Application and Research of Digital Technology in Media Industry in 5G Era

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Abstract. The increasing maturity of 5G technology opens a new era of Internet of Everything, in which the integration of many technologies such as artificial intelligence and big data makes the Internet of Things widely promoted and applied, and data streaming and video streaming become the development trend, driving the new development of the media industry in the 5G era. 5G technology realizes cross-scene user experience with its high speed, low latency and large connection. Based on the basic performance of the media industry in the 5G era, this paper analyzes some major applications of 5G in the media industry, including VR/AR, IoT, cloud games, and 4K HD video, etc. The organic combination of 5G technology and the media industry has driven the change of the traditional industry and will generate many new applications, and different application scenarios will be given rich content and newer forms, driving the 5G era media The new development of the industry.

Keywords-5G era; digital technology; media industry; applications

1   Introduction

With the innovation and progress of technology, the development of 5G technology has become a hot spot of social concern. 5G technology, as the main goal of the development of modern communication network technology, is developing towards faster network transmission, and the digitalization and video process in the 5G era will drive innovation in different industries, and the media industry will be one of the key application areas, and people's entertainment consumption mode will change with the Internet of everything, and the media Information dissemination channels will become more diversified.

2   Prospects and trends of the media industry in the 5g era

The impact of digital technology on the media industry in the 5G era is changing from the communication medium to the way it is experienced, and the development of new technologies

is bound to bring innovation. For the impact and changes brought by high technology, with the rapid growth of 5G user usage, (as in Figure 1) how to adapt, are facing unprecedented challenges. 5G's advantages are continuous wide area coverage, hotspot high capacity, low power consumption, large connection and low latency, high reliability, and meeting "key application scenarios, business needs and challenges of mobile Internet and IoT" [1]. Omni-directional video will become one of the super trends in the media industry in the 5G era. The interoperable transmission of all digital information also brings a series of chain reactions that change the limitations of mobile video terminals in the 4G era, making it possible for everything to be media in the 5G era.
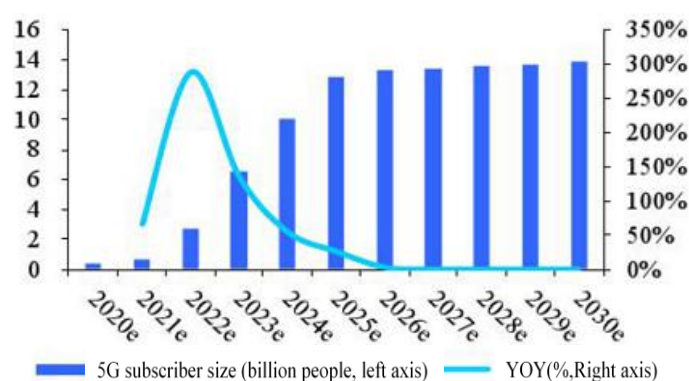

Figure 1. 5G subscriber scale in China, 2030. Data source Guotai Junan Securities Research

3   The basic performance of the media industry in the 5g era

First of all, 5G technology not only accelerates the communication process and enriches information content, but more importantly, reshapes communication relationships and life scenes, "creating a new information environment, a new concept of knowledge and intelligence", "the change of technology is systematic", "therefore, media change is the creation or reshaping of communication forms in the ontological sense" [2].

Secondly, the pluralistic symbiosis of the internal form of the media system, "traditional media are differentiated or evolved into three types of media as the main body of information production: professional media, institutional media, self-media, and platform media that provide technical and channel support for information aggregation and dissemination of these three types of media" [3]. With the popularity of 5G technology and the Internet of Things, the composition of the media system has changed, and "IT companies and the Internet of Things, which have smart machines and sensor data, will become members of the media system" [4].

The final redefinition of the user. In the 5G era, the way media connects with people, life scenes, and the relationship between people and things have all undergone fundamental changes. People travel through real and virtual spaces, and different spatial locations and scenes will generate

different information about the relationship between people and things. The media needs to push adapted information for people in different scenes and provide corresponding services. "The future information collection to the various aspects of processing, the participating subjects are not only people, machines and everything may become the collector of information, and machines can also complete the intelligent processing of information" [5]. In short, environments, smart facilities and scenarios all become elements and dimensions that describe users and understand people.

4   Exploration of key media application scenarios

The advent of the 5G era will not only transform the communications sector, but will also have a series of changes and impacts on the media industry. Applying 5G digital technology to the media industry is a bold experiment and innovation, and immersive emerging media applications are expected to reach an unprecedented scale by 2028. Some of the key applications of 5G in the media industry are analyzed below, including VR/AR, IoT, cloud gaming and 4K HD video applications.

