

Statistical Report on Internet Development in China

(January 2018)



Preface

In 1997 China's competent departments authorized China Internet Network Information Center (CNNIC) to organize relevant Internet entities to jointly carry out an Internet development survey. Ever since then, CNNIC has published 40 statistical reports on Internet development in China, forming the practice of regularly releasing the Statistical Report on Internet Development in China at the beginning and middle of each year. This report is the 41st report. All the reports of CNNIC have witnessed the whole development process of China's soaring Internet industry. With precise and objective data, the reports provide a significant basis for China's government agencies, companies at home and abroad, experts, and scholars to have a full understanding of the development of the Internet in China and make relevant decisions.

In 2017, General Secretary Xi Jinping repeatedly mentioned the Internet in the 19th CPC National Congress report. Under the strong leadership of the Party Central Committee with Comrade Xi Jinping at its core, China has moved on the fast track for the national strategy for cyber development, sped up the development of the Internet infrastructure, and kept enhancing its capacity for innovation. Thanks to all these efforts, the information economy is booming, and the cyberspace is becoming cleaner and healthier. As the Internet serves as an important driving force for the national development, the Internet-driven poverty alleviation, online education and e-government have boosted the dividends of Internet development shared by the people. As a witness to the development of the Internet, CNNIC continues to employ more investigation methods to conduct in-depth surveys on a broader range of areas. This Report focuses on the five aspects of Internet infrastructure, personal applications, government applications, industry development, and Internet security, and comprehensively reflects the development of China's Internet in 2017 by displaying the data in a multi-angle all-round manner.

We hereby express our sincere gratitude to friends who have participated in our 41st statistical survey on Internet development. Meanwhile, we would like to extend our sincere thanks to the government, enterprises and other related institutions supporting the data collection in this annual Report.

China Internet Network Information Center (CNNIC)

January 2018



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Abstract

1. Basic Information

- ◇ As of the end of December 2017, the number of Internet users in China reached 772 million, with an increase of 40.74 million from the end of 2016. The Internet penetration reached 55.8%, up 2.6 percentage points from the end of 2016.
- ◇ As of the end of 2017, the number of mobile Internet users in China reached 753 million, an increase of 57.34 million from the end of 2016. The mobile Internet users accounted for 97.5% of the total netizen population, while this percentage was 95.1% at the end of 2016.
- ◇ As of the end of 2017, the number of Internet users in Chinese rural areas was 209 million and accounted for 27.0% of the total netizen population, with an increase of 7.93 million or 4.0% from the end of 2016.
- ◇ As of December 2017, the proportion of Chinese netizens using mobile phones to access the Internet was 97.5%, 2.4 percentage points more than the end of 2016, hitting a new high record; the proportion of Chinese netizens using desktops, laptops or tablet computers to access the Internet was 53.0%, 35.8% and 27.1% respectively, decreasing slightly from the end of 2016; and the proportion of Chinese netizens using TV to access the Internet was 28.2%, an increase of 3.2 percentage point from the end of 2016.
- ◇ As of December 2017, the number of “.CN” domain names increased 1.2%, reaching 20.85 million, and its proportion in total domain names increased to 54.2%; the international Internet gateway bandwidth was 7,320,180Mbps, up 10.2% from the end of 2016.
- ◇ As of December 2017, the number of websites in China was 5.33 million, among which 3.15 million used “.CN” domain name.
- ◇ As of December 2017, the number of instant message (IM) users reached 720 million, increasing 53.95 million from the end of 2016 and accounting for 93.3% of the total netizen population. The number of mobile phone IM users reached 694 million, increasing 55.62 million from the end of 2016 and accounting for 92.2% of the total mobile phone netizens.
- ◇ As of December 2017, the online shopping users in China reached 533 million, an increase of

14.3% from the end of 2016, accounting for 69.1% of the total Internet users. The scale of netizens using mobile phone to do online shopping reached 506 million, up 14.7% from the end of 2016, and the utilization ratio increased from 63.4% to 67.2%.

- ◇ As of December 2017, the scale of online payment users in China reached 531 million, an increase of 56.61 million compared to the end of 2016. The annual growth rate was 11.9%, and the utilization rate reached 68.8%. Among the online payment users, the number of those using mobile phones increased rapidly to 527 million, an increase of 57.83 million compared to the end of 2016. The annual growth rate was 12.3% and the utilization ratio was 70%.
- ◇ As of December 2017, the scale of live webcast users reached 422 million, an increase of 22.6% compared to the end of 2016. Among them, the number of live game users reached 224 million, an increase of 77.56 million compared to the end of 2016 and accounting for 29% of the total netizens. The number of live reality show users reached 220 million, up 75.22 million from the end of 2016, accounting for 28.5% of the total netizens.
- ◇ As of December 2017, the scale of bicycle sharing users in China reached 221 million, accounting for 28.6% of the total netizens. The increase was 115 million in the second half of 2017, and the growth rate reached 108.1%.
- ◇ As of December 2017, the scale of online government service users in China reached 485 million, accounting for 62.9% of the total netizens.
- ◇ As of December 2017, the number of domestic and overseas listed Internet enterprises¹ reached 102, and their overall market value was RMB 8.97 trillion.
- ◇ As of December 2017, the total number of Unicorn Internet and IT enterprises² in China was 77. The number of Unicorn enterprises in Beijing accounted for 41.6% of the total, and that in Shanghai accounted for 23.4%.
- ◇ As of June 2017, the number of artificial intelligence (AI) enterprises in China was 592, accounting for 23.3% of the total AI enterprises in the world. In 2016, the number of patent

¹ Listed Internet company: a company listed in the United States, Hongkong, Shanghai or Shenzhen, whose Internet business generates more than 50% of its revenue. Internet business includes online advertising and marketing, personal value-added Internet services, online games, e-commerce and so on. The definition also considers whether the revenue process mainly depends on Internet products, including mobile Internet operation system, mobile Internet APP and traditional websites on PC.

² Unicorn Internet and IT enterprise: an unlisted Internet and IT enterprise in the new era, whose estimated value exceeded \$1 billion at the most recent financing event. The definition was adopted based on financing data of start-ups and approved estimates of main investing organizations about projects in the primary market.

applications related to AI in China reached 30115.

2. Trends and Features

The amount of basic resources steadily increased, and the application level significantly improved

As of December 2017, the total number of domain names in China decreased by 9% compared to the end of 2016. However, the total number of ".CN" domain name achieved a 1.2% growth, reaching 20.85 million. The proportion of ".CN" domain name increased from 48.7% at the end of 2016 to 54.2%. The international gateway bandwidth achieved a 10.2% growth, up to 7,320,180Mbps. In addition, the construction of infrastructure, including cable, network access point, base stations for mobile phones and Internet data centers was steadily put forward. On this basis, the use of web sites and web pages, data flow on mobile Internet and APP quantity developed rapidly, all of which increased significantly in 2017. Especially the data flow on mobile Internet has been doubled for three consecutive years since 2014.

With 772 million netizens, the Internet in China made new progress and benefited all the people

As of December 2017, the number of netizens in China reached 772 million, and the Internet penetration rate reached 55.8%, which was 4.1 percentage points higher than the global average (51.7%) and 9.1 percentage points higher than the average level in Asia (46.7%)³. In the year the number of new Internet users in China was 40.74 million, and the growth rate was 5.6%. The scale of Internet users in China continued to grow steadily. Its driving force was the innovation of Internet business modes, the integration of online and offline services, and the putting online of public services. The rapid spreading of information service, the poverty alleviation through the Internet and the improvement of public service have enabled the masses to share and take part in the development of the Internet.

The scale of mobile netizens accounted for 97.5% of the total, and the mobile Internet facilitated "connecting all the things"

As of December 2017, the netizens using mobile phones to access the Internet in China reached

³ About the Internet penetration in the world and in Asia, please see <http://www.internetworldstats.com/stats.htm>

753 million, and its proportion in the total netizen population increased to 97.5% from 95.1% in 2016. At the same time, the proportion of netizens using television to access the Internet also increased to 28.2%, up by 3.2 percentage points. The utilization ratio of desktop computer, laptop and tablet computer all declined. The use of mobile phone has constantly squeezed the use of other devices to access the Internet. Intelligent devices represented by mobile phones have become the foundation of "connecting all the things". Vehicles and home appliances able to be connected to the Internet have promoted the upgrading of "traveling and living experience", and enhanced the personalized and intelligent application scenarios. The enrichment of mobile Internet services, and the expansion of mobile terminals and mobile data, have enabled the mobile Internet industry to create higher value.

The scale of mobile payment users continued to expand, and the scale of online financial users increased significantly

The scale of mobile payment users in China continued to expand, and their using habits were further ingrained. The proportion of netizens using mobile phones to pay online bills while doing offline consumption increased from 50.3% at the end of 2016 to 65.5%. The mobile payment mode gradually became popular among netizens in rural areas. The proportion of rural netizens using mobile payment increased to 47.1% from 31.7% at the end of 2016. The scale of Internet users in China buying online financial products reached 129 million, with a year-on-year increase of 30.2%. The online financial scale of monetary fund maintained a rapid growth. At the same time, the regulations on P2P and the enforced supervision have greatly promoted the orderly development of the industry.

The scale of online entertainment users continued to grow rapidly, and the cultural and entertainment industry entered a boom time

In 2017, the scale of online entertainment users maintained a rapid growth. Strong market demands, policy incentives and guidance, and enterprise resources have jointly pushed the online entertainment industry to enter a boom time. Among all the online entertainment applications, the annual growth of live webcast users was the highest, reaching 22.6%. Among the live webcast users, the growth rate of live game users was 53.1%, and that of live reality show users was 51.9%. At the same time, the content of online cultural entertainment was further standardized. The revenue of

the online entertainment industry, represented by online games and videos, further increased. Considerable industrial revenue has promoted online entertainment producers to increase support for content creators, paving the way for the prosperity of the online entertainment content.

The scale of bicycle sharing users exceeded 200 million, and the regulations on online car hailing service were gradually implemented

The sharing economic business, based on third party information platform and integrated social resources to provide services to users, flourished in 2017. Data showed that, in terms of travel efficiency, the efficiency of "sharing bicycle + subway" mode was 17.9% higher than that of private car mode; in terms of energy conservation, sharing bike users rode more than 29.947 billion miles, reducing carbon emissions by more than 6.99 million tons; in terms of stimulating employment, the bike sharing industry created more than 30 thousand offline operation and maintenance jobs. At the same time, the scale of sharing bicycle users increased fastest among all kinds of applications in the second half of 2017. The scale of domestic users reached 221 million, and this application has also been used in 21 overseas countries. Regarding online car hailing services, since the *Interim Measures on the Management of Online Taxi Hailing Service* was implemented, detailed rules in local areas have been issued to adjust the market access, and enterprises have been looking for transformation and cross-industrial integration to enhance profit, such as cooperating with travel and recruitment companies and sharing customer resources for cross-industrial marketing.

60% netizens used online government services, and new media in government facilitated intellectualizing government services

In 2017, the scale of e-government service users in China reached 485 million, accounting for 62.9% of the total Internet users. The utilization ratio of Alipay or WeChat civic service platform to access government services was 44%. The development of online government services was speeded up and the utilization ratio increased significantly. Because of the integration with big data and AI technology, government services have been more smart, precise and scientific. The service scope of new media and platform in government, such as WeChat civic service and government WeChat accounts, micro-blog accounts and headlines, has been continuously enlarged. Many kinds of civic service, such as traffic violations, meteorology, society information and payment for living costs, have been put online and improved, and also expanded to cover counties.

The digital economy developed prosperously and the e-commerce continued its rapid growth

In 2017, the sectors such as e-commerce, online games and Internet advertising developed very well, and the corresponding growth rate of revenue in each sector was more than 20%. For example, the income of e-commerce platforms was RMB 218.8 billion from January to November, with a year-on-year increase of 43.4%. The driving force of the rapid growth was the continuous innovation on the modes of e-commerce service, technology and empowerment. The industry of online games increasingly focused on mobility, internationalization and competitiveness. The market of Internet advertising became mature, and the market structure became more stable.

The number of listed Internet companies in China exceeded 100, and their market value approached 8 trillion

As of December 2017, the number of Chinese listed Internet companies⁴ both at home and abroad reached 102, with a total market value of RMB 8.97 trillion. Among them, the market value of Tencent, Alibaba and Baidu accounted for 73.9% of the total. The proportion of companies conducting business on online games, e-commerce, culture and media, Internet finance, and software tools accounted for 28.4%, 14.7%, 10.8%, 9.8% and 5.9% respectively of the total number of listed Internet companies.

China had 77 Unicorn Internet and IT enterprises and great progress was made on AI

As of December 2017, the total number of Unicorn Internet and IT enterprises⁵ in China was 77. The proportion of such unicorn enterprises located in Beijing was 41.6%, and that in Shanghai was 23.4%. Such enterprises were also located in Hangzhou, Shenzhen, Zhuhai and Guangzhou. Among them, the proportions of e-commerce and Internet financial enterprises accounted for 18.2% and 15.6% respectively of the total unicorn enterprises, taking a significant position. The other unicorn enterprises focusing on cultural entertainment, vehicles and traffic, intelligent hardware, online health and AI also achieved rapid development. Specifically, since the *Development Plan*

⁴ Listed Internet company: a company listed in the United States, Hongkong, Shanghai or Shenzhen, whose Internet business generates more than 50% of its revenue. Internet business includes online advertising and marketing, personal value-added Internet services, online games, e-commerce and so on. The definition also considers whether the revenue process mainly depends on Internet products, including mobile Internet operation system, mobile Internet APP and traditional websites on PC.

⁵ Unicorn Internet and IT enterprise: an unlisted Internet and IT enterprise in the new era, whose estimated value exceeded \$1 billion at the most recent financing event. The definition was adopted based on financing data of start-ups and approved estimates of main investing organizations about projects in the primary market.

for AI in a New Era was issued and provided top-level strategy for the development of AI, China has made great progress in this field. As of June 2017, the number of AI enterprises in China reached 592, accounting for 23.3% of the global total. In 2016, the number of Chinese patent applications related to AI reached 30115 cases.

The regulations on cyber security gradually enhanced, and users' experience of safety obviously improved

The implementation of *Cyber Security Act of the People's Republic of China* and the publication of relevant rules and regulations in 2017 provided practical legal guarantee for the cyber security work. The government and enterprises jointly combat with all kinds of cyber security risks, and the proportion of Internet users having experienced cyber security incidents declined significantly. Data showed that up to 47.4% of Internet users said that they had not encountered any cyber security problems in the past six months, up by 17.9 percentage points from 2016.

Part 1 The Basic Internet Development

1. Basic Internet Resources

1.1 An Overview of Basic Internet Resources

Up to December 2017, China had 338,704,640 IPv4 addresses and 23,430 blocks/32 of IPv6 addresses.

China had 38.48 million domain names, down by 9.0% annually. Still, the number of “.CN” domain names increased by 1.2% annually to 20.85 million and accounted for 54.2% of the total domain names.

International Internet bandwidth reached 7,320,180 Mbps, with an annual growth rate of 10.2%.

Table 1 Comparison of Basic Internet Resources in China Dec. 2016 - Dec. 2017

	December 2016	December 2017	Annual increment	Annual growth rate
IPv4	338,102,784	338,704,640	601,856	0.2%
IPv6 (block/32)	21,188	23,430	2,242	10.6%
Domain name	42,275,702	38,480,355	-3,795,347	-9.0%
Wherein, .CN Domain name	20,608,428	20,845,513	237,085	1.2%
International Internet bandwidth (Mbps)	6,640,291	7,320,180	679,889	10.2%

1.2 IP Addresses

By December 2017, the number of IPv6 addresses in China had reached 23,430 blocks/32, a year-on-year increase of 10.6%.

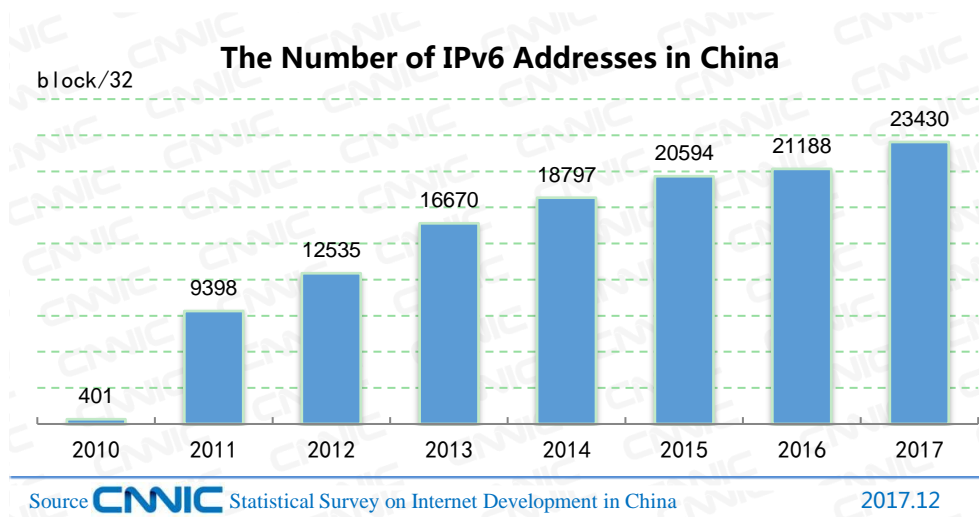


Figure 1 The Number of IPv6 Addresses in China

All IPv4 addresses had been assigned by February 2011 in the world. Since then, the total number of IPv4 addresses in China had been basically stable. The number reached 338.70 million up to December 2017.

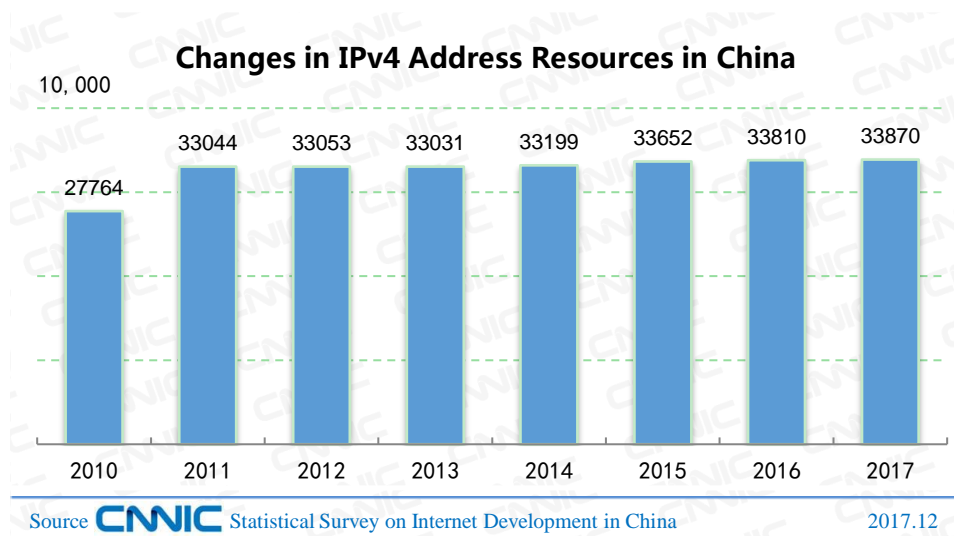


Figure 2 Changes in IPv4 Address Resources in China

1.3 Domain Names

By December 2017, the total number of domain names of China was 38.48 million, down by 9.0% annually.

Table 2 The Number of Domain Names in Each Category⁶

	Number	Proportion in total domain names
CN	20,845,513	54.2%
COM	11,307,915	29.4%
中国	1,895,745	4.9%
NET	1,288,239	3.3%
INFO	1,170,601	3.0%
ORG	253,819	0.7%
BIZ	154,322	0.4%
Others	1,564,201	4.1%
Total	38,480,355	100.0%

Up to December 2017, the number of “.CN” domain names reached 20.85 million, increasing by 1.2% on a year-on-year basis and accounting for 54.2% of all domain names of China; “.COM” domain names were 11.31 million, taking up 29.4% of the total; and “.中国” domain names were 1.9 million, an annual increase of 299.8%, while the proportion in the total increased from 1.1% in 2016 to 4.9%.

Table 3 The Number of “.CN” Domain Names in Each Category

	Number	Proportion in total “.CN” domain names
.CN	16,727,922	80.2%
.COM.CN	2,360,535	11.3%
.ADM.CN	1,309,978	6.3%
.NET.CN	233,738	1.1%
.ORG.CN	149,957	0.7%
.GOV.CN	47,941	0.2%
.AC.CN	9,017	0.0%
.EDU.CN	6,360	0.0%
.MIL.CN	65	0.0%
Total	20,845,513	100.0%

1.4 International Internet Gateway Bandwidth

By the end of 2017, the international Internet Gateway bandwidth of China reached 7,320,180 Mbps, up 10.2% annually.

⁶Generic top-level domains (gTLD) are provided by domestic domain name registration units.

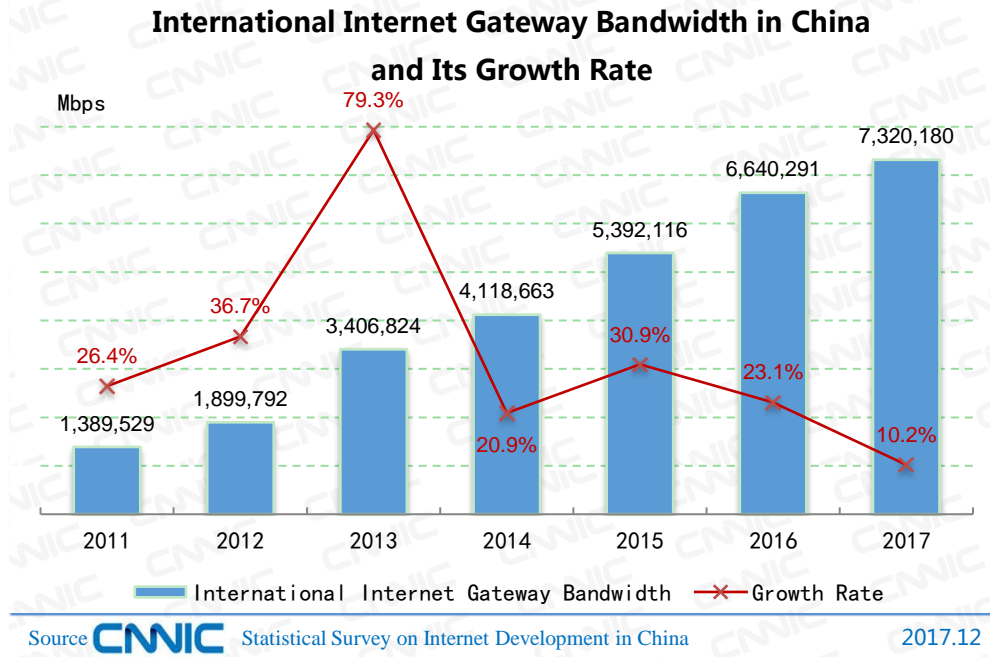


Figure 3 International Internet Gateway Bandwidth in China and Its Growth Rate

Table 4 International Internet Gateway Bandwidths of Backbone Networks

	International Internet gateway bandwidths (Mbps)
China Telecom	3,625,830
China Unicom	2,081,662
China Mobile	1,498,000
China Education and Research Network	61,440
China Science and Technology Network	53,248
Total	7,320,180

2. The Development of Internet Infrastructure

2.1 Cable length

As of the third quarter of 2017, the total length of optical cable lines reached 36.06 million kilometers, including 5.64 million kilometers of new ones. The length of optical cable has kept growing rapidly.

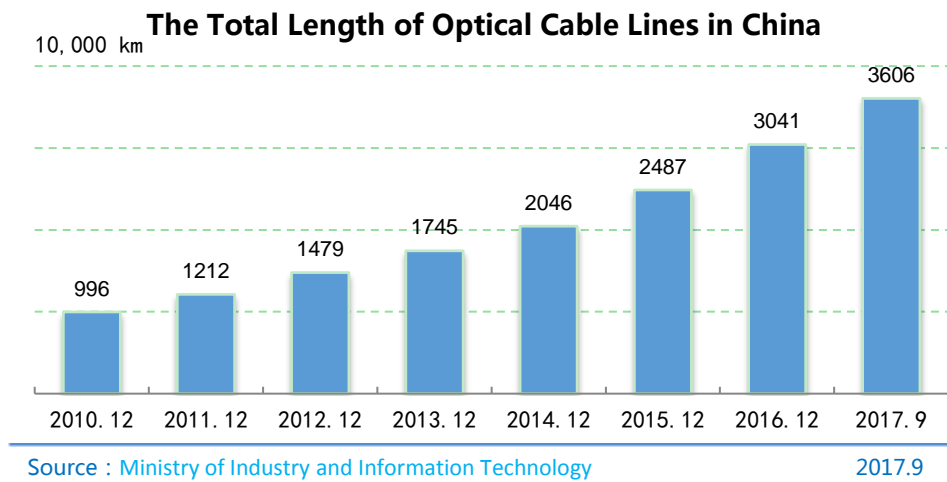
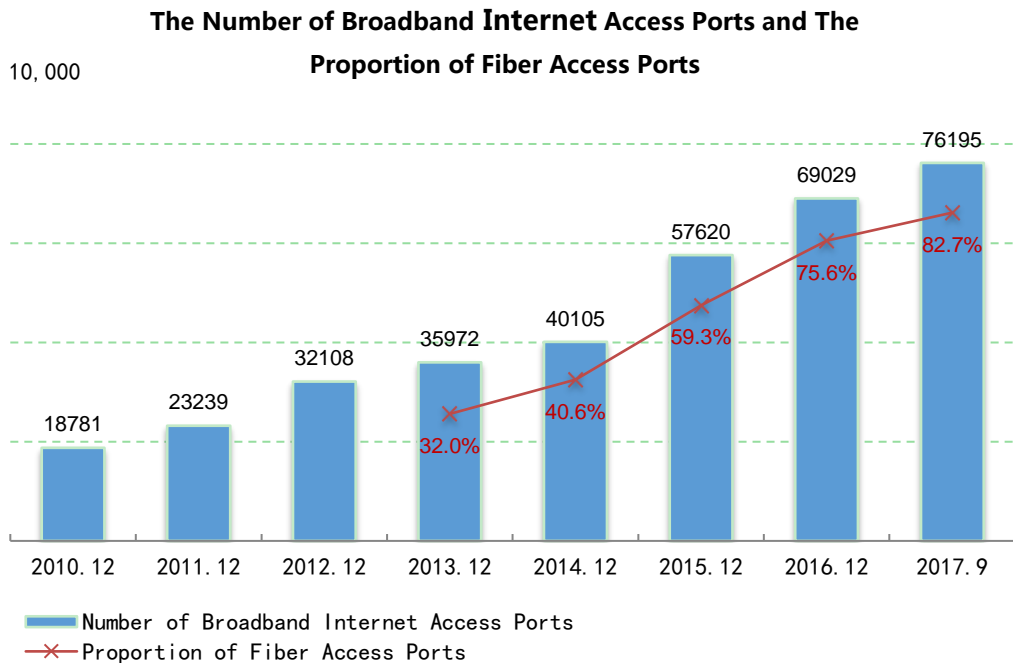


Figure 4 The Total Length of Optical Cable Lines in China

2.2 The Number of Broadband Internet Access Ports

Up to the third quarter of 2017, the number of Internet broadband access ports reached 760 million, a net increase of 71.66 million over the end of the previous year. Regarding Internet broadband access ports, the trend of “replacing copper cables with fiber cables” continued. xDSL ports decreased by 12.65 million to 26.22 million, and the proportion fell from 5.4% to 3.4% annually. The Fiber To The Home (FTTH/O) ports reached 630 million, a net increase of 92.3 million over the end of last year, up from 75.6% at the end of last year to 82.7%.



Source : Ministry of Industry and Information Technology

2017.9

Figure 5 The Number of Broadband Internet Access Ports and The Proportion of Fiber Access Ports

2.3 The Number of Base Stations for Mobile Phones

Up to the third quarter of 2017, basic telecommunications enterprises continued to accelerate the construction of mobile network infrastructure. In the first three quarters, a total of 447,000 new base stations for mobile communication were added, and the total amounted up to 6.041 million. For example, the total number of 3G/4G base stations reached 4.471 million, accounting for 74.0 %⁷, and the coverage and service capacity of mobile network continued to be improved.

⁷In the third quarter of 2017, the number and proportion of 4G base stations was not announced.

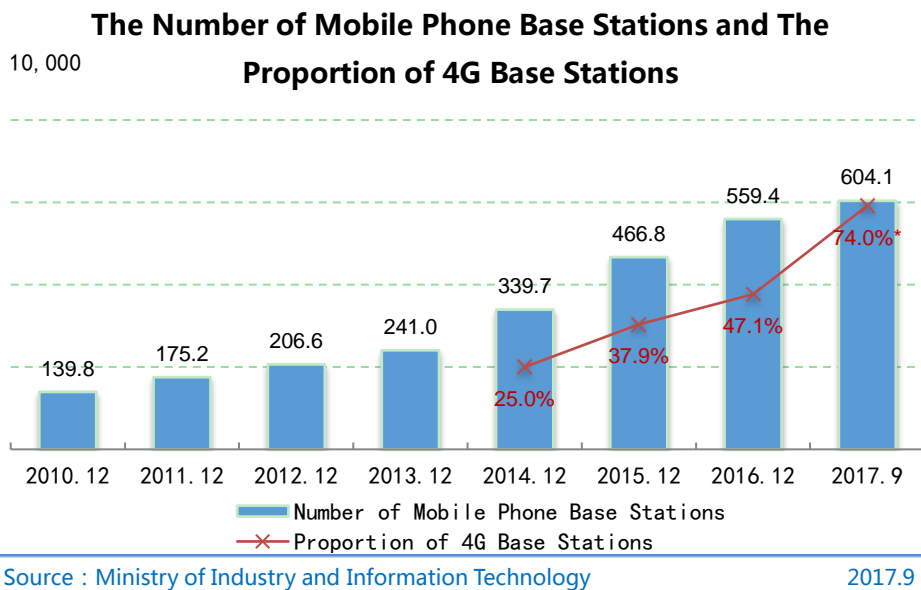


Figure 6 The Number of Mobile Phone Base Stations and The Proportion of 4G Base Stations

2.4 The Development of Internet Data Centers

From January to November 2017, the cumulative revenue of Internet data centers gained by Internet companies was RMB11.8 billion and maintained a positive growth for the fifth consecutive month, with a year-on-year increase of 8.2 %. As of November 2017, the number of servers deployed in Internet data centers stood at 1.16 million, up by 33.6% from the previous year.

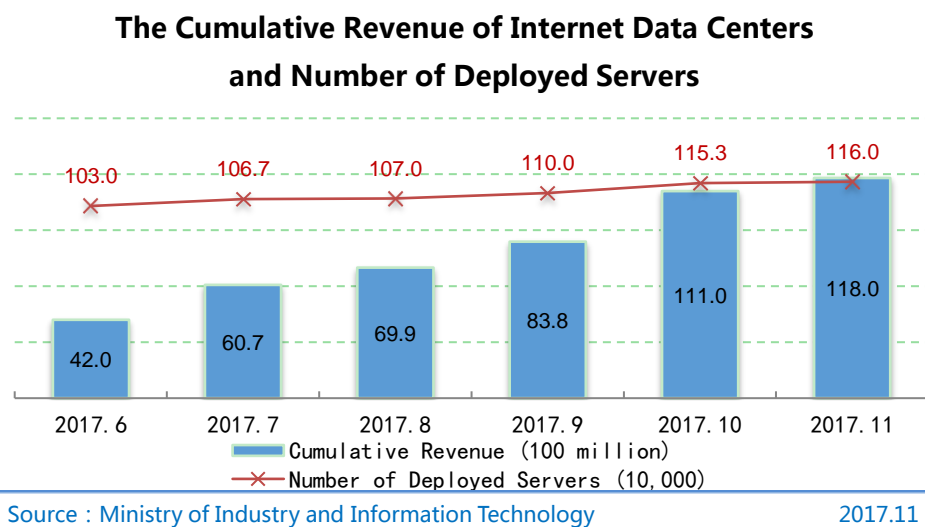


Figure 7 The Cumulative Revenue of Internet Data Centers and Number of Deployed Servers

3. The Use of Internet Resources

3.1 Websites

By December 2017, China had 5.33 million websites⁸, representing a yearly increase of 10.6%.



Figure 8 The Number of Websites in China

Note: Websites with the domain name of “.EDU.CN” are excluded.

Up to December 2017, China had 3.15 million websites with the domain name of “.CN”, representing a yearly increase of 21.8%.

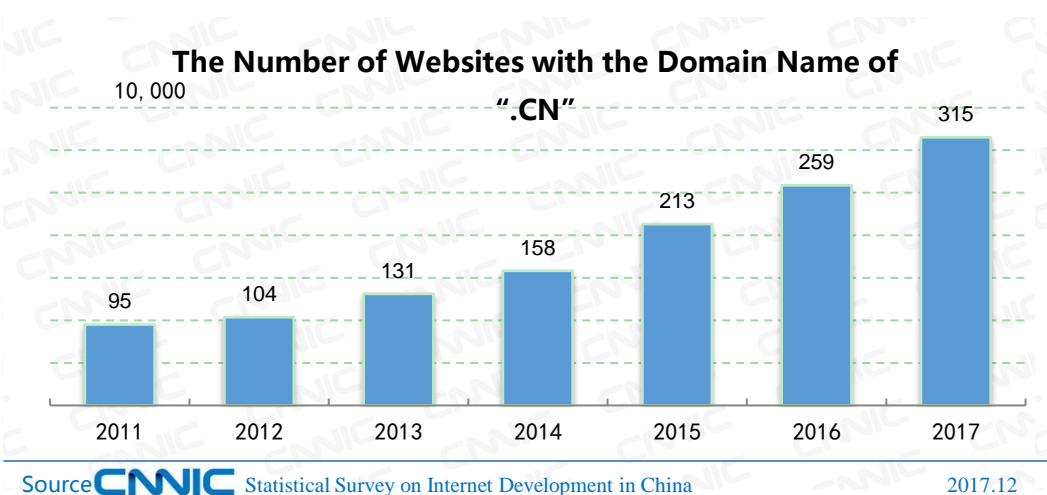


Figure 9 The Number of Websites with the Domain Name of “.CN”

Note: Websites with the domain name of “.EDU.CN” are excluded.

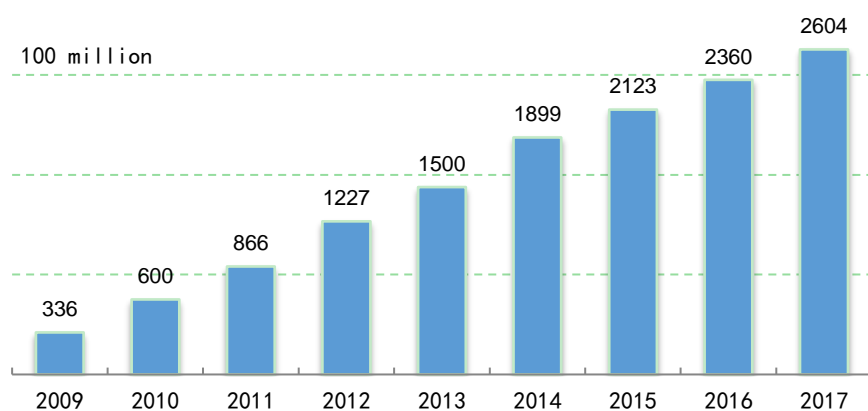
3.2 Web Pages

As of the end of 2017, China had 260.4 billion web pages, representing a yearly increase of

⁸It refers to the websites whose domain name registrants are within the territory of the P.R.C.

10.3%.

The Number of Web Pages in China



Source : Baidu Online Network Technology (Beijing) Co., Ltd.

2017.12

Figure 10 The Number of Web Pages in China

There were 196.9 billion static web pages and 63.5 billion dynamic web pages, accounting for 75.6% and 24.4% of the total, respectively.

Table 5 The Number of Web Pages in China

	Unit	2016	2017	Growth rate
Total web pages	Page	235,997,583,579	260,399,030,208	10.3%
Static web page	Page	176,083,292,929	196,908,897,175	11.8%
	Proportion in total web pages	74.6%	75.6%	1.3%
Dynamic web page	Page	59,914,290,650	63,490,133,033	6.0%
	Proportion in total web pages	25.4%	24.4%	-3.9%
Web page length (total number of bytes)	KB	13,539,845,117,041	17,107,296,355,296	26.3%
Average number of web pages per website	Page	48,922	48,828	-0.2%
Average number of bytes per page	KB	57	66	15.8%

3.3 Mobile Internet Traffic

The number of 4G mobile phone users continued to grow at a high rate and mobile Internet applications kept increasing, boosting the fast growth of mobile Internet traffic. From January to November 2017, the cumulative mobile Internet traffic totaled 21.21 billion GB, an increase of

158.2% over the same period of last year.

