Survey on 2017 Individual/Household Digital Opportunity Survey in Taiwan Executive Summary

(December 2017)

National Development Council, Taiwan

2017 Individual/Household Digital Opportunity Survey in Taiwan
Summary

I. Purpose of the Survey

Caring for disadvantaged groups and providing fair digital opportunities have always been the focuses of the government's efforts to construct information and communications infrastructure and improve the availability of government services. Since 2004, Taiwan's government has implemented policies such as 'Narrowing Digital Divide Plan', 'Creating Fair Digital Opportunities Plan', 'The Digital Outreach Project.' and 'Universal Digital Application Project for Remote Areas Project'. These policies all aim to utilize governmental and civil resources and provide all regions, groups, and industries with fair digital opportunities which also enable them to share the benefits of a high-quality Internet society.

In order to fully grasp the situation of digital development in Taiwan, the National Development Council conducts 'Survey on Individual/Household Digital Opportunity' each year. This understanding will lay the policy foundations for cultivating digital care.

II. Survey Methodology

"2017 Individual/Household Digital Opportunity Survey in Taiwan" was conducted from August to September 2017. Using Computer-Assisted Telephone Interviewing System (CATI), citizens aged 12 or above throughout Taiwan were randomly interviewed over the phone.

The Survey was conducted after 6 p.m. from Monday to Sunday, and 9,337 valid samples were completed among our populace. The number of valid samples size for each locality is shown in Table 1.

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

County/City	Number of residents aged 12 and above	Sampling Error	Expected Sample Size	Valid Samples Size
Total	21,112,962	±0.6%	8,448	8,475
New Taipei City	3,588,508	±5.0%	384	384
Taipei City	2,382,891	±5.0%	384	386
Taoyuan City	1,913,553	±5.0%	384	385
Taichung City	2,457,058	±5.0%	384	385
Tainan City	1,701,717	±5.0%	384	385
Kaohsiung City	2,512,530	±5.0%	384	384
Ilan County	413,794	±5.0%	384	386
Hsinchu County	477,526	±5.0%	384	384
Miaoli County	498,220	±5.0%	384	386
Changhua	1,150,563	±5.0%	384	384
Nantou County	459,958	±5.0%	384	386
Yunlin County	629,689	±5.0%	384	385
Chiayi County	474,890	±5.0%	384	385
Pingtung	762,585	±5.0%	384	384
Penghu County	94,528	±5.0%	384	384
Hualien County	298,473	±5.0%	384	384
Taitung County	199,552	±5.0%	384	385
Keelung City	341,454	±5.0%	384	387
Hsinchu City	378,570	±5.0%	384	390
Chiayi City	240,594	±5.0%	384	386
Kinmen County	124,880	±5.0%	384	385
Lianjiang	11,429	±5.0%	384	385

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

In order to make this survey a reliable source to infer opinions of all Taiwanese at or above the age of 12, this survey first conducts weighting operations on the sample structure for each county and city based on the age-sex structure of the population at or above the age of 12 in each county and city (as announced by the Ministry of the Interior in July of 2017). As for the inference of the overall national development, weighting operations are further conducted in the second phase based on the ratio of the population at or above the age of 12 in each county and city to the population at or above the age of 12 in Taiwan area to improve the rationality of

statistical estimates.

III. Research Framework and Survey Items

The "2017 Individual/Household Digital Opportunity Survey in Taiwan" includes these three sections: "Enabling", "Inclusion", and "Exclusion". The first section aims to investigate Taiwanese information device access、usage and general digital literacy. The second section investigates how Internet users apply information to learning, social life involvement, economy, civic duties, and fostering health. The third section, through the perspective of crisis and interest infringement, observes the negative impacts of an information society. The index structure is as shown in Tables 3, 4, and 5.

Table 2 Index Structure of "2017 Individual/Household Digital Opportunity Survey"

Primary Dimension	Secondary Dimension	Index Dimension
Enabling	Access to Information	Personal Internet Devices in Possession
		Wireless or Mobile Internet Usage Rate
	Skills and Literacy	Internet Access Knowledge
		Digital Footprint Knowledge
		Information Filtering Capability
		Information Identification Capability
		Programming Capability
Inclusion	Learning Application	Learning Skills Online
		Attending Online Courses/Tests
	Social Life Application	Searching for Information
		Social Networking
		Online Audios and Videos
		Online Games
		Internet Phone Calls
		Internet Content Creation
		Cross-Border Functionality of Social Media
	Economic Application	Online Reviews and Ratings
		Online Shopping
		Online Platform Sharing Economy
		Online Shopping Payment Methods
		Online Selling
		Mobile Payment
		Online Banking Services
	Citizen Participation	Receiving Push Notifications from the Government
		Searching for Information of Government Policies or Announcements
		E-government Online Request Service
		Download Government Open Data
		Expressing Public Policies Opinions via Official Platforms

		Expressing Public Policies Opinions via Social Networking
		Proposing Objections on the Internet
	Health Application	Hospital Online Appointments System or Clinic Status Querying
		Health Management apps or Activity Tracker
		Access Medical Records Online
Exclusion	Personal Crisis	Internet Anxiety Level
		Degradation of Physiological Abilities
		Degradation of Social Skills
		Deterioration in Writing Skills
	Social Crisis	Openness of Internet Remarks
		Cyberbullying
	Infringement of Privacy	Personal Data Leakage or Account Theft
	Damage to Rights and Interests	Damages from Internet frauds
		Virus Attacks on Internet frauds

IV. Classification of Areas

Comparisons on the digital development of different geographical regions were made by means of various kinds of classification; above all, it is important to observe whether the digital gap between the 5 different levels of region in Taiwan is closer or widening.

The classification is based on the conclusion made 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). Classification was carried out according to the overall performance of the 6 dimensions and 25 items of indicator. The 6 dimensions included the structure of human resources in each villages and towns, development of social economy, education & culture, means of transportation and living environment, also the information infrastructure. The digital development level 1 region included 32 villages and towns, the digital development level 2 region included 93 villages and towns, level 3 region covered 127 villages and towns, level 4 and level 5 regions covered 49 and 67 villages and towns respectively, among which the digital development of the level 1 region is the greatest.

V. Key Indicators

Table 3 Statistics on Important Indicators for the Individual/Household Digital Opportunity Survey

Item	2016	2017	Comparisons of 2016 and 2017 Figures
the Individual Internet Usage Rate(A)	79.7 %	82.3 %	increased by 2.6 percentage points, grown by 3.6%
Mobile Internet Usage Rate(A)	73.1 %	80.1 %	increased by 7.0 percentage points, grown by 9.6%
Household Internet Usage Rate(A)	81.1 %	85.1 %	increased by 4.0 percentage points, grown by 4.9%
Social Networking (B)	94.3 %	96.8 %	increased by 2.5 percentage points, grown by 2.7%
Online Banking Services (B)	31.9 %	33.2 %	increased by 1.3 percentage points, grown by 4.1%
Searching for Information of Government Policies or Announcements (B)	33.8 %	35.4 %	increased by 1.6 percentage points, grown by 4.7%

Note: (A) Survey Objects including citizens at or above the age of 12. (B)Survey Objects are Internet Users at or above the age of 12.

VI. Survey Results in Summary

I. Overview of The Digital Opportunity

(I) Enabling

Enabling is in the first tier of the Digital Opportunity Indicator Structure in Taiwan with two minor constructs, 'Access to Information' and 'Skills and Literacy'. Citizens must have 'Skills and Literacy' for opportunities of 'Access to Information' via relevant devices before they can enter the Digital Society and bear relevant risks.

As we investigate the first minor construct of 'Access to Information' under 'Empowerment', the 2017 survey indicates that **the Individual Internet Usage Rate** among citizens at or above the age of 12 in Taiwan is 82.3%, which has increased by 2.6 percentage points compared to the 2016 survey. Regarding the long-term trend, since 2005, the domestic Internet Use Usage has increased from 62.7% to 82.3% in 2017, and increased by 19.6 percentage points in 12 years.

The Mobile Internet Usage Rate in 2017 also hit a record. 97.4% of Internet Users have used Mobile or Wireless Internet access; and if citizens above the age of 12 are taken as the denominator, 80 out of 100 people in Taiwan has used Mobile Internet Access each year on average, which has increased by nearly 7 percentage points compared to that figure in 2016.

Regarding the personal **accessible information devices**, if multiple choices are allowed in terms of access to information devices, the number of citizens at or above the age of 12 in possession of the Smartphones, smart TVs, smart wearable devices and smart appliances has slightly increased compared to that in 2016, whereas the number of citizens at or above the age of 12 in possession of laptops and tablets has remained. And the number of citizens in possession of desktop computers has dropped from 74 to 69 in every 100 people.
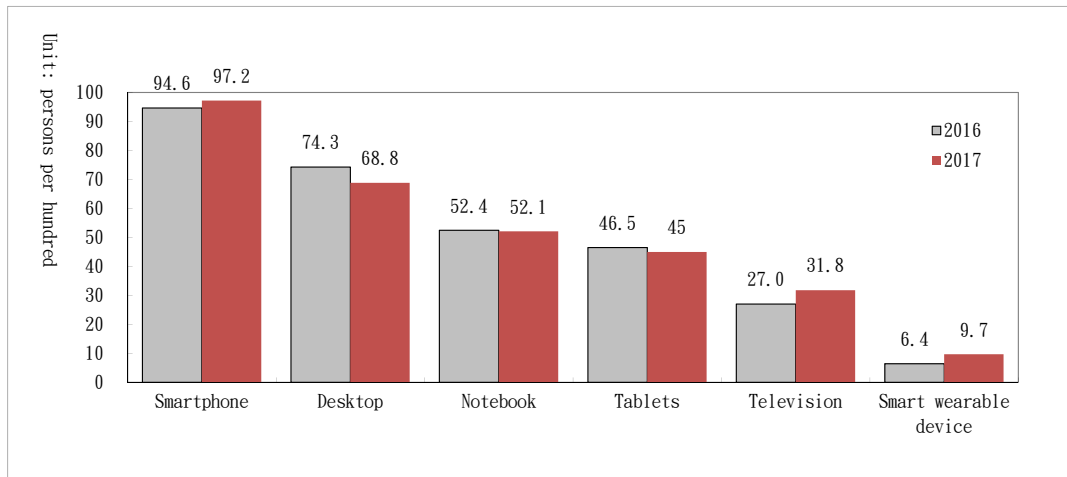
Figure 1 Internet users' possession of information equipment

Regarding the length of the Internet usage time, Internet Users who used Smartphone the most frequently to access Internet has increased from 66.7% in 2016 to 73.3% in 2017, while Internet Users who used desktop computer most frequently to access the Internet has dropped from 21.4% in 2016 to 16.0% in 2017, which confirms the change in habits of using ICTs.

