Survey on 2018 Individual/Household Digital Opportunity Survey in Taiwan Executive Summary

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Entrusted by: The National Development Council
Executed by: United Marketing Research Co., Ltd.

2018 Individual/Household Digital Opportunity Survey in Taiwan
Summary

I. Purpose

Caring for the disadvantaged and implementing fair digital opportunities has always been the government's priority in the promoting IT technology infrastructure and government services. Since 2004, there has been promotions such as "Project (2005-2007) - Reducing the Gap in Digital Opportunities", "Project (2008-2011) - Creating Digital Opportunities", "Project (2012-2015) - Deepening Digital Care", "Project (2016-2019) - Popularization of Digital Applications in Rural Area" and other projects that are intended to use government and private resources to provide equal digital opportunities for all regions, communities and industries to share the benefits of a quality online society .

In order to grasp the digital development situation in Taiwan, the National Development Council regularly conducts Individual/Household Digital Opportunity Surveys every year , from "Enabling", "Inclusion" and "Exclusion" to understand the digital opportunities and crises brought by the online society as a basis, so to take care of the disadvantaged groups and deepen the digital care policy.

II. Methodology

(1) Target Population

The "2018 Individual/Household Digital OpportunitySurvey" is based on the survey of residential home phone users in Taiwan, Taipei City, New Taipei City, Taoyuan City, Taichung City, Tainan City, Kaohsiung City, Kinmen County and Lianjiang County. It's targeting population of Taiwanese nationals who is 12 years old or older in the ordinary household.

(2) Survey Structure

"2018 Individual/Household Digital OpportunitySurvey" is planned and conducted in accordance with the digital development indicator structure by The National Development Council's newly revised "Digital Opportunity Development Indicator Structure Adjustment Research".

Continuing with the precedent structure, the "2018 Individual/Household Digital Opportunity Survey" still contains three sections: "Enabling", "Inclusion" and "Exclusion". The first section is to explore the use of information devices, use of information and information literacy; particularly, the discussion focus on the ability to identify information security and information screening; the second section aims to understand the situation and frequency how the users apply online information to multiple life aspects in learning, social life participation, economics, politics, healthcare...etc; the third section is about the crisis and the invasion of rights and, to observe the negative impact of the information society. Specifically, the questionnaire consists of four parts: “Enabling”, “Inclusion”, “Exclusion” and basic information. The indicators are shown in Table 1.

Furthermore, based on the results of the 2017 survey, it is difficult to verify that the two indicators of information screening and information identification capabilities are designed to reflect user confidence or real ability. Therefore, this year, with the approval of experts and scholars, the original questionnaires will be replaced with new ones.

Table 1 2018 Individual/Household Digital Opportunity Survey Indicators

Primary Dimension	Secondary Dimension	Indicator
Enabling	Use of Information	Ownership of personal Internet device Use rate of wireless or mobile Internet
	Skills and literacy	Awareness of network access Awareness of digital footprint Ability of screening information (new) Ability of identifying information (new) Ability of programming
Inclusion	Learning activities	Information utilization and creation Online course
	Social life	Information acquisition Instant messaging and social media Online audio and video Online gaming VoIP Web content creation Cross functional social media
	Economic development	Online comment or price comparison Online shopping experience Innovative Internet business model

		Online payment Online sales experience Near-field payment experience Online or mobile banking experience
	Civil participation	E-government initiative service contact experience E-government passive service experience E-government online application (new) Use of government open resource Official online channel public participation Review to legislate policy Comment
	Healthcare	Online registration or visit progress inquiry Online medical records, history, and results Autonomous health management
Exclusion	Personal crisis	Internet anxiety Physiological deterioration Social ability degradation Text expression ability deteriorates
	Social crisis	Internet freedom of speech Cyberbullying
	Invasion of privacy	Personal identity theft
	Impaired equity	Internet fraud damage IT device hacked

(3) Survey and Sampling

This survey uses a computer-assisted telephone interviewing system (CATI) for telephone survey. In order to make the sample structure reasonable, it was conducted after 6 pm from Monday to Sunday.

Sampling is conducted covering 22 counties and cities in Taiwan residential home phone subscribers randomly as the subgroup of population; and from these random sample of telephone numbers, alter each phone number by changing two ending digits in a random fashion, to cover unregistered home phone numbers.

The number of samples for each county and city is calculated based on the number of people over 12 years old in each county and city published by the Department of Statistics of the Ministry of the Interior in June 2018, except for 384 samples in Lianjiang County, the remaining counties and cities have 95% confidence level. The number of

samples is configured on the premise that the sampling error does not exceed ±4 percentage points. The valid samples for each county and city in the first stage are shown in Table 2.

Table 2 Sampling configuration and actual number of interviews in the first phase of the survey

County and city	Population of 12 years or older	Estimate error	Configure the number of samples	Actual number of completed samples
Total	20,978,352	±0.9%	12,984	12,992
New Taipei City	3,597,050	±4.0%	600	601
Taipei City	2,374,757	±4.0%	600	602
Taoyuan City	1,941,292	±4.0%	600	601
Taichung City	2,471,547	±4.0%	600	601
Tainan City	1,700,923	±4.0%	600	600
Kaohsiung City	2,510,816	±4.0%	600	600
Yilan County	413,372	±4.0%	600	600
Hsinchu County	482,125	±4.0%	600	600
Miaoli County	496,170	±4.0%	600	600
Changhua County	1,148,265	±4.0%	600	600
Nantou County	457,566	±4.0%	600	601
Yunlin County	457,566	±4.0%	600	600
Chiayi County	472,553	±4.0%	600	600
Pingtung County	760,120	±4.0%	600	601
Wuhu County	95,219	±4.0%	600	601
Hualien County	298,012	±4.0%	600	600
Taitung County	199,674	±4.0%	600	600
Keelung City	340,446	±4.0%	600	600
Hsinchu City	381,597	±4.0%	600	600
Chiayi City	240,371	±4.0%	600	600
Jinmen County	127,105	±4.0%	600	600
Lianjiang County	11,806	±5.0%	384	384

Note: Population Data are sourced from the Statistics Department under the Ministry of Interior.

After completing the first phase of the sampling, in order to ensure that there are also enough sample numbers for digital development analysis and inference in the remote rural areas, there are additional 230 people from the five-level region been added to the sampling. A total of 13,222 valid samples were completed, and the sampling error was within ±0.9 percentage points at 95% confidence level.

(4) Dates of interview, and contacts

The survey conducted telephone interviews on the evenings of July 4, 2018 to August 30, 2018. In this survey, a total of 219,599 calls were dialed, and the actual number of calls was 100,793 (the difference between the two is redials , rescheduling calls); deducting dials of fax machine, non-residential, telephone recording, telephone failure, empty number, suspended use and non-qualified sort of non-human factors, the total number of valid samples was 13,222, the completion rate was 64.7%, and the rejection rate was 35.3%.

(5) Data weighting

In order for the survey to infer the views of all people over the age of 12, the survey sample is weighted according to the population data aged over 12 by their gender, and age structure of each city and county published in July 2018 by the Ministry of the Interior ; As for the inference of the overall digital development of the country, the second stage weighting is carried out according to the proportion of the population over 12 years old in the cities and counties over that in the whole country; and then according to the proportion of the number in development areas over that in the whole country; to improve the rationality of statistical estimation.

(6) Area definition

This survey compares the degree of digital development in different geographical regions through various classifications. The most important thing is to observe whether the digital development gap between each digital development area level 1~ 5 converges or widens.

This classification is based on the research results of the “Digital Development Classification Research Report” in 2011 by the National Development Council (aka the

Research, Development and Evaluation Commission), and also categorized by the human resources structure, social economy, education and culture development, traffic dynamics development, living environmental development, and information infrastructure in each town and city, including the 6 major indicators and 25 indicators; within those, 32 townships and towns are in the level-1 development area, 93 in the level-2, 127 in the level-3, 49 & 67 in the level-4 and level-5, respectively; among which level-1 has highest digital development.

III. Key indicators

Table 3 Statistical Table of Key Indicators for Individual/ Household Digital Opportunity Survey

Indicator	2017	2018	Comparison of 2017 and 2018
Personal Internet access rate (A)	82.3%	86.5%	Increase by 4.2 percentage points and grow 5.1%
Mobile Internet access rate (A)	80.1%	84.9%	Increase by 4.8 percentage points and grow by 6.0%
Home Internet access rate (A)	85.1%	84.9%	The rate is similar
Instant messaging application (B)	96.8%	96.8%	The rate is similar
Online financial applications (B)	33.2%	32.9%	The rate is similar
E-government initiative service (B)	50.2%	60.0%	Increase by 9.8 percentage points and grow by 19.5%

Note: (A) The target of the survey is individuals over 12 years old. (B) The target of the survey is Internet users over 12 years old.

IV. Summary Report

(I) Overview of The Digital Opportunity

(1) Enabling

Enabling is the first section of digital opportunity indicator structure. It includes two secondary dimensions: "use of information" and "skills and literacy". People must have the skills and literacy for the use of information and the opportunities for use of information device, to make it possible to enter the information society, and then even to talk about the subsequent opportunity creation and risk-taking.

Looking at "Enabling "s first secondary dimension "Use of Information", 2018 survey shows that personal Internet access rate in Taiwan over 12 years old was 86.5%, a substantial increase of 4.2 percentage points compared with last year (2017) survey. From the long-term trend, since 2005, the Internet access usage rate has increased from 62.7% to 86.5% in 2018, and has grown by 23.8 percentage points in 13 years.

The mobile Internet access rate in 2018 has also reached a new high. Up to 98.2% of Internet users have used mobile or wireless Internet access. In the population over 12 years old in Taiwan, there are 85 people in every 100 people have used mobile Internet access, which is about 5 percentage points higher than that in 2017.

Because more and more people rely on mobile Internet, starting from 2017 survey, the use of Internet accessing through solely mobile has been classified as household Internet use.This year's survey shows that the household Internet access rate has remained flat in the past two years. It is 84.9% this year.

From the perspective of personal accessible information devices usage, from population of 12 year old who has ever accessed the Internet, the ratio of users who hold smartphones, smart TVs, smart wearable devices and smart home appliances slightly larger than that in 2017, and the ratio of users who hold desktop computers, notebook computers, and tablet computers has decreased. [figure 1]

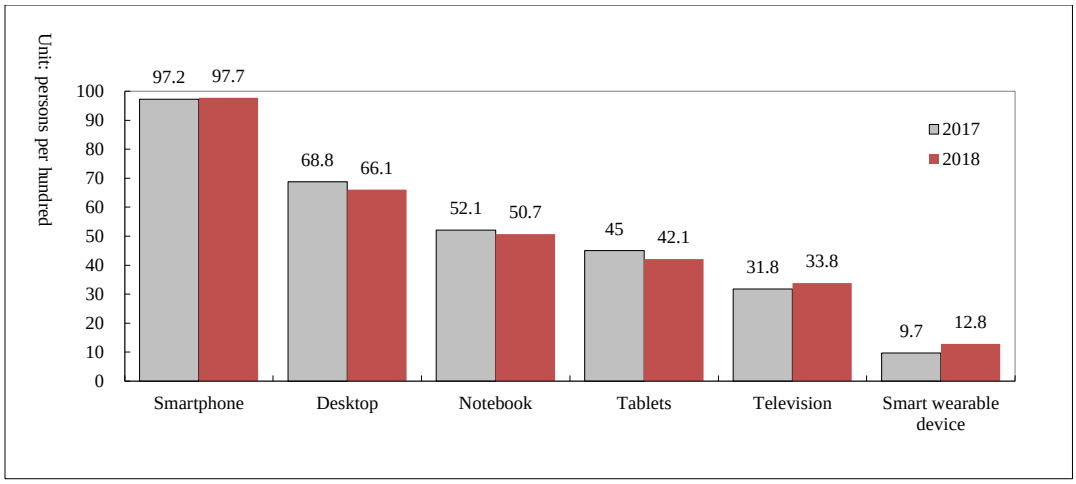

Figure 1 Internet users' ownership of information device

From the perspective of the length of Internet usage, the ratio of Internet users who mostly use smartphones is 66.7% in 2016, 73.3% in 2017, and then 75.3% in 2018. The ratio of Internet users who mostly use desktops is 21.4% in 2016, reduced every year, to 14.9% in 2018, which demonstrates the the usage shift of information device.

