Digital Economy in International Society Transformation and G20 Governance[1]

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Abstract: Digital economy, which is realized by the Internet, is a series of economic or social behaviors based on information and communication technology (ICT). The emergence of the issue of digital economy has introduced a new driving force to the transformation of international society. The cooperation between the countries around the world in their strategies of digital economy accelerates the progress of global governance, which is particularly represented by such mechanisms of global governance as the G20 and the BRICS. This article is to make its point from the following three aspects: firstly, the emergence, essential features, and the influence of digital economy; secondly, the strategies of digital economy initiated by G20 members as well as the challenges faced by all; finally, the approaches for digital economy management and global governance. It arrives at the conclusion that the G20 should position itself properly and actively, in particular, to coordinate in strategies of digital economy, so as to optimize its functions as the hub of global governance.

Key words: digital economy; transformation of international society; G20; global governance

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I. The Emergence, Essential Features, and Influence of Digital Economy

With the development of Information and Communication Technology (ICT), digital economy has paced into the social life of human beings, and has become the driving force for the economic development of every country

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around the world. The notion of "digital economy" appeared in the 1960s, and was first proposed by OECD [Feng and Xinmin,2013]. It's essentially featured by the integration of technologies, and ability to eliminate the boundaries between physical, digital and biological systems [T.H. Yudina,2016]. Digital economy is generally regarded as a type of economy based on digitized information. To be more specific, it promotes the circulation of commodities and development of service industry by means of the flow of digital information in the Internet and the trade online [Liu,2001]. In digital economy, the ICT facilities provide a globalized platform for the individuals and organizations around the world, so as to realize the intercommunication and cooperation between different ends. At the 2016 G20 Hangzhou Summit, there proposed the "G20 Digital Economy Development and Cooperation Initiative," in which digital economy is referred to as "a broad range of economic activities that include using digitized information and knowledge as the key factor of production, modern information networks as an important activity space, and the effective use of information and communication technology (ICT) as an important driver of productivity growth and economic structural optimization" [G20 Hangzhou Summit,2016]. By integrating different definitions, this article defines digital economy as a series of economic or social behaviors based on information and communication technology (ICT) and realized by the Internet. In some sense, the "Internet Plus" is digital economy.

i. The International Context of the Emergence of Digital Economy

The termination of the world configuration formed by the Cold War provided opportunities for the emergence of digital economy. Between 1947 and 1991, there had been a state of political and military tension between the powers in the capitalist bloc represented by the United States and Great Britain, and the socialist bloc represented by the Soviet Union. After the WWII, the Cold War split the temporary wartime alliance against Nazi Germany, leaving the Soviet Union and the United States as two superpowers with profound economic and political differences. The United States and its NATO allies formed the capitalist bloc, while the Soviet Union and its Warsaw Pact members formed the socialist bloc, hence started the tension between the two parties. The termination of the Cold War in the early 1990s marked the United States' rise to the only superpower in the world. It was the United States that took the initiative to apply such military technology as the Internet, mobile phone, and Global Positioning System (GPS) into the daily life of common people, which actually started a global revolution in information technology [Liu,2001]. Notably, APARNET, the former form of the Internet, was a computer network designed under the sponsorship of the United States Department of Defense.

The transformation of the information society is accompanied by the information revolution. After the agricultural revolution and industrial

revolution, the human society is currently undergoing a long-term information revolution, which has brought about essential development in productivity, and caused critical transformation in productive relations. The communication of digital economy or the information flow in the Internet will also become one of the contributions to the socialization of international politics. Meanwhile, the international society in the contemporary age is now developing and transforming conspicuously. It follows a tendency as such: the increasing interdependence between nations has strengthened globalization; the globalization has, on the one hand, enhanced the incorporation of the international society, while on the other hand proliferates issues of global concern; the severity of global issues is now requiring communication and cooperation between different nations, while at the same time in want of the effective involvement of the civil society around the world [Qiu,2016]. The global issues have become a vital challenge confronted by the contemporary international society, and are exerting significant and profound influence upon contemporary international relations. This is represented in the following aspects: firstly, they are shifting the focus of international relations from the "high politics" like military, security and power to "low politics" like economy, society, culture and environment; secondly, they are accelerating the diversification of the actors of international relations, and intensifying the importance of non-state actors such as NGOs, international enterprises as well as social elites; thirdly, they are transforming the theme of international relations from tension and confrontation to dialogue and cooperation, making peace and sustainable development the theme of the age [Qiu,2016].

The economic globalization is now standing at a historical crossroad. Under the influence of the sub-prime mortgage crisis in the United States and the Euro-Crisis, the world economy has now entered a post-crisis era of stagnation and adjustment. Each country in the world is exploring approaches for economic revitalization, but tends to confront enormous difficulties. Therefore, more and more countries are shifting their focus to digital economy. In terms of global economy, a new model of statistics indicates that the digital economy concerning digital skills and digitized capital will account for 22.5% of the world economy, and the digital economy of the mature economies will contribute up to 28%. The latest research by Accenture[2] demonstrates that, by applying optimized digital skills and technology, the world economy is expected to grow by $2 trillion by the year 2020.