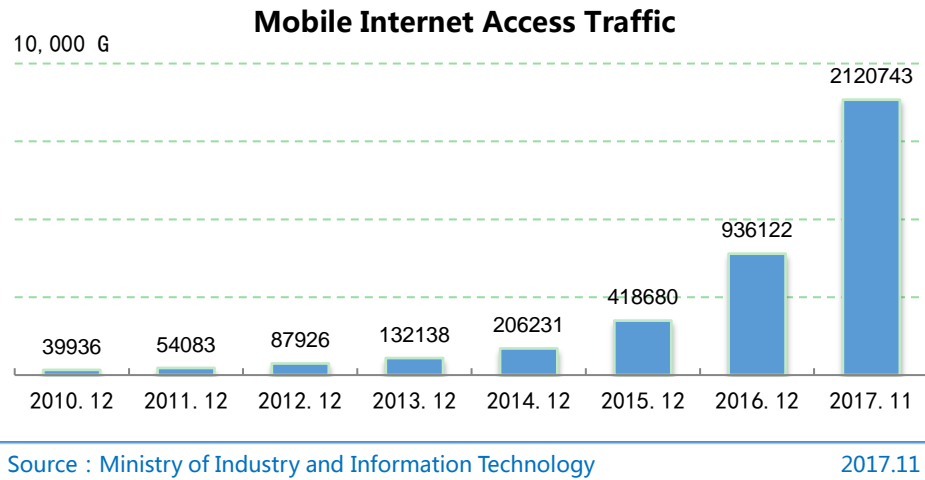


Figure 11 Mobile Internet Access Traffic

3.4 The Number and Category of APPs

As of November 2017, 3.91 million mobile applications (APP) had been available on China's market.

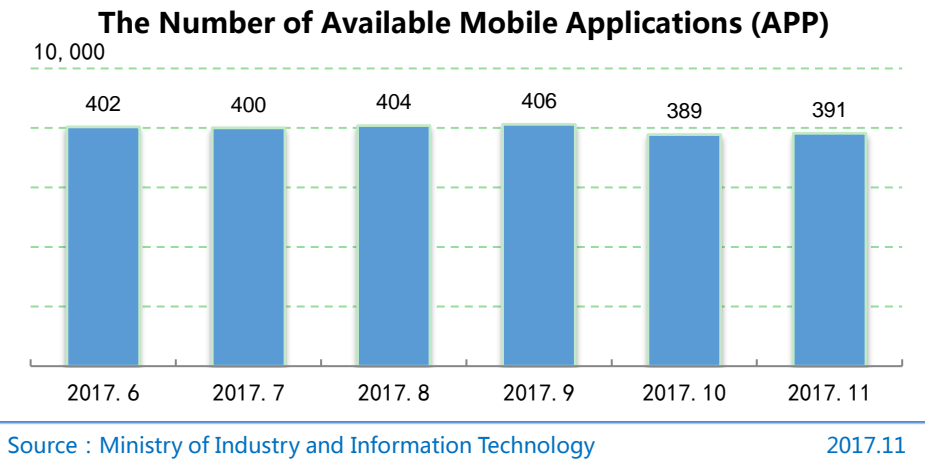
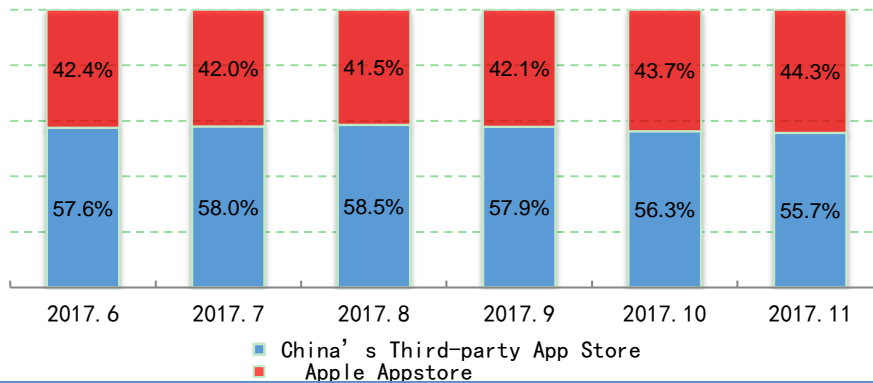


Figure 12 The Number of Available Mobile Applications (APP)

Up to November 2017, China's domestic third-party application stores had more than 2.24 million mobile applications, accounting for 55.7%; the number of mobile applications provided by Apple Store (China) exceeded 1.78 million, accounting for 44.3%.

The Ratio between the Number of Apps from China's Third-party App Store and that from Apple Appstore



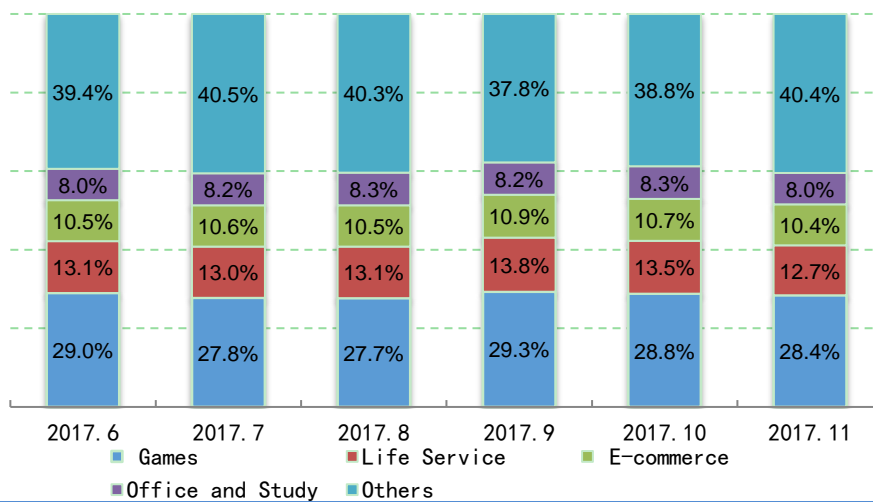
Source : Ministry of Industry and Information Technology

2017.11

Figure 13 The Ratio between the Number of Apps from China's Third-party App Store and that from Apple Appstore

From June to November 2017, gaming applications continued to take up a large proportion. Up to the end of November, the number of gaming applications exceeded 1.11 million, accounting for 28.4% of the total applications; that of life service applications was more than 497,000, ranking second and accounting for 12.7%; that of e-commerce applications was more than 408,000, ranking third and accounting for 10.4%; that of office and education reached 314,000, ranking fourth and accounting for 8.0%.

The Proportion of Mobile Apps by Category



Source : Ministry of Industry and Information Technology

2017.11

Figure 14 The Proportion of Mobile Apps by Category

4. The Internet Access Environment

4.1 Internet Access Devices

By December 2017, 97.5% of Chinese netizens accessed the Internet via their mobile phones, an annual increase of 2.4 percentage points from the end of 2016, showing a record-high utilization ratio; 53.0% used desktops and 35.8% used laptops, both declining from the end of 2016. Specifically, the proportion of those using desktops decreased by 7.1 percentage points. Meantime, the proportion of those accessing the Internet via their TVs reached 28.2%, up by 3.2 percentage points on an annual basis.

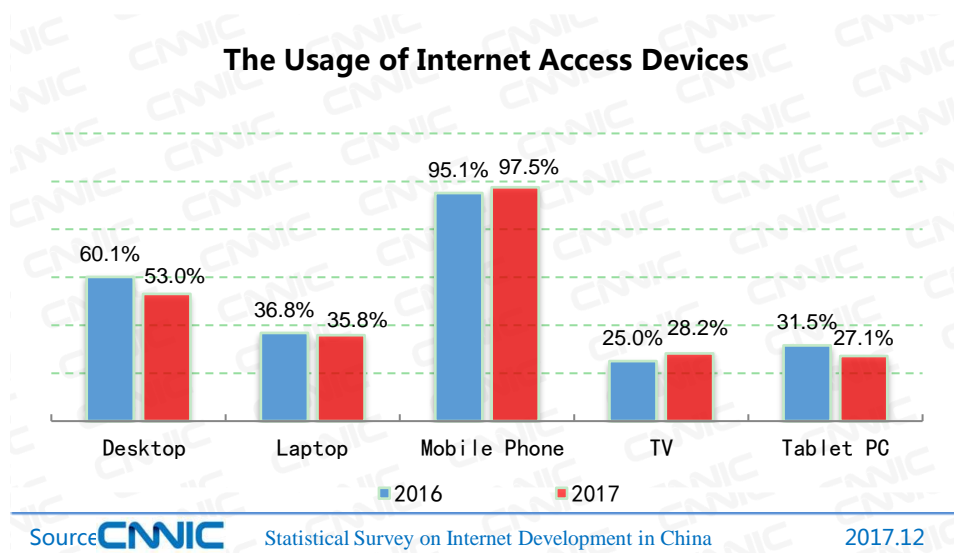


Figure 15 The Usage of Internet Access Devices

4.2 Venues of Internet Access

Up to December 2017, 85.6% of Chinese netizens accessed the Internet via computers at home, down by 2.1 percentage points from the end of 2016; the proportion of netizens who did so at Internet bars, workplaces, schools, and public places all edged up.

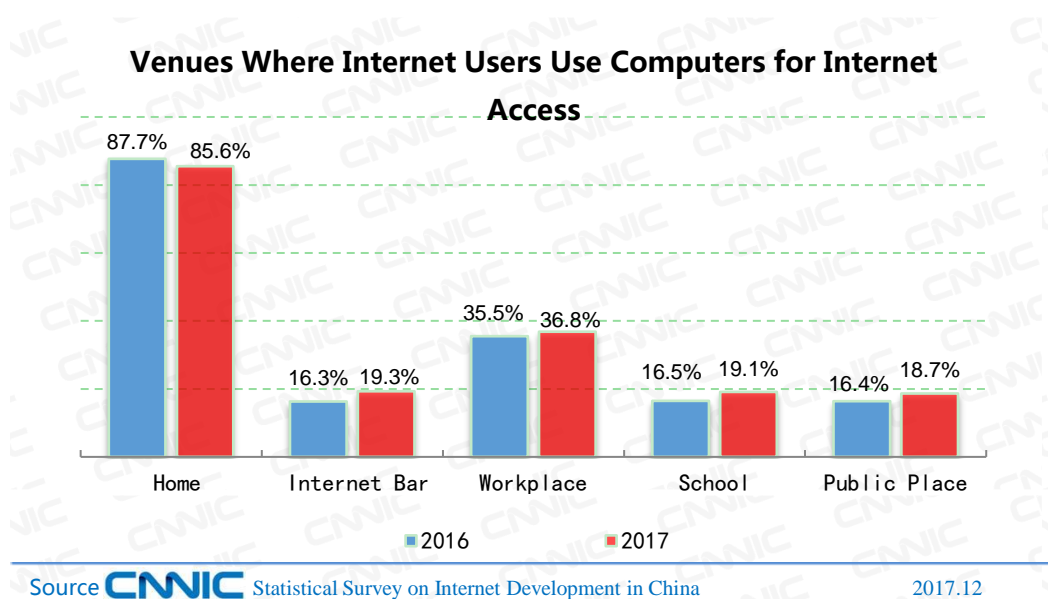


Figure 16 Venues Where Internet Users Use Computers for Internet Access

4.3 The Proportion of Broadband Subscribers at the Speed of 8Mbps/20Mbps or above

As of November 2017, the broadband subscribers accessing the Internet at a speed of 20Mbps or above accounted for 91.2% of the total broadband subscribers, an increase of 13.4 percentage points over the end of 2016. By the end of 2016⁹, the proportion of broadband users accessing the Internet at a speed of 8Mbps or above had reached 91.0%.

⁹In November 2017, the Ministry of Industry and Information Technology of the People's Republic of China didn't publish the proportion of broadband subscribers accessing the Internet at a speed of 8Mbps or above.

The Proportion of Broadband Subscribers Accessing the Internet at a Speed of 8Mbps/20Mbps or above

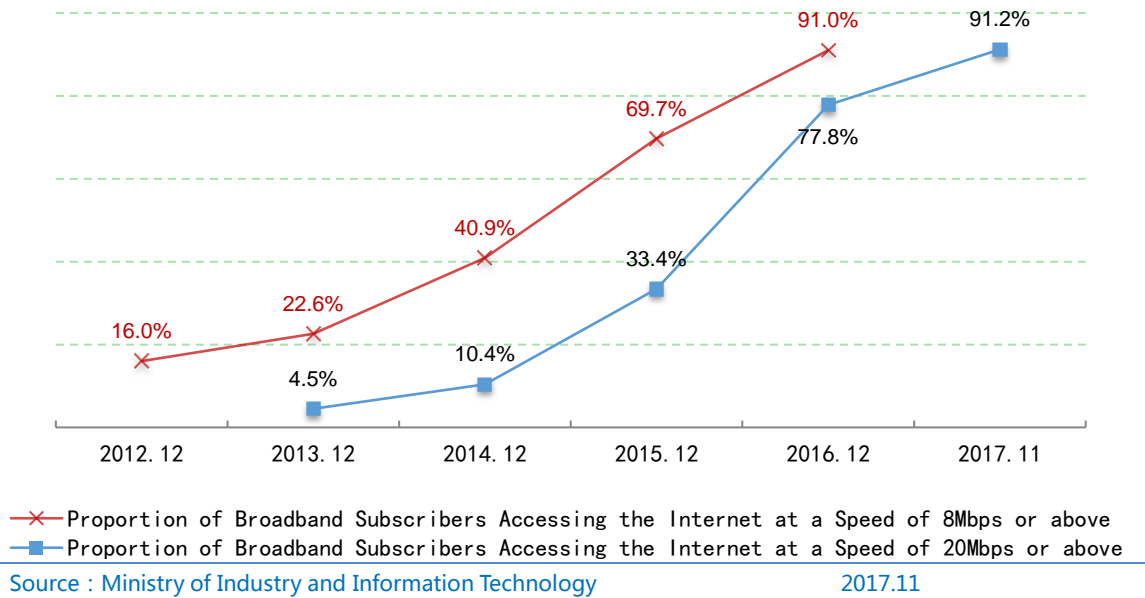


Figure 17 The Proportion of Broadband Subscribers Accessing the Internet at a Speed of 8Mbps/20Mbps or above

4.4 The Scale and Proportion of Fiber Broadband Users

In 2017 the program for urban broadband construction continued to promote the popularity of fiber broadband. From January to November, the Fiber To The Home (FTTH/O) subscribers increased 61.73 million. Their number totaled 290 million and accounted for 83.6% of all broadband subscribers, an increase of 7 percentage points from the end of 2016,.

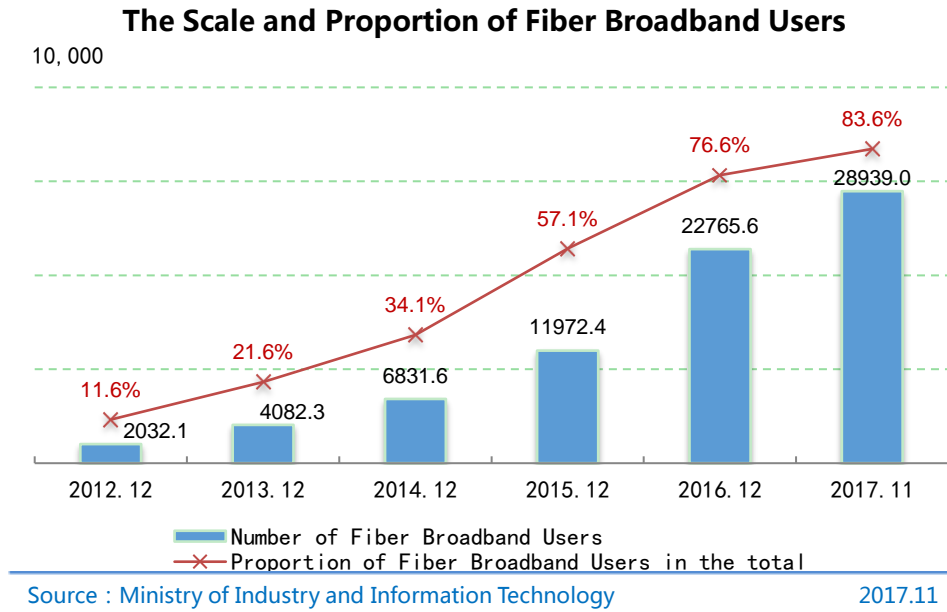


Figure 18 The Scale and Proportion of Fiber Broadband Users

4.5 Online Duration

In 2017, the average online duration of China’s netizens was 27.0 hours per week, an increase of 0.6 hour compared with the data in 2016.

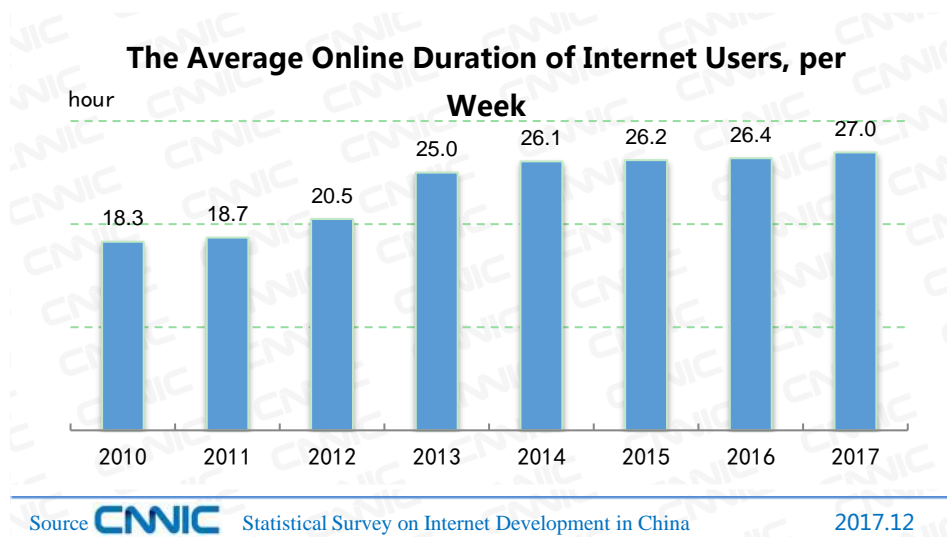


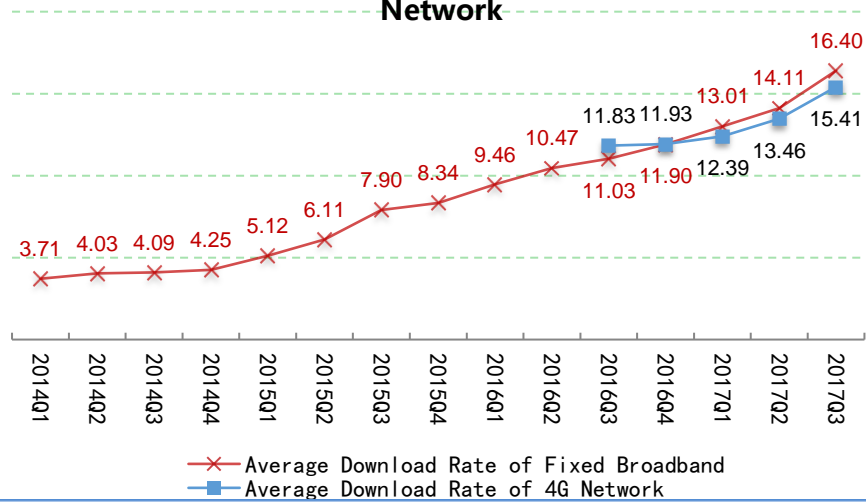
Figure 19 The Average Online Duration of Internet Users, per Week

4.6 Average Download Rate on the Internet

In the third quarter of 2017, the weighted average of peak-time and non-peak-time download

speeds¹⁰ for fixed broadband users was 16.4 Mbit/s, up by 16.2% from the previous quarter; the average download speed for mobile broadband users accessing the Internet via 4G network was 15.4 Mbit/s, up 14.5% from a quarter earlier. Since the *Guiding Opinions on Accelerating the Construction of High-Speed Broadband Networks, Boosting Internet Speed and Lowering Internet Charges* were released by the General Office of the State Council in 2015, relevant competent departments have been devoted to “increasing the network speed and reducing access charges”. China's broadband network entered a new period of rapid development. Since 2015, the Internet speed has been doubled and the work of acceleration has achieved remarkable results.

The Average Download Rate of Fixed Broadband/4G Network



Source: Broadband Development Alliance

2017.9

Figure 20 The Average Download Rate of Fixed Broadband/4G Network

¹⁰The weighted average of peak-time and non-peak-time download speeds is obtained through the following steps: dividing the number of samples detected at peak time and non-peak time by the total sample size respectively, to obtain two quotients; multiplying the two quotients by the peak-time average and the non-peak-time average respectively, to obtain two products; summing up the two products to obtain the weighted average of peak-time and non-peak-time download speeds.



Part 2 The Development of Internet Applications

1. The Scale of Internet Users

1.1 The Overall Scale of Internet Users

Up to December 2017, China had 772 million Internet users, up 40.74 million over the previous year. The Internet penetration reached 55.8%, up 2.6 percentage points from the end of 2016.

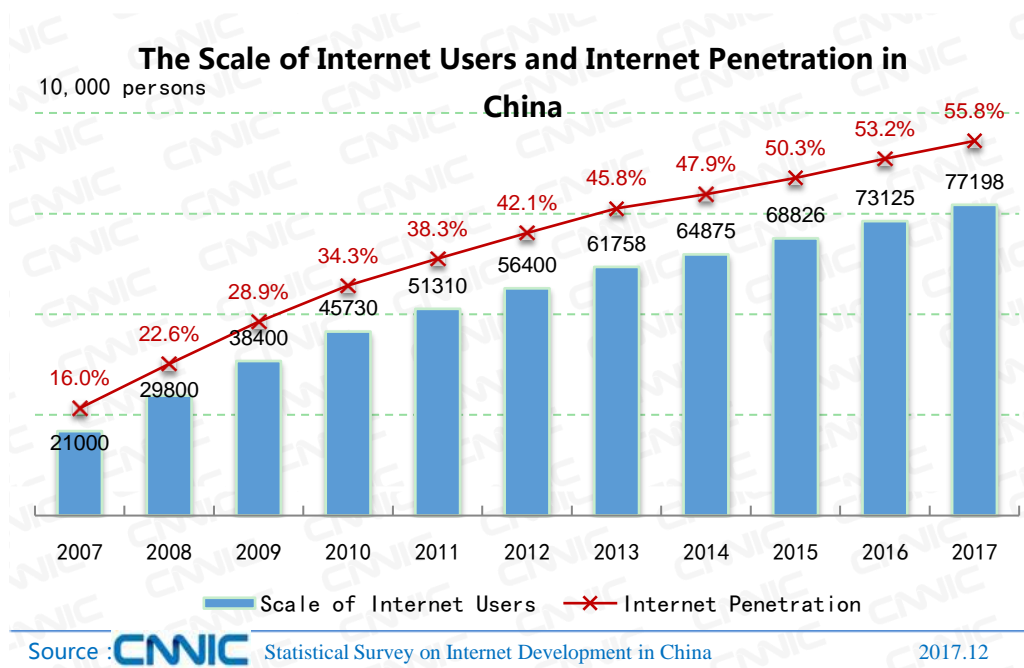


Figure 21 The Scale of Internet Users and Internet Penetration in China

The scale of China’s Internet users continued to grow steadily. We have kept making innovations in the Internet model, sped up the integration of online and offline services, and made more public services accessible online. All these efforts have served as a spur to the increasingly growing number of China’s netizens. In 2017, General Secretary Xi Jinping repeatedly mentioned the Internet in the 19th CPC National Congress report. The importance of the Internet in the socio-economic development has become more prominent. China has moved forward with the national strategy for cyber development. Over the past year, China’s Internet industry has accelerated

integration with other industries. The strategy of “Made in China 2025” has been implemented in all directions, the industrial Internet has been vigorously promoted, and the “Internet plus” has kept promoting the upgrading of traditional industries. The Internet, big data, artificial intelligence and real economy has moved from the initial integration to deep integration, and the transformation and upgrading has been brought about at a higher speed. Digital economy has become a new engine for economic development. Internet and digitization have transformed the traditional economy into the Internet economy. The spread of IT services, the vigorous development of the Internet-driven poverty alleviation and the improvement of public service have allowed the people to share the results of Internet development.

1.2 The Scale of Mobile Internet Users

As of December 2017, the number of mobile Internet users in China reached 753 million, an increase of 57.34 million from the end of 2016. The mobile netizens accounted for 97.5% of the total netizen population, while this percentage was 95.1% in 2016. The proportion of mobile netizens further climbed on a high base.

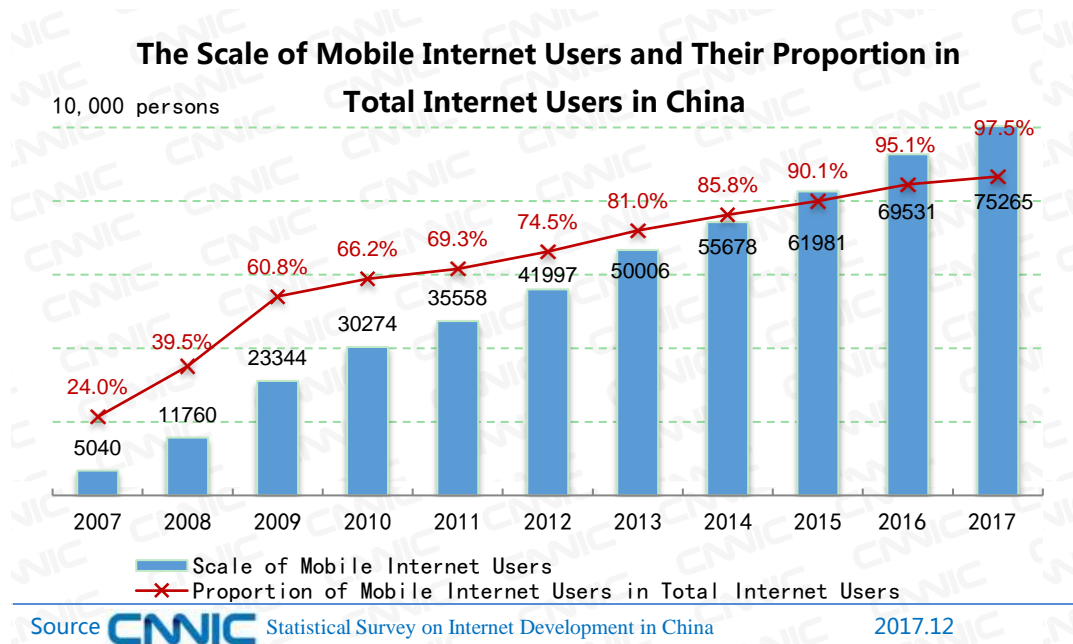


Figure 22 The Scale of Mobile Internet Users and Their Proportion in Total Internet Users in China

In 2017, the mobile Internet had three characters: diversified service scenarios, increased mobile devices and enlarged volume of mobile data. First of all, comprehensive mobile application

platforms were integrated with the functions of social networking, information services, financial services, travel, and livelihood services, and became one-stop service platforms to expand the scope and influence. Second, smart devices, presented by mobile phones, laid the foundation for the “interconnectivity” of all things, and the Internet of Vehicles and smart appliances upgraded the experience of travel and living, contributing to enhanced personalized and smart application scenarios. Finally, as the demographic dividend gradually disappears and the scale of Internet users tends to be stable, massive mobile data has become new valuable resources. Such data to be combined with big data processing technologies will create more valuable potential for the mobile Internet industry.

1.3 The Scale of Internet Users in Rural Areas

Up to December 2017, China had 209 million rural Internet users, accounting for 27.0% of the national total netizens, an increase of 7.93 million or 4.0% from the end of 2016; it had 563 million urban Internet users, accounting for 73.0%, an increase of 32.81 million or 6.2% from the end of 2016.

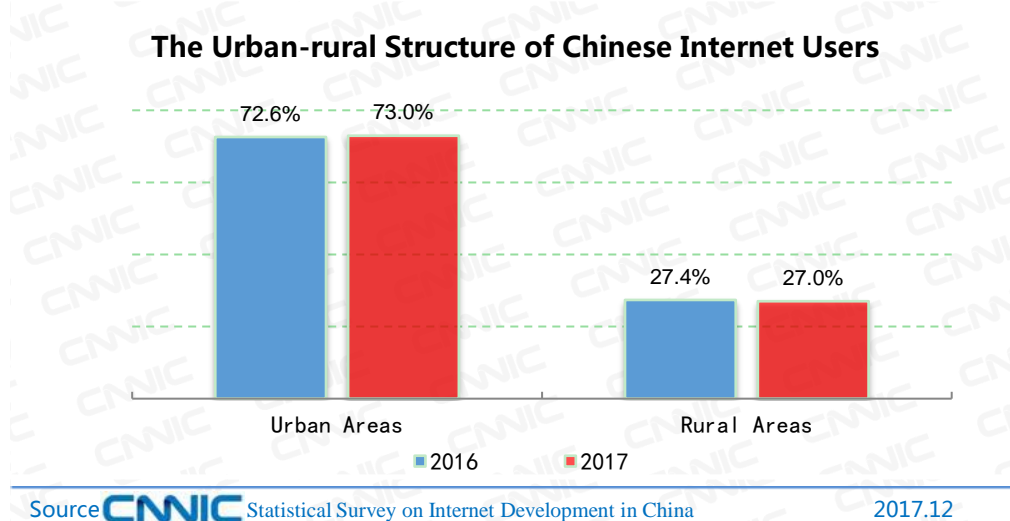


Figure 23 The Urban-rural Structure of Chinese Internet Users

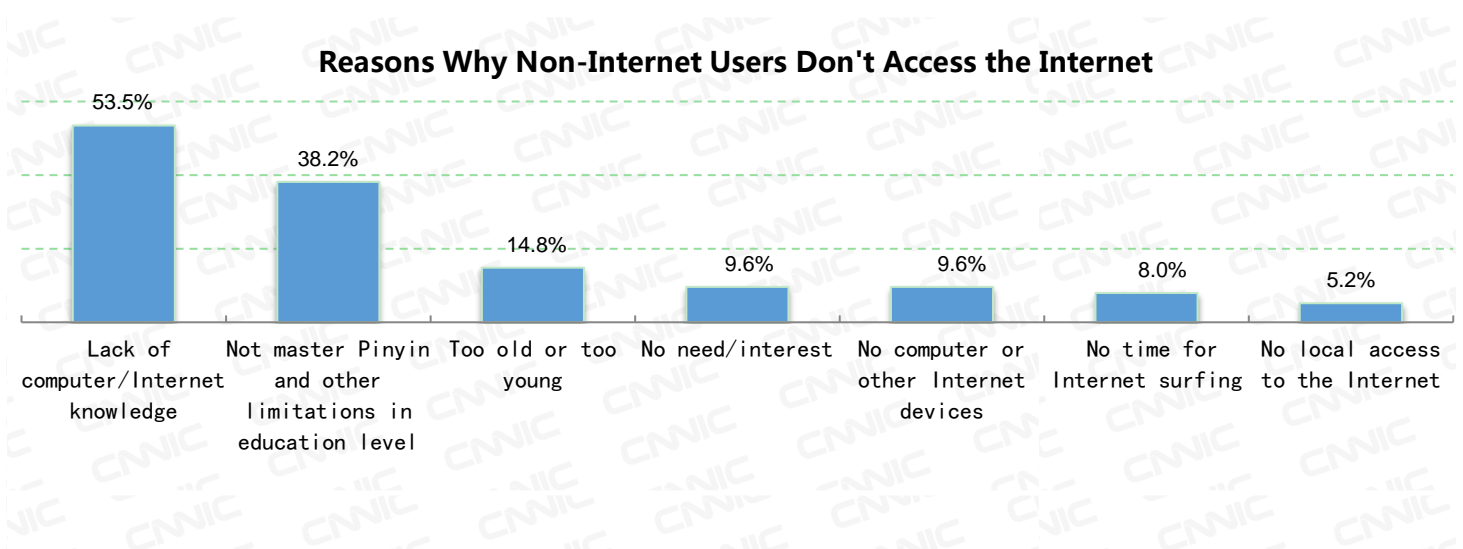
As of December 2017, the Internet penetration in Chinese urban areas was 71.0% while that in Chinese rural areas was 35.4%. In the meantime, the utilization rate of Internet applications varied from one region to another, mainly depending on types of Apps and regional features. On the one hand, due to a high threshold for use, rural Internet users lagged behind urban Internet users in the business and finance Apps. For example, the urban-rural gap ranged from 20% to 25% in the

use of Apps for online shopping, travel booking, online payment and Internet finance. On the other hand, in terms of Apps with distinct regional features, such as online meal ordering, online car-hailing and shared bike, the utilization rates in urban areas were more prominent than those in rural areas, and each exceeded rural areas by at least 20 percentage points. However, as for the earlier-developed basic applications such as instant messaging, online music and online video, the urban-rural gap in utilization ratio was not very significant, about 10 percentage points.

1.4 Analysis of Non-Internet Users' Status Quo

Rural residents took up a dominant part of non-Internet users. By December 2017, of 611 million non-Internet users in China, those in urban areas accounted for 37.6%, while those in rural areas were 62.4%.

Shortage of Internet skills and limited literacy level are major factors preventing non-netizens from accessing the Internet. According to a survey, 53.5% of non-netizens don't access the Internet due to shortage of knowledge about computer or the Internet; 38.2% of them not because they don't master pinyin or the Chinese phonetic alphabet; 9.6% of them not because of no needs or interests to access the Internet; and 14.8% of them not due to no computer or local access to the Internet.



Source : CNISC Statistical Survey on Internet Development in China

2017.12

Figure 24 Reasons Why Non-Internet Users Don't Access the Internet

To prompt non-netizens to surf the Internet, it is necessary to improve their Internet skills,

reduce the Internet access costs and stimulate their demands. According to a survey, among the non-netizens, 31.9% were willing to access the Internet if they were provided free Internet training; 28.9% were so due to reduced Internet charges and 25.4% due to free accessible Internet devices; 32% netizens chose to access the Internet to communicate with others, 26.4% to increase their incomes and 17.5% to do online shopping.

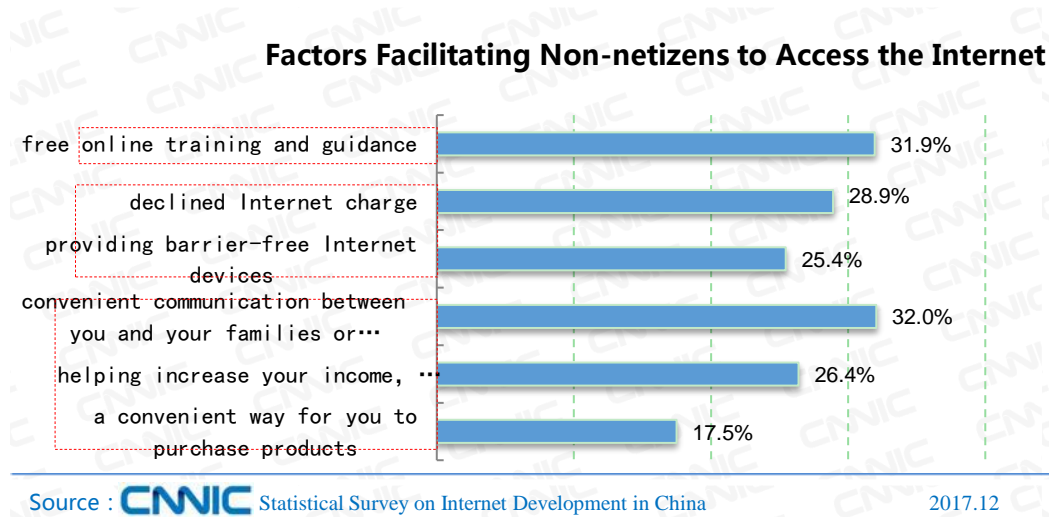


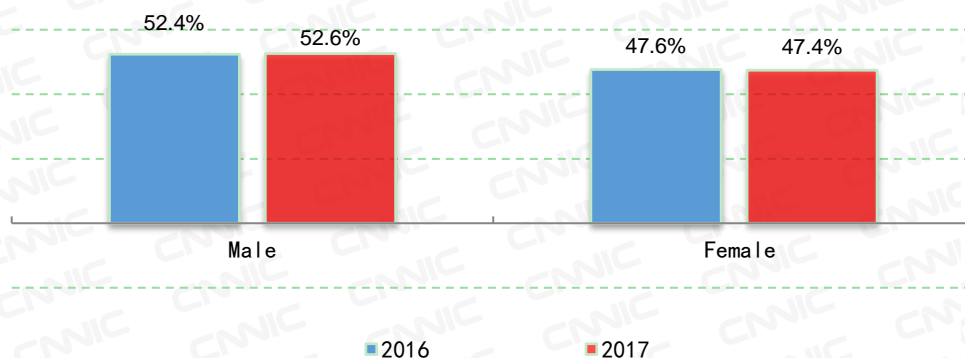
Figure 25 Factors Facilitating Non-netizens to Access the Internet

2. The Structure of Internet Users

2.1 Gender Structure

Up to December 2017, the male-to-female ratio was 52.6:47.4 among Chinese Internet users, and as of the end of 2016 the male-to-female ratio was 51.2:48.8 in the total Chinese population. These ratios indicate that the gender structure of Chinese netizens became closer to the sex ratio of the total population.