From the perspective of "skills and literacy", there is still room for improvement in information security awareness. Although 75.5% of Internet users recognize that online activities will always leave footprints (26.5% is very clear, 49.0% is somehow clear) However, only 51.7% of the Internet users know that their browser or application can access that personal information (11.5% is very clear, 40.2% is somehow clear). [figure 2]

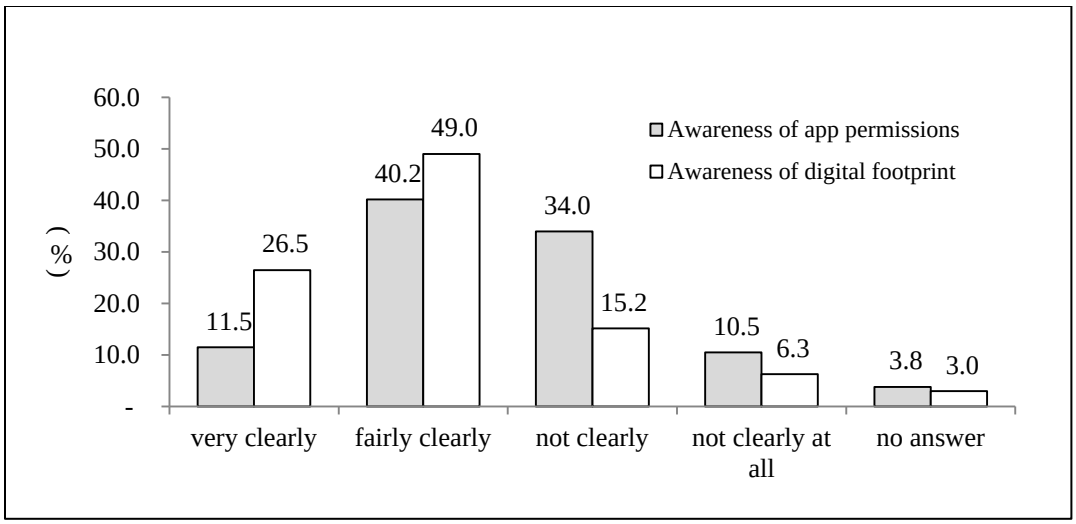

Figure 2 Internet users' security awareness

Regarding to the ability of information screening and ability to identify information value, unlike 2017 in that the survey asked the Internet users how did they determine themselves in the ability of information screening and the ability to identify the credibility of the information, this year the survey has been modified with specific information questions, to evaluate Internet users' information gathering capabilities in subjects of tourism, gourmet and thematic information, and to understand their possible actions when they are unable to identify the truthiness of online information.

The results showed that the higher the score, the better the identifying "Enabling" is, from 1 to 10 points. Internet users over 12 years old scored 6.2 points to 6.9 points for the above three indicators. As for online news or information on the Internet that could be true or false, only one out of every three Internet users "will not verify" (34.8%), and 53.0% "verify through Internet channels" such as google, and 34.9% "will consult with friends and relatives" around them. 9.3% will check the books.

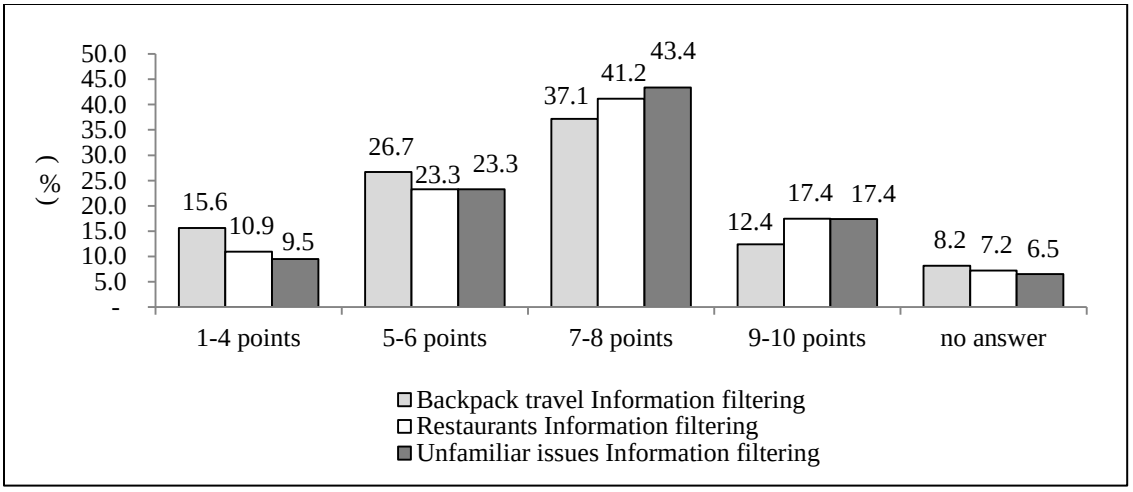

Figure 3 Internet users' ability of information screening and identifying, by self-evaluation

The last secondary dimension is the program design learning experience found that 23.9% of the Internet users over 12 years old in Taiwan had studied or self-trained programming.

(2) Inclusion

"Inclusion" is the second secondary dimension in digital opportunity indicator structure, mainly observing the Internet users' life anticipation and application in 5 key indicators of learning, social life, economic, civil engagement and healthcare to learn the possible influence that the use of ICT could do to our life quality.

"Learning Activities" focuses on understanding the individual's interactive behavior through one-way or two-way educational learning through ICT. It uses "learning new skills online" and "participating in online courses" as two major indicators.

The survey results show that the level of requirements for learning new skills through the Internet is not high. A total of 11.7% of Internet users are, for the purposes of learning, searching for information or videos on the Internet every day to learn new skills (6.9% several times a day, 4.8% once a day). Extended to include other purposes of use, in the past year, a total of 47.9% of Internet users have participated in online self-learning.

In the online course, a total of 2.4% of the Internet users participated at least once a day, 6.4% once a week, 6.8% once a month; 6.7% participated more than one month, and the total participation rate was 22.3%.

From the perspective of information sources, the frequency of learning new skills online is not only higher than the participation of the online course, but also the information sources are more extensive. Although 24.4% of the Internet users only look at domestic teaching instructions or videos, the rest more or less have referenced from abroad; online courses or tests are mostly concentrated on domestic platforms, and 64.9% only participate in domestic learning platforms.

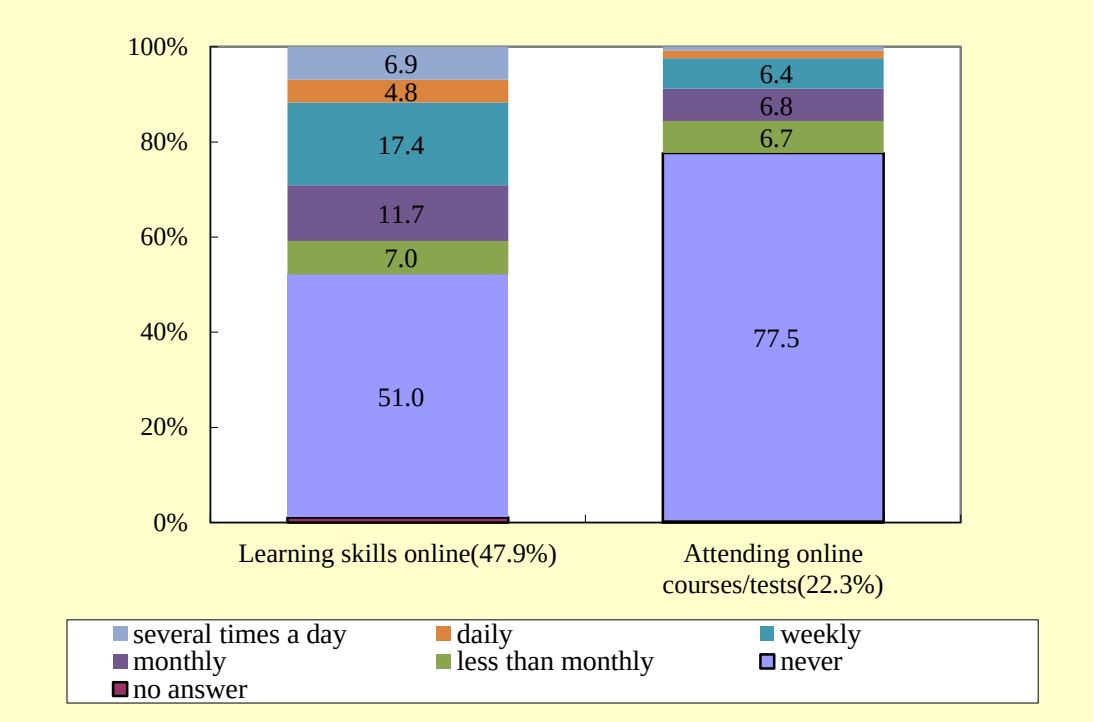

Figure 4 The participation of the online community in the past year

"Social Life Participation" focuses on understanding one-way social life participation or two-way interaction through ICT. Specific survey indicators include one-way information acquisition, audio or video entertainment, as well as two-way interactive instant messaging, VoIP, web content posting and online gaming.

The survey results show that the Internet community is very enthusiastic about engaging in one-way and two-way online social life. In the most recent year, the highest participation rate was instant messaging and social media (96.8%), followed by Internet telephony (85.7%) , online audio and video (83.1%) and new information acquisition (79.7%). 46.0% of the Internet users in the past year have posted articles, photos or videos online, participated in online content creation, while 45.4% have participated in mobile or online games.

In terms of frequency of use, instant messaging has the highest use rate and is also the most frequently used item among the six social life indicators. 80.3% of the Internet users use it several times a day, and 10.1% use it at least once a day, for a total daily usage rate at 90.4%. The daily use is by watching videos or listening to music on mobile phones or computers (50.5%), the rate is higher than the network users who make

Internet calls every day (41.3%), and those who get new information online every day (29.6%). Although the online game usage rate is relatively low in the social life secondary dimension among these indicators, 21.4% play several times a day, 11.7% play at least once a day, the frequency of use is not low.

Further to observe the pattern of using the instant messaging/social media, the survey found that the cross functional application of social media has not expanded more , 76.3% of the news provided by the social platform, 50.4% of the live broadcast of others, 35.6 % shopping through the social platform, 4.0% of themselves become the main broadcaster, the ratio is slightly lower or even comparing to 2017.

