over 20 percentage points.

Table 14   Summarized Region-related Similarities and Differences in "Enabling"

Secondary dimension	Index	Class-1 region	Class-2 region	Class-3 region	Class-4 region	Class-5 region
Information access	Household computer possession rate	88.2	87.9	80.1	80.9	66.9
	Household network connection rate	85.3	84.0	75.3	77.2	63.6
	Computer usage rate	82.3	80.5	70.0	74.7	58.5
	Network usage rate	82.0	80.1	69.9	74.5	58.9
	Mobile network access rate	91.5	90.9	86.1	91.3	88.4
	Network age (years)	11.3	10.6	9.3	10.3	8.9
Basic skills and attainments	Foreign language website browsing	45.2	42.8	29.6	38.3	27.8

If digital development class-3 to class-5 are categorized by the establishment of a Digital Opportunity Center (DOC), the results show that except for the class-4 region, the computer usage rate and network access rate among netizens in regions with established DOCs are still slightly lower than those in regions without established DOCs.

Concerning the experience of wireless network access, except for the class-3 region with established DOCs where the wireless network access rate is relatively high, in regions without established DOCs, the wireless network access rate is slightly higher. No matter if it is a class-3, class-4 or class-5 region, in those with established DOCs, there is a slightly lower percentage of netizens who have used free-of-charge wireless network sources offered by governmental organs than that in regions without established DOCs.

As the previous section shows, regions currently with established DOCs are still considered to have relative disadvantages compare to others.

Table 15 Information Access among Taiwan Netizens, as Classified by Digital Development Region and Established DOCs

	Once used computers		Once accessed networks	
	Without established DOCs	With established DOCs	Without established DOCs	With established DOCs
Digital development class-3 region	71.3%	65.8%	71.1%	65.9%
Digital development class-4 region	72.0%	75.1%	72.6%	74.8%
Digital development class-5 region	60.0%	58.2%	60.2%	58.7%

Table 16 Wireless Network Access Experience among Taiwan Netizens, as Classified by Digital Development Region and Established DOCs

	Without Wireless Network Access Experience		Experienced Free-of-Charge Governmental Organ's Wireless Network Access	
	Without established DOCs	With established DOCs	Without established DOCs	With established DOCs
Digital development class-3 region	85.0%	90.0%	25.6%	21.7%
Digital development class-4 region	92.6%	91.1%	39.0%	34.9%
Digital development class-5 region	90.6%	87.9%	26.0%	19.3%

2.3.2 Integrating

This dimension serves for observing whether the digital development regions differ in participation for cyber activities among netizens therein. As the survey shows, online courses are more popular in a class-4 region, while searching for class-related information enjoys a higher percentage of participants in class-1 and class-4 regions.

Concerning participation in social life, except searching for artists and event information and looking for lifestyle and news information feature the highest participation rate in class-1 region, the remaining indexes do not considerably differ among the regions.

With regard to participation in economic development, class-5 region features the lowest rate of online price inquiry, using cyber financial service and online shopping, yet the regions do not conspicuously differ in submitting resumes or participation in online auctions.

With regard to civic participation, the highest usage rate of E-government information inquiries or E-government service requests are both seen in class-1 and class-4 regions, while the lowest is in the class-5 region.

As for health promotion, the rate of participation in searching for health education or food safety information online is higher (73.9%) in a class-4 region dominated by offshore islands. The highest one in looking for comments on doctor as referential information is seen in the class-1 region.

Table 17　Summarized Region-related Similarities and Differences in "Integrating"

Secondary dimension	Index	Class-1 region	Class-2 region	Class-3 region	Class-4 region	Class-5 region
Learning	Usage rate of remote interactive teaching in the previous year	13.8	14.9	14.2	15.3	12.8
	Usage rate of online courses in the previous year	24.5	23.6	20.3	30.4	14.4
	Usage rate of searching for class-related information in the previous year	51.3	49.2	44.3	51.0	39.1
Social life	Usage rate of real-time communication software or visited social community websites in the previous year	93.2	92.9	90.9	91.8	88.5
	Usage rate of online forums in the previous year	19.9	18.4	16.7	18.0	11.8
	Searched for artist information and events through networks in the previous year	62.0	60.5	54.9	59.8	45.7
	Looked for lifestyle information or read news through networks in the previous year	83.7	80.0	78.4	83.1	74.3
	Usage rate of online movies in the previous year	71.0	69.3	67.3	66.4	64.6
	Usage rate of online music in the previous year	66.8	67.5	65.3	67.5	59.9
	Usage rate of online games in the previous year	45.2	46.5	47.3	46.3	53.0
Economic development	Inquired about commodity information or compared prices through networks in the previous year	67.9	65.5	59.0	66.1	52.8
	Usage rate of cyber financial services in the previous year	39.9	32.0	25.4	31.6	17.6

