

Communications Market Report 2018

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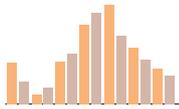


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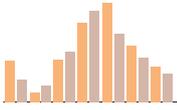


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Foreword

It is apparent that the rapid development in information and communications technologies is the driving force behind the flourishing digital economy. Consequently, the communications sector has become more vital than ever to a nation's economy and its overall development. This is underscored by the use of communications services not only affecting business operations and technological development within the communications industry, but also having a significant impact on all other sectors.

Conducting a comprehensive survey of communications thereby provides valuable insight to national development and has long been a means for organizations, such as Ofcom, the communications regulator in the UK, Ministry of Internal Affairs and Communications in Japan, KCC in Korea and IMDA in Singapore, to ascertain consumer behavior so that information can be regularly compiled and analyzed so as to determine key statistics and specific trends of the communications industry.

The National Communications Commission (NCC) of Taiwan conducted its first comprehensive communications market survey last year with the task again being undertaken in 2018. The aim of this year's survey was to acquire objective and detailed data on consumer behaviors and the status of the innovative applications through a comprehensive and in-depth investigation. Subsequently, the acquired information may serve as an indicator of the development of the digital economy of Taiwan, as well as a reference when determining future policies and regulations.

Part I : Survey of Development of Digital Convergence in Communications begins with an outline of the background and research methods undertaken for this survey. The questionnaire was designed with particular referral to those conducted by Ofcom. With respect to sampling, a stratified three-stage probabilities proportional to size sampling was employed. In the first and second stages, samples were allocated based on the PPS principle; while in the third stage, samples were selected using convenience sampling and interviews to survey how Taiwanese people aged 16 and over use services in four categories: Communications, Broadcasting, Development of Convergence, and Broadband. In addition to the methods and structure, limitations of the sampling structure, samples received and the sample reasoning of this survey have all been clearly explained.

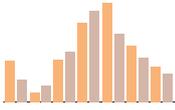
This report contains the brief results of the four surveys of telecommunications, broadcasting, broadband and digital convergence, which have then been combined to present an overall analysis and provide a comprehensive picture of consumer behavior in Taiwan. Then, a cross analysis including region, gender, age and marriage status has been shown to indicate the differences between groups.

Part II contains a comparison of domestic and international trends of digital convergence, whereby both international trends and global development in the communications industry have been shown alongside those of Taiwan. And then, in Part III, final conclusions are given, as well as some suggestions for the further study.

01

Survey of Digital Convergence Development of Communications





Methodology

Questionnaire Design

The questionnaires used for this survey were adapted from research undertaken by Ofcom, which has gained extensive experience of surveying consumer behavior and trends in the communications industry. The survey, which covers the four categories of telecommunications, broadcasting, broadband usage, and digital convergence, was conducted with the objective of obtaining data on consumer behavior and preferences, as well as key developments and innovations in the digital economy so as to obtain a thorough analysis and comprehensive in-depth investigation of demand for such services. This year, some new questions were added into the questionnaire in order to understand respondents' attitudes and behaviors in relation to cable TV cross-regional operations.

Population and Sampling Strategy

(1) Survey population

The survey was conducted in Taiwan proper (exclusive of Kinmen County and Lianjiang County) with people aged 16 and above (those who were born on and before December 31, 2002) being approached.

(2) Sampling Method

Due to the Personal Information Protection Act, household registers from the Ministry of the Interior were unavailable and a limited budget meant that sampling was designed and performed in three stages according to the principle of PPS (probabilities proportional to size) sampling. In the first and second stages, samples were allocated based on the PPS principle, while in the third stage samples were selected using convenience sampling.

(3) Pilot Test

Prior to the formal survey, pilot tests were conducted. Thirty successful samples were taken in each of the four categories, a total of 120 successful samples. The original seven levels were merged to five after the pretest¹.

(4) Formal Survey

Prior to conducting the formal survey, the proportions of population in the geographic areas were calculated based on the demographic data provided by the Ministry of the Interior at the end of December 2017, and the numbers of samples for all geographic areas were determined based on the proportions, with the numbers of townships and the expected number of completed samples within every township adjusted. Consequently, a total of 1,068 samples were expected to be completed in each of the four investigations. In view of the small population and extremely uneven distribution of population in the Hualien and Taitung area, the stratified two-stage PPS (probabilities proportional to size) sampling was actually used, while the stratified three-stage PPS sampling was used in other areas.

¹ In the pilot study, the classifications established by Pei-jun Hou et al. (2008) were adopted as the basis for the stratified sampling: villages, towns, cities and districts were grouped into seven levels based on the degree of development. The seven levels are city cores, commercial and industrial areas, emerging cities and townships, traditional industry townships, less-developed townships, aged townships and remote townships, with the last three levels— Levels 5, 6 and 7 – merged as one. The areas are defined as follows – North Area: Taipei City, New Taipei City, Keelung City, Taoyuan County, Hsinchu County and Hsinchu City, Miaoli County, Ilan County; Central



During the third stage, a survey point was set up at gathering places (such as village office, activity center, and market) in the townships selected to conduct the survey with local residents.

The sampling units in each stage are explained as below.

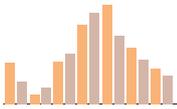
A. During a two-stage sampling, the primary sampling units were “township” and then “people.” All of the “districts and townships” in the geographic stratum were included.

B. During a three-stage sampling, the primary sampling units were “townships,” and the second sampling units were “villages.” The last sampling units were “people.”

During the implementation of the survey, the gender and age structures of all communities were strictly controlled with view to ensuring that the structure of the survey results could be similar to that of the target population. In case of any inconsistency between obtained samples and the population, the results were weighted based on variables like gender, age, and community. The weighted sample number in every age group must not exceed the original sample number by 60%.

Table 1 Allocation of Samples

Geographic stratum	Level	No. of People Aged 16 and above	Population Percentage	Planned Allocation of Samples	No. of Townships and Districts Selected	No. of Villages Selected	Total Samples of Villages
Taipei City, New Taipei City, Keelung, Yilan	Level 1	1,234,927	19.11%	66	2	2	4
	Level 2	3,180,892	49.22%	169	5	2	10
	Level 3	1,642,127	25.41%	87	3	2	6
	Level 4	404,626	6.26%	22	1	2	2
	Subtotal	6,462,572	32.15%	343	11	—	22
Taoyuan, Hsinchu, Miaoli	Level 1	1,136,158	36.42%	60	2	2	4
	Level 2	1,460,970	46.83%	78	3	2	6
	Level 3	522,787	16.76%	28	1	2	2
	Subtotal	3,119,915	15.52%	166	6	—	12
Taichung, Changhua, Nantou	Level 1	903,857	23.26%	48	2	2	4
	Level 2	1,266,346	32.59%	67	2	2	4
	Level 3	1,276,334	32.85%	68	2	2	4
	Level 4	438,815	11.29%	23	1	2	2
	Subtotal	3,885,352	19.33%	206	7	—	14
Yunlin, Chiayi, Tainan	Level 1	922,186	31.58%	49	2	2	4
	Level 2	1,216,056	41.65%	65	2	2	4
	Level 3	781,563	26.77%	42	1	2	2
	Subtotal	2,919,805	14.53%	155	5	—	10
Kaohsiung, Pingtung, Penghu	Level 1	1,132,325	35.01%	60	2	2	4
	Level 2	986,400	30.49%	52	2	2	4
	Level 3	1,115,990	34.50%	59	2	2	4
	Subtotal	3,234,715	16.09%	172	6	—	12
Hualien, Taitung	Level 1	252,400	52.97%	13	0	1	1
	Level 2	224,091	47.03%	12	0	1	1
	Subtotal	476,491	2.37%	25	—	—	2
Total		20,098,850	100.00%	1,068	—	—	72



(5) Allocation of Samples

At least 1,068 valid samples were investigated in each questionnaire with a sampling error of within $\pm 3\%$ at a 95% confidence level.

Since the original allocation of the survey site sampling is based on proportions of the entire population, these calculated decimal numbers had to be rounded to the nearest integers when the survey was actually performed. Moreover, to meet a specific requirement this year that the number of weighted samples in every age group must not exceed the original number of samples by 60%, the samples were allocated and adjusted accordingly in this project. The adjusted allocation of survey site sampling has been shown in the Table 1.

(6) Survey Period

The interviews took place in the selected areas between May 6 and July 13, 2018.

Implementation of Survey

(1) Timeline

Before the survey was formally launched, preparations for questionnaires and related affairs were undertaken from April 22 to April 26, 2018. After the questionnaires were modified based on the conclusions from the meeting with the agency that commissioned this study, the survey formally began on May 6, 2018. The timeline is explained as below.

A.Preparation period: April 1 to April 27, 2018

B.Survey period:

- Phase 1: April 22 to April 26, 2018
- Phase 2: May 6 to July 13, 2018

C.Review period: July 14 to July 18, 2018

(2) Survey Method

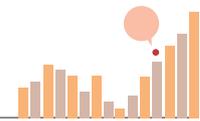
Face-to-face interviews were employed for this survey; a computer-assisted interview survey system was used during the interview, and was complemented with printed questionnaires.

Research Limitations

(1) Sample Frame Limitations

Based on the requirements of the NCC, at least 1,068 successful samples were to be completed with the allocation of samples proportional to the population of every county or city.

In order to undertake rigorous sampling, research was conducted with reference to the sample structure used in Taiwan Social Change Survey by Academia Sinica. Nonetheless, it may be worth noting that this research differed from Taiwan Social Change Survey, where household registrations were used as a sampling frame. With no access to Taiwan's household registration database, a



household survey seemed impossible. Instead, interviews were carried out at gathering places in townships or cities.

(2) Sample Recovery Restrictions

The survey questionnaires contained 82-112 questions. In order to meet the requirement of at least 1,068 successful sample responses, groups of two interviewers were arranged at bustling locations, such as parks and busy crossroads, to perform interviews.

During this survey, the average number of those who did not comply was four. Among the aged 55 and over groups, the average number of refusals was 7.5, making it much harder to achieve the planned number of interviews when compared with young people. Even so, the interviewers were urged to obtain the required number of samples by gender and age, so the weighted number of all age groups would not exceed the original number of samples by 60%.

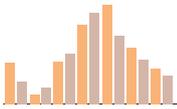
(3) Sample Inference Restrictions

A. Telecommunications: after weighting, the sample number of young people, such as ages 16-25, was 0.78 times greater; the sample number of ages 26-35 was 0.82 times greater; the sample number of ages 36-45 was 0.98 times greater; the sample number of middle-aged people such as ages 46-55 was 1.05 times greater; the sample number of ages 56-65 was 1.18 times greater; and the sample number of ages 66 and above was 1.47 times greater.

B. Broadcasting: after weighting, the sample number of young people, such as ages 16-25, was 0.79 times greater; the sample number of ages 26-35 was 0.81 times greater; the sample number of ages 36-45 was 1.06 times greater; the sample number of middle-aged people such as ages 46-55 was 0.98 times greater; the sample number of ages 56-65 was 1.17 times greater; and the sample number of ages 66 and above was 1.5 times greater.

C. Broadband: after weighting, the sample number of young people, such as ages 16-25, was 0.76 times greater; the sample number of ages 26-35 was 0.79 times greater; the sample number of ages 36-45 was 1.01 times greater; the sample number of middle-aged people such as ages 46-55 was 1.08 times greater; the sample number of ages 56-65 was 1.19 times greater; and the sample number of ages 66 and above was 1.53 times greater.

D. Digital Convergence: after weighting, the sample number of young people, such as ages 16-25, was 0.79 times greater; the sample number of ages 26-35 was 0.82 times greater; the sample number of ages 36-45 was 1 times greater; the sample number of middle-aged people such as ages 46-55 was 1.04 times greater; the sample number of ages 56-65 was 1.16 times greater; and the sample number of ages 66 and above was 1.45 times greater.



Results

Telecommunications

Household Phone Usage

OVERALL ANALYSIS

For household phone usage, 78.6% of people in Taiwan aged 16 and over have both landline and mobile phones. With the ubiquity of mobile and broadband networks, 16.9% people responded that they rely fully on mobile phones, while 2.4% people use only landline phones at home.

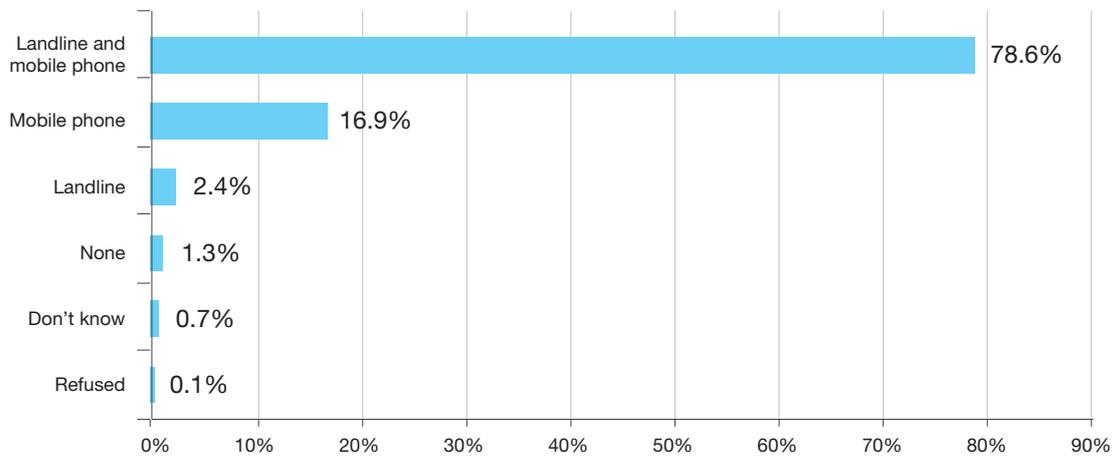


Figure 1 Household Phone Usage

Base: N = 1,068

Smartphone Usage

OVERALL ANALYSIS

The proportion of the households using smartphones is 92.8%.