Regarding 'Skills and Literacy', there is still room for improvement in information security awareness among Internet Users in Taiwan. Although 82.4% of Internet Users claim that they are aware of the trace will be left by their Internet activities, will undoubtedly leave a digital trace (where 33.8% is very aware and 48.6% is fairly aware.), only 52.7% of Internet Users know that their browsers or applications can access Personal Data (where 11.5% are very aware and 41.2% fairly aware.).
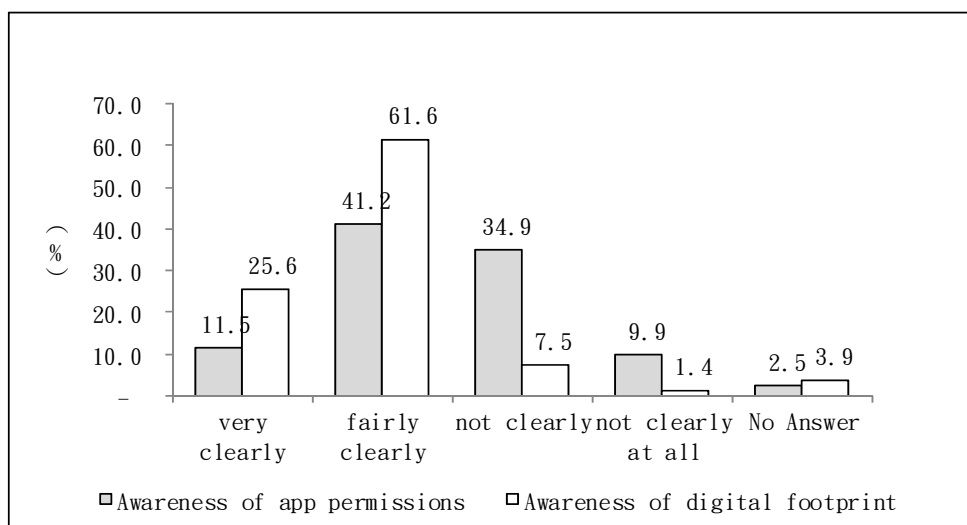

Figure 2 Internet Users Information Security Awareness

Regarding the abilities in **<u>Information Filtering and Identification,</u>** Internet Users at or above the age of 12 in Taiwan are rather confident about personal abilities in information discernment In total, 87.2% of Internet Users think they have good knowledge to discern authenticity of messages on the Internet (25.6% think they are very good and 61.6% think they are fairly good). Relatively speaking, Internet Users are more conservative in their ability to filter useful information. Only 13.9% of them think they are very good and 63.8% think they are fairly good, which adds up to 77.7% in terms of their good ability to filter useful information.
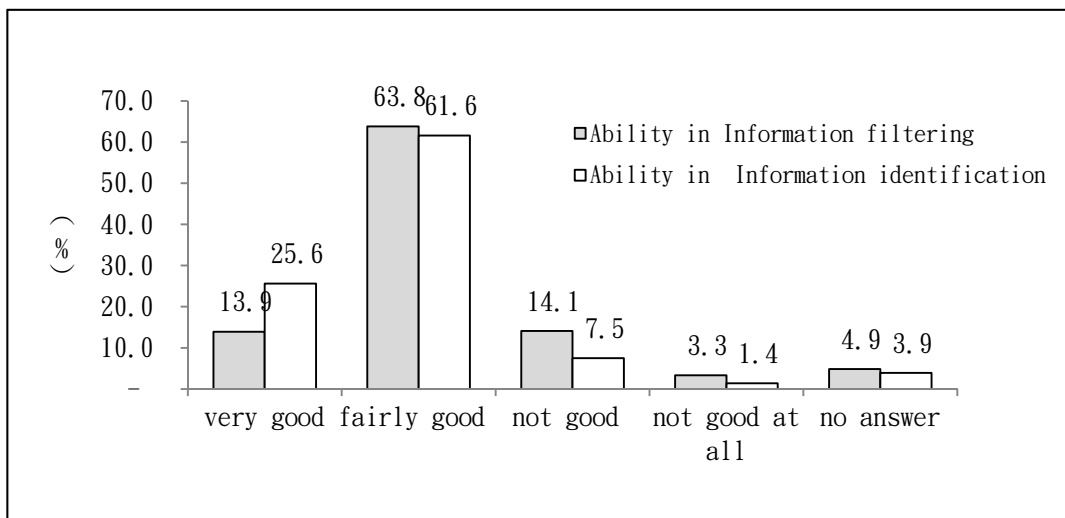

Figure 3 Self-Assessment on Information Filtering and Discernment Abilities by Internet Users

Last but not least, regarding the **<u>programming learning experience</u>**, it is found that among Internet Users at or above the age of 12 in Taiwan, 24.3% has attended programming courses or studied programming on their own.

(II) Inclusion

Inclusion is in the second tier of the Digital Opportunity Indicator Structure in Taiwan, where the possibility of access to ICTs improves or enhances the well-being of life (including the 5 major aspects of learning, social life, economic life, citizen participation and health promotion) is observed among Internet Users during the most recent year.

'Learning Application' focuses on interactive behaviors of individuals in one-way or two-way education and learning via the ICTs and takes 'learning skills online' and 'attending online courses/tests' as the two primary measures.

Survey Results show that it's quiet easy to learn new skills online. In total,

49.4% of Internet Users aims for learning and they acquire new skills by searching information or videos on the web, while 11.8% do this at least once per day.

Regarding attending online courses/tests, only 2.0% of Internet Users attend online courses every day, while 5.7% once a week, 7.2% once a month, and 6.3% participate less than once over a month in online courses. In total, 21.2% of Internet Users has attended online courses/tests.

Regarding Information Source, besides the fact that the frequency of learning new skills online is higher than that of attending online courses/tests, Information Source for learning new skills is also wider. Although 21.9% of Internet Users only watch the domestic teaching instructions or videos, others would more or less refer to foreign information. 66.6% of Internet Users would only use domestic learning platforms for domestic online courses or tests.
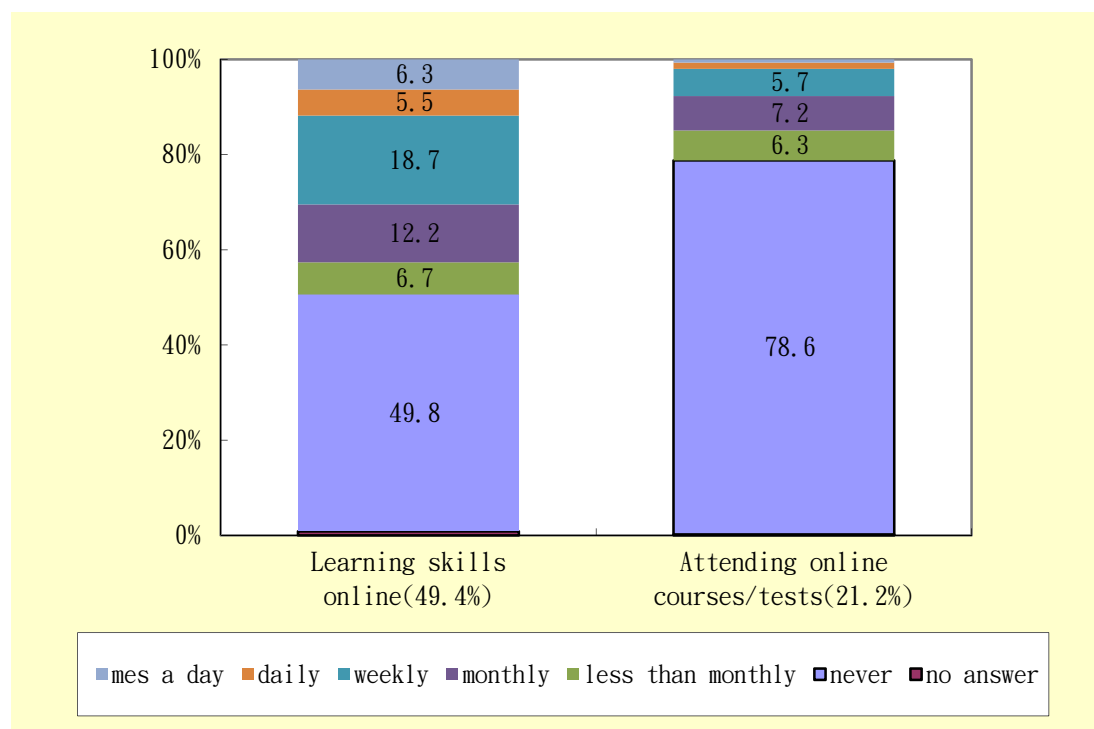

Figure 4 Learning application among Internet Users during the most recent year

'Social Life Application' focuses on one-way social life participation or two-way interaction via ICTs. Specific indicators in the 2017 survey include one-way searching for information, online audios and videos and two-way interactive social networking, Internet phone calls, internet content creation and online games.

Survey Results show that Internet users are very devoted to one-way and two-way online social life. During the most recent year, Internet users have used some type of instant messaging and social media most frequently (96.8%), and the usage rates of making or receiving phone calls over the internet (86.3%), watching online audios and videos (84.6%) and information query (84.4%) have also exceeded 84%. About half of Internet users have engaged in posting and sharing photos, videos and other content creation online in the past year, whereas 48.8% have been playing online games.

In terms of the frequency of use, social networking has been used most frequently amongst the 6 major indicators of social life. 79.6% of Internet users would use social networking several times a day, while 10.1% would use social networking at least once a day, which adds up to 89.7% in terms of the daily usage rate. The rate of watching online audios and videos via the Smartphone or PC every day (49.9%) is higher than that of using Internet phone calls (38.6%) and that of searching for information every day (37.6%). Although the usage of online games is the lowest among indicators in the social life construct, 19.6% of Internet users would play online games several times a day, while 12.4% would play online games at least once a day.

