

Report on China Internet Development 2017

Overview

Looking at the history of world civilizations, humanity has progressed along with agricultural, industrial and information revolutions. Each of these industrial and technological revolutions has had great and profound impact on our way of production and life. Today, information technologies represented by the Internet are experiencing rapid changes with each passing day. They have brought about new ways of social production, created new space for people's life, opened new horizons of state governance, and enhanced our ability to understand and shape the world. China is going through a historic process of rapid application of information technologies. The country attaches great importance to Internet development. Since it was connected to World Wide Web 23 years ago, we have, in keeping with the principles of proactive utilization, rational development, law-based regulation and assurance of security, strengthened IT infrastructure, developed digital economy and made life better for our people through IT application.

Since the 18th National Congress of the Communist Party of China (CPC), the CPC Central Leadership, with Xi Jinping as the core, holding the right banner, has been making the right strategies, conquering one difficult after another, forging ahead and launching reforms and innovations. They try to make everything better by considering the overall domestic and international situation. They have been planning and promoting the general layout of "Five in One" (*economic, political, cultural, social, and ecological progress*), coordinating and promoting the strategic layout of "Four Comprehensives" strategy (*to comprehensively deepen reform, comprehensively*

advance rule of law, and comprehensively strictly govern the Party so as to provide strong impetus and guarantee for comprehensively building a moderately prosperous society), carrying out new development ideas, further reforming difficult areas, and promoting ethical party and government construction and combating corruption. Thus many problems have been solved that remained unsolved before, and many desirable things have been done that remained undone, leading to historic changes in the CPC and state governance, and to the establishment of the guiding position of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era. The CPC Central Leadership stresses cyber security and information security, listing the perfection of the cyberspace leadership mechanism as one of the sixty reform tasks defined at the Third Plenum of the 18th CPC Central Committee. Thus the Central Leading Group for Cyber Affairs was formed, who integrates and coordinates cyber security and informatization issues in politics, economy, culture, society and military affairs. CPC General Secretary Xi Jinping, a visionary man, has put forward a series of new ideas, thoughts and strategies based on China's practice of Internet governance, systematically illustrating the important theoretical and practical issues concerning cyber security and informatization and thus forming rich, profound, scientific and systematic strategic thoughts on developing and strengthening China through Internet development. On the 19th CPC National Congress, the "Two Step Development Strategy" was put forward, ushering in a new era of building socialism with Chinese characteristics. The Congress has made strategic deployments on promoting development of Internet, big data, AI, and sharing economy so as to turn China into an influential country in cyberspace and a leading one in digital development and smart society, which will guide China's Internet development in years to come.

I. Achievements of China's Internet Development

Guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and his strategic thought on developing and strengthening China through Internet development in particular, the top-level design and general framework for the

country's Internet development and governance have been basically finished, positive energy and main theme spread has become the trend in the cyberspace, which is becoming cleaner day by day. China's cyber security has been consolidated. In the country, informatization plays an outstanding role in driving and leading the economic development. Meanwhile, China's power of discourse and influence concerning cyberspace in the world have increased, and the Chinese people have got more sense of gain in sharing the results of Internet development. All in all, we have achieved a lot in Internet development.

Network infrastructure has become a new type of public infrastructure that promotes economic and social development. General Secretary Xi Jinping points out that we should strengthen network infrastructure construction and in-depth information resource integration, and open up the “main artery” of information for economic and social development. Aware of the trend of the global Internet development, China is now implementing the “Broadband China” Strategy and launching the action of “Facilitating Faster and More Affordable Internet Connection”. We are constantly promoting network infrastructure construction and upgrading, and improving the capacity of broadband access, Internet service quality and application level. We are the leader in the world in broadband network scale and construction quality. By June 2017, the bandwidth of China's backbone network had exceeded 100Tbps, and that of international export had reached 7974.779Gbps; the number of the Internet broadband access ports had reached 739 million; that of fixed broadband users, 322 million; and that of mobile communication, 1.36 billion, including 890 million 4G users¹. Network infrastructure in rural areas has witnessed leapfrog development, general service in telecommunication has improved greatly, and all townships and 93.5 percent of administrative villages have access to broadband. Application infrastructure is developing fast, the node number of Content Distribution Network (CDN) has reached over 2,400, and peak broadband

¹ Data source: Economic Performance of Telecommunications Jan. to Jun., 2017, Ministry of Industry and Information Technology of the People's Republic of China (MIIT); The 40th China Statistical Report on Internet Development, China Internet Network Information Center (CNNIC)

reserve has exceeded 10TB. The quantity of key Internet resource has seen great growth, with the number of IPv4 addresses amounting to 338 million, that of IPv6 to 21,283 (in terms of blocks)/ 32 (in terms of addresses), both ranking second in the world. The number of registered domain names (.CN) is 20.61 million², ranking first in the world.