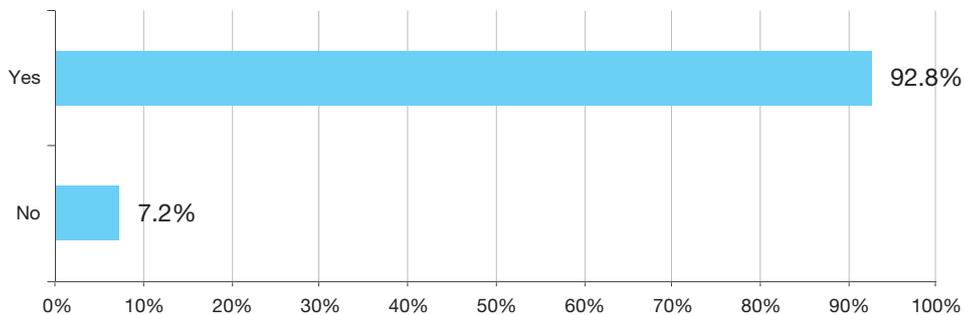
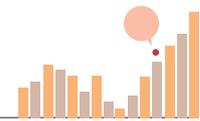


Figure 2 Smart Phone Usage in Households

Base: N = 1,068



Most Common Mobile Phone Tariff Plans and Types

OVERALL ANALYSIS

The most common mobile phone tariff plan is a monthly-based scheme (91.7%) with the rates of prepaid plan and the scheme combined with the monthly base and prepaid base accounting for just 4.7% and 0.8% respectively.

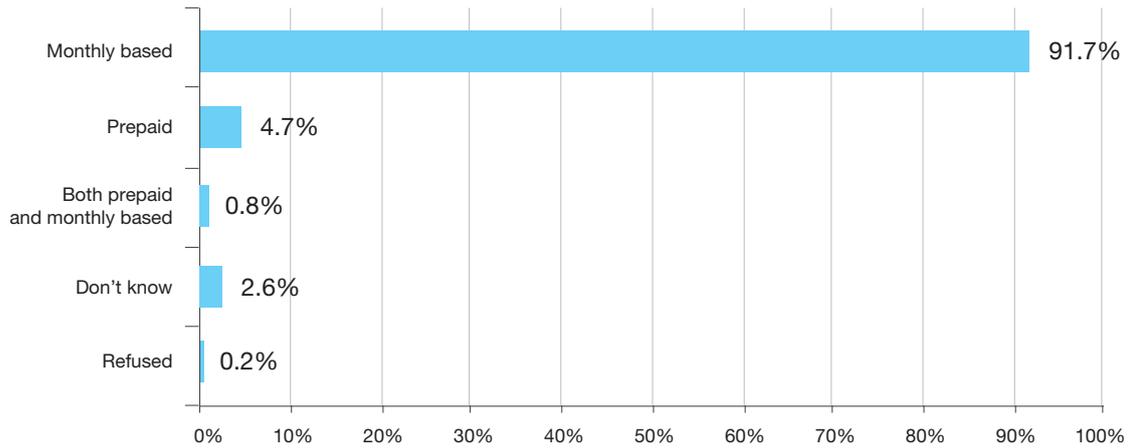


Figure 3 Most Common Mobile Phone Tariff Plans

Base: N = 1,020 (people who use mobile phones)

Mobile Phone Plans

OVERALL ANALYSIS

People in Taiwan have mainly opted for mobile phone plans with the phone number-binding contract (58.1%) and the handset-binding contract (30.5%). Only 6.7% people have opted for a SIM-only plan.

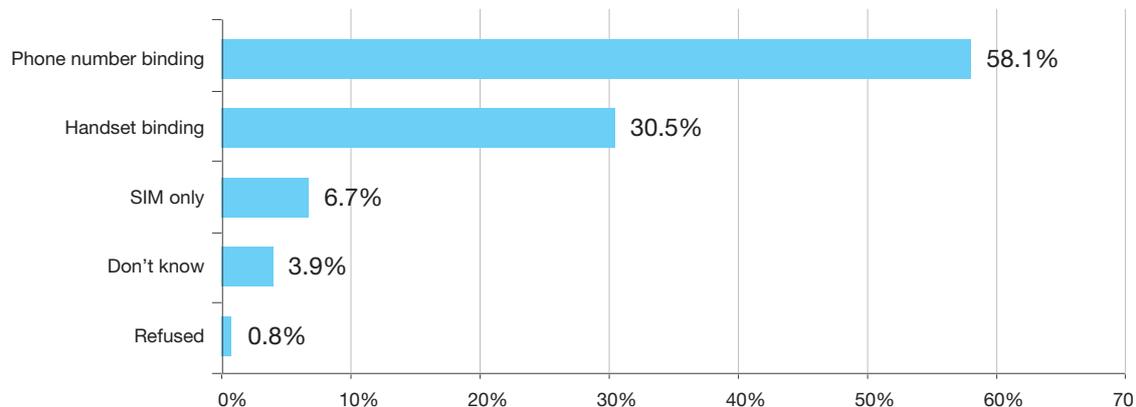
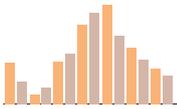


Figure 4 Mobile Phone Plans

Base: N = 992 (people who use mobile phone and know which phone plan they choose)



Internet Usage

OVERALL ANALYSIS

The survey shows that 86.2% of people in Taiwan aged 16 and over use the internet, while 13.8% of them do not.

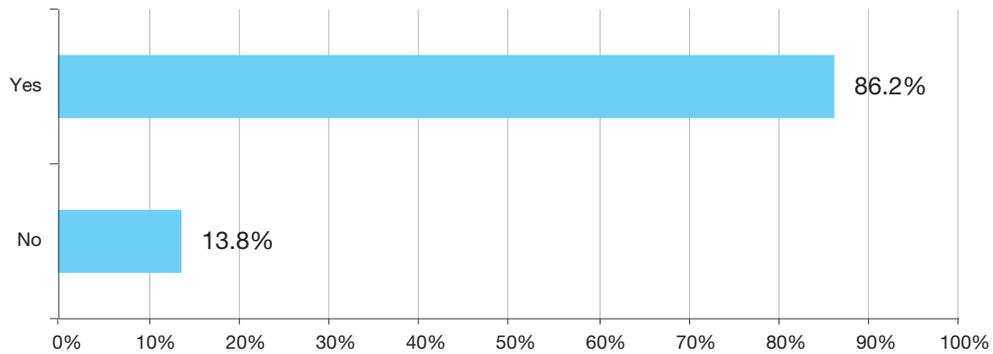


Figure 5 Internet Usage

Base: N = 1,068

Accessing Internet at Home

OVERALL ANALYSIS

The rate of people in Taiwan that access the internet at home is 89.0%, while only 8.8% do not.

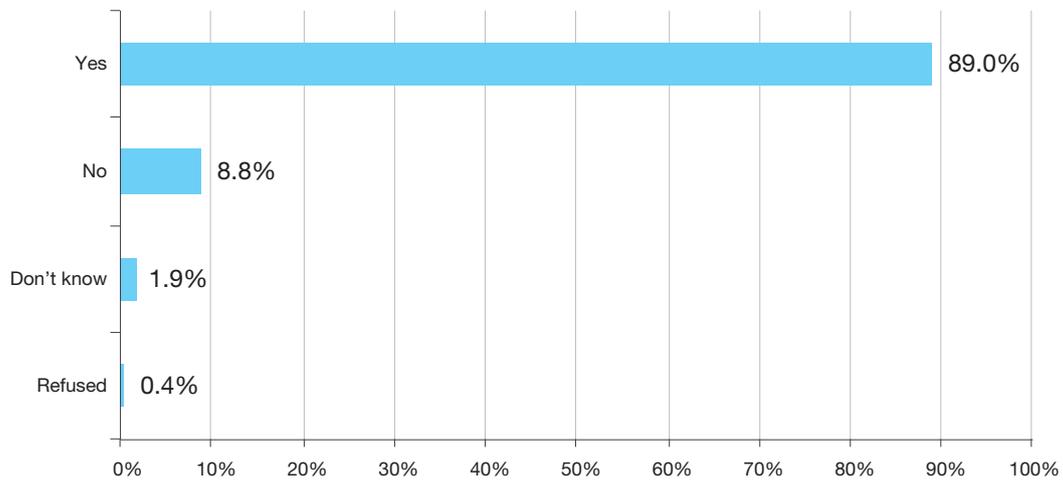


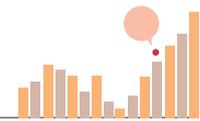
Figure 6 Access the Internet at Home

Base: N = 1,068

The Most Frequently Used Mobile Internet Service Outside Homes

OVERALL ANALYSIS

The most frequently used mobile internet service when people are outside their homes is broadband. After the launch of 4G services, the rate of 4G service users increased rapidly to 84.2%. In contrast, 6.5% of people do not use a mobile internet



service when they are outside their homes. The rates of using 3G service (2.6%) and sharing hotspots from family or friends (1.9%) are less than 3%.

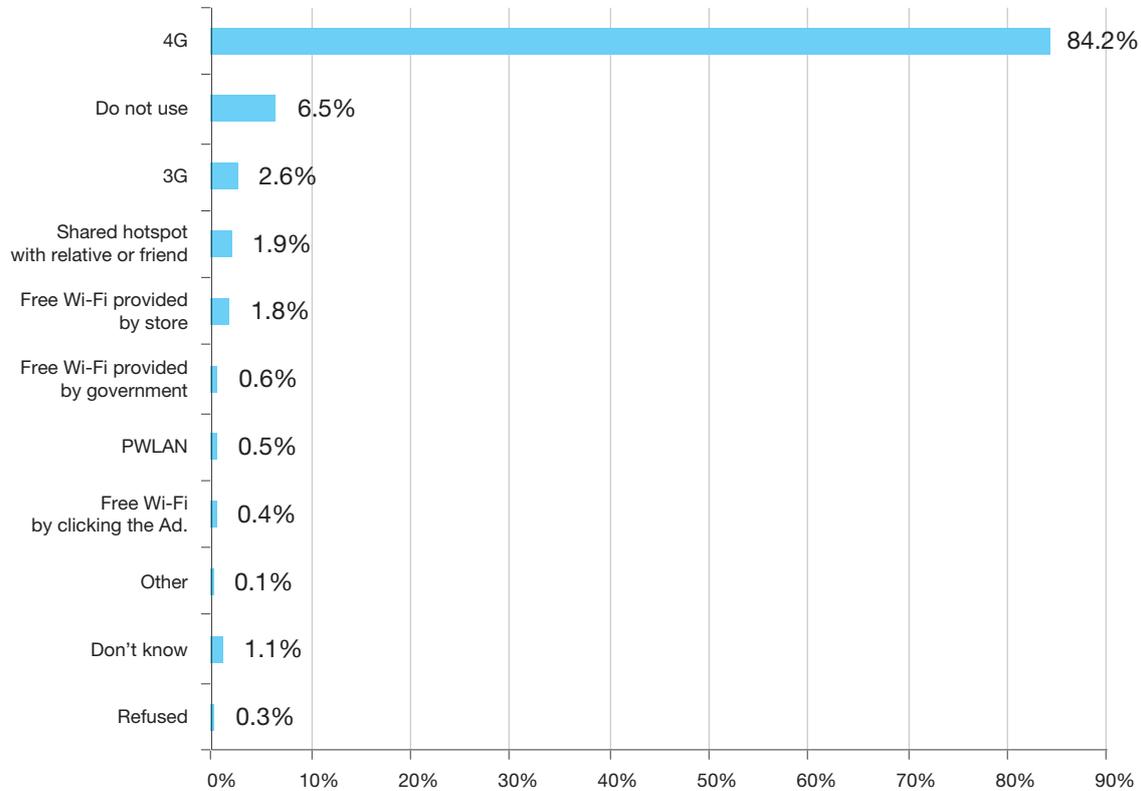


Figure 7 Most Frequently Used Mobile Internet Service outside Homes

Base: N = 944 (people who mainly use smartphones as their mobile phones)

Broadcasting

Audiovisual Behavior

OVERALL ANALYSIS

According to the survey results, 61.4% of the people over the age of 16 only watch television, while 30.8% watch television and listen to radio and only 1.5% listen to radio; 6.3% neither watch TV nor listen to radio.

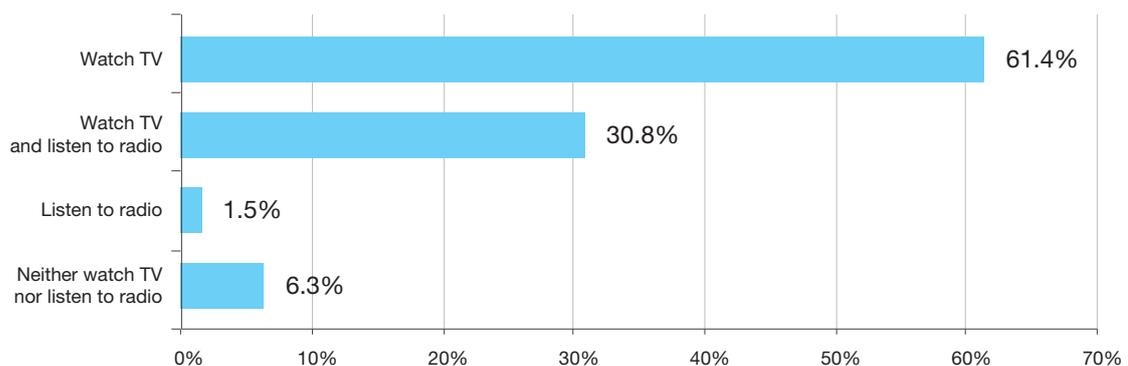
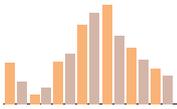


Figure 8 Those Who Watch TV or Listen to Radio

Base : N=1,078



The Main Visual Platform

OVERALL ANALYSIS

The most common platform for viewers in Taiwan is cable TV (63.1%), followed by Chunghwa Telecom MOD (16.5%) and terrestrial TV (13.2%).