[2] Accenture is the largest international company of management advisory, information technology and service outsourcing. Its clients include the enterprises of the Fortune 500, governments and military groups of different countries.

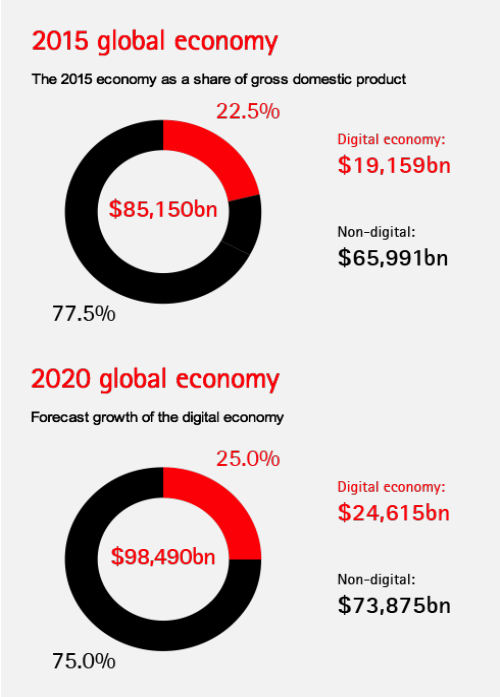

Figure 1: Digital share of global economy in 2015 and 2020.

ii. The Essential Features of Digital Economy

1. Major Basis: Information and Communication Technology

The Information and Communication Technology (ICT) is a new concept and area of technology formed by the integration of information technology and communication technology. Communication technology concentrates on the transference technology in the transmission of information; information technology, in essence, is the encoding or decoding of information, and its transferring fashion in the communicating carriers. ICT has now been pervasive in all aspects of human economy and social life, and contributing largely to the social and economic development, as well as the improvement of the livelihood. The function of ICT in promoting economic development is represented: firstly, in the self-development of ICT industry, i.e., the growth of productivity in ICT products and service sectors; secondly, in its application in different industries, so that it improves the ICT investment in all the sectors of the national economy; thirdly, in the development of ICT and extensive application of ICT, which improves the structure of the sectors of national economy; fourthly, in the application of ICT that improves the productivity. For example, the digital economy as the Internet application has increased the efficiency of the market trade, and lowered the cost of organizational supervision and management. Therefore, digital economy, in essence, is the application of ICT.

The pillar of the digital economy, based on information and communication technology, is the infrastructural construction based on the broadband access to the Internet, as well as the breakthrough and development of such information and communication technologies as network

communication, mobile communication, and satellite communication. Take broadband access to the internet as an example. According to the econometric analysis of 120 countries by the World Bank, whenever the broadband infrastructure or service increases by 10%, there will be a growth of 1.38% in the economy. [WorldBank,2009; He,2016] While if there is a larger popularity of the broadband usage, the productivity in manufacturing and service industry will witness a growth at a more profound level, which will generate a significant effect in economic development.

2. Main Form: Interdependence of Integrated Economies

Digital economy breaks down the traditional boundaries between countries and regions, and connects the whole world closely by the Internet. It is not limited by time, and reduces the information transmission between people and economic communication. In particular, the modern information network transmits data information at light speed, making digital economy processed almost simultaneously. The rapid development of ICT is characterized by its high penetrability and integration, enabling the quick development of ICT or digital facilities to the first and second industries, and the blurring of boundaries between the third industries. The trend of integration between three industries becomes more and more apparent. With the ascending Internet users, the value and benefit of digital economy are increasing with the exponential. In digital economy, once there are advantages or disadvantages, they will escalate by themselves due to the inertia of people's psychology and development [Sun,2004].

3. Principal Demand for Management: Global Governance

The paths, channels and length of time to information society of different countries vary because of the difference in economic development society, and culture. Such digital disparity engendered by the inequality of the possession of information network facilities and the application of information resources is expanding gradually. It even surpasses the disparity caused by the difference in the possession of material resources and economic fortune. Therefore, the global digital society in the future is likely to be an unbalanced digital society whose development and disparity are larger than their current situation. "Digital Unity," the theme of the first phase of World Summit on the Information Society (WSIS) is set up in the purpose of making joint efforts to eliminating the digital gaps, promoting the joint development of different regions and reducing poverty, by means of narrowing down the "digital disparity" between the developed and developing countries and calling for agreements between the stakeholders. In so doing, Internet governance should continue to follow the provisions set forth in outcomes of WSIS. In particular, the commitment to a multistakeholder approach to Internet governance is to be affirmed, which includes full and active participation by governments, private sector, civil society, the technical