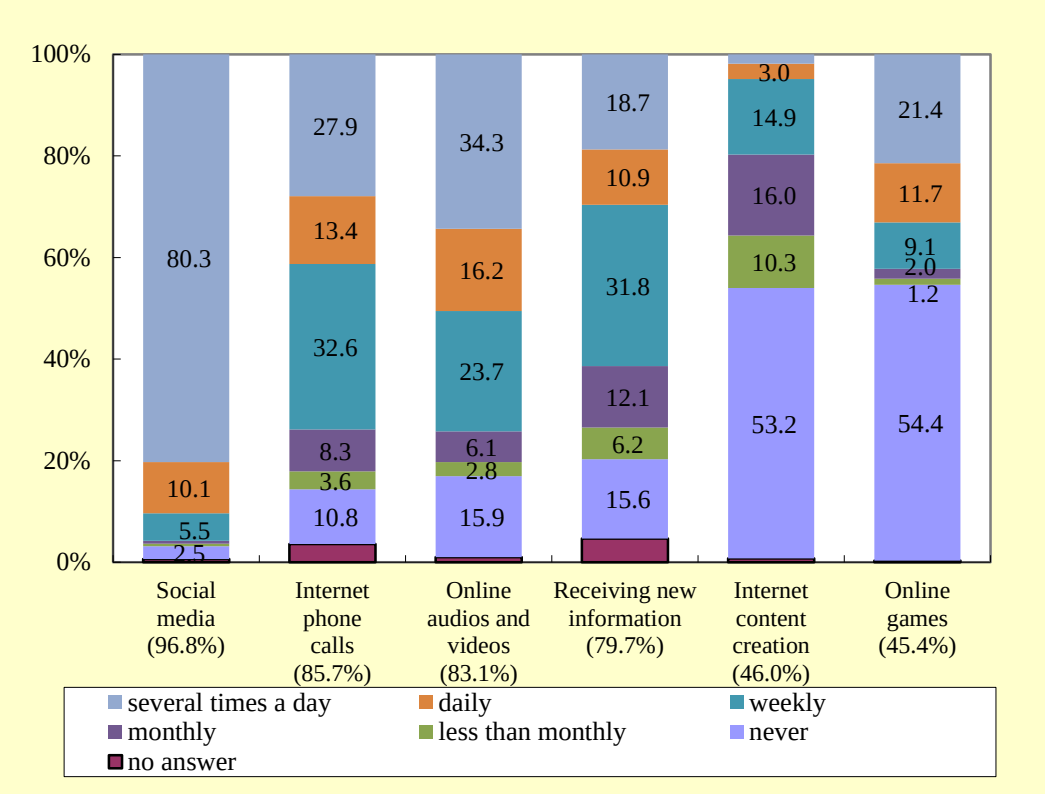

Figure 5 Internet users' participation in social activities in the past year

"Economic Activity Participation" focuses on understanding the use of e-commerce for buying, selling, investment and employment/entrepreneurship through ICT. Specific six survey indicators include product price comparison, online shopping, online innovation services, online banking, online merchandise and near-field mobile payment .

According to the results, online shopping is the main behavior among these Internet users 12 years old or older who have participated in digital economic activities. Over the past year, 59.8% have searched for product price comparison through the Internet, and 58.5% have shopped online; however, the acceptance of online banking has not improved, of which the usage rate was 32.9% in the past year. 11.2% used Internet innovation services such as AIRBnb and Uber. 7.1% used Internet to sell goods online in the past year, which is slightly lower than the 2017 survey results. As for the near-field mobile payment, it is one of the few applications that have obvious growth in the past year, from 10 to 15 people per 100 Internet users who has used it in the country.

In terms of frequency of use, a total of 9.1% of the Internet users query the goods or prices of interest every day, 24.5% study at least once a week, which is the most frequently used economic activity; the Internet users buys mostly once a month through the Internet (26.1%); a total of 12.1% of the Internet users are frequent users of online banking (3.9% once a day, 8.2% once a week), not much frequent use of network innovation services and network products selling goods, the ratio is less than 0.6%.

As far as how to pay for online shopping? Convenient store pickup is still the most common payment domestically (85 times per 100 times), online credit card, online banking transfer and mobile phone inductive payment have grown, and the traditional payment use ratio of cash-on-delivery, physical ATM transfer, and over-counter-remittance have slightly reduced.

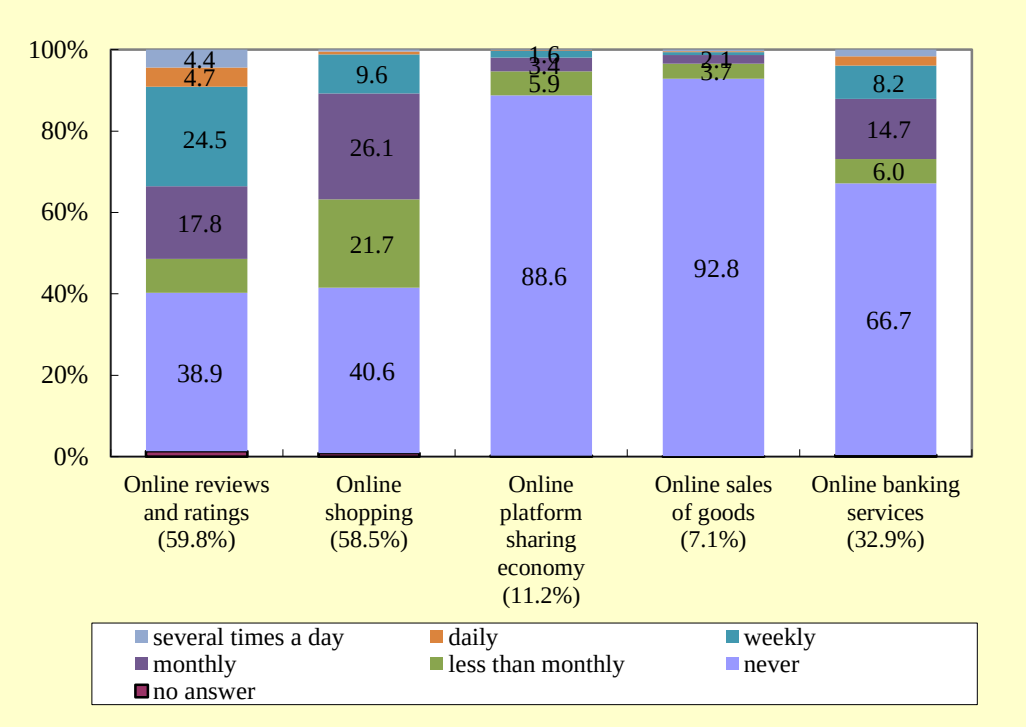

Figure 6 The participation of the Internet users in economic activities in the past year

"Civil Participation" explores the use of e-government resources and participation in online public issues through ICT. There are four indicators of use of e-government resources including receiving government information, accessing government public information online, using government online application services, and downloading government public information services. Online civil participation includes publishing through official channels and unofficial channels .

In terms of the use of e-government resources, government initiative Internet-based information providing in the past year has increased by nearly 10 percentage points over 2017, and 60.0% of Internet users have received disaster prevention notices or electronic reports from the government. The rate of public information is higher than that of other e-government services. The ratio of online government information was reduced from 35.4% to 32.7%. In addition, 27.8% used online application services such as tax returns, and 10.1% downloaded government public information.

In terms of frequency of use, the proportion of Internet users who received notifications from the government in the past year has exceeded 60%, but the

frequency of contacts is not high. The total rate of passive Internet users that the government was able to reach is only 3.7% per week, which is lower than the rate (6.4%) who actively went on government's websites for information acquisition. As for the online registration and downloading of government open resources, the frequency of use is not high, and it took less than one time in a month.

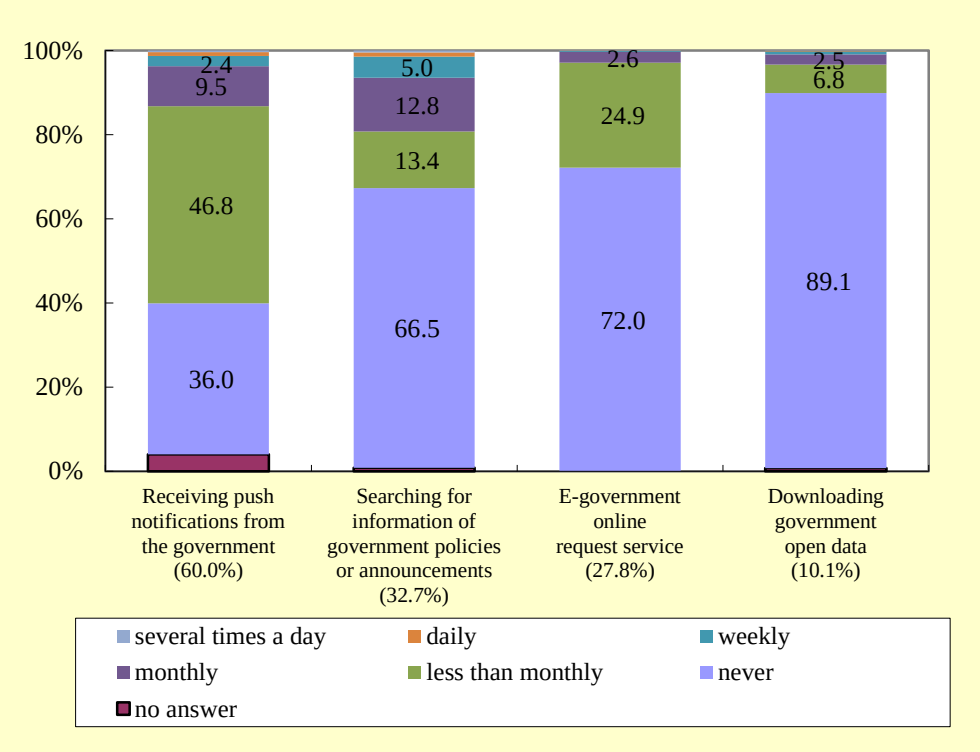

Figure 7 The use of electronic government resources in the last year of the Internet users

In the online civil participation section, the percentage of Internet users posting public policy opinions on the Internet is still low. In the past year, only 5.8% of the total voiced in the official channels, 7.9% through the unofficial channels; and 8.2% published with different opinions. Those who are willing to express their opinions on public policy through official or unofficial channels have a low frequency of speeches, with less than 2% of participants per week (0.2% for official channels and 1.6% for unofficial channels).

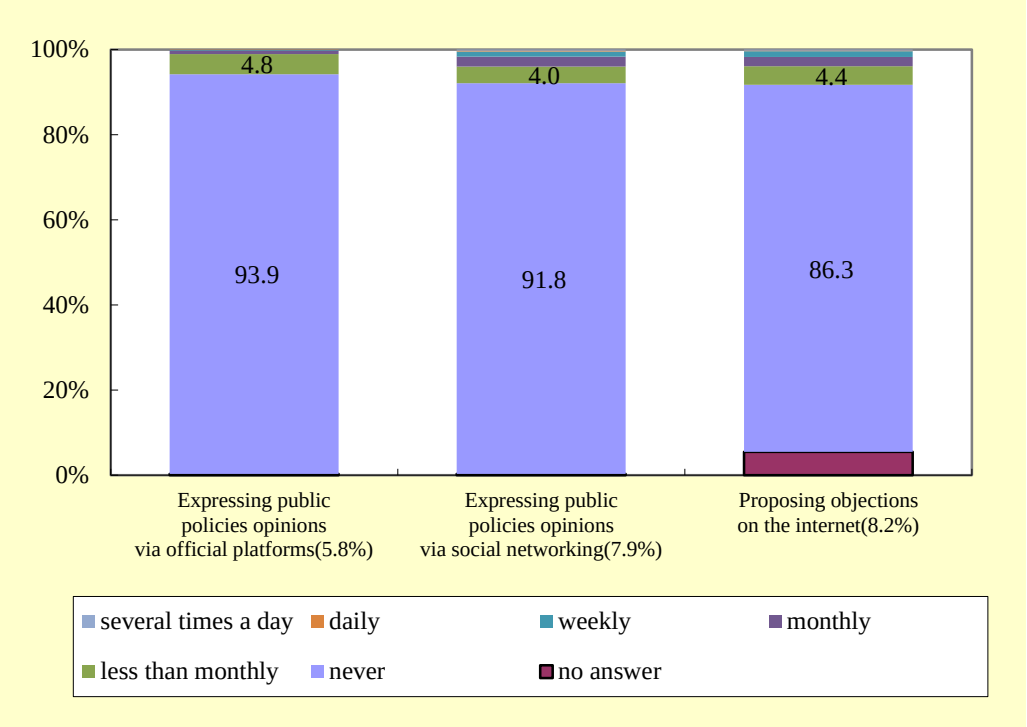

Figure 8　Internet users' public participation in the last year

"Healthcare Participation" focuses on the behaviors of individuals who received relevant medical resources or medical care through ICT. Specific indicators include " network registration or progress enquiry" , " online visit history, medical records or examination results" and "healthcare self-management via smartphone APP or health bracelet".