29

	Usage rate of online shopping in the previous year	61.6	58.6	53.0	66.0	46.8
	Sought jobs or submitted resumes through networks in the previous year	12.3	14.3	12.6	10.1	9.2
	Sold or auctioned goods online in the previous year	6.9	5.1	5.0	5.6	6.4
Civic participation	Inquired information by means of E-government service in the previous year	41.6	36.9	30.0	39.5	28.1
	Submitted "Online requests" by means of E-government service in the previous year	37.3	30.4	25.8	33.2	20.7
	Participated in E-government forums in the previous year	0.7	0.9	1.0	1.6	0.9
	Left personal opinions on public issues on networks in the previous year	8.8	6.7	6.5	8.5	5.9
	Read others' opinions on public issues on networks in the previous year	56.8	54.8	51.6	55.8	41.8
	Forwarded others' opinions on public issues on networks in the previous year	32.2	31.2	27.8	32.2	31.9
	Participated in online voting in the previous year	16.0	14.8	10.6	14.2	9.8
Health promotion	Searched for health education information through networks in the previous year	71.1	69.6	67.7	73.9	62.8
	Participated in online health counseling in the previous year	17.8	15.6	16.2	16.5	16.1
	Looked for doctor information on networks in the previous year	30.8	28.0	23.2	25.1	20.9
	Conducted online registration of medical visits in the previous year	40.8	38.0	34.6	42.8	31.8

2.3.3 Renouncing

In contrast to conspicuous region-related differences in both "Enabling" and "Integrating" section, there are inconsiderable region-related differences in the "Renouncing" section.

Table 18　Summarized Region-related Similarities and Differences in "Renouncing"

Secondary dimension	Index	Class-1 region	Class-2 region	Class-3 region	Class-4 region	Class-5 region
Personal crisis	Deteriorated face-to-face interaction ability as a result of network usage	11.5	13.2	14.2	14.2	8.7
	Deteriorated physical condition as a result of network usage	28.1	29.4	26.4	25.6	25.7
	Percentage who thought that net friends are trustworthy	9.6	11.0	11.2	11.2	11.5
Infringed rights and interests	Experienced personal information leakage as a result of network usage in the previous year	15.6	15.1	14.4	17.7	11.4
	Experienced cyber frauds as a result of network usage in the previous year	5.1	4.3	5.6	6.8	3.8
	Suffered from cyber verbal assaults from others as a result of network usage in the previous year	4.0	3.2	2.6	3.0	4.3

3. Trend-related comparisons based on cross-year survey results

3.1 Enabling

3.1.1 Household information access opportunity

Figure 19 shows the household computer possession rate and the household network connection rate in Taiwan from 2005 to 2015. As showed, the households computer possession rate in Taiwan presents a general upward trend between 2005 and 2013, rising from 79.5% to 88.5%,. However, the rate fell for two consecutive years since 2013. In 2015, only 85.3% of households have computers in their house.

The reduction in domestic household's computer possession rate since 2013 not only mirrored the global PC market shipment, but also corresponds to the time when people in Taiwan began to widely use smart phones to access networks (see related analysis below). Demonstrating how the smart phones have impacted the ways how people in Taiwan access the network

As mentioned above, the household network connection rate in Taiwan from 2005 to 2015 shows similar trend to the household computer possession rate. The steady growth from 2005 to 2013 (70.6% to 85.5%) and the two-year consecutive reduction to 82.0% in 2015 shows possible link to the increasing number of netizens who use mobile phones to access

networks, making it unnecessary for households to request installation of network access.
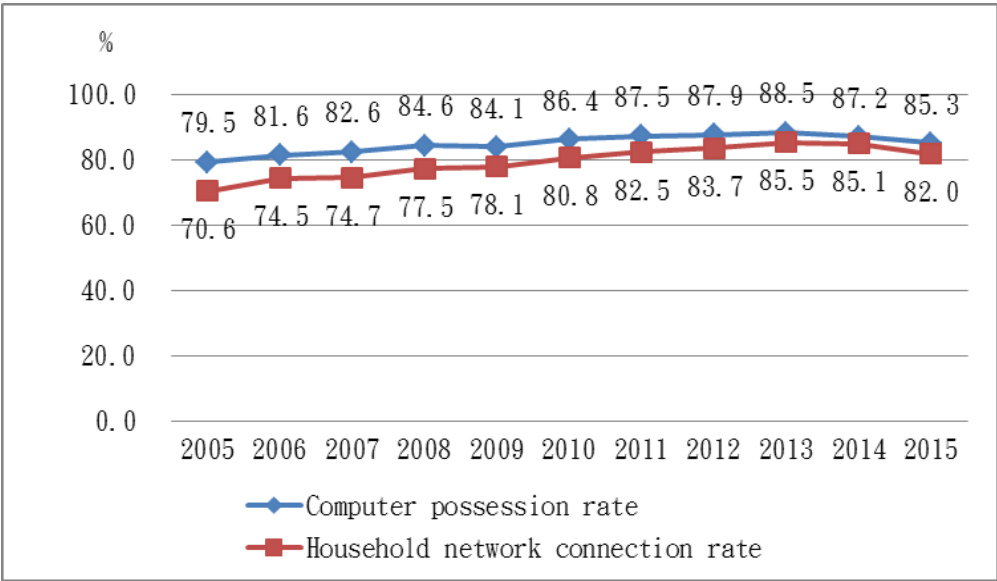