The Gender Structure of Chinese Internet Users



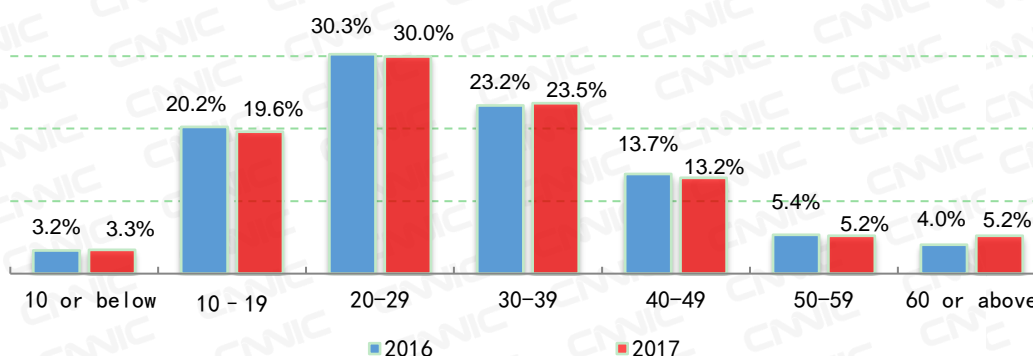
Source CNISC Statistical Survey on Internet Development in China 2017.12

Figure 26 The Gender Structure of Chinese Internet Users

2.2 Age Structure

An overwhelming majority of Chinese netizens were aged 10-39. Up to December 2017, of Chinese Internet users, 73.0% aged 10-39. Among them, 30.0% were aged 20-29, 19.6% aged 10-19 and 23.5% aged 30-39, showing little change from the end of 2016. Compared with the end of 2016, the percentage of those aged 60 or above rose, indicating that the Internet continued to penetrate into the elderly population

The Age Structure of Chinese Internet Users



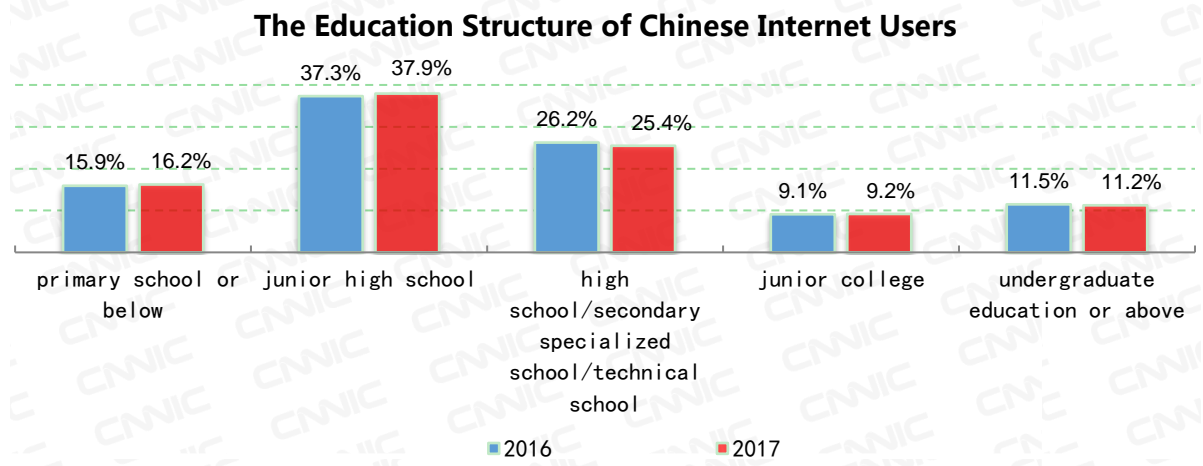
Source CNISC Statistical Survey on Internet Development in China 2017.12

Figure 27 The Age Structure of Chinese Internet Users

2.3 Education Structure

Netizens with a secondary education level constitute the major part. Up to December 2017, junior high school students constituted 37.9% of the Chinese netizen population, and this

percentage was 25.4% for senior high school/secondary specialized school/technical school students. The percentage of netizens with the education level of junior high school increased by 0.6 percentage points from the end of 2016.



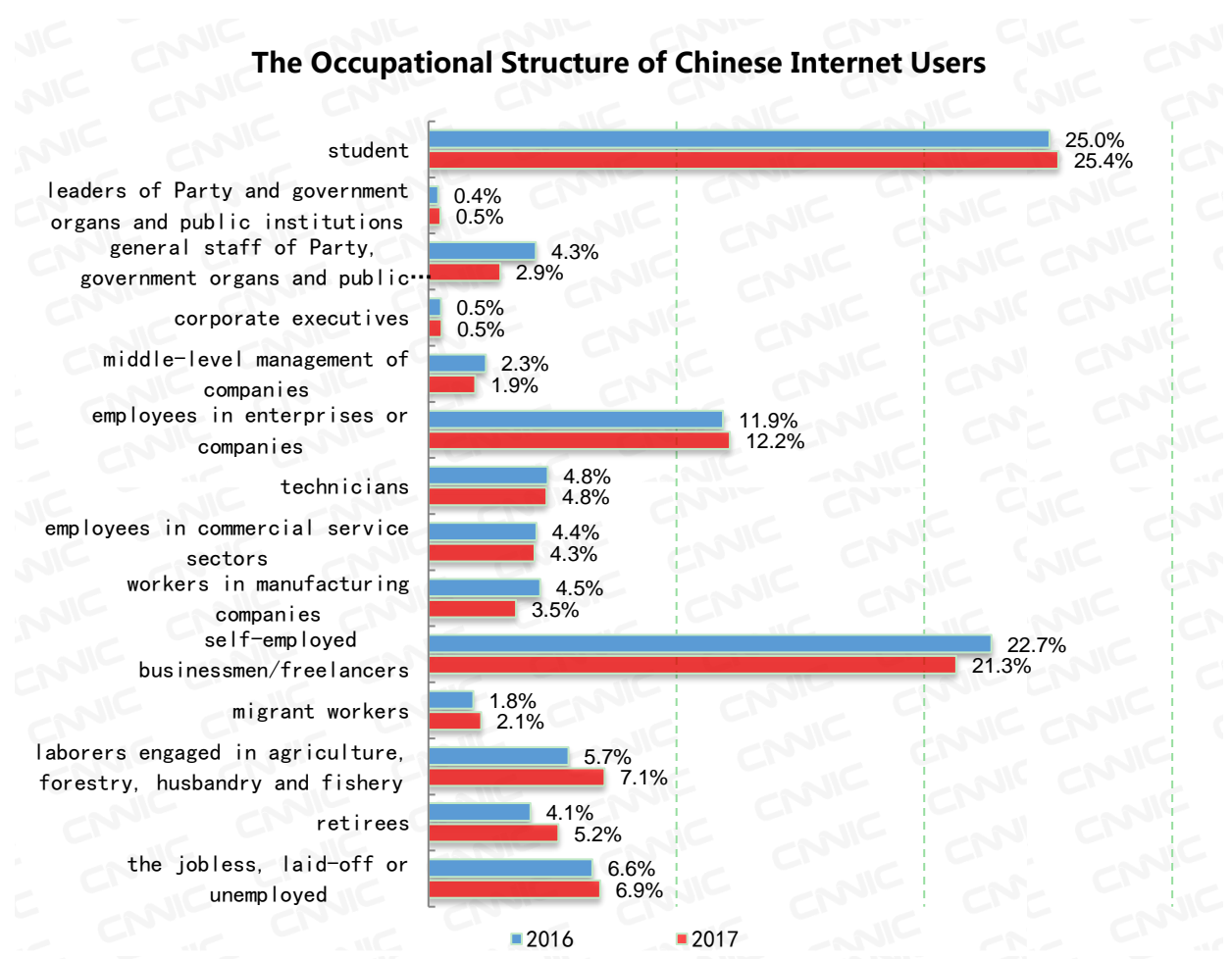
Source : CNNIC Statistical Survey on Internet Development in China

2017.12

Figure 28 The Education Structure of Chinese Internet Users

2.4 Occupational Structure

Middle school students are the largest group of Internet users. Up to December 2017, of Chinese Internet users, 25.4% were students; 21.3% were self-employed businessmen/freelancers; and 14.6% were enterprise managers and ordinary staff members. The occupational structure of Chinese netizens remained stable.



Source : CNISC Statistical Survey on Internet Development in China

2017.12

Figure 29 The Occupational Structure of Chinese Internet Users

2.5 Income Structure

Netizens with a monthly income¹¹ at a middle or high level form the largest part of China's netizens. By December 2017, the proportions of netizens with a monthly income of RMB 2001-3000 and RMB 3001-5000 were 16.6% and 22.4%, respectively. In 2017, as the scale of high-income netizen group increased, the proportion of the netizen group with a monthly income of more than RMB 5,000 increased by 3.7 percentage points over the end of 2016.

¹¹Specifically, the income of students includes living allowances provided by families, salary earned from work-study programs, scholarships and others. The income of peasants includes the living allowances provided by children, income of agricultural production, and government subsidy. The income of those who are jobless, laid off or unemployed includes the living allowances provided by children, government relief and subsidy, pension, and subsistence allowances. The income of retirees includes the living allowances provided by children and pension.

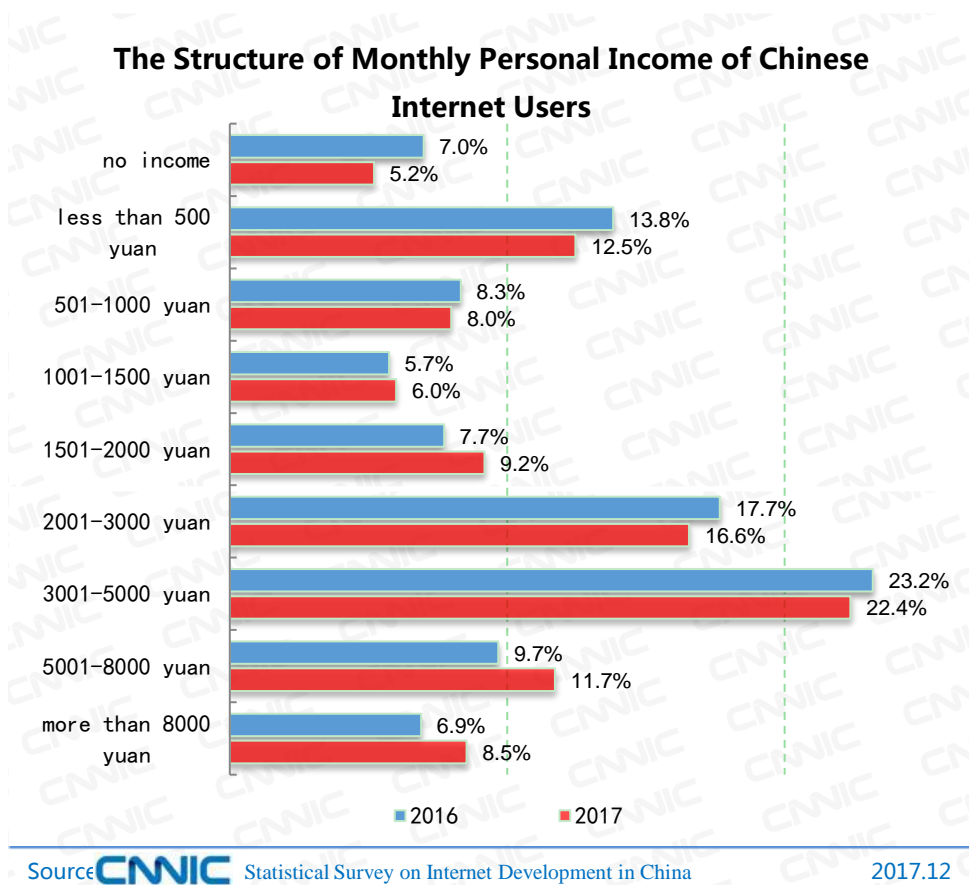


Figure 30 The Structure of Monthly Personal Income of Chinese Internet Users

3. The Development of Personal Internet Applications

The year of 2017 saw the fast development of personal Internet applications. Users of various applications were growing. For example, users of online meal ordering grew by 64.6% annually. In terms of mobile phone applications, users of mobile meal ordering and mobile travel booking increased by 66.2% and 29.7%, respectively.

Users of basic applications grew steadily, and platforms of basic applications sought for new drivers for differentiated growth.

Users of basic Internet applications, such as instant messaging, information searching, network news and social networking, grew steadily. The instant messaging sector has been further standardized, the positioning of instant messaging products has been further differentiated, and the capability to connect various services in daily life has been continuously expanded. Search engines have been used via mobile devices more frequently. Artificial intelligence has continued to inject

growth impetus into the search engine market, providing valuable user data for the innovative development of the diversified platforms of search engine companies. Relevant laws and regulations on online news have been further enhanced. The traditional news media has sped up the Internet-based transformation, multiple forms of media have integrated, and the sector enters a new development stage. The functions of various social networking platforms have become increasingly improved, social networking has been developed into an ecological platform “connecting all things”, and the influence of social media has been remarkably improved.

The scale of online meal ordering users saw a significant increase, and the online and offline integration of business transaction applications expedited.

Business transaction applications kept increasing at a fast pace in 2017. Most obviously, users of online meal ordering grew by 64.6% annually. With the improvement of laws and regulations in the e-commerce field, the e-commerce sector has continued to shift to a high-quality, high-efficiency stage and made good results, and the integration of online and offline activities was made even deeper. The environment for the online meal ordering sector has been further optimized, frequent market demands have been made, and online meal ordering platforms and catering brands began to prioritize building their own brands. In terms of travel booking, travel companies have strengthened strategic cooperation, introduced more tourism theme, and driven market sales with products and services.

The proportion of users of offline payment increased in rural areas, and the user scale of Internet finance rose significantly.

China’s mobile payment users have continued to expand, and their habit has been further consolidated. The proportion of Internet users paying their offline bills via mobile phones increased from 50.3% at the end of 2016 to 65.5%. Offline payment has penetrated into rural Internet users at a faster pace, and the proportion of rural Internet users using offline payment increased from 31.7% at the end of 2016 to 47.1%. 129 million netizens had purchased Internet financing products, an increase of 30.2% over the end of 2016, and the Internet financing market featured diversified development. At the same time, P2P credit market continued to lower the interest rate on loans, and loan business was in fuller compliance with relevant laws.

The user scale of online entertainment continued to grow at a high speed, and the cultural

entertainment stepped into a period of full bloom.

In 2017, the user scale of online entertainment applications maintained a high-speed growth. Driven by a strong market demand, policy stimulation and guidance, and resource support from enterprises, the online cultural entertainment sector entered a period of full bloom. Among all the online entertainment applications, the annual growth rate of the scale of live streaming users ranked the first, reaching 22.6%, while that of online games users ranked the last, amounting to 5.9%. In the meantime, the content of online cultural entertainment has been further standardized, and the revenue of the online entertainment sector represented by online games and video has grown. The sound revenue has motivated online entertainment companies to provide more support for content creators, laying a solid foundation for the prosperity of online entertainment content.

China's shared bike users exceeded 200 million, and regulations for online car-hailing services were gradually introduced.

In terms of the growth of user scale, shared bike became the most significant application type in the second half of 2017 with its users reaching 221 million. Shared bike has covered China's major cities and penetrated into 21 overseas countries. At the same time, as the industry competition becomes more fierce, small- and medium-sized enterprises, due to weak capital strength and limited innovation capabilities, generally began to face growing pressure from their capital chain in the second half of 2017. As a result, most of them exited from the market. Since the *Interim Measures for the Administration of Online Taxi Booking Service* came into force, local provisions on online car-hailing service have been introduced to realign the entry threshold. Online car-hailing companies sought for transformation and cross-sector integration to enhance profitability. They cooperated with travel and recruitment companies to share customer resources and conduct cross-sector marketing.

Table 6 Usage Rate of Internet Applications by Chinese Netizens Dec. 2016 - Dec. 2017

Applications	Dec. 2017		Dec. 2016		Annual growth rate
	Number of Internet users (10,000)	The percentage of Internet users using the application	Number of Internet users (10,000)	The percentage of Internet users using the application	
Instant messaging	72023	93.3%	66628	91.1%	8.1%
Search engine	63956	82.8%	60238	82.4%	6.2%
Online news	64689	83.8%	61390	84.0%	5.4%
Online video	57892	75.0%	54455	74.5%	6.3%
Online music	54809	71.0%	50313	68.8%	8.9%
Online payment	53110	68.8%	47450	64.9%	11.9%
Online shopping	53332	69.1%	46670	63.8%	14.3%
Online games	44161	57.2%	41704	57.0%	5.9%
Online banking	39911	51.7%	36552	50.0%	9.2%
Online literature	37774	48.9%	33319	45.6%	13.4%
Travel booking ¹²	37578	48.7%	29922	40.9%	25.6%
E-mail	28422	36.8%	24815	33.9%	14.5%
Internet financing	12881	16.7%	9890	13.5%	30.2%
Online stock or fund trade	6730	8.7%	6276	8.6%	7.2%
Microblog	31601	40.9%	27143	37.1%	16.4%
Map query	49247	63.8%	46166	63.1%	6.7%
Online meal ordering	34338	44.5%	20856	28.5%	64.6%
Online education	15518	20.1%	13764	18.8%	12.7%
Online taxi-hailing service	28651	37.1%	22463	30.7%	27.5%
Online car-hailing service or fast ride	23623	30.6%	16799	23.0%	40.6%
Live streaming ¹³	42209	54.7%	34431	47.1%	22.6%
Shared bike	22078	28.6%	-	-	

¹²Travel booking: It is defined in this report as booking air tickets, hotel, train tickets and travel & vacation products via Internet in the last 6 months.

¹³Live streaming services surveyed for this report include live sport broadcasting, host live show, live game streaming, and live concert streaming.

Table7 Usage Rate of Mobile Internet Applications by Chinese Netizens Dec. 2016 - Dec. 2017

Applications	Dec. 2017		Dec. 2016		Annual growth rate
	Number of Internet users (10,000)	The percentage of Internet users using the application	Number of Internet users (10,000)	The percentage of Internet users using the application	
Mobile instant messaging	69359	92.2%	63797	91.8%	8.7%
Mobile news	61959	82.3%	57126	82.2%	8.5%
Mobile search	62398	82.9%	57511	82.7%	8.5%
Mobile music	51173	68.0%	46791	67.3%	9.4%
Mobile video	54857	72.9%	49987	71.9%	9.7%
Mobile payment	52703	70.0%	46920	67.5%	12.3%
Mobile shopping	50563	67.2%	44093	63.4%	14.7%
Mobile games	40710	54.1%	35166	50.6%	15.8%
Mobile banking	37024	49.2%	33357	48.0%	11.0%
Cell phone literature	34352	45.6%	30377	43.7%	13.1%
Mobile travel booking	33961	45.1%	26179	37.7%	29.7%
Mobile email	23276	30.9%	19713	28.4%	18.1%
Mobile education course	11890	15.8%	9798	14.1%	21.3%
Mobile microblog	28634	38.0%	24086	34.6%	18.9%
Mobile map and mobile navigation	46504	61.8%	43123	62.0%	7.8%
Mobile meal ordering	32229	42.8%	19387	27.9%	66.2%

3.1 The Development of Basic Applications

3.1.1 Instant Messaging

Up to December 2017, China had 720 million users of instant messaging, accounting for 93.3% of the total netizen population and representing an increment of 53.95 million from the end of 2016. Users of mobile instant messaging reached 694 million, constituting 92.2% of mobile netizens and

recording an annual increase of 55.62 million from the end of 2016.

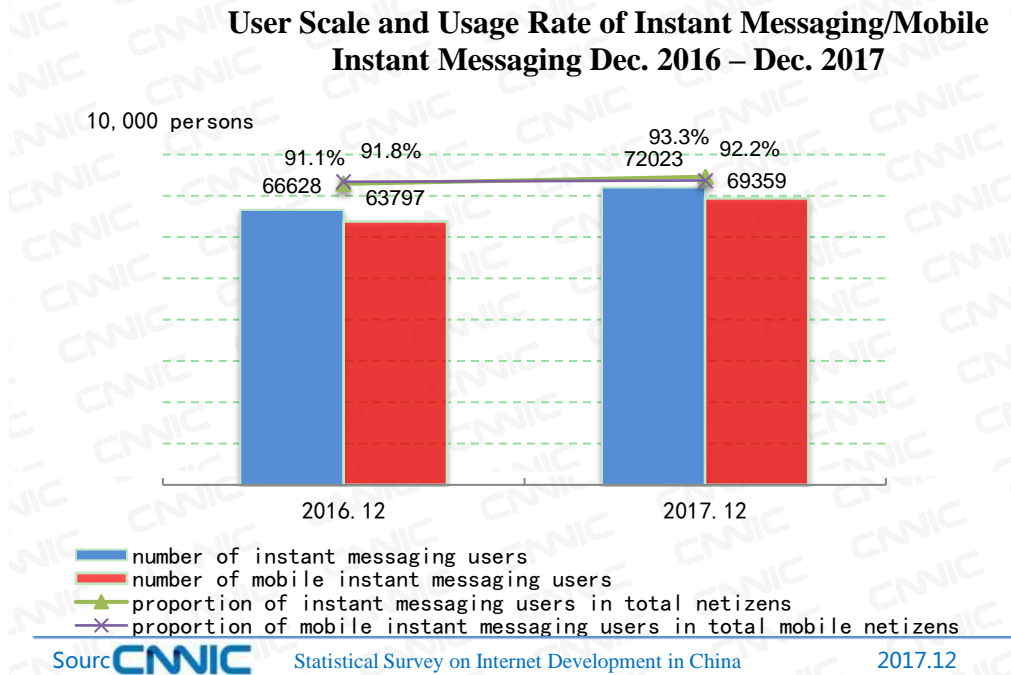


Figure 31 User Scale and Usage Rate of Instant Messaging/Mobile Instant Messaging Dec. 2016 - Dec. 2017

The scale of instant messaging users increased steadily in 2017, and the sector was further standardized. In September 2017, the Cyberspace Administration of China issued the *Provisions on the Administration of Internet Group Messaging*, which regulates group network behaviors and information release and aims to make network space for groups more civilized and orderly. From the perspective of development, we need to follow the three main directions, namely, the differentiation of instant messaging products, the expansion of service connectivity capacity and the enhancement of application capabilities in office scenarios.

First, the differentiated positioning of instant messaging products was more apparent in 2017. Because of the increasing information, services and content on the platform, WeChat launched two functions of “Search” and “Top Stories” to explore more effective distribution methods to meet users’ needs. QQ attached much importance to the integration of reading, games, live streaming and other entertainment functions, aiming to become a leisure entertainment platform for young users. Instant messaging products represented by Momo were trying to become pan-entertainment social networking platforms, hoping to improve their revenue with live streaming.

Second, those instant messaging products represented by WeChat continued to expand their

connectivity of various services in daily life. Different from various payment services via mobile payment in 2016, the function of “Mini Programs”, launched by WeChat in early 2017, expanded the connectivity to online and offline services for users. These services include travels, offline catering, electronic invoices and others. According to relevant data released by WeChat, mini programs on its open platform, as of the third quarter, had covered more than 200 subcategories in over 20 industry categories.

Third, the application capabilities of instant messaging in office scenarios were increasingly improved. In March, Tencent launched “TIM”, a mobile-end instant messaging APP that focuses on collaborative office functions, in addition to its enterprise WeChat products. The APP quickly became popular with users thanks to Tencent’s advantages in distribution channel. In September, DingTalk, one of Alibaba’s Apps, launched a new version and took the instant messaging for enterprises as the core to expand the field of smart office hardware. It provided stronger support for enterprise business with instant messaging products for office. As of the fourth quarter, DingTalk and WeChat announced that they had more than 5 million and 1.5 million registered companies, respectively, and will keep growing in the future.

3.1.2 Search Engine

Up to December 2017, China had 640 million search engine users, an annual increase of 37.18 million or 6.2% over the end of 2016; it also had 624 million mobile search users, an annual increase of 48.87 million or 8.5%. The utilization ratios of search engine and mobile search were 82.8% and 82.9%, respectively. As search engine is a basic Internet application, the growth rate of its users continues to keep pace with the overall growth rate of Internet users.

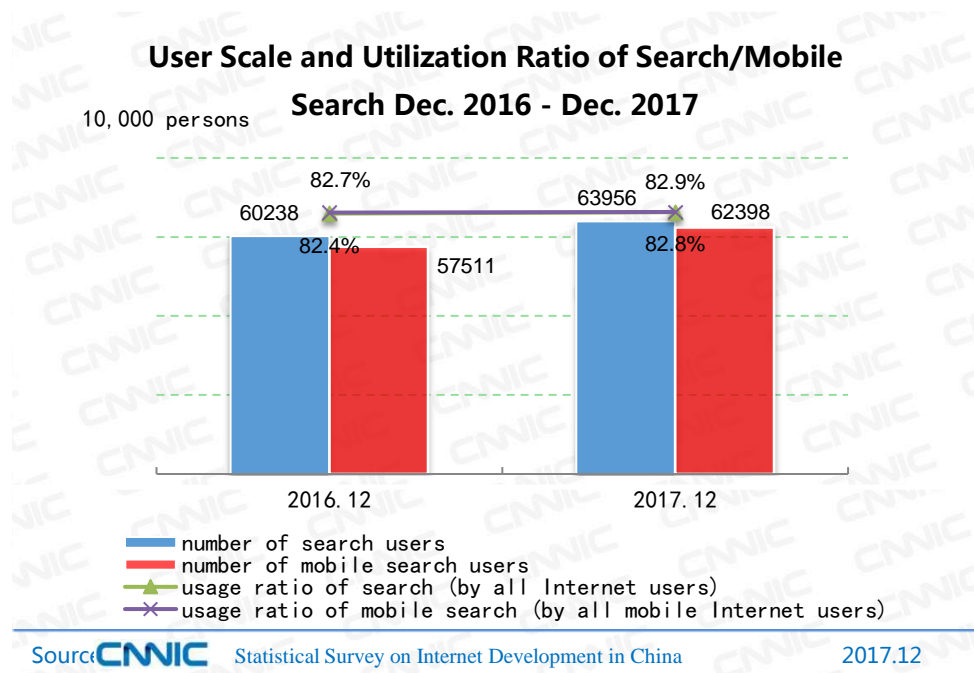


Figure 32 User Scale and Utilization Ratio of Search/Mobile Search Dec. 2016 - Dec. 2017

In 2017, an increasing number of users utilized search engine via their mobile devices. Although the number of mobile search users grew at a slow rate, the increment still exceeded the overall increment of search users and the mobile search users remained the main part of search users. From the perspective of revenue, the proportion of revenue of search engine companies from mobile search continued to increase in the total revenue. The Q3 financial report of Baidu showed that its revenue from mobile search accounted for 73% of its total revenue, up by 9 percentage points from the same period of last year. In the third quarter, the mobile search traffic of Sogou increased by 38% from a year earlier, the click-through rate of mobile-end ads also went up, and paid clicks for mobile search grew by 64.8% year-on-year and 27.3% quarter on quarter.

Artificial intelligence has continued to boost the search engine market and helped search engine applications remain fundamental Internet applications in the mobile Internet era when there is no more traffic dividend. It has also provided valuable user data for the innovative development of diversified search engine platforms. For one thing, artificial intelligence technologies have kept improving the recommendation algorithm, helped the search engine better understand search content and interest of users, and provided connection services with higher value, thereby promoting the increase of paid clicks and enhancing the monetization rate of advertising products. For another, products of artificial intelligence technologies have provided improved solutions for multi-hardware, multi-platform and multi-input searches. Speech input and image recognition have

provided users with a more convenient search experience. The question-answer technology based on the natural language processing has offered users a more natural search experience.

3.1.3 Online News

As of December 2017, China had 647 million of online news readers, accounting for 83.8% of all netizens, with an annual increase rate of 5.4%. Specifically, 620 million people, or 82.3% of mobile Internet users, read news on their phones, and the annual increase rate was 8.5%.

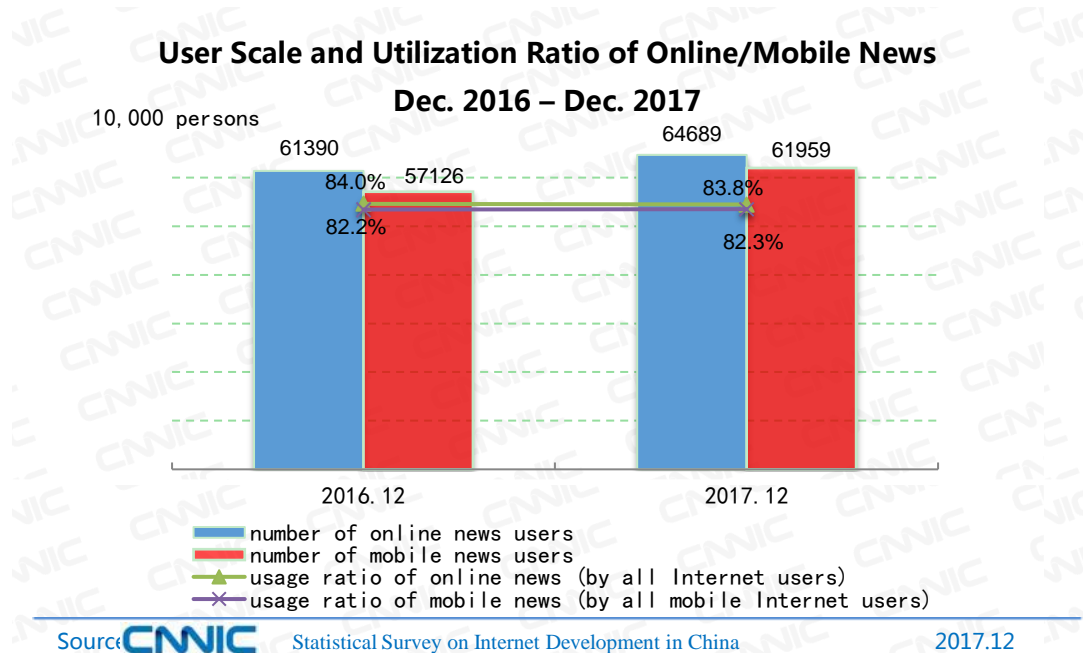


Figure 33 User Scale and Utilization Ratio of Online/Mobile News Dec. 2016 - Dec. 2017

In 2017, the development of news and information was characterized by three aspects.

First, laws and regulations concerning Internet-based news were further improved, standardizing the sectoral development. On May 2, 2017, the *Provisions for the Administration of Internet News Information Services* was issued by the Cyberspace Administration of China, and has been enacted since June 1, 2017. Relevant provisions have been introduced to further standardize the Internet news and information services. While protecting the legitimate rights and interests of organizations working on Internet news and information services, these provisions have also promoted the healthy and orderly development of the sector of Internet news and information services.

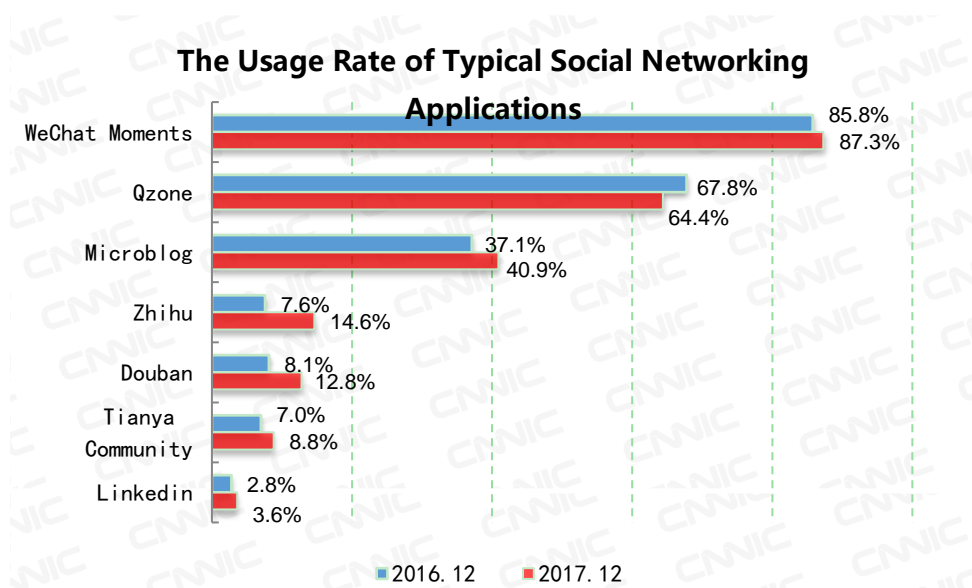
Second, the traditional news media has sped up the transformation based on the Internet, with

media convergence entering a new stage of development. The People's Daily, Xinhua News Agency, China Central Television (CCTV) and other traditional mainstream news media have given higher priority to the Internet-based media. By studying and using Internet products and forms, they have deepened the convergence in content, channels, platforms, and management. Consequently, they have created a number of new news and information platforms covering diverse forms, utilizing advanced means and having sound penetration, guidance, influence and credibility.

Third, the competition focus between Internet news and information platforms has shifted from traffic to content, forms, and technologies. Various news and information platforms have competed with each other to acquire quality content. Leading companies have continued to provide more support for original content. Based on user demands and related technologies, rich media content including short video, live streaming and virtual reality (VR) has gradually constituted the infrastructure for the sectoral development. With artificial intelligence as the core, technology has become the core competitiveness of information platforms, facilitating the further development of information aggregation platforms in information recommendation, marketing, deeper content creation, and interactive communication.

3.1.4 Social Networking Applications

As of December 2017, the utilization rate of WeChat Moments and Qzone reached 87.3% and 64.4% respectively; Microblog as a social media continued to lay out in short videos and mobile live streaming in 2017, with utilization ratio rising to 40.9%, up 3.8 percentage points from December 2016. Utilization rates of Zhihu, Douban, and Tianya Community were all improved, reaching 14.6%, 12.8% and 8.8%, respectively.



Source : CNISC Statistical Survey on Internet Development in China 2017.12

Figure 34 The Usage Rate of Typical Social Networking Applications

In 2017, the functions of various social networking platforms were increasingly improved, and media communication gained stronger influence.

Social networking is developing into an eco-platform “connecting all things”. Social networking applications have an increasing number of functions ranging from instant messaging to news feeds, live video, payment and transactions, games, and public services. The trend of platforms covering many areas is apparent, increasing users’ adhesiveness. Meanwhile, social networking has expedited the diversified development of the Internet business model. Marketing services and mobile advertising based on social networking have become the most active areas. Combined with functions of social circles and location services, online marketing has been more targeted and personalized to become the data entrance of e-commerce.

The communication of social media gained stronger influence. As one of the most popular media types in Internet-based media, social media has become an important force of online content dissemination, thanks to its large user base, rapid information dissemination, and strong interactive functions. For one thing, the traditional media actively embraces social networking by opening official microblogs and WeChat official accounts to publish authoritative information, expand the scope of communication, and strengthen public opinion. For another, the influence of We-Media is increasingly expanded. As of the third quarter of 2017, the monthly active users of Sina Weibo

amounted up to 376 million.¹⁴ Hot topics are updated every ten minutes to impact online public opinion on well-discussed issues. Internet celebrities and microblog users that have passed real-name authentication have stronger influence on online topics.

