Research on the Way to Promote the Value Chain of Animation Digital Publishing in the Context of AI

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ABSTRACT

With the development of AI (artificial intelligence), animation digital publishing has been integrated with intellectualization. This paper adopts the theory of the global value chain, and analyzes the basic structure of the animation publishing value chain. Then focuses on the analysis of digital technology and artificial intelligence technology to play an active role in the topic selection and content customization of animation digital publishing products, optimization of publishing platforms, and user experience of publishing products. Finally, it proposes the use of artificial intelligence data analysis and deep learning technology. The purpose of this paper is to realize the upgrading of animation digital publishing, product upgrading, industrial chain upgrading, and identify some promotion methods for the value chain, such as copyright protection.

Key words*: Digital Animation Publishing, AI, Value Chain Upgrade Path.*

1. INTRODUCTION

Since 1990s, with the rapid development of digital technology, animation digital publishing, as a new industry form, gradually occupies the traditional animation publishing market. United States, Japan and other developed countries lead the tide of animation and digital publishing. They allocate resources globally, and conduct the transnational production, management and sales of animation digital publishing; South Korea grasps the opportunity of digital technology development and takes the animation game industry as a breakthrough to establish its position in global animation and digital publishing [1], [2]. Facing with the global tide of digital technology, China's animation industry is also actively seeking the ways to transform and upgrade digital publishing. According to Annual Report of China's Digital Publishing Industry 2017-2018, by the end of 2017, the cumulative number of users in China's digital publishing industry reached 1.825 billion (household/persons), and the total annual revenue was 70.7193 billion yuan. Among them, Internet advertising, mobile publishing, online education and online games rank in the top four. Among the subdivisions, network animation earned 17.89 billion-yuan, mobile publishing (mobile reading, mobile music, mobile games, etc.) earned 17.96 billion yuan, and online games earned 88.49 billion yuan.

At present, AI industry supported by big data, deep learning and Internet technologies has brought about a new technological industry revolution. AI technology will reshape the animation publishing process, and make the digital publishing of animation expand intelligently in the production, dissemination and consumption links [3]. This article introduces the global value chain theory, constructs the animation digital publishing value chain, and analyzes the impact of digital technology and AI on the production, operation and consumption stages of the animation digital publishing industry, and analyzes the characteristics of animation digital publishing. Based on this, the industrial value chain such as the upgrade of animation digital publishing technology, product upgrades, industrial chain upgrades, and

copyright protection in China will be enhanced. To provide some reference and reference for the optimization of China's animation digital publishing value chain and the sustainable and healthy development of the animation digital publishing industry.

2. THEORETICAL BACKGROUND

2.1 Global Value Chain Theory

Global value chain theory began in 1980s, and was first put forward by Michael Porter, a strategist at Harvard Business School. In his book Competitive Advantage, Porter pointed out that the industrial chain is composed of a series of links from raw material suppliers to customers. Each link is interrelated with each other and creates industrial value on their own. These interrelated processes of value creation constitute the industrial value chain [4].

Animation publishing runs through the whole value chain of animation industry and is the most direct and the fastest profit link in the value chain of animation industry. The industrial chain in animation publishing was originated from the experiment of animation paper publishing, which was used to test the market reaction and audience preference of animation works. Successful animation works came into the animation film production and publishing process. Subsequently, the animation film and television publications which won the audience's favor came into some areas derived by image authorization, including animation dolls, Handmade stationery, clothes and theme park and so on. Finally, the value chain came into copyright trade and franchise and then carried out publishing experiments again, thus forming a closed cycle of the value chain in animation publishing industry, as shown in Figure 1.
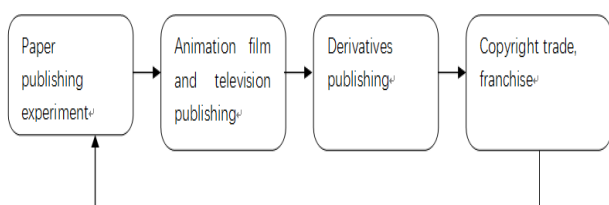

Fig. 1. Value Chain of Animation Publishing Industry

2.2 Digital Publishing

Digital publishing is a new publishing industry established on computer technology, communication technology, network technology, streaming media technology, storage technology, display technology and other high-tech digital technologies. So, it integrates and surpasses traditional publishing. In digital publishing, all information is stored in CD, disk and other media in the form of unified binary code digitalization. Computer or terminal equipment has been used to process and receive information. It emphasizes the digitalization of content, production mode and operation process, the digitalization of communication carrier, as well as the digitalization of reading consumption and learning form. Digital publishing started late in China, but it has developed rapidly. At present, it has new

formats including electronic books, digital newspapers, digital periodicals, network original literature, network education publications, network maps, digital music, network animation, network games, database publications, mobile publications and so on.