Survey shows that over the past year 50.1% of Internet users have registered doctor appointments online or enquired medical progress through the Internet, 14.5% have used smartphone APP or health bracelet for healthcare self-management, while 8.3% have checked online for doctor visit history, medical records or exam results.

In terms of frequency of use, healthcare self-management via smartphone APP has the highest frequency of use, 7.0% use on daily basis and view records; and the frequency of online registration or checking progress is related to the frequency of visits, 11.3% if once a month or 37.5% if by less than once a month.

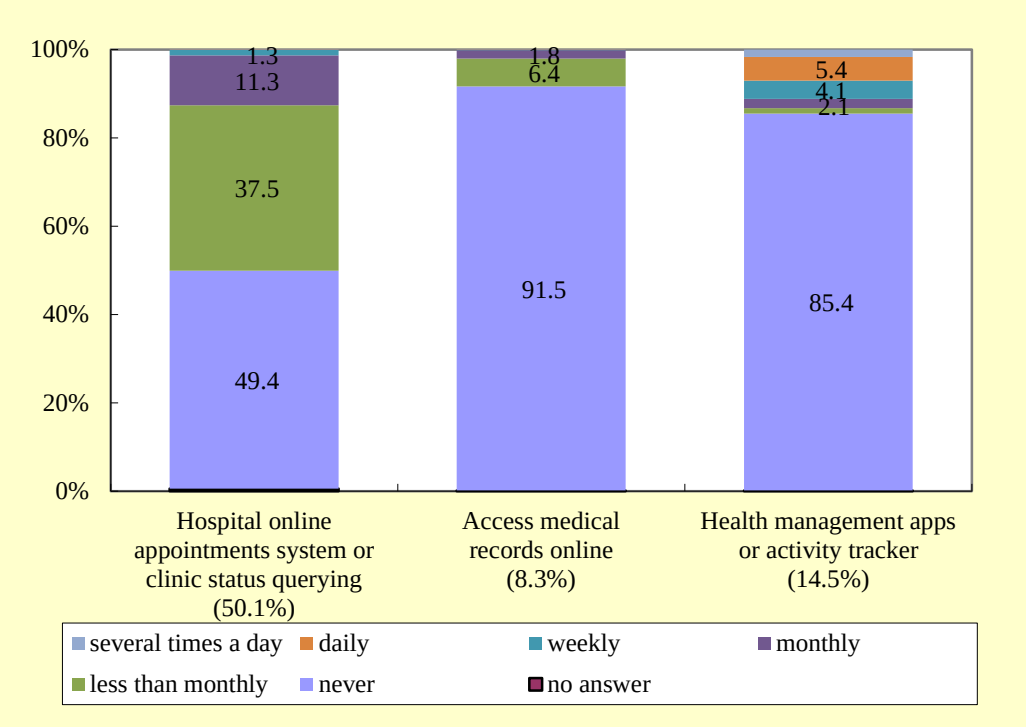

Figure 9 Internet users' healthcare participation in the last year

(3) Exclusion

"Exclusion" is the third Primary Dimension of digital opportunity survey indicator structure. It mainly discusses whether an individual has caused a crisis or rights invasion because of the use of ICT. Among them, the personal crisis includes four indicators: Internet addiction, social ability, physical condition and text expression ability. The social crisis refers the Internet freedom of speech and cyberbullying problem brought by anonymity. The invasion of rights can be divided into invasion of privacy and damages of equity. The former discusses whether individuals use the Internet to cause personal funds leakage or account identity theft. The latter understands the situation in which individuals experienced fraud and information device being hacked.

Personal crisis part, with lots of Internet senior users over 60-year-old added to the sample, the number of users who without Internet access over a certain time claims would feel anxious has slightly decreased from 54.2% in 2017 to 52.0% in 2018; and by the use of the Internet, the rate of users who have their own negative impact on the real social skills, physical condition and writing ability, 10.6%, 28.3% and 17.4%. [Figure 10]

In the social crisis part, the troll/hater culture and cyberbullying brought about by the high anonymity of the Internet which is a problem that the whole society needs to face together. According to the survey, although 81.8% of the Internet users think that their speeches in the online world are similar to or unwilling to speak on the Internet, 2.8% of Internet users admit that their online speech is more intense than in the real world ; On the other hand, the 3.5% Internet users said that in the past year, there has been a cyberbullying experience of being attacked by others on the Internet.

In the invasion of rights section, 9.8% of the Internet users said that in the past year, there was a situation in which personal data has leaked due to the use of the Internet. 5.5% had been scammed online due to Internet access in the past year, and 12.4% had encountered a computer or phone hacked, similar to the 2017 survey results, changes only in about one percentage point. [Figure 11]

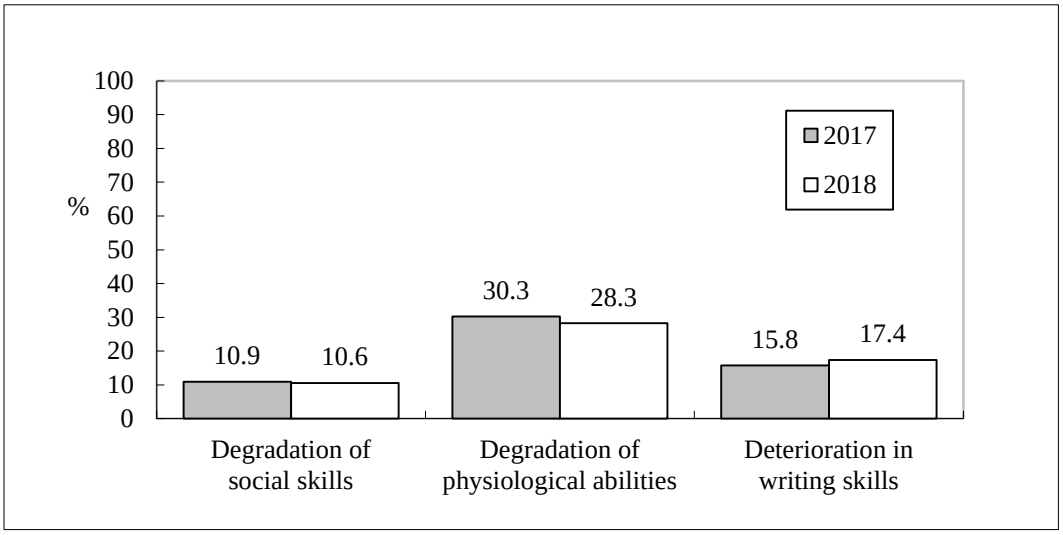

Figure 10 The Internet users' belief of degraded abilities due to Internet use.

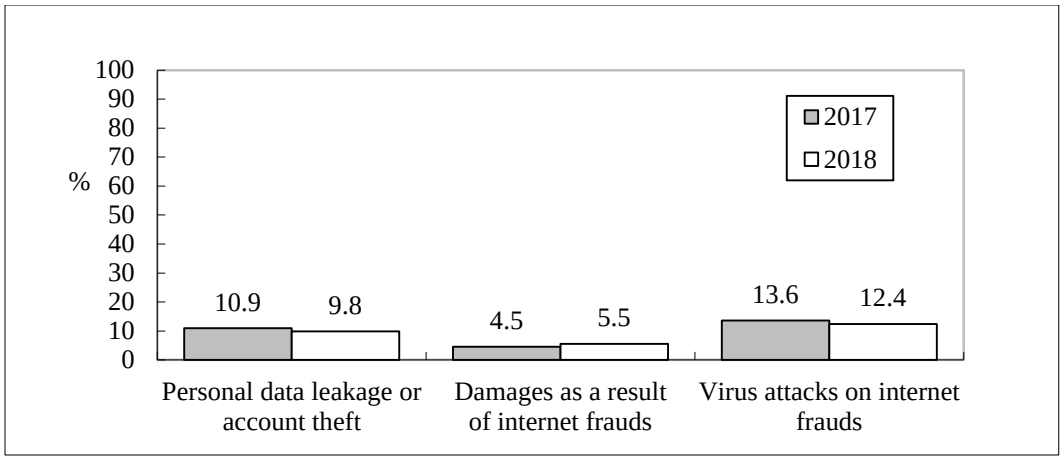

Figure 11 Internet users' experience of invasion of rights caused by the use of the Internet

(II) Differential Digital Opportunity

1. Digital opportunity in Gender Difference

(1) Enabling

Gender is an important variable used by scholars to explain the digital opportunity gap. The 2018 survey shows that although the female's Internet access rate has improved, it is similar to the increase in males. Therefore, the overall online access rate of women still maintains 3.5 percentage points behind males. After entering the online world, women's online experience, digital footprint awareness, or self-assessment of information gathering and judgment ability is not much different from that of men, but overall, males rates' over the access to Internet devices and access to the Internet, and programming learning experience is higher than women. [Table 4]

Table 4 Gender Differences and Similarities in " Enabling"

unit:%

Secondary Dimension	Indicator	Male	Female	Total
Use of information	Internet access rate	88.2	84.7	86.5
	Mobile phone use	92.8	89.4	91.1
	Personal Internet device ownership (items)	3.16	3.10	3.13
	Use rate of wireless or mobile internet	98.6	97.9	98.2
Skills and literacy	Network access rights awareness (clear %)	55.6	47.8	51.7
	Digital footprint cognition (clear %)	76.9	74.2	75.5
	Travel information collection ability self-evaluation (points)	6.4	6.1	6.2
	Self-evaluation of food information collection ability (points)	6.7	6.9	6.8
	Thematic new information gathering ability self-evaluation (points)	6.9	6.8	6.9
	Internet news or news verification (item)	0.93	1.01	0.97
	Programming learning experience	30.5	17.2	23.9

Note: □ indicates higher than or equal to the overall average; ▨ Indicates lower than the overall average.

(2) Inclusion

From the perspectives of Inclusion in the five areas of study, social life, economy, civil participation and healthcare, Tables 5 and 6 show that female Internet users are more active than male Internet users over non-public domains, online quotations, online reviews, and online shopping and healthcare, while male Internet users have a higher interests in online gaming and near-field mobile payments, as well as the willingness to express personal opinions on public sector policies. For other uses such as information creation, online courses, social media or online audio and video, gender differences in annual usage rate or daily usage rate are limited.