3.2 The Development of Business Transaction Related Applications

3.2.1 Online shopping

Up to December 2017, China had 533 million users of online shopping, accounting for 69.1% of the total netizen population and representing an increase of 14.3% from the end of 2016. The number of mobile shoppers grew rapidly to 506 million, a year-on-year increase of 14.7%. The usage rate of mobile shopping increased from 63.4% to 67.2%. At the same time, online retailing sector continued to maintain high-speed growth and its annual turnover reached RMB7175.1 billion, a year-on-year increase of 32.2%, up 6 percentage points from the end of 2016.

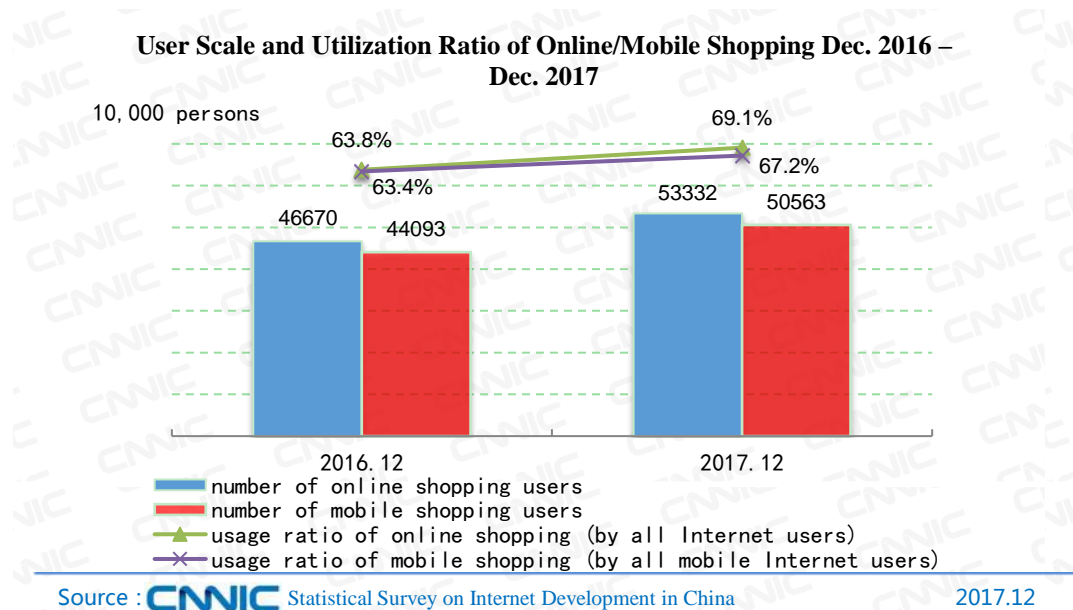


Figure 35 User Scale and Utilization Ratio of Online/Mobile Shopping Dec. 2016 - Dec. 2017

In 2017, in terms of the laws and regulations, model transformation, online and offline integration, the online shopping sector was featured by the following aspects.

First of all, laws and regulations in the field of e-commerce kept improving. For one thing, the legal system for e-commerce has been developing at a higher rate. The draft of the *E-Commerce*

¹⁴Source: Sina Weibo

Law was submitted to the Standing Committee of the National People's Congress for the second review in October, after opinions from all parties had been solicited. For another, policies and standards were introduced in succession. The *Implementation Plan for Fostering the E-Commerce Development (2016-2018)* and the *Guidelines for the Standardization of Online Retailing* were issued successively. At the same time, judicial innovations in the Internet field have continued to indirectly promote the development of e-commerce. In July, Hangzhou set up an Internet court to focus on resolving disputes related to online shopping and contracts within its jurisdiction, reducing the costs of litigation in online transactions. By the end of 2017, 4,859 cases had been filed, 3,064 of which were settled.

Then, the sector has continued to transform itself into a high-quality, high-efficiency one and achieved positive results, as shown mainly in the following three areas. First, the quality of online consumer goods has kept improving. NetEase Yanxuan, Youpin under Xiaomi Corporation, and other premium e-commerce platforms flourished, directly connecting manufacturers and consumers and promoting the supply-side reform in the circulation field. Second, online service-oriented consumption has maintained high-speed growth. In 2017, the transaction amount of online non-physical retail reached RMB1694.5 billion, accounting for 23.6% of the total. Third, green e-commerce and second-hand e-commerce have entered the period of rapid development. The use of new energy vehicles, green packaging, electronic freight notes and electronic invoices has been further promoted. Online consumer platforms such as second-hand automobiles and goods have increased the utilization efficiency of commodity by integrating idle social resources.

Finally, with the online-and-offline integration deepened, online shopping penetrated offline physical stores apparently. In 2017, Alibaba conducted strategic partnership with Shanghai Bailian, Auchan and other retailing enterprises; JD.com established several offline experience stores and specialty stores called JD Home, reflecting that e-commerce companies are moving towards offline business at a faster pace. The integration of resources has led to the digital upgrading of the supply chain in the circulation field, resulting in synergies of suppliers, sales channels, warehousing, and stores. The emergence of new models, such as mixed operations of Fresh Hema and unmanned retail stores, reflects that the digital and intelligent development of the circulation sector is taking shape.

3.2.2 Online Meal Ordering

Up to December 2017, 343 million Internet users had ordered meals online, an annual increment of 135 million or 64.6% from the end of 2016. Online meal ordering continued to grow at a high speed. Specifically, 322 million of them did it via mobile phones, an increase of 66.2%, and their proportion in the total increased to 42.8%, up by 14.9 percentage points.

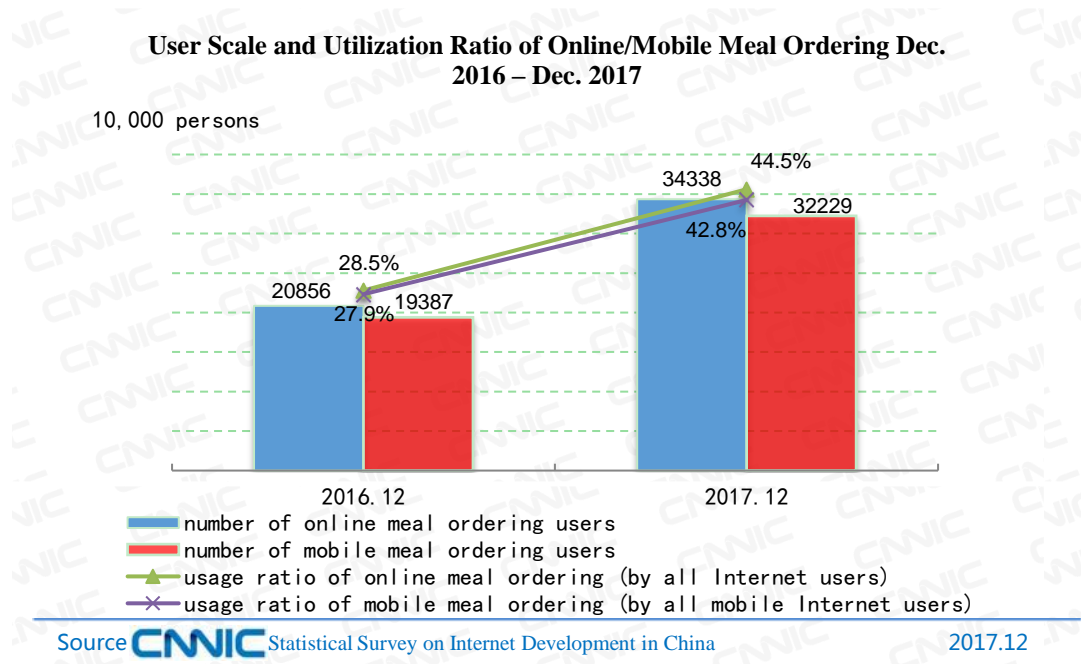


Figure 36 User Scale and Utilization Ratio of Online/Mobile Meal Ordering Dec. 2016 – Dec. 2017

First of all, the development environment for the sector has been further optimized. First, the legal regulations in the field of food safety have kept improving. The 2017 *Key Work Arrangements for Food Safety* released by the General Office of the State Council put forward the criminalization of food fraud. The 14 departments including the State Council’s Food Safety Office jointly published the *Opinions on Improving the Quality and Safety of Catering*, requiring that online meal providers must have physical stores and licenses. China Food and Drug Administration issued the *Measures for the Supervision and Administration of Food Safety in Online Catering Services*. Second, the market structure has been further integrated. After Eleme bought Baidu Takeout, the market has entered a new stage of competition between Meituan Takeout and Eleme. Platform-based resources have been further integrated, which is conducive to the refined operation of enterprises.

Then, the scale of users has maintained high-speed growth, and frequent market demands have been made. The scale of users increased 64.6% on a year-on-year basis in 2017. Meanwhile, after several years of market subsidy, online meal ordering has become another normal way for Internet users to have meals. Meal ordering for work overtime, weekend dinners, afternoon teas, and late-night snacks has appeared, and a diversified trend has been developed in the takeout consumption. The unit price of online takeout has increased, and nowadays consumers are much more particular about the brand, hygiene, safety and delivery time of the food, instead of merely wanting to have a full stomach.

Finally, online meal ordering platforms and catering brands have begun to give top priority to building their takeout brands by improving takeout products and service quality. Online meal ordering platforms have enhanced the popularity of takeout brands by cooperating with quality catering brands, standardizing food ingredients and packaging, designing and creating takeout IP, and establishing a special fund for food safety. Also, smart speech input assistant, smart scheduling, intelligent takeout vending machine and other applications have been put into use, further improving the efficiency of delivery.

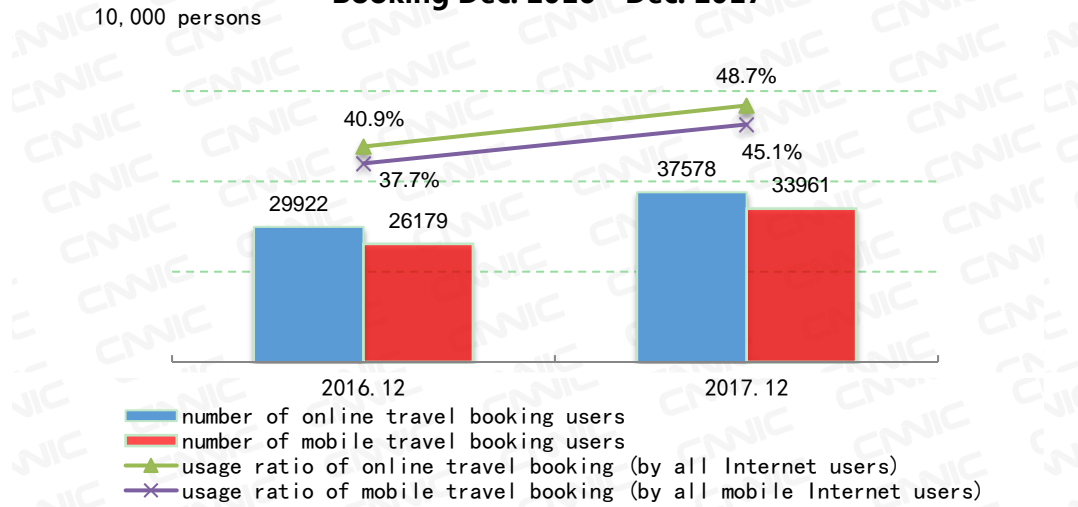
3.2.3 Travel Booking

As of December 2017, the user scale and utilization ratio of online travel booking¹⁵ in China were respectively 376 million and 48.7%, up by 76.57 million and 7.8 percentage points respectively over the end of 2016; the increase rate of user scale reached 25.6%. The Internet users who had booked train tickets, air tickets, hotel rooms and holiday travels online respectively accounted for 39.3%, 23.0%, 25.1% and 11.5% of the total.

Mobile phone has become the main channel for online travel booking. Specifically, the number of netizens having conducted the travel booking via a mobile phone reached 340 million, an increase of 77.82 million or 29.7% over the end of 2016. The utilization ratio of mobile travel booking among Chinese netizens increased from 37.7% to 45.1%.

¹⁵Online travel booking covers the booking of air tickets, hotels, train tickets and travel & vacation products via the Internet.

User Scale and Utilization Ratio of Online/Mobile Travel
Booking Dec. 2016 - Dec. 2017



Source : **CNISC** Statistical Survey on Internet Development in China 2017.12

Figure 37 User Scale and Utilization Ratio of Online/Mobile Travel Booking Dec. 2016 - Dec. 2017

In the field of online ticket booking, ticketing remains the main revenue source for OTA¹⁶ platforms. First, the large-scale growth of air tickets in China has brought stable revenue to OTA platforms. Second, the volume of international air ticket booking increases significantly and the original air ticket business has been strengthened through diversified models for service charging. Third, airport pickup, insurance and other value-added services have expanded the business of air tickets and kept improving profitability.

In the field of hotel reservations, OTA platforms have tapped offline resources, and the development of hotel direct sales and shared bed and breakfast (shared b&b) was prominent. OTA platforms have significantly increased hotel bookings by establishing offline stores and conducting marketing activities in second-, third-, and fourth-tier cities. Hotels have enhanced direct sales through multi-brand deployment and membership services. The gradual increase in the number of shared b&b in urban and rural areas has attracted investment and attention from the capital market.

In the area of travel & vacation products booking, tourism companies have strengthened strategic cooperation to enrich tourism themes and drive sales in products and services. With the further promotion of “Tourism plus”, products and services themed all-for-one tourism¹⁷ have been

¹⁶OTA: Online Travel Agent.

¹⁷All-for-one tourism, a concept defined at the 2016 National Tourism Work Conference, is a new philosophy and mode for coordinated development in a certain region. According to all-for-one tourism, the tourism is an

continuously innovated and upgraded. Through an integration of regional resources, enterprises work cooperatively to develop industrial tourism, red tourism, agricultural tourism, sports tourism, study tour, and other tourism products, which have stimulated the potential market demand of the general public and accelerated the process of the tourism sector entering the era of experience economy.

3.3 The Development of Internet Finance Applications

3.3.1 Internet financing

Up to December 2017, 129 million netizens had purchased Internet financing products, an increase of 30.2% over the end of 2016, and the utilization ratio was 16.7%, up 3.2 percentage points.

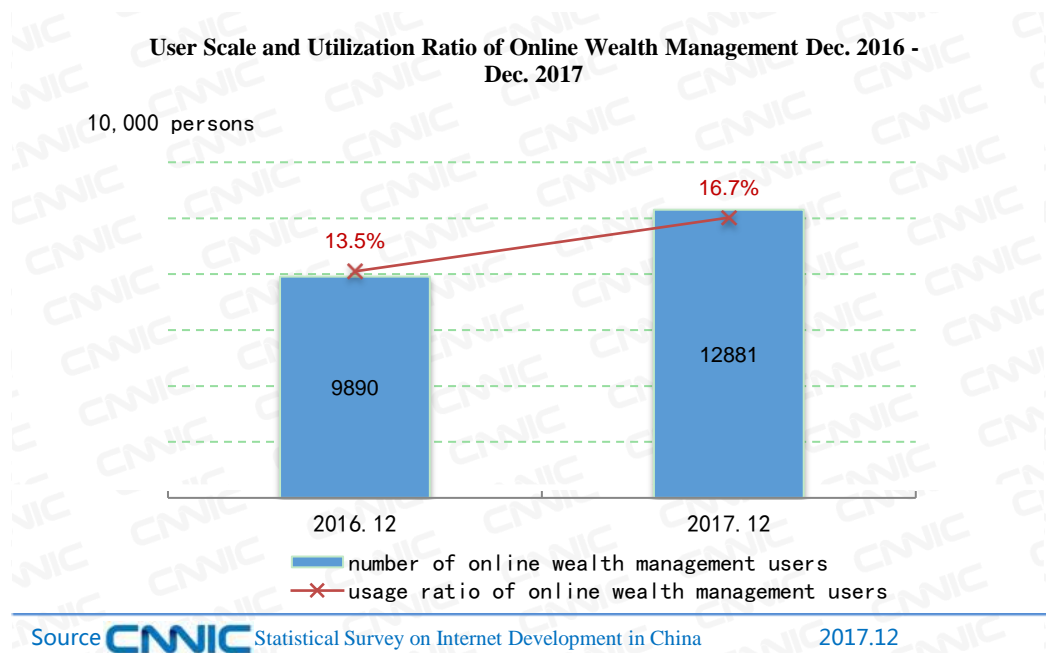


Figure 38 User Scale and Utilization Ratio of Online Wealth Management Dec. 2016 - Dec. 2017

In 2017, the Internet financing market was becoming diversified. Driven by the regulation of the financial sector and the strategic realignment of Ant Financial, Yu'E Bao lowered the ceiling on the single-day investment of an individual investor to RMB20,000 and put the cap of RMB100,000

advantageous industry and efforts should be made to optimize economic and social resources in the region in an all-round and systematic way, including in particular tourism resources, related industries, the ecological environment, public services, institutions & mechanisms, policies & regulations, and civilized quality, to achieve resource integration, integrated industrial development, common construction and progress sharing in the region, and boost coordinated economic and social development via tourism development.

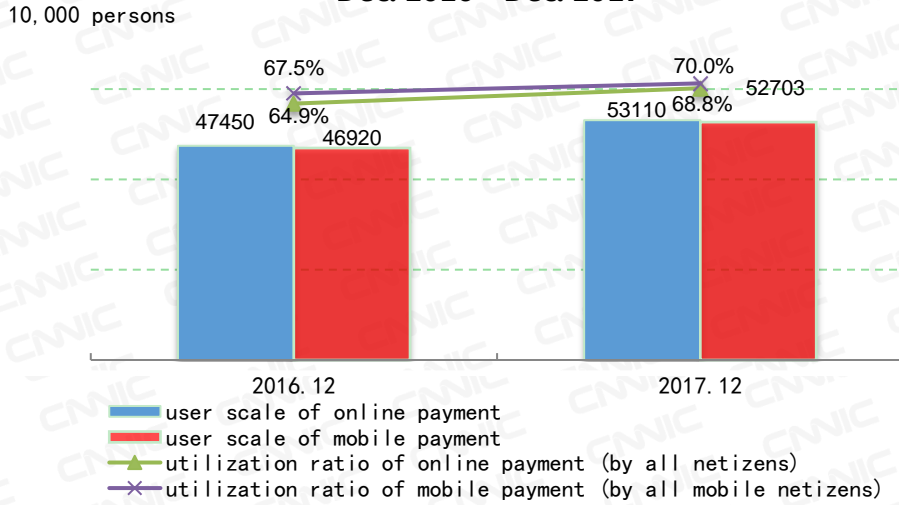
on his/her total investment. The reduction accelerated the diversion of capital of online wealth management users to traditional financial institutions such as banks, funds and other Internet financial platforms. Various short-term and regular products of online wealth management launched by traditional financial institutions including banks and fund companies have maintained rapid growth. Tencent and Industrial and Commercial Bank of China (ICBC) launched Micro-Gold, a wealth management product, and JD and Industrial Bank rolled out Industrial Bank-JD Small Financial Gold Card. All these efforts have further diversified products in the field of online wealth management.

P2P credit market continued to lower the interest rate on loans, ensuring that loan operations are in fuller compliance with relevant laws. In 2017, policies of the P2P sector were introduced intensively, including the *Guidelines for the Depository of P2P Lending Funds* and the *Guidelines for the Disclosure of information on Business Activities of Information Intermediaries in P2P Lending*. Together with the policies introduced in 2016, these policies established the institutional framework and long-term regulatory mechanism for the P2P sector. Driven by improved policies and strong regulation, the interest rate of wealth management products on P2P platforms has been declining. According to wdzj.com, a P2P credit platform, the overall rate of return of the P2P credit sector in 2017 was 9.45%, a decrease of 100 basis points from the year of 2016. In the meantime, illegal business concerning cash loan, financial assets exchange and online microfinance has been effectively rectified, reducing systemic risks.

3.3.2 Online Payment

By December 2017, China had 531 million online payment users, an annual increment of 56.61 million or 11.9%, with a utilization ratio of 68.8%. Specifically, mobile payment users grew rapidly, reaching 527 million, an increase of 57.83 million or 12.3% over the end of 2016, with a utilization ratio of 70.0%.

User Scale and Utilization Ratio of Online/Mobile Payment Dec. 2016 - Dec. 2017

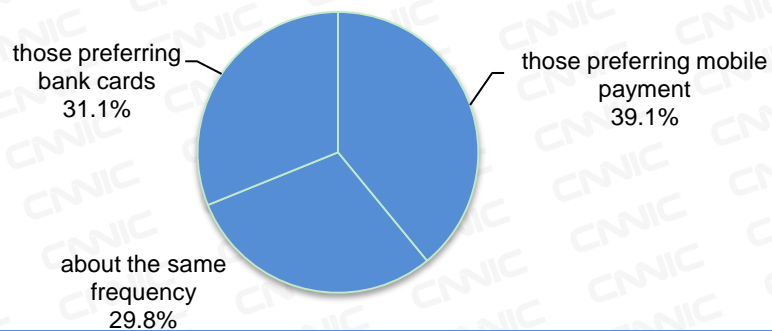


Source : CNISC Statistical Survey on Internet Development in China 2017.12

Figure 39 User Scale and Utilization Ratio of Online/Mobile Payment Dec. 2016 - Dec. 2017

In 2017, the user scale of China's mobile payment kept expanding, and the habit of users was further consolidated. According to the survey, the proportion of Internet users paying their offline bills via mobile phones increased from 50.3% at the end of 2016 to 65.5%. Specifically, the utilization ratio of urban users was 72.3% and that of rural users was 47.1%. Of the users using mobile phone to pay for their offline consumption, 39.1% used mobile payment more frequently (41.3% in urban areas and 33.0% in rural areas), 31.1% preferred traditional payment such as cash and bank cards, and 29.8% adopted the above two payment methods at about the same frequency.

Offline Payment Modes of Mobile Users



Source : CNISC Statistical Survey on Internet Development in China 2017.12

Figure 40 Offline Payment Modes of Mobile Users

In 2017 online payment Apps had three features. First, mobile payment was closely bound up

with the daily life of an individual. In addition to taxi-hailing, take-out, shopping and other scenarios of personal consumption, mobile payment further extended to other public services, ranging from utility fees including water and electricity rates to public transport fares, expressway toll, and medical expenses. Second, online payment accelerated its penetration among rural Internet users and the elderly netizens. According to the survey, the proportion of rural Internet users using online payment increased from 31.7% at the end of 2016 to 47.1%; the utilization rate of Internet users aged 50 or older increased from 14.8% to 32.1%. Third, technologies kept improving the security and convenience of mobile payment. As biometric technologies are becoming mature, fingerprint recognition has been used on a large scale and facial recognition has also been commercially available at its initial stage.

3.4 The Development of Online Entertainment Applications

3.4.1 Online Music

Up to December 2017, the user scale of online music was 548 million, accounting for 71.0% of the total netizen and representing an annual increment of 44.96 million. Users of mobile music reached 512 million, constituting 68.0% of total mobile netizens and recording an annual increase of 43.81 million.

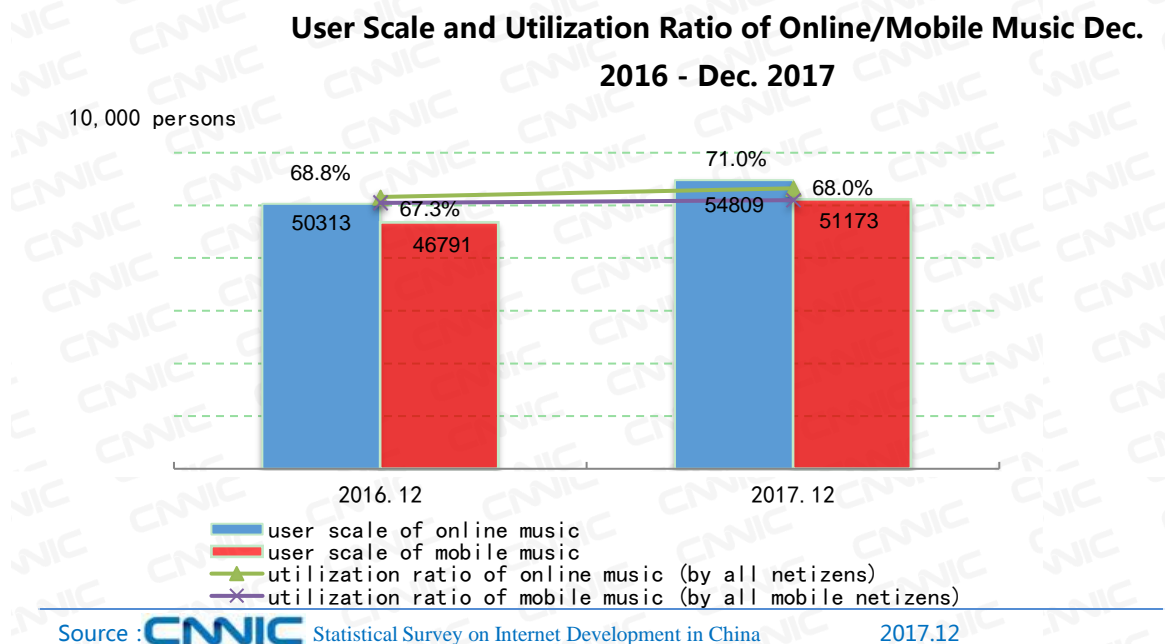


Figure 41 User Scale and Utilization Ratio of Online/Mobile Music Dec. 2016 - Dec. 2017

In 2017 the landscape of China's online music was basically established, the integration trend of copyright competition and pan-entertainment ecology continued, and online music was more closely related to offline music.

Seen from the development of the online music, copyright is still the long-term competitive focus of music distributors. In August, Tencent Music Group holding a dominant position in the copyright of online music works repeatedly filed lawsuits against the infringement of NetEase Cloud Music and suspended the cooperation with NetEase Cloud Music in the assignment and authorization of copyright of some content. Accordingly, some works were removed from NetEase Cloud Music. Since then, NetEase Cloud Music can only increase copyright resources through cooperation with music services companies such as Kobalt Music and has strengthened the support for authors of original user generated content (UGC) music on the platform.

From the perspective of the integration of online music with other new formats, the integration of music with social networking and short video is expected to become a new growth point in the future. With the establishment of copyright barriers to the traditional online music, it has been difficult for entrepreneurs to compete with large online music corporations. Therefore, content and new forms of UGC music have become the focus of innovation. In China, Tik Tok, a community App for short online music video, launched at the end of 2016, saw a rapid growth in the number of users in 2017. In November, it purchased Musical.ly, a similar App of North America, for US\$1 billion.

3.4.2 Online Literature

Up to December 2017, the user scale of online literature was 378 million, accounting for 48.9% of the total netizen and representing an annual increment of 44.55 million. Users of cell phone literature reached 344 million, constituting 45.6% of the total mobile netizens and recording an annual increase of 39.75 million.

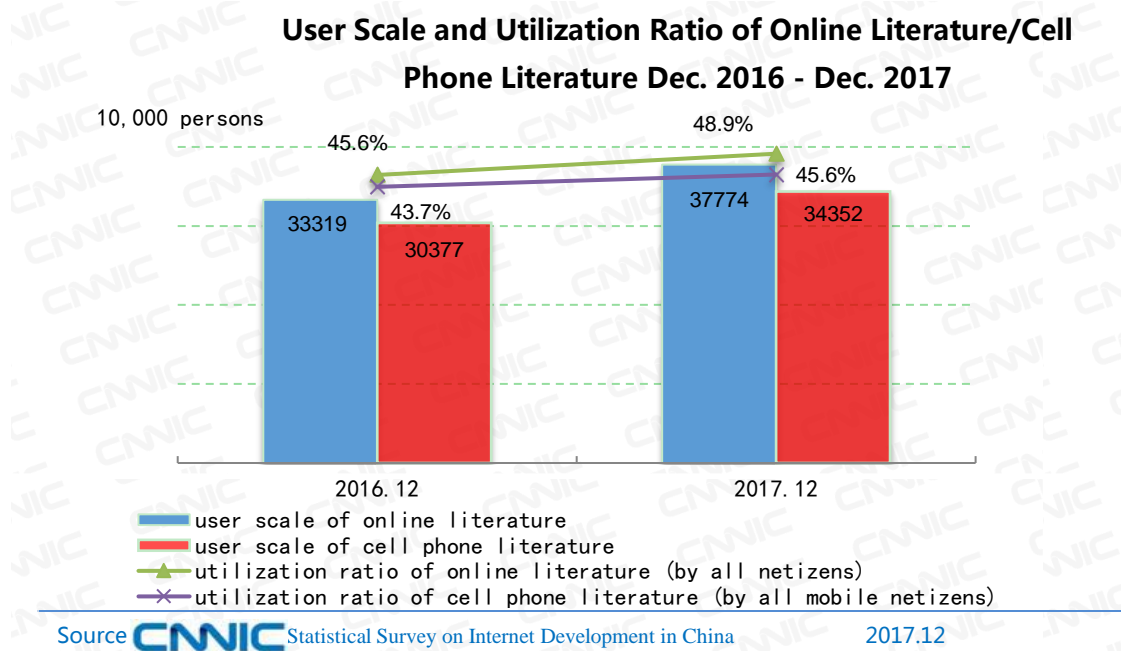


Figure 42 User Scale and Utilization Ratio of Online Literature/Cell Phone Literature Dec. 2016 - Dec. 2017

Thanks to the continuous improvement of China’s copyright system for digital content, the online literature sector achieved further development in 2017. In the second half of 2017, Yuewen Group and iReader Technology, the two domestic online literature platforms, went public. It marked the recognition of the online literature by market, which had developed for many years. Meanwhile, the online literature sector also entered a period of profitability in all directions. Public information shows that online literature enterprises, including Yuewen Group, iReader Technology, and Zongheng, achieved profits in 2017. From the development perspective, the support of original content and the development of storytelling business constituted two important features of the online literature in 2017.

Within the sector, online literature platforms continue to provide stronger support for creators. In June, Yuewen Group put forward the ecological strategy and set up the industrial fund for content, to support authors in the four aspects of quality content publishing, commercial support for content providers, content brand communication, and support for writings of excellent young writers. Ali Literature, together with its film and television division, announced that they will provide content producers with one-stop services including platforms, IP, publicity and other resources.

Outside the sector, storytelling, as a derivative of online literature, developed rapidly in 2017. According to the *2016 White Paper on Digital Reading in China* released by the State

Administration of Press, Publication, Radio, Film and Television in April 2017, nearly 70% of China’s digital readers had used the storytelling function in 2016. Users listening to books exceeded 100 million and 65.3% of them were willing to pay for the function. Under such circumstances, Qingting FM, Lanrentingshu and other vertical applications obtained the financing of more than 100 million in 2017; WeRead also released a new version in July, announcing its audio content went online.

3.4.3 Online Games

Up to December 2017, China had 442 million online game players, accounting for 57.2% of the total. The annual increase of online game players was 24.57 million. The number of mobile game users reached 407 million, a sharp annual increase of 55.43 million, accounting for 54.1% of mobile netizens.

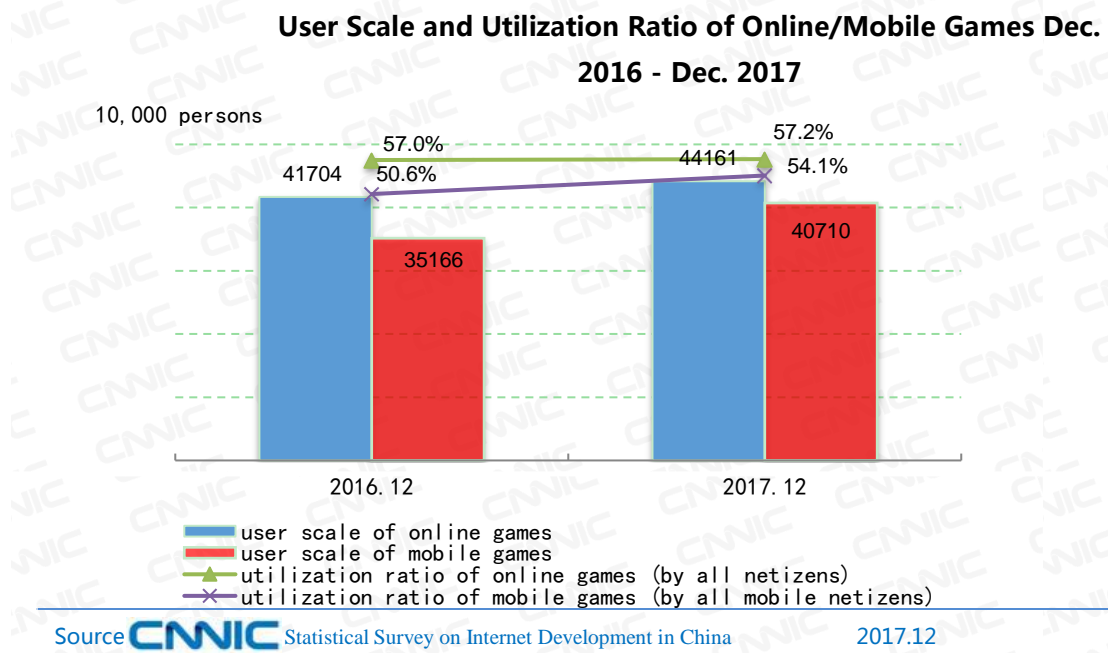


Figure 43 User Scale and Utilization Ratio of Online/Mobile Games Dec. 2016 - Dec. 2017

In 2017, China’s online game sector continued to grow in terms of revenue. The changes of users’ preferences, the success of premium games in overseas markets, and the enhancement of industrial standards constituted the three main development features .

From the point of view of changes in product types, thanks to powerful publicity capabilities

of live game platforms, emerging sandbox shooting games replaced MOBA¹⁸ games as the most popular game type in 2017. On the PC side, Player Unknown's Battle Grounds, a typical sandbox shooting game, was sold in 27 million copies, becoming the best-selling game in history. On the mobile side, four of top five games downloaded by the Appstore in November belonged to such games¹⁹. It is also noteworthy that WeChat launched the "Mini Programs" feature at the end of December, which is likely to be a new entry for H5 games²⁰ on the mobile phone. Thus, it provided new opportunities for the future growth of such games.

From the perspective of market coverage, Chinese game companies, represented by Tencent, NetEase, Linekong, and Xindong, were enthusiastic about expanding their business in 2017. Although China had overtaken the United States and Japan to become the world's largest games market, the fierce competition in the domestic market had also been intensified. In this context, local game makers were turning their eye to overseas markets for future growth and trying to output their product development experience and operation models to other countries. Some premium games, independently developed by domestic companies, have been tried in the markets of Europe, the US, and Southeast Asia, after they became successful in the local market. They won several international game awards at the end of 2017.

In terms of regulation, competent authorities and game makers worked together to standardize market operations in 2017, which, to a certain extent, has reduced the harm of undesirable online game content to underage users. In February, Tencent, guided by the Ministry of Culture, launched a monitoring system for parents of minors and a health system for game-addiction prevention. These efforts helped parents to monitor game accounts of their children and limited the duration of games for young people. In October, the State Administration of Press, Publication, Radio, Film and Television stated that the bloody violence in Player Unknown's Battle Grounds was not conducive to the healthy growth of youngsters. Thus, it promoted the improvement of similar game content produced by domestic game companies to avoid potential adverse social impacts.

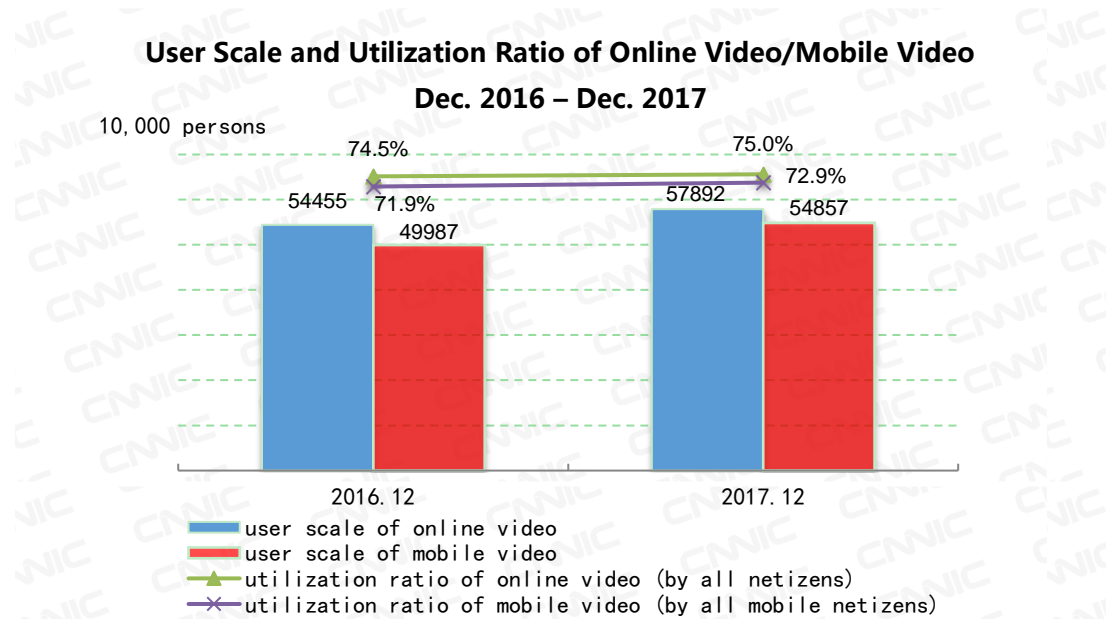
¹⁸MOBA games: Multiplayer Online Battle Arena

¹⁹Data comes from <https://www.appannie.com/cn/insights/market-data/november-2017-index-china/>

²⁰H5 games: mobile games based on Html 5.0 standards generally refer to mobile web-based games here.