Figure 19 2005-2015 Development Trend of Household Information Access Opportunity

3.1.2 Individual information access opportunity

In terms of the computer possession rates of households in Taiwan, it was estimated that at least 85% of people in Taiwan have the opportunity to be exposed to computers. However, the usage rate personal computer usage rate varies between 66.8% and 80.7% from 2005 to 2015; presenting a gap to the household computer possession rate. This indicates that information facilities at home may not be accessible to everyone in a household. However, such condition has been improved in the past ten years, with the gap between household computer possession rate and individual computer usage rate reduced from 13 to 7 percentage points.

Figure 20 shows another topic worthy of discussion, the personal computer usage. The trend begins with a rise from 66.8% in 2005 to a new high of 80.7% in 2014, but falls slightly to 78.3% in 2015. Although it is not certain whether such a fall is linked to the varying definition of "computers" by different surveying institutions, but it is clear that more people have adopted portable devices as their information browser as those devices are equipped with increasingly powerful functions and bigger screens. Hence challenge the suitability of that indexes which only yield results from computer.

As for the individual network access rate, the network usage rate in Taiwan has risen

from 62.7% in 2005 to 78.0% in 2015, presenting a growth by 15.3 percentage points in 11 years. However, after two waves of increase in 2013 and 2014 pushed by smart phones, there seems to be a halt as the latest figure in 2015 remain unchanged at 78.0%[1].
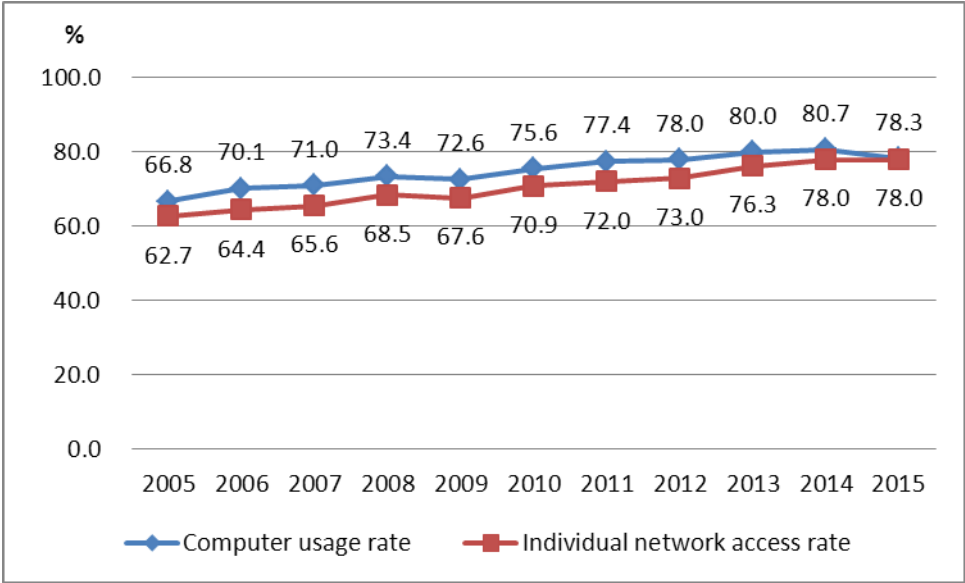

Figure 20   2005-2015 Development Trend of Household Information Access

Figure 21 presents the development trend of mobile network access among the aged 12 and above users across Taiwan from 2010 to 2015. The figure shows a healthy development in mobile network access in Taiwan over the past five years. It have risen from 37.6% in 2010, to 58.5% in 2013 and reached 70% in 2014, making a approximate growth of 33 percentage points in the five-year period. Further analysis indicates that the devices used for mobile network access   generally mirror the devices popular amongst the ICT industry.