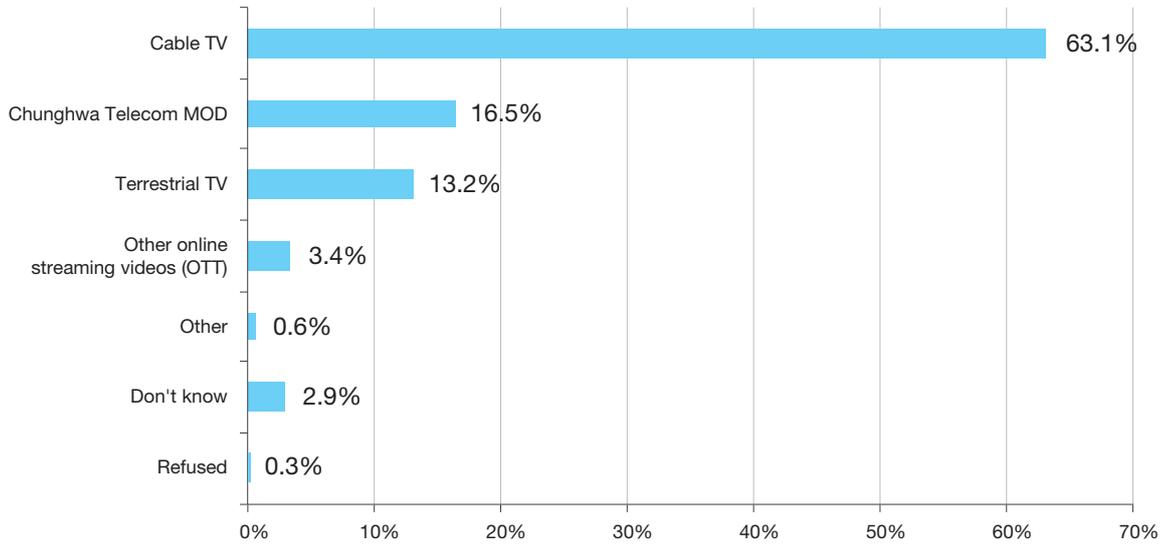


Figure 9 Primary Visual Platform

Base : N=1,041

Considering Cancellation of Subscription to Cable TV Services

OVERALL ANALYSIS

The above analysis shows that cable TV is the most common source of viewing in Taiwan. When interviewees were asked their willingness to renew the subscription for next year, 88.4% of them responded affirmatively, while 4.3% of cable subscribers considered suspension.

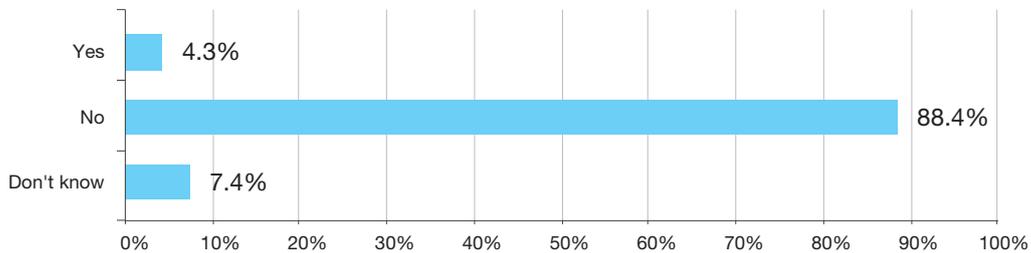
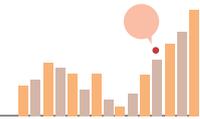


Figure 10 Considering Cancellation of Cable Television Services

Base: N=693 (cable TV subscribers)



Prime Time for Watching TV

OVERALL ANALYSIS

The most popular time for watching television is 20:00-21:00, accounting for 50%; followed by 19:00-20:00, accounting for 48.4%, and 21:00-22:00, accounting for 40.4%. In short, the survey result shows that 19:00-22:00 is the prime time for people in Taiwan to watch TV.

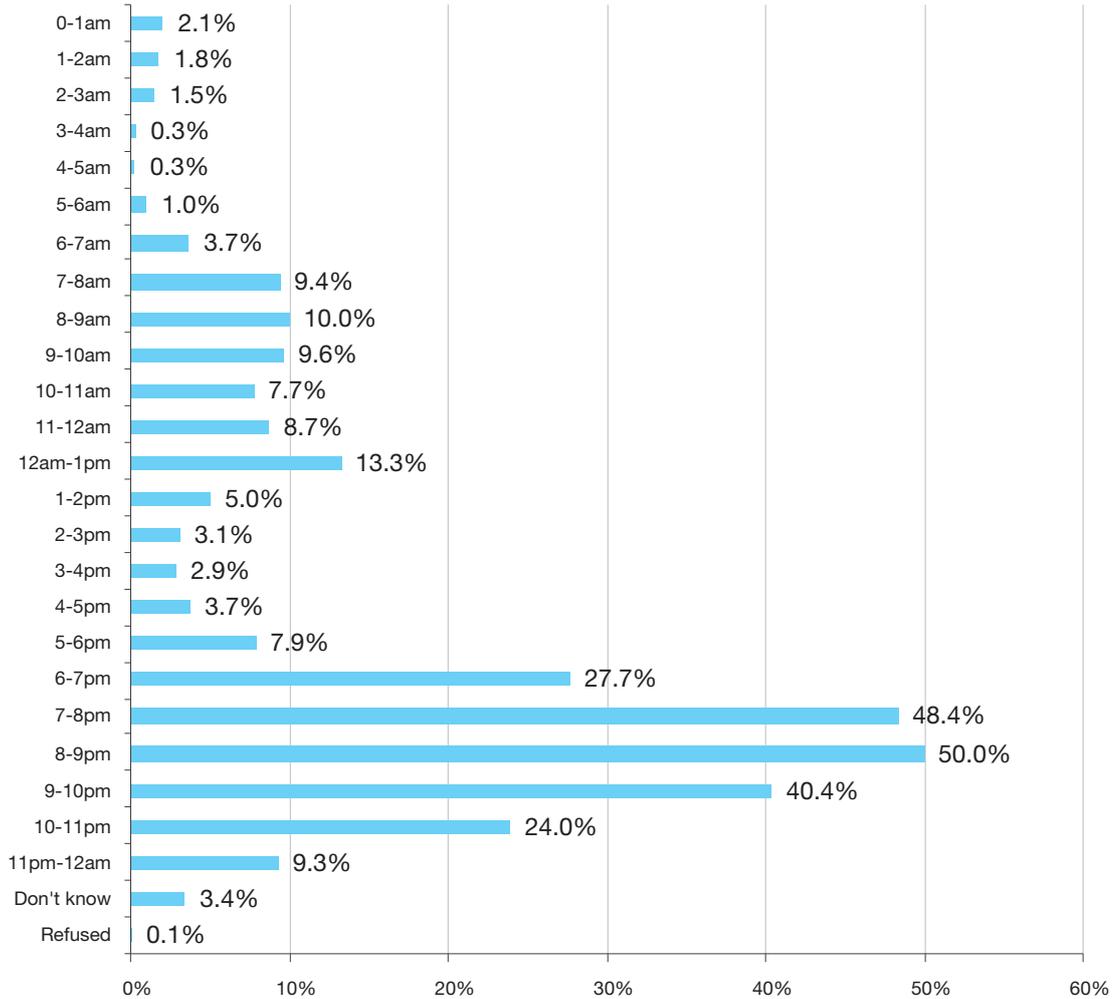
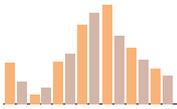


Figure 11 Most Frequent Time Slots for TV

Base : N=994 (TV viewers)



Quality of TV Programs

OVERALL ANALYSIS

Overall, 61% of the people believe that over the past 12 months, the overall quality of TV programs maintained their original level, while 14.2% expressed improvement, and 10.2% felt quality had become worse.

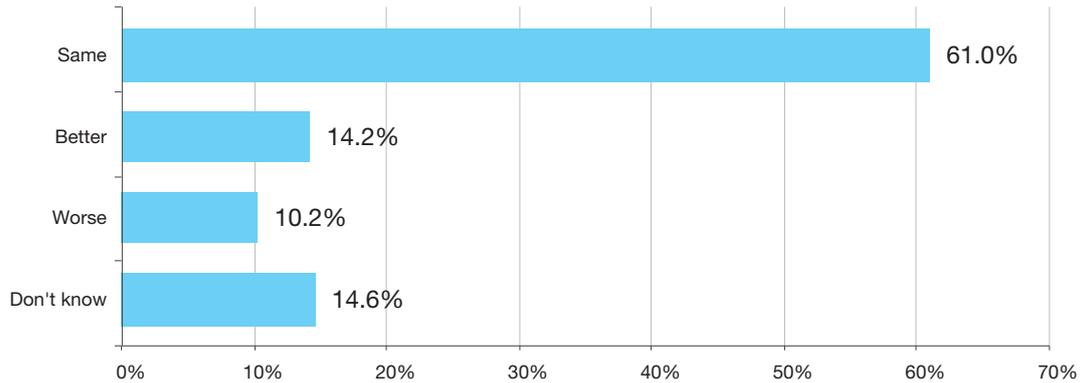


Figure 12 Whether Quality of TV Programs Have Improved over 12 Months
Base: N=994 (TV viewers)

Radio

OVERALL ANALYSIS

The frequency of those listening to the radio at least once a day was 38%, followed by those who listen several times a week (37.5%). In terms of the time slot of most frequently listening to the radio, the most common time is 7:00-8:00, with the ratio of 27%, and the second most common time is 9:00-10:00, with a ratio of 15.9%.

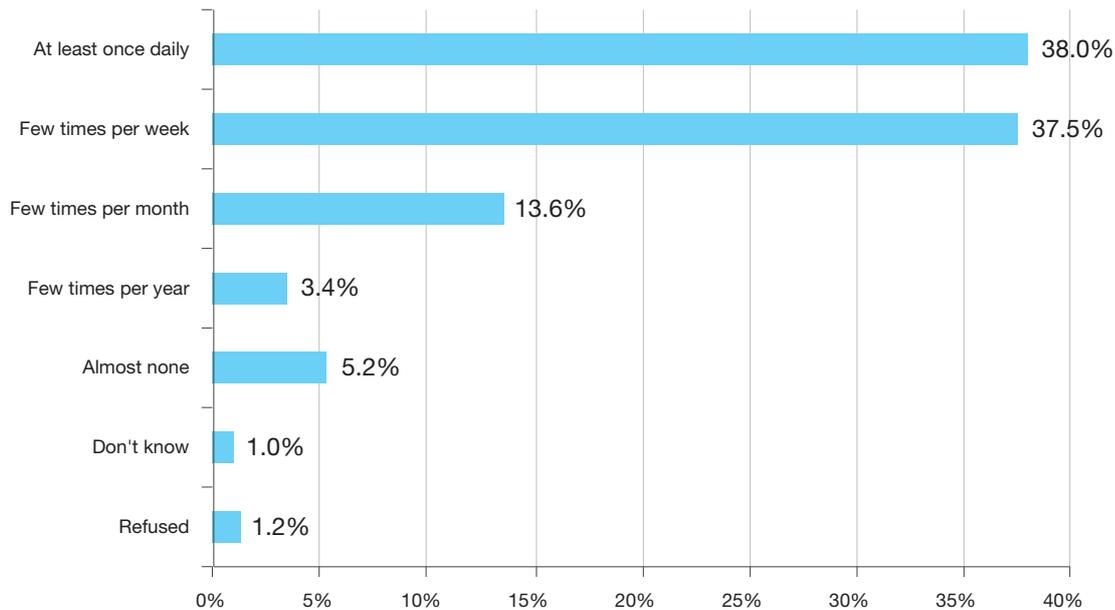
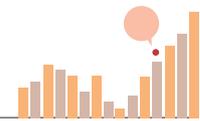


Figure 13 Frequency of Listening to Radio
Base : N=349 (respondents who listen to the radio)



Degree of Information Reliance on Radio Broadcasting

OVERALL ANALYSIS

As for the degree of information reliance on radio broadcasting, listening to music came first (an average of 6.7 points), followed by obtaining news, with an average of 5.41 points; recommended products returned the lowest results, with an average of 3.85 points.

Table 2 Degree of Information Reliance on Radio Broadcasting

Information obtained by radio broadcasting	Degree of information reliance (average points)by radio broadcasting
Listen to music	6.70
News	5.41
Disaster information (floods, typhoons, earthquakes)	5.39
Travel and weather information	5.23
Other life information	5.18
Recommended Products	3.85

Base : N=349 (radio listeners)

Public Attitude towards Exposing Privacy of Public Figures

OVERALL ANALYSIS

Regarding whether the TV programs can violate the privacy of public figures without consenting, more than 70% disagree - 38.1% strongly disagree while 37.9% disagreed. The ratio of agreeing and strongly agreeing was less than 8%.