community, and international organizations, in their respective roles and responsibilities. The multistakeholder processes and initiatives which are inclusive, transparent and accountable to all stakeholders in achieving the digitally connected world are to be supported. [G20,2016]

iii. The Contribution of the Digital Economy to the World Economy and Society

Digital economy has an impact on the world economy, politics and society. Accenture Strategy recently released a report titled "Digital Disruption: The Growth Multiplier", which measures the scale of digital economies in 11 major countries around the world, including hardware, software, related technologies, and the value to the GDP created by the employees using the digital tools. Besides, this report has measured the value of digital products and services generated in the process of production. More than one fifth of the global GDP (22 %) are closely related to the digital economy that encompasses skills and capital. The United States is the world's largest digital economy. Its digital investment currently occupies about 33% of the GDP. 43% of the US workforce and 26% of cumulative capital are capable of supporting digital-related activities.

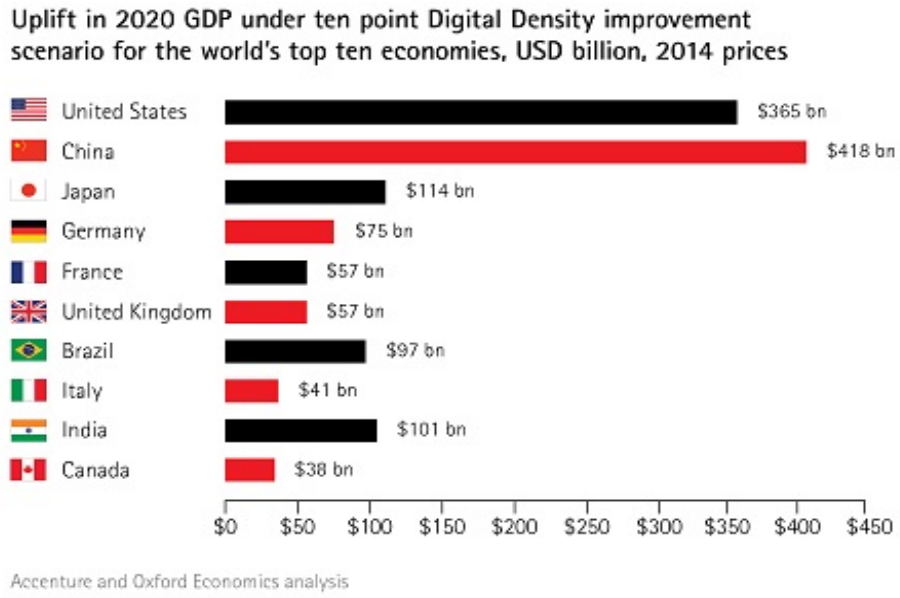

Figure 2: Uplift in 2020 GDP under ten-point Digital Density[3] improvement scenario for the world's top ten economies.

[3] The Accenture Digital Density Index measures the extent to which digital technologies penetrate a country's businesses and economy. A country's "digital density" is determined by a scorecard comprising over 50 indicators, such as the volume of transactions conducted online, the use of cloud or other technologies to streamline processes, the pervasiveness of technology skills in a company, or an economy's acceptance of new digitally driven business models.

Country	Change in 2020 gross domestic product (%)	Change in 2020 gross domestic product (US$ billion, 2015 prices)
Australia	2.4%	34
Brazil	6.6%	120
China	3.7%	527
France	3.1%	80
Germany	2.5%	90
Italy	4.2%	81
Japan	3.3%	146
Netherlands	1.6%	13
Spain	3.2%	43
United Kingdom	2.5%	84
United States	2.1%	421

Figure 3 The GDP impact of digital density optimization: Accenture.

1. Improvement of Labor Productivity and Production Mode

Technological flow, capital flow, talent flow and material flow driven by information flow have brought about the adjustment of economic structure and the transformation of economic growth momentum. In order to achieve faster growth, companies need to improve their "Digital Density Index"[4] score. Take the US economy as an example. If the overall digitization density is increased by 10 percentage points, the US cumulative GDP in 2020 will increase by $368 billion, which means 1.8% more than the current forecast. However, according to the Accenture, the cumulative US GDP in 2020 could increase by $ 421 billion, which means 2.1% more than the current forecast, if the United States can optimize the mix of digital skills, finance and other incentives. The largest beneficiaries from the overall digitization increasing are countries like Brazil (6.6%), Italy (4.2%), China (3.7%) and Japan (3.3%). [Accenture,2016]

Digital economy has also revolutionized production mode. Wintelism is such a new mode of production, deriving from the combination of Microsoft Windows System and Intel processor. Based on product standards and production network, through the effective integration of resources around the

