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Under the Background of New Quality Productivity, the Research and Prospect of Customer Value Creation of Chinese and American Communication Enterprises

BY

Qiu Feng Cai[1*], Wang Wei[2]

[1]Professor of Singapore Center, International Business School, Zhe Jiang University
[2]director of consulting Division of Shenzhen Haibo Wisdom Industry Management Consulting Co., LTD

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Abstract

The world communication industry has entered the 5G era, and manufacturing, consumption, finance, education and government are facing digital intelligence transformation. China has put forward the concept of new quality productivity with emerging technologies as the core to accelerate the transformation and upgrading of various industries and promote high-quality development. Innovation in the global communication industry is a typical representative of new quality productivity. This paper focuses on how the communication industry in China and the United States can help each industry create and innovate customer value and accelerate industrial transformation and upgrading to form new core competitiveness from the perspective of new quality productivity. The author adopts literature research method, case study method and comparative research method to reconstruct the customer value creation model of communication enterprises. This paper makes a comprehensive comparison and analysis of the strategy, operation and path of Chinese and American communication enterprises, and puts forward suggestions and management inspirations on customer value creation under the emerging technology of domestic and foreign communication enterprises, which has theoretical innovation and practical guiding value for domestic and foreign communication new value creation.

Keywords: *new quality productivity, customer value creation, communication transformation, digital intelligence*

1. Introduction

In the booming wave of digital economy, communication enterprises, as the basic industry of the information society, are facing unprecedented opportunities and challenges. On the one hand, the customer group is complex and the consumption is upgraded, expanding from basic telecom service demand to diversified digital service demand; on the other hand, due to the peak of product and service capacity, and the strong entry of Internet enterprises, the intensified market competition in the telecom industry, operators need to seek new value growth points. In the background of consumption upgrading and diversified service demand, how to make use of the development opportunity of new quality productivity to enhance the ability of customer value creation, is a question that communication operators must answer. Chinese and American communication companies have their own characteristics and advantages. China is leading the way in communication infrastructure and technology application, while the United States has strong strength in scientific and technological innovation and industrial transformation. Therefore, it is of far-reaching theoretical and practical significance to explore the similarities and differences of customer value creation of Chinese and American communication enterprises under the background of new quality productivity and to find their own development paths.

This paper will under the background of the development of new quality productivity, analyze the new productivity of communication enterprise customer value creation influence, build customer value creation comparison model, using literature research method, case evidence, comparative analysis, analysis of the communication operators in the customer value creation concept, strategy and path of similarities and differences, provide reference for communication enterprises to enhance customer value creation ability and inspiration.

*Corresponding Author: **Qiu Feng Cai** .

2. Concept analysis

2.1 New quality productivity

[1]In September 2023, xi general secretary during the first put forward the concept of "new quality productivity", then officially written into the government work report in 2024, as a Chinese modernization promoting power construction, national rejuvenation great first task, is to achieve high-quality development, construction of modern economic system, build the new development pattern of important support, for our country in the new era of new journey to win the advantage, win the initiative, win the crucial to win the future. As the latest achievement of the innovation and development of Marxist theory of productive forces, new quality productive forces have also triggered the discussion and research upsurge in academic circles. There are mainly four types of research results: first, deepen the understanding of the concept of new quality productive forces, such as connotation characteristics[1]Generate logic[2]Strategic significance[3], formation mechanism[4]class. Second, to explore the development path of new quality productive forces, such as strengthening scientific and technological innovation[5]Layout industrial chain[6]To build competitive industrial clusters[7]Optimize the role of the government[8], Data market empowerment[9]class. The third is to evaluate the development level of new quality productivity and use the entropy value method[10],Projection tracing genetic algorithm[11]Establish the comprehensive evaluation index of new quality productivity to reveal the spatial-temporal evolution trend of the development of new quality productivity. The fourth is to analyze the impact of new quality productivity, such as enabling high-quality development[12]To boost the development of a modern industrial system[13]Promote a new type of industrialization[14]To build an industry-education integration community[15]class.

The concept of new quality definition of academic productive forces is mostly based on the theoretical interpretation of General Secretary Xi Jinping, expanding the analysis of the connotation and characteristics of new quality productive forces, enriching the understanding and cognition of the elements, and reaching a general consensus on "the core feature of new quality productive forces is innovation and the essence is advanced productive forces". The new quality productive forces in this paper are the new productive forces aimed at high-quality development, adapting to new industries, and serving high-quality life. It is the new quality state of productive forces under the new economic normal composed of "high-quality" workers, "advanced" labor materials, and "new form" labor objects[1]。

[1]*In February 2024, xi jinping in the 11th collective learning of the Political Bureau of the CPC Central Committee, profoundly illustrates the new quality productivity theory, points out that " new quality productivity is innovation leading role, get rid of the traditional way of economic growth, productivity development path, with high technology, high efficiency, high quality characteristics, conform to the new development concept of advanced productive forces quality. It is spawned from revolutionary technological breakthroughs, innovative allocation of production factors, and deep industrial transformation and upgrading. It takes the improvement of workers, labor materials, labor objects and their optimized combination as the basic connotation, and the substantial improvement of total factor productivity as the core symbol. It is characterized by innovation, the key in high quality, and advanced productive forces in essence."*

2.1 Customer value creation

American marketing expert Lautebomm is one of the early scholars to realize the customer value, he will integrate the elaboration of customer value into the 4Cs marketing theory, that enterprises should first pay attention to the 4Cs (customer problems, communication, convenience, cost), which is the true embodiment of customer value. Gale defines customer value as the market perception quality obtained by customers for the price of products, and refers to the abstract subjective evaluation of products or services after a comprehensive analysis of the relevant information obtained through various formal or informal channels in the market according to their own use purpose and demand for products or services[16]. Zaithaml Think that the customer value is actually the customer perceived value (CPV), that is, the overall evaluation of the utility of the product or service after weighing the perceived benefits of the customer with the cost paid in acquiring the product or service[17]. Kotler Put forward the concept of customer transfer value (CDV), customer transfer value = total customer value-total customer cost, the greater the difference, the greater the customer value, and otherwise, the smaller the customer value[18]. Zhao Luping introduced the perspective of competitors, believing that customer value should be embedded in competitive products or services, and win competitive advantages through the heterogeneity of products or services[19]. Wan Weihua et al. point out that enterprises create customer value through products and reflect the value of the enterprise with the "dividend" of customer value, and customer satisfaction is the concentrated reflection of customer value[20]。

In the author's opinion, customer value creation can be defined as creating more and better value experience for customers by providing products, services, and brand value, so as to improve customer satisfaction and loyalty and enhance the market competitiveness of enterprises. The key to creating customer value lies in a deep understanding of customer needs, providing quality products and services, and continuous improvement and innovation.

3. The impact of new quality productivity on the customer value creation of communication enterprises

3.1 Strengthen the characteristic service concept of personalized customization

New quality productivity emphasizes innovation, efficiency, and integration, and attaches importance to user experience and value realization, which requires communication operators to closely focus on meeting customer needs and

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improving service experience when providing products and services. New quality productivity contains big data, artificial intelligence, cloud computing and other cutting-edge technologies, make communication operators can widely collect and analyze user behavior data, consumption habits, personal preferences, through accurate user portrait, develop and provide personalized packages, content, push, value-added services, etc., even for users work, life, entertainment and other different scenarios to provide highly customized, characteristics of integrated service scheme, meet the unique needs of each user, make the user get more intimate, convenient and efficient service experience, so as to improve customer satisfaction and loyalty. For example, according to the needs of customers, YD company specially designed a set of basic solutions for government, finance, and other fields, and provides users with innovative service experience in service and marketing aspects by upgrading the components of China Cloud intelligent service system.