Breakthroughs have been made in Internet information technology. General Secretary Xi Jinping points out that China should speed up its self-dependent innovation of core technologies in information area and thus to narrow the gap between China and developed countries and even to become the leader of the world in some IT areas. According to Xi, by implementing the innovation-driven development strategy, China should launch a series of key projects with long-term benefits to the overall development of the country, carry out with unified strength researches into key generic technologies of the Internet and into cutting-edge technologies, trying to make breakthroughs in high-performance computing, quantum communication, artificial intelligence, cloud computing, big data, kernel processor chip, operating system and 5G technology. By the end of 2016, the country had had 227,365 valid invention patents in computer, communication and other electronic equipment manufacturing, including 118,725 in the single year of 2016, putting China on the top of the world in terms of international patent registration four times in recent five years. Mozi Satellite, China's first quantum science experimental satellite, has been successfully launched into the sky; Beijing-Shanghai Trunk, the world's first quantum confidential communication network, has been opened, covering over 2,000 kilometers; and Beidou Navigation System (BDS), a global satellite navigation system researched and developed by China itself, has been applied in a large scale, with two Beidou No. 3 satellites launched at the first time, leading the country into a new era of globally networking. China has taken active part in the formulation of international telecommunication technology standards, playing a leading role in completing a number of IETF standards, making key breakthroughs in IPv4/IPv6 interconnection,

² Data source: The 40th China Statistical Report on Internet Development, CNNIC

cyber security and routing protocols, and producing increasing influence on the next-generation core technologies of the Internet.

New economy represented by digital economy is thriving. According to General Secretary Xi Jinping, cyber and information technology sector represents the new productivity and new development direction, so it is expected to take one step ahead in practicing the new development philosophy. China gives full play to informatization's role in driving and leading the development of economy and society and develops its digital economy, having made remarkable achievements in e-commerce, information service, network terminal equipment, Internet finance, sharing economy and Internet+ integration. In 2016, the country's digital economic gross scale reached RMB 22.58 trillion *yuan*, leaping to the second place of the world, and accounting for 30.3 percent of national GDP³. Digital economy has become the new engine and new highlight of China's economic growth. E-commerce, the most active sphere in China's digital economy today, involved 467 million online shoppers in 2016, with its transaction volume amounting to RMB 26.1 trillion *yuan*⁴ and online retail sales volume to RMB 5.2 trillion *yuan*, ranking first in the world. Sharing economy is booming, with the market turnover amounting to RMB 3.45 trillion *yuan*⁵ in 2016. China's Internet finance is also developing rapidly, with the number of its electronic payment services amounting to 139.56 billion in 2016, and thus a service value of RMB 2,494.5 trillion *yuan*⁶. The country encourages, supports and regulates the development of digital economy through political guiding and administration under laws to create a favourable market environment for information network business, which has led to the increase of international influence of a number of companies such as Alibaba, Tencent, Baidu, and Huawei, and the emergence of many

³ Data source: White Paper of China's Digital Economy Development 2017, China Academy of Information and Communications Technology, (CAICT)

⁴ Data source: Report on China's E-commerce 2016, Ministry of Commerce of the People's Republic of China (MOFCOM)

⁵ Data source: Report on China's Sharing Economy Development 2017, Research Branch of Sharing Economy, State Information Center of China (SIC) and Sharing Economy Working Committee, Internet Society of China (ISC)

⁶ Data source: Overview of Payment System Operation, The People's Bank of China (PBOC)

new Internet companies with innovation energy. As of October 2017, 730 Chinese companies in this area have gone public at home or abroad, with a total market value exceeding RMB 17.5 trillion *yuan*. Among the world's top 20 Internet companies in terms of market value, there are eight from China.

The development of e-government has helped to innovate social governance. General Secretary Xi Jinping stresses that we should speed up our e-government and encourage the governments of different levels to break the information barrier and improve their service efficiency so that the common people will made less effort to get more information even from afar and so that we can make things easier, faster and simpler. China has listed “Internet +e-government” into the 12 priorities under the *National Informatization Planning for the Thirteenth-five-year Plan Period*, having formulated policies such as *Guidelines on Promoting the Coordinated Development of E-government* and *Guidelines on Speeding up the Internet + E-government*. All the local governments are expected, in accordance with the planning made by the Central Government, to keep deepening the application of e-government, establish the mechanism of governmental interlink, information sharing and business interconnection, promote the construction of online service platforms for public service integration, and provide the full-flow, one-stop online service across sectors and areas. By the end of 2016, out of 31 provinces, autonomous regions and municipalities directly under the Central Government, and Xinjiang Production and Construction Corps, 27 had established the provincial e-government service platform⁷. New media of e-government are witnessing rapid development. By June 2017, there had been 170,000 e-government weibo accounts verified by SinaWeibo Open Platform, and 514, 000 e-government WeChat public accounts. They are new means of enhancing information openness, interaction between the governments and the people, and supervision from the people, guaranteeing the citizens' rights to know, to participate, to express their opinions and to supervise the governments.