[4]This indicator system was developed by the Accenture strategy to measure the penetration of digital technology in a country's business and the economy. It covers not only digital skills and technology, but also observes broader support factors such as the ease of access to financial support and the openness of the regulatory environment in the country.

world, it generates product components, modular products and the final combination with high standards [Tao,2016].This model is the product of informatization, digitization and globalization. Enterprises have achieved management of horizontal division of labor by digital network, formed the horizontal cross-border production system based on modular, mass customization and outsourcing production, and firmly locked customer groups through the monopoly of product standards. [Huang and Wen,2004] Therefore, the Wintelist System breaks through the traditional production mode of scale economies, and obtains market monopoly profits by the advantages of standards and network. It is a new production mode rooted in the economic digitalization and global competition in the wave of new production mode. [He,2013]

2. Industrial Revolution and Employment Improvement

On the one hand, traditional industries have established digital content industries across the entertainment, communication networks, media and cultural arts, by means of new types of digital technology, and by active product innovation, business integration and industrial restructuring. Nowadays, a number of digital content industries are becoming or have already become new growth points of economy in some areas. They include digital finance, digital communications, digital entertainment and digital media art. These will also be a new growth point of economy for China and the world. Besides, digital technology is also infiltrated in the fields like industrial manufacturing, which has improved the economic efficiency of the whole industry and promoted a wider, deeper, larger-scale industrial integration. On the other hand, the digital economy can also bring about employment opportunities directly or indirectly. According to the European Policies Research Center, the job vacancy of telecommunications industry in 2013 was about 300,000, while in 2015 the number amounted to 900,000. Fortunately, the development of digital economy can effectively fill the vacancy. [Yuan and Xiaojuan,2013]. In the United States, the workforce engaged in digital related work accounts for 43% of the total, and the digital capital stock has accounted 26% of the whole capital stock through the cumulative investment for software, hardware and communication equipments. Digitalization is particularly evident in some sectors. For example, financial services industry has achieved 57%, followed by business services with 54% and communications with 47%. [Accenture,2016] Generally speaking, digital economy is taking the initiative to promote the industrial transformation and employment.

3. The Advent of Global Society

The “global society” is regarded as the highest stage of the “international society,” in which the authority and violence are more concentrated, the common interests are globalized, and the country is gradually becoming a

regional administrative institution resembling the domestic society. The impetus for the formation of the international community not only comes from the early ideal of mankind, but more importantly from the accelerating development of human science and technology, and the practical needs of human survival and development. And the need for technological realities and interests, through the learning process of human knowledge, further reinforces the concept of the international society [Wang,1994]. Then has the emergence of the digital economy or digital society accelerated the formation of the world society and the global society? The broadband access and communication infrastructure are unbalanced in different countries. Whether from the international society or domestic society, the fiber broadband access rate of different regions varies a lot. For example, the total population size of the United States, Japan and South Korea is equal with the European Union, but their fixed broadband Internet access is 8 times of that in the EU, and the 4G coverage is close to 15 times of that in the EU. EU mobile phone roaming fees and other issues have not been resolved for a long time, seriously hindering the construction of the EU single market, not to mention accelerating global socialization.

II. The Strategies of Digital Economy Initiated by G20 members and the Challenges Ahead

i The Digital Economy Strategies of G20 Members

In recent years, the G20 members have mapped out their respective strategies of digital economy or medium-term or long term manufacture, initiated by the United States' Information Super Highway in 1993, and represented by the three steps of the digital strategy in Japan. All these strategies aim to develop digital economy because it will be the vital driving force of the world economy.

Actor	Strategies	Focuses
US	✧ Information Super Highway (1993)	➢ Digital communication system ➢ Information telecommunications network
	✧ National Broadband Plan[5] (2010)	➢ Capability of accessing to broadband ➢ High-speed
Japan	✧ e-Japan (2001)	➢ Information infrastructure and technology research and development
	✧ u-Japan (2004)	➢ Ubiquity in industries and services, diversification in application
	✧ i-Japan (2009)	➢ Focus on public administration -- government, hospital and school
EU	✧ i-2010 (2005)	➢ Open and competitive digital economy

[5] The plan set an ambitious goal of providing at least 100 million homes with affordable access to actual download speeds of minimum 100 Mbps and actual upload speeds of minimum 50 Mbps by 2020.