4.1   VR/AR: Diversified application scenarios to trigger media industry innovation

The immersive video experience brought by VR/AR technology will bring the 5G era to the path of super video. In the current VR/AR experience, users often feel uncomfortable when watching for long periods of time due to the transmission speed and high latency of 4G networks, while the 5G era will bring consumers a more comfortable experience (as shown in Figure 2). In addition, 5G will also help push VR/AR cordless. That is, users can perform VR/AR experiences anytime and anywhere with the help of mobile terminals, free from hardware tethering [6]. The computation and content processing of cloud VR/AR are done in the cloud, and the high-speed and low-latency characteristics of the 5G era can further help the expansion of the new industry.
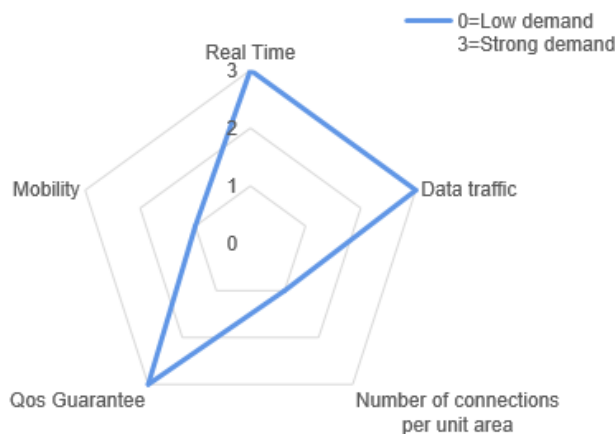

Figure 2. Cloud VR/AR has high demand for communication network latency, transmission rate and stability The value of content applications is highlighted. Data source: Wiress Xlabs

According to the China Academy of Information and Communication Research, from the application scenario and cloud-based process, giant theaters, live streaming, panoramic video, games and education are the main focus of the current stage on the cloud, and with the deployment of 5G construction bandwidth latency can ensure the realization of the network. In the 9 major applications of VR/AR in the field (Figure 3), video games, live events and video entertainment account for most of the overall VR/AR, "the new technology propagation network connects the original unrelated geospatial elements ...... to achieve the integration of virtual information networks and physical space networks" [7]. There is much room for future development.
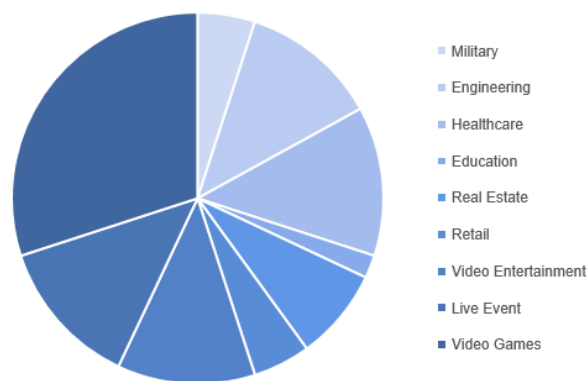

Figure 3. Top 9 Application Areas for VR/AR in 2025. Data Source: Goldman Sachs, Tencent Technology

VR film and television ushered in the explosion, "content" + "technology" has become a strategic focus. 5G era of advances in communications technology, long-video VR content has become possible, VR film and television content will be further popularized. According to the newly released IDC Global Augmented and Virtual Reality Spending Guide data, the global spending size of the AR/VR market is forecast to reach $12.07 billion in 2020, up 43.8% year-on-year. China's overall market size will reach about $6.6 billion by the end of 2020, up 72.1% year-over-year from 2019, surpassing the U.S. and Japan to rank first in the world in terms of both size and growth rate. The scale of spending by Chinese VR market enterprises in 2020 is expected to reach $24.34 billion and $92.18 billion in 2024, which is about to break through the $100 billion scale (Figure 4).
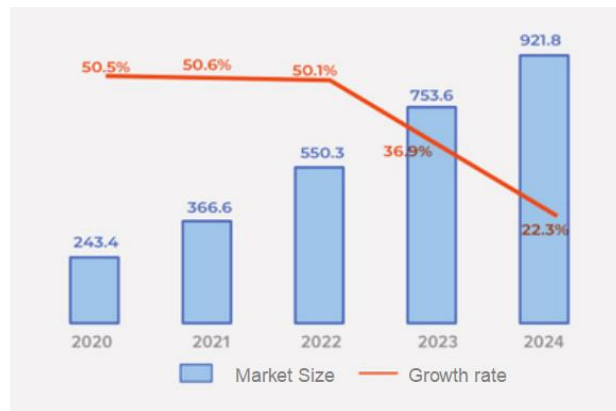
Figure 4. Enterprise IT spending size forecast for China VR market, 2020-2024 (unit: billion yuan) Data source: IDC, 2020