The capacity of cyber security safeguarding keeps improving. General

⁷ Data source: Blue Book of E-government: Report on China's E-government Development 2017, Social Sciences Academic Press of China

Secretary Xi Jinping points out that without cyber security there would be no national security and without informatization there would be no modernization. According to Xi, security ensures development, and development is what security is aimed at. China has formulated a series of laws, regulations, strategies and plans including the *Cyber Security Law of the People's Republic of China* and the *National Cyber Security Strategy*, established and strengthened the cyber security accountability, cyber security review mechanism, and cyber security monitoring, warning and response mechanism, amended the *National Emergency Response Plan for Internet Security Incidents*, and enhanced cyber security awareness and capacity of incident analyzing and tracing as well as of quick recovery after cyber attacks. The country has reinforced the security protection of key network infrastructure, and has, for the first time, launched nationwide inspection on the key network infrastructure in the key areas like finance, energy, electric power, communication and transportation to promote improvement and construction. It is speeding up standardization of cyber security. By the end of 2016, the National Technical Committee for Information Security Standardization (NTCISS) had issued 195 information safety standards⁸. The cyber security industry scale keeps increasing, with over 1,000 such enterprises and RMB 135.5 billion *yuan*⁹ of value in 2017. The first-level disciplines of cyber security have been established in universities. Seven demonstration projects in cyber security colleges have been launched and cyber security schools have been established in 21 universities. Insisting that the cyber security should serve and rely on the people, we attach importance to cyber security publicity and education, having held four “National Cyber Security Publicity Weeks”, involving over two billion participants, and thus the cyber security awareness and techniques have been dramatically improved nationwide.

The cyberspace is becoming clearer day by day. General Secretary Xi has pointed out that the cyberspace is the common home of humankind. Making it better,

⁸ Data source: CCID

⁹ Data source: Blue Book of China's Cyber Security Development 2016-2017, China Academy of Electronics and Information Industry Development

cleaner and safer is the common responsibility of the international community, according with the interests of the people. Positive energy spread in cyber content construction and administration is the general requirement, and the controllability is the absolute principle. We are enhancing positive publicity, innovating the dissemination means, managing the timeliness, appropriateness and efficiency of public opinion in cyberspace, improving the transmissibility, leadership, influence, and credibility, and launching a large number of phenomenal news broadcasts and thematic publicity products conforming to the online dissemination features and the interest of users. All of these measures have helped to increase the rate of arrival, reading and thumbing up. We also pay attention to the cultivation and practice of the core socialist values. For example, we have launched the online dissemination of excellent Chinese culture and cultivate healthy online culture, so that the core socialist values can be adopted to increase cohesion of society. We have adopted legal, administrative and technical means to strengthen the cyberspace administration, improve the network communication law enforcement system and mechanism, promote Internet governance, opening and visiting in accordance with laws, and enhance the accountability of competent authorities for the local cyberspace administration and the responsibility of website entities, and advocate administration in a scientific and regulated way. Full play has been given to the roles of social organizations, enterprises and specialists, and the mode of network environment management involving different participants has been formed. The mechanism for linked tackling of illegal information and websites, and complaints from users has been improved. In 2016, 40 million complaints were tackled, and more than 92 percent of harmful information was disposed of. So far, twenty specific projects like “cleaning” and “seedling-protection” have been launched to dispose of harmful information, which has helped to make cyberspace cleaner.

China’s power of discourse and influence in cyberspace keeps increasing. General Secretary Xi Jinping has illustrated the concept of the international cyberspace administration on many an occasion. He has proposed “four principles” for promoting the global Internet governance system reform and “five proposals” for

constructing a community of shared future in cyberspace, which has contributed to global Internet development and governance. Guided by Xi's "four principles" and "five proposals", China has released *Strategy of International Cooperation in Cyberspace*. It enhances its communication and cooperation with other countries, and participates in and produces influence on the progressing of the international Internet governance. It has listed "digital economy" as the theme of G20 Summit for the first time in the history of G20 Summit, and released the *G20 Digital Economy Development and Cooperation Initiative*, in the formulation of which China was the coordinator. We have enhanced the almost totally self-reliant construction of the Internet governance platforms and opened and hosted three times the World Internet Conference (Wuzhen Summit), with 4,600 participants, including officials, specialists, entrepreneurs, and leaders from different countries and international organizations. The Wuzhen Summit has become the international platform for interconnectivity between China and other countries and the Chinese platform for Internet sharing and shared governance. We have deepened the cyberspace cooperation in the framework of the UN, APEC, and BRICS, promoted the internationalization of Internet name and digital address distribution mechanisms, as well as bilateral communication and cooperation between China and the US, Russia and Europe. Cooperation has been launched among countries along the Belt & Road, the construction of key projects like China-ASEAN Information Harbor, China-Arab States Online Silk Road Ningxia Pivot has been accelerated, and China's views on Internet governance have been made into common consensus. The country's power of discourse and influence in cyberspace has increased dramatically.