Table 5 Gender Differences and Similarities in "Inclusion" [1]

unit:%

Secondary Dimension	Indicator	Every day		Last year		
		Male	Female	Male	Female	Total
Learning activities	Information utilization and creation	12.6	10.9	46.5	49.3	47.9
	Online course	2.5	2.3	22.5	22.1	22.3
Social life	Information acquisition	29.7	29.5	78.6	80.8	79.7
	Instant messaging and social media	89.3	91.4	96.4	97.3	96.8
	Online audio and video	52.7	48.3	83.8	82.3	83.1
	Online gaming	38.7	27.4	50.4	40.3	45.4
	VoIP	43.8	38.7	84.6	86.8	85.7
	Web content creation	4.9	4.8	43.3	48.7	46.0
	Cross functional social media	—	—	1.58	1.74	1.66
Economic development	Online comment or price comparison	8.5	9.6	56.9	62.7	59.8
	Online shopping experience	7.4	14.0	52.6	64.4	58.5
	Innovative Internet business model	2.1	1.6	10.9	11.4	11.2
	Online payment	—	—	3.36	3.31	3.33
	Online sales experience	1.1	1.5	5.8	8.5	7.1
	Near-field payment experience			15.6	13.7	14.6
	Online or mobile banking experience	5.3	2.6	32.7	33.1	32.9

Note: □ indicates higher than or equal to the overall average; □ Indicates lower than the overall average.

Table 6 Gender Differences and Similarities in "Inclusion"

unit:%

Secondary Dimension	Indicator	Every day		Last year		
		Male	Female	Male	Female	Total
Civil participation	E-government initiative service contact experience	14.6	11.9	61.8	58.3	60.0
	E-government passive service experience	21.3	17.1	33.4	31.9	32.7
	E-government online application (new)	3.7	2.2	28.7	26.9	27.8
	Use of government open resource	4.2	2.5	10.9	9.4	10.1
	Official online channel public participation	1.2	0.8	6.0	5.6	5.8
	Review to legislate policy	5.5	2.3	9.9	5.8	7.9
	Comment	5.7	2.0	11.0	5.5	8.2
Healthcare	Online registration or visit progress inquiry	11.5	13.7	45.7	54.5	50.1
	Online medical records, history, and results	2.3	1.7	8.6	8.0	8.3
	Autonomous health management	7.3	6.7	13.8	15.1	14.5

Note: ☐ indicates higher than or equal to the overall average; ☐ Indicates lower than the overall average.

(3) Exclusion

Evaluating the difference in risk of Internet use between two genders, the results show that the female Internet users reflects due to the use of Internet that the degradation of physical condition is higher than that in the males; the male Internet users has higher rates who admit their Internet speech is more intense than in the real life, rate of being speech attacked and the rate of device being hacked is slightly higher than that of females. [Table 7]

Table 7 Gender Differences and Similarities in "Exclusion"

unit:%

Secondary Dimension	Indicator	Male	Female	Total
Personal crisis	Internet anxiety	51.1	52.9	52.0
	Physiological deterioration	25.8	30.8	28.3
	Social ability degradation	10.7	10.6	10.6
	Text expression ability deteriorates	17.1	17.7	17.4
Social crisis	Online speech scale (% intense)	4.0	1.5	2.8
	Cyberbullying	4.6	2.4	3.5
Invasion of privacy	Personal account leakage or account stolen	9.3	10.3	9.8
Impaired equity	Internet fraud damage	5.8	5.1	5.5
	IT device hacked	14.5	10.3	12.4

Note: □ indicates higher than or equal to the overall average; □ Indicates lower than the overall average.

2. Generational Digital Opportunity Difference

(1)Enabling

The gap of digital capacity between different generations is very obvious. People over 65 years old are obviously behind over the use of information opportunities (42.8% of Internet access rate, and only 65.3% have used mobile phones in the past three months). For who entered the Internet world at the age of 60, their types of information device, security awareness, information screening and identification capabilities are also significantly weaker. As for the programming experience of the Internet users, it is fairly better at 30 years old or younger (more than 30%). [Table 8]

Table 8 Generational Differences and Similarities of "Enabling"

unit:%

Secondary Dimension	Indicator	aged between 12-14	aged between 15-19	aged between 20-29	aged between 30-39	aged between 40-49	aged between 50-59	aged between 60-64	at or above the age of 65	Total
Use of Information	Internet access rate	99.6	99.7	99.4	99.0	97.7	89.3	77.6	42.8	86.5
	Mobile phone use	85.9	97.1	98.9	98.9	97.7	94.1	88.1	65.3	91.1
	Personal Internet device ownership (items)	2.55	3.00	3.22	3.40	3.38	3.03	2.83	2.54	3.13
	Wireless or mobile internet	98.1	98.7	99.4	99.8	98.7	97.5	96.3	94.2	98.2
Skills and literacy	Awareness of network access	59.6	68.5	71.1	61.8	50.7	33.8	30.5	26.6	51.7
	Awareness of digital footprint	83.2	89.3	90.8	83.7	76.6	64.8	55.5	45.5	75.5
	Travel information collection ability self-evaluation (points)	5.9	6.5	7.1	6.9	6.5	5.5	4.7	4.1	6.2
	Self-evaluation of food information collection ability (points)	6.2	6.9	7.6	7.3	7.1	6.1	5.4	4.9	6.8
	Thematic new information gathering ability self-evaluation (points)	6.5	7.2	7.6	7.3	7.2	6.3	5.6	5.2	6.9
	Internet news or news verification (item)	1.02	1.09	1.20	1.12	0.96	0.82	0.78	0.51	0.97
	Programming learning experience	31.8	37.4	33.1	25.3	22.6	16.7	15.4	11.7	23.9

Note: □ indicates higher than or equal to the overall average; □ Indicates lower than the overall average.

(2) Inclusion

Table 9 compares the different Internet usage of different generations. In the secondary dimension of "learning activity", users of 15~29 year-old are more enthusiastic. In terms of social life and economic activities, there is no significant difference in the use of social media in all generations, and the rest are mostly by 20~39 year-old. As for civil participation and healthcare, the group of 30~49 year-old is relatively more active.

Table 9 Generation differences & similarities in "Inclusion" (use rate in the last year)

unit:%

Secondary Dimension	Indicator	Aged between 12-14	aged between 15-19	aged between 20-29	aged between 30-39	aged between 40-49	aged between 50-59	aged between 60-64	at or above the age of 65	Total
Learning activities	Information utilization and creation	65.0	68.6	64.6	51.2	46.2	36.2	30.7	22.7	47.9
	Online course	36.1	39.2	34.8	23.3	20.2	14.5	10.1	4.7	22.3
Social life	Information acquisition	83.5	87.1	88.9	85.5	84.8	74.2	64.3	50.1	79.7
	Instant messaging and social media	91.9	98.1	99.1	98.2	97.4	96.2	92.7	93.2	96.8
	Online audio and video	94.9	96.4	94.9	89.9	84.5	73.4	63.8	58.3	83.1
	Online gaming	88.6	76.6	69.0	50.1	40.6	24.4	20.6	15.4	45.4
	VoIP	63.0	82.2	90.8	89.9	87.3	85.4	81.2	77.3	85.7
	Web content creation	42.7	44.9	60.0	59.3	49.1	31.6	31.3	21.9	46.0
	Cross functional social media	1.27	1.64	1.85	1.86	1.72	1.55	1.46	1.21	1.66
Economic development	Online comment or price comparison	40.8	60.5	76.9	73.6	68.5	47.9	33.7	23.3	59.8
	Online shopping experience	22.4	57.6	75.8	74.1	68.1	46.7	33.6	22.8	58.5
	Innovative Internet business model	3.2	8.2	19.7	16.4	10.4	6.5	4.5	3.3	11.2
	Online payment	1.86	2.27	3.46	3.64	3.57	3.20	2.89	2.35	3.33
	Online sales experience	2.0	9.1	10.3	11.9	6.4	4.2	1.3	1.9	7.1
	Near-field payment experience	5.9	8.6	21.3	21.6	17.5	10.4	4.9	3.0	14.6
	Online or mobile banking experience	2.7	5.8	36.8	47.7	42.8	29.1	24.5	16.6	32.9
Civil participation	E-government initiative service contact experience	39.6	56.4	59.7	63.2	66.8	60.8	55.3	51.0	60.0
	E-government passive service experience	22.7	22.3	33.7	39.9	39.6	31.7	23.7	19.3	32.7
	E-government online	1.1	2.9	21.6	42.1	42.6	26.7	18.9	13.9	27.8

	application (new)									
	Use of government open resource	2.7	4.7	10.6	13.6	14.6	8.1	6.9	4.8	10.1
	Official online channel public participation	2.0	3.5	7.0	6.0	7.1	5.7	3.8	4.8	5.8
	Review to legislate policy	5.8	8.8	9.5	9.5	8.7	5.9	6.9	3.9	7.9
	Comment	9.2	7.2	8.8	9.3	7.1	8.4	9.1	6.6	8.2
Healthcare	Online registration or visit progress inquiry	14.4	22.8	49.9	61.4	60.4	51.7	43.6	38.8	50.1
	Online medical records, history, and results	4.8	6.0	10.2	11.7	8.8	5.7	6.2	6.1	8.3
	Autonomous health management	16.3	14.2	18.5	16.9	16.4	11.8	8.8	5.2	14.5

Note: ▯ indicates higher than or equal to the overall average; ▯ Indicates lower than the overall average.

(3) Exclusion

From the perspective of generational differences, about 70% of the Internet ages of 15-29 years old admit that they will be anxious when they are not online for more than a period of time. The ratio is significantly higher than other generations. The deterioration of social ability has a greater impact on the age of 20-29, and the ability to express words is degraded. It is most obvious for 30-49 years old. As for the physiological impact of Internet use, it is more obvious to the Internet users of 40-59 years old. [Table 10]

In the online speaking scale section , the 15-19-year-old Internet users admitted that their Internet speaking is the highest rate than the real world . The younger generation of 12-14 years old is the highest rate of cyberbullying .As for foreign capital or online fraud , the most active Internet-based 20-39-year-old Internet users has the highest rate of victimization . Device poisoning is common among Internet users aged 50-59 . [Table 10]

Table 10 Generation differences and similarity of "Exclusion"

unit:%

Secondary Dimension	Indicator	aged between 12-14	aged between 15-19	aged between 20-29	aged between 30-39	aged between 40-49	aged between 50-59	aged between 60-64	at or above the age of 65	Total
Personal crisis	Internet anxiety	60.0	69.7	70.1	61.9	51.5	36.7	28.2	24.6	52.0
	Physiological deterioration	16.3	21.2	28.2	29.0	34.3	30.6	23.0	22.9	28.3
	Social ability degradation	4.2	11.8	14.5	12.6	10.7	8.4	7.6	6.6	10.6
	Text expression ability deteriorates	3.1	8.6	14.7	21.3	20.6	18.9	16.9	16.2	17.4
Social crisis	Internet freedom of speech	1.2	4.6	3.9	3.2	2.1	1.8	2.0	2.5	2.8
	Cyberbullying	5.8	4.7	4.1	4.7	3.0	3.1	0.9	1.6	3.5
Invasion of privacy	Personal identity theft	5.4	3.6	15.4	12.9	9.6	7.7	6.5	5.3	9.8
Impaired equity	Internet fraud damage	1.2	3.0	5.6	8.0	5.6	5.9	4.0	3.5	5.5
	IT device hacked	6.6	9.3	10.2	12.6	12.3	17.1	12.5	12.0	12.4

Note: ☐ indicates higher than or equal to the overall average; ☐ Indicates lower than the overall average.

3. County/city Regional Digital Opportunity Difference

(1) Enabling

The impact of the county, city or region on information use opportunities, as a whole, is still mainly affected by urbanization development, population structure and living needs .

Differences from the city/county jurisdiction perspective, Taipei & Hsinchu ranked first in all indicators of “Enabling” section among the 22 counties and cities, the aging of the population structure of agricultural counties such as Chiayi County, Yunlin County public, although access rate significantly improved, but overall development is still relatively behind.

From the perspective of the degree of urbanization development, each region generally conforms to the pattern of higher urbanization has better performance. The aging and rural areas have a considerable gap apart from the development of major cities.