The emergence of digital technology has brought about new opportunities to animation publishing industry. Digital technology provides more support in animation data storage, animation publishing and dissemination channels, animation product types and so on. Many digital animation production software has lowered the threshold of animation industry and has offered convenience for general public to learn, produce and publish animation works. At the same time, digital storage and media integration under new media technology have enriched and diversified the animation publishing resources, resulting in digital animation works growing tremendously in recent years [5], [6].

2.3 Artificial Intelligence (AI)

AI is a computer program that makes reasonable actions and maximizes benefits based on the perception of environment. AI covers a wide range of areas, including but not limited to intelligent reasoning, news recommendation and news writing, machine vision, AI art, intelligent search, machine translation, speech recognition, automatic driving, robots, in-depth learning, data mining, knowledge mapping, etc. It covers economic, political, social, ecological and other fields, including intelligent home, intelligent education, intelligent transportation, intelligent finance, intelligent medical treatment, intelligent manufacturing, intelligent supermarket and so on [5], [7].

With AI technology, one can determine the topics of animation paper publishing, and even create animation scripts through big data analysis of Internet users. At the same time, it carries out personalized intelligent recommendation of animation digital publishing products for different users, and makes use of holographic imaging, augmented virtual reality technology, etc., to provide users with rich experience of animation digital publishing.

3. THE IMPACT OF AI ON ANIMATION DIGITAL PUBLISHING

With the help of core technologies including big data, in-depth learning and Internet technology, AI plays an important role in the production, operation and consumption of animation digital publications.

3.1 Custom Animation Digital Publishing Product Form

With the help of big data on Internet, the user's usage scenarios, habits and preferences can be fully investigated and analyzed So the topic selection and product form can be determined and customized. At present, animation movies can be produced not only as videos and films, but also as VCD and DVD of high-density laser discs for publication and distribution. Animation audiovisual laser disc publications have entered millions of households. With digital storage and processing technology, many classic animation films have gained vitality in the form of VCD and DVD laser disc.

Zhuoyue, Dangdang, Taobao and other large online merchants have sold over 10,000 items of animation discs. As the price of flash technology drops, solid-state hard disk storage gradually replaces traditional hard disk storage. In addition, the technology of network storage and cloud storage is becoming more and more mature. Comics, animation and games are published in the form of network cloud data such as VOD, Baidu cloud disk, 360 cloud disk and Netease cloud disk, which are favored by young audiences [7]. Therefore, according to the user population of different ages and occupations, the form of digital publishing products that push the cloud can be customized.

3.2 Customized animation digital publishing platform

Tencent, Sohu and Netease have set up animation channels to operate animation business. Tencent has established a long-term strategic alliance with well-known animation and game companies. With content introduction and cooperation, Tencent tries to expand its content publishing field from a simple website publishing platform. Tencent has established cooperative relations with Disney and China Animation Group, and launched platforms for comprehensive Tencent animation and for original animation to provide one-stop service for animation audiences and creators of original animation. In addition, Tencent Game has cooperated with the global well-known publishing house Jiying and well-known game manufacturer Wandai Nanmenggong Game Strategic to co-develop online games and hand games.

Youku, Baidu Video, Aiqiyi (IQI), Xunlei and other video websites set up animation channels to provide audiences with animation audio-visual publications. Taking IQI as an example, By purchasing copyright, IQI has more than 700 publications and nearly 30,000 animation series with domestic and foreign animation copyright.   In addition, China Mobile, China Telecom and China Unicom take up the publishing field of mobile animation with mobile phone MMS, mobile comics, mobile animation, app animation customization and other mobile animation publishing products [8].

3.3 Enrich user experience with animation publishing products

AI integrates holographic projection, voice reading, virtual reality and other technologies to comprehensively enrich the presentation forms and modes of animation digital publishing products and thereby enhance user experience. For example, Migu reading can realize multi-scene and multi-role intelligent dubbing, also it can simulate human language. As a result, Migu reading brings users the new audio-visual experiences [9] .