While ensuring basic user experience (high resolution, color, 3D, low latency, etc.), the increase in video length adds new possibilities for immersive film and TV experiences, and the interaction modes and special sensory effects realized by technology will also constitute elements that attract users [8]. In the future, the film and television industry will further use technology to make changes based on improving the quality of content, and the way theaters are viewed and operated will be very different.

4.2 5G drives the development of the Internet of Things

The application of 5G implies a huge breakthrough in connectivity. The development of IoT is a continuous process of solving "connectivity", from the physical connection of machines to the connection of information content to the connection of human relationships (Figure 5). Everything is connected and data intelligence ushers in new opportunities for media, and the IoT built in this context will bring massive amounts of raw data that can reflect users' behaviors and habits from all angles, further realizing artificial intelligence in communication and fueling more accurate digital marketing [9]. For example, Xinhua's "MAGIC" intelligent production platform can realize data visualization, data video, and video automation based on the production of large amount of MGC news to meet the needs of different audiences. In addition, the changes in transmission rate and cell phone performance in the 5G era will further expand the content area of small programs and subvert the APP ecology and traffic acquisition channels.
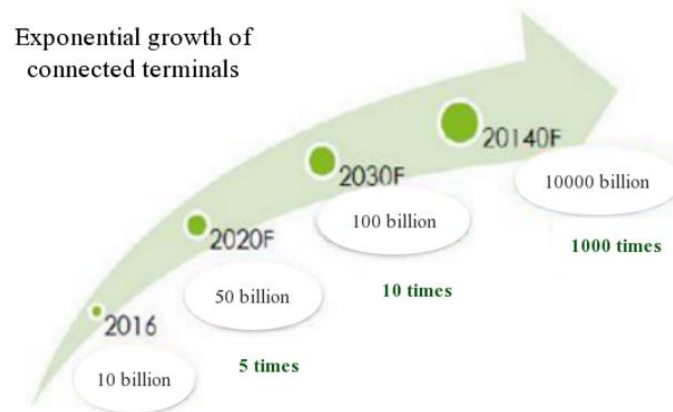
Figure 5. Exponential growth in the number of IoT linked terminals. Data source Deloitte Research

5G+AIoT realizes intelligent interaction of home terminals. 5G, as the foundation for building the IoT, will rapidly structure the IoT with a new communication technology, while artificial intelligence will empower the connection ecology and realize intelligent interaction of home terminals [10]. The traditional 4G network is often difficult to meet the network connection density required for smart homes, with problems such as poor terminal stability and low compatibility; while 5G communication technology enables more devices to be connected to each other, while further improving the response time between devices. On top of the connection ecology, user data is gradually accumulated, at which time artificial intelligence will help carry out big data analysis and character portraits based on user habits to meet customers' needs for diversified and intelligent scenarios. In the smart home scene: living room as an important functional scene, will use large-screen smart TV as the IoT control center to achieve entertainment, life all-round interactive applications, and establish large-screen AToT super potential [11]. TCL announced to enter the AT*OT track, combining user needs, I0T device functions and AI capabilities with each other, while laying out the TV large-screen emotional interaction function, that is, the TV can distinguish users by The TV can distinguish users through portrait recognition, use visual interaction to gain insight into preferences, and recommend content on this basis to achieve intelligent personalized services that "understand you" [12].

4.3 VR live streaming has been successfully applied in several fields

The combination of VR and live streaming technology enhances the live viewing experience and makes the audience convert from passive viewing to active participation, more integrated into the scene, breaking the space and distance barrier, VR live streaming brings immersive experience in a number of industries are of great significance, with huge market potential, by 2021, the market size of VR live streaming will reach 6,430 billion yuan, with a market share of 11.8% (Figure 6).
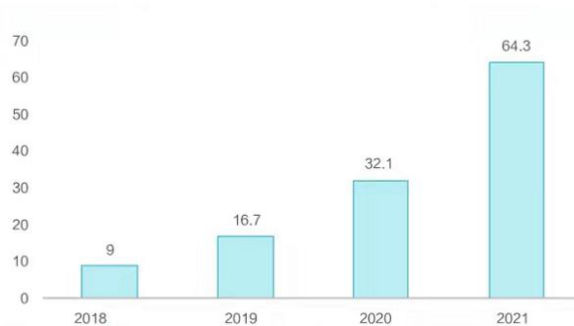
Figure 6. 2018-2021 China VR live streaming development trend Data source: Sadie Consulting