As the survey further investigates the pattern of domestic Internet users using Instant Messaging/Online Community Software, it is found that as Line and FB platforms started to expand their business items, domestic Internet users have also become accustomed to the **Cross-Border Functionality of Social Media**. 79.4% of Internet users would watch the news on social media platforms, 53.9% would watch live broadcasts by other Internet users, 35.3% would engage in online shopping on social media platforms, 4.7% would conduct live broadcasting, and only 12.5% would simply use the original features of Instant Messaging/Community Software.
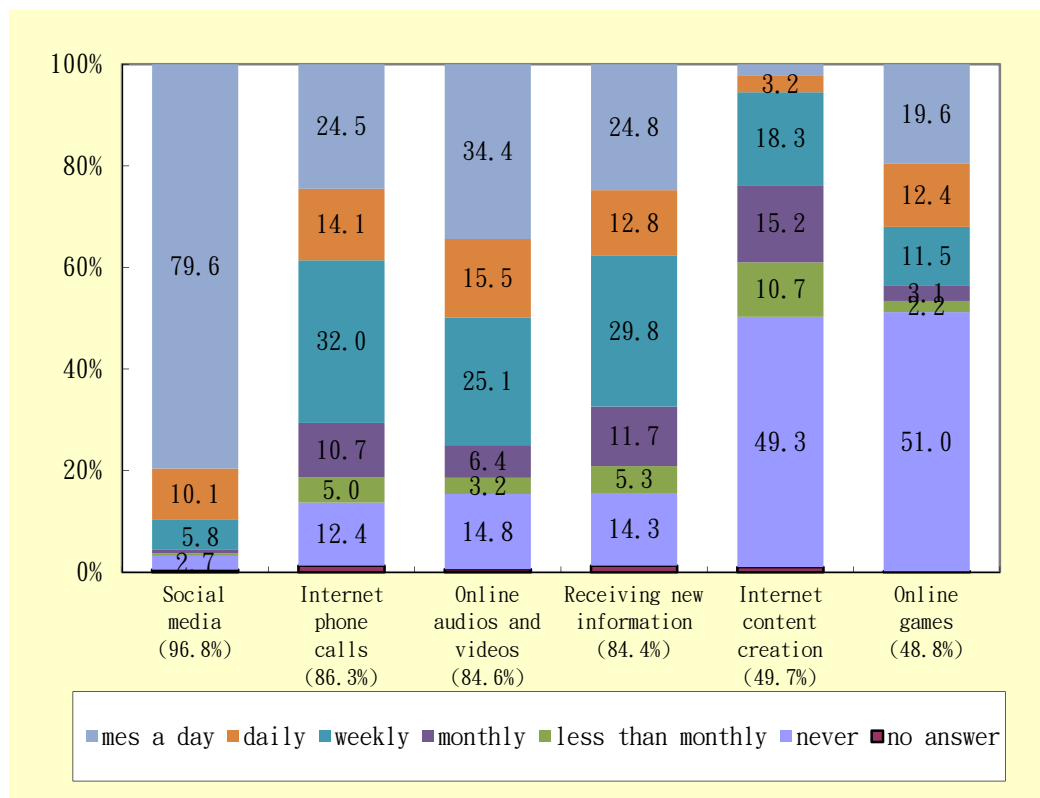
Figure 5 Social life application among Internet Users during the most recent year

'Economic Application' focuses on understanding how individuals use ICTs for e-commerce, consumption, sales, investment and employment/entrepreneurship. Specific indicators in the 2017 survey include six indicators, which are Online Reviews and Ratings, Online Shopping, Use of Online Innovative Services, Online Banking, Online Sales of Goods and Mobile Payment.

Surveys Results show that online shopping is the primary way that Internet users at or above the age of 12 in Taiwan participate in the digital economy. Over the past year, 61.3% of Internet Users have regularly checked online reviews and ratings before making purchasing decisions, while 59.2% have conducted online shopping. However, acceptance of online banking services amongst Internet users has not improved. In the past year, the rate of online banking services has been 33.2%, where 10.2% of Internet users have used online platform sharing economy such as Airbnb and Uber and 7.3% of them have conducted online sales of goods in the past year. As for mobile payment, 10 Internet users out of 100 (10%) have experienced mobile payment in Taiwan.

Regarding the frequency of usage, 9.1% of Internet users would check online reviews and ratings before making purchasing decisions every day. 25.8% would at least once a week checked online reviews, which became the most frequent economic

activity online. It is most common that Internet users would conduct online shopping once a month (27.7%). 12.5% of Internet users are regular users of online banking (3.3% for daily use and 9.2% for weekly use), while there is only a small number of Internet users who would regularly use online platform sharing economy and conduct sales of goods (only 0.5%).

As for how to make payment for online shopping, payment for pickup at convenience store is still the most common way, and the usage rate has increased from 79% in 2016 to 87% in 2017, while the usage rates of other payment methods are also on the rise. For example, the use rate of cash on delivery has increased from 74% to 82%. Online credit card payment has increased from 53% to 56%. Physical ATM transfer payment has increased from 34% to 43%. Online banking transfer payment has increased from 21% to 31%. Over-the-counter remittance payment has increased from 19% to 25%. And Smartphone Sensor or Scanner Payment has increased from 4% to 12%.

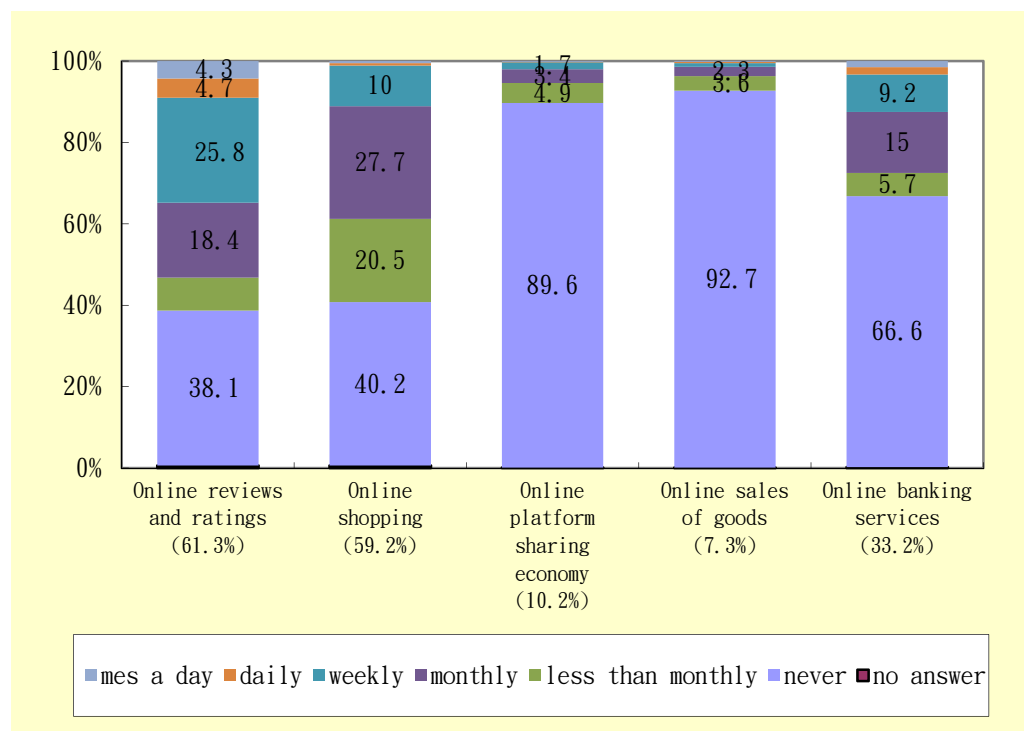Figure 6 Economic application among Internet Users during the most recent year

'**Citizen Participation**' examines how individuals use e-Government resources and participate in online public issues via ICTs, where e-Government resources use conditions including 4 indicators, which are Receiving Push Notifications from the Government, Searching for Information of Government Policies or Announcements,

E-government Online Request Service and Download Government Open Data, whereas Online Citizen Participation includes expressing public policies opinions via official platforms and social networking.

Regarding the e-Government Resources Use Conditions, the rate of received push notifications or newsletters from the government amongst Internet users has been the highest in the past year. 50.2% of Internet users have received public information such as government notifications of disaster preparedness or newsletters (which has the highest use rate than that of any other e-Government services), 35.4% have searched for information of government policies or announcements through E-government websites, 27.6% have used e-government online request service , while 11.4% have downloaded open government data.

Regarding the frequency of usage, although nearly half of the Internet users have received push notifications or newsletters from the government during the most recent year, the exposure rate is still not high enough as the government can only reach 5.5% of Internet users each week, which is similar to the rate of Internet users who would proactively search for information of government policies or announcements through E-government websites each week (5.5%). As for e-government online request service and downloading government open data, the usage rates are not high either, as most Internet users would only use those functions less than once a month.