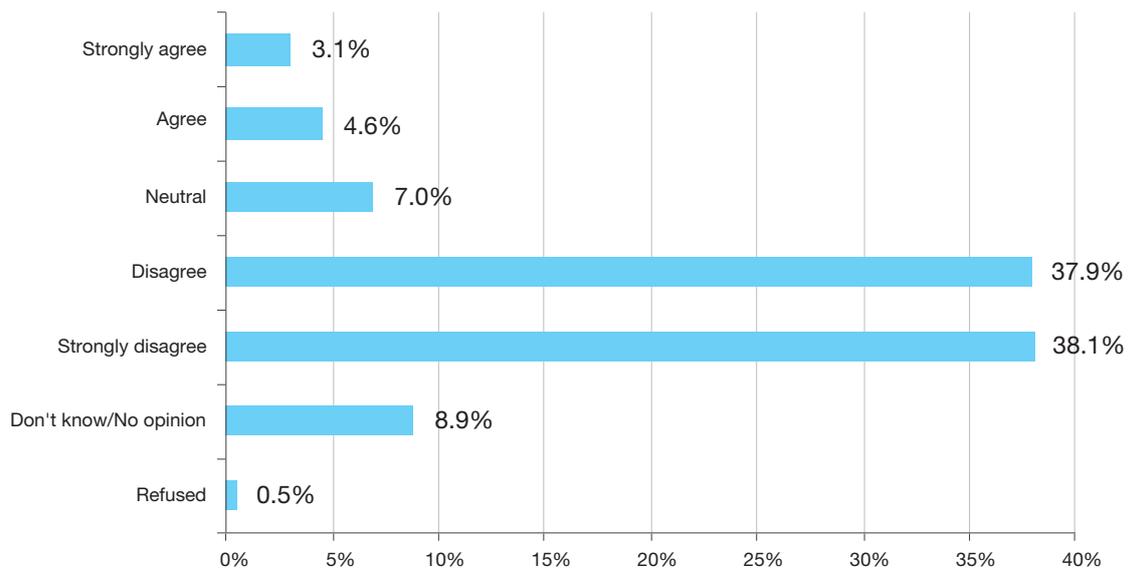
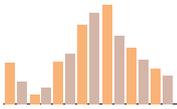


Figure 14 Attitudes toward Violating Privacy of Public Figures

Base: N=1,078



Broadband

Measures Taken to Protect Online Security

OVERALL ANALYSIS

The most commonly used measure to protect internet security by people in Taiwan is anti-virus software (61.6%), followed by firewall (36.1%); while 20% of people do not take any internet security measures.

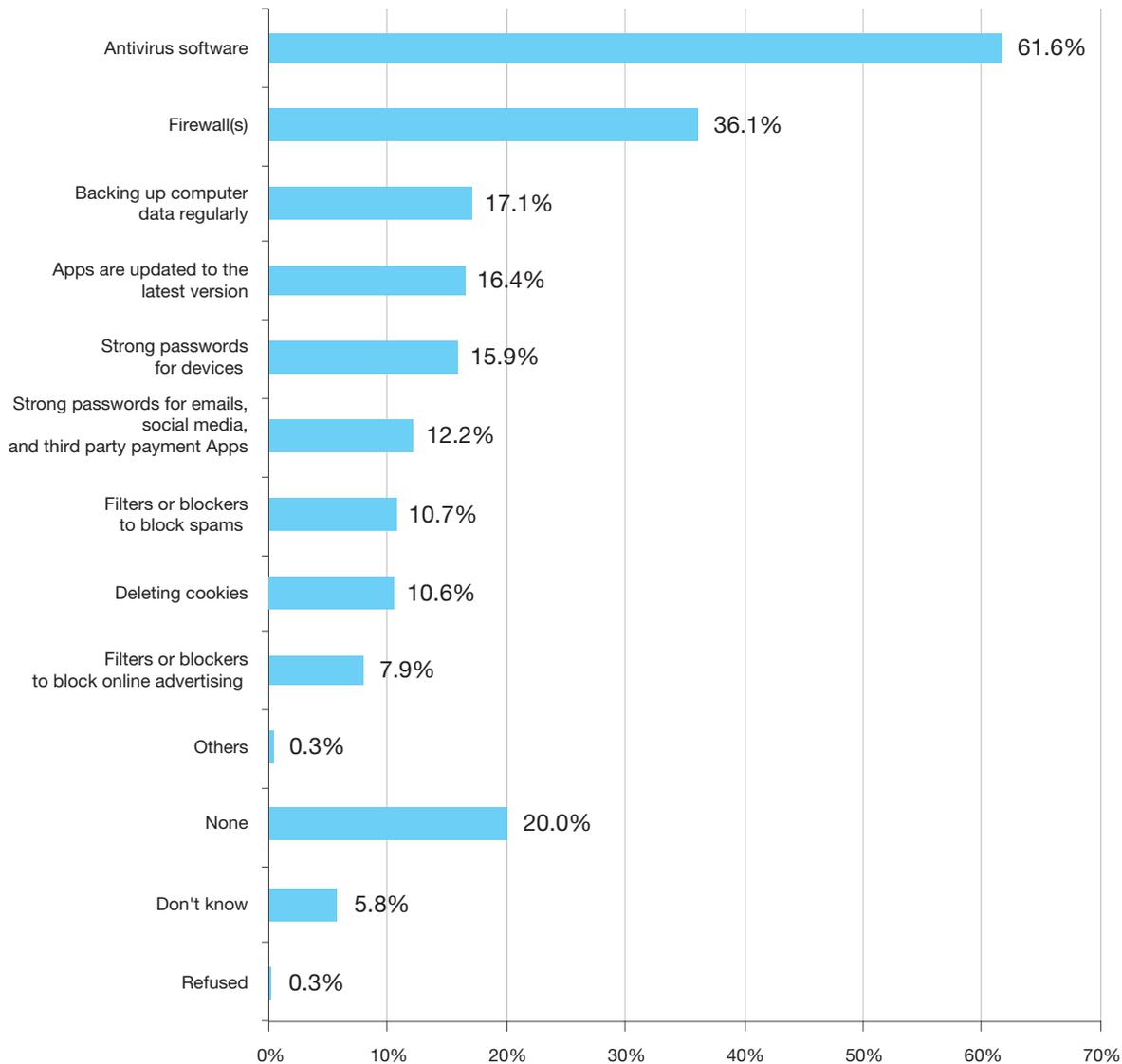
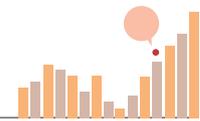


Figure 15 Internet Security Measures

Base : N=959, multiple-choice (Internet users)



Online activities

OVERALL ANALYSIS

The survey shows that the most common online behavior was browsing/searching (65.3%), followed by obtaining news (53.8%) and searching for products or services (47.9%).

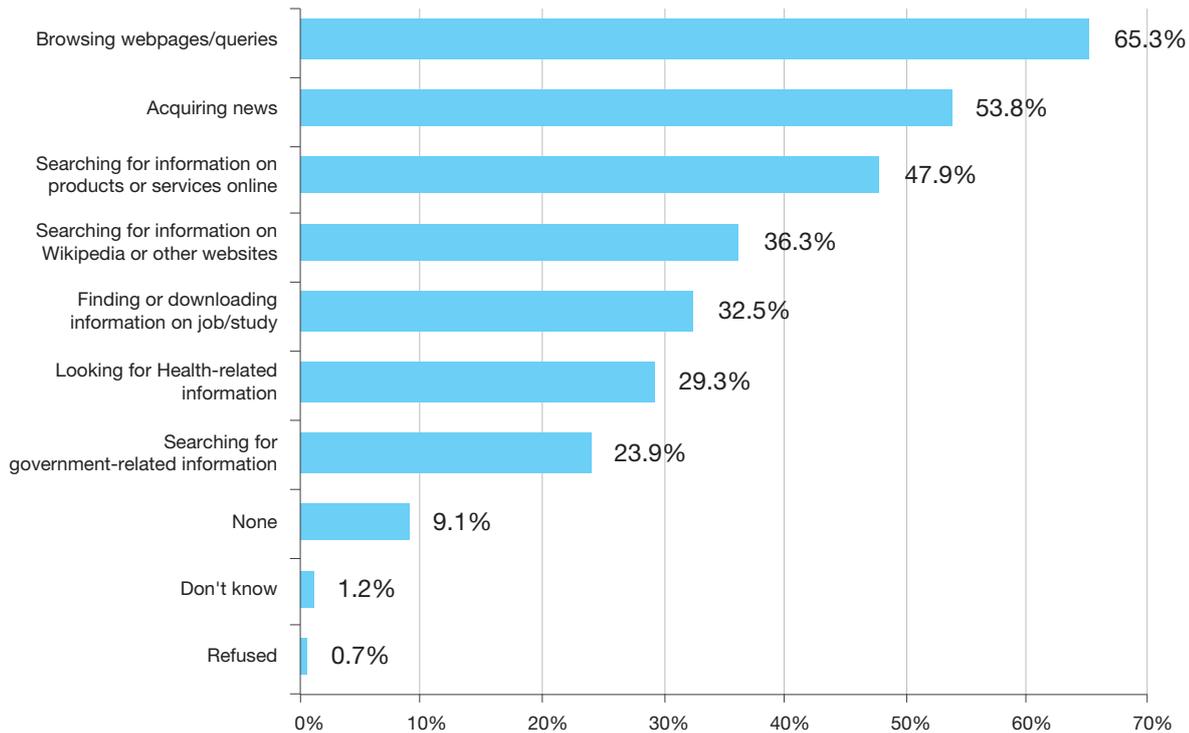


Figure 16 Online Activities

Base: N=959, multiple-choice (Internet users)

Social Media and Instant Messaging Accounts

OVERALL ANALYSIS

The survey shows that 88.2% of people in Taiwan have at least one social media or instant messaging account, while only 8.3% have no such account.

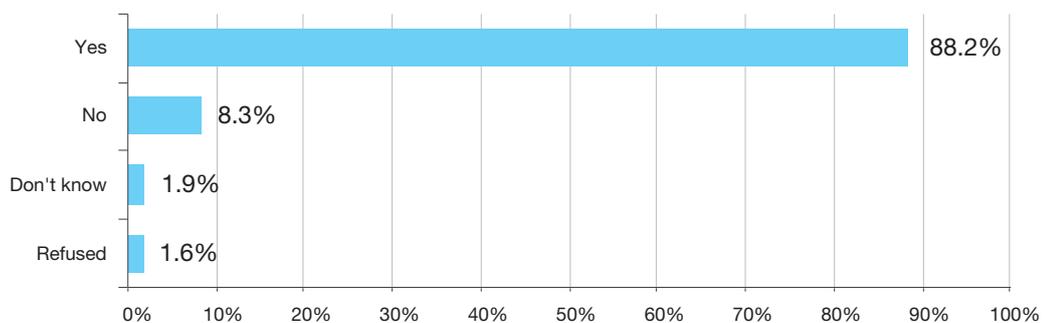
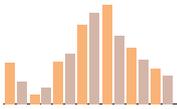


Figure 17 Using Social Media or Instant Messaging Accounts

Base: N=959 (Internet users)



Believing in What One Reads or Sees on Social Media

OVERALL ANALYSIS

The survey shows that 58.4% of people strongly agree or agree that they tend to believe in what they read or see on social media, while 34.5% of people strongly disagree or disagree.

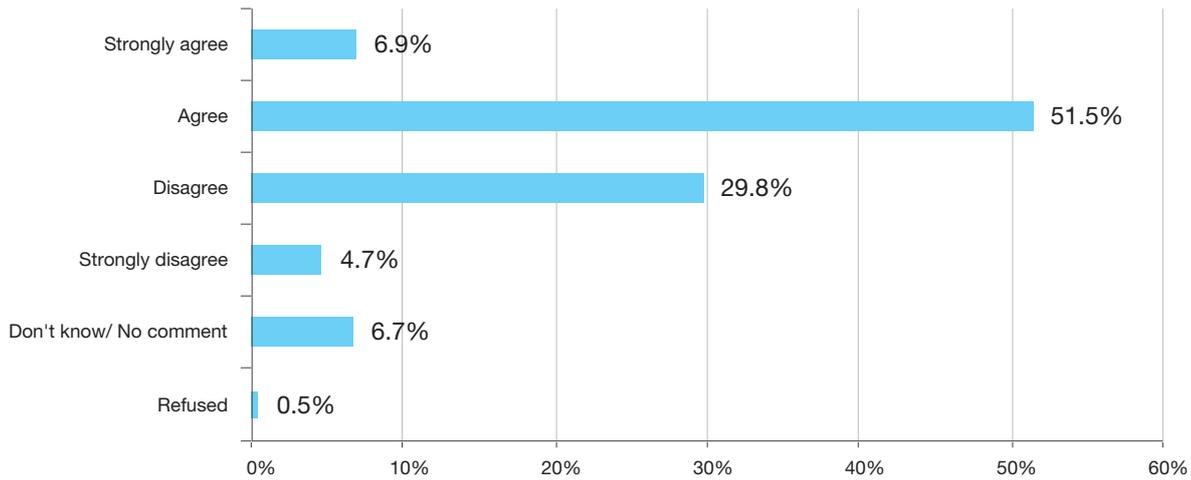


Figure 18 Belief in What is Read or Seen on Social Media
Base: N=845 (People who have social media or instant messaging Apps)

Frequency of Considering Privacy or Security When Posting Photographs or Tagging Others

OVERALL ANALYSIS

The survey shows that 61.3% and 63.6% of people (always and often) consider privacy or security when posting photographs or tagging others in photographs.