As 2010 data showed, 28.1% participants in the survey replied that they have accessed the network wirelessly via notebook, and network connection via mobile phones was not common (16.6%). By the end of 2010, Apple's iPad was launched in Taiwan which led to an immediate increased in access network via tablet the following year. In 2011, the network access via tablet rose by 15.1% whereas the network access via mobile only rose by 6.5%.

Between 2012 and 2013, the rate of using tablets to access networks grew slightly to about 20%, but there was a major shift from using mobile to access network rather than notebooks, which was the first time that mobile phones became the leading device for accessing networks (within approx.50% adoption rate). In 2014, the adoption rate of tablets for accessing networks rose to 38.3%, and rate for using mobile phones rose to 67.5%.

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[1] As the individual and household digital opportunity survey shows, newly added network users in the latest three years can be mainly attributed to smart phones. However, of those that have never been a netizen, only 10.3% wish to learn how to access networks, which indicates limited room for the network access rate to rise.

However, the rate of using notebooks to access networks remains at less than 30%.

Up until 2015, the population of mobile network access users stopped growing for the first time, while the use of tablets to access networks have begun to decrease.

The trend described above was found similar to the findings in the IDC report, as it suggested an up to two-digit growth in table adoptions due to mass tablet adoption worldwide in 2012 and 2013. However, the trend took a sharp turn in 2014. Comparing the tablet produced in the fourth quarter of 2013 and 2014, the production felled by 3.2% from 78.60 million units produced in 2013 to only 76.10 million units in 2014. This was also the first time such change occurred since the introduction of tablets[2].

On the other hand, smart phone production experienced a dramatic 27.5% growth in 2014. As the screen size of smart phones increases, various manufactures began to feel the impact in the tablet markets. Unfortunately, the global productions of smart phones began to slump in 2015 as the production growth bound to hit below 10% at the end of the year. The production rate in the similar timeframe in 2014 was 27.5%[3].

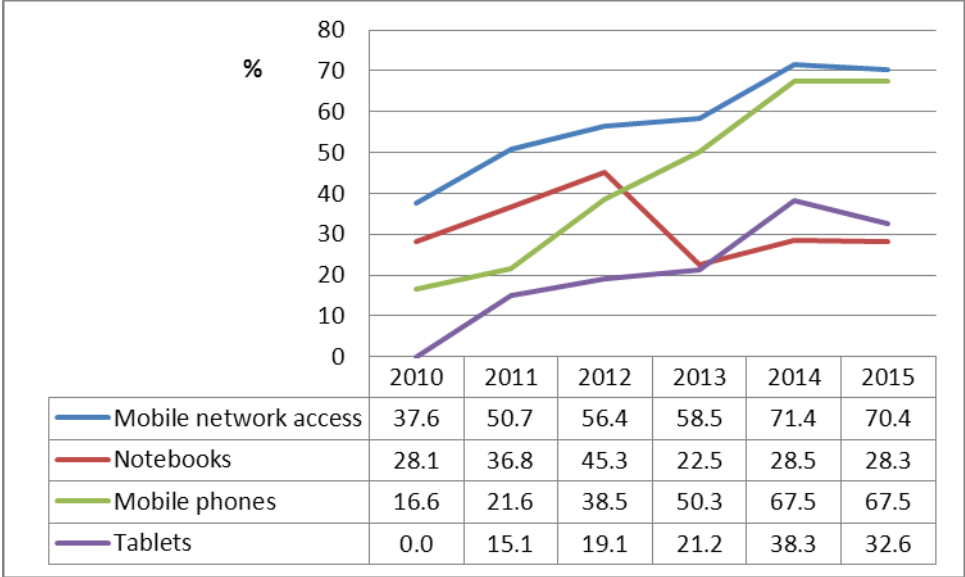| %	2010	2011	2012	2013	2014	2015
Mobile network access	37.6	50.7	56.4	58.5	71.4	70.4
Notebooks	28.1	36.8	45.3	22.5	28.5	28.3
Mobile phones	16.6	21.6	38.5	50.3	67.5	67.5
Tablets	0.0	15.1	19.1	21.2	38.3	32.6

Figure 21   Cross-year Comparison of Mobile Network Access among the Above-12
Population in Taiwan

3.2 Integration

[2] http://iknow.stpi.narl.org.tw/Post/Read.aspx?PostID=10700
[3] http://iknow.stpi.narl.org.tw/post/Read.aspx?PostID=11517

In the digital opportunity index structure of Taiwan, integration of information covers a range of dimensions including participation in learning activities, participation in social life, participation in economic activities, civic participation and participation in health promotion. Netizens were inquired about their participation in the previous year. Therefore, by researching the changes in application, we may understand popular applications among Taiwan netizens in the previous year.