From the perspective of digital development classification, in addition to the wireless or mobile Internet access rate, most of the various “Enabling” indicators show the best performance in the digital development level 1 area, the digital development level 2 area ranked 2nd, and the digital development level 5 area ranked last; As for digital development level 4 areas, because of the remote county and city including the outlying islands and the east, it is more dependent on the Internet and mobile phones than the digital development level 3 area, but the technical literacy such as the concept of security is similar to the digital development level 3 area. There is no obvious advantage. [Table 11]

Table 11 Regional differences and similarities of "Enabling"

unit:%

Secondary Dimension	Indicator	Level-1 Digital Development Areas	Level-2 Digital Development Areas	Level-3 Digital Development Areas	Level-4 Digital Development Areas	Level-5 Digital Development Areas	Total
Use of information	Internet access rate	90.0	87.9	81.5	84.3	62.1	86.5
	Mobile phone use	93.2	92.0	88.3	89.9	76.1	91.1
	Personal Internet device ownership (items)	3.29	3.17	2.82	2.96	2.54	3.13
	Use rate of wireless or mobile internet	98.6	98.2	97.9	98.0	98.2	98.2
Skills and literacy	Network access rights awareness (clear %)	52.1	52.4	49.6	52.7	47.9	51.7
	Digital footprint cognition (clear %)	77.4	75.6	72.3	75.5	70.7	75.5
	Travel information collection ability self-evaluation (points)	6.4	6.2	6.0	6.3	5.7	6.2
	Self-evaluation of food information collection ability (points)	7.0	6.7	6.6	6.6	6.1	6.8
	Thematic new information gathering ability self-evaluation (points)	7.0	6.8	6.7	6.7	6.5	6.8
	Internet news or news verification (item)	1.00	0.97	0.94	0.96	0.87	0.97
	Programming learning experience	26.4	24.2	20.0	21.0	12.3	23.9

Note: □ indicates higher than or equal to the overall average; □ Indicates lower than the overall average.

(2) Inclusion

As for the impact of other variables on the participation of applications, the overall application is still the best in Taipei, Hsinchu City or major cities.

From the perspective of digital regional differences, the “learning” secondary dimension indicators perform best in the digital level 4 area, but it has little difference with other areas. In addition to the use of information, the secondary dimension of “social life” has almost no regional gaps, and they have the most equal opportunities for digital opportunities . [Table 12]

As for “economic life” and “civil participation” , although the online shopping ratio of the level 4 area in the outlying islands and the eastern part of the country is high, the remaining indicators are still most active in the digital level 1 area. [Table 12]

Table 12 - Regional differences and similarities of "Inclusion" (use rate in the last year)

unit:%

Secondary Dimension	Indicator	Level-1 Digital Development Areas	Level-2 Digital Development Areas	Level-3 Digital Development Areas	Level-4 Digital Development Areas	Level-5 Digital Development Areas	Total
Learning activities	Information utilization and creation	48.8	48.2	45.8	49.5	42.0	47.9
	Online course	22.7	23.3	19.0	24.9	18.4	22.3
Social life	Information acquisition	81.6	79.7	77.6	77.2	68.5	79.7
	Instant messaging and social media	97.5	96.7	95.9	96.0	98.2	96.8
	Online audio and video	84.5	82.5	81.7	82.9	82.3	83.1
	Online gaming	44.0	46.5	45.5	45.5	46.1	45.4
	VoIP	85.8	85.9	84.9	84.9	86.3	85.7
	Web content creation	47.9	44.5	45.7	46.2	43.8	46.0
	Cross functional social media	1.63	1.66	1.72	1.70	1.75	1.70
Economic development	Online comment or price comparison	61.4	60.4	56.9	55.4	50.3	59.8
	Online shopping experience	58.7	60.4	54.5	59.4	52.2	58.5
	Innovative Internet business model	13.6	10.9	7.6	9.3	5.8	11.2
	Online payment	3.42	3.34	3.12	3.41	2.90	3.33
	Online sales experience	8.0	6.0	7.6	7.4	7.7	7.1
	Near-field payment experience	16.9	14.0	12.1	14.9	9.2	14.6
	Online or mobile banking experience	38.4	31.8	26.5	28.8	19.2	32.9
Civil participation	E-government initiative service contact experience	61.2	59.3	58.5	62.0	63.8	60.0
	E-government passive service experience	34.4	32.8	29.9	31.6	25.1	32.7
	E-government online application (new)	31.2	27.6	23.6	25.6	13.2	27.8
	Use of government open resource	11.4	10.1	8.4	10.1	3.9	10.1
	Official online channel public participation	7.5	4.8	4.5	7.6	2.4	5.8
	Review to legislate policy	8.6	7.3	7.9	9.6	3.8	7.9
	Comment	8.5	7.5	9.3	8.7	8.1	8.2
Healthcare	Online registration or visit progress inquiry	53.7	50.5	43.5	49.4	35.5	50.1
	Online medical records, history, and results	9.4	7.7	7.9	6.5	7.3	8.3
	Autonomous health management	16.0	14.7	11.5	12.8	11.0	14.5

Note: ☐ indicates higher than or equal to the overall average; ☐ Indicates lower than the overall average.

(3) Exclusion

Judging from the differences in digital development, Internet users in digital development level 5 area have experienced the least anxiety, and the ratio of self-recognition impacts to their physiological ability and written expression is relatively low. The Internet freedom of speech and cyberbullying are slightly higher in the ratio of digital level 1 and level 3 area. As for invasion of privacy or equity damages, digital level 1 area has higher ratio in privacy leakage and Internet fraud, but hacking takes place more common in digital level 5 comparing to other areas. [Table 13]

Table 13 Regional Differences and Similarities in "Exclusion"

unit:%

Secondary Dimension	Indicator	Level-1 Digital Development Areas	Level-2 Digital Development Areas	Level-3 Digital Development Areas	Level-4 Digital Development Areas	Level-5 Digital Development Areas	Total
Personal Crisis	Internet Anxiety Level	54.3	52.0	48.4	50.7	43.3	52.0
	Degradation of Physiological Abilities	29.4	27.9	27.3	28.3	25.0	28.3
	Degradation of Social Skills	9.9	10.9	11.5	10.9	10.1	10.6
	Deterioration in Writing Skills	17.9	17.6	16.2	17.6	12.4	17.4
Social Crisis	Openness of Internet Remarks	3.3	2.6	2.0	3.1	2.1	2.8
	Cyberbully	4.4	3.2	2.4	4.1	1.9	3.5
Infringement of Privacy	Personal Data Leakage or Account Theft	11.5	9.6	7.2	9.3	7.9	9.8
Damage to Rights and Interests	Damages as a result of Internet frauds	6.4	5.4	4.1	5.7	3.1	5.5
	Virus Attacks on Internet Frauds	12.3	11.8	13.7	12.5	15.6	12.4

Note: ☐ indicates higher than or equal to the overall average; ☐ Indicates lower than the overall average.

V. Trends in the results of the annual survey

(I) Enabling

1. Household Use of Information Opportunity

In response to the fact that more and more people rely on mobile phones to access the Internet, the 2017 survey has officially listed "accessing Internet solely on smartphone" as one of the method for household use. As a result, it is found that the trend of household Internet connection declines along with the changes of definitions. 81.1% in 2016 rebounded to 85.1% in 2017, and 84.9% of households still have access to the Internet this year. [2] [Figure 12]

Observing the information environment improvement of households in various counties and cities. In the past year, the Internet connection rate of households in 22 counties and cities increased by more than 3 percentage points in Chiayi County and Taitung County. [Table 14]

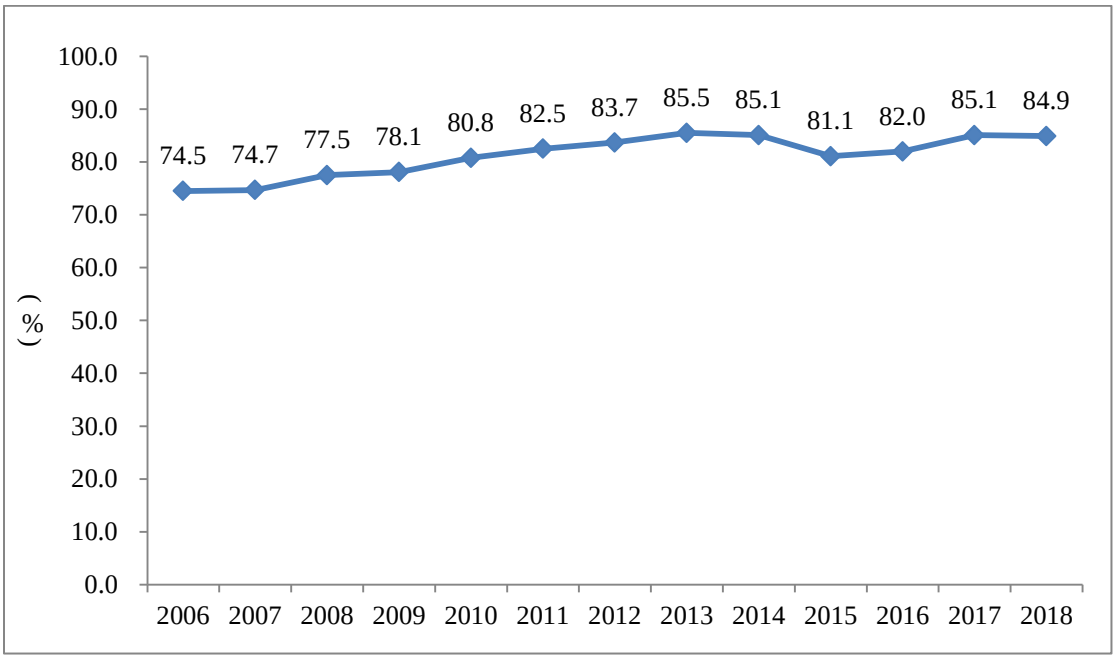

Figure 12 Cross-year comparison of Taiwan household information environment

Table 14 Cross-year comparison of household information environment in counties and cities

unit:%

	2015	2016	2017 (A)	2018 (B)	B-A Increased/ Decreased by
Total	82.0	81.1	85.1	84.9	-0.2
New Taipei City	85.5	84.6	87.6	88.1	0.5
Taipei City	86.4	87.1	90.7	91.1	0.4
Taoyuan City	84.2	83.8	88.8	89.1	0.3
Taichung City	83.5	82.5	88.7	84.0	-4.7
Tainan City	79.5	76.1	81.3	82.8	1.5
Kaohsiung City	79.9	80.3	82.8	83.8	1.0
Ilan County	79.0	79.2	80.7	80.2	-0.5
Hsinchu County	84.1	83.2	87.7	89.5	1.8
Miaoli County	79.9	78.3	83.6	84.3	0.7
Changhua County	80.8	75.8	81.9	79.7	-2.2
Nantou County	76.9	75.2	80.3	81.7	1.4
Yunlin County	73.7	73.3	75.6	78.2	2.6
Chiayi County	70.9	71.0	73.6	76.7	3.1
Pingtung County	74.6	73.2	79.8	79.7	-0.1
Penghu County	71.8	76.0	78.1	78.4	0.3
Hualien County	79.0	78.9	84.8	85.2	0.4
Taitung County	72.7	75.4	79.8	83.5	3.7
Keelung City	85.3	83.9	85.6	85.4	-0.2
Hsinchu City	88.7	88.2	90.1	90.5	0.4
Chiayi City	81.0	81.3	85.2	85.9	0.7
Kinmen County	80.6	79.5	85.6	83.9	-1.7
Lianjiang County	77.9	82.9	85.6	84.1	-1.5

