Evolution logic and path choice of IP development of media virtual image in the digital twin era

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ABSTRACT

With the integration of various types of technologies and virtual media, the development potential of various types of products will continue to emerge in the future. Based on the rational analysis of the evolution logic and format presentation of virtual anchor, this paper comprehensively extracts the core points of the establishment of upstream, middle and downstream systems in the process of virtual anchor IP development from the dimensions of iconic feature shaping, emotional concrete expression, diversified scene application landing, operation management mechanism establishment, endogenous resource integration, user touch and emotional maintenance, hoping to be beneficial to the development and layout of virtual anchor IP.

Keywords: digital twin; virtual anchor; IP based; identifying features

1. Introduction

“Digital twin”, as a visual model connecting physical space and physical space, has gradually crossed, penetrated and integrated with the real world with the development of industrial Internet and the maturity of artificial intelligence, Internet of things and big data technology. In 1992, David Gelernter, a professor at Yale University, published a book called Mirror Worlds in which he vividly imagined and described the future world. He said, “Mirror worlds (that is, software models that represent the real world as seen on a computer screen) have a huge amount of information pouring into the models through huge software channels, so much information that the models can simulate every moment of real-world motion”[1]. On May 27, 2019, during the high-end dialogue with the theme of “blockchain—the cornerstone of digital civilization”, Kevin Kelly, the founding editor of Wired magazine and the author of “out of control”, delivered a speech with the theme of “digital twin mirror world”, and made forward-looking predictions and innovative ideas for the future digital civilization platform[2]. Immediately, the word “digital twin” became a hot concept in the world. Countries and major enterprises all over the world entered the new digital twin track one after another, and took the lead in several application scenarios such as smart factory, smart building, smart city, smart medical treatment and smart media.

The birth and popularity of any new concept...
must be driven and led by the evolution of technological civilization and the transformation of the whole society behind it. It is the symbolic representation and realistic projection of real existence. On November 7, 2018, the world’s first full simulation intelligent synthesis host “Xin xiaohao”, designed and created with host Qiu Hao as the prototype, appeared at the 5th World Internet Conference, attracting extensive attention from the global media and industry. Thanks to the deep integration of artificial intelligence and news gathering business, AI virtual anchors such as “Xinxiaomeng” (based on Qu Meng), “Xiaoxiaosa” (based on Sa Beining) and “Xinxiaowei” (based on Zhao Wanwei) have arrived one after another, opening up a wide space and future potential for digital imagination and IP development on the road to deep media integration and innovation.

On October 20, 2021, the State Administration of radio, film and television officially released the 14th Five Year Plan for scientific and technological development of radio, television and network audio-visual, which clearly proposed to “promote the wide application of virtual anchor and animation sign language in the production of news broadcast, weather forecast, variety science and education and other programs, innovate the form of programs, and improve the production and broadcasting efficiency and intelligence level”, which will further promote the development of virtual anchor in the future.

2. Technology engine and industry layout: Evolutionary logic of virtual anchor

Virtual anchor is a practical product of innovative design and creative development based on real imagination and real needs. It reflects human yearning and pursuit for a better life and is an important starting point to support the in-depth promotion of media integration. Throughout the whole birth and evolution process of virtual anchor, it shows the development trend from low-level to high-level, from simplification to intelligence, and from niche to intensive. The continuous iteration of innovative technology and the industrial layout of technology giants jointly drive the improvement of virtual anchor function value and application system.

2.1. Iterative update of virtual anchor driven by technology

The first virtual anchor in the world is “Ananova”, which was born in 2000. It is designed and developed by the British newspaper media association based on digital technology and is suitable for the simulated real-life image of news information broadcasting. The newborn “Ananova” is relatively single in facial expression and image shaping, but because of its unique new appearance and 24-hour uninterrupted reporting ability, it immediately attracted the attention of major media all over the world, and soon set off a global trend of imitation manufacturing. In the same year, the first virtual anchor “GoGirl” appeared on China’s 51go website (www.51go.com), the United States launched the virtual anchor “Vivian” for home business hosting, and South Korea launched the virtual singer “Lucia”, opening a new era of global virtual anchor development.