3.2 Clarify the customer operation orientation for sustainable development

Develop new quality productivity requires operators adhere to the concept of sustainable development, in the customer value creation customer insight and precision, establish growing customer relationship, with high quality and reliable service and products to improve customer experience, to continue to deepen expand customer value creation and cash scope, realize the sustainable development of customer value operation. In addition, the development of new quality productivity helps communication operators to low carbon, environmental protection, efficient new development model, to better promote the enterprise along the path of sustainable development to create and enhance value, it not only conforms to the national development strategic direction, is also an important means of win social recognition and support, communication operators to create good brand image, cultivate long-term competitive advantage, to enhance market share and value creation ability, achieve long-term, stable sustainable development.

3.3 Highlight the development strategy of technological innovation-driven production operation

New quality productive forces are the leading role of innovation, getting rid of the traditional mode of economic growth and the path of productivity development, characterized by high technology, high efficiency, and high quality, and in line with the new development concept. This requires communication operators must vigorously promote technological innovation, increase the 5G, AI, cloud computing, big data new productivity key technology investment and research and development, and technology innovation to drive product innovation, promote customer service mode innovation, promote the enterprise operation management mechanism innovation, form a complete set of innovation-driven development strategy system, help operators to cope with market rapid changes and the diversification of user demand, keep its business vitality and competitiveness, to constantly open up new business areas, create new value, create new kinetic energy.

3.4 Indicate the reform path of the transformation and optimization of operation and management of digital intelligence

In the era of digital economy, the transformation of digital intelligence is an inevitable choice and a key measure for communication operators to respond to market changes, expand their business areas, and enhance their competitiveness. Develop new quality productivity, can make communication operators more clearly realize the necessity and urgency of intellectualization transformation, and from the enhanced data elements value mining ability, improve the factors of production of resource allocation efficiency, optimize the quality of business operation process, promote organizational change and personnel training, etc., power communication operators improve internal operation management of digital, intelligent and refinement level, accelerate the communication enterprise digital, intelligent, low carbon transformation and upgrading.

3.5 Advocate cross-border integration to enhance customer value

Driven by the new quality productivity, communication enterprises are actively participating in the process of cross-industry and cross-field deep integration. The development of new quality productivity helps communication operators to find an important path to enhance customer value through cross-border integration, which is mainly reflected in the construction of an open ecosystem and the integration of upstream and downstream industrial chains. On the one hand, the communication operators adopt cross-industry cooperative research and development, cross-border joint marketing and promotion to build an open ecosystem integrating communication, IT, content, and application, to provide customers with one-stop comprehensive service experience and enhance customer satisfaction and recognition; on the other hand, the communication operators strengthen extensive cooperation and deep integration with equipment manufacturers, jointly optimize and enhance the overall efficiency of the industrial chain, improve the service quality and efficiency, thus strengthening the customer value creation ability.

4. Analysis of the operation and development environment of Chinese-American communication enterprises

As a strategic, basic, and leading industry supporting economic and social development, information and communication enterprises play an important role in promoting economic development and social progress, and their operation and development are also profoundly affected by the macro environment. Macro-environment refers to the sum of forces that directly or indirectly influence on the development of the industry, including major factors such as population, economy, politics, science and technology, and social culture. This paper selects the four dimensions of policy and law, economic situation, social trends, and new

*Corresponding Author: **Qiu Feng Cai** .

technological changes, and uses the PEST model to analyze the current situation of the development environment of communication enterprises in China and the US (see Table 1 for details). It can be seen from this:

4.1. China's communication enterprises have huge market potential and development space

With the support of favorable policies, the policies, laws, and regulations related to the high-quality development of China's communication industry will be more and more perfect, the ability of disruptive technology innovation will be continuously enhanced, the infrastructure will be gradually upgraded and improved, and the market potential and development space are huge. The operation and development of domestic communication enterprises must meet the requirements of the macro environment and new changes, in order to ensure that the whole industry is orderly, healthy, and stable development along the direction of national strategic planning.

4.2. American communications companies urgently need to accelerate innovation to stay ahead

As the first country in the world to layout digital transformation, the United States is still an important pioneer and leader in the global information technology and business development in communication enterprises. The US government and enterprises have paid close attention to and supported the development of the information and communication technology field, and created a relaxed and favorable policy and business environment. However, with the continuous development and reform of communication technology, in the face of China's strong 5G technology research and development strength, American communication enterprises are in urgent need of strengthening their technological innovation strength in order to maintain their leading position in the industry.

5. Comparison of customer value creation of Chinese and American communication enterprises

5.1. Comparative model construction

The author through the relevant literature at home and abroad, the us communication enterprise case study, under the background of developing new quality productivity, around the customer value creation, compare the communication enterprise customer value creation concept, strategy path, and action of key factors, build the communication enterprise customer value creation comparison model (see figure 1), this model in-depth comparative study analysis.

Table 1 Analysis of the macro environment of Chinese-American communication enterprises[2]

code	class	China	America
P	Political and legal environment	① China's political environment is stable, and the foundation of infrastructure construction and technological development of information and communication enterprises is solid. ② The 14th Five-Year Plan proposes to develop digital economy and build digital China; the 2024 government report proposes to accelerate the development of new quality productivity, carry out the "artificial intelligence +" action, and relax the telecom market access. ③ The "14th Five-year Plan" development plan for information and communication enterprises points out the direction for the realization of high-quality development of communication enterprises. ④ During 2020-2023, the state has successively issued more than 9 laws and regulations on communication enterprises and 15 industrial policy documents to promote the high-quality development of communication enterprises.	① The United States has a stable political environment, a sound legal system, a sound market system, and a solid foundation for the development of the communications industry. ② In 2015, the United States issued the FCC net neutrality regulatory policy, including broadband service providers into the management of telecommunications services, and establishing FCC's management power of broadband service providers. ③ From 2009 to 2023, the United States has issued national broadband plan, cloud computing strategy, big data research and development plan, national spectrum strategy and other industrial policies to ensure the international competitive advantage of the American information and communication industry. ④ Since 1999, the United States has continuously issued more than 30 communications industry planning bills, and the legal guarantee system has been improved.