2. Personal Use of Information Opportunities

According to the 2018 survey, the percentage of people over the age of 12 who used the Internet was 86.5%, an increase of 4.2 percentage points from the survey of the previous year (2017) , and the growth rate was the fastest in the past years. From the

long-term trend, since 2005, the domestic Internet usage rate has increased from 62.7% to 86.5% in 107 years, and has grown by 23.8 percentage points in 13 years. [Figure 13]

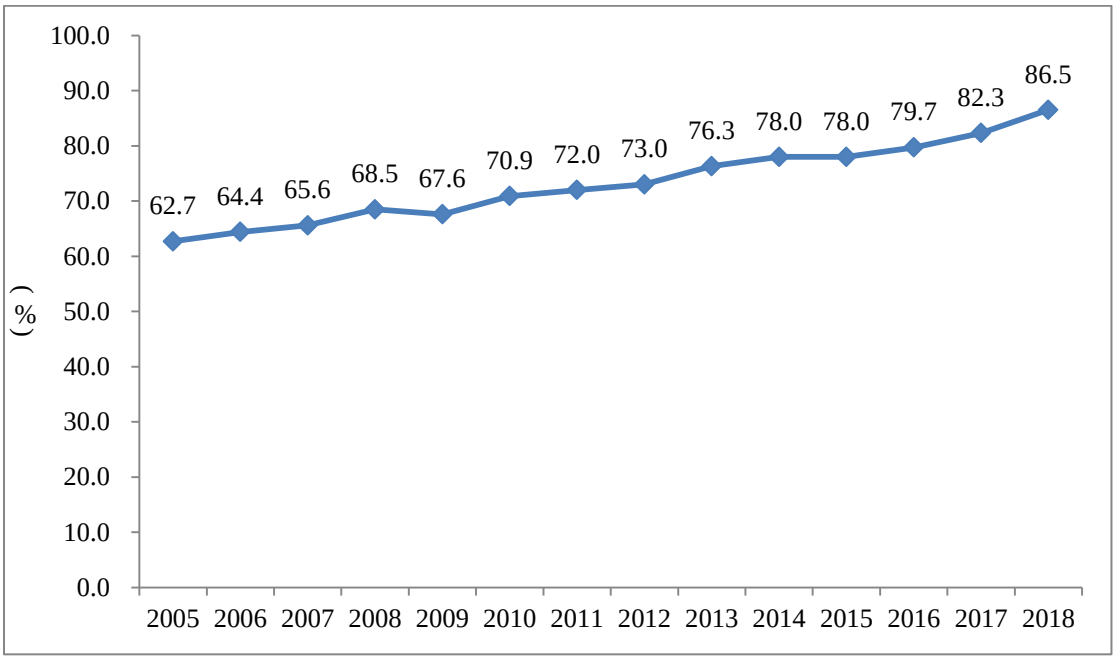

Figure 13 Cross-year comparison of Internet usage of Taiwanese people over 12 years old

According to the changes in the network usage rate of counties and cities, the Internet access rate of 22 counties and cities has increased from 2017. Among them, Chiayi County, which has the lowest Internet access rate in the past years, has the fastest growth rate, and the Internet access rate has increased by 7.9 percentage points. In Kaohsiung City, Taitung County, Nantou County, Pingtung County and Yunlin County the Internet access rates also showed a better performance, which was more than 5 percentage points higher than last year. [Table 15]

From the perspective of the digital development level in urban and rural areas, in the past year, the growth rate of the Internet usage rate of the digital development level 3 area has been the most obvious, which is 7.2 percentage points higher than that of 2017 . The number of people in the digital development level 5 area is slightly lower than that of 2017, but the change is within the sampling tolerance. [Table 16]

Table 15 Cross-year comparison of the Internet usage rate in each county and city

Unit: %

County/City	2005	2006	2007	2008	2009	2010	2011	2012	2014	2015	2016	2017 (A)	2018 (B)	B-A Increased/ Decreased by
Total	62.7	64.4	65.6	68.5	67.6	70.9	72.0	73.0	78.0	78.0	79.7	82.3	86.5	4.2
New Taipei City	67.9	70.1	70.9	72.6	71.7	74.6	77.0	77.0	81.6	79.8	82.4	85.8	90.6	4.8
Taipei City	72.2	72.8	71.6	75.5	73.0	77.6	80.1	78.5	85.0	82.6	85.4	87.0	90.6	3.6
Taoyuan City	66.6	69.8	69.6	73.7	72.3	75.9	74.4	76.9	80.4	82.0	84.3	87.1	90.0	2.9
Taichung City	66.6	67.1	69.4	70.8	71.2	74.1	73.7	74.3	79.1	81.7	82.4	83.3	88.0	4.7
Tainan City	58.6	58.4	61.8	63.3	64.5	66.7	66.8	68.5	75.5	74.4	74.4	80.2	83.5	3.3
Kaohsiung City	62.3	63.1	62.6	67.7	66.4	70.3	71.3	70.3	76.8	76.6	77.8	79.3	85.4	6.1
Ilan County	57.6	59.5	62.0	64.0	61.4	66.6	65.0	68.6	74.9	77.0	78.3	78.9	83.6	4.7
Hsinchu County	65.3	64.8	68.0	69.6	68.9	72.0	74.4	74.2	81.3	80.9	82.3	83.4	87.9	4.5
Miaoli County	55.9	59.5	64.1	63.3	66.2	67.1	69.9	71.4	72.3	75.3	76.9	81.1	85.9	4.8
Changhua County	54.1	56.9	56.9	63.1	59.4	63.0	64.9	69.2	76.0	73.6	74.1	79.1	82.9	3.8
Nantou County	52.1	56.0	58.5	60.9	63.1	64.6	65.3	68.3	71.1	73.2	74.4	77.3	82.8	5.5
Yunlin County	49.5	48.6	53.2	56.3	53.1	58.7	61.0	65.4	67.1	68.7	71.3	73.5	78.7	5.1
Chiayi County	48.6	51.0	52.2	56.2	54.5	56.8	59.5	63.1	64.2	65.4	68.5	70.0	77.9	7.9
Pingtung County	50.6	56.1	56.0	59.5	58.0	59.5	61.9	66.1	69.4	69.3	72.0	77.4	82.6	5.1
Penghu County	49.3	53.7	55.4	58.0	55.4	62.9	61.2	64.9	68.3	74.4	75.0	76.7	81.2	4.4
Hualien County	57.1	59.8	61.8	63.8	65.5	68.8	69.4	71.5	74.9	75.0	78.1	81.8	85.4	3.6
Taitung County	54.6	57.6	61.8	64.9	64.4	67.3	66.3	68.9	71.0	73.1	75.5	78.2	84.0	5.8
Keelung City	62.8	65.7	71.1	70.8	69.1	73.8	72.8	72.8	77.6	83.1	83.2	83.5	87.9	4.4
Hsinchu City	70.0	73.2	75.5	75.9	76.0	76.6	78.0	79.7	84.0	84.7	86.1	89.3	90.9	1.6
Chiayi City	62.8	64.6	67.2	71.1	67.9	72.1	74.5	75.3	81.0	80.0	81.9	82.6	86.7	4.1
Kinmen County	54.0	59.8	61.3	64.5	62.0	67.5	66.6	69.4	75.5	77.7	77.7	83.8	85.6	1.8
Lianjiang County	63.2	68.8	67.5	70.1	66.8	72.6	75.8	76.3	77.8	78.8	83.3	84.3	85.7	1.4

Note: The 2014 survey is not included for analysis as the sample sizes in each county and city are smaller.

Table 16 Cross-year comparison of the usage rate of the population network in each digital development area

unit:%

Item	Level-1 Digital Development Areas	Level-2 Digital Development Areas	Level-3 Digital Development Areas	Level-4 Digital Development Areas	Level-5 Digital Development Areas
2013	84.3	81.4	73.6	72.0	59.9
2014	82.6	79.2	70.8	72.3	58.1
2015	82.0	80.1	69.9	74.5	58.9
2016	83.8	81.5	73.1	76.4	57.8
2017(A)	87.2	83.8	74.2	80.0	65.1
2018(B)	90.0	87.9	81.5	84.3	62.1
B-A Increased/ Decreased by	2.8	4.1	7.3	4.3	-3.0

3. Mobile Internet Use Rate

From the mobile Internet experience, the ratio of the users who had used the Internet on any mobile devices climbed every year from 53.0% (2010). This year, mobile Internet usage reached a new high 98.2%; the rate of mobile Internet access increased from 80.1% in 106 years to 84.9%. [Figure 14]

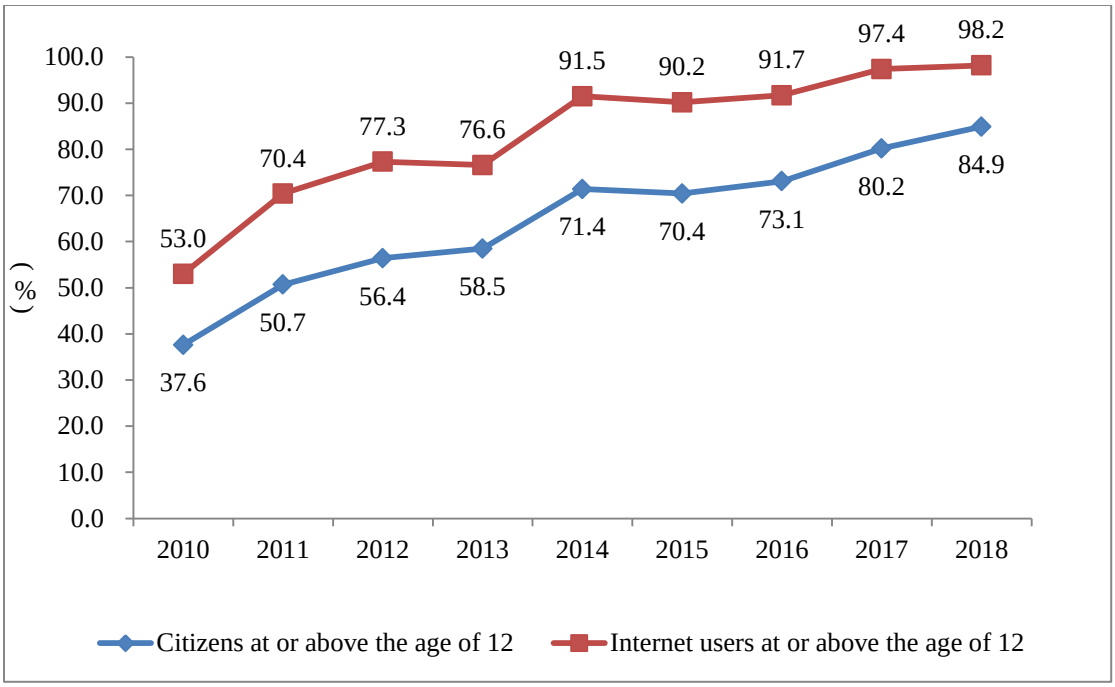

Figure 14 Cross-year comparison of the use of mobile Internet access

(II) Inclusion

Observing the trend of changes in the use of learning activities, social activities, economic activities, healthcare and civil participation, similarity observed in the "Enabling" section is noticeable, because the newcomers in the online world are mainly people over the age of 60, their use of the Internet is still based on community applications. Except for instant messaging or social media maintained at a high participation rate of 96.8% and healthcare at 2017 rate, most of the other indicator rates were slightly lower than those in 2017. Among them, information acquisition, online gaming and Internet content creation declined the most.