3.4.4 Online Video

Up to December 2017, the user scale of online video was 579 million, accounting for 75.0% of the total netizen scale and representing an annual increment of 34.37 million. Users of mobile video reached 549 million, constituting 72.9% of all mobile netizens and recording an annual increase of 48.7 million.



Source **CNNIC** Statistical Survey on Internet Development in China 2017.12

Figure 44 User Scale and Utilization Ratio of Online Video/Mobile Video Dec. 2016 – Dec. 2017

In 2017, the online video sector maintained healthy development and users' affordability was greatly enhanced. According to the survey, the proportion of China's online video users paying the service in 2017 reached 42.9%, an annual increase of 7.4 percentage points, with a user satisfaction rate of 55.8%. Therefore, it is expected that online video users will grow at a high rate. Viewed from the development of the online video sector, this sector as a whole attracted more Internet users to watch videos via mobile devices, produced more quality contents and developed its ecological process in 2017.

Online videos were played on more mobile devices in 2017 than in 2016. Seen from the use of terminal devices, with the popularity of large-screen mobile phones, the gap is significantly narrowed between watching experience on mobile phones and that on other devices including computers, televisions, and tablet computers. Meanwhile, thanks to the obvious advantages of

mobile phones in terms of personalization and fragmentation, users are more inclined to use mobile phones to watch online video. Viewed from the development of video applications, applications for short mobile video, represented by Kuaishou, developed rapidly in 2017. They have attracted large producers, such as Ali, 360 and Top News, to enter this field.

The regularization and quality of online video content have kept improving. In terms of regularization of content, the State Administration of Press, Publication, Radio, Film and Television announced that it had handled 155 illegal Internet original programs in the first half of 2017, and would resolutely put an end to illegal programs played in the name of “unabridged edition” or “tidbits from abridged content”, in a bid to regulate the content development. Regarding the quality of content, iQIYI and Youku have reached content licensing agreements respectively with Netflix and Sony Pictures, and they improved their content competitiveness through the introduction of overseas genuine video resources.

The ecological degree of online video sector is further increased. Within the video sector, Sohu, Tencent, Perfect, Ali, and iQIYI released the plan for producing video content or made investment in agencies for creating video content in 2017. By deploying the whole industrial chain including the upstream and downstream of producing video content, they have attracted the audience with exclusive original content. Outside the video sector, online video companies have been actively engaged with related content industries such as literature, comics, film, and games. The overall synergies and commercial value of these eco-platforms are becoming increasingly prominent.

3.4.5 Live Streaming

Up to December 2017, China had 422 million live streaming users. The user scale of live game streaming was 224 million, accounting for 29.0% of the total netizen scale and representing an annual increment of 77.56 million. Users of host live show reached 220 million, constituting 28.5% of all netizens and recording an annual increase of 75.22 million.

User Scale and Utilization Ratio of Live Game Streaming and Host Live Show Live Show Dec. 2016 - Dec. 2017

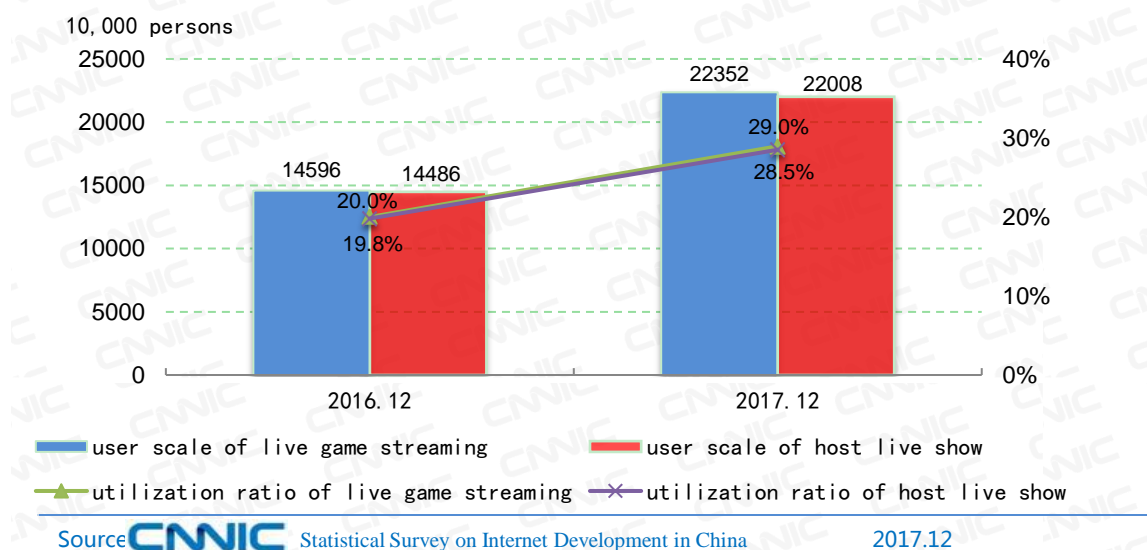


Figure 45 User Scale and Utilization Ratio of Live Game Streaming and Host Live Show Dec. 2016 - Dec. 2017

With regard to regulatory policies, the content supervision for live streaming was enhanced constantly in 2017, and the governance of illegal live streaming content achieved positive results. In April, the Cyberspace Administration of China, for the first time, shut down 18 types of live streaming applications that had disseminated illegal content, in accordance with the *Provisions on the Administration of Online Live-Streaming Services*. At the end of June, the Ministry of Culture deployed integrated law enforcement agencies for cultural markets in 29 provinces across the country to conduct investigations, and these agencies carried out centralized law enforcement inspections on 50 main online performance units. YY live streaming, Longzhu live streaming, Huomao living streaming, Miaopai and other 26 illegal online performance platforms were investigated, and 12 platforms were shut down. By the second half of 2017, the illegal content of all live streaming platforms had been significantly reduced, and content standards for the sector had taken shaped.

Regarding sectoral development, the live streaming sector continues to flourish. From the perspective of the revenue of live streaming services provided by listed enterprises, the revenue from live streaming services on all major online platforms still maintains high-speed growth. According to the Q3 financial report of all live streaming platforms in 2017, the quarterly revenue of Momo's live streaming services increased by 178.6% year-on-year and that of YY also grew by

60.4% year-on-year. From the perspective of the financing of unlisted companies, Huya, Panda, Huajia, and Douyu announced in 2017 that they have completed a new round of financing and the amount of financing exceeded RMB100 million. The sector has a promising future.

3.5 The Development of Public Service Applications

3.5.1 Shared Bike

Shared bike became the Internet application with the most significant growth of users in the second half of 2017. Up to December 2017, China had 221 million shared bike users, accounting for 28.6% of all netizens and representing a half-year increase of 115 million or 108.1%. From the perspective of business coverage, shared bike accomplished the coverage of major cities in China and penetrated 21 overseas countries.

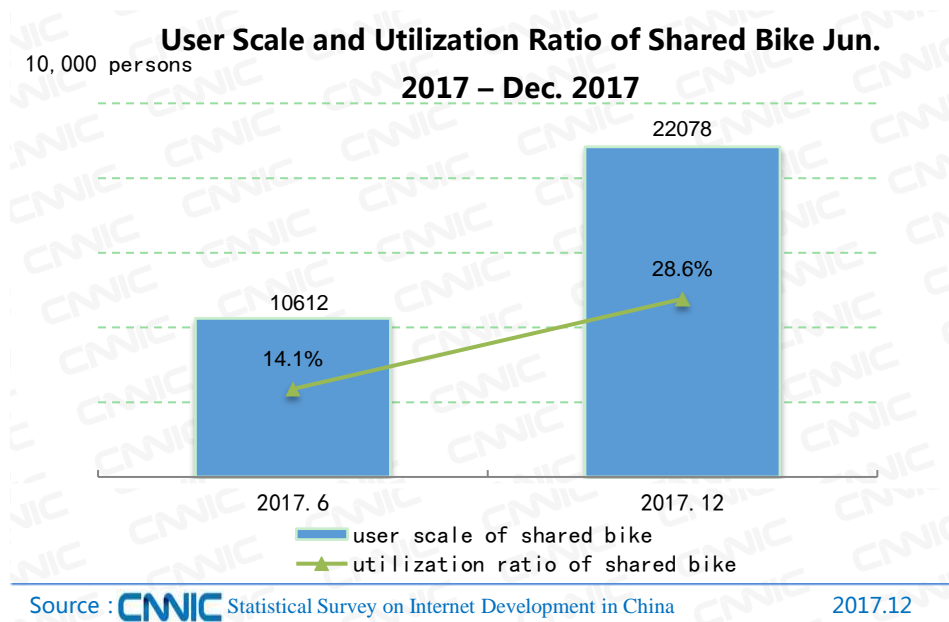


Figure 46 User Scale and Utilization Ratio of Shared Bike Jun. 2017 - Dec. 2017

The shared bike sector experienced significant changes from booming to elimination and consolidation in 2017, and featured three significant aspects: flourishing business, improved market concentration and sectoral standardization.

In terms of sectoral development, large shared bike enterprises, driven by the capital force, frequently completed high-volume financing in the first half of 2017; a large number of start-ups also entered the market, attracting more than 200 million users in less than two years. In the meantime, enterprises taking the lead in the sector have begun to fully deploy their business in

overseas markets after comprehensively establishing their presence in first- and second-tier cities.

Regarding market competition, the market concentration of shared bike was further enhanced in 2017. As the industry competition became more fierce, small- and medium-sized enterprises, due to weak capital strength and limited innovation capabilities for products, generally began to face growing pressure from their capital chain in the second half of 2017. The situation resulted that most poorly-operated manufacturers were eliminated from the market. Some brands including Xiaolan, Xiaoming and Kuqi were unable to refund the deposits of users. As a result, deposit management and protection of user rights in the emerging short-term rental sector has become the focus of attention.

As to the regulation, the standardization of the shared bike sector has been promoted. With the promulgation of the *Guiding Opinions on Encouraging and Regulating the Development of Online Leasing Bicycles*, the common governance model based on the joint efforts of government, enterprises, social organizations, and the public has become the main direction. Relevant local departments have strengthened communication and coordination with shared bike companies. They have worked to calculate the number of vehicles to be put into use and formulate the parking program. As a result, municipal administration problems caused by too many shared bikes put into operation in the first half have been alleviated to a certain degree in the second half of the year.

3.5.2 Online Car-hailing Services

As of December 2017, the user scale and utilization ratio of online taxi-hailing in China were respectively 287 million and 37.1%, up respectively by 61.88 million and 6.4 percentage points over the end of 2016. The increase rate of user scale reached 27.5%. China had 236 million online tailored taxi or fast ride users, an increase of 40.6%, and the utilization ratio increased from 23.0% to 30.6%, up 7.6 percentage points over the previous year.

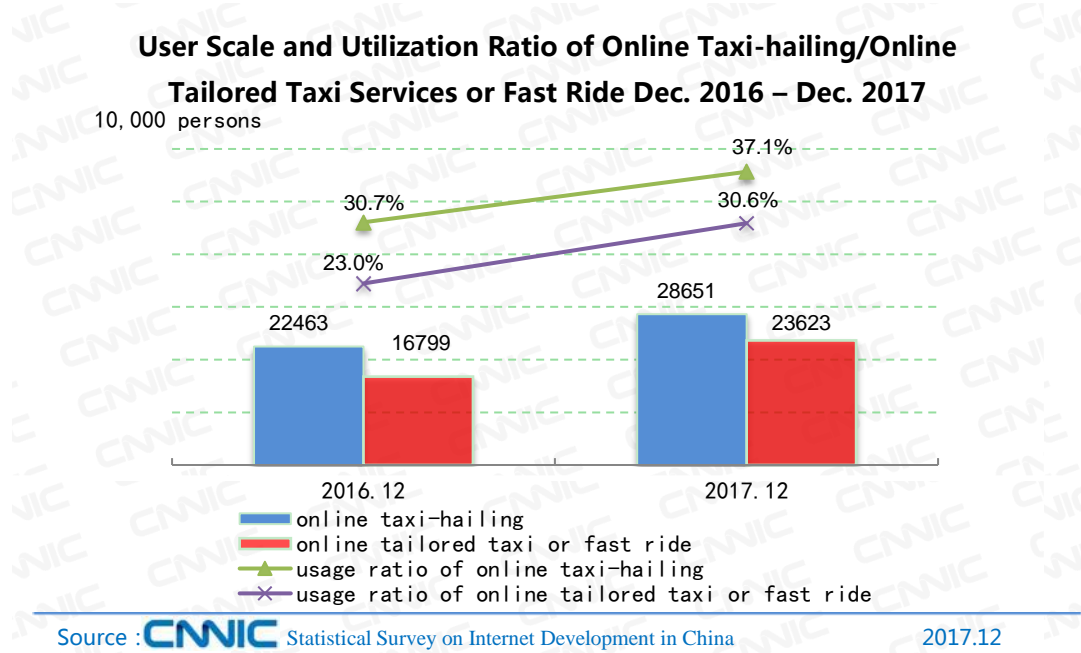


Figure 47 User Scale and Utilization Ratio of Online Taxi-hailing/Online Tailored Taxi Services or Fast Ride Dec. 2016 – Dec. 2017

Since the implementation of the *Interim Measures for the Administration of Online Taxi-Hailing Services*, the provisions for local online car-hailing services have been gradually introduced to readjust the entry threshold and the number of cars for online car-hailing services has been rationally realigned. During this period, the online car-hailing market evolved from disorderly radical development to orderly progressive development; the entry threshold for vehicles and personnel was raised and the legitimate rights and interests of passengers and car safety were secured. However, as the service threshold for online car-hailing is raised and the number of car is reduced, the problem of taking a taxi in rush hour has not been alleviated and the supply and demand imbalance still calls for the government-enterprise cooperation to promote the sector to seek a breakthrough in the standardized development and technological innovation.

To respond to new regulatory policies, online car-hailing businesses seek transformation and cross-sector integration to enhance profitability. Users of online car-hailing market have developed their habit and enterprises have conducted multi-dimensional secondary development of user resources through cross-sector resource integration and diversified business development. In terms of resource integration, online car-hailing platforms have been connected to the railway booking system to create a one-stop travel service model; online car-hailing companies have cooperated with travel and recruitment companies to share in customer resources for cross-sector marketing.

With respect to derivative business forms, Mobike and Didi have extended the concept of sharing and vigorously developed shared cars and shared bikes respectively; Meituan has expanded its business to the online car-hailing market and re-adopted its subsidy strategy; Yongche has diversified its business to engage in the taxi services.

Part 3 The Development of Government Applications

1. An Overview of E-government Services

1.1 The User Scale and Utilization of E-government Services

Up to December 2017, 485 million Internet users or 62.9% of all netizens received e-government services in China. Specifically, the utilization rate of e-government services based on Alipay or WeChat civic service platform was 44.0%, up 26.8 percentage points over the end of 2016, and this service platform became the most popular way of using e-government services. The utilization ratio of government WeChat official accounts was 23.1%, and those of websites, microblogs and Apps used by governments at all levels were 18.6%, 11.4% and 9.0% respectively.

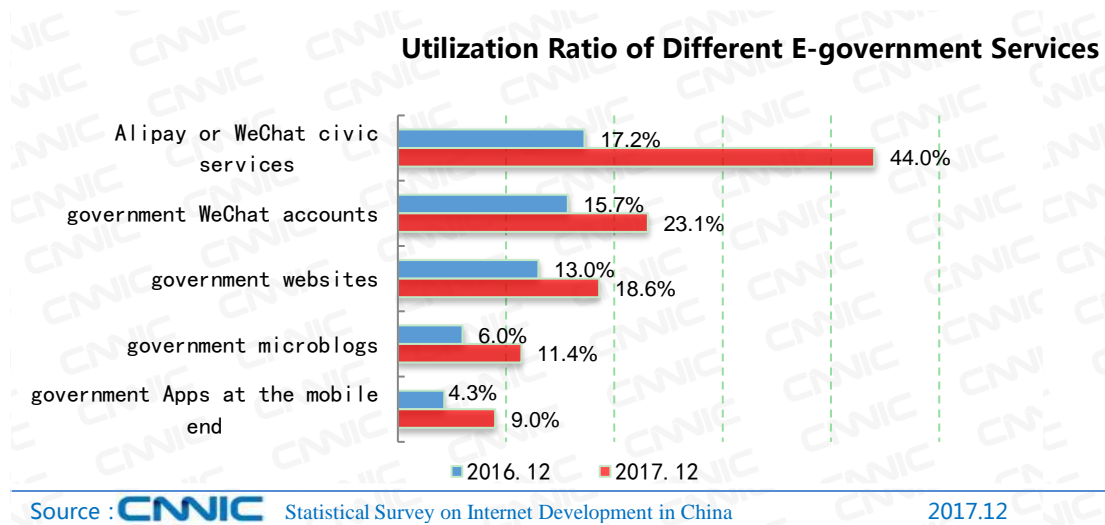


Figure 48 Utilization Ratio of Different E-government Services

In 2017, China's E-government services developed faster, and its utilization rate by online users was greatly improved.. E-government services became more intelligent and refined and began to be expanded to all counties. First of all, big data, artificial intelligence technologies and government services have continued to be converged, services have been more intelligent, accurate and scientific, and the experience of government service is reconstructed. Secondly, service content has been refined constantly. Alipay and WeChat have opened government service portals and

gradually improved service content covering all aspects of users' daily life, ranging from car owner services, government affairs services, medical treatment, travels, and recharging and payment. Thirdly, government affairs services across all counties have been more mobile, including microblogs, official accounts, and Zhengwutoutiao at the county level, covering weather, industry and commerce, justice, and public security.

1.2 The Number and Distribution of the Domain Name “.gov.cn” by Province

As of December 2017, China had 47,941 “.GOV. CN” domain names mainly distributed in 31 provinces, autonomous regions and municipalities directly under the central government. There are obvious regional differences in the development of government domain names. Top three provinces ranked by the number of “.GOV.CN” domain names are in east China, namely Shandong, Zhejiang, and Jiangsu.

Table 8 The Distribution of the Domain Name “.gov.cn” by Province in Mainland China in 2017

Province	Number	Proportion	Rank
Shandong	3890	8.1%	1
Zhejiang	3261	6.8%	2
Jiangsu	3167	6.6%	3
Sichuan	3029	6.3%	4
Guangdong	2822	5.9%	5
Henan	2542	5.3%	6
Anhui	2049	4.3%	7
Beijing	2023	4.2%	8
Hubei	1952	4.1%	9
Hebei	1761	3.7%	10
Fujian	1662	3.5%	11
Shaanxi	1577	3.3%	12
Guizhou	1539	3.2%	13
Jiangxi	1329	2.8%	14
Hunan	1317	2.7%	15
Inner Mongolia	1314	2.7%	16
Liaoning	1244	2.6%	17

Heilongjiang	1203	2.5%	18
Yunnan	1192	2.5%	19
Shanxi	1180	2.5%	20
Guangxi	1073	2.2%	21
Gansu	1006	2.1%	22
Chongqing	923	1.9%	23
Jilin	893	1.9%	24
Xinjiang	660	1.4%	25
Shanghai	619	1.3%	26
Qinghai	482	1.0%	27
Tianjin	386	0.8%	28
Ningxia	369	0.8%	29
Tibet	277	0.6%	30
Hainan	248	0.5%	31
Others	952	2.0%	-
Total	47941	100%	-

2. WeChat Civic Services

2.1 An Overview of WeChat Civic Services

The cumulative number of WeChat Civic Services users in China had reached 417 million by the end of December 2017, representing a growth of 91.3% over the end of 2016.

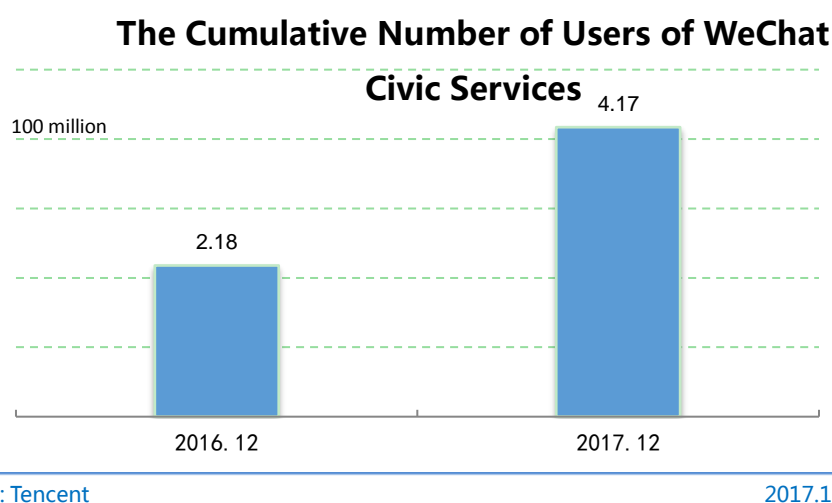
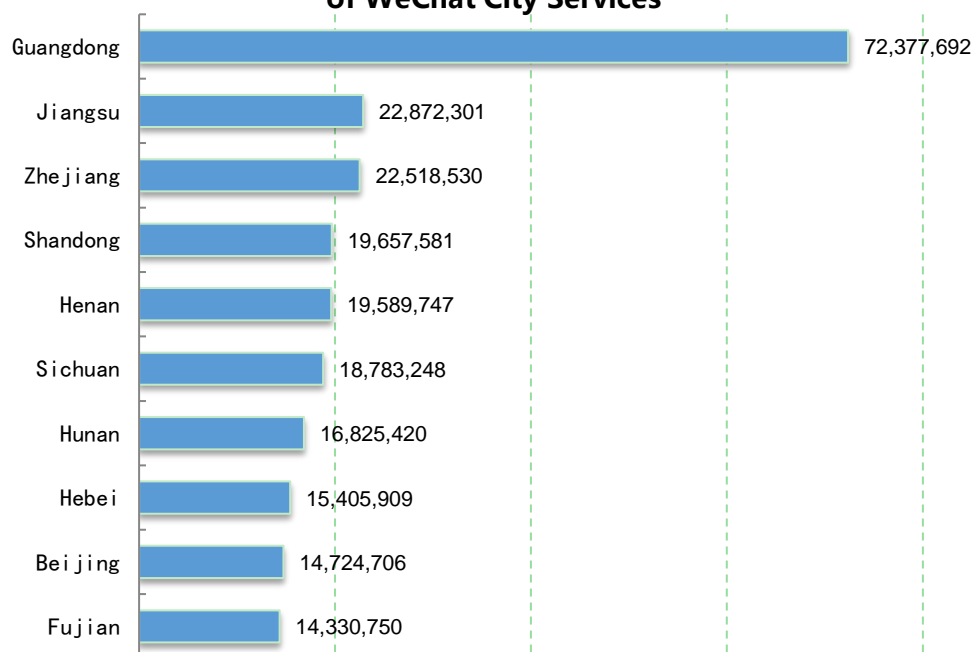


Figure 49 The Cumulative Number of Users of WeChat Civic Services

2.2 The Use of WeChat Civic Services by Province

As of November 2017, 31 provinces, autonomous regions and municipalities directly under the central government in Mainland China launched WeChat Civic Services. Specifically, Guangdong province had a total of 72.38 million users, ranking first in the country.

The Top Ten Provinces by the Cumulative Number of Users of WeChat City Services



Source: Tencent

2017.12

Figure 50 The Top Ten Provinces by the Cumulative Number of Users of WeChat City Services

2.3 Fields Covered by WeChat Civic Services and the Distribution of Users

As of December 2017, the number of types of services inquired and handled via WeChat Civic Services reached 9,930, covering 30 categories such as public security, human resources and social security, housing provident fund, transportation, taxation, justice, education, and civil affairs. Specifically, traffic offense services had the largest cumulative number of users reaching 52.36 million, followed by meteorological services whose cumulative number of users was 33.98 million. In the meantime, the types of services covering all cities and provinces are meteorological, public transportation, education and refueling services, which are available in 362 cities of 31 provinces.

Table 9 User Scale, Number of Provinces and Cities Covered by WeChat Civic Services 2016 –

2017

Type of services	2016			2017		
	Cumulative number of users	Number of cities	Number of provinces	Cumulative number of users	Number of cities	Number of provinces
Traffic offense	24,112,768	245	29	52,364,753	247	27
Meteorological services	22,168,845	318	31	33,975,905	362	31
Human resources and social security	10,154,379	126	21	31,306,288	160	26
Utility fees	8,757,960	93	22	30,096,991	221	27
Health care	11,507,127	364	32	28,666,509	186	30
Public transport	14,996,524	338	32	27,021,290	362	31
Train, bus or ship ticket	13,622,039	271	29	26,478,671	124	11
Education	4,983,805	278	26	20,084,516	362	31
Gasoline station services	10,093,602	363	32	18,390,987	362	31
Exit-entry administration	11,210,198	73	13	16,758,293	55	10

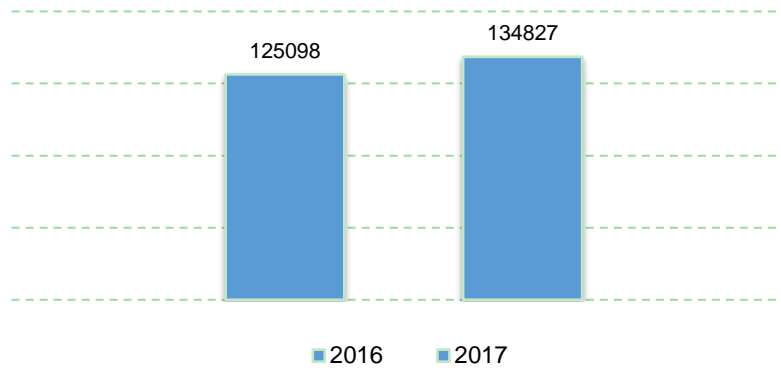
Source: Tencent

3. Government Microblogs

3.1 An Overview of Government Microblogs

Up to December 2017, the number of government microblogs verified by Sina had reached 134,827.

The Number of Government Microblogs



Source: Sina Weibo

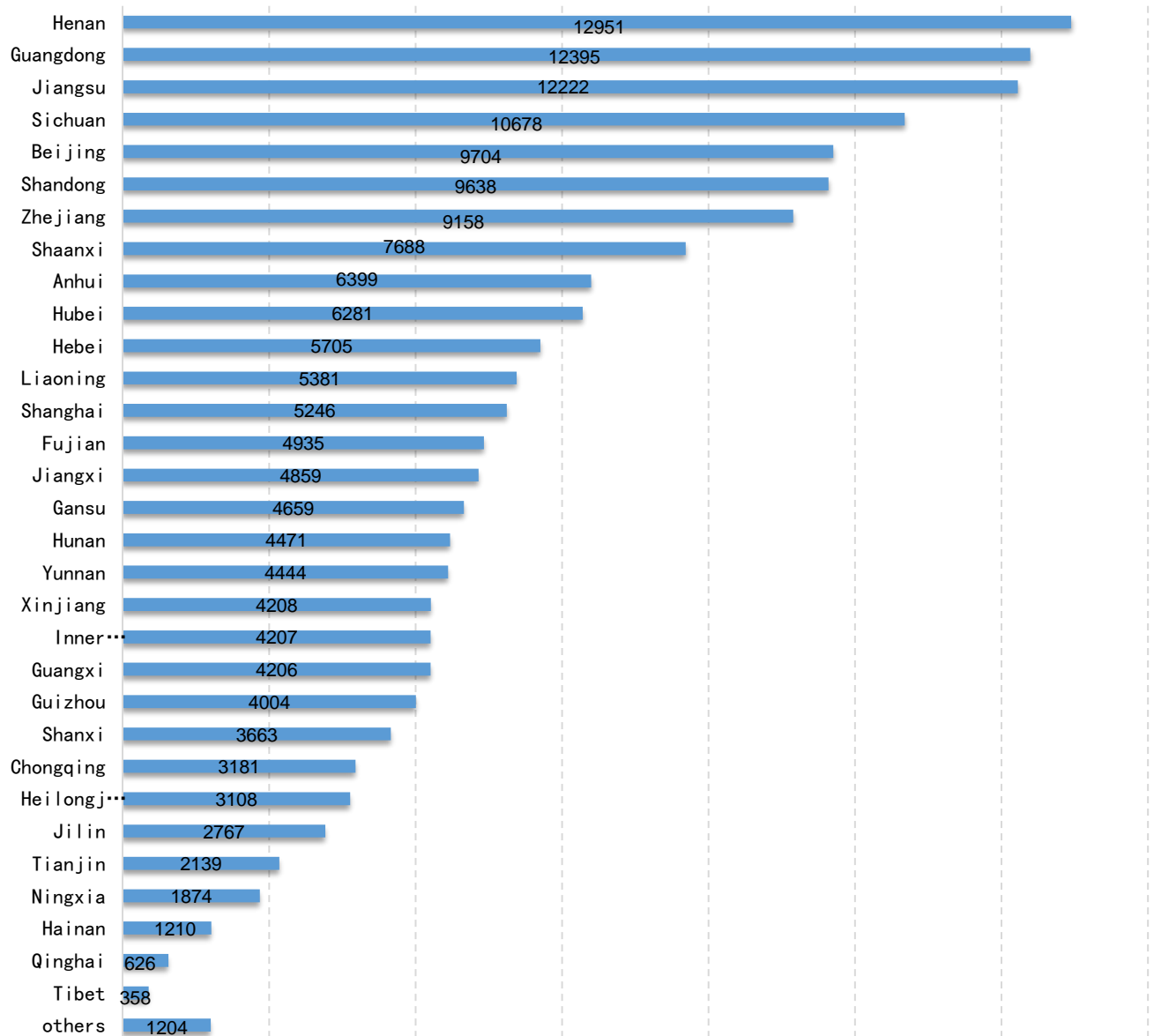
2017.12

Figure 51 The Number of Government Microblogs

3.2 The Distribution of Government Microblogs by Province

As of December 2017, 31 provinces, autonomous regions and municipalities directly under the Central Government in Mainland China launched government microblogs. Specifically, Henan province has opened 12,951 government microblogs, ranking first in the country, followed by Guangdong province with 12,395 government microblogs.

The Distribution of Government Microblogs by Province



Source: Sina Weibo

2017.12

Figure 52 The Distribution of Government Microblogs by Province

Up to December 2017, 255 administrative units at the provincial or ministerial levels had launched government microblogs, and administrative units at the county level or below had opened more than 150,000 government microblogs. Local government information was posted online, yielding significant results.

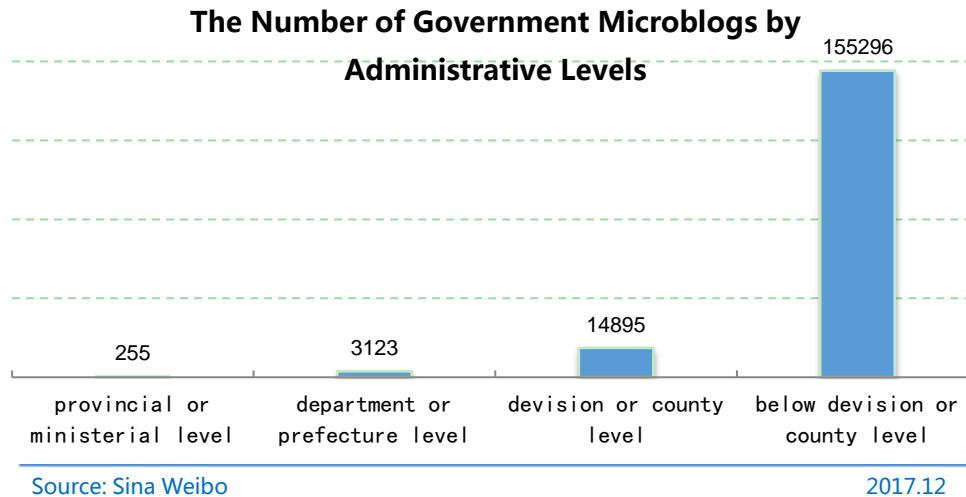


Figure 53 The Number of Government Microblogs by Administrative Levels

3.3 The Composition of Organizations Operating Government Microblogs

As of December 2017, government microblogs were launched, mainly by governments, social organizations, Party committees, and people’s procuratorates. Governments at all levels had the most government microblogs totaling 88,215, followed by social organizations having 33,792 microblogs. The microblogs opened by governments covered many types of service, such as public security, publicity, grassroots organizations, health and family planning, judicial administration, transport and tourism agencies. Among these microblogs, a total of 20,863 were launched by Public security organs.

Table 10 Government Microblogs Classified by Operating Organization

Primary category	Number	Proportion	Secondary category	Number
Government	88,215	65.4%	Public security	20,863
			Publicity	10,947
			Grassroots organizations	7,871
			Health and family planning commissions	4,941

			Judicial administration	3,555
			Transportation	2,901
			Travel agencies	2,868
Social organizations	33,792	25.1%	Youth League committee	30,635
Party committee	4,549	3.4%		
Procuratorate	3,675	2.7%		
Court	3,566	2.6%		
The National People's Congress	316	0.2%		
The Chinese People's Political Consultative Conference	195	0.1%		
Others	519	0.4%		
Total	134,827	100%		

Source: Sina Weibo

3.4 The Operation of Government Microblogs

Up to December 2017, the Central Committee of the Communist Young League ranked first by the number of microblog repost totaling 6.89 million. In terms of fields, microblogs for public security and those for publicity enjoyed the highest public attention. Among the top 20 government microblogs ranked by repost number, eight belonged to the fields of public security and publicity. In term of regions, among the top 20, Beijing had 11 government microblogs that worked hard to publicize its online government services in 2017.

Table 11 The Top 20 Government Microblogs Ranked by the Number of Reposts Jan. 2017 -

Dec. 2017

Ranking	Name of microblog	Province	Field	Number of fans	Number of reposts
1	The Central Committee of the Communist Youth League	Beijing	Youth League committee	5140829	6894461
2	Shanghai Railway Bureau	Shanghai	Transportation	1726448	5236559
3	Crime-fighting Office, Ministry of Public Security	Beijing	Public security	29390990	4422269
4	wenming.cn	Beijing	Office for Guiding Cultural and Ethical Progress	468980	3591581
5	Gulou Information	Jiangsu	Publicity	5201329	3312103
6	China Quick Reporting Network for Earthquake	Beijing	Earthquake report	6232404	2150846
7	Binhai Release	Tianjin	Publicity	3385694	1338890
8	China Fire Control	Beijing	Public security	2496950	1302062
9	Leyou Shanghai	Shanghai	Tourism	3815199	1160058
10	Chengdu High-tech	Sichuan	Publicity	669138	942629
11	Traffic Safety of the Ministry of Public Security Micro-release	Beijing	Public security	4737791	909079
12	Supreme People's Procuratorate	Beijing	People's Procuratorate	10498466	899002
13	Qinhuai Release	Jiangsu	Publicity	616189	840395
14	Supreme People's Court	Beijing	People's Court	16179514	813011
15	The People's Procuratorate of Henan	Henan	People's Procuratorate	771257	783441
16	Nanchang Railway	Jiangxi	Transportation	4027927	734208
17	Yongqiao Education	Anhui	Education	11111	657231

18	School Department, the Central Committee of the Communist Youth League	Beijing	Youth League committee	988601	655836
19	The Palace Museum	Beijing	Culture	3849774	639675
20	Safe Beijing	Beijing	Public security	12397276	636725

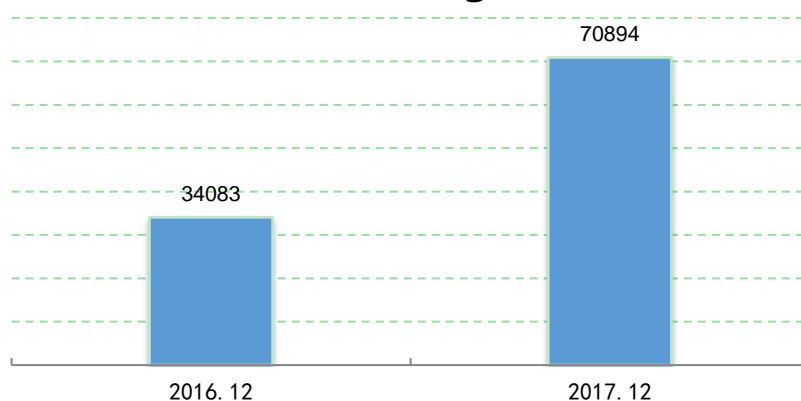
Source: Sina Weibo

4. Zhengwutoutiao

4.1 An Overview of Zhengwutoutiao²¹

As of December 2017, the number of Zhengwutoutiao launched by Party and government organs at all levels reached 70894, representing an increase of 36811 from the end of 2016.