[2] Source: according to the public information and literature

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E	economic environment	① China's GDP reached 126.06 trillion yuan in 2023, an increase of 5.2% year on year, indicating the overall economic recovery. ② China's digital economy will reach US $7.5 trillion in 2022, ranking second in the world, accounting for 41.5% of GDP. The digital economy has become an important engine for steady growth and transformation. ③ China's telecom revenue in 2023 is 1.68 trillion yuan, with a year-on-year growth of 6.2%. the expansion of digital transformation services; telecom business structure presents the "three wheel" driving characteristics of emerging services such as mobile Internet, fixed broadband access, and cloud computing; and basic telecom business is accelerating from scale operation to value operation.	① According to the statistics of the US Department of Commerce, the GDP of the US reached us $27.37 trillion in 2023, an increase of 2.5% over the previous year after deducting the influence of price factors, still having the world's largest modern market economy. ② In 2022, the scale of the US digital economy was us $17.2 trillion, accounting for 67.53% of GDP, and the scale of the US digital economy ranked first in the world. ③ In 2023, the cumulative revenue of the three mainstream operators in the United States (AT&T, Verizon, T-Mobile) was $334.96 billion, down 0.65% year on year. The market competition intensifies, and the operators are in urgent need to find new business growth points.
S	Social and natural environment	① China's total population keeps growing, the degree of aging continues to deepen, the level of urbanization steadily improves, the demographic dividend disappears, the development of communication business enters the slow lane, and the reform and transformation has become the only way for the sustainable development of communication enterprises. ② The National smart education public service platform continues to enrich the supply of high-quality resources, effectively expand the coverage of high-quality education resources, and narrow the gap between urban and rural areas, regions, schools, and groups in education. ③ The smart medical service platform will help solve the problems of overall insufficient supply of medical resources and uneven regional distribution. ④ Developing a positive network culture is one of the important requirements for the construction of digital culture in the new era.	① The market economic system of the United States is complete and the capital market is mature, which is conducive to the sustainable development of communication enterprises. ② The Internet penetration rate in the United States is more than 80%, and the people generally use smart phones, tablet computers, and smart homes, providing a broad market space for the development of the communication industry. ③ Consumers with different cultural backgrounds and consumer needs provide diversified market opportunities for communication enterprises, which stimulate the development and improvement of communication technology. ④ The development trend of the transformation and upgrading of the US digital medical market provides good opportunities for the development of communication technology.
T	Technical environment	① By the end of 2023, China had built and opened 3.377 million 5G base stations, with the world's largest optical fiber and mobile broadband network, and 5G networks covering all prefecture-level cities, urban areas, and counties. ② Substantial breakthroughs have been made in the AI model. Artificial intelligence has been upgraded to an indispensable infrastructure and core capability to support economic and social	① The United States has established 150,0005G base stations, with a network coverage of nearly 98%, and has the world's largest 5 GFWA market. ② The United States adopts the "whole society" model, with deep learning model Transformer, natural language processing training technology BERT, deep learning framework TensorFlow, and generative artificial intelligence product ChatGPT as typical representatives, integrating multiple

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		transformation and upgrading, and accelerating the transformation from "+ AI" to "AI +". ③ China's 6G patent applications accounted for 40.3%, ranking first in the world. From Huawei's launch of a dual-satellite communication mobile phone to the successful launch of the world's first 6G architecture verification star, China's 6G technology development, and application is far ahead. ④ From the low-orbit satellite Internet constellation program such as "Hongyan constellation" and "Apocalypse constellation" to the "Star Network Project" approved in 2022, China has continued to compete for satellite Internet resources and technological innovation.	forces to accelerate the iteration and upgrade of artificial intelligence and maintain the leading advantage. ③ From MOTOROLA's "Iridium" program to SpaceX's "Starlink" program, the United States continues to make efforts to build a high-speed Internet in space to seize the satellite broadband network resources and development opportunities. ④ The United States is a leader in the development of communication standards, and enterprises and institutions play a key role in various international communication standards organizations, such as 3 GPP, IEEE, etc.

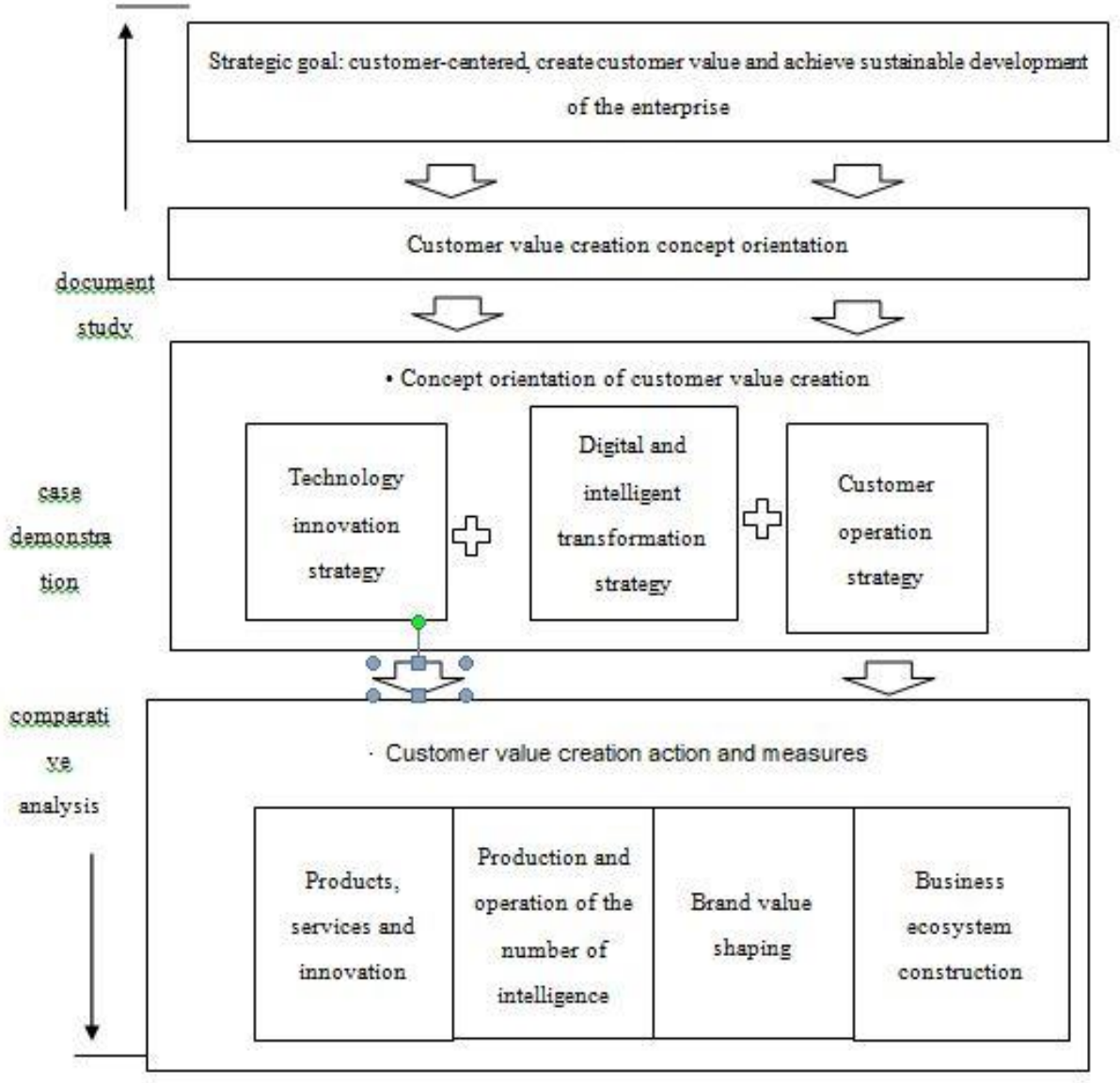

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Figure 1. Comparative model of customer value creation of Sino-American communication enterprises

5.2. Comparison of customer value creation concepts

Creating value for customers is the basis of the survival and development of an enterprise. Only by providing products and services that meet the needs of customers and meet their expectations, can the enterprise obtain the recognition and satisfaction of customers, and then enhance the market competitiveness and achieve sustainable development. Domestic and foreign communication service providers all emphasize the customer-centered service concept, and are committed to providing services and products to meet customer needs and improve customer experience and satisfaction. However, due to the different social and cultural environment, industry development stage, and policy constraint mechanism, there are some differences between Chinese and American communication operators in the concept of customer value creation.