4. WAYS TO PROMOTE THE VALUE CHAIN OF ANIMATION DIGITAL PUBLISHING IN THE CONTEXT OF AI

According to the theory of global value chain, animation digital publishing is one of the value chain modes driven by producers and consumers. In the producer-driven value chain, the value-added part is the main part in the production field,

while in the buyer-driven value chain, the value-added part is mainly concentrated in circulation links such as marketing and branding. In the global value chain system of animation publishing, the United States, Japan and South Korea are firmly locked in the upstream (animation image, story conceptual design and production) and downstream (animation derivatives publishing, original game publishing, copyright trade and franchising) links with high value-added animation publishing [2], [10]. The successful experience of animation digital publishing in United States, Japan and Korea can be used as a reference to enhance the value chain of animation digital publishing in China. At the beginning of AI, to provide services to target-oriented customers, China's animation digital publishing should make full use of data analysis and in-depth learning of AI, and devote itself to improving the technical strength of animation production. Also, to upgrade the industrial value chain of digital publishing, it should develop the original design of animation, the publication of animation peripheral products and copyright trade according to customers' usage habits and preferences.

Global value chain upgrades from easy process to difficult process, that is, "process upgrading - product upgrading - industrial upgrading - chain upgrading", but this order is not absolutely irreversible. Process upgrading refers to the improvement of technology and the enhancement of management so as to increase and improve the quantity and quality of products; product upgrading refers to the gradual shift of products to more complex and sophisticated products in the same industry; industrial upgrading refers to the transition from low value-added links to high value-added links; chain upgrading refers to the transition from one industry to another [11].

4.1 Expanding product line of animation digital publishing for content customization to achieve process upgrading

Product Line refers that a group of related products are similarin function and they are sold to the same customer group by the same sales channels or within the same price range. Since 21st century, the state has strengthened its support for animation industry. It has developed animation production technology, digital storage, streaming media and other related digital technologies rapidly, and has strengthened the production and management of animation digital publishing. The animation digital publication has achieved explosive growth, and its quantity and quality have been significantly improved. This has laid a solid foundation for process upgrading of animation digital publishing. In the context of AI, our state makes data analysis and prediction on customers' usage habits and preferences, offers customized products and recommendation to target customers, puts forward problem solutions, expands the width, length and depth of animation digital publishing product line, promotes copyright transactions of animation digital publications, and provides a new market and development space for the reconstructing animation digital publishing. The product line of animation digital publishing mainly includes animation digital books, animation digital laser discs, animation digital films and TV, animation digital games, animation applications in mobile phones, etc. Among them, the animation publishing products based on digital storage

technology, such as DVD, hard disk, cloud disk, especially digital games, are the products with higher profits in animation digital publishing product line, as shown in Table 1.

Table.1. Product Line of Animation Digital Publishing

Ebook	Picture book	comic	magazine	Original painting	illustration	book
Video Disc	VCD	DVD	Virtual dissc	Cloud disk	Hard disk	
Movies & Animation	movie	TV animation	Web animation	Mobile anime		
Electronic games	education	action	simulate			
Mobile Application	CRBT	MMS	Emotion	App customization	play	Leisure
Derivative products	stationery	toy	clothes	Themed restaurant	theme park	Cosplay
Copyright trade	publisher	website	Carrier	Thchnical Servic	Software develop	

4.2 Optimize the format combination of animation digital publishing industry to achieve product upgrading

With the rapid development of new media technology, animation paper publishing, film and television publishing, game publishing form the "trinity" pattern, and implement the upgrade of animation digital publishing products, which brings a new economic growth point to animation digital publishing industry. In the context of AI, animation digital publishing should analyze the characteristics of different formats, and realize the development of multi-format, multi-platform, online and offline, cross-professional and professional integra. For example, Japanese animation and games cooperate with each other. Many excellent animation works are made into video games and go global. At the same time, many games are adapted into animation movies to attract more animation audience. Korean publishing giant Daewon Company sells comic magazines at low prices, so that more original animation works can be published. Then it selects excellent animation images, animation works and creative talents as the developing focus, and makes profits by issuing animation books and selling intellectual property rights of original animation images. At the same time, it establishes its brand awareness all over the world. In addition, a number of excellent online animation images such as Broken Child, Rabbit Sky, Mung Bean Frog, Hippy Monkey and so on have been sold well offline; many animation books have been published in films, television, mobile and online with digital technologyto expand the audience of animation publishing, animation has also been combined with the publication of professional books related to education, science and technology, finance, health science and so on; many traditional publishing enterprises and animation companies are also trying to get involved in the whole process of animation digital publishing to achieve vertical integration of publishing [12].