The number of Zhengwutoutiao



Source: Top News

2017.12

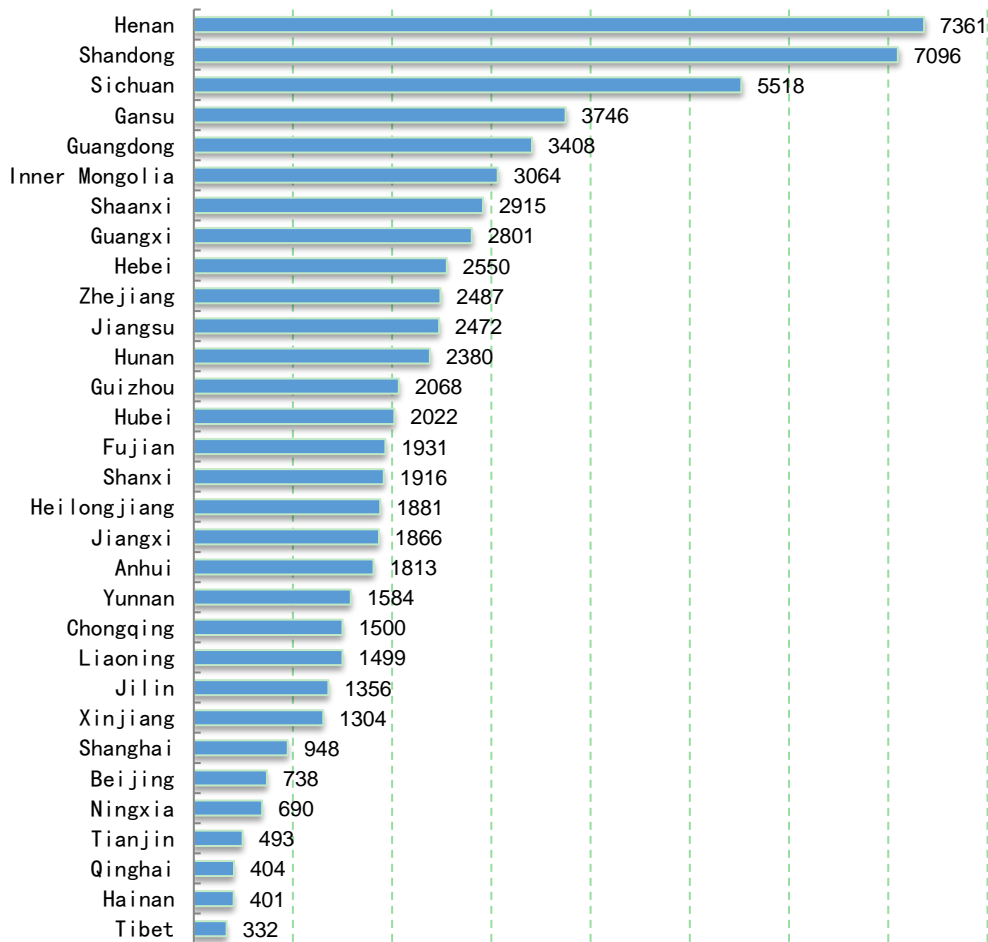
Figure 54 The number of Zhengwutoutiao

4.2 The Distribution and Views of Zhengwutoutiao by Province

Up to December 2017, 31 provinces, autonomous regions and municipalities directly under the Central Government in Mainland China launched Zhengwutoutiao. Specifically, the number of Zhengwutoutiao in 14 provinces exceeded 2000 and the number of Zhengwutoutiao in 10 provinces ranged from 1,000 to 2,000. Henan owned 7361 Zhengwutoutiaos, ranking first in China.

²¹ Zhengwutoutiao: a public information publishing platform for governmental departments, which is based on the App Top News.

The Distribution of Zhengwutoutiao in Mainland China, by the Number in Each Province



Source: Top News

2017.12

Figure 55 The Distribution of Zhengwutoutiao in Mainland China, by the Number in Each Province

In terms of views, Liaoning province ranked first in China with 1.8 billion views, and in terms of articles, Shandong province ranked first with 350,000 articles.

Table 12 The Top 10 Provinces, Autonomous Regions or Municipalities Directly under the Central Government Ranked by Views Jan. 2017 - Dec. 2017

	Province	Number of Zhengwutoutiao	Number of articles	Views
1	Liaoning	1499	More than 90,000	More than 1.8 billion
2	Shandong	7096	More than 350,000	More than 1.48 billion

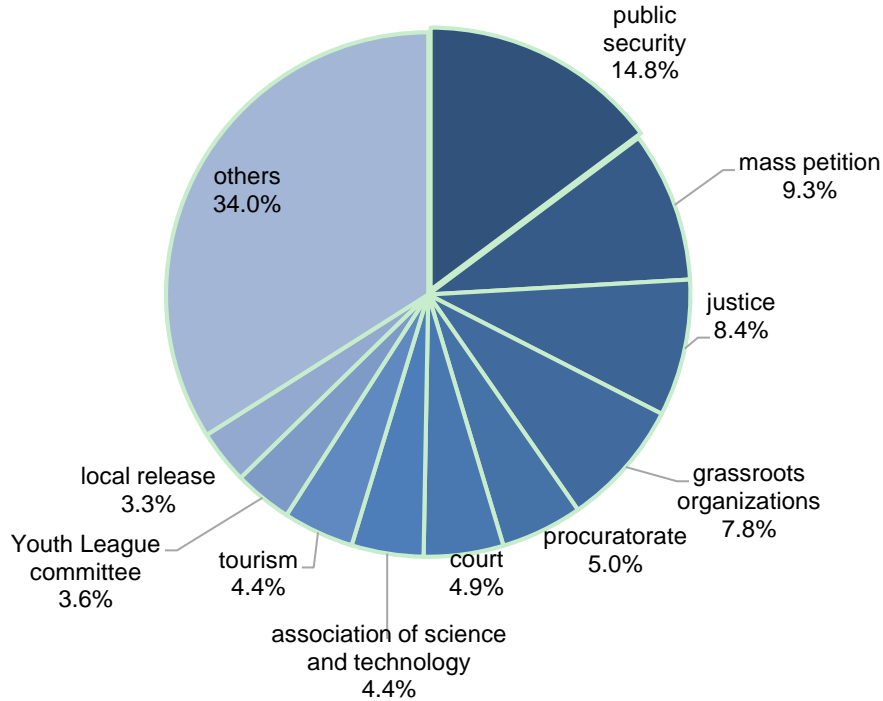
	Province	Number of Zhengwutoutiao	Number of articles	Views
3	Hebei	2550	More than 220,000	More than 860 million
4	Guangdong	3408	More than 210,000	More than 840 million
5	Jiangsu	2472	More than 190,000	More than 780 million
6	Sichuan	5518	More than 300,000	More than 720 million
7	Ningxia	690	More than 50,000	More than 710 million
8	Shaanxi	2915	More than 290,000	More than 680 million
9	Henan	7361	More than 270,000	More than 530 million
10	Gansu	3746	More than 240,000	More than 480 million

Source: Top News

4.3 The Composition of Organizations Operating Zhengwutoutiao

As of December 2017, more than 100 vertical systems launched Zhengwutoutiao, including public security, mass petition, procuratorate, justice, grassroots organizations, court, and Youth League committee. Among them, the Zhengwutoutiaos of public security accounted for 14.8% of the total Zhengwutoutiaos, followed by those of mass petition, accounting for 9.3%.

Fields Covered by Zhengwutoutiao



Source: Top News

2017.12

Figure 56 Fields Covered by Zhengwutoutiao

In terms of the number of Zhengwutoutiaos for all vertical systems, public security, mass petition, and justice intensified more efforts on e-government services; grassroots organizations, procuratorates, and courts showed great initiative; and other vertical systems still needed improvements.

4.4 The Operation of Zhengwutoutiao

Currently, the number of Zhengwutoutiaos opened by central state organs reached 350, covering the State Council, the Supreme People’s Procuratorate, the Supreme People’s Court, the Ministry of Public Security, the Ministry of Education, etc. Specifically, the top three Zhengwutoutiaos by views belonged respectively to www.gov.cn, the Ministry of National Defense, and the Supreme People’s Procuratorate.

Table 13 Number of Articles Published by Zhengwutoutiaos under the Control of Central State

Organs Jan. 2017 - Dec. 2017

	Name of Zhengwutoutiao	Organization name	Time put into use	Number of articles	Views
1	gov.cn	The Office of Government Information Disclosure of the General Office of the State Council	3/4/2015	1498	154.41 million
2	Information Release by the Ministry of National Defense	Department of National Defense	2/22/2017	632	81.54 million
3	Supreme People's Procuratorate	Supreme People's Procuratorate	11/18/2014	4051	71.38 million
4	China Quick Reporting Network for Earthquake	China Earthquake Networks Center	12/23/2014	1081	56.86 million
5	Supreme People's Court	Supreme People's Court	12/2/2014	2840	29.64 million
6	Ministry of Public Security	Ministry of Public Security	3/1/2016	768	27.16 million
7	China Meteorological Administration	China Meteorological Administration	9/25/2014	7759	24.1 million
8	Weiyan Education	Ministry of Education	12/12/2014	695	17.26 million
9	Ministry of Human Resources and Social Security	Ministry of Human Resources and Social Security	3/28/2016	905	16.67 million
10	Healthy China	The National Health and Family Planning Commission	12/5/2014	1797	6.81 million

Source: Top News

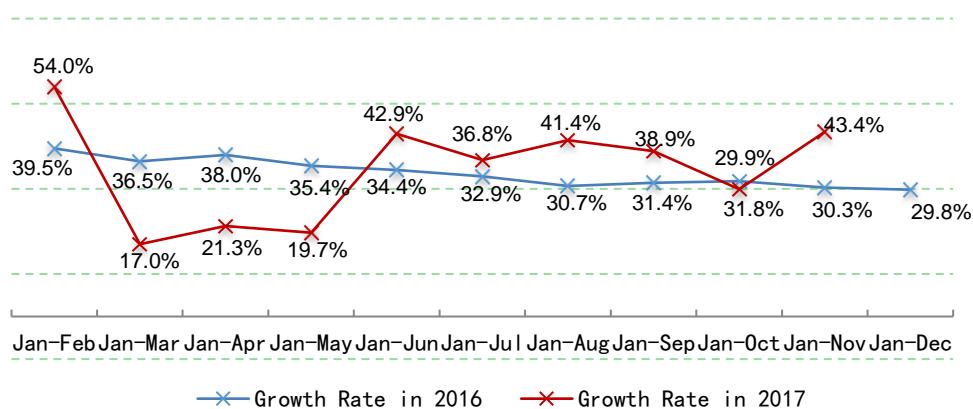
Part 4 The Development of the Industry

1. The Scale of the Internet Industry

1.1 The Scale of the E-commerce Sector

From January to November 2017, the revenue of e-commerce platforms was RMB218.8 billion, up 43.4% year on year.²² While the growth rate of monthly cumulative revenue of e-commerce platforms slowed down in 2016, such growth rate fluctuated significantly in 2017. Still, the overall revenue grew at a fast pace.

The Growth of Revenue of E-commerce Platforms



Source: Ministry of Industry and Information Technology

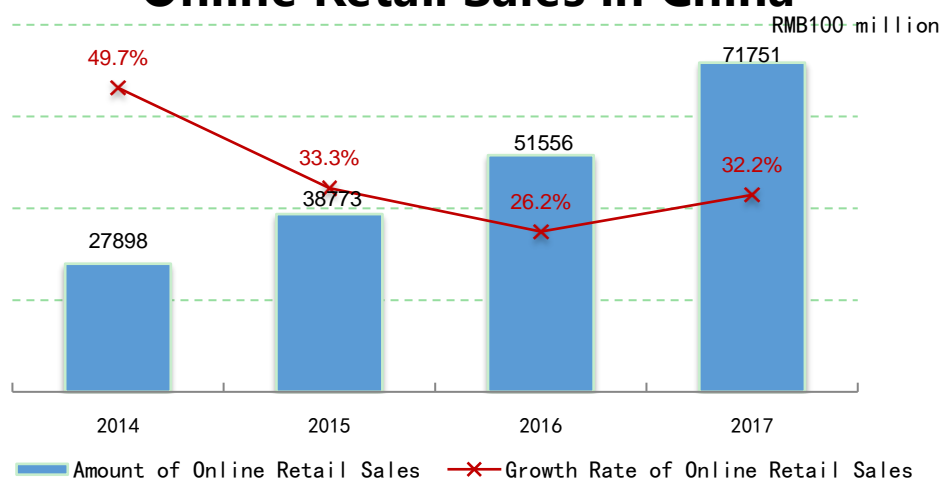
2017.12

Figure 57 The Growth of Revenue of E-commerce Platforms

Online retail sales in China reached a record high of RMB7.18 trillion in 2017, an annual increase of 32.2%, up 6 percentage points from a year earlier. Specifically, online retail sales of physical goods reached RMB5.4806 trillion, an increase of 28.0%, accounting for 15.0% of the total retail sales of consumer goods, up 2.4 percentage points over the previous year.

²² Data source about the revenue of e-commerce platforms:
<http://www.miit.gov.cn/n1146312/n1146904/n1648355/c5990780/content.html>

Online Retail Sales in China



Source: China National Bureau of Statistics

2017.12

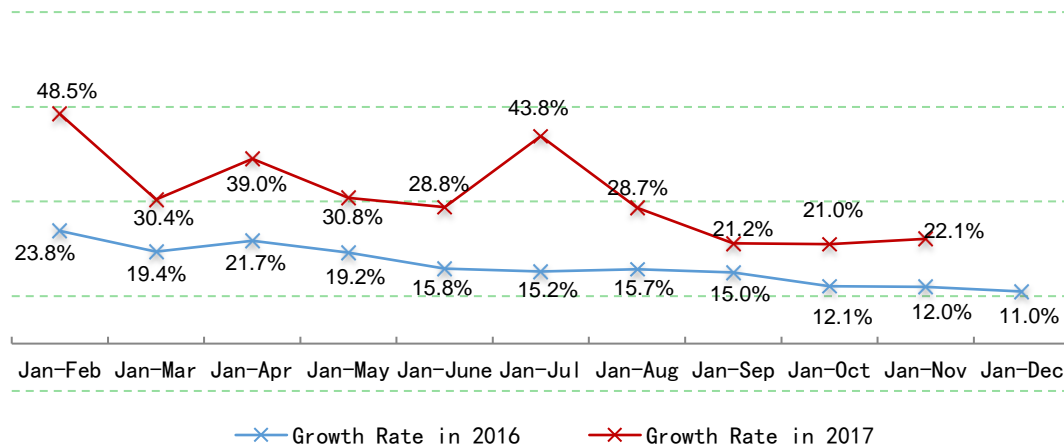
Figure 58 Online Retail Sales in China

In 2017, the environment for the Internet economy in China continued to improve, e-commerce maintained rapid growth, and innovations and breakthroughs were made in service model, technical form and empowerment effectiveness. In the B2B field, e-commerce companies, with the help of big data and cloud computing technologies, have utilized the service model of “industry chain + supply chain finance” to build an integrated supply-chain service platform. Based on such platform they meet the demand of upstream and downstream customers and provide improved financial services, to complete more business transactions. In the B2C field, the online retail market has maintained strong development momentum and innovation has led to new business forms and technologies. New retail forms such as unattended convenience stores, unattended restaurants, and unattended in-office shelves have emerged one after another. Facial recognition payment has made online retail more convenient once again. Meanwhile, e-commerce has penetrated and empowered traditional formats at a higher pace. E-commerce platforms have extended their services to the upstream of the supply chain, while establishing off-line physical stores for customers to personally experience the products and services and empowering these stores with technology and big data. Augmented Reality (AR) technology, virtual fitting room and other products will upgrade offline business and technologies.

1.2 The Scale of the Online Games Sector

From January to November 2017, the revenue of online games (including client games, mobile games, and web games) amounted up to RMB134.1 billion, up by 22.1% on a year-on-year basis.²³ As the online game sector developed to a new level, its revenue growth rate fluctuated between 21.2% and 48.5% from January to November in 2017. In contrast, the growth rate ranged from 11.0% to 23.8% in 2016.

The Revenue Growth of Online Games



Source: Ministry of Industry and Information Technology

2017.12

Figure 59 The Revenue Growth of Online Games

In 2017, the online game sector was more internationalized, where more and more games were designed as competitive sports for mobile users to play. As mobile games developed rapidly, its revenue accounted for more than 90% of the total revenue of the online game sector. Mobile games have become a new driving force in the online game sector. In the course of fast development, the market competition of mobile games has evolved into a comprehensive one integrating the industrial chain, including game works, user resources, intellectual property (IP), and channels. Meanwhile, China's online games expanded from the Southeast Asia to Europe, the US, Japan, South Korea, Russia and other front-line consumer markets. Thanks to the growing market, game brands and products have gained stronger influence. As the game sector has greater influence than other culture and entertainment industries, e-sports, for the first time, have become an official event of the 19th Asian Games to be held in Hangzhou, China, in 2022.

²³ Data source related to the revenue of online games:
<http://www.miit.gov.cn/n1146312/n1146904/n1648355/c5990780/content.html>

1.3 The Scale of the Online Advertising Sector

In 2017 the market scale of China's online advertising reached RMB295.7 billion, representing an annual increase of 28.8% and growing at a faster pace than that in 2016.

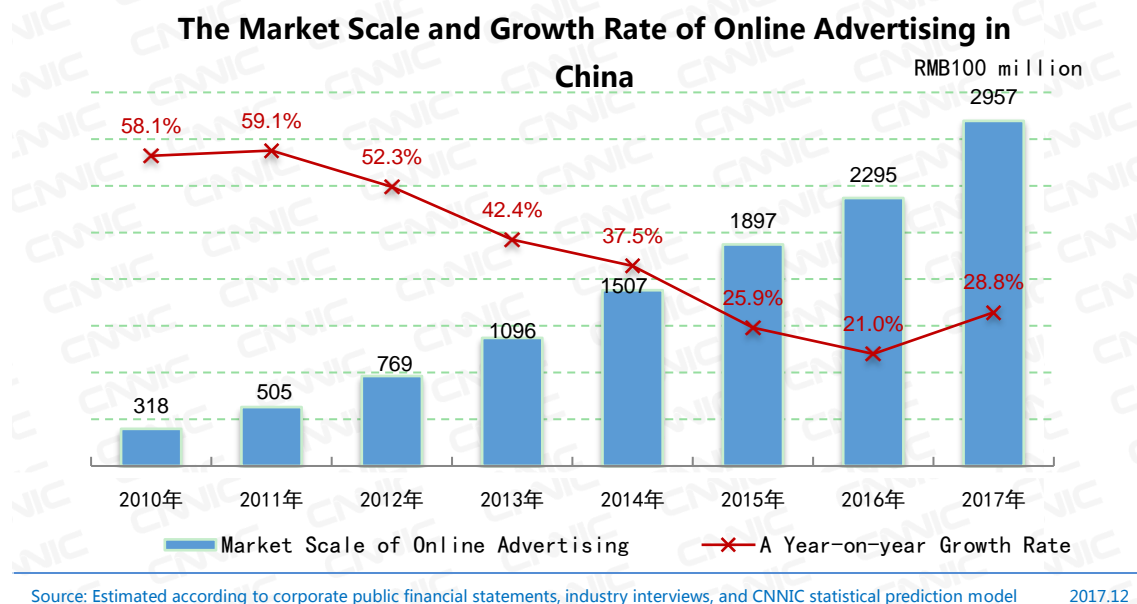


Figure 60 The Market Scale and Growth Rate of Online Advertising in China

In 2017 China's online advertising market grew mature, resulting in a more stable market structure. Advertisers have allocated their budget to mobile advertising at a faster rate. Therefore, mainstream Internet advertising agencies have much more revenue from mobile advertising than from PC ads. From the perspective of future development, technology is still the driving force for the rapid development of internet advertising. Accurately targeted ads are pushed out through intelligent algorithms and data mining. In terms of creativity, Internet advertising will be deeply integrated with live streaming, social networking, games, bonuses and other incentives. As for channels, Internet advertising will gradually become a routine, efficient, and mainstream channel for advertisers.

2. An Overview of Listed Internet Companies

2.1 The Number of Listed Internet Companies

Up to December 2017, China's listed Internet companies²⁴ at home and abroad totaled 102,

²⁴Listed Internet companies refer to those going public in the US, Hong Kong, Shanghai and Shenzhen whose

up by 12% over the previous year. Specifically, companies going public in Shanghai and Shenzhen, the US, and Hong Kong numbered 46, 41 and 15 respectively.

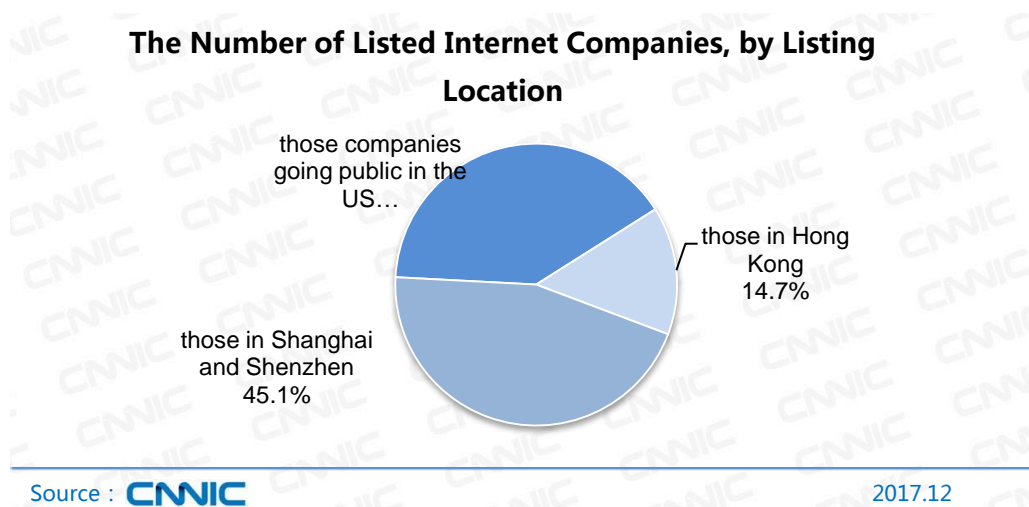


Figure 61 The Number of Listed Internet Companies, by Listing Location

In recent years, some Chinese Internet companies going public overseas have initiated the privatization process and gotten listed at home. The phenomenon is mainly caused by two reasons. First, because the price-to-earnings ratio of the IT industry is higher in domestic securities market, it is easier for Internet companies to obtain a higher market value. Second, China's financial environment has been increasingly improved, which attracts some China's Internet companies that went public abroad. As superb startups increase, the number of China's listed companies will increase in the future.

2.2 The Market Value of Listed Internet Companies

Up to December 2017, the market value²⁵ of China's Internet companies going public at home and abroad totaled RMB8.97 trillion, an annual growth of 66.1%. China's Internet companies getting listed in the US accounted for 54.8% of the total market value, those in Hong Kong 37.5%, and those in Shanghai and Shenzhen 7.7%.

revenue from their respective Internet business takes up more than 50% of their total revenue. Internet business includes Internet advertising and marketing, personal Internet value-added services, online games, e-commerce, etc. The above definition also considers whether these companies depend mainly on Internet products to generate revenue, including mobile Internet operating systems, mobile Internet Apps and traditional PC websites.

²⁵Market value of listed Internet companies: the market value of China's companies going public overseas is calculated according to the exchange rate on December 31 of that year.

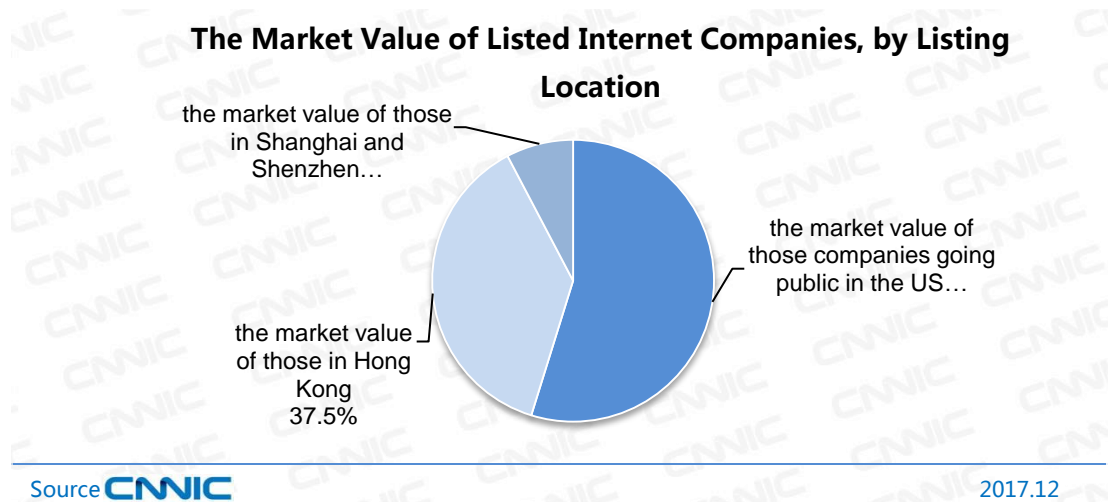


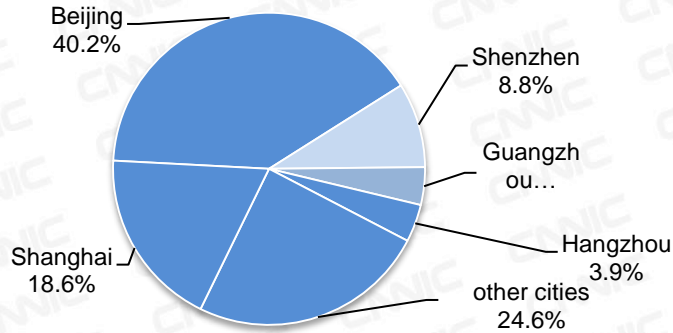
Figure 62 The Market Value of Listed Internet Companies, by Listing Location

As of December 2017, the market value of Tencent, Alibaba and Baidu reached RMB3.1 trillion, RMB2.9 trillion and RMB0.5 trillion, respectively, all together accounting for 73.9% of the total market value of all listed companies. Thanks to the large amount of capital, the three companies gained considerable advantages in investment and M&A, research and development, and model innovation.

2.3 The Composition of Listed Internet Companies

By December 2017, of the 102 listed Internet companies, 40.2% handled the industrial and commercial registration in Beijing, 18.6% in Shanghai, 8.8% in Shenzhen, 3.9% in Guangzhou and 3.9% in Hangzhou.

The Number of Listed Internet Companies, by Registration City



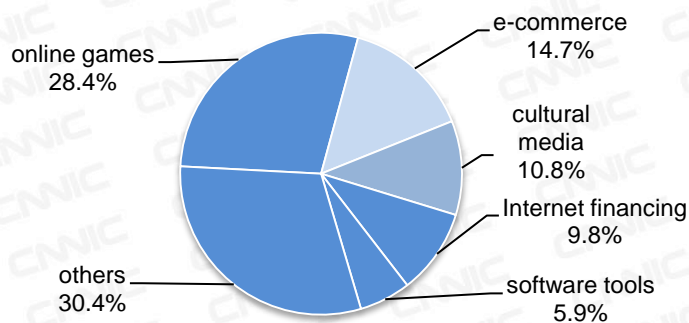
Source CNISC

2017.12

Figure 63 The Number of Listed Internet Companies, by Registration City

The regional distribution of listed Internet enterprises indirectly reflects the local environment for the Internet industry. The advantages of talents, industries, and investments in first-tier cities have driven the development of local listed Internet companies. With the development of innovative startups and the advancement of the multi-level capital market reform, listed Internet companies will emerge in more regions in the future.

The Types of Listed Internet Companies



Source CNISC

2017.12

Figure 64 The Types of Listed Internet Companies

Of China's listed Internet enterprises, online game companies accounted for 28.4% of the total, ranking first by number, and e-commerce, cultural media, Internet finance and software tools took up 14.7%, 10.8%, 9.8%, and 5.9%, respectively. China's online game sector is advancing rapidly, constituting an integral part of China's Internet industry. Vertical e-commerce enterprises and e-

commerce enterprises with platforms are embarking on the path of differentiated development. The Internet finance sector is developing rapidly, and various new forms of wealth management have been launched. In the future, with the continuous improvement of the financial market and the introduction of relevant policies, the types of companies going public will be further balanced.

3. Innovation and Entrepreneurship based on the Internet

3.1 The Development of Sharing Economy

Based on the third-party information platform, the sharing economy integrated with social resources to provide services for users was booming in 2017. Specifically, online car-hailing and shared bike as typical representatives of the sharing economy have been favored by China’s capitals. According to a survey, the penetration of online car-hailing and shared bike reached 30.6% and 28.6% respectively; the penetration of shared power bank was 12.5%; shared bed and breakfast and shared car with the penetration of 2.8% and 2.2% respectively had a niche market.

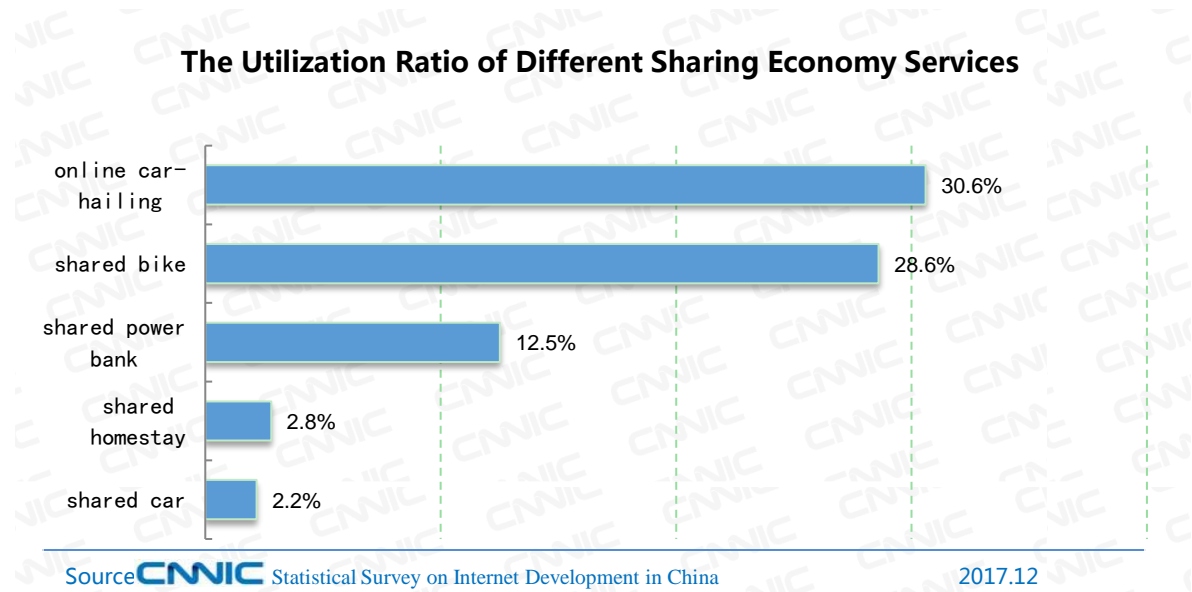


Figure 65 The Utilization Ratio of Different Sharing Economy Services

Three forces have jointly promoted the rapid penetration of the sharing economy among Internet users. First, the services of sharing economy have, to a certain extent, integrated fragmented social resources, and utilized platform-based resources to meet the demand of users via the Internet, thus enhancing the use of social resources in an efficient and convenient way. Second, China has

vigorously supported the sharing economy at the policy level and incorporated the goal of “boosting the development of the sharing economy” into the 13th Five-Year Plan. Third, China’s good investment environment has facilitated startups that had not yet gained profits to attract large amounts of financing and roll out their business on a large scale.

The vigorous development of sharing economy has effectively mobilized social idle resources, making positive social impacts on travel efficiency, employment promotion, and energy saving and emission reduction. According to relevant statistics, in terms of improving travel efficiency, the travel model of “shared bike plus subway” is more efficient than that of private cars by approximately 17.9%²⁶; regarding energy saving and emission reduction, the trips of users riding shared bike exceed 29.947 billion kilometers and reduce carbon emission by more than 6.99 million tons²⁷; with regard to employment promotion, the shared bike sector creates more than 30,000 positions for offline operation and maintenance²⁸, providing new job opportunities for the jobless group. In addition, the short-term rental business represented by shared bike has also provided new impetus for the development of the traditional manufacturing industry, bringing nearly RMB10 billion to bicycle-manufacturing enterprises.

With the vigorous development of new forms of sharing economy, the problems are gradually exposed. First of all, the existing regulatory policies are difficult to cover all aspects of the new forms of the sharing economy, and capital forces enable the sharing economy to enter the stage of “barbaric growth”. In the process of excessively pursuing quantitative growth, enterprises tend to overlook the potential problems that they may cause, which brings many challenges to government. Secondly, various types of sharing-economy enterprises are mixed, leading to the fact that the new forms of sharing economy are often faced with fierce competition and rapid integration. Some enterprises have many problems including insufficient innovation capacity, poor service, and lax operation supervision, not only bringing adverse effects to the healthy development of the industry, but also incurring losses on personal safety and property of users. Finally, domestic capital and media have excessively advocated and abused the concept of sharing economy. Since the second

²⁶ The data is from the *Research Report on the Employment of the Shared Bike Industry* released by the Sharing Economy Research Center under China’s State Information Center

²⁷ The data is compiled from the *Report on Shared Bike and Urban Development 2017* and the *2017 Report on Traveling by Shared Bike in China’s Major Cities*.

²⁸ The data is from the *Research Report on the Employment of the Shared Bike Industry* released by the Sharing Economy Research Center under China’s State Information Center

half of 2017, a large number of new business forms have emerged to take sharing economy as a stunt, but much business has not improved the use efficiency of idle social resources. Attracting financing in the name of sharing has resulted in rapid but chaotic market development.

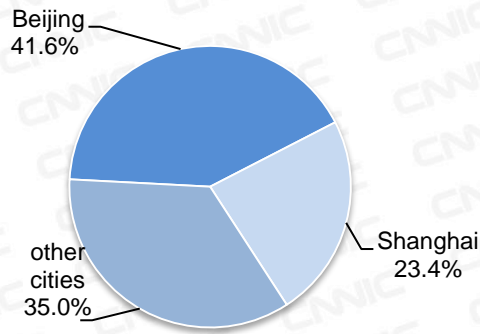
New problems arising in the development of all forms of sharing economy have set higher requirements for regulatory means and concepts of relevant government departments. With respect to regulatory measures, new business models that have been constantly introduced and industrial development issues that are always changing require that regulatory departments advance with the times. It is not feasible to simply follow out-of-date management ideas and methods and thus innovations on management should be made in light of actual problems of new business. Regarding regulatory philosophy, regulators need to uphold the principle of inclusiveness and prudence, in order to introduce new ways to explore the establishment of the multi-party collaborative governance mechanism in which government, enterprises, resource providers and consumers participate, and avoid excessive regulation curbing market innovation.

3.2 The Status of Unicorn Internet and IT Enterprises

According to the financing data of start-ups and the valuation level approved by mainstream investment institutions, the total number of China's unicorn enterprises²⁹ in the field of Internet and IT was 77, as of December 2017. Beijing has the largest number of unicorn enterprises, accounting for 41.6% of the total; Shanghai ranked second, accounting for 23.4%. Unicorn enterprises are also distributed in Hangzhou, Shenzhen, Zhuhai, Guangzhou and other places.