As for online citizen participation, the rate of Internet users publishing opinions on the Internet is still low. During the past year, only 6.3% have voiced their opinions via official platforms that collected ideas and feedback on public policies while 8.5% have voiced their opinions via social networking channels. The percentages of Internet users who are willing to comment, or voice on public policies via official or unofficial channels are both low, as only less than 2% of Internet users are willing to do so weekly (0.2% via official channels and 1.6% via unofficial channels).
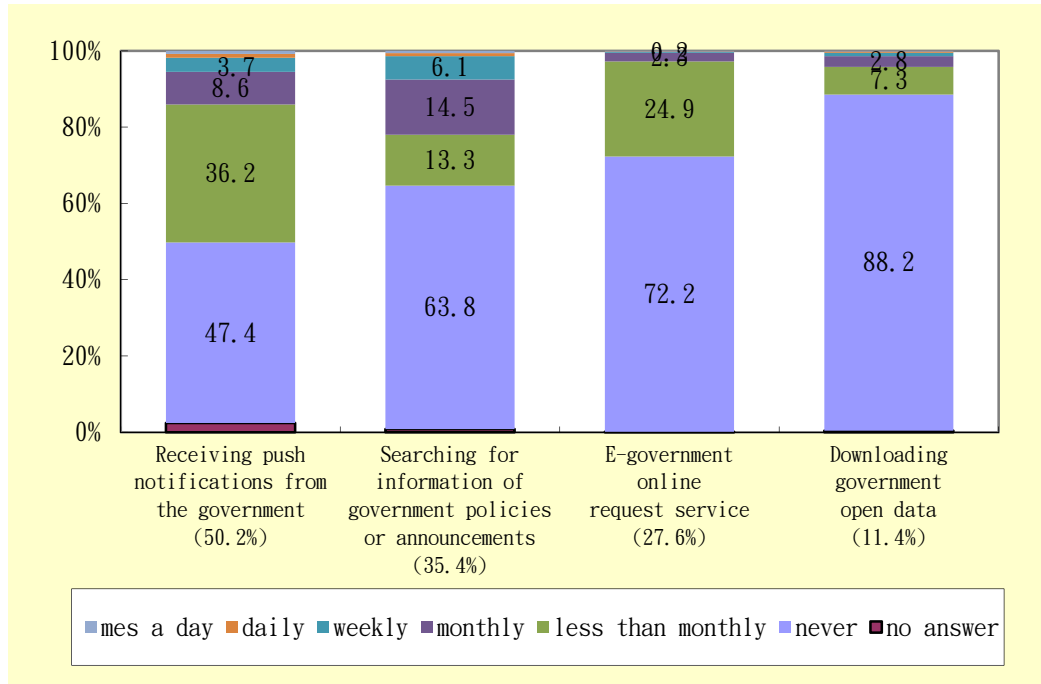
Figure 7 e-Government Resources Use Conditions among Internet users during the most recent year
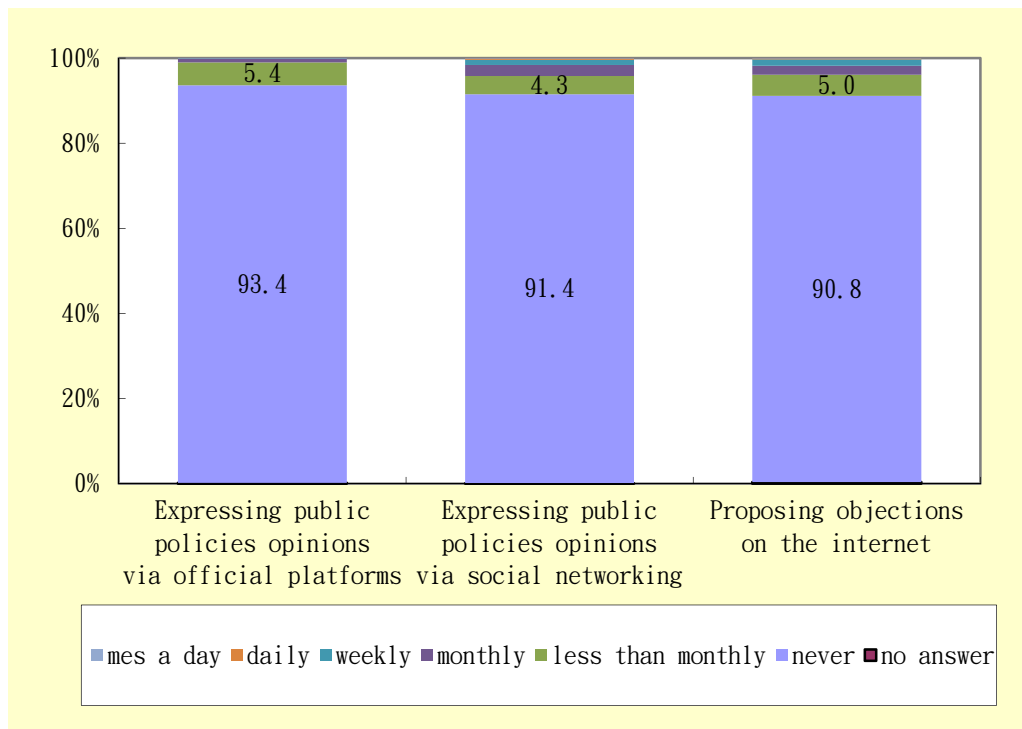
Figure 8 Online Public participation among Internet users during the most recent year

'Health Application' mainly explores access to relevant medical resources or medical care via ICTs amongst Internet users. The specific indicators include Hospital

Online Appointments System or Clinic Status Querying, Health Management apps or Activity Tracker, and Access Medical Records Online.

Survey results show that during the most recent year, 49.0% of Internet users have used hospital online appointments booking system or queried today clinic status over the internet, while 14.2% have used health management application (apps) or wireless-enabled wearable activity tracker and 7.2% have accessed their medical records online.

Regarding the frequency of usage, the frequency of using health management application (apps) or wireless-enabled wearable activity tracker is the highest of the 3 health application, where 7.2% would use the APP to view relevant records each day, while the frequency of using hospital online appointments booking system or queried today clinic status over the internet is related to the hospital visit frequency, which is once a month (11.4%) or once more than one month (36.2%).

Figure 9 Health application among Internet users during the most recent year

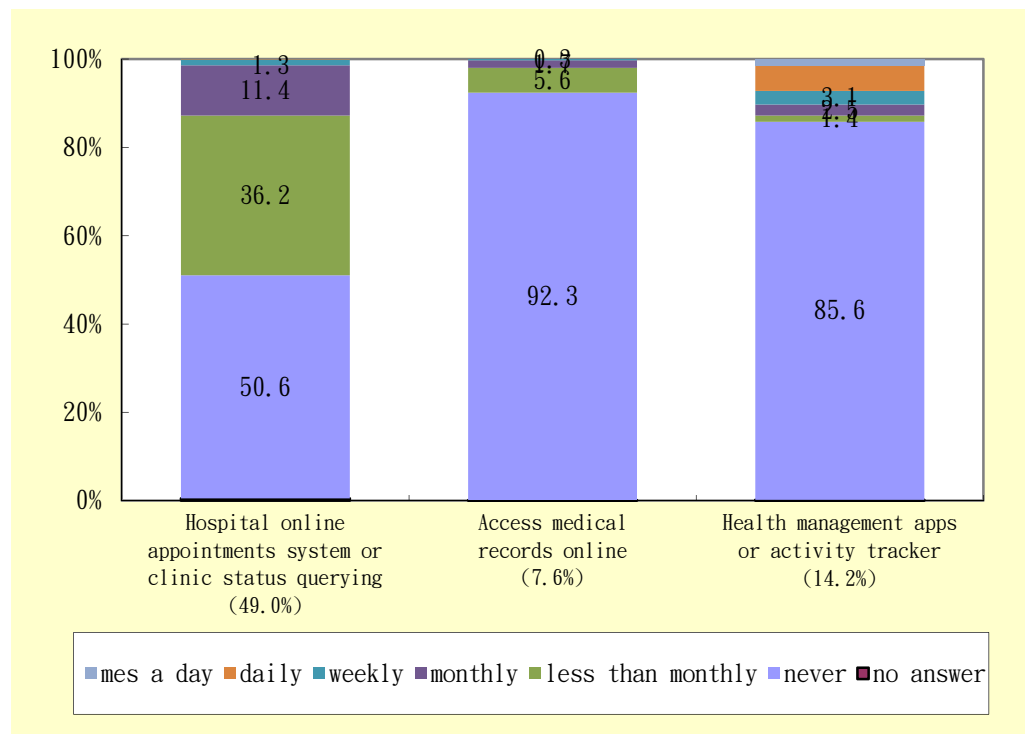**(III) Exclusion**

'Exclusion' is in the third tier of the Digital Opportunity Indicator Structure in Taiwan. It mainly explores whether individuals are subject to the Internet Use Crisis or infringement on rights and interests due to use of ICTs. The personal crisis due to Internet Use contains 4 indicators including Internet Addiction, Social Skills, Physical Conditions and Degradation of Abilities in Written Expressions, while the social crisis involves issues such as openness of Internet remarks and Cyberbully caused by anonymity on the Internet. Infringement on rights and interests can be divided into Infringement on Privacy and Damage to Rights and Interests, whereas the former explores whether the individual use of Internet can lead to Personal Data Leakage or Account Theft, and the latter concerns frauds and virus attacks on Internet frauds due to personal use of the Internet.

Regarding personal crisis, the percentage of Internet users who report anxiety if they do not use Internet for a period of time has increased from 47.4% in 2016 to 54.2% in 2017, showing that domestic Internet users at or above the age of 12 rely on the Internet more heavily. Meanwhile, regarding the influence of Internet use on social skills, physical conditions and abilities in written expressions, 10.1%, 30.3% and 15.8% have respectively reported negativity by such influences.

Regarding social crisis, the 'Sarcastic Comment' culture and Cyberbully caused by the high anonymity of Internet are issues that the entire society must deal with together. According to the survey, while 81.1% of Internet users consider their remarks on the Internet are similar to those in the real world, 2.2% of Internet users admit that their remarks on the Internet are more ferocious than they are in the real world. On the other hand, 3.7% of Internet users said that during the most recent year, they have been bullied or verbally attacked by others on the Internet.

In infringement on rights and interests section, 10.9% of Internet users said during the most recent year there has have been cases of personal information being leaked due to using the Internet, 4.5% during the most recent year experienced scam on the internet, 13.6% during the most recent year experienced computer or virus attacks on Smartphone or PC.
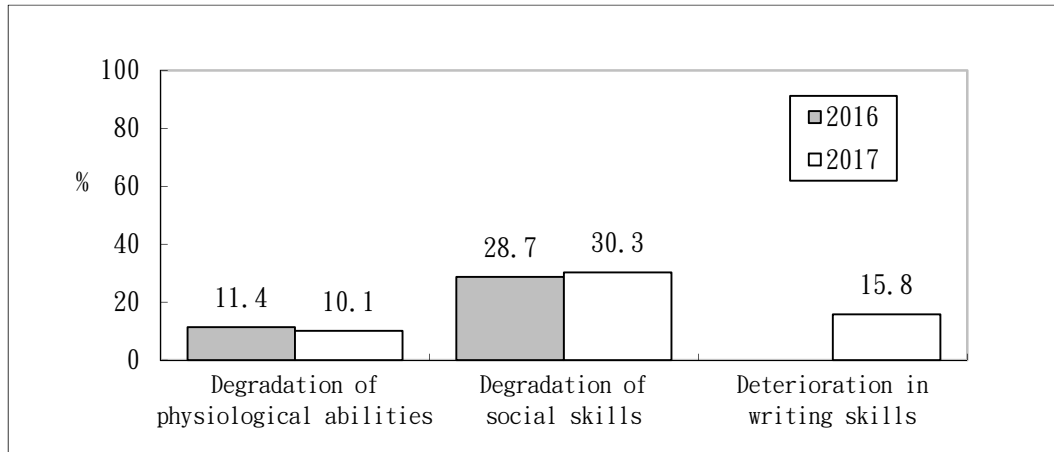
Figure 10 Degradation of Abilities claimed by Internet users due to Internet use
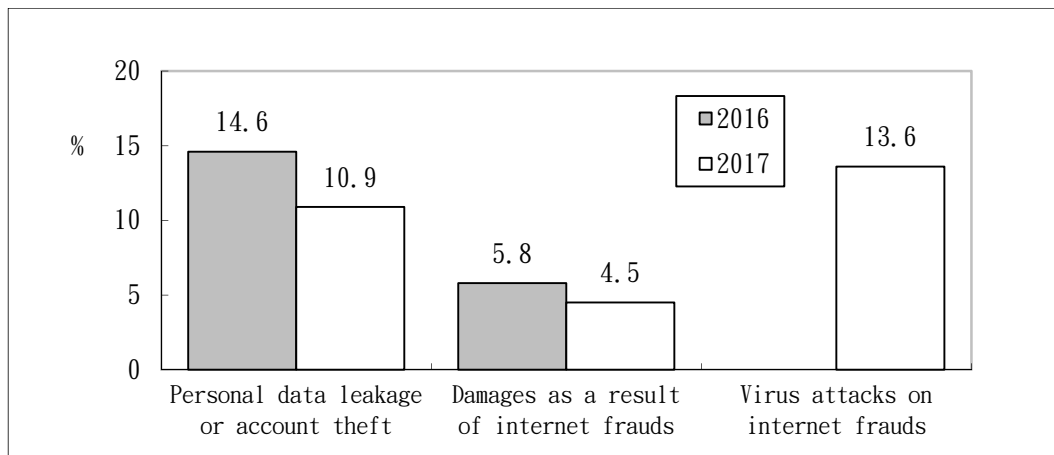
Figure 11 Infringement on rights and interests of Internet users due to Internet use

I. Overview of the Digital Opportunities for Different Focus Groups

(I) Differences in the Digital Opportunity due to genders

(1)Enabling

Gender is a key variable used by scholars to explain the digital opportunity gap. The 2017 survey shows that as the Male Internet Usage Rate goes up majorly, the gap in Internet Usage Rate due to genders had been widened, and reached 3.2 percentage points. Although there is not much difference in Mobile Internet Usage Experience, Digital Trace Knowledge or Self-Assessment on Abilities in Information Filtering and Identification on the internet due to genders, Internet access devices and Internet Access and Programming Capability possessed by Male Internet users are generally better than those possessed by Female Internet users.