The Chinese people are sharing the benefits of Internet development. General Secretary Xi Jinping points out that the development of the Internet development must be oriented to benefit the people, who can afford to use the Internet and then have the chance to use it and use it well, thus having the sense of gain in enjoying the benefits of Internet development. By June 2017, the number of China's Internet users had reached 751 million and that of websites in the country, 506

million¹⁰. The Internet has become an indispensable part in our daily life, with hundreds of millions of Internet users obtaining and exchanging information on it. We have implemented as a whole five projects of poverty alleviation through the Internet, which has seen great success thanks to the targeted poverty alleviation and elimination. We are promoting resource sharing and developing education through the Internet to realize education equality and improve the efficiency. In 2016, the online education market scale was RMB156 billion *yuan*. We are making information service convenient and beneficial to the people, who then can go through official procedures, do shopping, see the doctor and pay on the Internet. By the end of 2016, over 400 cities had opened up online city service through WeChat and Alipay, covering 50 types of online service and over 400 million users.

II. Assessment of the Internet development in all provinces, autonomous regions and municipalities directly under the Central Government

In this report, we set up China's Internet Development Index System covering infrastructure construction, innovation capacity, digital economic development, Internet application, cyber security and cyberspace regulation. We have made an objective, authentic and accurate assessment of the effect and level of the Internet development in all provinces, autonomous regions and municipalities directly under the Central Government. Scientific analysis and quantitative assessment have been adopted as the method. It is a comprehensive assessment index system in the Internet area, the first of its kind in China.

1. China's Internet Development Index is the specification, standardization and indexation of General Secretary Xi Jinping's strategic thought on developing and strengthening the country through the Internet. Guided by Xi's thought, and based on the "six accelerations" (*namely, to accelerate self-dependent innovation in network information technologies, to accelerate digital economy's drive for economic development, to accelerate the improvement of cyberspace administration, to accelerate cyber security protection, to accelerate the promotion*

¹⁰ Data source: The 40th China Statistical Report on Internet Development, CNNIC

of social governance through network information technologies, and to accelerate the enhancement of China's power of discourse and rule-making right in the world in terms of cyberspace) put forward by President Xi when he presided over the 36th Collective Study Session of the Political Bureau of the CPC Central Committee, our assessment covers the major content of cyber security and informatization. The Index System will make local governments more aware of their strategic goals and focus of Internet development, as well as their comparative, geographical and development advantages, so that they can take more practical and efficient measures to fulfill the local responsibilities, improve their local Internet development and governance and promote the development of the national cyberspace administration and information sector in the direction defined by Xi Jinping.

2. China's Internet Development Index focuses on the domestic situation through a comparison with the international situation. Based on the domestic situation, by referring to the E-Government Development Index (EGDI), ICT Development Index, Global Cyberspace Security Index, and Networked Readiness Index (NRI) released by the UN, International Telecommunication Union (ITU) and World Economic Forum (WEF), and referring to the weight distribution and calculation method contained in the World Internet Development Report 2017, we have got the scores of the Internet Development Index of 31 provinces, autonomous regions and municipalities in accordance with China's score (41.8), providing measurable and referable basis for all provinces, autonomous regions and municipalities.

3. China's Internet Development Index is an objective, authentic and accurate assessment of the effect and level of the Internet development in all provinces, autonomous regions and municipalities directly under the Central Government. To ensure the scientificity, accuracy and authority of the Index, we have adopted all the data and materials provided by the local authorities and referred to statistics and materials provided by local departments, industries, research institutes and enterprises. But, due to the limited data collection, our assessment in 2017 does not involve Hong Kong, Macao and Taiwan. Besides, in view that the system has just

been established, it is to be tested. We will adjust and improve the index system, enhance data collection and expand the coverage, so that the assessment will reflect the reality more completely, accurately and scientifically.

Table 1: China's Internet Development Index System

Indicator	Key assessment factors	Weight	Specification
Infrastructure construction	Number of broadband access ports and percentage of optical fiber users, number of 4G mobile base stations, number of wireless network accesses and access speed	18%	Local infrastructure construction level and Internet coverage of broadband, mobile and wireless network
Innovation capacity	Number of patents registered, accumulated patent efficiency, human resources, and investment in R &D.	16%	Level , capacity and environment of local industrial innovation and local talents cultivation
Development of digital economy	ICT industry, income of telecommunication, e-commerce, Internet finance, and sharing economy	16%	Development of local ICT industry and e-commerce
Internet Application	Rate of individuals' use of the Internet for socializing, entertainment and finance, rate of corporations' use of the Internet, and online governments	25%	Local individuals' use and corporations' use of the Internet, and e-government
Cyber security	Cyber security working mechanism, cyber security holes protection, phishing site intercept, and Internet users' cyberspace security awareness	13%	Security and protection of local WiFi, websites, and personal information

Cyber regulation	Establishment of cyber organizations, number of governmental Weibo and WeChat accounts, and net commentators' number	12%	Capability of constructing and managing local cyber regulation organizations and personnel
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Following the above weight distribution and calculation method, we have got the scores of the Internet Development Index of 31 provinces, autonomous regions and municipalities of China.