		➢ Information Communication Technology
	✧ Digital Agenda/Europe 2020 strategy	➢ Develop a digital single market
Singapore	✧ iN2015 (2006)	➢ Intelligent Nation ➢ Global City ➢ Ubiquitous information technology
UK	✧ Digital Britain (2009)	➢ The country at the leading edge of the global digital economy
	✧ "Digital Economy Act 2010" (2010)	➢ Media policy issues related to digital media - copyright infringement, Internet domain names, Channel 4 media content, local radio and video games
	✧ "Digital Economy Strategy 2015-2018" (2015)	➢ Encouraging digital innovators; focus on the user; equipping the digital innovator; growing infrastructure, platforms and ecosystems; ensuring sustainability.
France	✧ Digital France 2020 （2011）	➢ Develop the fixed and mobile broadband ➢ Popularize the digital application and service, especially e-government or e-commerce
Australia	✧ National Digital Economy Strategy（2011）	➢ e-health, e-education, smart grids, e-government, digital economy, digital media, etc.
Germany	✧ Industry 4.0 (2013)	➢ Cyber-physical systems ➢ Internet of things ➢ Cloud-computing
	✧ Digital strategy 2025 (2016)	➢ Digital sovereignty ➢ Digital infrastructure ➢ Gigabit optical fiber ➢ Data security
Russia	✧ National Technology Plan (2014)	➢ EnergyNet, FoodNet, SafeNet, HealthNet, AeroNet, MariNet, AutoNet, FinNet, and NeuroNet
South Korea	✧ Manufacture innovation 3.0 （2014） ✧ Scheme of Manufacture innovation 3.0 (2015)	➢ Information technology + Manufacture
India	✧ Digital India （2015）	➢ The creation of digital infrastructure ➢ Delivery of services digitally ➢ Digital literacy
China	✧ Internet Plus (2015)	➢ Information Communication Technology (ICT) ➢ Integration of internet and other traditional industries

Table 1: Digital Strategies of Different Nations[6]

[6] The order of nations is arranged by the chronological appearance of the respective digital strategy.

In summary, every country has its own digital strategy. The major differences lie in the following aspects: (a) The extent of maturity varies due to how long the strategies have been implemented. The United States, for example, started commercializing its digital information network in March 1991, while other countries, particularly the developing ones, only began recently. In consequence, the US and Japan are more experienced in its ICT infrastructure[7][Shen,2016]; (b) There are different priorities in the digital economy strategies of different countries due to the varieties of their traditional industries. These countries tend to combine their strategies with their respective competitive industries. Germany stresses the dynamic combination of internet industry and manufacturing industry in the construction of the broadband infrastructure. UK focuses on the cultural industries like music, games and media. Australia, however, exerts more effort in industries of digital ad sales and services, while Japan places its priority on public administration.

Diversified as they are, the digital strategies of the above mentioned nations all share the following characteristics: (a) They value the construction and investment in broadband infrastructure; (b) They aim to improve internet penetration rate; (c) They place emphasis on the dovetail of the internet industry with other industries.

i. Challenges faced by international society in digital economy cooperation

1. The Ignorance of "Digital Society" Resulting from a Narrow Definition of "Digital Economy"

Through comparing digital economy strategies of different countries, we find that a number of them still restrict the definition to information and communication technology (ICT), including technological fields such as the Internet, broadband and e-commerce and fails to integrate it with most traditional fields. In order to build up smart homes, cities, countries and societies, the development of digital economy should involve not only digitalized entertainment and publishing industries, but also fields of industrial control that are expected to be digitalized, such as medical equipment, transportation and military equipment.

2. Conflicts between Developed and Developing Countries as to the Control of International Information Flow

Some Western countries object to monitoring international information flow as they hold that free flow of information should be allowed unconditionally, while Chinese experts believe that security, which enables

[7] Germany's average internet speed is 10.7Mbps in the second quarter of 2015, and only 15% of its internet speeds exceed 15Mpbs. whereas in America, 21% of its internet speeds surpass 15Mpbs, and Japan 38%. Only 7% of the German family has fiber-optical connection, whereas in America, the figure is 9% and Japan, 73%. The data are provided by Shen, Z. (see the references)

the protection of important rights including individual privacy, is a prerequisite to the free flow of information which is indeed essential to economic development. As stated in *Tunis Commitment*: "Recognizing the principles of universal and non-discriminatory access to ICTs for all nations, the need to take into account the level of social and economic development of each country, and respecting the development-oriented aspects of the Information Society, we underscore that ICTs are effective tools to promote peace, security and stability, to enhance democracy, social cohesion, good governance and the rule of law, at national, regional and international levels. ICTs can be used to promote economic growth and enterprise development. Infrastructure development, human capacity building, information security and network security are critical to achieve these goals. We further recognize the need to effectively confront challenges and threats resulting from use of ICTs for purposes that are inconsistent with objectives of maintaining international stability and security and may adversely affect the integrity of the infrastructure within States, to the detriment of their security. It is necessary to prevent the abuse of information resources and technologies for criminal and terrorist purposes, while respecting human rights." [Tunis Commitment,2005] Thus international information flow does not mean absolute free information flow without any monitoring but has to maintain security of the international society.