Table 4 Differences in 'Enabling' due to genders

Unit: %

Secondary Dimension	Index Dimension	Male	Female
Access to Information	Internet Usage Rate	83.9	80.7
	Smartphone Usage	91.8	87.8
	Personal Internet Device Possession(Items)	2.22	2.15
	Wireless or Mobile Internet Usage Rate	97.5	97.2
Skills and Literacy	Internet Access Knowledge	56.4	49.0
	Digital Trace Knowledge	82.4	82.4
	Information Filtering Capability	78.7	76.7
	Information Identification Capability	88.0	86.3
	Programming Capability	31.3	17.1

(2) Inclusion

Regarding the 5 indicators including Learning Application, Social Life Application, Economic Application, Citizen Participation, and Health Application under 'Integration', Table 5 and Table 6 show that Female Internet users are more active in online posts in non-public domains, online shopping, and health promotion activities than Male Internet users, while Male Internet users are more interested in online games and mobile payment and more willing to express personal opinions on public policies in public domains. As for indicators such as Information Utilization and Creation, Online Courses, Social Media or Online Videos, differences in the annual use rate or the daily use rate due to genders are quite limited.

Table 5 The Differences in 'Inclusion' due to genders

Unit: %

Secondary Dimension	Index Dimension	Daily		The most recent year	
		Male	Female	Male	Female
Learning Application	Learning Skills Online	11.3	12.2	48.2	50.6
	Attending Online Courses/Tests	2.2	1.7	20.4	22.1
Social Life Application	Searching for Information	37.9	37.3	84.4	84.4
	Social Networking	88.5	90.9	96.4	97.2
	Online Audios and Videos	51.9	48.0	83.9	85.4
	Online Games	37.8	26.1	52.7	44.9
	Internet Phone Calls	38.9	38.2	83.9	88.8
	Internet Content Creation	6.0	5.1	46.9	52.7
	Cross-border functionality of social media	—	—	1.29	1.46
Economic Application	Online Reviews and Ratings	7.5	10.6	57.4	65.2
	Online Shopping (each week)	7.4	14.8	53.0	65.6
	Online Platform Sharing Economy (each week)	2.4	1.5	9.3	11.2
	Online Shopping Payment Methods	—	—	1.48	1.79
	Internet Sales Experience (each week)	1.3	1.5	6.9	7.7
	Mobile Payment			11.1	9.1
	Online Banking Services	4.6	1.9	33.1	33.3

Table 6 The Differences in 'Inclusion' due to genders

Unit: %

Secondary Dimension	Index Dimension	Monthly		The most recent year	
		Male	Female	Male	Female
Citizen Participation	Receiving Push Notifications from the Government	15.7	12.5	51.0	49.5
	Searching for Information of Government Policies or Announcements	23.3	20.7	36.8	33.9
	E-government Online Request Service	3.0	2.5	27.4	27.8
	Download Government Open Data	4.4	3.8	11.9	10.9
	Expressing Public Policies Opinions via Official Platforms	1.3	0.6	7.1	5.6
	Expressing Public Policies Opinions via Social Networking	6.1	2.3	10.8	6.1
	Proposing Objections on the Internet	5.8	2.0	11.5	6.1
Health Application	Hospital Online Appointments System or Clinic Status Querying	11.8	13.8	44.2	53.8
	Access Medical Records Online	1.9	2.0	7.5	7.6
	Health Management apps or Activity Tracker (each day)	7.0	7.4	12.6	16.0

(3)**Exclusion**

As the survey assesses risks of Internet Use due to genders, the results show that Female Internet users report anxiety without using Internet for a period of time, and physical conditions of Female Internet users degrade due to Internet use more than those of Male Internet users. Male Internet users admit that their Internet remarks are more ferocious than in real life, and they are more vulnerable to virus attacks on information devices slightly more than Female Internet users are. [Table 7]

Table 7 Differences in 'Exclusion' due to genders

Unit: %

Secondary Dimension	Index Dimension	Male	Female
Personal Crisis	Internet anxiety level	52.0	56.6
	Degradation of physiological abilities	26.2	34.5
	Degradation of social skills	9.9	10.3
	Deterioration in writing skills	15.4	16.1
Social Crisis	Openness of Internet remarks	2.7	1.6
	Cyberbully	4.1	3.3
Infringement of Privacy	Personal data leakage or account theft	10.2	11.6
Damage to Rights and Interests	Damages as a result of Internet frauds	4.0	5.1
	Virus attacks on Internet frauds	15.1	12.1

(II) **Differences in the Digital Opportunity due to Generations**

(1)**Enabling**

The gap in the digital capabilities across different generations is clear. Citizens at or above the age of 65 fell behind in terms of Opportunities for Access to Information (as the Internet Usage Rate is only 28.3% and only 58.2% have Smartphones), and Internet users at or above the age of 60 that have entered the Internet world also showed inadequacy in terms of Information Devices Possession, Information Security Awareness, and Abilities in Information Filtering and Identification. Regarding Programming Capability of Internet Users, only Internet users at or under the age of 30 (more than 30%) have better Programming Capability. [Table 8]

Table 8 Differences in 'Enabling' due to Generations

Unit: %

Secondary Dimension	Index Dimension	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
Access to Information	Internet Usage Rate	99.5	100	99.2	98.7	96.1	83.3	62.0	28.3
	Smartphone Usage	86.9	98.8	99.3	99.0	97.1	92.7	82.9	58.2
	Personal Internet Devices in Possession(Items)	2.17	2.45	2.64	2.87	2.73	2.10	1.46	0.67
	Wireless or Mobile Internet Usage Rate	98.0	97.9	99.6	99.5	98.5	95.0	88.9	92.5
Skills and Literacy	Internet Access Knowledge	62.6	68.5	70.1	61.2	49.1	34.4	29.8	26.5
	Digital Trace Knowledge	89.7	94.6	93.4	88.1	83.1	70.0	62.2	57.2
	Information Filtering Capability	78.2	88.2	93.8	84.9	76.5	61.7	59.9	52.8
	Information Identification Capability	87.0	89.6	93.6	91.4	88.8	79.6	75.9	75.3
	Programming Capability	33.3	35.3	33.6	23.2	24.7	15.3	12.6	13.5

(2) Inclusion

Table 9 shows the proportions of Internet users across different generations participating in various applications on the Internet. In terms of learning application, social life application, and economic application, all generations show no significant differences in use of social media, while Internet users aged between 20-39 show exhibit the highest percentage in other indicators amongst all generations. As for citizen participation and health application, Internet users aged between 30-49 exhibit the highest percentage.

Table 9 Differences in 'Inclusion' due to Generations (in terms of the use rate during the most recent year)

Unit: %

Secondary Dimension	Index Dimension	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
Learning Application	Learning Skills Online	64.5	71.1	65.6	51.3	47.9	34.3	23.9	24.3
	Attending Online Courses/Tests	23.5	39.4	30.5	20.9	20.9	11.1	10.6	6.9
Social Life Application	Searching for Information	85.4	89.2	91.6	92.9	88.4	75.0	60.7	58.0
	Social Networking	90.6	99.0	99.4	98.6	96.9	94.8	93.0	91.8
	Online Audios and Videos	95.7	98.8	97.2	89.3	85.5	72.0	57.2	60.3
	Online Games	83.0	77.5	66.4	55.1	42.9	27.0	21.0	18.2
	Internet Phone Calls	72.0	84.4	90.2	89.7	87.6	86.0	81.2	74.2
	Internet Content Creation	36.0	55.9	65.6	64.7	49.3	31.2	26.8	23.0
	Cross-Border Functionality of Social Media(Items)	1.3	1.7	2.0	1.9	1.6	1.2	0.7	0.3
Economic Application	Online Reviews and Ratings	43.2	60.9	78.6	77.9	64.1	45.7	27.6	24.2
	Online Shopping	35.2	52.8	76.5	76.1	66.0	44.2	23.0	20.8
	Online Platform Sharing Economy	5.7	6.0	18.8	14.0	8.6	5.0	4.3	4.8
	Online shopping payment methods	0.7	1.2	2.6	2.8	2.2	1.1	0.5	0.2
	Internet sales experience	5.6	7.7	10.2	11.0	7.2	3.0	3.0	1.5
	Mobile payment	3.7	9.2	12.3	18.0	9.0	5.5	3.4	3.6
	Online Banking Services	1.0	5.5	37.3	48.9	41.7	28.9	21.3	15.5
Citizen Participation	Receiving Push Notifications from the Government	33.9	47.4	49.3	54.8	53.3	51.0	45.5	42.2
	Searching for Information of Government Policies or Announcements	11.3	23.1	38.2	45.3	41.9	30.4	21.5	27.5
	E-government Online Request Service	0.5	1.2	22.9	44.4	40.0	23.7	18.3	10.8
	Download Government Open Data	3.7	6.2	11.8	13.9	15.7	9.8	9.9	4.3
	Expressing Public Policies Opinions via Official Platforms	0.0	2.4	6.8	7.7	9.0	4.2	5.9	7.2
	Expressing Public Policies Opinions via Social Networking	2.4	8.7	9.4	11.5	11.0	4.9	3.7	4.6
	Proposing Objections on the Internet	7.0	7.8	7.2	11.4	9.8	7.1	8.6	9.7
Health Application	Hospital Online Appointments System or Clinic Status Querying	21.2	17.4	43.4	62.5	59.5	51.4	39.2	43.0
	Access Medical Records Online	5.1	8.2	8.7	10.4	7.8	5.0	3.9	4.6
	Health Management apps or Activity Tracker	11.9	16.0	16.1	16.8	15.6	11.1	7.3	9.5

(3)**Exclusion**

Regarding differences across generations, over 66% of Internet users aged between 15-39 admit that they feel anxious without using Internet for a while, which is higher than the percentages of other age groups. Regarding degradation of social skills, Internet users aged between 20-29 are the most susceptible age group. Regarding degradation of abilities in written expressions, Internet users aged between 30-39 are the most susceptible age group. As for the impact of Internet use on physical conditions, Internet users aged between 40-59 are the most susceptible age group.