Table 2 Ranking of the Provinces, Autonomous Regions and Municipalities in the Assessment of the Internet Development

Ranking	Region	Index of infrastructure construction	Index of innovation capacity	Index of development of digital economy	Index of Internet application	Index of cyber security	Index of cyberspace regulation	Total score
1	Guangdong	5.75	7.69	7.65	16.27	3.83	3.99	45.19
2	Beijing	6.66	5.68	5.51	18.93	3.57	4.35	44.70
3	Zhejiang	7.34	6.73	6.46	14.60	2.93	4.31	42.36
4	Jiangsu	7.44	7.60	6.62	13.03	3.57	3.65	41.92
5	Shanghai	6.47	4.18	4.50	16.81	3.05	3.93	38.94
6	Fujian	5.53	2.89	3.89	14.46	3.66	3.00	33.43
7	Sichuan	5.19	2.79	3.65	12.50	4.17	3.74	32.04
8	Shandong	5.98	4.69	3.72	11.24	2.81	3.01	31.45
9	Tianjin	5.49	3.50	2.67	12.40	3.91	2.72	30.69
10	Hubei	3.94	2.69	4.35	11.86	4.39	3.11	30.34
11	Anhui	2.52	3.20	3.26	11.98	5.22	2.68	28.86
12	Henan	6.49	2.94	2.82	8.95	3.27	3.73	28.20
13	Shaanxi	3.32	2.50	2.94	12.50	3.58	3.23	28.07
14	Hunan	5.39	2.50	2.50	12.43	2.70	2.55	28.06
15	Liaoning	6.36	2.42	3.22	10.24	2.56	3.02	27.81
16	Hainan	2.89	2.01	2.46	13.98	3.63	2.66	27.62
17	Chongqing	5.76	2.48	3.08	10.08	3.32	2.84	27.57
18	Shanxi	4.34	2.11	2.76	10.19	4.59	2.85	26.83
19	Hebei	6.55	2.31	2.34	8.47	3.62	3.02	26.31

20	Guizhou	4.89	2.63	2.26	9.86	3.49	2.87	25.99
21	Qinghai	3.94	2.40	2.32	9.25	5.32	2.60	25.81
22	Guangxi	4.61	2.18	1.97	10.09	3.70	2.92	25.48
23	Xinjiang	3.63	2.78	2.44	8.21	4.51	3.84	25.41
24	Jiangxi	4.30	2.49	2.51	9.86	2.92	2.57	24.64
25	Inner Mongolia	4.39	1.61	2.29	8.90	4.31	2.89	24.41
26	Ningxia	5.20	1.87	2.64	7.49	4.48	2.69	24.37
27	Heilongjiang	3.94	2.18	1.99	9.27	2.93	2.81	23.12
28	Yunnan	1.90	2.12	2.60	10.56	4.33	1.24	22.74
29	Xizang (Tibet)	1.97	0.77	1.69	7.46	6.99	3.49	22.37
30	Jilin	4.73	1.85	1.83	8.35	2.76	2.77	22.30
31	Gansu	3.22	2.35	2.39	7.96	4.45	1.91	22.28

In general, since the 18th CPC National Conference, the whole nation has been carrying out General Secretary Xi Jinping's strategic thought on developing and strengthening the country through the Internet. They are, in accordance with the unified arrangement by the CPC Central Committee, enhancing the cyber content construction, cyber security guarantee, and informatization through a series of new creations and practices based on their local reality, and have achieved great success.

In terms of infrastructure, the coverage of information infrastructure and the number of Internet users have increased, and the gap between urban and rural areas in information infrastructure is narrowing since the local governments have increased the fund and political support. In general, there is positive correlation between the information infrastructure development and the local economic and social development and investment level, and in some regions, the information infrastructure development is even ahead of the local economic and social development and investment level. For example, Guangdong, Sichuan and Fujian take the lead in the FTTH (Fiber to The Home) and 4G network, Guizhou, Hubei and Shanxi are constructing their data center and new-type infrastructure to lay a solid infrastructure foundation for the Internet development.

In terms of innovation capacity, all regions participating in the assessment have begun to take network information technology innovation as the grip for the local

innovative development. For example, Beijing and Shanghai, by taking the advantage of having more talents and technology, take the lead in developing artificial intelligence technology, having made breakthroughs in artificial intelligence chips; Inner Mongolia and Shaanxi have increased their support for innovation projects in the areas concerning information, encourage patent registration and application, and support research institutes and Internet enterprises in establishing core technology R&D centers and industrial alliances, and promote R&D design mode revolution; Guizhou, Shandong and Jilin support high-end information industry development, and especially support telecommunication, chip and software industry development with leading technology.

In terms of development of digital economy, all regions participating in the assessment take e-commerce and sharing economy as the development focus, so e-commerce is increasing and seeing little regional difference. Regions leading in e-commerce attach importance to mode innovation, cultivate unique features, increase the scale and go global. For example, Zhejiang takes the lead in digital economy scale by establishing experiment and advance zones for information economy development, and seven centers including the International E-commerce Center, National Intelligence Logistics Center, and National Digital Content Industry Center. Chongqing is trying to become one of the national pilot cities of the provincial level in terms of e-commerce, and Henan is cultivating local e-commerce platforms, trying to take the lead in the country in terms of industrial segment of e-commerce.