As shows in Figures 22, 23 and 24, this survey categorizes various activities according to the development trend since the survey conducted in 2012, The activities could be categorized into "rising apps (used by more and more netizens)", "flat apps (used by a stable number of netizens throughout years)" and "declining apps (used by fewer netizens)".

It is easy to discover that real-time communication; online shopping and online games are increasingly popular network apps among Taiwan netizens. Although remote teaching enjoys a growth in usage rate, the figure is low to mean the app is not widely adopted. (see Figure 21)

Flat apps cover the cyber financial service, online searching for doctor-related information, online registration of medical visits, online requests, etc., which are all in connection with finance, health or E-government services. In the latest four years, the usage rate of such apps has been kept between 30% and 40%, which reflects a stable population with needs, and also reflects the not yet shaped lifestyle of handling daily life affairs through networks.

Declining apps account for almost half of the opportunity indexes, covering information (lifestyle information, price comparison, artist and culture information, government announcement, employment information) searching, online courses, online forums, health counseling, online auction or cyber entrepreneurship, among others.

The above-mentioned development trends of Integration might imply that given limited time, netizens would give priority to social communities, shopping and games and thus become less interested in other information.
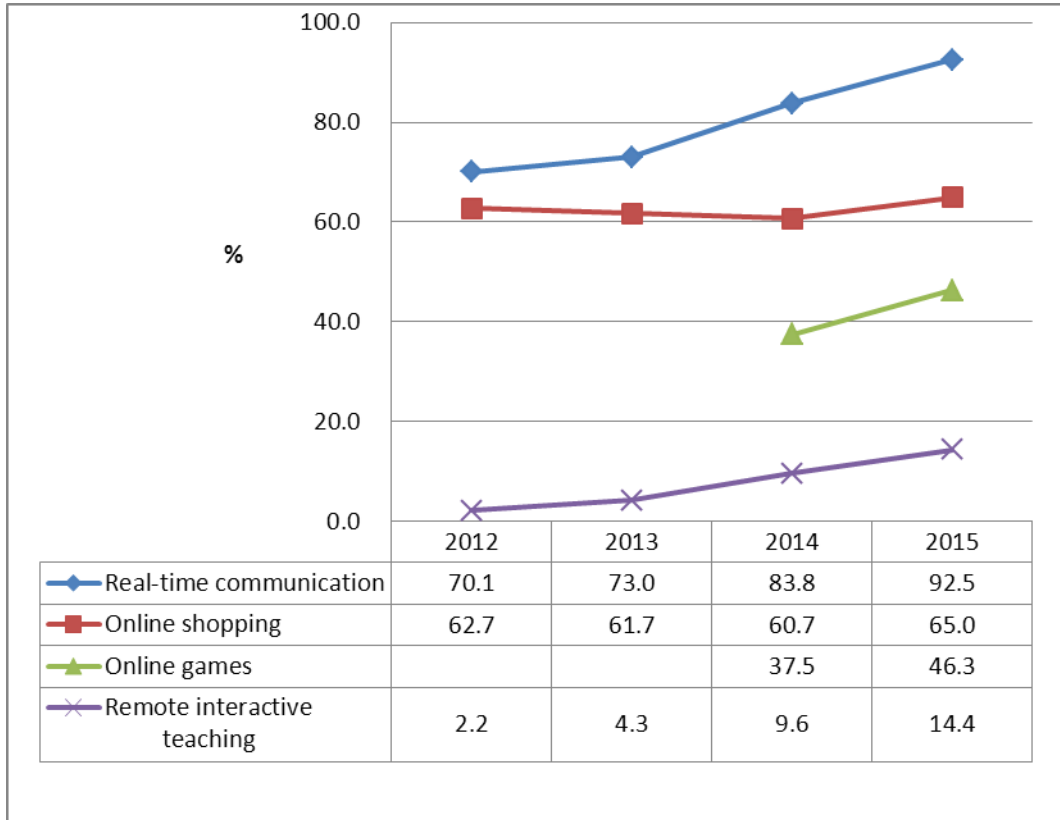
	2012	2013	2014	2015
Real-time communication	70.1	73.0	83.8	92.5
Online shopping	62.7	61.7	60.7	65.0
Online games			37.5	46.3
Remote interactive teaching	2.2	4.3	9.6	14.4

Figure 22 Cross-year Comparison of Integrating among the Above-12 Population in Taiwan, with Rising Apps Involved