5.2.1. China emphasizes serving the public, fine operation, and integrating social responsibility elements

First of all, adhere to the customer scale priority, to serve the public. China's communications market is relatively concentrated, China mobile, China Unicom, China telecom and other three mainstream operators have a huge user scale, the concept of customer value creation first focus on large-scale user coverage and network quality, by expanding network coverage and optimize network performance to meet the customer demand for basic communication services. Secondly, implement the concept of refined operation. As the domestic communication market scale and competition situation, Chinese operators pay more attention to customer segmentation and differentiation service, using large data analysis tools for accurate portrait, to identify high value customers and provide personalized services, by deepening the customer relationship management and mining customer lifetime value to create value. Moreover, pay attention to all-round integration services. Domestic communication operators gradually pay attention to the changing trend of customer service demand diversification, intelligent, in improving basic communication services (voice and SMS), pay more attention to provide a comprehensive, integration of intelligent value-added services, such as broadband Internet access, digital content, cloud computing, Internet of things and other value-added services, to create one-stop service platform, aims to enhance through diversified product portfolio customer stickiness. Finally, bear the responsibility and mission of realizing social values. Under the national policy guidance, as a state-owned enterprise communication operators also attaches great importance to social pratt & whitney service, based on the basic communication service, actively fulfill the mission of state-owned enterprises, for rural construction, education, medical sharing fields to provide communication services and technical support, to fulfill the social responsibility of state-owned enterprises, increase the brand influence.

5.2.2. The United States attaches great importance to technological innovation and market competition to improve customer experience

First, the emphasis on technological innovation drives value growth. AT & T, Verizon, T-Mobile and other operators in the United States focus on driving the growth of customer value through technological innovation. For example, in December 2018, AT & T announced the launch of 5G network deployment and pioneered the introduction of new communication technologies (such as 5G networks) to provide users with faster data transmission speed and more stable network connection quality. Secondly, the market competition characteristics of operators are obvious. The domestic communications market implements the concept of free competition. Communication operators must attract and retain high-value customers by providing flexible package options, unlimited data services, cross-platform integration services (such as bundled phones, broadband and streaming services), and create economic value for customers. Moreover, focus on improving the user experience. Due to the fierce competition in the domestic market, American telecom operators pay great attention to the quality of user experience. By constantly optimizing the customer service system, they improve the level of online and offline services, and use digital tools to simplify the business ordering process and improve service efficiency, so as to improve customer satisfaction and reputation. Finally, the service strategy is adjusted flexibly. Because of the market highly freedom, the government is the leading role, the communication operators on customer value creation and service strategy adjustment more flexible, less limited, according to market demand and industry development rapidly adjust strategy, through mergers and acquisitions, cooperation, rapidly expand or adjust the business areas, improve the market adaptation ability, to better create and deliver customer value.

5.3. Comparison of customer value creation guidance strategies

5.3.1. Technology innovation strategy

[3]In the rapidly developing communication enterprises, technological innovation has become the core driving force for communication operators to maintain competitiveness, meet customer needs, reduce operating costs and promote the progress of the whole industry. We should lead industrial innovation with scientific and technological innovation, and actively cultivate and develop new quality productivity. Both China and the United States pay special attention to scientific and technological innovation, increasing R & D r & d investment scale and intensity (see figure 2,3), actively carry out AI model, 5G,

Internet of things, a new generation of communication technology research and development, application innovation

[3]*From March 18 to 21,2024, General Secretary Xi Jinping visited Hunan and presided over a symposium on promoting the rise of the central region in the new era. He pointed out that "industrial innovation should be led by scientific and technological innovation, and new quality productive forces should be actively cultivated and developed", and made new arrangements and requirements for the development of new quality productive forces.*

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and service development, and strengthen the consciousness of independent innovation, enhance independent innovation ability through a variety of ways. However, due to the different development environment of Chinese and American communication operators, there are certain differences in technological innovation strategies and methods.

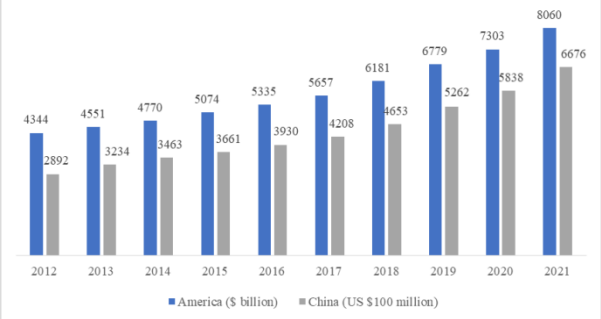

Figure 2 Comparison of R & D investment scale between China and the United States from 2012 to 2021

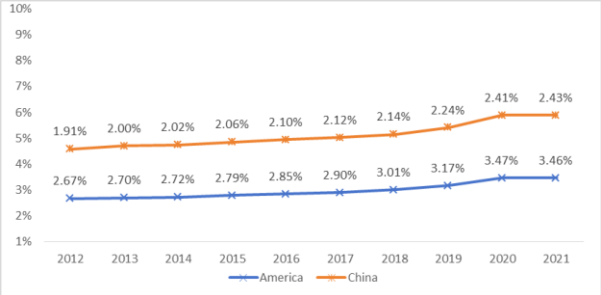

Figure 3 Comparison of R & D investment intensity between China and the United States from 2012 to 2021[4]

5.3.1.1 China attaches great importance to the cultivation of independent research and development capabilities, and accelerates technological iteration and large-scale application

First of all, China's mainstream operators invested a lot of money on technology research and development, and through with domestic equipment manufacturers (such as Huawei, zte), research institutes depth cooperation, accumulated a certain number of 5G, 6G core in the field of mobile communications technology, and strive for the basic research of communication enterprise development and key technologies to realize independent control. Secondly, Chinese operators have shown strong execution and advanced awareness in the commercial process of new technologies. For example, under the guidance of national policies, the three major communication operators quickly promoted the construction of 5G network nationwide, and actively explored the integration and innovation of 5G application scenarios and vertical industry applications. Finally, the innovation of communication technology is vigorously promoted by the national level, and the relevant industrial policies support domestic technology, which helps to accelerate the iteration and large-scale application of communication technology. Such as national ministries and commissions successively launched "on strengthening 5G + wisdom tourism collaborative innovation development notice" "5G + industrial Internet" fusion application pilot work rules (provisional) " such as industry policy, fully value and support the application of 5G technology in various industries, promote the development of 5G technology and industry integration, promote industrial upgrading and transformation.

5.3.1.2 The United States is good at technology application and innovation research, and steadily promotes the commercial process of cutting-edge technologies

First of all, the American operators in technology research and development budget also has a big investment, but more is to buy or lease mature communication technology solutions, and with the world's leading equipment suppliers and software developers (such as Ericsson, nokia, qualcomm, etc.) depth cooperation, in order to the application level and service integration on technology innovation, rather than the basis of the underlying communication technology research and development. For example, AT & T has introduced its advanced 5G technology solutions, including 5G network equipment, core network equipment and terminal equipment, enabling AT & T to quickly deploy 5G networks, improve network performance and service quality, so as to meet users' needs for high-speed and low-latency communication services. Second, US operators focus on steadily advancing the commercialization of new technologies, such as satellite communications (such as SpaceX's Starlink project), and the development and gradual promotion of application technologies such as virtual reality and the Internet of Things. At the same time, in some specific technology fields, it is important to maintain its technology leading position, such as millimeter wave technology 5G deployment in the forefront of the world. Finally, American operators carry out technological innovation from the perspective of globalization and make full use of advanced technological resources in the international market, but at the same time, they are subject to international trade rules and national security review, and are limited in certain specific technical cooperation, which has a negative impact on their domestic technological innovation and application.