3. The paradox of digital economic globalization and cultural diversity preservation

In nature, the globalization of digital economy will contribute to internetization, Anglicization, digitalization. It will also engender the direct or indirect technicalization and homogenization of languages. Thus, there is a high possibility that the cultural independence of non-English languages will be reduced, leading to cultural identification or homogenization which will harm cultural diversity. Apparently, digital economy development and cultural diversity are two sides of a coin. That is why it has been a heated topic of the World Summit on the Information Society in which the *Declaration of Principles* was later issued, expressing expectations for information society and the shared wish and promise to construct an inclusive information society that puts people first and aims to develop [Tan, Li and Zhan,2004]. An important principle of such a society is to facilitate and respect cultural diversity while strengthening the access of information and communication infrastructure.

4. The Increased Risk with the Imbalanced Development of Digital Economy and the Fragmentation of the International Society

That fact that the international society is as united as it is divided [Guo,2016] will be manifested in some way in the system due to the imbalanced development of digital economy. The view of some Western

countries to try to reduce or negate the dominance of the government of a sovereign state over the internet will threaten the sovereignty of developing countries. Take the European Union as an example. There is a huge gap between the member states of northern and southern Europe. Statistics show that currently, more than 3/4 of European residents frequently use the Internet, while half of residents in Bulgaria and Romania do not. The network coverage in Belgium reaches 99%, while that in Italy is only 55%, which falls far behind other European countries. The imbalance of digital economy has been conspicuous inside a region, not to mention the imbalanced development in the international society that has already existed. [He,2013]

Network Users and Online Penetration Gap

region	population	Users(2000)	Users (2012)	Online penetration	Growth rate(2000-2012)
Africa	1,073,380,925	4,514,,400	167,335,676	15.6%	3,606.7%
Asia	3,922,066,987	114,304,000	1,076,681,059	27.5%	841.9%
Europe	820,918,446	105,096,093	518.512,109	63.2%	393.4%
Middle east	223,608,203	3,284,800	90,000,455	40.2%	2,639.9%
North America	348,280,154	108.096.800	273,785,413	78.6%	153.3%
Latin America	593,688,638	18,068,919	254,915,745	42.9%	1,310.8%
Oceania	35,903,569	7,620,480	24,287,919	67.6%	218.7%
Global	7,017,846,922	360,985,492	2,405,518,376	34.3%	566.4%

Figure 4 Network Users and Online Penetration Gap [He,2013]

Figure 4 shows the amount of network users and the online penetration rate in different regions around the globe and how the increase of the penetration rate contributes to regional economic growth. Furthermore, the online penetration gap among different regions highlighted the digital gap, i.e. the digital gap of key information infrastructure is strengthening the inequality among countries, some of which monopolize the production of key products of internet software and hardware and increase the imbalance of global digital economy and the risk of a divided international society.

III. The Approaches for Digital Economy Management and Global Governance

i. Major Multilateralism and the G20 Governance

1. The Contribution of G20 Governance to Major Multilateralism

The G20 has its unique strengths. Since the G20 Hangzhou Summit, the G20 has been the center of global governance system with the advantage as a comprehensive and major governance platform of multilateral international cooperation on the global level. In terms of digital economy development and cooperation, the G20 boasts the following merits: The limited number of the G20 members enables higher efficiency in decision-making; the major members of the G20 such as China, the United States, Japan and Germany have achieved considerable success in developing digital economy. Such

success could be transformed into international cooperation and construct the foundation of international trust; to have the G20 member states as the main source for developing countries to gain financial support and foreign investment is beneficial to narrowing digital gap. The joint participation of developed and developing countries in the G20 to include digital economy development and cooperation in the agenda helps to reinforce the North-South cooperation and reduce the imbalance of digital economy. Moreover, the G20 is able to keep close contact with other international organizations, especially the United Nations. As the world's most common, authoritative and representative intergovernmental organization, the United Nations has been the first formal mechanism of global governance. The UN and the G20 are not conflicting with each other. Instead, they should optimize their own strengths to jointly build up a fair and reasonable order of global development and improve the governance system of global development through a shared agenda of sustainable development and joint governance [Zhang,2016]. Digital economy development and cooperation have to be led by the G20 and facilitated and popularized by the United Nations. For instance, the WSIS has been highly valued by member states of the G20. It was held by the UN in Geneva in 2003 and in Tunis in 2005 which produced *WSIS Declaration of Principles*, *WSIS Plan of Action*, and *Tunis Commitment and Agenda*.

2. Collective Efforts of G20 in Digital Economy Governance

During the 2015 Antalya Summit, the G20 leaders all realized that we are in an age of Internet economy which brings about both opportunities and challenges to global growth. They also realized that ICT and its usage can possibly pose threat to national security, which will cripple our ability to utilize internet to promote global economy. G20 is devoted to eliminating the digital gaps. Every nation has its special responsibility in the field of information technology, just like in others. They are responsible for its security and stability, as well as the close economic relationship with other countries. At the 2016 G20 Hangzhou Summit, the member states discussed the roles digital economy played in economic growth and innovation. This Summit issued the "Digital Economy Development and Cooperation Initiative", the first of its kind in the world, forming a strategy that accelerates digital economy and inclusive growth.