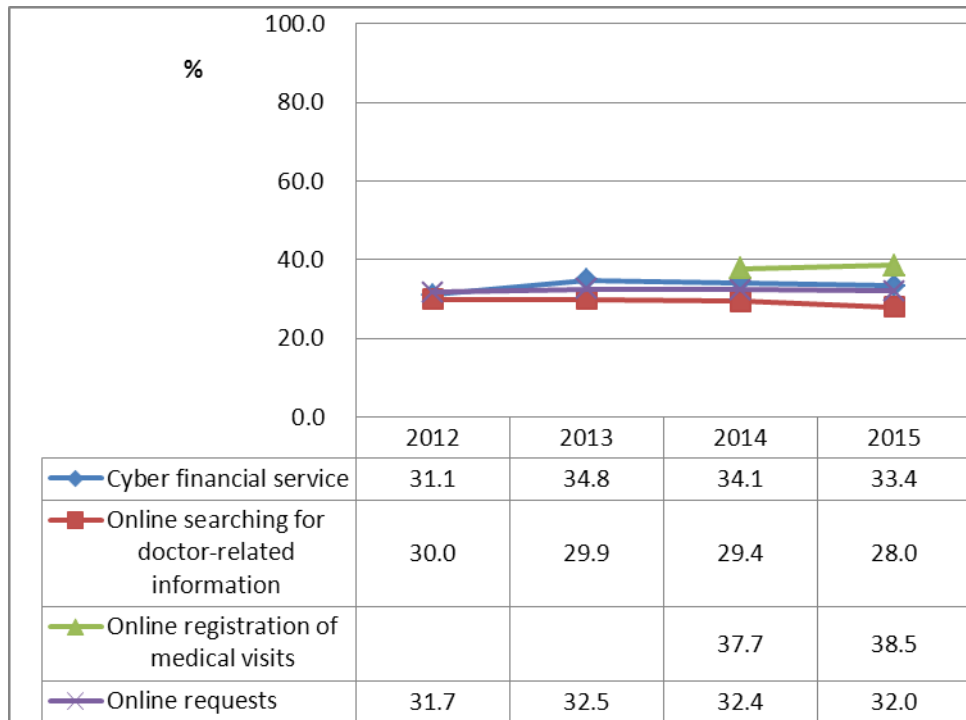|	2012	2013	2014	2015
Cyber financial service	31.1	34.8	34.1	33.4
Online searching for doctor-related information	30.0	29.9	29.4	28.0
Online registration of medical visits			37.7	38.5
Online requests	31.7	32.5	32.4	32.0

Figure 23 Cross-year Comparison of Integrating among the Above-12 Population in Taiwan, with Flat Apps Involved