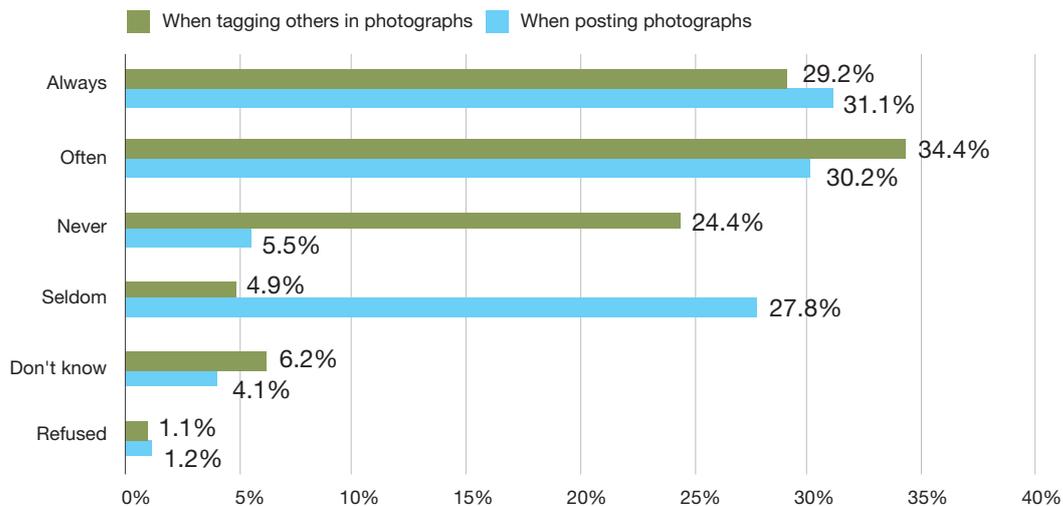
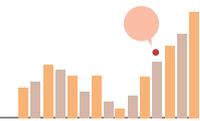


Figure 19 Frequency of Considering Privacy or Security When Posting Photographs or Tagging Others
Base: N=845 (People who have any social media or instant messaging App)



Protecting Internet Users from Inappropriate or Offensive Content

OVERALL ANALYSIS

The survey shows that 90.1% of people strongly agree or agree that internet users must be protected from inappropriate or offensive content, while 5.8% strongly disagree or disagree.

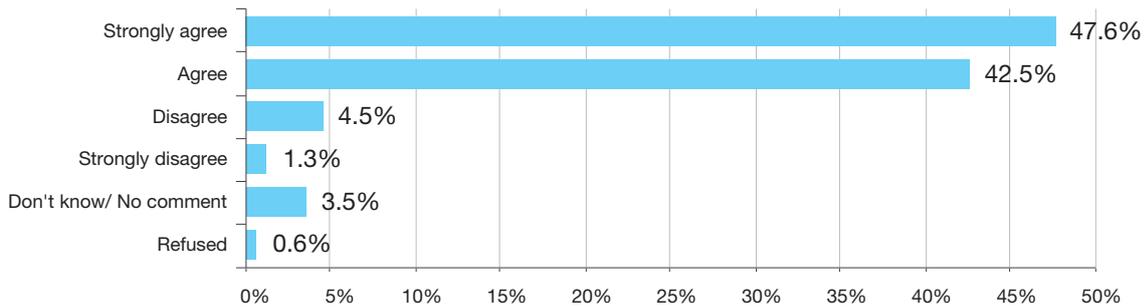


Figure 20 Internet Users Must Be Protected from Inappropriate or Offensive Content
Base : N=959 (Internet users)

Methods Confirming the Authenticity of Information on Websites

OVERALL ANALYSIS

The survey shows that 27.9% of people verify with information from other websites, and 27.3% verify by looking for the credibility of the source (such as name of the writer, link to the original source, etc.); in contrast, 29.8% never confirm the authenticity of the content on the website.

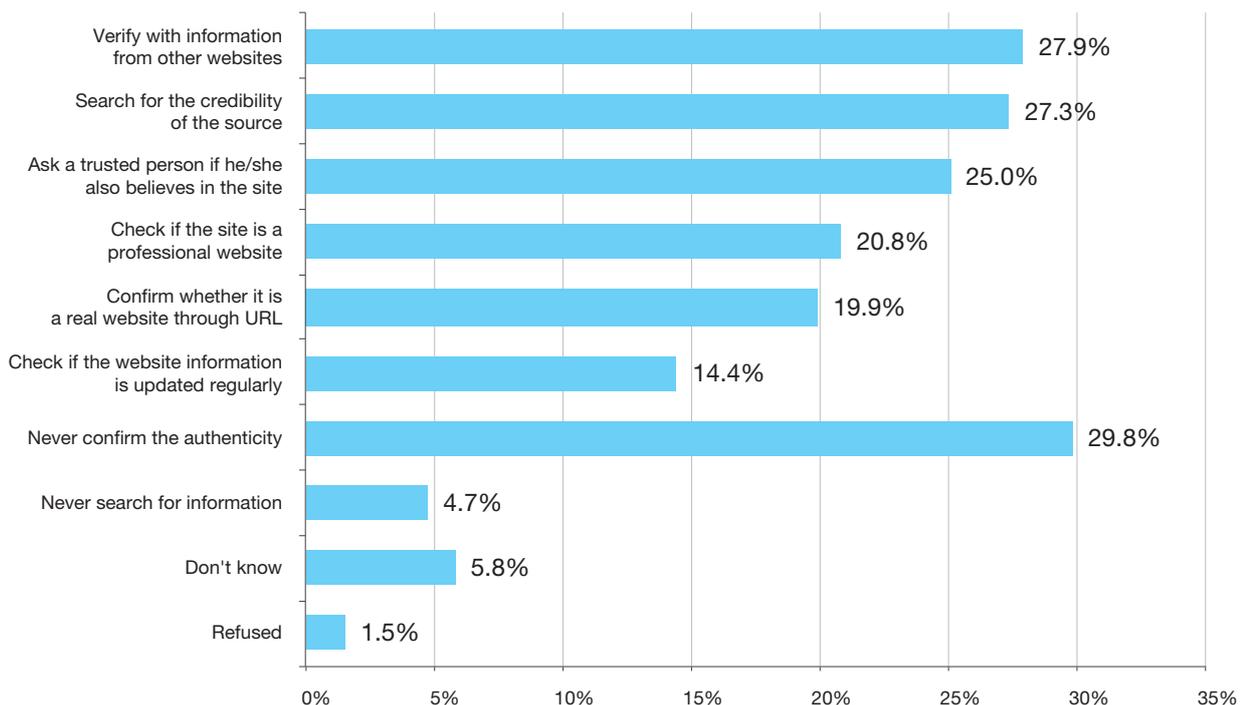
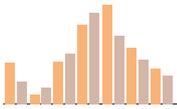


Figure 21 Methods Confirming Authenticity of Online Information
Base : N=959, multiple-choice (Internet users)



Digital Convergence

The Owning and Use of Home Equipment

OVERALL ANALYSIS

According to the results, 92.4% of people in Taiwan aged 16 and over own a smart phone while 74.9% of them have a television set (not connected to internet), and 63.8% have desktop computers, 48.7% of the interviewees own laptops and 39.5% own tablets.

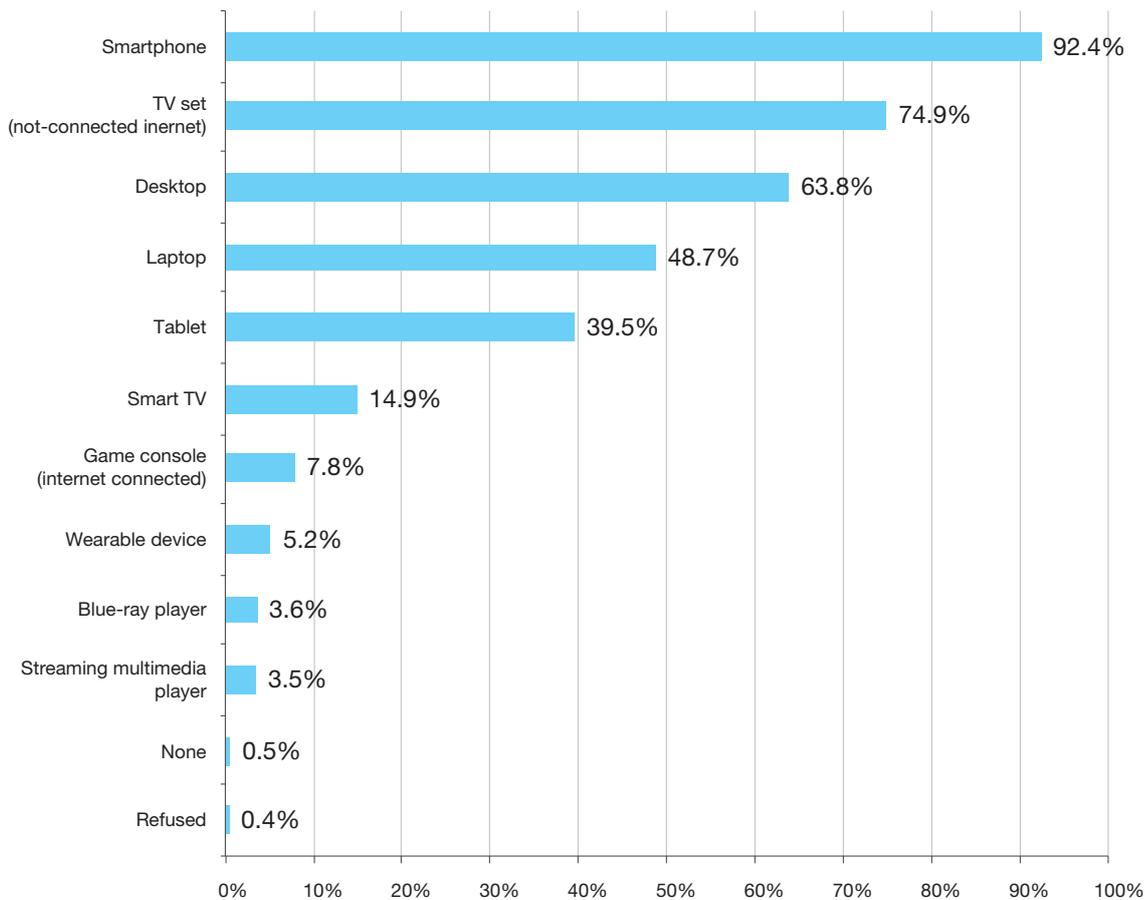


Figure 22 Home Equipment and Devices

Base: N= 1,069, multiple-choice

Online Streaming Experience

OVERALL ANALYSIS

According to the survey, 37.6% of the people have watched online streaming video (including paid and free video services). The main reasons for viewing are flexibility of viewing time (60.8%), viewing online streaming videos without paying (40.2%), and recommendation made by family and friends (30.1%).

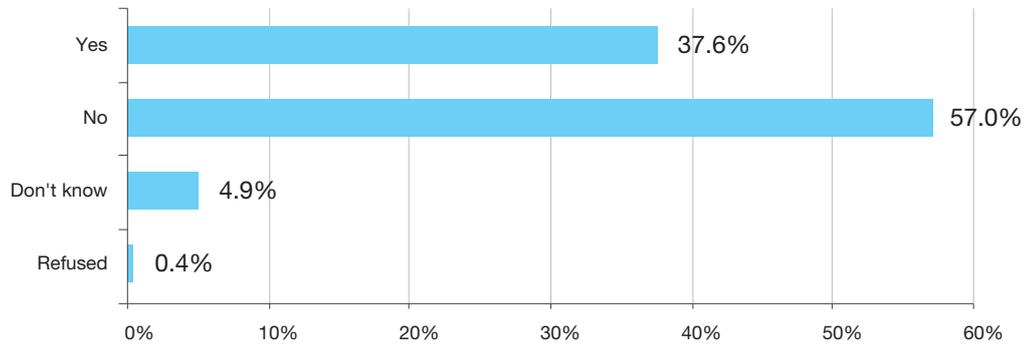


Figure 23 Online Streaming Experience

Base: N=1,069

Online Viewing Platforms

OVERALL ANALYSIS

Regarding whether or not people have viewed content of online sharing video platforms, 71.9% of the people responded affirmatively.

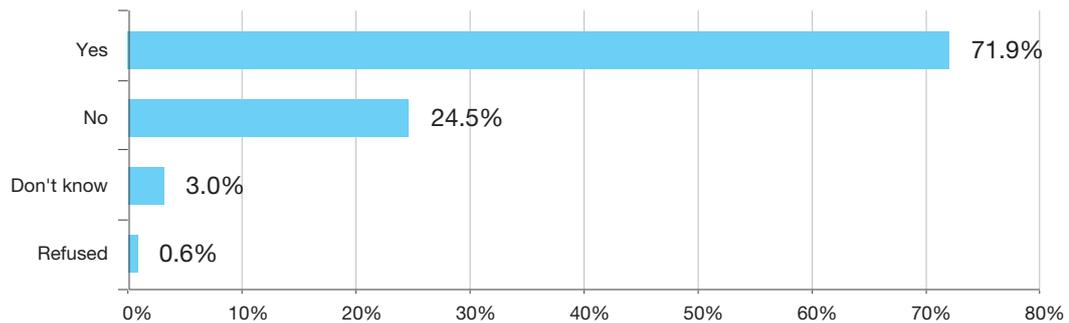


Figure 24 Watching Online Sharing Platforms

Base: N=1,069

Apps via Mobiles

OVERALL ANALYSIS

Over the past 12 months, the most commonly downloaded Apps were free Apps (77.9%) ; the second most common were mostly free Apps (18.4%).

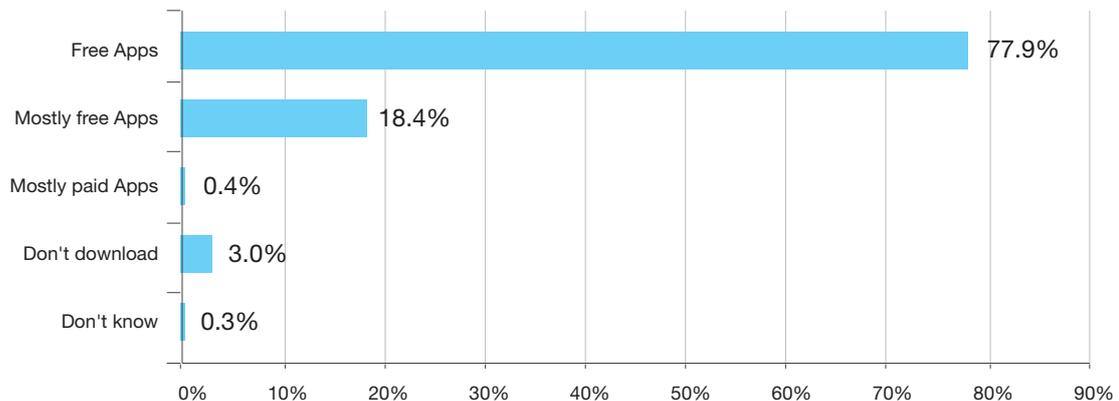
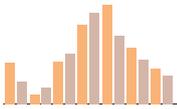


Figure 25 Apps Downloaded over the Last 12 Months

Base: N=777 (for those who know how to download the Apps)



Mobile Payment

OVERALL ANALYSIS

17.2% of people in Taiwan use mobile payment (using mobile devices for payment), and 79.3% do not use this service.