²⁹A unicorn enterprise in the field of Internet and IT: a new-generation unlisted company in the field of Internet and IT whose estimated value exceeds US\$1 billion at the time of its last financing. The defined criteria also refer to the financing data of a start-up and the project valuation recognized by mainstream investment institutions in the primary market.

The Distribution of Unicorn Internet and IT Companies



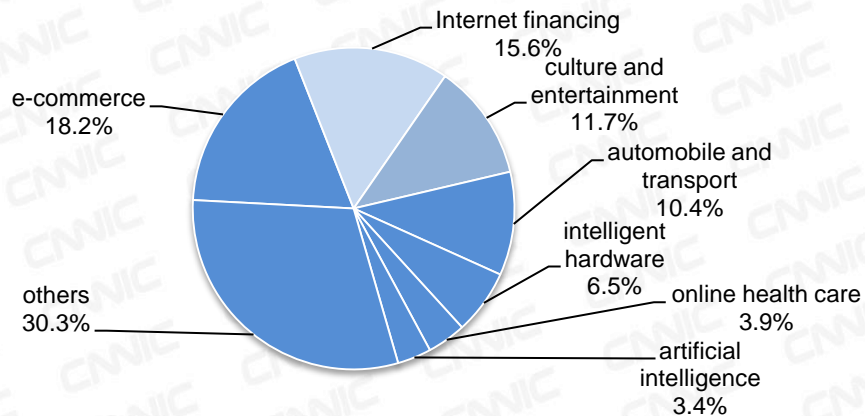
Source CNNIC

2017.12

Figure 66 The Distribution of Unicorn Internet and IT Companies,

According to the analysis of service types of unicorn enterprises, as of December 2017, e-commerce and Internet financing companies in the first echelon accounted for 18.2% and 15.6% of the total, respectively; cultural entertainment and automobile transport enterprises in the second echelon took up 11.7% and 10.4%, respectively; intelligent hardware, online medicine and artificial intelligence companies accounted for 6.5%, 3.9% and 3.4%, respectively.

The Types of Unicorn Internet and IT Companies



Source CNNIC

2017.12

Figure 67 The Types of Unicorn Internet and IT Companies

3.3 The Development of Artificial Intelligence

In 2017 China made important progress in the field of artificial intelligence. As a strategic technology that leads the future, artificial intelligence has sparked the increasingly fierce global

competition in its development. The world's main developed countries have adopted artificial intelligence as a major strategy for enhancing national competitiveness and safeguarding national security. They have stepped up their introduction of plans and policies in an effort to grasp the dominant power in this new round of international competition in science and technology. In the 19th CPC National Congress report, General Secretary Xi Jinping made it clear that we need to “promote further integration of the Internet, big data, and artificial intelligence with the real economy”. China's new round of technological and industrial revolution with artificial intelligence at the core has gained momentum to be launched. New technologies such as artificial intelligence and virtual reality are changing with each passing day, and the integration of virtual economy and real economy has revolutionized people's production modes and lifestyle. The national strategies, including the *Made in China 2025 Initiative*, the *Guidelines for the “Internet Plus” Action*, and the *National 13th Five-Year Planning for Science and Technology Innovation*, have demonstrated China's commitment to artificial intelligence and its development. The *Planning for New-Generation Artificial Intelligence* issued by the State Council on July 8, 2017 proposed the top-level strategic concept for the development of China's artificial intelligence.

As of June 2017, the total number of global artificial intelligence companies reached 2,542, of which 1,078 were in the United States, accounting for 42.4%, and 592 in China, accounting for 23.3%. The gap between China and the United States was 486 companies. The remaining 872 companies were located in Sweden, Singapore, Japan, the United Kingdom, Australia, Israel, and India. China's artificial intelligence companies were mainly located in Beijing, Shanghai, Shenzhen, Hangzhou, Guangzhou, Hong Kong, Chengdu, Nanjing, Xiamen and Suzhou.

In 2017 China's artificial intelligence delivered outstanding results in technology development and industrial application.

In terms of technology development, Nanjing University, Tsinghua University, and Shanghai Jiaotong University produced a range of academic achievements in the research of core theories of artificial intelligence. Internet companies made a variety of R&D and application results in human-computer interaction technologies such as computer vision and natural language processing. The number of patent filings related to artificial intelligence in China continued to increase over the past two decades, totaling 30,115 in 2016. In the research and development of recognition technologies, Baidu Deep Learning Network produced world-leading achievements such as 99.84% in the

accuracy of facial recognition and 95% in the accuracy of speech recognition. Tencent gained 83.29% in the accuracy of face recognition on the test of the international face database MegaFace, which stored the data of one million faces, and won the champion. Ali Cloud ET’s face recognition technology obtained the accuracy of more than 99.5% in recognizing people’s faces in the outdoor by matching its database. Huawei established the Noah’s Ark Lab specializing in artificial intelligence, machine learning and data mining, investing more than RMB50 billion annually. iFlytek took speech as its R&D priority and steadily advanced the ecological layout of artificial intelligence from perceptual intelligence to cognitive intelligence. In the R&D of artificial intelligence chips, the Cambricon Technology Co., Ltd., incubated by the Chinese Academy of Sciences, released new-generation global AI chips, including the Cambrian 1H8, 1H16, and 1M series, in November 2017. These chips could be applied in various scenarios of artificial intelligence application.

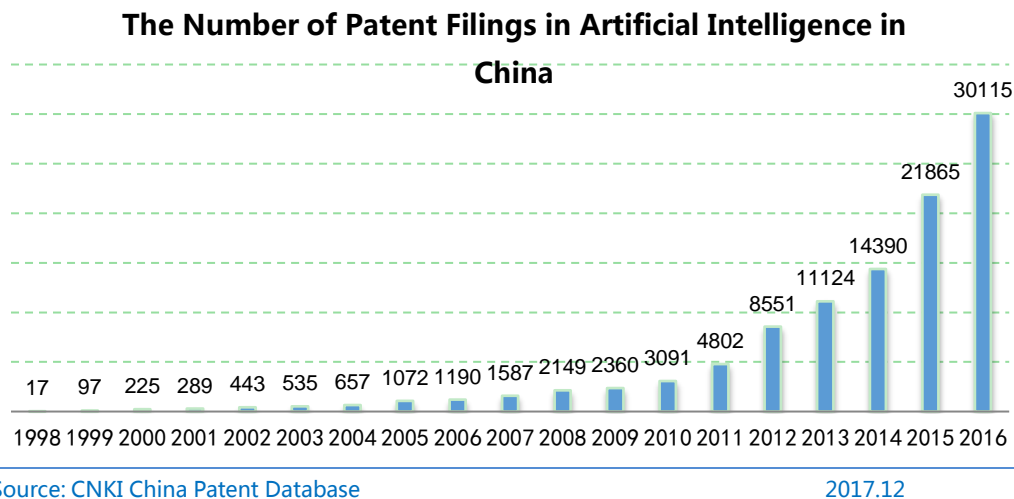


Figure 68 The Number of Patent Filings in Artificial Intelligence in China

With respect to industrial applications, the rapid development of artificial intelligence technologies has accelerated the integration of artificial intelligence with electronic terminals and vertical industries in China. These efforts have produced a number of artificial intelligence products such as smart homes, smart cars, wearable devices, and intelligent robots, reshaping the industries of home appliances, robotics, medical services, education, finance, and agriculture. The smart home sector has worked to create an open and connected platform to realize the interconnection and interaction between smart terminals through cloud data interaction, and build a smart home ecosystem, such as Huawei’s Hilink protocol, Xiaomi’s SmartThings, and Haier’s U Plus. The

driverless has served as the typical product of smart car, attracting a lot of attention from the market as well as a large number of auto manufacturers, tech giants and startups engaged in the R&D of this product. As medical services are also one of the important applied areas of artificial intelligence, the integration of these services with artificial intelligence, sensor technology and big data has made various medical services smarter and facilitated the smart medical sector to embark on the fast lane. Now, artificial intelligence technologies have already explored, or been applied in auxiliary diagnosis, genetic testing, personalized treatment, smart care for the patients and the elderly, and intelligent drug R&D.

Part 5 The Cybersecurity Administration

1. Security Incidents and Equipment Infection

China's cybersecurity remained stable in 2017, but problems, such as user information leakage, network hacker blackmail and communication information fraud, still occurred frequently. The blackmail worms named “WannaCry” and “Petya” ravaged the world in May and June respectively, affecting more than 150 countries in the finance, energy, and medical services. As such, government agencies and enterprises have paid more attention to hidden risks of their network security. At the policy level, the *Cybersecurity Law of the People's Republic of China* was enacted on June 1. The 31st Session of the Standing Committee of the 12th National People's Congress on December 24 proposed to accelerate the legislative process of supporting laws and regulations for cybersecurity law, so as to protect personal information and key information infrastructure. All these efforts marked that the information security would shift from being driven by compliance to by compliance and mandatory together, providing practical legal safeguard for the subsequent work.

1.1 Cybersecurity Problems Encountered by Internet Users

In 2017, the percentage of China's Internet users encountering cybersecurity problems dropped significantly. According to relevant data, 47.4% of Internet users have not encountered any cybersecurity problems, down by 17.9 percentage points from the end of 2016. By analyzing these cybersecurity problems encountered by users, it can be found that the proportions of all kinds of cybersecurity incidents are significantly lower than those in 2016. Specifically, personal information leakage accounted for the highest proportion of 27.1%, down by 5.7 percentage points year on year; only 18.8% of netizens had account or password theft, representing the largest drop from the year of 2016.

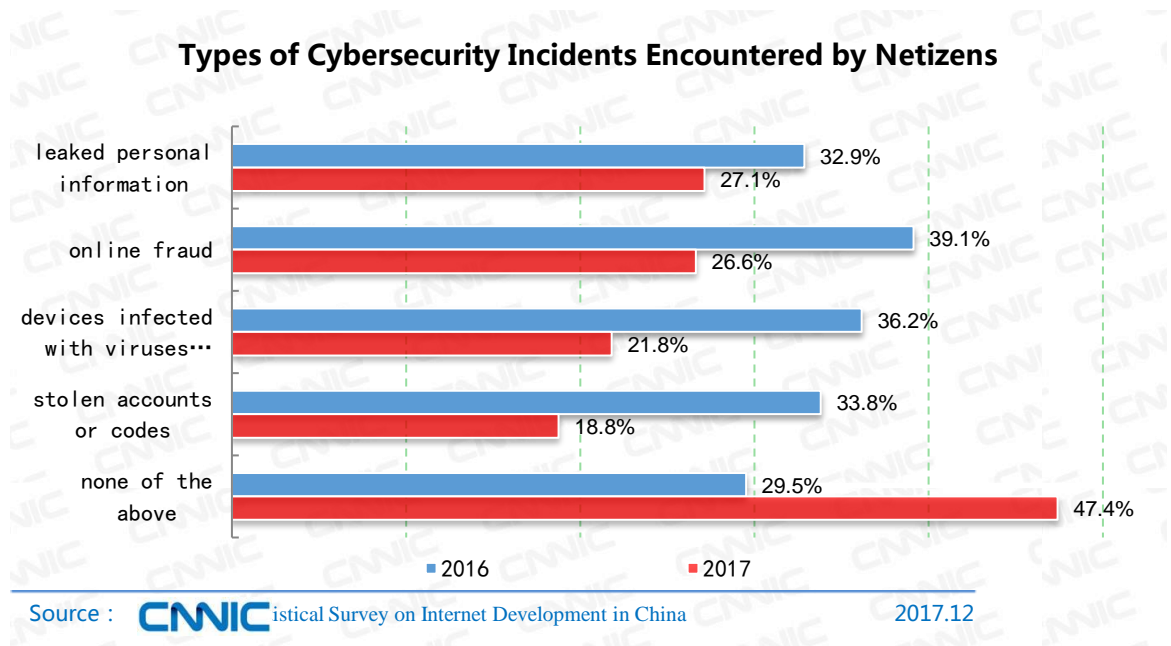
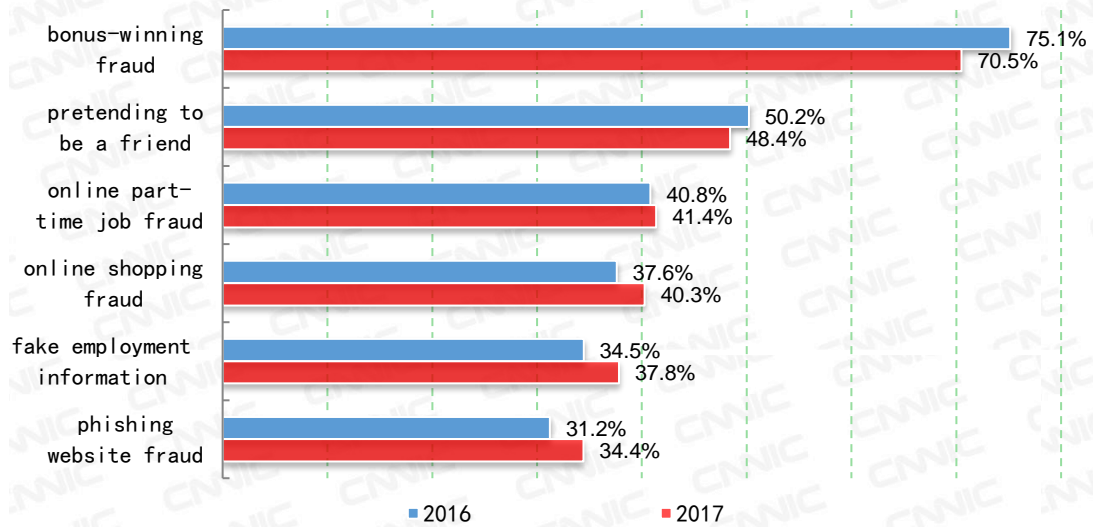


Figure 69 Types of Cybersecurity Incidents Encountered by Netizens

1.2 Fraudulences Encountered by Internet Users

According to a further investigation on users who encountered online fraud in 2017, fake bonus-winning messages are still the most widespread type, reaching 70.5% of the internet users who suffered from online fraud. The second most widespread type is pretending to be a friend of the victim's, which affected 48.4% of the above-mentioned internet users. However, the share of these two types of frauds in all users who suffered from online fraud decreased from 2016. In addition, among the users who encountered online fraud, the number of users encountering the fraud incidents of online part-time jobs, online shopping, cheating recruitment information, and phishing websites saw a slight increase compared with 2016.

Types of Online Fraud Incidents



Source : CNISC Statistical Survey on Internet Development in China

2017.12

Figure 70 Types of Online Fraud Incidents

2. Internet Virus Transmission, Website Security and Loopholes

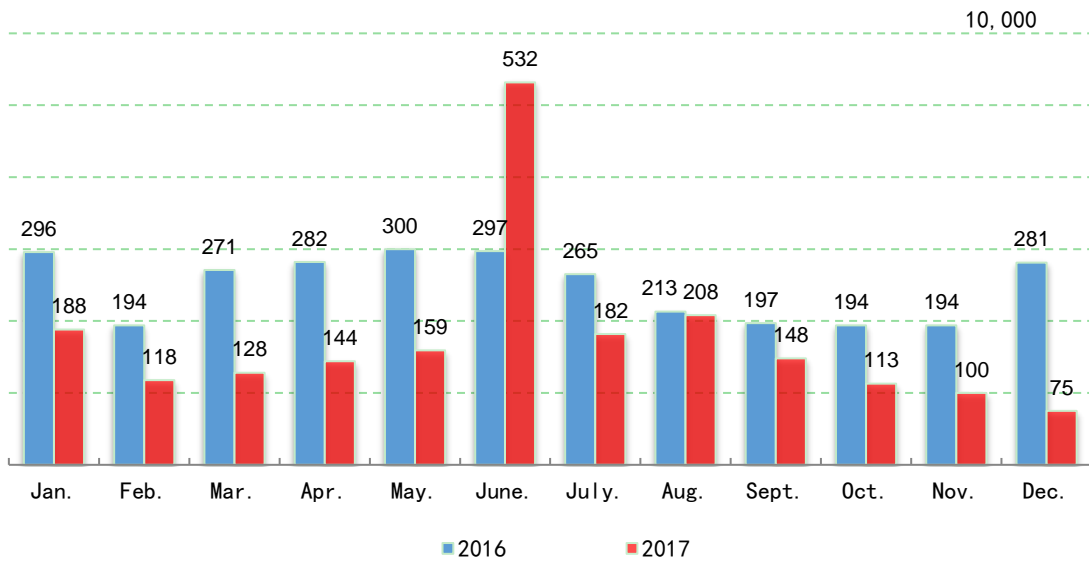
2.1 The Number of Terminals Infected with Internet Virus in China

In 2017, CNCERT monitored 20.95 million terminals³⁰ infected with Internet virus³¹ in China, down by 29.8% from 2016. In 2016, it monitored 29.84 million terminals. Specifically, due to the impact of the “Dark Cloud III” Trojan program across China’s Internet, the number of infected terminals in China reached 5.32 million in June, far more than those in other months.

³⁰The term “terminals” refers to servers and computer equipment monitored by CNCERT.

³¹The term “Internet virus” refers to malicious code having network communication.

The Number of Terminals Infected with Internet Virus in China



Source : Report of CNCERT on Internet Security Threat

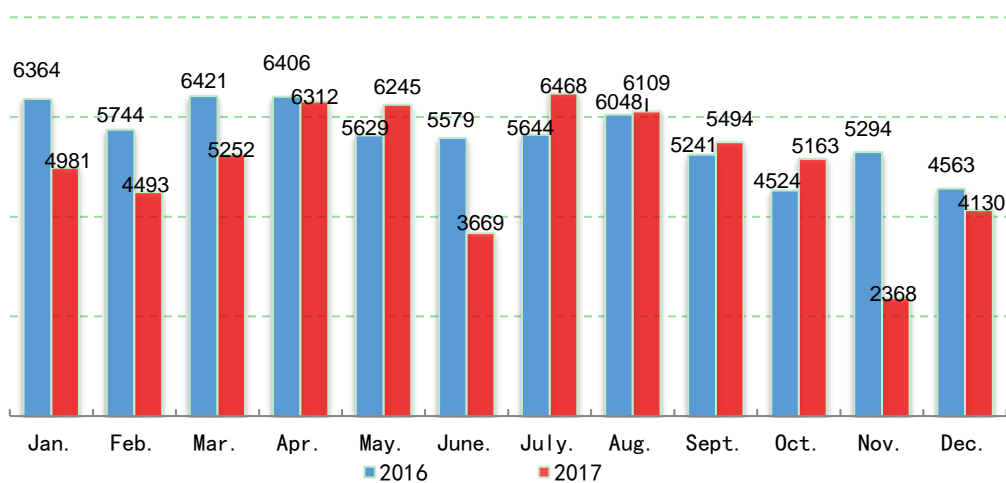
2017.12

Figure 71 The Number of Terminals Infected with Internet Virus in China

2.2 The Number of Websites Tampered with by Hackers in China

In 2017, CNCERT monitored 60,684 websites tampered³² with by hackers in China, down by 10% from 2016. In 2016, it monitored 67,457 websites.

The Number of Websites Tampered with by Hackers in China



Source : Report of CNCERT on Internet Security Threat

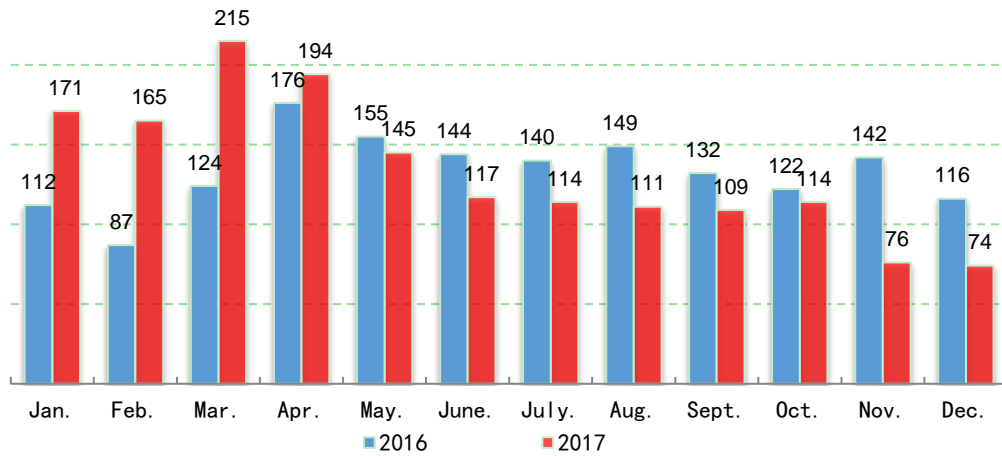
2017.12

Figure 72 The Number of Websites Tampered with by Hackers in China

³²Websites tampered with by hackers mean that malicious destruction or change of webpage content leads to the fact that a website is unable to work properly or inserted with abnormal webpage content by hackers.

In 2017, CNCERT monitored 1,605 government websites³³ tampered with by hackers in China, which remained flat from 1,599 government websites in 2016.

The Number of Government Websites Tampered with in China



Source : Report of CNCERT on Internet Security Threat

2017.12

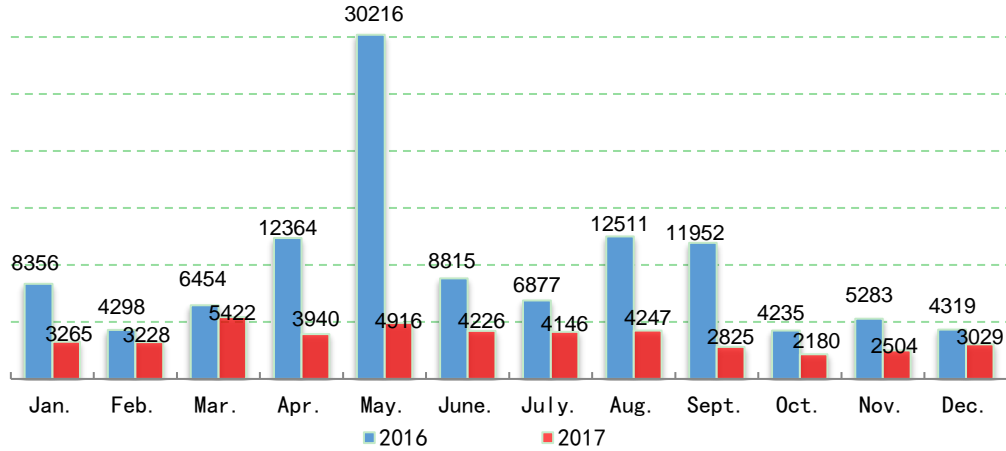
Figure 73 The Number of Government Websites Tampered with in China

2.3 The Number of Websites Implanted with Backdoor Malwares in China

CNCERT monitored 43,928 websites implanted with backdoor malwares in China in 2017, down 62% from 115,680 in 2016.

³³Government website refers to a website whose English domain name ends with “. gov. cn”, but we do not exclude such domain names used by individual non-governmental departments.

The Number of Websites Implanted with Backdoor Malwares in China



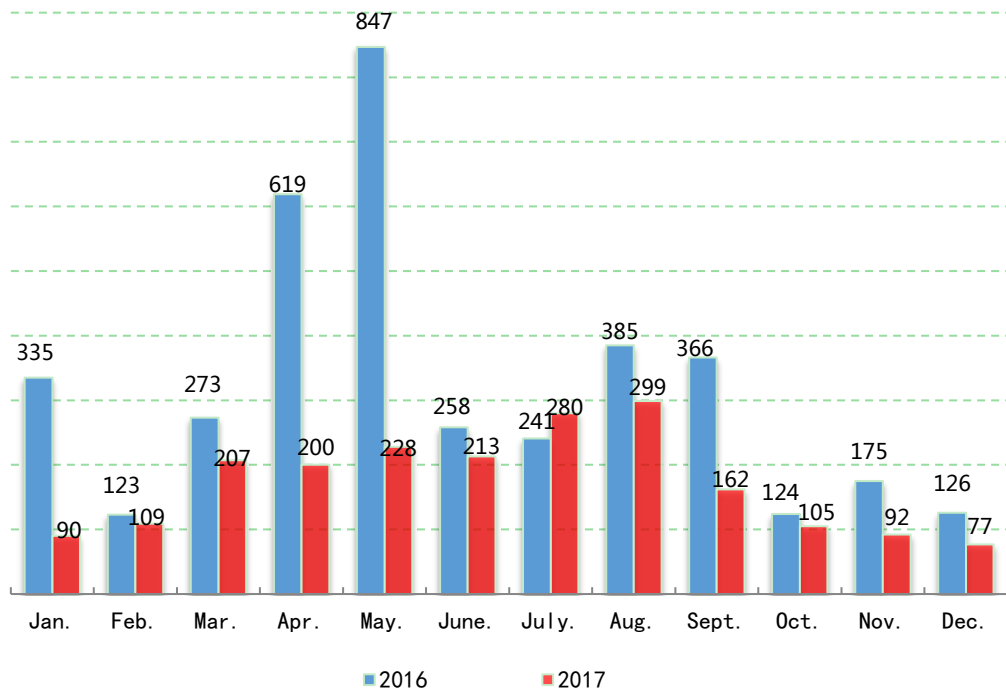
Source : Report of CNCERT on Internet Security Threat

2017.12

Figure 74 The Number of Websites Implanted with Backdoor Malwares in China

CNCERT monitored 2,062 government websites implanted with backdoor malwares in China in 2017, down 46.7% from 3,872 in 2016.

The Number of Government Websites Implanted with Backdoor Malwares in China



Source : Report of CNCERT on Internet Security Threat

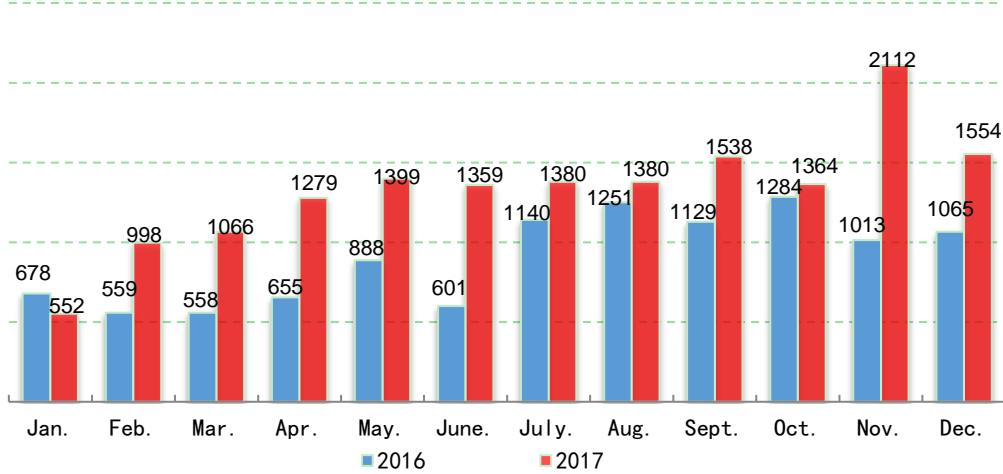
2017.12

Figure 75 The Number of Government Websites Implanted with Backdoor Malwares in China

2.4 The Number of Security Loopholes

In 2017, China National Vulnerability Database (CNVD)³⁴ collected 15,981 information system security loopholes, up by 47.7% from 10,821 in 2016.

The number of System Security Loopholes Collected by CNVD



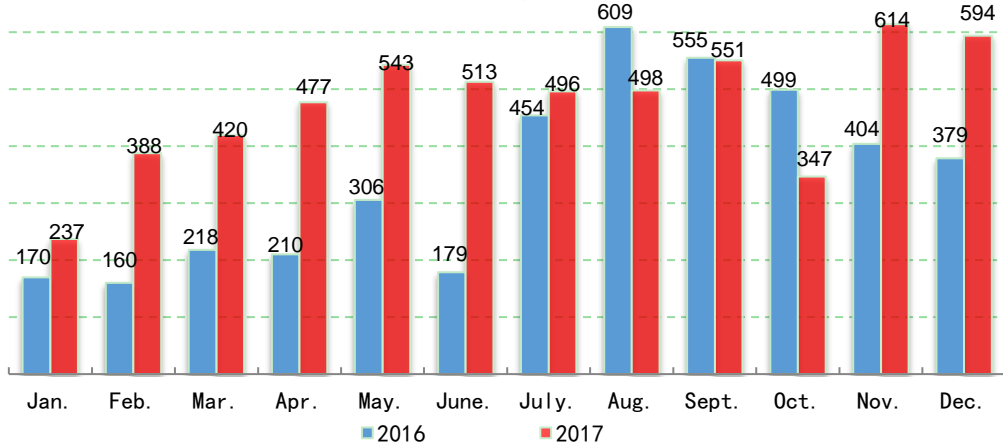
Source : Report of CNCERT on Internet Security Threat

2017.12

Figure 76 The number of System Security Loopholes Collected by CNVD

Specifically, the number of high-risk system security loopholes totaled 5,678, up by 37.1% from 4,143 in 2016.

The Number of High-Risk System Security Loopholes Collected by CNVD



Source : Report of CNCERT on Internet Security Threat

2017.12

Figure 77 The Number of High-Risk System Security Loopholes Collected by CNVD

³⁴China National Vulnerability Database (CNVD) is an information-sharing knowledge base for security loopholes developed by the National Computer Network Emergency Response Technical Team/Coordination Center of China (CNCERT for short), together with China's important information system units, basic telecom carriers, network security manufacturers, software vendors and Internet enterprises.

3. The Reporting and Handling of Cybersecurity Incidents

In 2017, all relevant departments continuously strengthened the network security inspection and threat governance and took corresponding measures to rectify the problems of telecom fraud, information disclosure and content infringement, especially in the field of Internet information and content services. The Cybersecurity Administration of China has issued a number of administrative measures and regulations, which are of great significance in regulating the dissemination of Internet content and information, purifying the Internet-based public opinion, and forming an active healthy atmosphere for network culture.

3.1 The Number of Reported Cybersecurity Incidents Received by CNCERT

CNCERT received 103,463 reports of cybersecurity incidents in 2017, a 17.7% decrease from 125,660 incidents in 2016.

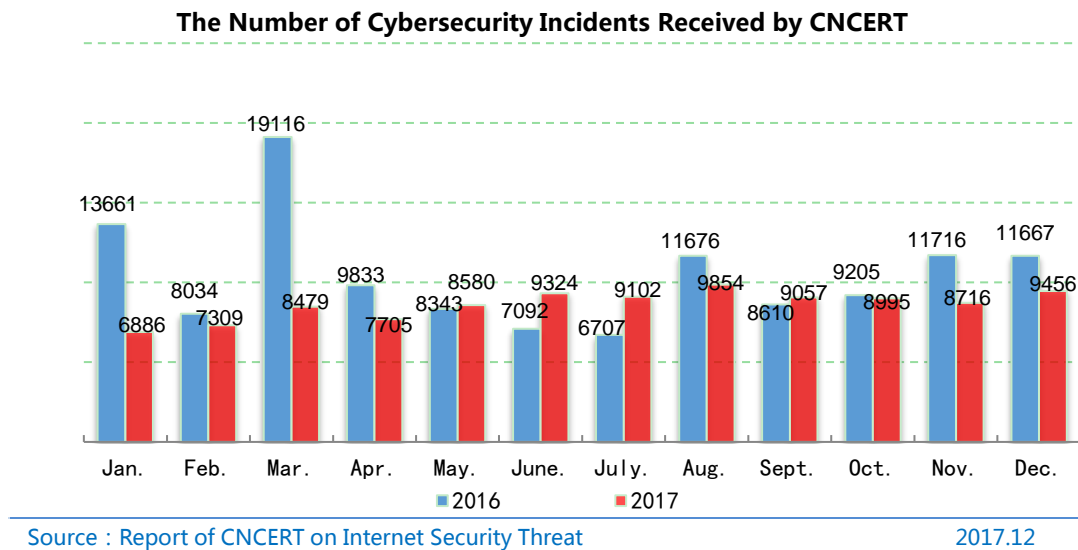


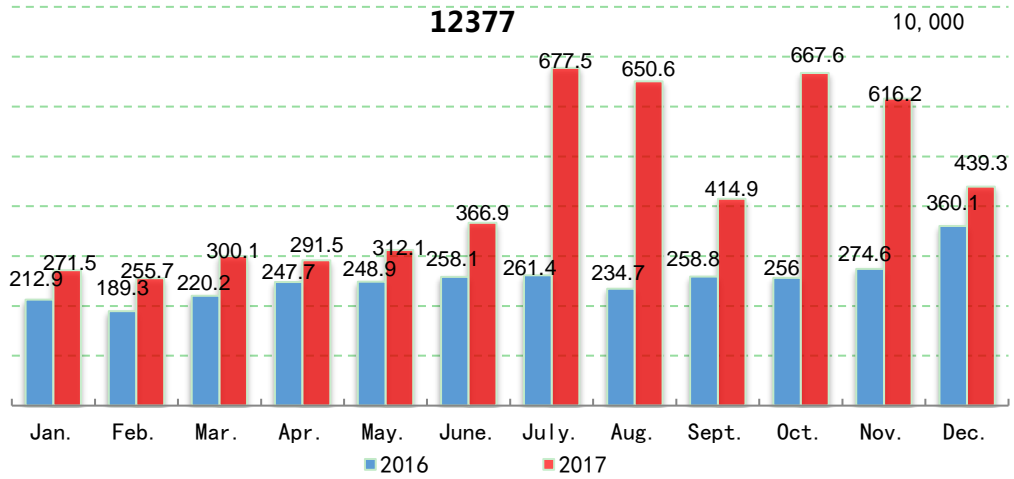
Figure 78 The Number of Cybersecurity Incidents Received by CNCERT

3.2 The Handling of Reported Illegal and Inappropriate Internet Information across China

In 2017, China Reporting Center for Illegal and Inappropriate Internet Information (hotline:12377) received 52.639 million valid reports from Internet users, an increase of 74.1%, while it got 30.227 million in 2016. The *Cybersecurity Law of the People's Republic of China* and

the *Provisions for the Administration of Internet News and Information Services* have been enacted since June 1, 2017. These laws and regulations have effectively mobilized the enthusiasm of Internet users to report illegal and bad information, increasing the number of valid reports in the second half of 2017 more significantly than in the first half.

The Number of Valid Reports Received by the Hotline



Source: China Reporting Center for Illegal and Inappropriate Internet Information

2017.12

Figure 79 The Number of Valid Reports Received by the Hotline 12377

Part 6 Summary

1. From the Perspective of Law and Policy, the Environment for the Healthy Development of the Internet Has Been Further Improved

The legal foundation of the cyber security management was solidified.

The implementation of *Cyber Security Act* on June 1, 2017 marked a new page on cyberspace governance, network information dissemination, and cyber crime punishment. On December 24, 2017, the NPC Standing Committee reviewed reports on the implementation of the *Cyber Security Act* and the *Decision on Strengthening the Internet Information Protection*, and proposed to speed up the legislative process of related regulations on personal information protection, critical infrastructure protection, hierarchical cyber security protection and cross-border data evaluation. It indicated that information security would be driven by both compliance and enforcement, instead of by compliance only, providing practical legal guarantee for the cyber security work.

The policy on the management of online information content was gradually completed.

To guide the orderly dissemination of online content and information and construct a healthy environment for online public opinion, in 2017 the Cyberspace Administration of China released successively *Regulations on the Management of Internet News and Information Service*, *Enforcement Procedures on the Management of Online Information Content*, *Implementation Details on License Management of Online News and Information Service*, *Regulations on Internet Forum Service*, *Regulations on the Management of Internet Follow-up Comments*, *Regulations on Internet Group Information Service*, and *Regulations on the Service of Internet Public Accounts*. All of these regulations and rules play a significance role for the development of a healthy online cultural environment.

The legalization process on e-commerce was accelerated.

The legislation process of e-commerce was speeded up. After widely absorbing all sorts of opinion, the draft of *E-commerce Act* was submitted to the Standing Committee of the National

People's Congress for the second time in October 2017. Policies and standards of the e-commerce industry were published successively, such as the *Action Plan for Promoting the Development of E-commerce in Three Years (2016-2018)* and the *Guide for Work on Standardization of Online Retail*. At the same time, the increasing judicial innovation related to Internet indirectly promoted the development of e-commerce. In July an Internet court was set up in Hangzhou to solve disputes on online shopping contracts within the jurisdiction and other cases involving the Internet, reducing litigation costs regarding online transactions. By the end of 2017, 4859 cases were filed and 3064 were closed.

Policies promoting the information technology were published successively.