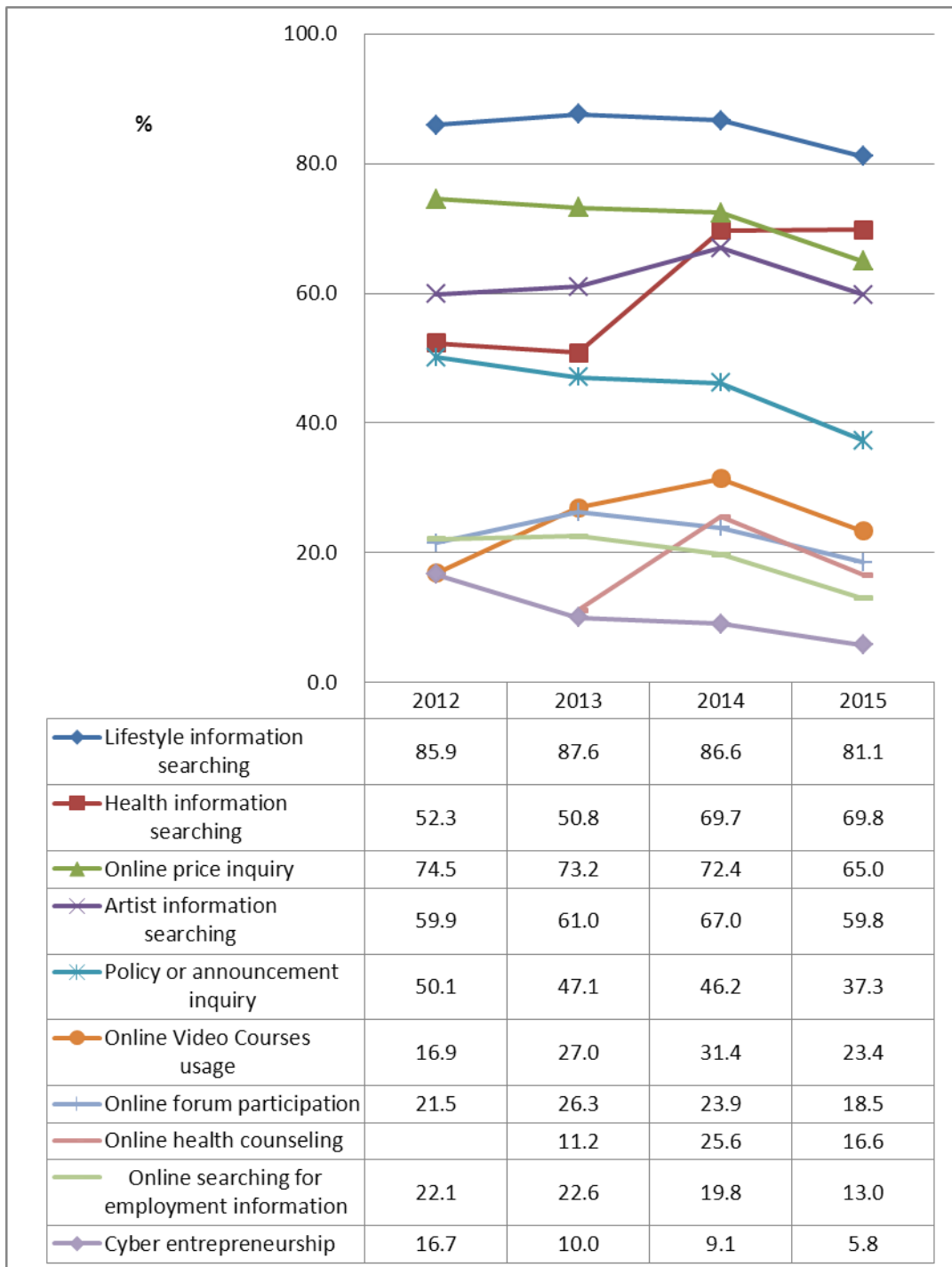|	2012	2013	2014	2015
◆ Lifestyle information searching	85.9	87.6	86.6	81.1
■ Health information searching	52.3	50.8	69.7	69.8
▲ Online price inquiry	74.5	73.2	72.4	65.0
✕ Artist information searching	59.9	61.0	67.0	59.8
✳ Policy or announcement inquiry	50.1	47.1	46.2	37.3
● Online Video Courses usage	16.9	27.0	31.4	23.4
┼ Online forum participation	21.5	26.3	23.9	18.5
Online health counseling		11.2	25.6	16.6
Online searching for employment information	22.1	22.6	19.8	13.0
◆ Cyber entrepreneurship	16.7	10.0	9.1	5.8

Figure 24 Cross-year Comparison of Integrating among the Above-12 Population in Taiwan, with Declining Apps Indicated

3.3 Renouncing

The dimension "Renouncing" in the digital opportunity index structure of Taiwan serves for observing adverse impact brought on by the information society from the perspective of

personal crisis and infringed rights and interests. However, as the survey questions were altered in 2013 and 2014, only cyber anxiety and personal information leakages are left available for trend comparison.

Regarding a personal crisis, as survey results in the latest four years show, the proportion of netizens who stated that they felt anxious without accessing networks remained between 40% to 44% in 2012 and 2013, and then rose to 48.3% in 2014 and even up to 50% in 2015. This reflects the risk of becoming addicted as a result of accessing networks has become a problem deserving attention after far and wide penetration of networks.

As for the proportion suffering from personal information leakage and infringed rights and interests as a result of using networks among netizens in the previous year, the development trend is unstable according to the data collected in the latest three years. The highest occured in 2013 and the lowest in 2015.

Table 19 Cross-year Comparison of "Renouncing" among the Above-12 Population in Taiwan

Primary dimension	Secondary dimension	Index dimension	Index	Year 2012	Year 2013	Year 2014	Year 2015
Renouncing	Personal crisis	Cyber anxiety	Feeling anxious without accessing networks	44.2	40.0	48.3	51.2
	Infringed rights and interests	Personal privacy	Personal information leakage	-	17.1	19.6	15.2

IV Suggestions

In this section, suggestions are made with considerations to the results of the 2015 survey:

1. Smart phones have changed the model of network access, and challenge the applicability of digital opportunity indexes.

The survey shows that as portable devices thrive, the household computer possession rate fell from a peak of 88.5% in 2013 to 87.2% in 2014, and again shrunk to 82.0% in this year. This means that computers are no longer regarded as a necessary information facility in households. Therefore, whether such a possession rate is still an applicable index for observing household informatization should be open to discussion.