In terms of Internet application, application dimension of new technologies represented by the Internet has been increasing, with diversified individual application, in-depth industrial application and efficient governmental application. For example, Beijing, Shanghai, Hunan and Heilongjiang are fostering their new local media and trying to establish new models like Internet+ senior citizens caring and online teaching. The client use ratio of Toutiao, The Paper and Inke keeps increasing. Enterprises in Zhejiang, Guangdong and Shaanxi have launched intelligent production and network-based management by using big data, industrial cloud platforms and industrial software. Inner Mongolia, Ningxia and Henan are promoting precise

production of agriculture and animal husbandry by using the prairie big data system and agricultural intelligent networking system. Guangdong has set up the assessment mechanism for governmental websites, and Guangxi and Hainan have set up governmental information sharing platforms and provide one-stop online government service, so their e-government has seen great success.

In terms of cyber security, since the cyber security accountability system was adopted, especially since the Key Information Infrastructure Inspection and China Cyber Security Week were carried out, the cyber security awareness and guarantee strength have obviously increased in different regions, but there remain problems like insufficient organization guarantee and insufficient talents support. Provinces like Shaanxi has strengthened cyber security monitoring and found and blocked cyber attacks. Beijing, Guangdong and Sichuan have seen rapid development of cyber security industry. Jiangsu and Hubei have established cyber security colleges to enhance the cultivation of talents in that field, with great potential in development.

In terms of cyberspace regulation, all local governments are, in accordance with the unified requirement of the Central Government, promoting the establishment of provincial and prefectural cyberspace administration organizations, innovating the cyberspace administration patterns, strengthening team-building and fulfilling local accountability. For example, Beijing, Shanghai, Guangdong and Qinghai have constructed website classification and categorization administration systems, urging websites to fulfill their accountability and increasing the pertinence of the administration. Jiangxi has extended cyberspace administration organization construction to the county level, and channeled cyberspace administration into the local assessment indicator system. Tibet became the first to set up and improve three-level cyberspace administration organizations, namely, the autonomous region level, the prefectural level and the county level, which has helped to form an integrated cyberspace public sentiment monitoring, guidance and governance platform system and thus has improved the cyberspace administration capacity. Xinjiang attaches importance to institutional construction and team-building, punishment and governance of illegal information spread. They have achieved great

success in cyberspace crime punishment and punishment of piracy and patent infringement. Ningxia, Chongqing and Qinghai have, in accordance with the local needs for the Internet development and governance, launched a series of laws and regulations on mobile Internet administration and webcast service.

III. China's Experience in Internet Development

China attaches importance to both development and governance of the Internet. After 23 years of development, the country has made historic achievements, witnessed historic changes and found a path of Internet governance with Chinese characteristics, thus contributing China's experience and wisdom to the global Internet development and governance. The country's experience in Internet development can be summarized as follows:

1. Ensuring the CPC's leadership in cyberspace affairs. The leadership of the Communication Party of China (CPC) is the greatest advantage for the socialist system with Chinese characteristics and for the rapid development of China's Internet. Since the country's full-function access to the Internet in 1994, its Internet has developed from nothing to something, from small to big and from weak to strong. During the process, the CPC is not only the decision-maker on the country's access to the Internet, but also the planner, organizer, promoter and navigator of its network construction, development and administration. Since the 18th CPC National Congress, the Central Leadership of CPC with Xi Jinping as the core has been attaching great importance to cyber security and informatization. They have taken the improvement of the cyberspace administration leadership mechanism as one of the 60 reforms defined at the Third Plenum Session of the 18th CPC National Congress. They founded the Central Leading Group for Cyberspace Affairs, of which Xi is the director and Li Keqiang and Liu Yunshan the deputy directors. General Secretary Xi Jinping has chaired a series of meetings and symposiums, such as the Meeting of the Central Leading Group for Cyberspace Affairs, the Symposium on Cyber Security and Informatization, and the 36th Collective Study Session of the Political Bureau of the CPC Central Committee, putting forward a series of new ideas, thoughts and

strategies about cyber security and informatization, drawing the great blueprint for China's Internet development, and thus defining the direction and guidelines for cyber security and informatization of all sectors.

2. Committing to the people-centered development philosophy. The Internet has become the new space for people's study, work and life, and the new platform for obtaining public services. Over the past 23 years, China has been pursuing the basic principle of developing the Internet to benefit its people. By developing the Internet, the country is speeding up the coverage of information service, reducing the application cost, carrying out poverty alleviation, and meeting the expectation and need of the people. It is enhancing content construction and governance of the Internet, punishing illegal online actions and crimes, and creating clean cyberspace for Internet users, especially young people. The Party is carrying out the mass line, using the Internet to gather the public opinions, unite the people, carry out some work and mobilize the initiative and enthusiasm of the people, who contribute to and enjoy the Internet development results.

3. Taking innovation as the first driver for Internet development. Cyberspace administration represents new productivity and new development direction, so it must be ahead in new idea practice. In developing its Internet, China is carrying out Five Development Concepts, namely, innovation, coordination, greenness, openness and sharing, with innovation always in the very first place. The country is brave enough to innovate and reform. It is speeding up the innovation in system and mechanism, ideas, technology, culture and application by making use of the features and advantages of the Internet. It releases new demand, creates new supply, cultivates new drive, optimizes the allocative efficiency of labour, capital, land, technology and management. It also cultivates and attracts a large group of Internet entrepreneurs, talents, leading figures in this field, and enhances the thriving of new technologies, new industries, and new ecology, so that the Internet has become the rising field with the most active innovation and the most rapid development.