Regarding openness of Internet remarks, Internet users aged between 15-19 admit that their online remarks are more intense and impolite than they really are in real life (about 6.0%), and they are also most susceptible to Cyberbully. Regarding personal data leakage or Internet frauds, Internet users aged between 20-29 known as most frequent Internet Users are also the most susceptible age group. Regarding virus attacks on information devices, Internet users aged between 50-59 are the most susceptible age group. [Table 10]

Table 10 Differences in 'Exclusion' due to Generations

Unit: %

Secondary Dimension	Index Dimension	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
Personal Crisis	Internet Anxiety Level	51.5	66.0	70.8	67.4	52.8	35.6	27.5	23.8
	Degradation of Physiological Abilities	16.7	23.2	29.9	30.2	37.3	33.0	22.7	25.0
	Degradation of Social Skills	9.0	10.5	12.3	1.5	9.6	8.3	9.5	8.9
	Deterioration in Writing Skills	2.6	11.4	16.5	20.5	18.2	13.7	10.7	13.1
social crisis	Openness of Internet Remarks	0.9	3.2	2.4	1.7	2.0	2.6	1.9	1.9
	Cyberbully	5.1	6.0	4.8	3.5	3.5	3.2	1.8	1.8
Infringement on Privacy	Personal Data Leakage or Account Theft	8.3	7.6	17.9	13.7	10.3	7.6	3.3	3.8
Damage to Rights and Interests	Damages as a result of Internet frauds	0.5	0.7	7.1	5.6	5.2	3.7	2.4	1.9
	Virus Attacks on Internet Frauds	9.4	9.6	10.6	12.7	15.5	17.9	14.6	14.8

(III) Differences in the Digital Opportunity across each county, city and area.

(1)Enabling

Regarding the influence of Opportunities for Access to Information on the County / City or Area, urbanization, demographics and daily needs are the main factors influencing Opportunities for Access to Information on the whole.

Regarding differences across each County/City, Hsinchu City and Taipei City have the top rankings amongst 22 counties/cities in minor constructs under empowerment. Although the Internet Usage Rate in agricultural counties/cities such as Chiayi county and Yunlin county subject to population aging has been significantly improved, the overall development is still relatively backward.

Regarding Classification of Digital Development Areas, almost every indicator under Empowerment shows that Level-1 Digital Development Areas have the top ranking, while Level-2 Digital Development Areas have the second rank and Level-5 Digital Development Areas have the lowest ranking in terms of their performances. However, as Level-4 Digital Development Areas include islands and counties/cities in eastern Taiwan where traffic is less convenient, residents living in Level-4 Digital Development Areas depend on the Internet and Smartphone more heavily than those living in Level-3 Digital Development Areas. Nevertheless, they fail to show significant advantages in terms of technology literacy and information security literacy. [Table 11]

Table 11 Differences in 'Enabling' due to Areas

Unit: ％

Secondary Dimension	Index Dimension	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
Access to Information	Internet Usage Rate	87.2	83.8	74.2	80.0	65.1
	Smartphone Usage	92.7	90.2	85.7	89.5	79.8
	Wireless or Mobile Internet Usage Rate	97.3	97.6	97.6	97.6	94.5
Skills and Literacy	Internet Access Knowledge	54.3	52.4	51.2	49.5	49.9
	Digital Trace Knowledge	84.6	82.8	78.0	80.7	77.5
	Information Filtering Capability	79.0	79.1	73.2	75.2	72.8
	Information Identification Capability	88.8	87.6	84.4	86.3	79.6
	Programming Capability	26.6	25.3	18.8	19.9	18.9

(2) Inclusion

As for the influence of other variables on integration applications, Taipei City、Hsinchu City or Core Cities on the whole exhibit better performances in terms of integration applications.

Regarding differences across digital development areas, although Level-1 Digital Development Areas exhibit the best performance in Information Utilization and Creation (a minor construct under learning), the online courses use rates in Level-4 and Level-5 Digital Development Areas are comparable to that in Level-1 Digital Development Areas.

Regarding the minor constructs under social life, as all indicators (except for New Information Acquisition) show almost zero differences across different areas, the minor constructs under social life exhibit the highest equality across different areas in terms of Digital Opportunity.

Regarding economic life and citizen participation, although online shopping rate in Level-4 Digital Development Areas such as islands and counties/cities in eastern Taiwan is rather high, Level-1 Digital Development Areas exhibit the highest percentages amongst almost all the other indicators. [Table 12]

Table 12 Differences in 'Inclusion' due to Areas(in terms of the use rate during the most recent year)

<div align="right">Unit: %</div>

Secondary Dimension	Index Dimension	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
Learning Application	Learning Skills Online	52.1	49.1	44.9	48.7	46.6
	Attending Online Courses/Tests	23.1	20.3	18.6	23.8	23.1
Social Life Application	Searching for Information	85.3	85.3	82.1	82.6	76.4
	Social Networking	96.9	96.6	97.4	96.9	95.0
	Online Audios and Videos	86.1	85.3	80.8	85.3	79.0
	Online Games	48.2	49.1	50.2	46.4	46.3
	Internet Phone Calls	86.3	85.9	87.0	86.6	87.2
	Internet Content Creation	49.3	50.9	48.0	53.2	46.4
Economic Application	Online Reviews and Ratings	63.1	62.8	57.2	57.3	45.7
	Online Shopping	60.6	60.4	55.4	61.6	46.7
	Online Platform Sharing Economy	14.5	9.1	5.1	8.0	4.5
	Internet Sales Experience	7.5	7.8	6.2	6.1	4.9
	Online Banking Services	38.2	33.7	25.0	27.1	20.5
Citizen Participation	Receiving Push Notifications from the Government	56.4	45.4	48.0	52.9	49.9
	Searching for Information of Government Policies or Announcements	36.5	36.4	32.5	32.7	26.9
	E-government Online Request Service	32.2	27.7	21.6	24.0	9.3
	Download Government Open Data	13.3	11.5	8.1	12.0	5.6
	Expressing Public Policies Opinions via Official Platforms	9.0	6.2	1.9	6.2	0.7
	Expressing Public Policies Opinions via Social Networking	9.9	8.7	5.9	8.5	3.4
	Proposing Objections on the Internet	9.3	8.6	8.8	10.1	5.9
Health Application	Hospital Online Appointments System or Clinic Status Querying	52.1	49.8	41.0	49.4	44.9
	Access Medical Records Online	8.8	7.0	6.6	8.4	4.5
	Health Management apps or Activity Tracker	14.9	15.2	11.1	15.6	10.1

(3) **Exclusion**

In terms of differences across Digital Development Areas, although Internet users in Level-5 Digital Development Areas are the least susceptible to Internet anxiety, their physical conditions and social skills are rather more susceptible to influences. Regarding Openness of Internet remarks, 2.6% to 2.8% of Internet users in Level-3 and Level-4 Digital Development Areas consider their Internet remarks more intense than they actually are in real life, which is slightly higher than that in Level-1 Digital Development Areas. As for Invasion of Privacy or Damage to Rights and Interests, Level-4 Digital Development Areas that include islands and Counties/Cities in eastern Taiwan are relatively susceptible to Invasion of Privacy or Damage to Rights and Interests. [Table 13]

Table 13 Differences in 'Exclusion' due to Areas

Unit: %

Secondary Dimension	Index Dimension	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
Personal Crisis	Internet Anxiety Level	54.9	56.3	51.2	51.8	40.5
	Degradation of Physiological Abilities	31.8	29.1	29.8	29.1	32.5
	Degradation of Social Skills	9.7	9.3	11.3	11.7	16.0
	Deterioration in Writing Skills	16.2	15.3	16.3	17.1	12.5
Social Crisis	Openness of Internet Remarks	1.8	2.2	2.8	2.6	2.3
	Cyberbully	4.3	3.7	3.0	3.7	2.0
Infringement of Privacy	Personal Data Leakage or Account Theft	11.9	10.1	10.5	14.1	8.5
Damage to Rights and Interests	Damages as a result of Internet frauds	4.6	4.6	3.7	7.3	3.2
	Virus Attacks on Internet Frauds	13.3	13.9	12.6	14.5	17.8

I. **Comparisons of Trends across the Years based on Survey Results**
(I)   **Enabling**

(1)   Opportunities for Household Access to Information

As more and more people only rely on Smartphone for Internet access, the 2017 survey officially classifies Smartphone Internet access as an instrumentation of

household networking, and finds that the trend of Household Internet Usage Rate declined year after year, which ends as the definition changes and Household Internet Usage Rate has increased from 81.1% in 2016 to 85.1% in 2017. [Figure 12]