To implement the strategy of building a cyber power of the CPC Central Committee and the State Council, in November 2017 the General Office of CPC Central Committee and the General Office of the State Office issued the *Action Plan on Promoting the Deployment of IPv6*, aiming at developing the next generation Internet based on IPv6 and enhancing the capacity and service of the Internet in china. The State Council issued *Guiding Opinions on Enhancing the "Internet + Advanced Manufacturing" and Developing Industrial Internet*, aiming at deepening the structural reform at the supply side and regulating the development of industrial Internet. In June 2017, the Cyberspace Administration of China, the National Quality Inspection Administration, and the National Standards Committee jointly issued the *Guidance on Informatization Standards in the "13th Five-Year"*, completing the national system of standards on promoting information technology.

2. From the Perspective of Growth, the Internet Has Become a Driving Force for the Economic Transformation and Upgrading

The rapid growth of online retail drove the consumption upgrade.

Data from the National Bureau of Statistics showed that in 2017 the total retail sales of consumer goods was RMB 36626.2 billion, up 10.2% over the previous year; the online retail sales was RMB 7175.1 billion, up 32.2%, or with a growth rate of 6 percentage points higher over the previous year; Chinese online retail sales accounted for 40% of the global online retail sales. On

the one hand, the online retail sales of physical goods reached RMB 5480.6 billion, an increase of 28%, accounting for 15% of total retail sales of consumer goods. Among the online retail sales of physical goods, that of food, clothing and articles for daily use increased by 28.6%, 20.3% and 30.8% respectively. On the other hand, the online retail sales of non-physical goods reached RMB 1694.5 billion, an increase of 48.1%. The sales of non-physical goods grew more quickly than that of physical goods, indicating that more consumers were shifted to service and the consumption was upgraded.

The business modes of sharing economy went abroad.

The rapid development of sharing economy in China has contributed to cultivating new engine to drive growth, leading innovation and expanding employment. As of December 2017, the user scale of sharing bicycles reached 221 million, with an increase of 115 million in six months or a growth rate of 108%. Sharing bicycle business has covered all the major cities in China. The sharing bicycle mode has gone global and spread to 21 overseas countries, serving as a new label of export business mode. For example, Citi Bike in New York, the largest sharing bicycle company in the US, had 10 thousand bicycles and 236 thousand users. Sharing bicycles not only effectively solve the problems of travel and traffic, but also relieve the greenhouse gas effect caused by carbon dioxide emissions, contributing to the sustainable development of cities in the world.

Young netizens promoted the rapid popularization of Internet applications.

China has a large number of young Internet users and thus a huge market, which is a good condition for the rapid application of digital commerce modes. At the end of 2017, the scale of Internet users in China reached 772 million, of which the number of young Internet users under 30 was 408 million. Compared to the end of 2016, the scale of online meal ordering users continued to grow rapidly and reached 343 million, an increase of 135 million or 64.6%; the scale of online travel booking users reached 376 million, an increase of 76.57 million or 25.6%; the scale of live game users reached 224 million, an increase of 77.56 million; and the scale of live reality show users reached 220 million, an increase of 75.22 million. In general, the young user group with digital consumption enthusiasm has greatly speeded up the popularity of Internet applications.

3. From the Perspective of Social Welfare, the Internet Has Accelerated the Development of the Digital Society Benefiting All the People

The broadband network covered both urban and rural areas.

China continued to increase the international gateway bandwidth, and expand the coverage of base stations for mobile Internet by implementing the "Broadband China" program. As of December 2017, China's international gateway bandwidth was 7,320,180Mbps, with an annual growth of 10.2%. As of the third quarter of 2017, the total length of optical cable lines reached 36.06 million kilometers. The optical cable lines built in the first three quarters of 2017 were as long as 5.64 million kilometers, keeping a rapid growth. Basic telecommunications enterprises continued to accelerate the construction of mobile Internet infrastructure. The newly built base stations for mobile communication in the first three quarters of 2017 reached 447 thousand, and as a result, the total number of such stations was 6.041 million. Mobile broadband Internet can now basically cover cities and counties uninterruptedly and cover some relatively developed areas in towns and villages. The coverage and users' experience of 4G network in China are superior to those of many developed countries.

The online payment and Internet finance promoted the development of finance benefiting all the people.

With the enhanced coverage of information technology and the improved level of security, most payment by means of physical money in exchange for social commodities has been replaced by online payment. As of December 2017, the scale of online payment users in China reached 531 million. Among them, the scale of mobile online payment users grew rapidly and reached 527 million, with an increase of 57.83 million or an annual growth rate of 12.3% compared to the end of 2016. The utilization ratio of mobile online payment was as high as 70.0%. The online payment mode also increasingly penetrated to netizens in rural areas and the aged netizens. For example, the proportion of netizens using online payment in rural areas increased to 47.1% from 31.7% at the end of 2016. Meanwhile, the scale of netizens who had purchased Internet financial products reached 129 million, a year-on-year increase of 30.2%. The utilization ratio of Internet finance was

16.7%, increased by 3.2 percentage points from the end of 2016.

The government provided basic public services through the mobile e-government.

The government WeChat and government client end opened up new platforms for convenient civic services, and the integration of mobile Internet and government produced the new form of "Internet + government services". As of December 2017, the number of online government service users in China reached 485 million, accounting for 62.9% of the total Internet users. The Alipay and WeChat civic service platforms became the most frequently used means of accessing online government service. Their utilization ratio together was 44% and increased 26.8 percentage points from the end of 2016. On the one hand, the WeChat platform can provide online services, including social security, taxation, transportation, education, health care and utilities payment. On the other hand, in the "e-government supermarket" provided by the Ali cloud computing platform, citizens can "handle government affairs" like visiting Taobao, and pay for online government bills by means of Alipay, which is a remarkable development in China.

4. From the Perspective of Technological Development, the Internet Has Become the Origin of New Information Technology

The research on 5G standards of network communication in China led the world.

On January 17, 2017, the Ministry of Industry and Information Technology issued the *Development Plan on Information Communication Industry (2016-2020) (2016 No. 424)*, aiming at carrying out research on 5G standards in the 13th five-year period, constructing commercial 5G network, enabling 5G to support the integrated and innovative development of mobile Internet and Internet of things, and laying the foundation for the commercial 5G service. In 2017, HUAWEI maintained its leading position in 5G technology research, such as its high level of equipment maturity, and became a leader of technological innovation instead of a follower in the telecom industry. This will enhance China's influence on formulating the 5G network standards, improve China's bargaining power with foreign patent holders, and reduce the costs of telecom equipment manufacturers, chip companies and related companies on the supply chain of telecom equipment. 5G is expected to be commercially available in 2020, when everything will be interconnected and

human beings and machines will have deep interaction.

The independent research on supercomputer made breakthroughs.

China has ranked first for four consecutive years on supercomputing in the world. In November 2017, in the list of top 500 supercomputers in the world released by the International High Performance Computing Conference, China's Shenwei Taihu Light and Tianhe No. 2 won the first and the second places, and their floating point velocities were 9.3 quadrillion times per second and 3.39 quadrillion times per second respectively. The number of Chinese high performance computers in the list reached 202 sets, the highest record in history, and exceeded that of the United States (144 sets) by 58 sets. In terms of market share, Lenovo and Sugon were among the top 5 manufacturers, highlighting the independent research and development capacity of Chinese companies on supercomputing. It is worth noting that the Shenwei Taihu Light was totally made of domestic processors.

The development of quantum communication and quantum computing entered a fast period.

The “Quantum Communication and Quantum Computer”, one of the major projects of “Scientific and Technological Innovation 2030”, was fully launched this year. In June 2017, Chinese scientists made remarkable achievements on two-way quantum entangled distribution in the world and published a cover paper in the journal of *Science*. As soon as it was published, the paper attracted wide attention from the international academia and the media. In September 2017, Chinese and Austrian scientists successfully made the first intercontinental quantum secure video call in the world with the help of the Mo-tse satellite. In May 2017, the first light quantum computer better than the early classical computer was born in China, indicating that the quantum computer research in China is leading the world. In the future, China needs to enhance the investment, the supporting environment and the coordination of production, learning and research.

The construction of the industrial ecology of AI speeded up.

Many policies supporting AI were published in 2017, such as the *Development Plan of the New Generation AI (Guo Fa [2017] No.35)* and the *Three-Year Action Plan for Promoting the New Generation AI Industry (2018-2020)*. The huge market and a large number of leading digital enterprises in China would provide large amount of data and thus boost the rise of AI. According to the data of McKinsey's research, in 2017 the world's leading technology companies competed

for AI investment to obtain patents and intellectual property rights, and the US and China were taking the leading positions. A number of AI innovative companies were booming, such as IFLYTEK, Cambricon, Horizon Robotics, Face ++ and Sense Times. AI technology has been widely used in finance, education and security in China and keeping pace with the international level.

The exploration and research on block chain technology started.

In December 2016, the *National Informatization Plan in the "13th Five-Year"* mentioned supporting the development of block chain technology for the first time. In 2017, the policy environment of block chain was gradually improved. The People's Bank of China established the Digital Monetary Research Institute, and governments and enterprises in local areas began to carry out the research and application of block chain. However, China as a whole still stands in the exploratory stage of block chain application. In the future two challenges should be solved. On the one hand, more application scenarios should be developed. Except the digital currency, the current application of block chain in China is still in the exploration stage, and a small amount of application in tracking and recording information has not given full play to the advantages of block chain. On the other hand, the application of block chain demands high computational efficiency and huge storage. Thus, technology is still an important issue.

Appendix 1 Survey Methodology

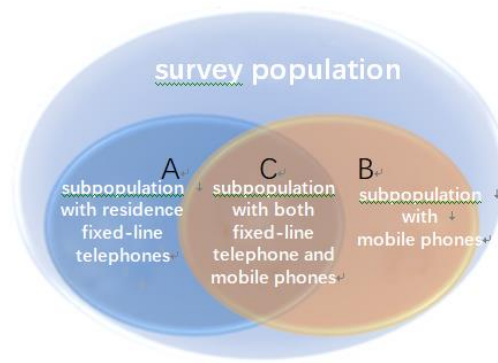
1. Survey Methodology

1.1 Survey on Individual Internet Users

Survey Population

Chinese permanent residents at the age of 6 or above who have residence fixed-line telephones (including home phones, PHS and dormitory telephones) or mobile phones

◇ Division of survey population



The survey population can be divided into three categories:

Subpopulation A: Survey subpopulation using residence fixed-line telephones (including residents with home phones, PHS users, students with dormitory telephones, and other users with dormitory telephones);

Subpopulation B: Survey subpopulation with mobile phones;

Subpopulation C: Survey subpopulation with both residence fixed-line telephones and mobile phones (there is an overlap between subpopulation A and subpopulation B, and the overlapped part is subpopulation C), $C=A \cap B$.

Sampling Method

CNNIC surveys subpopulation A, B and C. Double sampling is adopted for the survey so as to cover as many Internet users as possible. The first sampling frame is subpopulation A, the people with residence fixed-line telephones. The second sampling frame is subpopulation B, the people with mobile phones.

For the survey population with fixed-line telephones, stratified two-stage sampling is adopted.

To ensure the sufficient representativeness of samples, the whole country is divided into 31 tiers according to the province, autonomous region and municipality directly under the central government and the sampling is made independently at each tier.

The self-weighted sampling method is adopted for each province. The sample sizes for each district, city and prefecture (including the governed districts and counties) are allocated in accordance with the proportion of the people at the age of 6 or above covered by residence fixed-line telephones in the local area compared to the total population covered in the whole province.

Sampling in subpopulation B is the similar to that in subpopulation A. The whole country is divided into 31 tiers according to the provinces, autonomous regions and municipalities directly under the central government, and sampling is made independently in each tier. Samples are allocated in accordance with the proportion of the residents in each district or city, in order to make the sample allocation in each province conform to the self-weighting method.

To ensure the residence fixed-line telephones are taken with almost the same probability in each district, city or prefecture, that is, the local bureau number with more residence fixed-line telephones will more likely be taken, and to make the phone visit more feasible, the residence fixed-line telephone numbers in each district, city and prefecture are taken according to the following procedures:

For mobile phone user groups, all the mobile bureau numbers in each district, city and prefecture are sampled; a certain quantity of 4-digit random numbers are generated according to the valid sample size in each district, city or prefecture, and then combined with the mobile bureau numbers in each district, city or prefecture to form a number library (local bureau number + the random 4-digit number); randomly order the number library; dial and visit the randomly ordered number library. Survey of the subpopulation with fixed-line telephones is similar to that of the subpopulation with mobile phones: a random number is generated and combined with the local bureau number to form a telephone number, and then such number is dialed and visited. To avoid repeated sampling, only residence fixed-line telephones are visited.

Survey Method

The computer-assisted telephone interviewing (CATI) system is adopted for the survey.

Differences between survey population and targeted population

A study for the subpopulation who are not covered by telephones, conducted by CNNIC at the

end of 2005, shows that Internet users are very few in this subpopulation. Currently, the subpopulation is downsizing gradually with the development of our telecom industry. In this survey, there is an assumption, i.e.

Internet users who are not covered by fixed-line telephones or mobile phones are negligible.

1.2 Automatic Online Search and Data Report

Automatic online search is used to conduct technical statistics about the quantity of domain names and websites, and their geographical distribution. Statistical data for reporting mainly includes the number of IP addresses and international Internet gateway bandwidth.

Total Number of IP Addresses

The data of IP addresses counted by provinces come from the IP address databases of Asia-Pacific Network Information Center (APNIC) and CNNIC. Registered data in each database, that can clearly distinguish the provinces which the addresses belong to, can be added respectively by province to generate data of each province. As address allocation is a dynamic process, the statistical data are only for reference. The Ministry of Industry and Information Technology, as the national competent department for IP addresses, also require IP address allocation organizations to report the quantity of IP addresses they own biannually. To ensure the accuracy of IP data, CNNIC will compare and verify APNIC statistical data and the reported data to confirm the final quantity of IP addresses.

Total Number of Websites in China

It is worked out by CNNIC according to the lists of domain names. The lists of domain names with .CN and .中国 come from the CNNIC database, while the lists of gTLDs come from relevant international domain name registries.

International Internet Gateway Bandwidth

Through a reporting system, the Ministry of Industry and Information Technology can obtain on a regular basis the number of total bandwidth of Internet connecting Chinese operators with other countries and regions. The reported data are included in the Statistical Report on Internet Development in China.

2. Definitions of Terms in the Report

◇ **Internet Users:** Chinese residents at the age of 6 or above who have used the Internet in the past 6 months.

◇ **Mobile Internet Users:** Internet users who have used mobile phones to access and surf the Internet in the past 6 months, but not limited to those surfing the Internet via mobile phones only.

◇ **Computer Internet Users:** Internet users who have used computers to access and surf the Internet in the past 6 months, but not limited to those surfing the Internet via computers only.

◇ **Rural Internet Users:** Internet users who have been living in rural areas of China in the past 6 months.

◇ **Urban Internet Users:** Internet users who have been living in urban areas of China in the past 6 months.

◇ **IP Address:** As the basic resource on the Internet, the IP address functions to identify computers, servers and other devices connected to the Internet. Connection with the Internet can be realized only when an IP address (in any form) is acquired.

◇ **Website:** It refers to a web site with a domain name itself or “www. + domain name”. Such domain names include Chinese top level domain, such as .cn and .中国, and gTLD, and registrants of the domain names are within the territory of P.R.C. For example: for the domain name of “cnnic.cn”, it has only one website and the corresponding web address is “cnnic.cn” or “www.cnnic.cn”. Other web addresses with such domain name as the suffix, like “whois.cnnic.cn” and “mail.cnnic.cn”, are regarded as different channels of the website.

◇ **Scope of Survey:** Unless otherwise expressly indicated, data in this Report only refer to mainland China, excluding Hong Kong, Macao and Taiwan.

◇ **Deadline of survey data:** The deadline of the statistical survey data is December 31, 2017.

Appendix 2 Attached Tables of Basic Internet Resources

Table 1 The Number of IPv4 Addresses in Different Regions of China

Region	Number of Addresses	Equivalence
Mainland China	338,704,640	20A+48B+57C
Taiwan	35,523,072	2A+30B+10C
Hong Kong SAR	11,846,144	180B+194C
Macau SAR	334,080	5B+25C

Table 2 The Allocation of IPv4 Addresses among Organizations in Mainland China

Organization Name	Number of Addresses	Total Number of IPv4 Addresses
China Telecom	125,763,328	7A+126B+255C
China Unicom	69,866,752 ^{note1}	4A+42B+21C
IP Address Allocation Alliance of CNNIC	61,739,776 ^{note2}	3A+174B+19C
China Mobile	35,294,208	2A+26B+140C
China Education and Research Network	16,649,728	254B+14C
China Tietong Telecom	15,796,224 ^{note3}	241B+8C
Others	13,594,624	207B+112C
Total	338,704,640	20A+48B+57C

Data sources: Asia-Pacific Network Information Center (APNIC) and China Internet Network Information Center (CNNIC)

Note 1: The addresses of China Unicom include the addresses of former China Unicom and former China Netcom. Specifically, the IPv4 addresses 6316032 (96B+96C) of former China Unicom are assigned by CNNIC;

Note 2: As a national Internet registry (NIR) approved by APNIC and national competent authorities in China, CNNIC has organized ISPs, enterprises and public institutions of certain size in China to set up IP Address Allocation Alliance. So far, the total number of IPv4 addresses held by the members of IP Address Allocation Alliance is 84.03 million, equivalent to 5A. The IPv4 addresses of the members of IP Address Assignment Alliance listed in the above table do not include those IPv4 addresses already assigned to former China Unicom and Tietong.

Note 3: The IPv4 addresses of China Tietong Telecom are assigned by CNNIC;

Note 4: The deadline for the above statistical data is December 31, 2017.

Table 3 The Number of IPv6 Addresses in Different Regions of China (/32^{note1})

Region	Number of Addresses
Mainland China	23430 blocks/32
Taiwan	2363 blocks/32
Hong Kong SAR	361 blocks/32
Macau SAR	6 blocks/32

Table 4 The Allocation of IPv6 Addresses in Mainland China

Organization Name	Number of IPv6 Addresses (/32 ^{note1})
IP Address Allocation Alliance of CNNIC	8648 ^{note2}
China Telecom	4099
China Unicom	4097
China Mobile	4097
China Tietong Telecom	2049 ^{note3}
China Education and Research Network	18
China Science and Technology Network	17 ^{note4}
Others	405
Total	23430

Data sources: APNIC and CNNIC

Note 1: /32 as shown in the IPv6 address tables is a method to present IPv6 addresses, and the corresponding number of addresses is $2^{(128-32)}=2^{96}$.

Note 2: At present, the number of IPv6 addresses held by the members of IP Address Allocation Alliance of CNNIC is 10,714/32. The IPv6 addresses held by the members of IP Address Allocation Alliance listed in the above table do not include those IPv6 addresses already assigned to China Tietong Telecom and China Science and Technology Network (CSTNET).

Note 3: The IPv6 addresses of China Tietong Telecom are assigned by CNNIC.

Note 4: The IPv6 addresses of CSTNET are assigned by CNNIC.

Note 5: The deadline for the above statistical data is December 31, 2017.

Table 5 The Proportion of IPv4 Address in Each Province/Autonomous Region/Municipality Directly under the Central Government

Province	Proportion
Beijing	25.49%
Guangdong	9.53%
Zhejiang	6.47%
Shandong	4.89%
Jiangsu	4.76%
Shanghai	4.51%
Liaoning	3.34%
Hebei	2.85%
Sichuan	2.77%
Henan	2.63%
Hubei	2.39%
Hunan	2.36%
Fujian	1.94%
Jiangxi	1.73%
Chongqing	1.68%
Anhui	1.65%
Shaanxi	1.63%
Guangxi	1.38%
Shanxi	1.28%
Heilongjiang	1.21%
Jilin	1.21%
Tianjin	1.05%
Yunnan	0.98%
Inner Mongolia	0.78%
Xinjiang	0.60%
Hainan	0.47%
Gansu	0.47%
Guizhou	0.44%
Ningxia	0.28%
Qinghai	0.18%
Tibet	0.13%
Others	8.93%
Total	100.00%

Data sources: APNIC and CNNIC

Note 1: The above statistics are made on the basis of the location of the IP address owners.

Note 2: The deadline for the above statistical data is December 31, 2017.

Table 6 The Number and Proportion of Domain Names, .CN and .中国 Respectively by Province

Province	Domain Names		Among Which: .CN		Among Which: .中国	
			Number	Proportion in Total .CN Domain Names	Number	Proportion in Total .中国 Domain Names
Fujian	8,824,912	22.9%	5,820,350	27.9%	1,496,239	78.9%
Beijing	5,374,574	14.0%	2,752,795	13.2%	201,121	10.6%
Guangdong	3,978,682	10.3%	1,520,838	7.3%	28,764	1.5%
Shanghai	2,405,562	6.3%	1,437,350	6.9%	21,524	1.1%
Zhejiang	2,075,633	5.4%	1,166,955	5.6%	12,120	0.6%
Jiangsu	1,616,149	4.2%	609,358	2.9%	13,801	0.7%
Henan	1,231,752	3.2%	559,891	2.7%	5,220	0.3%
Shandong	1,196,463	3.1%	447,051	2.1%	16,429	0.9%
Sichuan	1,183,839	3.1%	494,879	2.4%	10,962	0.6%
Hunan	1,124,496	2.9%	719,366	3.5%	3,194	0.2%
Hubei	789,674	2.1%	406,515	2.0%	4,489	0.2%
Anhui	721,542	1.9%	261,928	1.3%	3,024	0.2%
Hebei	637,602	1.7%	229,761	1.1%	6,282	0.3%
Guangxi	528,885	1.4%	334,905	1.6%	2,412	0.1%
Liaoning	474,958	1.2%	181,654	0.9%	7,656	0.4%
Chongqing	437,663	1.1%	213,864	1.0%	5,474	0.3%
Shaanxi	396,283	1.0%	166,753	0.8%	4,597	0.2%
Hainan	385,853	1.0%	323,246	1.6%	452	0.0%
Jiangxi	332,293	0.9%	159,217	0.8%	9,005	0.5%
Tianjin	265,043	0.7%	98,504	0.5%	2,361	0.1%
Guizhou	254,716	0.7%	144,022	0.7%	1,794	0.1%
Jilin	246,436	0.6%	134,992	0.6%	2,055	0.1%
Shanxi	244,481	0.6%	107,905	0.5%	2,268	0.1%
Yunnan	233,410	0.6%	99,283	0.5%	4,998	0.3%
Heilongjiang	201,075	0.5%	74,856	0.4%	7,654	0.4%
Gansu	116,618	0.3%	49,167	0.2%	603	0.0%
Inner Mongolia	99,292	0.3%	43,796	0.2%	1,799	0.1%
Xinjiang	82,352	0.2%	32,374	0.2%	798	0.0%
Ningxia	32,747	0.1%	14,713	0.1%	1,200	0.1%
Qinghai	20,124	0.1%	4,034	0.0%	141	0.0%
Tibet	17,882	0.0%	12,684	0.1%	264	0.0%
Others	2,949,364	7.7%	2,222,507	10.7%	17,045	0.9%
Total	38,480,355	100.0%	20,845,513	100.0%	1,895,745	100.0%

Table 7 The Number of Websites by Province

	Number of Websites	Proportion in Total Number of Websites
Guangdong	777464	14.6%
Beijing	705622	13.2%
Shanghai	414567	7.8%
Zhejiang	400281	7.5%
Shandong	312313	5.9%
Fujian	302777	5.7%
Jiangsu	289345	5.4%
Henan	235364	4.4%
Sichuan	233502	4.4%
Hebei	131471	2.5%
Liaoning	123272	2.3%
Hubei	116646	2.2%
Hunan	87629	1.6%
Anhui	80503	1.5%
Shaanxi	68675	1.3%
Tianjin	58202	1.1%
Shanxi	54983	1.0%
Chongqing	54588	1.0%
Guangxi	50333	0.9%
Jiangxi	44145	0.8%
Heilongjiang	43015	0.8%
Jilin	33284	0.6%
Yunnan	26658	0.5%
Hainan	25310	0.5%
Guizhou	19741	0.4%
Inner Mongolia	17262	0.3%
Gansu	12944	0.2%
Xinjiang	10611	0.2%
Ningxia	7105	0.1%
Qinghai	3586	0.1%
Tibet	1547	0.0%
Others	590233	11.1%
Total	5332978	100.0%

Note: The total number of websites by province does not cover .EDU.CN.

Table 8 Web Pages Classified by Updating Cycle

The Updating Cycle of Web Pages	Proportion
weekly	3.4%
monthly	12.2%
every three months	20.2%
every six months	19.4%
every more than six months	44.8%
Total	100%

Data source: Baidu Online Network Technology (Beijing) Co., Ltd.

Table 9 Web Pages Classified by Suffix

The Suffix of Web Pages	Proportion
html	33.72%
htm	4.33%
/	23.11%
shtml	4.42%
asp	0.84%
php	4.08%
txt	0.00%
nsf	0.00%
xml	0.20%
jsp	1.48%
cgi	0.00%
pl	0.00%
aspx	2.18%
do	0.29%
dll	0.00%
jhtml	0.02%
cfm	0.00%
php3	0.00%
phtml	0.01%
Other suffixes	25.32%
Total	100%

Data source: Baidu Online Network Technology (Beijing) Co., Ltd.

Table 10 Web Pages Classified by Multimedia Form

The Multimedia Form of Web Pages	Proportion (in Multimedia Web Pages)
jpg	34.06%
gif	31.64%
zip	0.59%
swf	8.42%
doc	8.27%
pdf	4.70%
rm	0.00%
mid	0.00%
ram	0.00%
mp3	0.01%
ppt	0.13%
mpg	0.00%
Other multimedia	12.18%
Total	100%

Data source: Baidu Online Network Technology (Beijing) Co., Ltd.

Table 12 The Number of Bytes of Web Pages by Province

	Total Size of Web Pages	Average Size of Web Pages (KB)
Anhui	58,630,475,569	28
Beijing	7,275,356,232,274	76
Fujian	431,956,012,166	52
Gansu	4,378,226,866	39
Guangdong	1,989,606,304,004	61
Guangxi	83,308,712,473	66
Guizhou	11,289,661,784	66
Hainan	40,898,025,633	48
Hebei	895,470,202,879	85
Henan	663,378,256,550	56
Heilongjiang	137,924,970,472	53
Hubei	103,573,249,015	55
Hunan	58,456,225,079	38
Jilin	85,276,220,335	56
Jiangsu	637,124,396,865	49
Jiangxi	80,899,901,754	38
Liaoning	125,022,040,175	60
Inner Mongolia	6,967,124,727	52
Ningxia	2,681,578,181	47
Qinghai	599,107,926	39
Shandong	241,984,028,094	48
Shanxi	319,041,985,099	97
Shaanxi	52,865,106,240	33
Shanghai	1,223,064,314,249	65
Sichuan	164,401,122,513	55
Tianjin	303,446,705,841	65
Tibet	124,202,825	33
Xinjiang	3,934,850,678	38
Yunnan	111,554,662,797	63
Zhejiang	1,936,549,140,528	58
Chongqing	57,533,311,705	74
The whole country	17,107,296,355,296	66

Data source: Baidu Online Network Technology (Beijing) Co., Ltd.

Table 13 Proportion of Web Pages in Each Province, Classified by Their Updating Cycle

	Weekly	Monthly	Every Three Months	Every Six Months	Every More than Six Months
Anhui	3.3%	9.6%	18.9%	16.1%	52.1%
Beijing	3.2%	11.8%	18.9%	19.4%	46.7%
Fujian	2.7%	10.8%	15.5%	17.4%	53.6%
Gansu	3.4%	11.8%	17.1%	12.9%	54.9%
Guangdong	3.5%	12.6%	20.2%	18.3%	45.3%
Guangxi	5.3%	16.4%	26.6%	18.3%	33.3%
Guizhou	3.5%	12.0%	23.5%	17.8%	43.2%
Hainan	4.6%	12.5%	14.6%	15.2%	53.1%
Hebei	3.5%	11.4%	19.8%	17.8%	47.5%
Henan	3.2%	11.5%	20.9%	17.9%	46.6%
Heilongjiang	2.2%	10.4%	19.2%	21.3%	46.8%
Hubei	4.4%	14.4%	25.0%	22.1%	34.0%
Hunan	3.5%	11.4%	17.8%	17.7%	49.5%
Jilin	4.9%	16.2%	20.4%	20.6%	38.0%
Jiangsu	3.7%	14.0%	23.6%	20.3%	38.5%
Jiangxi	4.2%	14.2%	22.0%	17.7%	41.9%
Liaoning	3.0%	12.7%	26.1%	24.1%	34.1%
Inner Mongolia	2.5%	12.4%	27.4%	26.5%	31.1%
Ningxia	0.9%	11.7%	41.6%	34.2%	11.7%
Qinghai	6.0%	14.1%	14.2%	11.0%	54.8%
Shandong	4.1%	12.4%	23.4%	20.9%	39.2%
Shanxi	3.6%	12.8%	20.4%	21.7%	41.4%
Shaanxi	4.2%	13.0%	24.4%	22.6%	35.8%
Shanghai	2.8%	11.0%	18.4%	19.0%	48.8%
Sichuan	4.6%	16.0%	27.9%	20.1%	31.4%
Tianjin	3.6%	13.5%	23.6%	24.2%	35.0%
Tibet	5.2%	9.9%	10.2%	8.5%	66.1%
Xinjiang	4.0%	12.8%	15.4%	19.3%	48.5%
Yunnan	2.7%	9.1%	18.2%	17.2%	52.8%
Zhejiang	3.6%	13.2%	22.2%	20.7%	40.3%
Chongqing	4.6%	13.2%	18.1%	14.3%	49.9%
The whole country	3.4%	12.2%	20.2%	19.4%	44.8%

Data source: Baidu Online Network Technology (Beijing) Co., Ltd.

Table 14 Proportion of Web Pages in Each Province, Classified by Their Coding Type

	Simplified Chinese	Traditional Chinese	English	Others
Anhui	99.5%	0.3%	0.0%	0.1%
Beijing	99.2%	0.5%	0.2%	0.2%
Fujian	99.4%	0.1%	0.3%	0.2%
Gansu	99.7%	0.0%	0.1%	0.2%
Guangdong	99.0%	0.6%	0.2%	0.2%
Guangxi	99.7%	0.2%	0.1%	0.1%
Guizhou	99.8%	0.1%	0.1%	0.0%
Hainan	99.4%	0.5%	0.1%	0.0%
Hebei	99.3%	0.3%	0.2%	0.2%
Henan	99.6%	0.1%	0.1%	0.2%
Heilongjiang	99.4%	0.2%	0.3%	0.1%
Hubei	99.3%	0.3%	0.2%	0.2%
Hunan	99.6%	0.1%	0.3%	0.1%
Jilin	98.8%	0.6%	0.5%	0.1%
Jiangsu	99.4%	0.2%	0.2%	0.2%
Jiangxi	96.7%	3.0%	0.3%	0.1%
Liaoning	99.7%	0.1%	0.1%	0.1%
Inner Mongolia	99.8%	0.1%	0.1%	0.1%
Ningxia	99.8%	0.0%	0.1%	0.0%
Qinghai	99.8%	0.0%	0.1%	0.1%
Shandong	97.5%	1.2%	1.2%	0.2%
Shanxi	98.3%	1.4%	0.1%	0.3%
Shaanxi	98.5%	0.1%	1.2%	0.3%
Shanghai	98.9%	0.9%	0.1%	0.1%
Sichuan	99.6%	0.1%	0.1%	0.1%
Tianjin	98.9%	0.7%	0.2%	0.2%
Tibet	98.6%	0.0%	0.5%	0.9%
Xinjiang	98.9%	0.5%	0.1%	0.4%
Yunnan	99.2%	0.1%	0.1%	0.7%
Zhejiang	97.9%	1.5%	0.4%	0.1%
Chongqing	99.5%	0.3%	0.1%	0.2%
The whole country	99.0%	0.6%	0.2%	0.2%

Data source: Baidu Online Network Technology (Beijing) Co., Ltd.

Appendix 3 Supporting Organizations

We would like to express our heartfelt thanks to the following organizations that have supported the collection of data on basic resources. (Not listed in any particular order)

China Telecom

Network Center of CERNET

Network Center of CSTNET

China Unicom

China Mobile

China Organizational Name Administration Center

Ministry of Industry and Information Technology

Alibaba Cloud Computing Co. Ltd.

Baidu Online Network Technology (Beijing) Co., Ltd.

Beijing Guoxu Network Technology Co., Ltd.

Beijing Lanhaijiye Technology Co., Ltd.

Beijing Wangzun Technology Co., Ltd.

Beijing Xinwanghulian Software Service Co., Ltd.

Beijing Xinnet Digital Information Technology Co., Ltd.

Beijing SanFront Information Technology Co., Ltd.

Beijing Zhongwan Network Technology Co., Ltd.

Chengdu Feishu Technology Co., Ltd.

Chengdu Shijidongfang Network Communication Co., Ltd.

Chengdu West Dimension Digital Technology Co., Ltd.

Foshan Yidong Network Co., Ltd.

Fujian Litian Network Technology Co., Ltd.

Guangdong Jinwanbang Technology Investment Co., Ltd.

Guangdong NaiSiNiKe Information Technology Co., Ltd.

Guangdong Shidai Hulian Technology Co., Ltd.
Guangxi Beibu Gulf Investment Group Co., Ltd.
Guangzhou Mingyang Information Technology Co., Ltd.
Henan Weichuang Network Technology Co., Ltd.
Jiangsu Bangning Technology Co., Ltd.
Xiamen Nawang Technology Co., Ltd.
Xiamen 35.com Technology Co., Ltd.
Xiamen Shangzhong Online Technology Co., Ltd.
Xiamen CNSPEED Network Technology Co., Ltd.
Xiamen ZZY Network Service Co., Ltd.
Xiamen Xin-ClickNet Technology Co., Ltd.
Xiamen eName Technology Co., Ltd.
Shanghai Best Oray Information Technology Co., Ltd.
Shanghai Meicheng Technology Information Development Co., Ltd.
Shanghai Yovole Network Co., Ltd.
Tianjin Zhuri Technology Development Co., Ltd.
Zhejiang 22net Inc.
Zhengzhou Shijichuanglian Electronic Technology Development Co., Ltd.
Zhengzhou Zitian Network Technology Co., Ltd.

We would like to express our heartfelt thanks to the following organizations that have supported the collection of data on sharing bicycles. (Not listed in any particular order)

Beijing Mobike Technology Co., Ltd
Beijing OFO Technology Co., Ltd

We would like to express our heartfelt thanks to the following organizations that have supported the collection of data on government applications. (Not listed in any particular order)

Shenzhen Tencent Computer System Co., Ltd.
Beijing Micro Dream Network Technology Co., Ltd. (Micro-blog)
Beijing Bytedance Technology Co., Ltd. (Toutiao)

We would like to express our heartfelt thanks to the following organizations that have

supported the collection of data on cyber security. (Not listed in any particular order)

National Internet Emergency Center (CNCERT)

China Reporting Center for Illegal and Inappropriate Internet Information (12377)

Beijing Qihu360 Technology Co., Ltd.

Shenzhen Tencent Computer System Co., Ltd.

Appendix 4 An Introduction to CNIDP

The China Internet Information Data Platform (CNIDP.CN) : Providing Open and Shared Internet Statistical Data and Services

- ◆ Launched and run by CNNIC
- ◆ Providing Internet statistical data and services for free
- ◆ Reflecting the situation of Internet development in China objectively and timely

Website of the Platform: www.cnidp.cn

Introduction to the Platform

The China Internet Information Data Platform (CNIDP), launched and run by CNNIC, adopts the research method of fixed sample panel, to investigate the using behavior data of Chinese Internet user samples collected at the client-side continuously in real time and analyze those data statistically. It reflects multiple facets (macro and micro) of the Internet development situation in China and provides multifaceted decision-making support for the participants of the Internet industry.

Function Demonstration

<p>Statistical Data</p> <p>It provides weekly, monthly, quarterly and half-year statistical data, including the covered users, visiting times, page views, visiting duration and other indicators, regarding domestic mainstream websites/software; the data are updated within no more than 3 days.</p>	 <p>覆盖人数 访问次数 PV 页面浏览量 访问时长</p>
	<p>User Characteristics</p> <p>It provides multi-dimensional structural distribution data, classified by gender, age, education background, occupation, income, region and development level of city, regarding domestic mainstream websites/software.</p>
<p>Overlap Analysis</p> <p>It does statistics about user group overlaps and the structural distribution of different user groups, regarding different websites/software.</p>	
	<p>Trend Comparison</p> <p>It provides detailed historical statistics on a daily basis regarding domestic mainstream websites/software, so as to reflect trends of historical changes.</p>

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