5.3.2 Digital intelligence transformation strategy

The global telecom industry is actively exploring the digital intelligence transformation model based on the new generation of information technologies such as artificial intelligence, cloud computing, big data and the Internet of Things, and accelerating the upgrading from a simple network service provider to an ICT comprehensive service provider. In the current of transformation and development, Chinese communication operators, under the national guidance, take technology innovation and application as the core,

[4]*National R & D investment intensity = total R & D R & D expenditure of the current period / 100% of the total GDP of the current period.*

Data source: OEDC database https: // stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB

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comprehensively promote the digital intelligence transformation of production and life style and social governance; the United States focuses on the transformation operation and organization, make use of the digital intelligence transformation to consolidate the basic ability, promote organizational reform, and strengthen the market competitive advantage and position.

5.3.2.1 China: With technological innovation and application as the core, comprehensively promote the digital intelligence transformation of operators

Under the guidance of the national "Digital China" construction program, China's communication operators focus on their advantages in the field of technology innovation and application, fully implement the development action plan of "computing network and digital intelligence", actively carry out forward-looking business layout, and promote the digital intelligence transformation of production mode, lifestyle and social governance mode. Such as YD to "promote the intelligence transformation, achieve high quality development" as the main line, system with 5G, power network, the ability of the new information infrastructure, innovation to build "connection + force + ability" new information service system, actively carry out forward-looking business layout, promote production mode, lifestyle, social governance way of intellectual transformation. China LT is trying its best to implement the development action plan of "computing network number intelligence", to deepen market segments, to strengthen brand leadership, and to strengthen value creation.

5.3.2.2 United States: Focus on transforming the operation and organization, stabilize the market position of operators + reduce costs and increase efficiency

With the focus on the domestic market, AI, Internet of Things and big data, the American communication operators begin to realize the transformation from a single basic communication service provider to a diversified digital service provider and consolidate the market position. Meanwhile, they actively promote organizational reform, speed up professional operation, and realize cost reduction and efficiency improvement by stripping non-strategic assets and optimizing labor cost. For example, Verizon follows the basic strategy of "focusing on high-performance network capabilities and promoting business growth with high-quality network", and actively promotes the transformation of digital intelligence by focusing on building digital video (streaming media aggregation platform + Play) and Internet of Things (Thing Space). AT & T focuses on the core connection business as the strategic direction, takes AI, Internet of Things, big data and other technologies as the starting point, actively explores the layout of 2B business, excavates 2C new fields, and at the same time, adopts cloud computing, AI and other technologies to realize service integration, business continuity and intelligent management. In addition, AT & T has adjusted its organization to adapt to the transformation strategy, including AT & T Communications, Warner Media, Latin America and Advertising and Analysis.

5.3.3 Customer operation strategy

In the era of globalization and liberalization, when customers demand more value-added services (VAS) and a higher level of connectivity at lower prices, and the communication market is filled with a variety of products and services, communication service companies are under great pressure to attract and retain customers[21、22]. In the highly competitive business environment, customer operation is one of the important factors for the commercial success of communication operators. Through effective customer operation strategy, communication enterprises can establish long-term and good relationship with customers, improve customer loyalty and satisfaction, and achieve a win-win situation of customer value creation and enterprise business growth.

5.3.3.1 China: Integrated scale operation, upgrade and strengthen customer value

5G has opened a new development cycle. The goals of Chinese operators in customer operation have changed from simple pursuit of scale improvement, share control and ARPU growth to integrated scale operation of increase and storage and more refined customer value enhancement. Through the application of 5G technology, the need to carry out integrated marketing of different products for customers with different labels in different segmentation scenarios has become the key to improve the value improvement of operators. Those who know better about customers can get more operating dividends. For example, China YD adheres to the tenet of "respecting customers and serving attentively", providing 4G / 5G high-speed network service, mobile payment, cloud storage, smart home and other innovative services to attract new users; using big data technology to build a customer label library with attribute system and label system as the core[23](As shown in Figure Figure 44), And provide personalized customization services, Improve existing customer satisfaction and loyalty; Also established extensive ecological partnerships with partners in various industries, With the help of artificial intelligence and other technical means to achieve the intelligent operation of customer service; Launch various preferential policies and point feedback programs, Build a customer loyalty management platform, Collect and analyze customer feedback information, Improve the service deficiencies, Realize the customer value operation refinement; At the same time, it integrates multiple online and offline customer service channels, Such as the physical business hall, online business hall, social media, etc., Shorten the user service acquisition path and costs, Provide convenient and diversified services, To build and maintain long-term customer relationships.

*Corresponding Author: **Qiu Feng Cai** .