4 . Pursuing both opening up and self-reliance. To tackle the relationship

between opening up and self-reliance is the basic experience of China over the past 30 years and the solid foundation for the rapid Internet development of the country. As is known, core technology is a nation's treasure, so China, with self-dependent innovation, self-reliance and self-improvement, would like to cooperate with others in developing fundamental technologies and general technologies, asymmetric techniques and trump-card techniques, core technologies like cutting-edge technology and game-changing technology, and thus we can make breakthroughs in R&D of chips for cell phones, super computers, servers and searching technologies. Besides, China keeps constructing everything in opening up and introduces and absorbs advanced technologies and fruits from global network information areas, and makes its Internet development keep up with the world's pace and trend, so that the country has become the leader in many areas of the Internet.

5. Pursuing paralleled development of regulation and service. China's Internet enterprises have been developing from small to big and from weak to strong, playing an important role in stabilizing the growth, promoting employment and improving the people's life. To develop the Internet enterprises healthily is not only the goal of the entrepreneurs, but also the requirement of the country's development. China attaches importance to the dominating role of enterprises in the Internet development. We encourage, support and regulate their development and guide and manage them in accordance with laws. We strengthen the construction of laws concerning the Internet, speed up the establishment and improvement of the law and regulation systems concerning the Internet, strengthen Internet governance in accordance with laws, and urge the enterprises to fulfill their accountability. Besides, China has formulated a series of policies and measures to support the development of the Internet enterprises. It speeds up the reform in examination and approval, funding and patent systems, breaks the barriers in systems and mechanisms, establishes the unified market, reduces the enterprises' burdens and creates favourable environment for their development. Chinese Internet enterprises attach equal importance to economic and social effects, volunteer to be supervised by the government, undertake social and moral responsibilities, reward society and serve the people, and form the

joint force for the government-enterprise cooperation and coordination and for the Internet development.

6. Ensuring both security and development. Cyber security and development are the two wings of one bird and two wheels of a cart. China always takes the proper tackling of the relationship between cyber security and development as the priority among priorities of the work concerning cyber security and informatization. The country insists on unified planning, layout, promoting and implementation, and ensures development through security and vice versa. We have formed the correct outlook on cyber security, which is always taken as a priority in informatization, and set up the cyber security accountability. We have carried out a thorough examination on the key information infrastructure, strengthened self-dependent innovation, security inspection and opening and cooperation, and complemented the shortcomings in security with core technology breakthroughs, while consolidating security through key information infrastructure protection to safeguard complete, dynamic, open, relative and common cyber security, and thus to guarantee security for the rapid development of the Internet.

IV. Trend of future development and suggestions on policies

From October 18 to 24, 2017, the 19th CPC National Congress was held. General Secretary Xi Jinping, on behalf of the CPC Central Committee, gave a report at the Congress. In the report, he analyzed the situation of the world and China today, put forward the Two Centenary Goals and the new “two-step” strategy, described the general blueprint of the socialist modernization, and made overall, strategic and prospective plans, opening up a new era for the socialism with Chinese characteristics. The report also makes strategic planning for promoting the Internet, big data, artificial intelligence and digital economy as well as for constructing a strong Internet country, a digital country and a smart society, providing fundamental principles and action guidelines for the country’s Internet development. The coming 30 years will be a great strategic period of opportunity for China’s Internet development. At the new historic starting point, the Internet development of China should be guided by Xi Jinping

Thought on Socialism with Chinese Characteristics for a New Era, the spirit of the 19th CPC Congress and the people-centered approach. We will speed up the implementation of the strategy on developing and strengthening the country through the Internet, promote the construction of digital China, and ensure more complete and balanced, and fuller and better sustainable development of the country, so that the Internet can better benefit the country and its people, and thus it will contribute more to the modernization of socialism with Chinese characteristics.

The Internet development should be shifted from coverage acceleration to quality improvement, and the Internet should be a new facility and platform for economic and social development, with the construction of “digital China” as the leading part. The Internet in China, after 23 years of rapid development, is now experiencing the shift of changes of capacity to changes of quality. At present, the difference between provinces in the field of the Internet is decreasing, the increase of the number of users is not so dramatic, and the social investment in the Internet is becoming rational. There is limited sustainability in the rapid growth resulting from the bonus of facilities, population and capital. In the future, a “Digital China” should be built with high standards, quality and level, the Internet should play a driving and leading role in deepening the supply-side reform, the network infrastructure should be completely upgraded, the promotion of the commercial layout of the new-generation information and telecommunication technology should be accelerated, the next-generation Internet construction should be sped up, and IPv6 should be laid out in an all-round way. We should make the network infrastructure fast, integrated, intelligent and open, set up infrastructure platforms, data platforms and resource platforms which can improve the economic development quality and efficiency to push the development of the primary, secondary and tertiary industries into the top of the global value chain.