3. Key Principles and Main Areas of G20 Digital Economy Governance

The Hangzhou Summit pointed out that the idea of innovative growth includes actions that support innovation, new industrial revolution and digital economy. According to the above-mentioned Initiative, G20 members agree to the following principles for the stimulation of digital economic growth: **(a) Innovation.** The ICT innovation and the accompanied innovation in economic activities are crucial to an inclusive economic growth; **(b) Partnership.** G20 members make concerted and flexible efforts in the choice

of issues concerning digital economy. A closer partnership between G20 members is conducive to sharing knowledge information and experience for further cooperation in response to challenges and promotion of global digital economy. In so doing, disagreements can be reduced while benefits can be enlarged by means constructive dialogue between member states. **(c) Inclusiveness.** An inclusive and open business environment will facilitate economic growth, build up mutual trust and safeguard information flow.

In terms of the main area of G20 governance in digital economy, the following aspects will be covered according to the agenda and issues of the previous WSIS and G20 summits: **(a) the investment and construction of the ICT infrastructure**. The items for improvement include the quality and access of broadband service, the popularization of digital technology and application of ICT, especially in remote areas, small islands and inland developing countries; **(b) the reduction of digital gaps by political and technological measures.** Regional infrastructure and network and relevant regional projects are made to link multinational network and regional network. Assistance should be sent to developing countries so that efficiency of international donation will be greatly improved and the cost will be reduced [Tunis Commitment,2005].

ii. Minor Multilateralism and Cooperation among the BRICS Countries

As a minor multilateral platform in the framework of the G20 mechanism, BRICS is believed to be a promising force of selectively global governance. To facilitate digital economy development and cooperation at the regional level requires cooperation mechanisms such as the BRICS countries and Shanghai Cooperation Organization (SCO) to fully play their part and "The Belt and Road Initiative" or "Silk Road Economic Belt" to collaborate with strategic plans such as Eurasian Economic Union.

1. **Advantages of the BRICS countries in digital economy development and cooperation.** As emerging economies, the BRICS countries hold important strategic positions in current world structure. China and India are the two countries that have the two largest populations around the world but differ massively in economic scale. Russia and China both have massive land area but their economic scale and GDP per capita are very divergent. Brazil has the economic scale most similar with China [Cai, 2012]. Five BRICS countries have their own unique strengths in terms of land area, population, resource and market with their whole land areas making up 29.7% of that of the world and their overall population 42.4% of the globe population [Zhao,2011]. That is to say, The BRICS have enormous potential in rapid economic growth with their consumer market expected to continually expand. The fact that they share common interests in plenty of international issues makes them complementary to each other and leaves large room for cooperation.

The advantages of BRICS cooperation contribute to their joint efforts of developing digital economy. *Goa Declaration* at the 8th BRICS Summit held on October 16th 2016 mentioned cooperation on digital economy: 1) to reinforce the security of adopting information and communication technology and to fight against information crimes and terrorism; 2) to bridge the gap in digital technology between developed and developing countries; 3) to share knowledge and experience of information and communication technology in fields of e-government, financial inclusion and digital products [Goa Declaration, 2016].

2. Multi-mechanism cooperation and strategy collaboration. Both "The Belt and Road Initiative" and the Eurasian Economic Union proposals aim to increase connectivity and remove tariff barriers while ensuring cooperation in infrastructure of trade and transportation. The two proposals happen to unite Central Asian countries and thus achieve a win-win situation. In terms of digital economy development and cooperation, countries along the Silk Road Economic Belt can join hands to broaden broadband infrastructure such as optical network, share information and communication technology, increase investment in information and communication technology, facilitate cooperation in silk road e-commerce, promote digital technology, improve digital skills of people, and increase the involvement in digital economy among people from developing countries with low incomes along the Silk Road Economic Belt.

3. Information infrastructure partnership. Centering on "Information Infrastructure Partnership", the forum "Digital Silk Road for Win-Win Cooperation" at the 2nd World Internet Conference founded "Centurial Joint Investment Fund for 'One Belt One Road' Digital Economy Development". In the form of fund of funds (FOFs), the ten-billion-dollar fund dedicates to facilitating investment cooperation and joint development in digital economy areas including internet information infrastructure, digital industrial parks, big data, cloud computing, the internet of things, small and medium-sized internet enterprises and youth innovation which contributes to the informatization and digitalization of countries along "the New Silk Road Economic Belt" [Renmin,2015].

iii. Optimizing the Leadership of US and China?

1. The US as a Digital Superpower

The United States used to be the leading country in developing digital economy. The digital information network was created in the United States. Between 1995 and 2000, the American Internet industry rose by 1.79 annually. Its sales revenue increased from $301.4 billion in 1998 to $523.9 billion in 1999, which, for the first time in the history of American economy, overtook the car industry and other traditional industries.