There are two main categories of VR live streaming, one is PGC (Professional Generated Content), such as sports events, variety shows, news events, education and training, product marketing, etc.; the second is UGC (User Generate Content), such as Netflix live streaming, outdoor live streaming, life live streaming, etc. Digital technology in the 5G era helps to transmit smooth HD images in real time. 5G era digital technology helps to transmit smooth HD images in real time, the potential of HD VR cameras will be fully utilized, and user terminals will have a better viewing experience. 2019 CCTV Spring Festival Gala realized the real-time transmission of 5G/VR live 720° panoramic video for the first time, bringing a new audiovisual experience to hundreds of millions of viewers. The future 5G+VR live broadcast is expected to realize the diversification of business models [13].

4.4 Cloud game: 5G landing completely solves the network technology problem

Cloud-computing-enabled games bring new opportunities to the industry. Based on cloud computing, cloud games load and run games on remote cloud servers and transmit the rendered and compressed images to user terminals through the network, which can perform video and game operations after receiving them From the perspective of users, cloud games help improve user experience and expand the market scale. As of 2018, VR game experience accounts for the first place in the industry market size (Figure 7).
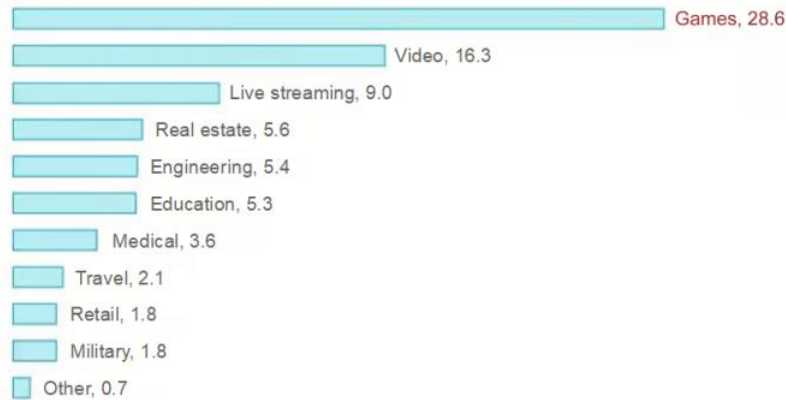
Figure 7. China VR/AR industry market size in 2018 Data source: Sadie Consulting

On the one hand, cloud games will lower the entry threshold of high-quality games, and the user terminal only needs to have the basic The basic video decompression ability, which will greatly reduce the entry cost of players. On the other hand, cloud games will break through device limitations and introduce innovative gameplay, players do not need to spend time downloading, and can realize games anytime and anywhere through computers, cell phones, tablets and other devices that can access the network, which will expand user channels to a greater extent and reduce game customer costs and maintenance costs, while game developers do not need to study game adaptation problems and can focus on the content itself [14].

4.5 The development of 5G technology provides guarantees for ultra-high definition video network dissemination and terminal development

The future scale of Ultra HD application market is promising, the higher the bandwidth, the better the video quality. Among the segments of China's Ultra HD market, industry applications occupy the major share, among which broadcast TV has taken the lead in realizing some Ultra HD applications, such as Jiangsu Cable TV, Sichuan Broadcasting Network, Hunan Cable TV has provided 4K Ultra HD channels for broadcast. At present, the country is accelerating the implementation of UHD industry development planning. on March 1, the Ministry of Industry and Information Technology, the State Administration of Radio, Film and Television, and CCTV jointly released the "Action Plan for the Development of Ultra HD Video Industry (2019-2022)", which clearly follows the general technical route of "4K first, taking into account 8K". Further promote the rapid development of ultra-high-definition industry [15].

5   Conclusions

5G digital technology, as a high-end technology, has a very positive significance for building a more efficient and secure network era, and more and more countries are beginning to pay attention to this technology, and China has also conducted vigorous research in 5G digital technology and achieved very good results. In the future, 5G will be widely used and spread to

every corner. 5G is not an evolution based on 4G, but a new revolution and generation. In the face of the new round of technological innovation, the role of media is changing from "information service provider" to "information at your fingertips, everything is accessible". 5G era digital technology in the media industry is the new trend, new opportunities and new challenges of the times.

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