Artificial intelligence has become the new “blue sea” of the network information technology. We should occupy the commanding point by taking the R&D of key and basic software and hardware as the focus. In the new active period of the global information technology development, cloud computing, big data,

Internet of things, artificial intelligence and other new-generation information technologies are developing fast. In particular, artificial intelligence, as a cutting-edge comprehensive discipline integrating computer science, statistics, cerebral neuroscience and social sciences, will be the leader of the next wave of the world's science and technology revolution as well as of the in-depth technical revolutions in all industries. It will bring about big leap in technology, data and industries. Technically, China's high-performance computing capacity is increasing fast, its deep learning algorithms is evolving, and its mobile Internet is accelerating. The leap of these comprehensive technical capacities makes the breakthroughs in artificial technology possible, so we should concentrate our effort on the R&D of basic computing, chip/processor technology, intelligent operation system, computer vision and image technology, high-speed computing and large-scale data processing technology, and intelligent robots, which are all related to the development of artificial intelligence technology, occupying the commanding point of the new-round information technology development. Industrially, China's mass user data will become the absolute advantage of the artificial intelligence development. Data computing, processing and application of artificial intelligence will create more high-value data for society. We should shift the investment focus from "Internet+" to "artificial intelligence+", launch a new-round innovations and new business and a number of phenomenal artificial intelligence products meeting the requirement of multiple applications and intelligent service to boost innovations and revolutions in industrial organization pattern, service model and business model of different industries.

Digital economy is developing fast, so we should make use of the trend of the new-round economic globalization to expand China's digital economy development space. China's digital economy development speed and level are in the leading position of the world, and such economy boasts the potential for sustainable growth. In the future, with the deep integration of the Internet, big data, artificial intelligence and the real economy, a new-round economic globalization driven by data will accelerate, globalization of data trade, e-commerce, Internet finance and online

service will be unavoidable, cross-border platform trade volume, demand volume and user number will be increasing by leaps and bounds, more small and medium-sized enterprises and individuals will share the benefits of economic globalization, and platform economies will replace traditional multinationals and become the most influential international trade platforms. China should seize the opportunity to speed up the construction of the new-type open digital economy system and mechanism that combines advantages from both home and abroad and benefits the world. The country will promote intelligent agriculture, manufacturing, online service and Internet finance, and form new growth point and new drive in mid and high-end consumption, sharing economy, modern supply chain, and human capital service. It will lose no time in studying and formulating international rules and standards in terms of cross-border data trade, e-commerce, service trade, and Internet finance. It will also promote the establishment of the Global Digital Economy Development Union, guide Chinese Internet enterprises in participating in the construction of the Belt and Road Initiative, free-trade ports and multi-lateral free trade zones, and further expand the space for its digital economy development and thus improve the development level.

Paid content will become the new hot spot of the Internet media profit growth, and we should promote creative transfer and innovative development of Chinese culture. With the increase of cyberspace copyright awareness and the formation of the digital content consumption habit, paid online subscription will become more popular, involving news, video, literature and socializing and other areas. It enables original content and quality content to be sold in a more convenient and efficient way, which, in turn, will lead to a bigger digital content production, service and consumption market. “Content-priority” is becoming more important, so traditional media can make use of content production to find new opportunities for transformation and breakthrough and enhance the influence and yield rate of the content. New media can explore the areas with professional subdivision by optimizing user experience to occupy exclusive copyright resources and constantly increase the content “premium”. Chinese culture, with a history of over 5,000 years, combining revolutionary culture and advanced socialist culture, is becoming

increasingly popular in the international community and among the people of the world, so we should take advantage of new network technologies and commercial patterns like qualified platforms, artificial intelligence and paid subscription to promote the creative transformation and innovative development and international communication of Chinese culture. We should tell the Chinese story properly to show an authentic, three-dimensional and overall China and thus improve the country's soft power.

The construction of a smart society is closely related to the reform effect of the Party and State leadership system and mechanism, and we should promote data resources' opening up and utilization to enhance the modernization of the national governance system and capacity. With the development of the mobile Internet, the popularity of smart phones and the villagers' access to telecommunication service, the construction of a smart society will accelerate, online service and life, and platform governance will become the new patterns of economic and social development, which will produce profound influence on the construction of politics, economy, culture, society and ecology. In the future, e-government will be more intensive, and integrated e-government platforms throughout the country will become the main stream. Therefore, it is necessary to promote the opening up and sharing of data resources, break data barricades between governmental agencies, between network platforms, and between governments and network platforms, and to realize cross-level, cross-region, cross-sector and cross-system governmental administration and coordinated governance. We will keep deepening the development and unitization of governmental information resources and shift the static storage and simple application to dynamic management and deep analysis. We should find the hidden risks and hazards, fix the bug in supervision and improve the social governance effect by using big data and artificial intelligence. The construction of a smart society will be expanded from individual pilot areas to the whole country. We will make social governance and public service more personalized, intelligent and precise to meet the people's diversified demands and their longing for a better life.