As we observe Household Access to Information in each county and city in the most recent year, the Household Internet Usage Rates have increased more (over 6%) in Pingtung County, Taichung City and Kinmen County among 22 counties/cities. [Table 14]
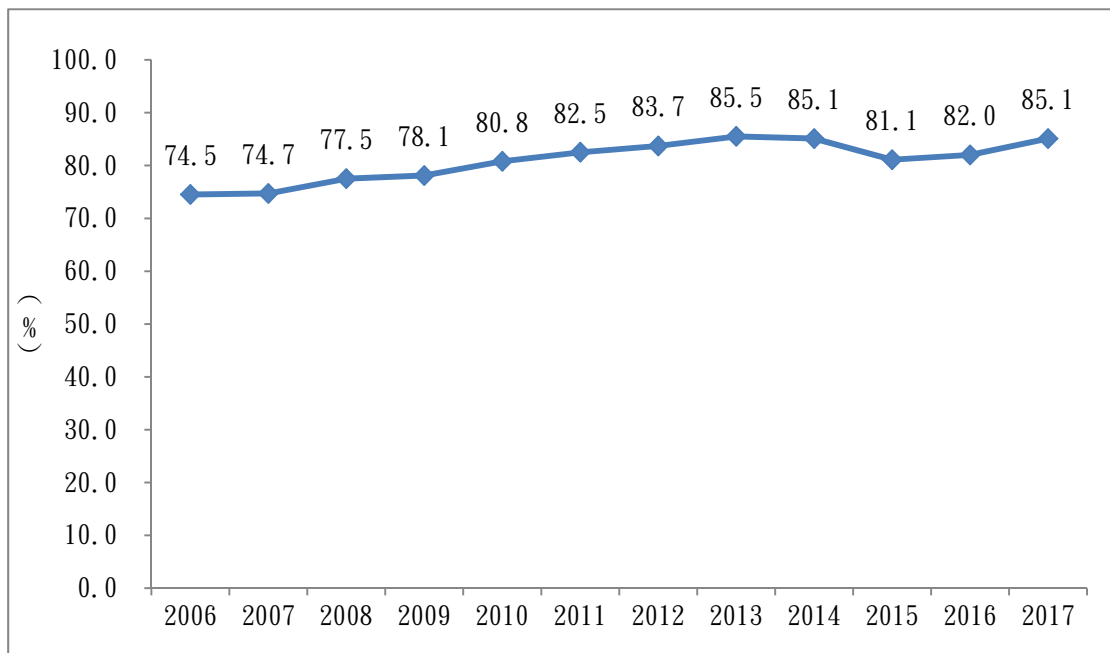

Figure 12 Comparisons of Household Access to Information in Taiwan across the Years

Table 14 Comparisons of the Household Internet Access to Information in Taiwan among citizens in each county and city across the Years

	2015	2016 (A)	2017 (B)	B-A Increased/ Decreased by
Total	82.0	81.1	85.1	+4.0
New Taipei City	85.5	84.6	87.6	+3.0
Taipei City	86.4	87.1	90.7	+3.6
Taoyuan City	84.2	83.8	88.8	+5.0
Taichung City	83.5	82.5	88.7	+6.2
Tainan City	79.5	76.1	81.3	+5.2
Kaohsiung City	79.9	80.3	82.8	+2.5
Ilan County	79.0	79.2	80.7	+1.5
Hsinchu County	84.1	83.2	87.7	+4.5
Miaoli County	79.9	78.3	83.6	+5.3
Changhua County	80.8	75.8	81.9	+6.1
Nantou County	76.9	75.2	80.3	+5.1
Yunlin County	73.7	73.3	75.6	+2.3
Chiayi County	70.9	71.0	73.6	+2.6
Pingtung County	74.6	73.2	79.8	+6.6
Penghu County	71.8	76.0	78.1	+2.1
Hualien County	79.0	78.9	84.8	+5.9
Taitung County	72.7	75.4	79.8	+4.4
Keelung City	85.3	83.9	85.6	+1.7
Hsinchu City	88.7	88.2	90.1	+1.9
Chiayi City	81.0	81.3	85.2	+3.9
Kinmen County	80.6	79.5	85.6	+6.1
Lianjiang County	77.9	82.9	85.6	+2.7

(2) Opportunities for Individual Access to Information

The 2017 survey shows that the Internet usage rate among citizens at or above the age of 12 in Taiwan is 82.3%, which has increased by 2.6% compared to the previous (2016) survey. In terms of long-term trend, the domestic Internet Usage Rate has risen from 62.7% in 2005, to 82.3% in 2017, and has grown by 19.6% in 12 years. [Figure 13]
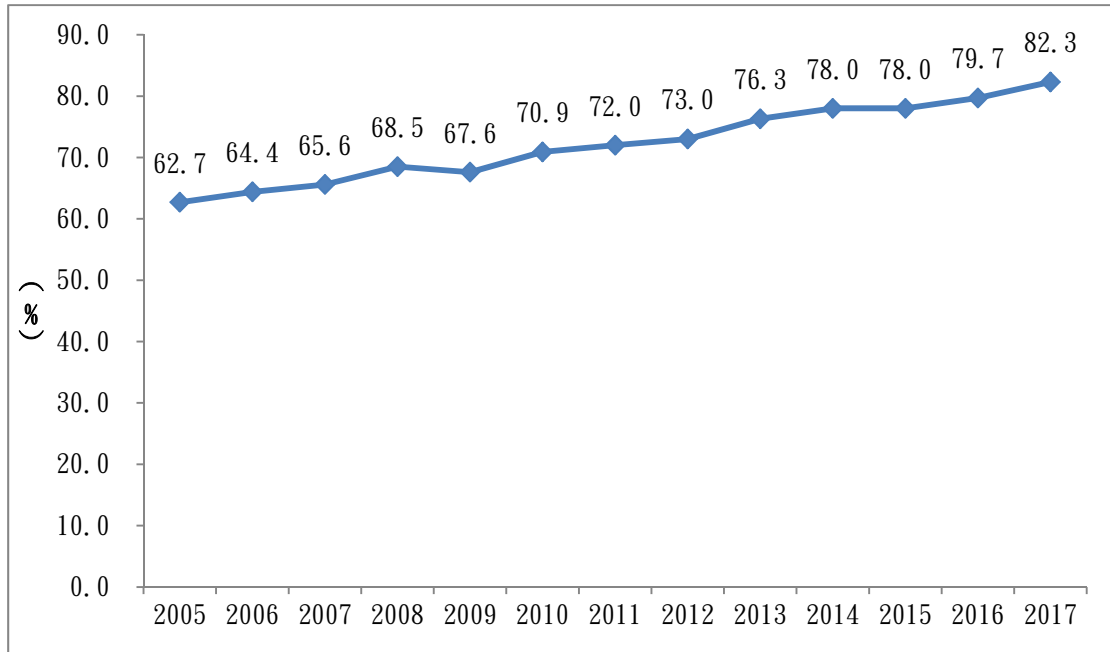
Figure 13 Comparisons of Internet Use Conditions at or above the age of 12 citizens in Taiwan across the Years

Regarding changes in the Internet Usage Rate across each county and city, the Internet Usage Rates across 22 counties/cities have grown compared to those in 2016, whereas the Internet Usage Rates in Kinmen County, Pingtung County, Tainan County and Changhua County exhibit the largest growths by at least 5%, comparing to those in 2016.【Table 15】

Regarding Digital Development in townships/urban areas, the Internet Usage Rates amongst citizens across Level-5 Digital Development Areas exhibited the most significant growth during the most recent year by 7.3%, comparing to those in 2016.【Table 16】

Table 15 Comparisons of the Internet Usage Rates among citizens in each county and city across the Years

Unit: %

County/City	2005	2006	2007	2008	2009	2010	2011	2012	2014	2015	2016 (A)	2017 (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	2.6
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	3.4
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	1.6
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	2.8
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	0.9
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	5.8
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	1.5
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	0.6
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	1.1
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	4.2
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	5.0
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	2.9
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	2.2
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	1.5
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	5.4
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	1.7
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	3.7
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	2.7
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	0.3
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	3.2
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	0.7
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	6.1
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	1.0

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

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Table 16 Comparisons of the Internet Usage Rate among citizens in the Digital Development areas across the Years

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 (A)	83.8	81.5	73.1	76.4	57.8
2017(B)	87.2	83.8	74.2	80.0	65.1
B-A Increased/ Decreased by	3.4	2.3	1.1	3.6	7.3

I. Mobile Internet Usage Rate

Regarding Mobile Internet User Experience, the rate of Internet users using any type of mobile device for Internet access has increased year by year from 53.0% in 2010, and the Mobile Internet Usage rate has reached a record of 97.4%. And if citizens at or above the age of 12 are taken as the denominator, 80 out of 100 people in Taiwan has used Mobile Internet Access on average. 【Figure 14】
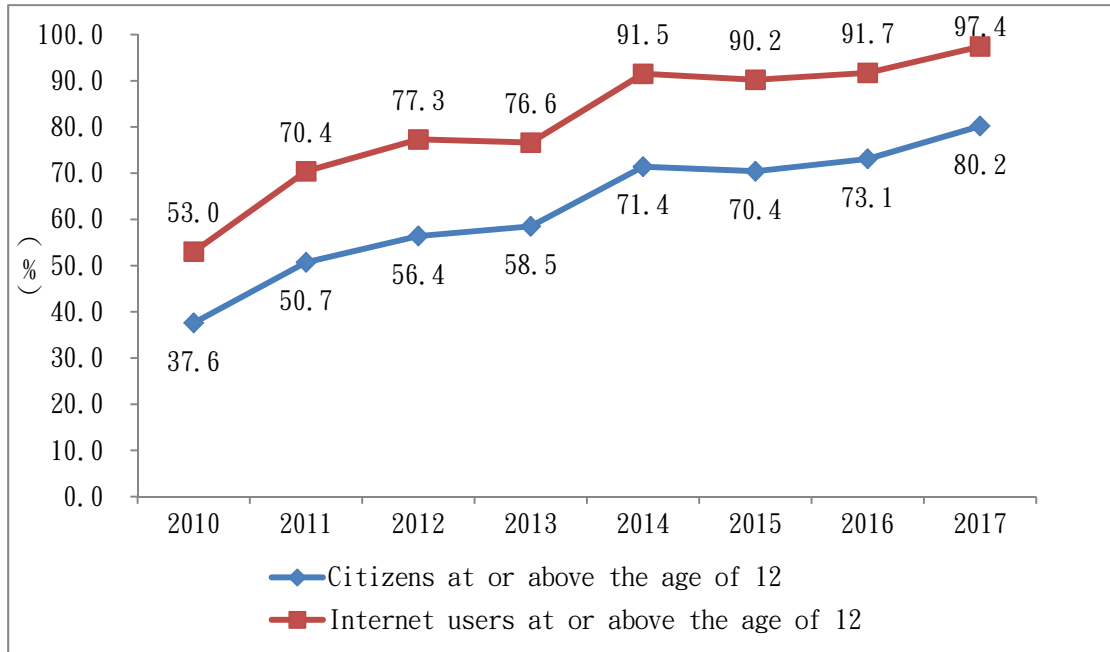
Figure 14 Comparisons of Mobile Internet Use conditions citizens at or above the age of 12 in Taiwan across the Years

(I)   Inclusion

As we observe changes in indicators under the Integration construct such as Participation in Learning Activities, Participation in Social Activities, Economic activities, Health Promotion and Citizen Participation among Internet Users, the number of Internet users participating in Instant Messaging and Online Games has slightly increased amongst the comparable indicators. And the number of Internet users inquiring about Information via various electronic channels has also increased slightly by 1.6%. However, as new Internet users are mostly middle aged the rate of Online Inquiry into Product Information and the online shopping rate have dropped instead.