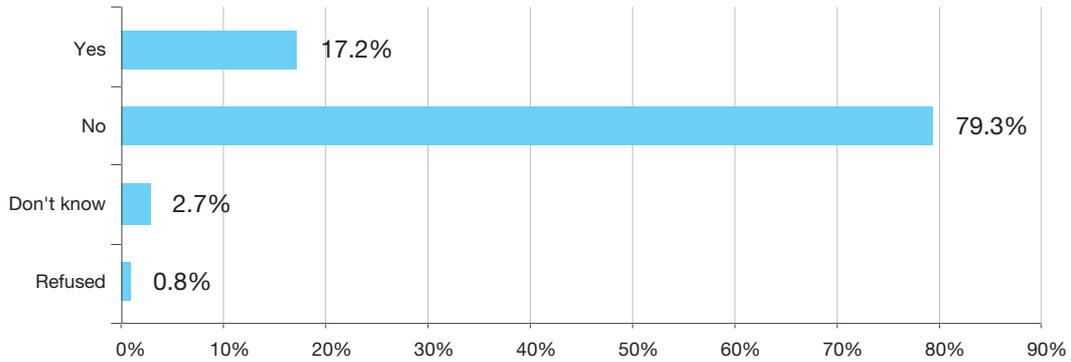


Figure 26 Mobile Payment

Base: N=1,069

Means to Obtain News

OVERALL ANALYSIS

As for means to obtain news, the highest proportion is TV (59.1%) with the second most common means being online community website/App (15.2%) while all others are less than 10%.

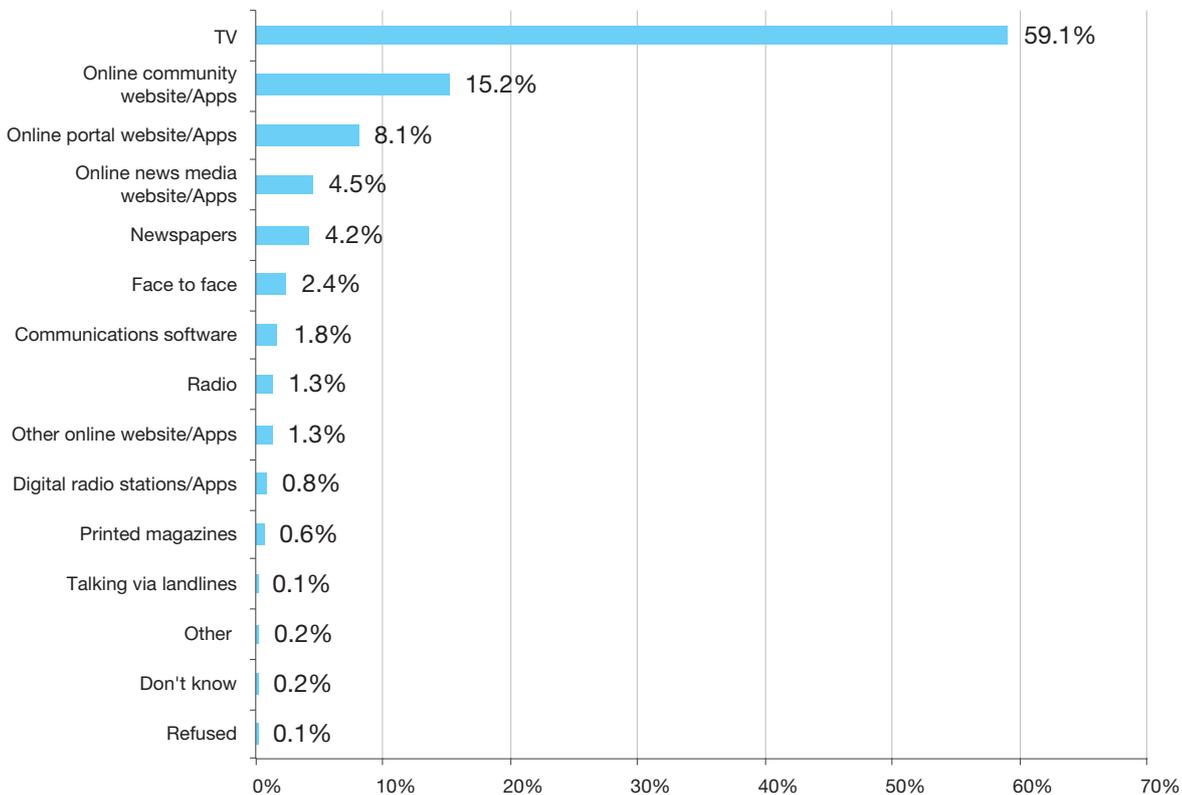
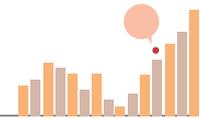


Figure 27 Means to Receive News

Base: N=1,040 (for those who receive news)



The Accuracy of News

OVERALL ANALYSIS

51.2% of people believe that the most accurate source of news is TV, followed by printed newspapers (7.0%) and online news media websites/Apps (6.7%).

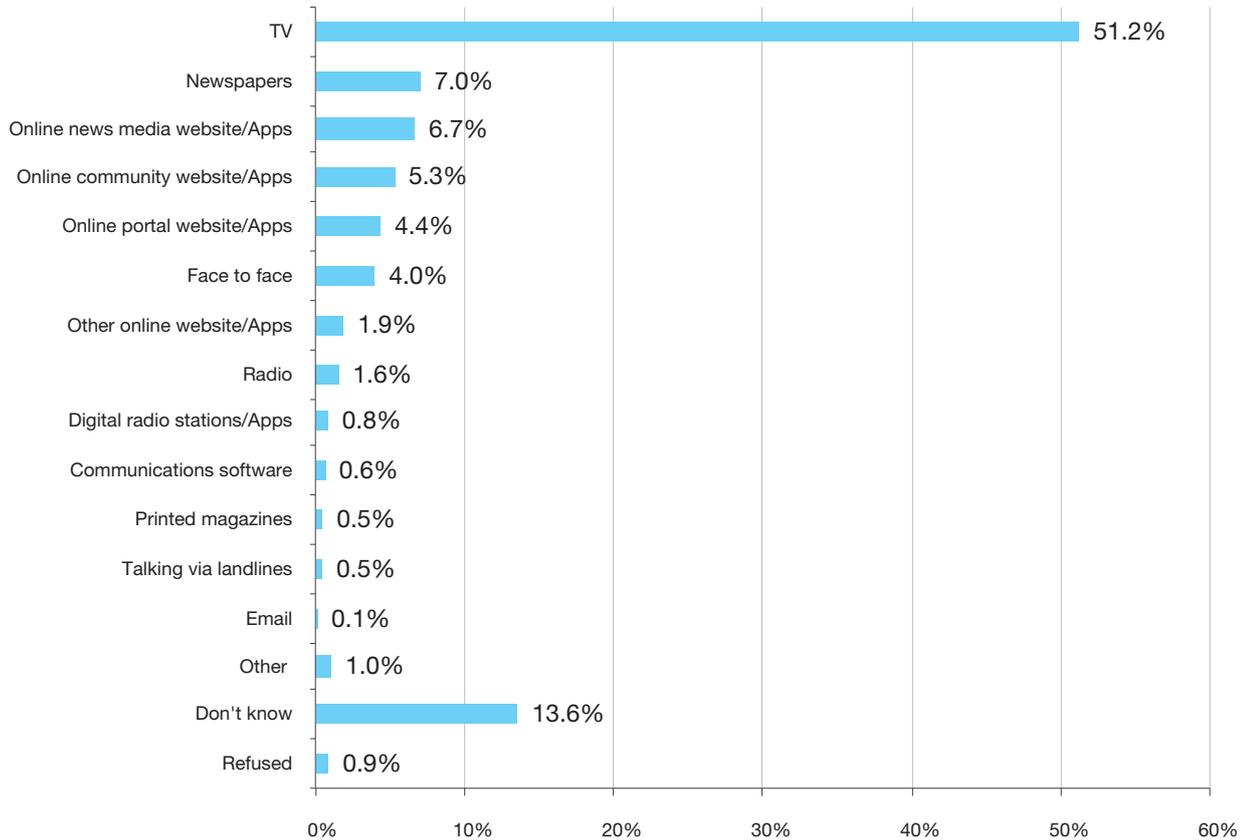
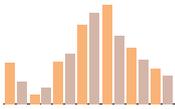


Figure 28 Accuracy of News

Base: N=1,069



The Impartiality of News

OVERALL ANALYSIS

Regarding the impartiality of the news for television, 89.9% of people believe it is very important or important while 4.2% of people claimed it was not important or least important; for newspapers, 87.9% of people believe it is very important or important while 4.7% of people claimed it was not important or least important; for radio, 84.9% of people believe it is very important or important while 6.3% of people claimed it was not important or least important; for printed magazines, 83.6% of people believe it is very important or important while 7.7% of people claimed it was not important or least important.

Table 3 Importance of Impartiality of News Sources

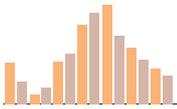
News Sources	Impartiality of News Sources					
	Very important	Important	Total	Not important	Least important	Total
TV	66.0%	23.9%	89.9%	3.5%	0.8%	4.2%
Newspapers	61.2%	26.7%	87.9%	3.7%	1.1%	4.7%
Radios	57.4%	27.5%	84.9%	5.6%	0.7%	6.3%
Printed magazines	52.0%	31.6%	83.6%	6.3%	1.4%	7.7%
Online news media websites/Apps	51.9%	30.6%	82.5%	4.7%	0.8%	5.4%
Online portal websites/Apps	48.8%	32.9%	81.8%	5.4%	1.1%	6.5%
Digital radio stations/Apps	50.0%	31.3%	81.3%	5.5%	0.6%	6.1%
Online community websites/Apps	48.0%	32.0%	79.9%	6.3%	1.2%	7.6%
Other online websites/Apps	45.2%	31.6%	76.8%	8.1%	1.4%	9.5%
Communications software	42.3%	34.0%	76.2%	8.8%	2.1%	10.9%
Face to face	38.8%	34.1%	72.9%	13.0%	4.6%	17.5%
Email	34.7%	33.0%	67.6%	12.9%	3.0%	15.9%
Talking via landlines	30.2%	36.9%	67%	16.3%	4.4%	20.7%

N=1,069

02

Domestic and International Trends of Digital Convergence





Comparison of Supplied Data

PENETRATION OF LANDLINES

When comparing landline penetration in various countries from 2011 through 2017, it can be seen that penetration in most nations has been declining with the exception of Japan and the UK where the penetration has remained stable. The penetration rate in Taiwan and the US has declined dramatically. Once a nation with the highest landline penetration, Taiwan was surpassed by Hong Kong in 2014 when the penetration in Taiwan dropped significantly.

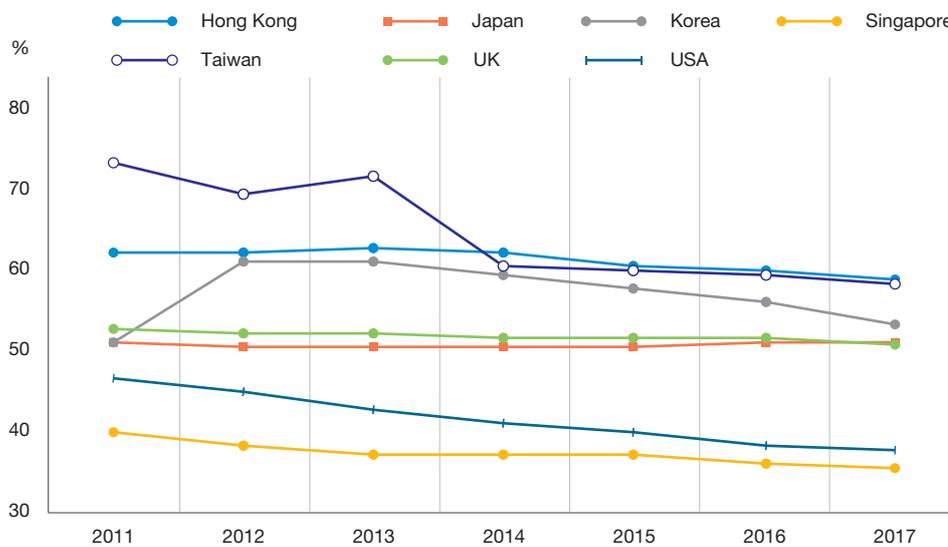


Figure 29 Comparison of Landline Penetration
Source: ITU's Telecom/Information & Communications Database.

PENETRATION OF FIXED-BROADBAND

When comparing the penetration rate of fixed broadband in various countries from 2011 through 2017, it can be seen that penetration in most nations has been increasing except in Singapore, where the penetration decreased slightly. Penetration in Taiwan has remained fairly stable. Meanwhile, South Korea has had the highest fixed broadband penetration, followed by the UK.