Among the trends in which most indicators are declining or maintained, the e-government proactive service contact experience and near-field mobile payment experience are more specific. The former's reach rate was 9.8 percentage points higher than that of 2017, reflecting the government's more active contact with the public. The latter was because young people aged 20-49 began to try near-field mobile payments. [Table 17]

Table 17 Cross-year comparison of digital opportunity "Inclusion" indicators

Unit: %

Secondary Dimension	Indicator	2017 (A)	2018 (B)	B-A Increased/ Decreased by
Learning Application	Learning Skills Online	49.4	47.9	-1.5
	Attending Online Courses/Tests	21.2	22.3	+1.1
Social Life Application	Searching for Information	84.4	79.7	-4.7
	Social Networking	96.8	96.8	0.0
	Online Audios and Videos	84.6	83.1	-1.5
	Online Games	48.8	45.4	-3.4
	Internet Phone Calls	86.3	85.7	-0.6
	Internet Content Creation	49.8	46.0	-3.8
	Cross-Border Functionality of Social Media	1.73[3]	1.66	-0.07
Economic Application	Online Reviews and Ratings	61.3	59.8	-1.5
	Online Shopping	59.2	58.5	-0.7
	Online Platform Sharing Economy	10.2	11.2	+1.0
	Online Shopping Payment Methods	3.36[4]	3.33	-0.03
	Online Selling	7.3	7.1	-0.2
	Mobile Payment	10.1	14.6	+4.5
	Online Banking Services	33.2	32.9	-0.3
Citizen Participation	Receiving Push Notifications from the Government	50.2	60.0	+9.8
	Searching for Information of Government Policies or Announcements	35.4	32.7	-2.7
	E-government Online Request Service	27.6	27.8	+0.2
	Download Government Open Data	11.4	10.1	-1.3
	Expressing Public Policies Opinions via Official Platforms	6.3	5.8	-0.5
	Expressing Public Policies Opinions via Social Networking	8.5	7.9	-0.6
	Proposing Objections on the Internet	8.9	8.2	-0.7
Health Application	Hospital Online Appointments System or Clinic Status Querying	49.0	50.1	+1.1
	Access Medical Records Online	7.6	8.3	+0.7
	Health Management apps or Activity Tracker	14.3	14.5	+0.2

(III) Exclusion

From the perspective of Internet crisis and invasion of rights, to observe the negative impact of the information society, the overall Internet crisis has also eased with the addition of a large number of older Internet users. The number of Internet users who expressed anxiety that they did not have access to the Internet was slightly reduced from 54.3% in 2006 to 52.0%. [Table 18]

As for the damage to the physiology and real social ability caused by the use of the Internet, the rate of physiological deterioration is slightly reduced by 2.0 percentage points compared with last year. The problem of social ability degradation is even, and the ability to express words is slightly worse .

In terms of invasion of rights, the Internet users' use of the Internet in the past year has caused little change in the rate of capital leakage, device hacking , fraud or cyberbullying. The increase or decrease is within one percentage point .

Table 18 Cross-year comparison of digital opportunity "Exclusion" indicators

unit:%

Secondary Dimension	Third Dimension	Indicator	**2017** (A)	**2018 (B)**	**B-A Increased/ Decreased by**
Internet Use Crisis	Internet addiction	Feeling anxious without using Internet	54.3	52.0	-2.3
	Degradation of physiological abilities	Degradation of physiological abilities	30.3	28.3	-2.0
	Degradation of social skills	Degradation of social skills	10.1	10.6	+0.5
Infringement on rights and interests	Personal data privacy	Personal data leakage	10.9	17.4	+1.6
	Cyber crime	Damages as a result of Internet frauds	4.5	2.8	+0.6
	Cyberbully	Victimized by verbal attacks or insults from Internet remarks	3.7	3.5	-0.2

VI. Suggestions

Based on the results of the 2018 survey, the following two areas of research and policy suggest future directions worth considering:

(I) Policy Recommendations

1. Encourage people over the age of 60 to own smartphones and deepen the demand

Last year (2017) Individual/Household Digital Opportunity Survey showed that the mobile phone ownership rate and Internet access rate of 15-59 year olds have almost reached its limits. If Taiwan's Internet access rate is expected to continue to increase, opportunities will fall on those people who are over 60 years old who can be encouraged to own mobile phones. The above observations were confirmed in the 2018 survey.

In the past two years, the survey pointed out that the ratio of mobile phones held by people over 60 years old in Taiwan increased from 66.3% in 2017 to 72.6%, an increase of 6.3 percentage points a year. Another good news that accompanied the rise in mobile phone holding rate is that the Internet access rate over 60 years old has also increased from 39.4% in 2017 years to 53.9% this year, an increase of 14.5 percentage points. Further analysis found that although the increase rate of senior citizen Internet access rate is the most obvious among senior citizens with high school and junior college degree, the Internet access rate of senior citizens with primary school education or below is also nearly seven percentage points higher than last year. The agriculture, forestry, fishermen, and retired communities, which have been stagnant at all times, have observed an increase of 9 to 14 percentage points this year, which is the most important flip this year.

This flip, in the National Development Council this year, another survey on the number of senior citizens of the digital opportunity has also been confirmed, 2017 senior citizens online rate less than 30% among six counties (Yilan County, Changhua County, Yunlin County, Chiayi County , Pingtung County and Wuhu County), in just one year, the Internet rate rose to 39.3%.

Although the true reason that triggered the flipping is unknown[5], in recent years, the new trend of mobile phone usage has clearly shrunk the digital gaps, among new residents to the aged and agriculture, forestry, fishermen and pastors. If the policy can

continue to encourage those seniors age over 60 to own smartphones and create an environment, the seeds of opportunity will obviously sprout. However, another senior citizen survey this year can find that senior Internet users are more limited in information participation, which will lead to a retirement situation. It is recommended to use policy leverage to encourage the development of seniors' APP from the perspective of seniors, in order to deepen demand and continue the motivation of senior citizens to explore the online world .

2. Digital opportunity scores low in "Inclusion" indicators; policy support can bring results

According to the 2018 survey, in addition to the high Inclusion rate of 96.8% in the use of instant messaging or social media, healthcare has remained at a level of 2017. Most of the other indicator application rates have declined slightly from 2017, among which information acquisition, online gaming, and web content creations have dropped the most.

The reason why the Inclusion rate decrease, in fact, has to do with the new entrants to the online world are many of 60 years old, which means: although the domestic Internet population increased significantly, but if the users has not had a significant use of new applications, and the new entrants use more on social media, the users will have a "dilution" effect, which will lead to a decline in the ratio.

The study believes that with Internet access rate reaches 86%, the mobile Internet rate at 85%, the government should go beyond the demands, in addition to thinking about how to use these mobile phones and mobile networks to draw more convenient e-life blueprints for our nation and also try to understand and rule out the obstacle.

Take near-field mobile payment as an example, currently 15% of the Internet users have used in the past year, having most grown rate, showing the importance of policy support. However, another survey on mobile phone users shows that no credit card or no debit card binding is the main reason why near-field mobile payment can not be used. The loosening or adjustment of relevant financial regulations may bring more possibilities for near-field mobile payment.

3. The e-government initiative to increase the strike rate by 10 percentage points, and the information risk promotion may follow this pipeline.

According to the 2018 survey, among the various e-government services, the government has taken the initiative to provide Internet-based information with the highest rate of access. 60.0% of the Internet users have received public information such as disaster prevention notices or e-newsletters sent by the government. It grew by nearly 10 percentage points from 2017. On the other hand, the rate of active access to electronic government information services as a result of personal needs has fallen from 35.4% to 32.7%, and the rate of public participation through official and unofficial channels has also fallen slightly.

The study believes that the government service utilization rate may not be aimed at maximizing users as its pursuit. However, the promotion of concept of security and information society risk sent autonomously via messages to the high-risk group, will bring more knowledge and healthy attitude to the information society.

(II) Research methods

1. Be cautious to the influence by change of indicators in the interpretation of digital opportunity

The "2018 Individual/Household Digital OpportunitySurvey" was the second large-scale telephone survey after the adoption of the adjusted digital opportunity development indicator. Although the periodic annual survey is best to maintain the consistency of the indicators, the 2017 survey shows that the experts and scholars are most concerned about the information screening and information identification capabilities of the two ability indicators, because of the question "How do you consider your ability in information screening? it’s good or not ?" And "There are a lot of unverified news on the Internet. Do you think that your ability to judge the credibility of information is good ?" As a general subjective appraisal, as many as 63.9% of the Internet users think that their ability to screen information is good, 71.7% think they have good ability to judge whether the information is credible or not. It is impossible to verify whether these results reflect user confidence or real ability.

Therefore, this year's survey had specially corrected these questions, although they are still subjective self-evaluation questions, according to experts and scholars, information screening is based on the specific information collected by the top three most inquired questions for the users to score, including "If you are going to a new country or other city in Taiwan you have never been to, What do you consider your ability in using online information to arrange a three- to five-day trip including transportation, accommodation, planning routes and attractions? From 1 to 10 points. How many points do you give yourself ?"; "What's your ability in searching for a restaurant where you have never been to by using online information, including its location, reviews, price, and must-order dishes. From 1 to 10 points. How many points do you give yourself ?" And "What's your ability to integrate new information from the Internet that you didn't understand, but good for work, school, or personal interest ? From 1 to 10 points. How many points do you give yourself ?" The ability to identify information was by directly asking the Internet users about specific actions when unable to verify the credibility of information online.

It was found that the use of specific information and specific action self-evaluation significantly revised the original highly optimistic values, which led to the average score of "skills and literacy" indicator dropped from 50.4 points in 2017 to 42.2 points in 2018. When interpreting, it should be noted that this year's change does not mean that the ability in use of information is declining, but the influence from the change in the indicator.

2. It is recommended to ask whether the user is new to Internet within one year

Secondly, due to the popularity of mobile Internet access and the decline in price rates, the rate of Internet access use has soared in the past two years, even faster than when tablets are first popular. It is a pity that the questionnaire has not included the question of year-of-experience, it is impossible to screen the independent analysis of the application behavior of new Internet users. It is suggested that the question to be added to survey next year .

In addition, for information or network retirement, you may also consider adding relevant items to the routine survey to understand the characteristics and possible causes of information or network retirement, and further observe the development of the Internet use.

3. It is recommended to conduct online surveys and regularly track changes in application behavior of Internet users.

In the past, our company has undertaken digital opportunity surveys. It has multiple experiences of follow-up survey and investigations. The advantage of follow-up investigations is that it is more conducive to the evolution of the participation of domestic Internet users. The disadvantage is that the follow-up survey cost is high, and the investigation content will also be limited by time restrictions, it's difficult to conduct frequently. However, considering that the Internet access rate of people under the age of 50 is over 99%, assisting nationals to expand the scope of information participation should be a more important policy issue. Therefore, it is recommended to collect small-scale online questionnaires for those who are interested. The information is integrated into the content to help tracking the changes in the behavior of the internet users.

4. Whether or not the classification method of Internet usage frequency should be adjusted can be listed as a revised reference for future investigation and research

As the current online application behavior of the "Inclusion" indicators has been changed to ask once-a-day, once-a-week or monthly usage frequency, from the results of the survey in the past 2 years, some online application indicators will focus on a certain frequency of use, such as instant messaging and community software, at least 90% of the daily use, but the government's initiative notification may be less than half a month, whether the frequency of use of online applications is appropriate or whether it should be adjusted can be listed as a revised reference for future research.

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[1] Some indicators are totaled weekly, and are marked after the indicator name. The rest of the content are the same.

[2] In the 2018 survey, 9.0% of respondents were unclear about whether they could connect or connect at home, and the ratio was 3 percentage points higher than that of 2017.

[3] Average number of cross-border projects for community users

[4] Average number of payment methods used by former online shoppers

[5] The number of domestic 4G users has increased from 20.97 million in 2017 to 25.53 million in 2018. In May 2018, there was a $499 rate war.