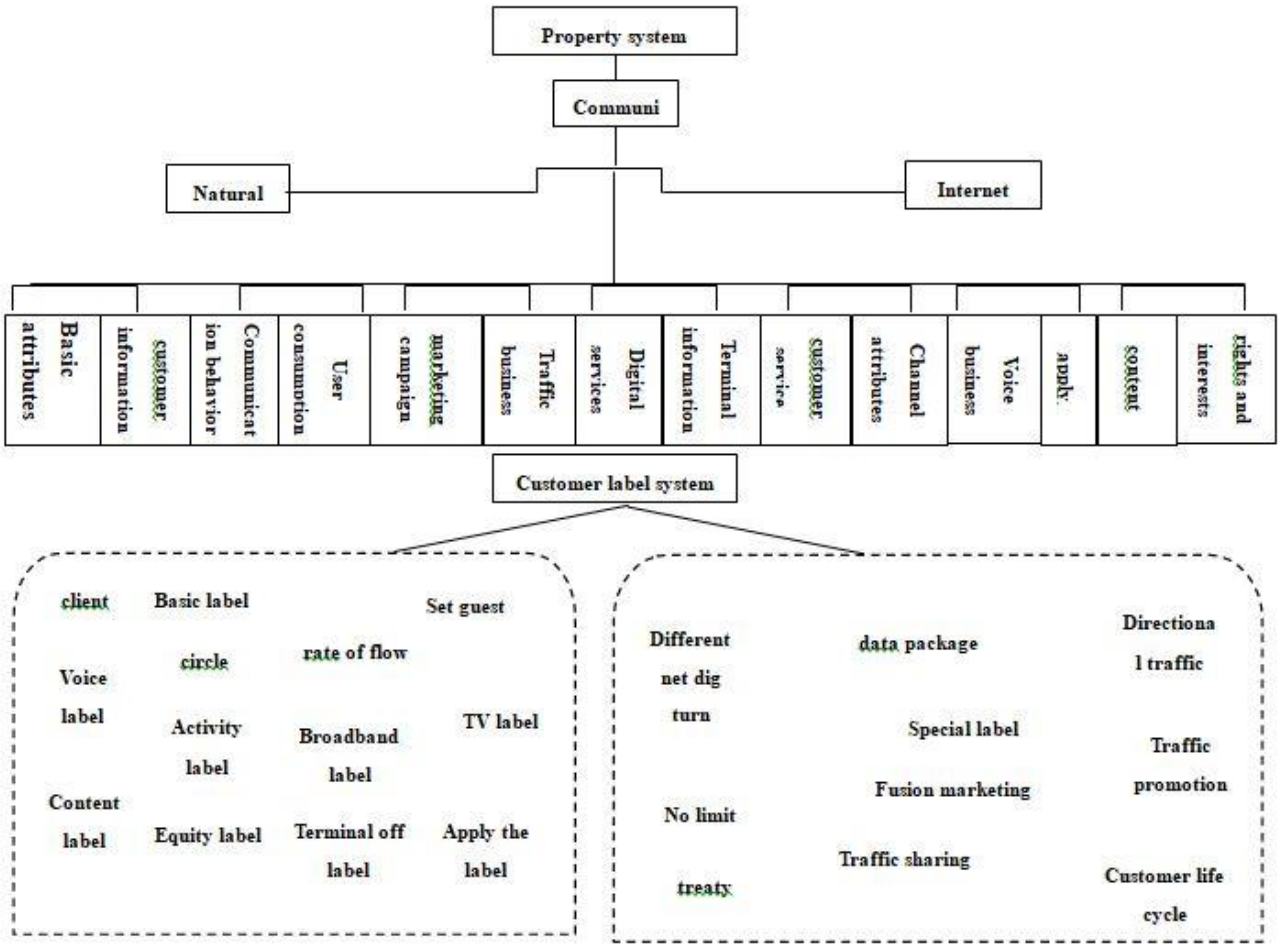

Figure 4 YD communication operator customer tag library

5.3.3.2 USA: Pay equal attention to both stock and new users, and innovation leads the new markets

Mainstream operators in the United States have both existing user retention and new user acquisition. In terms of existing users, it mainly means innovating product and service packages, improving network coverage and network quality, expanding customer interactive marketing channels, paying attention to customer experience management and other means, to deepen the existing customer experience upgrading and value creation. In terms of new users, it focuses on cultivating a culture of innovation and reform, and providing users with multi-scene, personalized and characteristic services. For example, T-mobile puts forward the strategy of "extreme customer service" in terms of existing users, optimizes the normal service and network, and innovates service packages; at the same time, it strengthens the integrated user experience support system, and establishes a unified call center organization and customer management system CRM, so as to improve customer relations and reduce customer turnover rate. In terms of new user acquisition, T-mobile actively promote Un-carrier scheme, from 1.0 no contract package to 9.0 users EIP loan balance compensation / original rates unchanged a total of nine special products, provide users with all kinds of preferential and convenience, solve different scenarios in different stages of the user pain points and difficult problems, break the traditional "paid" mode and terminal subsidies situation, leading the development of new business market.

5.4 Comparative comparison of customer value creation mechanism

5.4.1 Innovation mode of products and services

Through innovative products and services, communication service enterprises can provide better-quality and more convenient services to meet the personalized needs of customers. China and the United States have different priorities on communication products and service innovation: Chinese operators focus on innovating the business model of digital intelligence products and services to create a multi-scene service product system; the United States focuses on using digital intelligence technology to customize Internet of Things solutions to expand their business scope.

5.4.1.1 China: Innovate product and service business model and build a multi-scene cloud data service product system

—— **Build a multi-dimensional business model for products and services.** Build a product matrix multi-dimensional business model for 5G and other new technologies, by changing the channel channel CH built between customers, and then completely change the cost structure of the business model CS and revenue source RS,

*Corresponding Author: **Qiu Feng Cai** .

build a new business system and a new profit model, and bring satisfactory value experience to customers[23]. Such as YD communication company for enterprise customers to build the "B + A + F" more dimensions of 5G private network new business model: 5G private network products are divided into network function (Basic) and service function (Advanced), enterprise customers can be combined with specific business scenarios and actual requirements, personalized service customization and combination, package contains "traffic, bandwidth, base station, speed, operations" and other billing dimensions, let customers "by order", flexible to meet customer diversified needs.

—— **Relying on digital intelligence technology, to build a multi-scene cloud data service product system.** For example, for the individual market, YD relies on the latest transmission technology, innovates and expands cloud games, cloud AR, cloud VR, video SMS, cloud storage and other products, and provides a wired transmission network with low latency, high reliability and flexible scheduling. For the life market, YD focuses on building a one-stop enabling platform of "harmony family and family" based on "cloud-tube-end-edge", building an intelligent family network, and promoting a wide range of home HICT solutions to meet the needs of users for scenario-based, digital and intelligent family life.

5.4.1.2 United States: Expand the product and service portfolio, enhance differentiated competitive advantage and customer service experience

—— **Focus on the core connection business, focusing on a diversified product and service portfolio.** From the product side, the major US operators in the structural design and promotion policies of 5G plans are much the same, and the highlight is that they all provide users with 5G fusion packages with unlimited traffic limit. From the service side, mainstream operators provide differentiated services such as preferential purchase of machines and brand discounts. For example, T-Mobile has exclusive offers every Tuesday, such as brand discount coupons, free T-Mobile products, and Starbucks gift cards. Verizon The MMU plan allows multiple routes to have multiple package plans to enhance user engagement and improve retention. From the resource side, the packages of mainstream operators all include a wealth of streaming media products, and launch free members of videos, music and other applications to highlight the selling points of 5G packages. T-Mobile's 5G plan, for example, includes free streaming services for all of 12 months.

—— **Use machine learning technology to enhance the customer service experience.** In order to allow users to contact customer service immediately and get customer service staff to respond quickly, T-Mobile's AI team developed an ML model based on natural language understanding. The model can analyze a large number of customer requests and data, predict the reasons why the customers contact T-Mobile, and determine the information that can meet the customer needs. It also uses Amazon's Ground Truth solution to automate data annotation and improve the quality and quantity of model training data sets, so as to improve and enhance the customer experience.

5.4.2 Intelligent innovation of production and operation data

Through the innovative application of digital intelligence technology, communication operators can automate the processing of business processes, improve the efficiency of customer service, reduce customer waiting time, optimize and improve customer experience, so as to create more customer value. Through comparison, it is found that Chinese communication operators are more inclined to give full play to the advantages of technological innovation, reform the business operation mode, and provide customers with high-quality and convenient services efficiently and quickly. In the United States, it focuses on business refinement, uses technology innovation and application to expand business boundaries, and promotes the improvement of user scale and customer value.

5.4.2.1 China: Give full play to the advantages of innovative technology and improve the level of production and operation

—— YD company gives full play to its technical advantages and improves the digital intelligence level of production and operation. In terms of marketing, YD company fully mining and marketing data value, accurate positioning target users, analysis of user access behavior, purchase conversion rate, customer activity, potential customer demand, stores and platform operating efficiency data, accurate description customer portrait, provide personalized recommendation, meet the demand of one thousand one thousand face, realize the intelligent marketing[24]. In terms of business opening, YD has realized the intelligent operation of cable business opening, transforms the manual data production into automatic system operation, shortens the data operation efficiency from "day" to minutes, greatly improves the opening efficiency, reduces customer waiting, and improves customer satisfaction.