Meanwhile, the convergence of Internet remarks has been more significant as the rate of Internet users willing to express different ideas on the Internet has dropped from 10.5% to 8.9%.【Table 17】

Table 17 The Digital Opportunity Information 'Integration' Indicators across the Years Comparison

Unit: ％

Secondary Dimension	Index Dimension	2012	2013	2014	2015	2016 (A)	2017 (B)	B-A Increased/ Decreased by
Social Life Application	Social Networking	70.1	73.0	83.8	92.5	94.3	96.8	2.5
	Online Games	-	-	37.5	46.3	46.0	48.8	2.8
Economic Application	Online Reviews and Ratings	74.5	73.2	72.4	65.0	67.4	61.3	-6.1
	Online Banking Services	31.1	34.8	34.1	33.4	31.9	33.2	1.3
	Online Shopping	62.7	61.7	60.7	65.0	64.3	59.2	-5.1
	Internet Sales Experience	16.7	10.0	9.1	5.8	6.3	7.3	1.0
Citizen Participation	Searching for Information of Government Policies or Announcements	50.1	47.1	46.2	37.3	33.8	35.4	1.6
	Proposing Objections on the Internet	-	-	-	10.9	10.5	8.9	-1.6

(II) Exclusion

Regarding Internet use crisis and infringement on rights and interests under the Exclusion construct, we observe the negative influences of the Digital Society. Regarding Internet use crisis, the rate of Internet users who feel anxious without using Internet for a while has increased from 47.4% in 2016 to 54.3% in 2017, showing that the risk of Internet Addiction is on the rise. 【Table 18】

Regarding impacts on physical conditions and degradation of social skills amongst Internet users due to Internet use, the rate of Internet users who are subject to impacts on physical conditions has slightly increased by 1.6% compared to 2016, while the rate of Internet users who are subject to degradation of social skills have decreased by 1.3% and shown slight improvement.

Regarding infringement on rights and interests, Internet users during the most recent year, the rates of Personal Data Leakage and Internet Frauds due to Internet use

have decreased by 3.7% and 1.3% respectively, whereas the rate of cyberbully exhibits no significant changes.

Table 18 The Digital Opportunity Information 'Exclusion' Indicators across the Years Comparison

Unit: %

Secondary Dimension	Third Dimension	Index Dimension	2012	2013	2014	2015	2016 (A)	2017 (B)	B-A Increased/ Decreased by
Internet Use Crisis	Internet addiction	Feeling anxious without using Internet	44.2	40.0	48.3	51.2	47.4	54.3	6.9
	Degradation of physiological abilities	Degradation of physiological abilities	-	-	30.0	28.2	28.7	30.3	1.6
	Degradation of social skills	Degradation of social skills	-	-	9.7	12.7	11.4	10.1	-1.3
Infringement on rights and interests	Personal data privacy	Personal data leakage	-	17.1	19.6	15.2	14.6	10.9	-3.7
	Cyber crime	Damages as a result of Internet frauds	-	-	3.1	4.9	5.8	4.5	-1.3
	Cyberbully	Victimized by verbal attacks or insults from Internet remarks	-	-	4.0	3.4	3.5	3.7	0.2

I.   **Recommendations**

According to 2017 Survey Results, the following section proposes aspects that should be considered, concerning policy implementation and research:

I.   **Recommendations on Research Methods**

(I)   **Reviewing the Digital Opportunity Indicator Structure and Developing Subjective Indicators**

The Digital Opportunity Development Indicator Adjustment Architecture is formulated in July of 2017 for a large-scale telephone survey in August and

September. According to the survey results, asking more questions would not increase the refusal rate in telephone surveys. The additional information also helps us understand the conditions of various technology applications adopted by domestic Internet users more clearly.

However, the biggest drawback to the existing architecture lies in that, it is still difficult to evaluate the correctness of subjective assessment indicators. 63.9% of Internet users think they have a fairly good Information Filtering Capability. 71.7% of Internet users are quite confident about their Information Discernment Capability. The survey is not able to determine whether the results merely reflect the Internet users' confidences or real conditions. In fact, the survey may change from the original questions to other questions with objective answers in the future.

(II) Pending Suitability of The Digital Opportunity Score

In this study, we calculate the Digital Opportunity Score according to Indicator Weighting Criteria derived from 'The Digital Opportunity Development Indicator Adjustment Architecture Research'. However, in actual operations, we find that the Digital Opportunity Score is not only applicable for Internet users, the score under Exclusion construct would reach 100 for non-Internet Users, as to ensure the basic digital score. And if the calculation is based on the concept of 'Total Score = Empowerment + Integration-Exclusion' proposed by the Research Team, then 32.5% of citizens at or above the age of 12 in Taiwan will fall into the group with negative scores. That is, except for 17.5% of the non-Internet population, 15.0% of Internet users will get negative scores owing to conditions that can not necessarily be attributed to improper use of Personal Data (such as Cyberbully or Personal Data Leakage), which also seems unreasonable. Thus, how to calculate the Digital Opportunity Score is an issue that requires further research in the future.

I. Policy Recommendations

(I) The Internet Usage Rate among citizens at or under the age of 50 has almost reached the plateau. We encourage citizens at or under the age of 60 to use Smartphone for Internet Access and fuel the next wave of breakthroughs.

Comparing to the 2016 Survey, the Results show that the Internet Usage Rate of Female at or above the age of 12 in Taiwan was approximately the same to that of

Male, the Internet Usage Rate of Female at or above the age of 12 in Taiwan has again fallen behind that of Males by 3.2% this year. It is mainly because the Internet Usage Rate of Male at or over the age of 50 has risen by more than 10%, which caught up with the Internet Usage Rate Female by filling the original gap of 3.8%, while the Internet Usage Rate of Male at or over the age of 60 has been higher than that of Female at or over the age of 60 by 3.7% and further expanded to 10%.

As we explore this wave of changes, it is possibly because 2G mobile phones would become history by the end of July of 2017 and nearly 500 thousand 2G subscribers had to upgrade their mobile phone service to 3G or 4G services (accounting for 2.4% of the population at or above the age of 12), thus increasing the chance of these people having Internet access. However, as the penetration rate of Smartphone amongst citizens aged between 15-59 in Taiwan reaches the plateau, without the help of structural factors in the future, we can only encourage citizens at or above the age of 60 to apply for Smartphone Internet access (as the current usage rate is only 58.2%) to bring about the next wave of breakthroughs.

(II) **As for the Digital Opportunity Score, the Integration construct obtains the lowest score in Taiwan, and the application requires further improvement.**

The Digital Opportunity Indicator Structure in Taiwan is composed of three constructs, which are Empowerment, Integration and Exclusion. The higher the Empowerment score is, the more the information access channels there is, and the better the information processing capabilities would be. The higher the Integration score is, the more channels there will be and more frequently the individuals can participate in more online activities. The higher the Exclusion score is, the lower risk or damage that the individuals might have to bear while participating in online activities.

The results show that, if the full score is 100, the highest score that citizens at or above the age of 12 in Taiwan have under the Exclusion construct is 90.0, showing that most citizens are still in a secure online environment. The second highest score under the Empowerment construct (52.7), shows that the Taiwanese ability in Access to Information is still of a certain level. However, the Integration construct only gets a score of 26.1, which shows that most Taiwanese only use Internet for social networking and entertainment purposes, and information technology has not yet been fully applied to learning, economic life, citizen participation and health promotion.

The limitations on the abilities of Taiwanese in applications of information technology can also be sufficiently corroborated by another Digital Opportunity Survey on Mobile Phone Users this year. In Taiwan, 16.4% of Mobile Internet users would use Smartphone only for online networking purposes daily. 47.9% would use Smartphone daily only for online networking purposes, or one or two other basic applications (e.g. Information Inquiry, Playing Games, and Watching Videos). Only 30.5% of Mobile Internet Users would use Smartphone for life applications such as health promotion, finance, learning, government services, tools, shopping and so on. This shows that the ability to use information applications amongst Internet users in Taiwan is still not solid enough. There is still considerable room for improvement.

(III) The Digital Opportunity Center that is set up in Level-5 Digital Development Areas has begun to show effects. Case studies are recommended for the accumulation of valuable experience.

This year's survey continues to adopt research design from the previous two years. Level-5 Digital Development Areas are divided into two major categories based on the establishment of the Digital Opportunity Center and the absence of the Digital Opportunity Center, and 600 additional samples are included to reduce the sampling error.

This year's Survey Results show that during the most recent year, the Internet Usage Rate in Level-5 Digital Development Areas for the first time exhibits significant growth by 7.3% comparing to that in 2016, while the rate of Access to Information in areas with the Digital Opportunity Centers goes significantly higher than that without the Digital Opportunity Centers by 9%.

Level-5 Digital Development Areas mainly include aging population and remote villages and towns. Thus, it is hard to implement digital development policies. As the increase in the Internet Usage Rate has not been seen in earlier years, the performance in 2007 is getting better. Our recommendation is that the Ministry of Education can conduct case studies in Level-5 Digital Development Areas based on the policy implementation conditions from last year, in order to find out the key points in policies for increasing Access to Information in rural areas.

(IV) e-Government proactive services exhibit the highest rate of exposure to citizens, which may increase service frequency.

The 2017 survey shows that exposure rate of government-initiated messages is highest among Internet users. 50.2% of Internet users have received government notifications of disaster preparation or public information such as newsletters, which is higher than other use rates of e-Government services, by 15%. Unfortunately, although the exposure rate is high, the frequency of service delivery is still low, so the effects are not significant.

In our opinion, it is a good idea to avoid official messages being marginalized in the process of information distribution in the online community. However, how to avoid fixed contents and modes would still require further considerations.

(V)   Male and female exhibit the same willingness to speak on the Internet. Considerations shall be given on how to convert private talks to public discussions on policies.

The promotion of citizen participation and communication efficiency via Internet has always been the focus of e-Government in Taiwan. However, this year's survey results show that Internet remarks became more centralized (converged) and the number of people who are willing to express themselves differently on the Internet dropped from 10.5% to 8.9%, though Male exhibit a higher enthusiasm for expressing view on public policies.

However, as we investigate another indicator in this year's survey (whether articles/videos are posted/uploaded to the online community/blogs), Female Internet users are actually more active in expressing opinions on the Internet than Male Internet users are. The rate of Female Internet users that have expressed opinions on the Internet is also higher than that of Male Internet user by 3.5%.

Nevertheless, more than 80% of Female Internet users who have expressed opinions would only share their private feelings and thoughts. In the future, if we want to increase female participation in public policies, we may need to carefully select topics of interest to women, and cultivate their experience in public participation to break the existing gender imbalance in public speech.