Secondly, this year witnessed the smallest gap between the computer usage rate (78.3%) and the network access rate (78.0%) among the above-12 population, of which the figure is only 0.3 percentage points. That the first usage of smart phones accounts for the largest proportion among all the motives for accessing networks among the newly added network users in the latest three years shows, there are more and more people pushing aside traditional computer devices but directly use tablets or mobile phones to access networks and, therefore, it is possible that the network usage rate exceeds the computer usage rate in the following year. Under such circumstances, this study suggests either to consider the necessity of reserving this index, or redefining the scope of "computers".

Finally, similar doubts are found in the household connection rate. The question raised in the past years has always been "May I ask whether your household has been connected to the Internet?" As the request for installation of the traditional fixed network has been made on a household basis, such ways to raise a question would not lead to ambiguity. However, as there are mores people taking mobile phones as their only way to access networks or share information, the interviewees might have given a wrong answer as mobile phone accessing shall be deemed as "individual" instead of "household". Therefore, in future surveys, the question might be altered as "May I ask whether you are able to connect to the Internet at home?" which should lead to a more precise understanding of the household connection situation.

2. Smart phones once motivated a wave of new netizens, but the growth thereof is slowing down.

With reflections to previous survey, 2013 marked the transformation year for portable devices. Not only the smart phones possession rate surpass the notebooks for the first time in 2013, the mobile network access rate also reach above 90% in 2014, consequently motivated a new growth of individual network access rate in Taiwan. However, from 2014 to 2015, voluntary phone replacement has significantly reduced in number. As for those who have never access networks lacks motivation to change. Hence the unchanged data from 2014 to 2015

The only way forward from here is for the government to consider continuous to promotion of the use of network usage within the country will require practical steps in order to motivate more smart phone usage.

3. As social communities, shopping and games prevail among netizens, this leaves other information to be less attractive; countermeasures shall be taken in advance.

Compared to 2014, the past year of 2015 witnessed the largest growth in the proportion of netizens in Taiwan participating in social community, and a growing proportion enjoying games and shopping. However, the proportion of inquiring about policies and announcements, participating in forums, searching for artists and event information, looking for lifestyle and news information, searching for employment information, doing online price comparison, supporting cyber entrepreneurship or participating in online health counseling all registered a reduction in their statistics.

Such changes in the "Integrating" model may imply that given limited time, netizens would give priority to social communities, shopping and games, leaving other information to be pushed aside. In particular, the survey (2015) shows that, there are over half of the netizens who admit that they feel anxious if don't access networks for a certain number of days or use mobile phones for a certain period of time. Whether such a trend from the perspective of a digital "opportunity" creation is a forward development or an adverse one, is worth considering. It is believed in this study that, at the same time of creating digital opportunity, the government should pay attention to adverse effects brought on by highly focused "Integrating" models and formulate countermeasures.

4. As those who are silent account for the majority of the netizens, due care is needed when interpreting cyber public opinions.

With regard to the exposure to online topics in relation to politics, society or policies, this survey shows that over a half of the netizens were once exposed to comments made by others on public issues by means of social communities or news websites in the previous year. Seeing opinions that they agree with, giving a thumbs-up is the most common (48.0%) reaction to show consent; but if they don't agree with the opinions, nearly 90% of them would keep silent. It is such an information spreading model that creates the "normality" of one-sided online opinions.

Yet most of the netizens are "readers" instead of "speakers". Those who would personally go online and express personal opinions on current public issues account for less than ten percent (7.5%), and the proportion that would do the same on government websites or forums is even smaller (0.8%). Therefore, only less than twenty percent of the netizens agree that online opinions can fully or mostly represent their own views, and 25.8% think that online opinions completely cannot represent their own thinking. When interpreting online public opinions for formulating policies, the government shall take into consideration such restrictiveness.

5. The Electronization in digital development class-5 region remains at a low level. Resources should be invested in continuously.

To ensure sufficient samples from remote villages and towns available for analysis and deduction, the survey for this year purposely categorizes class-5 regions into two groups, one with established DOCs, and the other with no established DOCs, to add supplementary samples. The sample size in each group thus exceeds 600, with a smaller sampling error than that in the previous years.

As the results show in the digital development class-5 region, household computer possession rates and connection rates are 66.9% and 63.6% respectively, presenting a considerable distance from class-1 and class-2 regions (where 88% of households have computers and about 84% may connect to networks). Even from the perspective of individuals, the computer possession rate and network access rate in class-5 region are 58.5% and 58.9% respectively, also less than those in class-1 region by over 23 percentage points.

Compared to a 64.8% household connection rate and a 58.1% individual network access rate in 2014, a growth of 1.2 and 0.8 percentage points respectively is seen in the previous year in the digital development class-5 region. The change is limited. This shows that such regions remain disadvantaged, and thus are in need of public policy intervention.