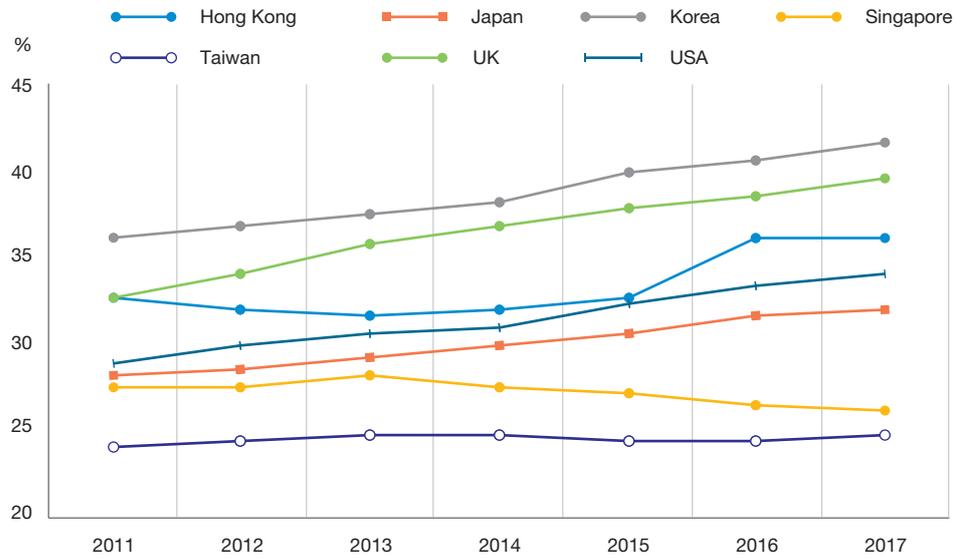


Figure 30 Comparison of Fixed-Broadband Penetration

Source: ITU's Telecom/Information & Communications Database.

Note: Since the 2011-2014 Taiwan figures from the ITU database contains the number of Wi-Fi subscribers, the figures used in the report are based on the 2017 NCC's communications statistics with some revisions.

MOBILE PHONE PENETRATION

When comparing the mobile phone penetration in various nations from 2011 through 2017, it can be noted that the penetration in most nations has been on the rise with the exceptions being in Singapore and Taiwan, where penetration rose only slightly before dropping off, and in the UK, where the penetration remained stable. Hong Kong not only has the highest landline penetration, but is also the only area to have a mobile penetration of over 200%, indicating a significant difference from other nations.

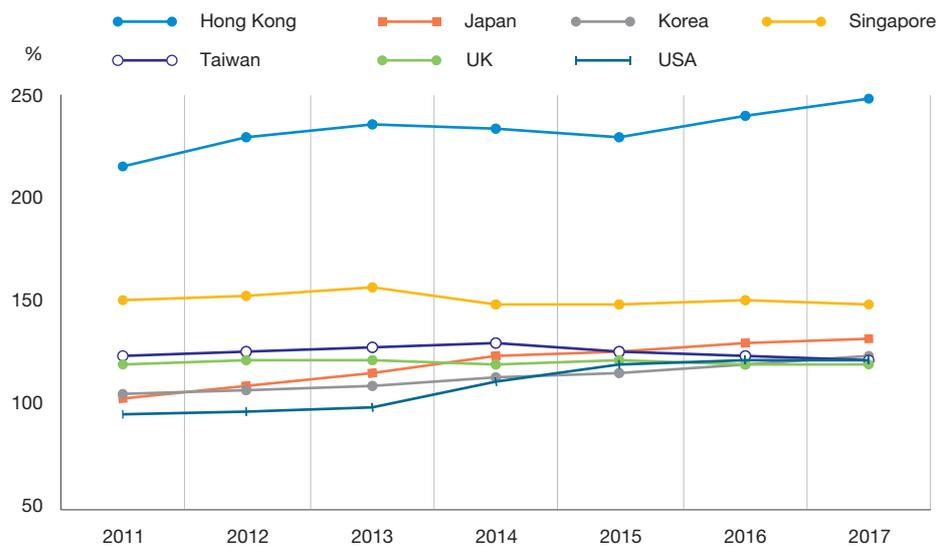
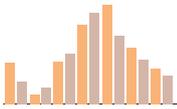


Figure 31 Comparison of Mobile Phone Penetration

Source: ITU's Telecom/Information & Communications Database.



MOBILE BROADBAND PENETRATION

When comparing the mobile broadband penetration in various nations from 2011 through 2017, it can be seen that the penetration in most nations was generally on the rise, except in Hong Kong, where the penetration rose sharply between 2011 and 2014 and then began to decline in 2015. Singapore shows the highest penetration, while the penetration in Taiwan has grown steadily and surpassed that in the UK in 2016.

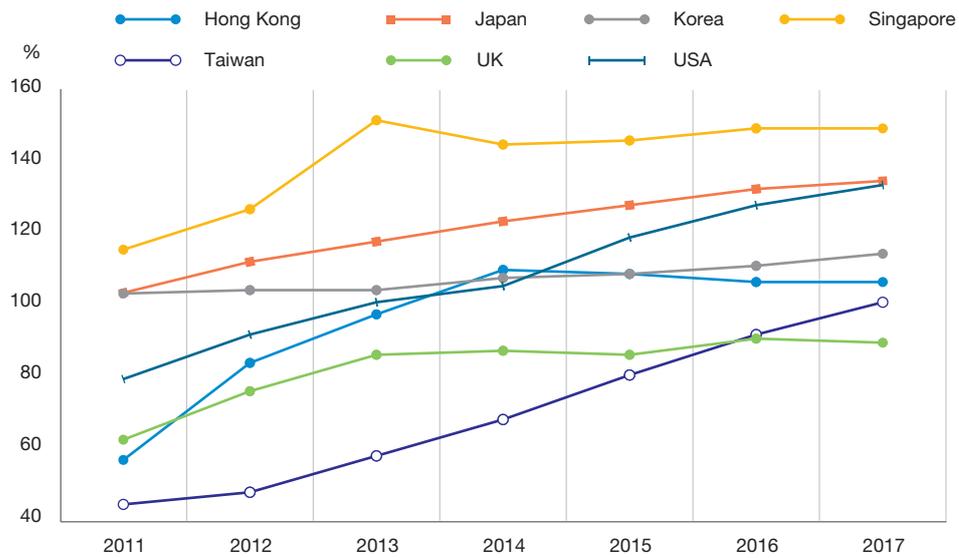


Figure 32 Comparison of Mobile Broadband Penetration

Source: ITU's Telecom/Information & Communications Database



SUBSCRIBERS OF CABLE TV

When comparing the number of cable TV subscriber in various nations from 2011 through 2017, it can be noted that the number in most nations remained stable without any obvious fluctuations, except in the US, where the number began to decline in 2013 and then dropped sharply in 2014, in contrast to Japan, where the number increased slightly.

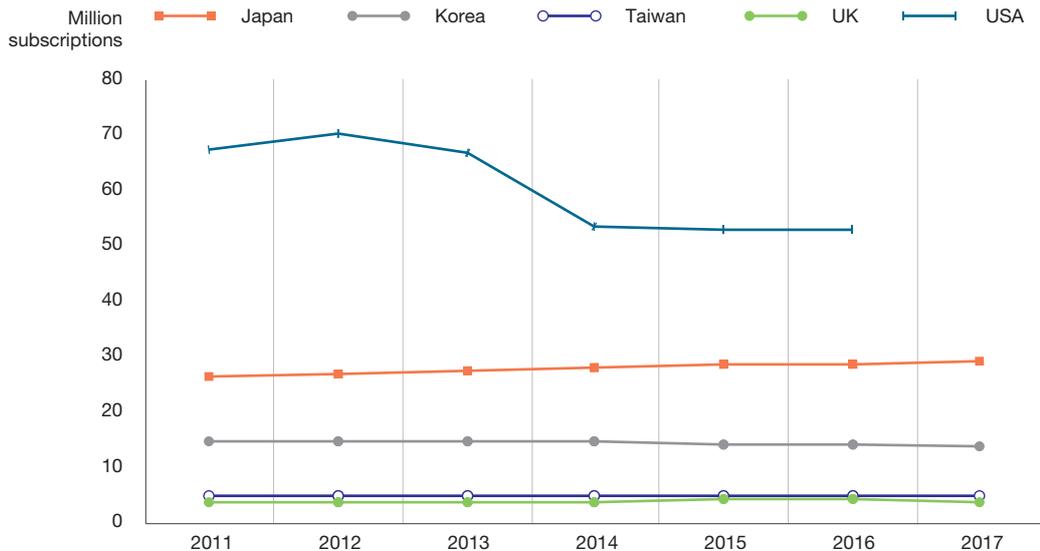


Figure 33 Comparison of the Number of Cable TV Subscribers

Source: ITU's Telecom/Information & Communications Database, Japan's Ministry of Internal Affairs and Communications, National Communications Commission (NCC), Research and Markets- Pay TV Market in South Korea: IPTV, Cable TV and Satellite TV.

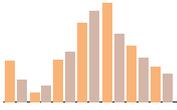
Note 1: ITU contains data on the number of cable TV subscriber in Japan no later than 2016. The 2017 figures are taken from Japan's Ministry of Internal Affairs and Communications.

Note 2: ITU contains data on the number of cable TV subscriber in South Korea no later than 2016. The 2017 figures are taken from the 2017 June statistics from Research and Markets.

Note 3: The 2011, 2012 and 2017 figures on the number of cable TV subscriber in Taiwan are taken from the statistics of NCC.

Note 4: The 2017 US data are not available.

Note 5: The database contains no data on the number of cable TV subscriber in Hong Kong or Singapore.



Comparison of the IoT Policy

POLICY COMPARISON

Analyzing current policies and applications concerning the Internet of Things (IoT) within the UK, the US, Japan, South Korea, Singapore and Hong Kong, it can be noted that the UK emphasizes the value of the IoT for the creation of an ecosystem, while the US stresses the importance of the IoT for revitalizing the economy. Japan assigns IoT policy as a part of the ICT strategy for the whole country. Meanwhile, South Korea promotes IoT to enhance the quality of public services. Singapore focuses on development of the knowledge economy, and smart nation policy. Hong Kong treats cities as a base to develop relevant technology and solve problems.

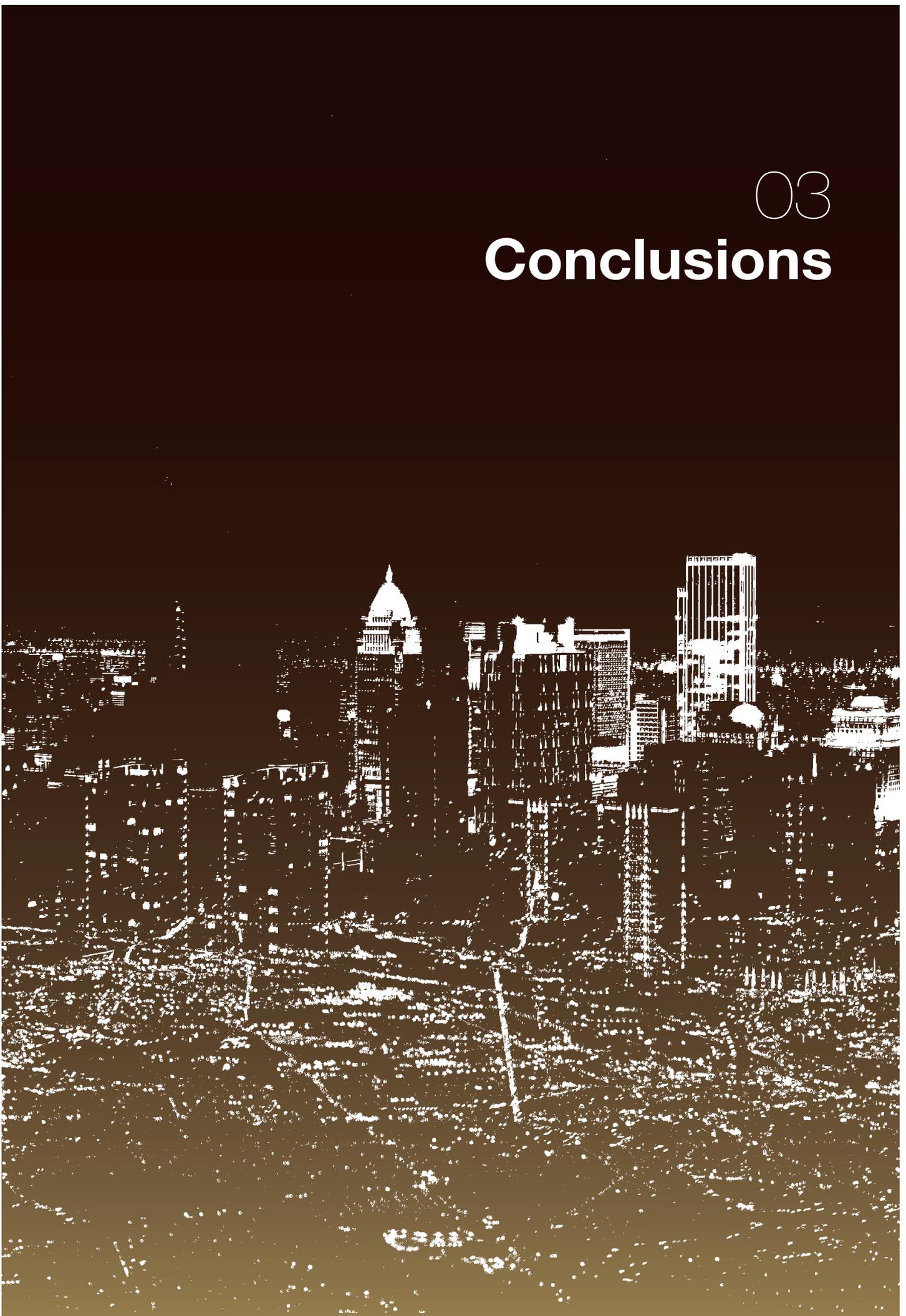
For its development of the IoT policy, Taiwan puts emphasis on the concept of the innovative ecosystem constructing IoT policy from the perspective of “innovation and entrepreneurship”.