—— TT Company realizes the intelligence of operation and maintenance inspection to ensure the stable and efficient operation of communication infrastructure equipment. TT company through the installation of hd camera, inspection recorder, digital qr code labels, communication base station image acquisition annotation, model training optimization and AI automatic identification operation, solve the communication base station in hidden trouble, fault reservation, resources change, etc, establish "intelligence tour + patrol" collaborative inspection mode, basic implementation "intellectual tour, tour is auxiliary" digital inspection, effectively reduce labor costs, improve production efficiency, ensure operational inspection quality and customer perception[25]。

5.4.2.2 United States: Improve the refinement level of business operation and promote the improvement of user scale and value

—— **AT & T continues to strengthen its business operations and promote the growth of its user scale.** On the one hand, riding the launch of the new mobile phone, the launch of a very competitive advantage of the promotion

*Corresponding Author: **Qiu Feng Cai** .

program. For example, AT & T takes advantage of the consumption habits of most American consumers to buy mobile phones through carriers, cooperates with the launch of new mobile phones such as iPhone, and launches a highly competitive terminal bundle promotion scheme. In 2022, AT & T offers up to $700 to $1000 for iPhone13 series and 14 series phones respectively. On the other hand, deep ploughing market segments, to carry out refined operation. For example, in the face of the sinking market, AT & T strengthens the cooperation with Wal-Mart to increase the marketing contacts, so that users in remote areas can buy mobile phones for fiber-optic broadband, and the marketing team into the community for optical fiber and wireless cross-selling to promote the overall growth; for Hispanic customers, AT & T seize the unique needs of entry and exit and frequent overseas contact, with the border free roaming package, while expanding third-party distribution, to strengthen the coverage of this group of customers.

——Verizon Terminal subsidies and additional services to drive the value of wireless users. In 2022, due to the increase of costs, rising inflation and economic downturn, Verizon will "raise price" as the entry point of high-quality operation on the premise of constantly improving the network quality. For example, in June 2022, Verizon increased the monthly cost of the limited data plan by $6 or $12. At the same time, we will continue to implement strong terminal subsidies and package additional package services to attract users, enhance user engagement, and avoid excessive loss of users due to rising rates. For example, increase Fios user subsidy and terminal sales subsidy, launch a series of promotional activities for iPhone, tablet, headset, smart watch, including old replacement and direct subsidy; provide upgrade service, i cloud storage space service, Apple Music, Apple TV + and Apple Arcade service; and provide "Plus Play" service for mobile post-payment, 5H Home and LTE Home users.

5.4.3 Brand value shaping strategy

A good brand image can improve customers' trust and loyalty to operators, establish a good trust relationship with customers, and promote operators to continuously improve their products and services, so as to create more customer value. The comparative analysis shows that both operators in China and the US attach great importance to brand value building and brand publicity, but Chinese operators tend to build brand reputation and value with high-quality services and products, while the US focuses on using diversified marketing methods to actively promote brand value connotation and obtain customers' value recognition.

5.4.3.1 China: Improve brand awareness and reputation with high-quality service and brand image

Chinese operators have established a clear and unified brand identification system (including signs, fonts, colors, etc.), gradually forming a differentiated competition pattern in terms of brand positioning. For example, YD is committed to creating a brand image of "network excellence and leading service", while LT attracts consumers with its brand positioning of "innovation, youth and wisdom".

In terms of brand promotion, by optimizing network coverage, improving service quality and launching featured businesses, it meets the diversified needs of users and builds brand reputation. At the same time, we pay full attention to the collection of customer service opinions and complaint handling, timely solve problems for customers, cultivate loyal brand fans with high-quality service experience, and create more commercial value for operators. For example, YD Company changes the service mode, realizes the seamless connection between robot customer service and expert customer service, and provides business consultation, fault claim and handling services. After the registration in the business center, the customer implements localized and grid operation, binds the installation and maintenance personnel with the customer, and combines online contact, integrating marketing, installation and maintenance, changing the traditional offline leading service mode and allowing customers to enjoy convenient, fast and thoughtful service.

5.4.3.2 The United States: Operators use diversified marketing means to promote the connotation of brand value

American operators focus on differentiation in brand value building. For example, Verizon, AT & T and other mainstream operators focus on advantages such as wide network coverage, stable speed and technological innovation, while T-Mobile focuses on affordable prices, flexible packages and good customer experience.

American operators adopt diversified promotion strategies to promote the connotation of brand value. In terms of content marketing, it is good at using social media, blogs, short videos and other platforms to release content about network coverage, technological innovation and customer cases, so as to enhance users' cognition and trust of the brand. In terms of partnership, communication operators have carried out in-depth cooperation with equipment manufacturers and streaming media service providers, providing customized services and preferential packages, and jointly explore the market. In terms of celebrity marketing, well-known celebrities or influential people are hired as brand spokesmen to expand brand awareness with the help of their fan base and influence.

5.4.4 Business ecological model

By enabling traditional industries and layout emerging digital industries, communication operators expand the application scenarios of new technologies, provide more abundant, convenient and high-quality products for thousands of industries, meet the diversified digital service needs of users, and create more customer value. The comparative analysis shows that Chinese operators dominate the layout of emerging digital economy, innovate the business model of "communication + digital economy industry", so as to establish a more comprehensive digital ecology. American operators combine both traditional industries and emerging industries, and build a diversified innovation ecosystem through diversified industry cooperation methods.

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5.4.4.1 China: Lay out the digital economy field and establish a more comprehensive digital ecology

China's telecommunication operators have established a more comprehensive digital ecology through their forward-looking layout in the digital economy field. Through the in-depth cooperation with the industrial Internet, smart medical care, smart education and other digital economy fields, communication operators participate in the innovation of more application scenarios, and realize the all-round penetration of digital technology (see Table 2 below for details).

Table 2 Typical examples of the layout of digital economy in China's communication operators[5]

Digital ecology	typical case
5G + industrial Internet	Shanghai LT has joined hands with Jiangnan Shipyard to integrate the industrial chain, jointly promote the intelligent transformation of 5G private network + collaborative manufacturing, and combine the ship production technology to create 5G intelligent application, promote the digital transformation of the shipyard, and improve the production efficiency and production management level. Through the 5G intelligent manufacturing innovation laboratory, it will create a new ecology of 1 + 1 + N smart shipyard, enabling high-end manufacturing of ships, and boosting the transformation and upgrading of the national shipbuilding industry.
5G + smart medical care	Shanghai DX, together with Huashan Hospital affiliated to Fudan University, jointly built a 5G medical demonstration network, and established an AR visual surgical navigation platform for the treatment of neurosurgical diseases.5G, artificial intelligence algorithms and edge calculation were adopted to comprehensively analyze the risk factors and correlation coefficients of progressive intracranial hemorrhage, innovate and change the traditional methods of craniotomy surgery plan formulation, and accurately implement the surgery to ensure that the treatment was in place.
5G + smart education	China DX introduced the new concept of "5G dual domain fast network" in Wuhan to meet the diversified network experience and personalized access needs, and provide instant, fast and stable network access service; meanwhile, configure campus security control platform to meet the individual needs of secondary authentication and IP traceability; and provide university cloud broadband service, providing differentiated products and services such as international academic website access, low network delay and live broadcast acceleration, and provide fresh network service experience for college students.

[5]Source: according to the public information and literature

5.4.4.2 United States: Cooperate with various industries to build a diversified innovation ecosystem

The American communication operators innovate the industry cooperation mode, empower all industries through diversified cooperation methods, and build a diversified innovation ecosystem. This includes not only cooperation with technology companies, but also deep integration with traditional industries, which promotes the wide application of communication enterprises in various fields.(See Table 3 below)

Table 3 Typical example of the diversified innovation ecosystem for communication operators in the United States[6]

ways of cooperation	typical case
Industry empowerment	① Enable traditional manufacturing plants and promote intelligent manufacturing: AT & T cooperates with General Motors (GM) to provide network connection and data analysis services for GM's intelligent manufacturing plants, help GM realize real-time monitoring of factory equipment, only data collection and analysis, and improve production efficiency and quality. ② Can assign health care, power wisdom medical: Verizon and veterans affairs, Medivis and Microsoft cooperation to open 5G hospital, doctors can scan CT or other imaging program data converted to 3D images, and with the help of 5G enhanced bandwidth will be 3D image fast transmission and display on the HoloLens headset, help patients to intuitively understand the condition.
cooperative development	① AT & T is working with IBM to launch a solution called "Watson for Telecommunications," which uses IBM's Watson AI platform to help telecom companies improve the customer experience, optimize network performance, and enhance security. By combining AT & T's telecommunications expertise with IBM's AI technology, it aims to provide more innovative and personalized services. ② AT & T works with Amazon to develop Internet of Things solutions, which use AT & T's communication network and Amazon's AWS cloud computing platform to enable enterprises to connect and manage IoT devices and applications.