4.3 Extend the upstream and downstream chain of animation publishing to improve industrial and chain upgrading

Based on the new media platform, animation digital publishing expands the consumer market, enriches the digital product form, enhances the penetration, coverage and form of animation digital publishing products, makes animation digital publishing antenna develop from traditional paper media, film and television animation to game publishing and derivative publishing, and realizes the upgrading of animation digital publishing industry and publishing chain. The animation publishing industry and chain upgrading in United States and South Korea set examples for us. AKOM, the largest Korean animation studio, originally undertook animation outsourcing. It subcontracted the animation production of the famous American TV animation The Simpsons. Now AKOM has joined forces with the game industry to expand to upstream of the value chain of the animation industry, and outsourced the animation production to North Korea, thus realizing the industrial upgrading from outsourcing animation production to participating in game design [2]. Disney animation in United States, developed from the original film and television animation production to derivatives development and copyright trade, has now expanded from pure culture industry to theme parks, brand authorization and other "subculture" industries, thereby achieving the chain upgrading of animation publishing. China's animation digital publishing can learn from foreign experience to seek a breakthrough in industrial upgrading and make efforts in upgrading animation design, animation derivatives, and the value chain of copyright trade.

4.4 Strengthen the Branding of Animation Digital Publishing

The animation digital publications are becoming more and more abundant, and the competition is becoming more and more fierce, so it is particularly urgent to strengthen the branding of publications. The old animation powers, such as United States and Japan, have established their gold status in animation digital publishing worldwide. Korea has become the forefront of animation digital publishing with the help of its game industry. European animation is famous for its beautiful pictures and ideas. In order to achieve sustained and healthy development of animation digital publishing in China, we must dig deeply into the essence of our national culture, attach importance to animation image and original design, and take the design and publishing of games and original animation's derivatives as breakthroughs. At the same time, we should pay attention to the application of digital technology and new media so as to expand the communication channels of animation digital publishing, increase the marketing promotion of original animation, and re-establish Chinese brand of animation digital production.

In order to create animation publishing brands in the new business circle, animation production enterprises, animation originators, technology providers and service providers need to find their own direction for development, strengthen product differentiation and channel differentiation, as well as seek new development paths of animation digital publishing.

4.5 Strengthen copyright protection of animation digital publishing

With the rapid development of animation digital publishing, digital technology makes it very convenient to transfer, copy, download, install and use, but it also breeds piracy, copyright infringement, so copyright protection is very urgent and important. United States has well-developed

copyright trade because it takes good measures for copyright protection. Digital publishing of animation needs comprehensive development in scientific and technological means, legal policy and industry supervision.

At present, DRM technology is widely applied in Internet copyright management. It is a high-tech technology based on traditional digital watermarking and content encryption. Its core is to protect the interests of publishers and authors. DRM technology can prevent digital publications from being copied and tampered with casually. It can conduct trusted computing on transactions of electronic books and make the secondary dissemination of digital publications controllable. A well-known technology for digital copyright filtering and authentication abroad is the "digital media manager" service launched by AC Nielsen, an international media giant, which can maximize the protection of copyright owners' rights and interests.

China has promulgated Interim Regulations on Internet Publishing Management, Regulations on the Protection of Information Network Communication Right and Regulations on the Implementation of Copyright, etc., but the criteria on how to classify the forms of animation digital works are still unclear. In addition, there is a lack of copyright protection law for upstream and downstream animation digital publishing, original creators, publishing agencies, game development agencies, new media development agencies, as well as network operators and communication operators. Only by raising the awareness of copyright use and protection, adopting scientific and technological and legal means, and coupled with social and industrial supervision, can China's animation digital publishing get a sound development.

5. CONCLUSION

With the arrival of the third AI climax supported by big data, in-depth learning and Internet, practitioners from all walks of life have felt strong impact and influence in their ideas and practices. The coming era of AI will have a profound impact on all aspects and formats of animation digital publishing. The most obvious feature of AI is that it is established on big data, the accumulation of massive data and the application of in-depth learning. In the future, the formats of animation digital publishing, because of the emergence of intellectualization, will follow the trend of intelligent development in all links of the value chain in animation digital publishing, realize content customization and recommendation, and optimize the format of digital publishing products and publishing platform. In animation digital publishing industry, seen from the perspective of AI, process reengineering and process remodeling will be influenced first, and a large number of automated and intellectualized systems will replace human resources investment and become the main trend.

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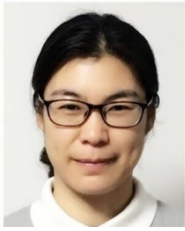
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