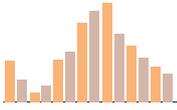
Based on the above analysis, three suggestions can be proposed:

1. Encourage citizen participation to enhance access to the IoT. In this respect, the functions of the IoT can be more effectively implemented.
2. Widen the application of IoT under the concern of social change: at present, the global IoT development expects to resolve problems via the adoption of technology and responding to social change for the whole society.
3. Set sustainability as a development goal: according to the definition provided by the United Nations, sustainability means to meet current needs without compromising the needs of the next generation. It is imperative that talents can be cultivated so as to place focus on the needs of the next generation.

03

Conclusions





Telecommunications

86.2% of people in Taiwan aged 16 and over use the internet, while 13.8% do not. People spend an average of 37.0 hours online per week. The Chi-square test suggests internet use is significantly related to the area where one lives, age and education level. People in Yilan, Hualien, and Taitung have a lower rate (77.6%) of usage than other areas. While more than 90% of people in most age groups use the internet, those aged 56-65 (81.7%) and 66 and above (41.4%) are less inclined to do so. Up to 72% of people with primary school education or below do not.

People spend an average of NT\$416 on landline calls every month. The average score for the satisfaction with the landline call quality is 7.73 (on a scale of 1 to 10). The one-way ANOVA suggests that satisfaction with the landline call quality is significantly related to the area where one lives. People in Taichung, Changhua and Nantou (7.41), and Yunlin, Chiayi and Tainan (7.44) have lower satisfaction than in other areas.

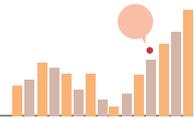
73.8% of homes are equipped with fixed internet. The average satisfaction with the overall fixed internet scores 7.39 points. The one-way ANOVA suggests that the satisfaction with the overall fixed internet is significantly related to the area where one lives. People in Taoyuan, Hsinchu and Miaoli (8.02) gave the highest score, while people in Taichung, Changhua and Nantou (6.90), and Kaohsiung, Pingtung and Penghu (6.91) all gave a score less than 7 points.

A question was added to this year's questionnaire to ask whether people have shifted to the broadband internet service offered by new providers after the cross-regional operations was approved for cable TV. 17.2% of respondents answered yes, while 82.8% replied no. And the most popular broadband internet provider is Chunghwa Telecom (67.6%), followed by Taiwan Fixed Network and Kbro (both 5.6%).

Broadcasting

According to this year's survey, 92.2% of Taiwanese people watch TV while 32.3% listen to the radio. The viewing and listening behaviors are significantly related to gender. Females account for a higher ratio than males. Over 95% of households have at least one TV set. Among them, households with one TV set account for the largest portion (44.3%), followed by those with two TV sets (34.2%). 20.8% of households have at least one smart TV, while 62.5% connect to the broadband network through the smart TV.

Cable TV is the most popular means of watching TV (63.1%), followed by Chunghwa Telecom's MOD (16.5%), and terrestrial TV (13.2%). The Chi-square test suggests that the source of viewing data is significantly related to the area where one lives. People in Taoyuan, Hsinchu and Miaoli have the highest rate of subscribing to cable TV, people in Yunlin, Chiayi and Tainan have the highest rate to view terrestrial TV, and those in Yilan, Hualien and Taitung have the highest rate to subscribe to Chunghwa Telecom's MOD. Moreover, the



source of viewing data is also significantly related to age. People who subscribe to cable TV account for the largest rate in all age groups, while people aged 66 and above make up the largest portion (17.5%) of terrestrial TV audience. Chunghwa Telecom's MOD is selected mostly by 16-25 year olds (24.4%), and streaming videos are most popular among 26-35 year olds.

A question was added to this year's questionnaire about cross-regional operations for cable TV. In areas with new providers, 23.5% of people have switched to a new provider. Among those who change providers, people in New Taipei City have a higher rate than other areas.

Turning to viewing times of TV in Taiwan, the 20:00-21:00 time slot (50%) is known as prime time, followed by 19:00-20:00 (48.4%), and the 21:00-22:00 (40.4%). Local news programs are the most viewed (67.8%) among all types of program. 61.0% of the respondents think TV programs should maintain the status quo. Among those who think TV programs have improved, 54.9% recognize the diversity of TV programs. 33.5% think more or better movies have been provided, and 32.6% think more high-quality dramas. Among those who think TV programs had become worse, 48.6% of people do not like the over repetition of TV programs. 39.0% think many political talk shows impart too much discordance, and 37.7% think political coverage is biased.

Turning to radio broadcasting, the most commonly used device to listen to the broadcast is vehicle radio (54%), followed by a radio set (34.8%) and mobile phone (26.1%). Only 31.1% of households have a radio. 07:00-8:00 is the prime time (27.0%) for people to listen to the radio. People mostly depend on the radio for music (6.7) most, followed by news (5.41), and disaster information (5.39).

When it comes to media ethics and privacy protection, most people believe that the media should not disclose the privacy of public figures (76%) or the general people (83.5%) without consent.

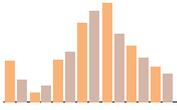
Broadband

People in Taiwan spend an average of 21.06 hours online at work or school, 13.08 hours online at places other than home, and 20.61 hours online at home per week.

Among the incidents concerning security encountered by Taiwanese people over the last 12 months, those who never encountered any situation account for the highest percentage (71.1%); meanwhile, virus attacks and personal information leaks make up 13.3% and 7.0% respectively.

Turning to online behavior, website browsing and searching are responsible for the largest percentage (65.3%), and obtaining news constitutes 53.8%. The 26-35 year-old range accounts for the highest portion to search for products and services online.

For social networking activities, use of social media make up the highest percentage (67.4%), communicating through instant messaging Apps account for 63.2%, and making video calls



constitutes 58.6%. Among the used online services, accessing files from the cloud is the most common (36.3%), followed by participating in groups (35.5%), and online banking and financial services (30.3%). Among the engaged online behaviors, watching videos constitutes the highest rate of 56.4%, followed by uploading or sharing photographs or videos (43.7%).

50.5% of people have concerns regarding internet use. Their main concerns include personal information leaks (53.8%) and fraud (44.3%). The Chi-square test suggests that whether one has concerns about the internet use is significantly related to the area where one lives and age. People in Taoyuan, Hsinchu and Miaoli have the highest rate (69.5%) of concerns about internet use, and people aged 46-55 have a higher rate (56.6%) of concerns about internet use than any other age group.

88.2% of people in Taiwan have at least one social media or instant messaging App account; Line is the most commonly used App (92.5%), followed by Facebook (75.3%) and Facebook Messenger (51.5%). 58.4% of people agree that they tend to believe in what is read or seen on social media, while 34.4% do not. The Chi-square test suggests that when analysed by age, people aged 66 and above have a higher portion to agree that they believe what is read and seen on social media than people in any other age group.

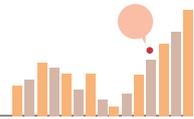
90.1% of people agree that internet users must be protected from inappropriate or offensive content; 57.5% of people disagree that personal information can be provided to get what they wish online. The Chi-square test suggests that people aged 46-55 have a higher rate to agree that personal information can be provided to get what they wish online than any other age group.

61.7% of people have experience in online shopping, while just 14.8% of people have experience in selling products online. 27.9% of people verify online information by comparing with information from other websites, and 27.3% verify online information by looking for the credibility of the source; meanwhile 29.8% have never confirmed the authenticity of the content on the website.

Digital Convergence

92.4% of Taiwanese households have smartphones, and 37.6% of Taiwanese people have experience in watching streaming videos. The Chi-square test suggests that whether one has experience in watching streaming videos is significantly related to the area where one lives and their education level. When analysed by area, people in Kaohsiung, Pingtung and Penghu have the highest rate (51.5%) of watching streaming videos. People with a bachelor's degree have the highest rate (60.0%) of watching streaming videos, while those with elementary school education and below have the lowest rate (0.5%). Flexible watching time (60.8%) is the most common reason for streaming videos, followed by the mostly free streaming videos (40.2%).

Among the combinations of services offered by communication operators, Chunghwa Telecom's MOD plus fixed broadband internet accounts for the highest rate (20.0%), whereas



the cable TV plus cable internet accounts for 6.7%.

Among people's attitudes toward online advertising, people who agree that they don't mind viewing advertisements as long as they are interested in it contributes to the largest share (37.9%). On the other hand, people who dislike online advertising account for more than 30% (31.9%). As for whether to take action to prevent online advertising, almost half (49.0%) of respondents do not take any action, while 36.9% of people choose not to watch or allow transmission of information to avoid advertising.

In terms of use of mobile Apps over the last 12 months, free Apps are the most commonly downloaded (77.9%), while among the types of downloaded Apps, games are the most common (28.3%), followed by social Apps (21.5%).

In general, up to 62.6% of people recognize the importance of mobile payment, but in reality most of the people do not use mobile payment (79.3%). Whether one uses mobile payment is significantly related to age. People aged 26-35 (29.9%) and 36-45 (29.0%) have the highest rates of usage, while only 0.8% of people aged 66 and over have used this service. Among the mobile payment Apps, Line Pay accounts for the largest share (39.6%) with Apple Pay reaching 19.4%.

Printed newspaper is most commonly recognized as an impartial source of news (71.8%), followed by television news (70.6%), and radio (62.3%). On the contrary, printed magazines are mostly considered a biased source of news among all the media (28.3%), while television news and websites/Apps operated by news media account for 22.2% and 22.1% respectively.

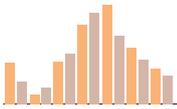
Development Trend of Digital Convergence in Taiwan

SUPPLY AND DEMAND ANALYSIS

Based on the data analysis of the supply side of the communication industry in Taiwan, the mobile broadband penetration rate rose from 90.5% in 2016 to 99.9% in 2017. The main reason was after the suspension of 2G service in June 2017, a large number of 2G customers took up 3G/4G services. The mobile phone penetration rate has dropped slightly from 124.1% in 2016 to 121.8% in 2017. The landline penetration rate has also fallen from 49.7% in 2016 to 48.6% in 2017.

The above data indicates that the market of landline phones and mobile phones is almost saturated, and almost everyone can use mobile broadband to access the internet. The coverage rate of mobile broadband increased from 99.3% in 2016 to 99.9% in 2017, which paves a way for developing value-added applications of mobile broadband.

The survey shows the average hours per week increased from 28.77 hours in 2017 to 37 hours in 2018. More than 50% of respondents have used mobile broadband (3G/4G) in 2018. The proportion of smart phones has exceeded 90% (92.5%).



Cable TV is still the main viewing platform for people in Taiwan. The penetration rate has remained at 60% for the last two years, and the number of subscribers has also remained steady at about 5.2 million. The number of IPTV increased significantly from 1.33 million in 2016 to 1.6 million at the end of 2017, the growth of which is related to the service providers improving content.

The results of two years' survey show that television is still the main source for people to acquire information when facing new media competition (63.7% in 2017 and 59.1% in 2018). Television is also considered the most accurate when obtaining news (56.9% in 2017 and 51.2% in 2018) compared to other media.

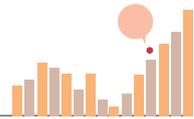
In terms of privacy disclosure, according to surveys conducted in 2017 and 2018, television is the main media that exposes the privacy of others, without consent of the parties. With regards to the disclosure of public figure's information, television dropped slightly from 36.7% in 2017 to 35.6% in 2018 while figures for magazines and new media increased in 2018 when compared with 2017.

INTERNATIONAL COMPARISONS

When compared with the development of convergence of the communications industry in other countries, the 4G penetration in Taiwan has reached 95.83% in 2017 and reached more than 100% (101.92%) in April 2018. Hence, it is clear that the people here enjoy the convenience of high-speed wireless access.

Meanwhile, the rate of smartphone subscriptions stands at 90%. As to online activities of smartphone users, there are differences between users in Taiwan and other countries. For example, a Swisscom survey showed the top three activities in Switzerland are using instant messaging/chat Apps (80%), accessing/browsing the internet (76%) and sending/receiving emails (68%), all of which are higher than for Taiwanese users. In contrast, the rate of watching live streaming videos in Taiwan (53%) is much higher than the results shown in Swisscom's survey (37%).

On average, people in Taiwan watch online streaming videos for 13.35 hours per week. The main reason for watching online is that the viewing time is flexible (60.8%), followed by free content (40.2%), or recommended by family or friends (30.1%). Among those who view online streaming videos, 21.1% have SVoD (subscription of video on demand), and this proportion is lower than those who choose free services (75.3%). In comparison with other countries' viewers, according to the survey conducted by Ofcom in the UK, the interviewees from UK (56%), France (64%), Germany (72%), Italy (54%), USA (64%), Japan (65%), Austria (66%), Spain (61%) and Sweden (78%) respond that the most common reason to opt for SVoD is convenience. The second reason is being attracted by high-quality content, while the responsive rate in each country is: UK (49%), France (62%), Germany (46%), Italy (53%), USA (51%), Japan (36%), Austria (53%), Spain (58%) and Sweden (34%). The analysis shows that the strategy of high-quality content has been relatively successful when entering the markets of the aforementioned countries.



Turning to social media, almost 90% (88.2%) of people in Taiwan have social media accounts. In terms of penetration of social media accounts in the regions, the highest rate is in North America (70%), followed by North Europe (66%) and East Asia (64%). In terms of comparison with other countries, the highest is the United Arab Emirates (99%). Although lower than that of the UAE, the rate in Taiwan is higher than South Korea (84%), Singapore (83%), Hong Kong (78%), Argentina (76%), Saudi Arabia (75%) and Malaysia (75%). The high penetration rate of social media in Taiwan is reflected in the development of digital advertising. It is also worth noting that for issues related to internet use, such as privacy protection, since the beginning of this year (2018), the EU has implemented the General Data Protection Regulation (GDPR). Currently, Taiwan adheres to GDPR's adequacy decision, as data protection of social media has become even more important for society as a whole.

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