[6]Source: according to the public information and literature

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ways of cooperation	typical case
Cross-border joint	① T-Mobile and T a co Bell co-branded theme store, to bring exclusive rights and interests to users. T-Mobile has worked with Taco Bell to open a joint themed store called T-MoBell, which aims to provide exclusive goods and food to consumers. As part of the T-Mobile Tuesday Equity Day event, the two brands joined forces to provide customers with free burrito giveaway and develop limited edition drinks like T-Mobile Freeze and Taco Bell themed socks, making T-Mobile Tuesday a number one app in the AppStore. ② AT & T x NBA co-branded customized service to bring users a unique experience. For example, AT & T Playmaker and NBA Crossover jointly develop the universe, where users can customize personalized virtual characters and stay in the all-star themed AR playground; AT & T 5G provides exclusive event concert shots to bring users a multi-perspective live viewing experience, showing the strong business capability and value of AT & T.

6. Conclusion and outlook

6.1 Study Conclusion

Communication enterprises in China and the United States in the political, economic, technology, and social environment has significant differences, but the two communications operators actively grasp the development of new quality productivity opportunity, make full use of technological innovation and the power of intelligence transformation, committed to strengthen customer value creation and value management ability, mainly reflected in the following points: one is to make full use of domestic communication enterprises in the field of technology innovation and application, active layout of other industries, give play to the role of communication enterprises, promote the mode of production, way of lifestyle, social governance change. The second is to implement the customer business strategy of "both, both hard" to increase existing customers, establish long-term and good relationship with customers, improve customer loyalty and satisfaction, and achieve a win-win situation of customer value creation and enterprise profit growth. Third, operators in both countries attach importance to the in-depth mining of users 'personalized and characteristic service needs, and use big data technology to provide personalized customized services for customers' accurate portraits.

There are still significant differences between communication operators in terms of customer value creation concept, digital intelligence transformation strategy, and customer value creation path. Firstly, in terms of customer value creation concept, Chinese operators put more emphasis on scale customer service and integration of social responsibility elements; while the United States conducts technological innovation and market competition around the improvement of customer experience. Secondly, in terms of the transformation strategy of digital intelligence, China takes technological innovation and application expansion as the core to comprehensively promote the transformation of digital intelligence of operators. In the United States, the focus is on changing the operation model and organizational structure, focusing on stabilizing the market position of operators in the country, and simultaneously promoting cost reduction and efficiency improvement. Moreover, in terms of customer operation strategy, Chinese operators advocate integrated scale operation of increase and storage and consolidate customer value creation ability through iterative upgrading. In the United States, both the stock and the new stock are equal. On the basis of upgrading the existing customer experience, we will create new products and services to attract new users and expand new business markets. Finally, in the path of customer value creation mechanism, China focuses on the innovation of digital intelligent product service mode, improve the level of production and operation digital intelligence, focus on the layout of digital economy, build brand reputation and value with high-quality services and products, and create more value contributions for customers. In the United States, it focuses on providing differentiated digital products and services, improving the refined operation level of enterprises, highlighting the building and publicity of the brand value of operators, and jointly building a diversified innovation ecosystem together with various industries.

To sum up, under the background of the development of new quality productivity, China and the United States communication operators take customers as the center, give full play to their technology innovation and application advantages, adopt the diversification of value creation mode and path, deepening the transformation of enterprise number intellectualization and strengthen customer value creation ability, help communication enterprises to achieve leapfrog and sustainable development, and for other enterprises number intellectualization transformation and sustainable development has important reference value and realistic guiding significance.

6.2 Management enlightenment

(1) in order to adapt to the change of customer service demand, communication operators should stand in the perspective of customers, put yourself in for the sake of the customer, understanding of customer communication demand trends and rules, and according to customer demand changes, flexibly adjust the enterprise production and marketing activities, to provide customers with more comprehensive, convenient, high-quality products or services.

(2) in terms of production operations, communication operators should be guided by customer service demands data, based on the unified identification system of production factors, automated network system resource allocation, optimize production operation process, quickly open business, robot customer service and expert customer service seamless,

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instant provide high-quality operation services, realize the digital and intelligent production operations.

(3) Communication enterprises should actively build diversified innovation ecosystems. Communication enterprises need to increase R&D investment, strengthen independent innovation ability, build innovation culture atmosphere, stimulate innovation incentive mechanism, and actively explore new business models, such as platform operation and sharing economy model. Externally, it is necessary to continuously strengthen the cooperation between the upstream and downstream of the industrial chain, build open innovation platforms, attract innovative resources and technologies at home and abroad, and at the same time combine communication technology with the needs of the transformation and upgrading of various industries, and develop innovative products and services with industry characteristics. Both internal and external repair, collaborative innovation, so as to continuously improve the competitiveness of enterprises, to adapt to the changes in the market and customer needs.

6.3 Future Outlook

6.3.1 Customer participation in value co-creation

In the era of digital intelligence, the future customers will not only be the recipients of communication products and services, but also the co-creators of value. Through in-depth cooperation and communication, customers and enterprises can jointly participate in product design, production, marketing, and other links, so as to make the products more in line with the needs of consumers, and improve the product satisfaction and market competitiveness. How to guide customers to participate in the creation process of enterprise products or services, and how to obtain greater value from customer participation, will become an important theoretical research topic.

6.3.2 Release of data asset value

In the context of new quality productivity, data assets, as the core assets of operators, can improve the quality of decision-making, optimize user experience, enhance data security, promote data circulation and sharing, and improve organizational efficiency. The development of new quality productivity will further promote the release of the value of data elements of operators, and the role of data assets will be upgraded from service support to value reengineering. The integration of data resources will put forward a quantitative reference and judgment on the operation scenario more comprehensively[26], To quickly and efficiently transform scattered and fragmented market data into decision support data to realize the "data-driven" of enterprise strategy. How to accurately identify, collect, and integrate data assets, and how to deeply mine and play the value of data assets will become an important application research theme in the future.

6.3.3 Virtual digital people step into a new stage of development

With 5G, AI, Internet of things technology progress, and continuous expansion of application scenarios, virtual digital people will interact in customer service, marketing, entertainment, cross-border integration, promote communication operators for the future business growth point, innovative business service model, promote reshape industry ecological pattern, provide strong driving force for the development of communication industry. At present, virtual digital people have been in the incubation stage, the number of enterprises and market size are growing rapidly, its concept is no longer limited to the image of "people", but extended to the category of "things", that is, the so-called everything in the world can be virtual. In addition, the development of virtual digital people is also faced with challenges and problems such as data security and privacy protection. In the future, the theoretical research, technological innovation, application expansion, and security and privacy protection of virtual digital people will be very important research directions.

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