In 1992, the United States put forward the initiation of "national

information infrastructure plan". One year later, the "information super-highway plan" was officially developed and implemented. From a macro perspective, they framed the digital information network technologies development. Afterwards, the Congress passed the "Telecommunications Act of 1996", and the then President Clinton signed the "global e-commerce framework" in the following year. At the beginning of the new millennium, Clinton signed the "Electronic Signatures Act" with an electronic signature. This act ensures the Internet-based contracts and trades the same legal effects as common on-paper signatures. This series of regulations and policies have created a highly favorable macro-economic environment for the Digital Economy. In 2000, Albert Gore, the former US Vice President, and William Daley, the former Secretary of Commerce, jointly declared the advent of an era of digital economy.

Over a decade, the United States has been leading the world in digital information technology and product innovation. In the face of the gap between the US and other countries in Europe and Asia in the post-financial crisis era, the US should make its efforts to find proper ways to shoulder the international responsibility to help these countries by offering technical assistance, rather than turning a blind eye to the broadening gap. From the perspective of the US and other countries, G20 is an important way to lead the global economic governance in the new era which falls in line with the United States' economic interest. As a new platform for global economic governance, G20 has a huge potential for development, through continuous reform and improvement it can lead to further "Institutional Bonus". Through the economic rise of G20 countries, the United States can put an end to the old international economic order, maintain the dollar hegemony, back up the liberalization of multilateral trade, and even boost its own political potency.

2. China as a Potential Leader

With its increasingly active involvement in the international arena, China is becoming the potential leader of the era of digital economy. The Chinese government has been intensifying its efforts towards international cooperation in digital economy policy. The G20 Hangzhou Summit in 2016 placed the issue of digital economy on the high agenda, proposing "The G20 Digital Economy Development and Cooperation Initiative". This initiative symbolizes the realization of the idea of digital economy governance at the Antalya Summit, heralding China's possible leadership in this era.

In order to create conditions more favorable for digital economy governance, China is carrying on with its efforts for developing digital economy and Internet power with a series of ideas and policies, such as "Everyone is an entrepreneur, and innovation by the masses", "Made in China 2025", "Internet Plus", "National IT Development Strategy", "Big Data Strategy" and Strategy of Internet Power. The above-mentioned strategies aim at promoting China's digital development, informatization, as well as the

integration of digital economy and real economy. As a result, it will bring about the fundamental changes in core technology, enabling the digital and manufacturing industries to reach the international advanced level. In October 2016, Chinese President Xi Jinping stressed the need to include the Internet as an element for economic development, to focus on technology innovation, and to seek new competitive advantages of the Internet as a strategic direction. In particular, there is the need, according to President Xi, to increase investment and strengthen the infrastructure of information technology so as to promote the integration of digital and real economy. He also underlined the necessity to accelerate the digitalization of traditional industry, develop a smarter and stronger digital economy, and generate a new space for economic development.

Since the G20 Antalya Summit in 2015, China has embarked on promoting the cooperation and connectivity between countries around the globe in international strategies for digital economy. It has also expressed its unswerving adherence to the provisions of the WSIS, emphasizing the importance of the international society's commitment to a model of Internet governance that includes the full and active participation of governments, private sector organizations, international organizations, and civil societies, in accordance with their respective roles and responsibilities. It has further called for a cooperation to establish an international Internet strategy among different stakeholders at the both regional and global levels and seek greater consensus to advance a digital economy based on ICT. China plays an important role in the development and cooperation of the digital economy. Its contribution to the global economic development represents not only China's own digital economic development and investment in the building of Internet Power, but also China's call for an International strategy for digital economy and cooperation of World Powers through initiatives such as the "The Belt and Road Initiative" and the Asian Infrastructure Investment Bank (AIIB) for present and future regional and international communication infrastructure.

IV. Conclusion

It is widely acknowledged that we are now entering an epoch of digital economy governance. As a new driving force of economic globalization, the development of digital economy poses both opportunities and challenges for global governance. If the international society fails to take proper measures to handle its development, the digital gap between developed and developing countries will be broadened. The ensuing uncertainties and disorders will escalate the tensions of uneven development and prolong the economic stagnation. In order to avoid these risks, the G20 should position itself properly and actively, in particular, to coordinate in strategies of digital economy, so as to optimize its functions as the hub of global governance. Based on the ideas and notions of digital economy governance at the Antalya Summit, the 2016 Hangzhou Summit has taken a practical and historical step

in this regard, demonstrating the vision and leadership of China, US and other G20 powers. This is a promising but challenging mission, which requires the joint endeavors of major multilateral institutions, such as the G20 and the UN, and minor multilateral institutions such as BRICS and others.

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