After entering the 21st century, the leap forward of the Internet and the breakthrough of CG technology have made a breakthrough in the development of virtual anchor. In 2004, CCTV-6 launched the “Xiaolong”, the first virtual TV program host using CG technology in China[3]. The “Xiaolong” using CG technology represented the high level of virtual anchor development at that time. However, due to the double burden of technical bottleneck and high cost, the application time limit of virtual anchor in the initial stage is very short, and the “Xiaolong” with a long service life only exists for two years, which is convenient for it to be officially offline in 2006.

After a long period of stagnation, in 2016, alphago defeated the human world go champion Li Shishi with a score of 1:4. With the advent of the human like robot “Sofia”, the artificial intelligence technology that has been silent for many years is revitalized again, and gives unlimited space for the
re emergence and comprehensive application of virtual anchor. AI “Microsoft Xiaobing” Avatar “host” has successively shown his style in TV programs such as “look at the East” of Oriental satellite TV, “I am the future” of Hunan Satellite TV, and “smart future” of CCTV. AI synthetic anchors such as “Xinxiaohao”, “Xinxiaomeng” and “Xinxiaowei” driven by a new round of AI technology have made great achievements in the field of news broadcasting, the digital host “Xiaoyang” created by Hunan Satellite TV has become the spokesman of the new generation of cities for the first time ...(see Table 1), the continuous maturity of artificial intelligence synthesis, separation and interaction technology and the accelerated development of algorithms, big data, cloud computing and other technologies have endowed the digital personality and intelligent characteristics of the virtual anchor, and catalyzed the intelligent transformation and organizational reconstruction of the media ecosystem.

| Table 1. Statistics of domestic virtual anchor R & D platform and application (incomplete statistics) |
|---|---|---|---|
| Technical support platform | Name | Service organization and platform | Online time |
| Sogou | Xinxiaohao | Xinhua News Agency | August 2018 |
| | Xinxiaomeng | Xinhua News Agency | March 2019 |
| | Lisa | Xinhua News Agency | June 2019 |
| | Xinxiaowei | Xinhua News Agency | May 2020 |
| Baidu | Xiaofei | Surging news | July 2019 |
| | Xiaozhi | CNTV | May 2020 |
| iFLYTEK Co.,Ltd. | Yangxiaoguang | China Media Group (CCTV) | February 2019 |
| | Tongtong | China Media Group (CCTV) | April 2019 |
| | Guo | People’s daily | May 2019 |
| | Xiaqing | People’s network | October 2019 |
| | Huilui | Xinhua newspaper | March 2020 |
| | Xianmei | Daily economic news | May 2020 |
| | Wangxiaojian, Maxiaoteng | Hefei TV station | May 2019 |
| FaceUnity | Xiaomoer | Jinan radio and television station | September 2019 |
| | Xiaoyi | CCTV news | May 2020 |
| | Zhengxiaozheng | Zhengzhou all media | May 2020 |
| Oubang | Xiaoxiaoasa | CCTV Spring Festival Gala | February 2019 |
| DeepBrain AI | Shijian Xiaoni | Beijing Radio and television station | October 2021 |
| Independent research and development | Xibao | Wuxi observation | January 2020 |
| | Jixiaolan | Great Wall New Media | March 2019 |

2.2. Presentation of business format of virtual anchor with the help of technology giants

At present, the research and development mode of virtual anchor is mainly divided into two types: independent research and development and cooperative research and development. The “Xinxiaohao”, “Xinxiaomeng” and “Xinxiaowei” series products jointly developed and designed by Xinhua news agency and Sogou and the “CCTV”, “Tongtong” and other series anchors jointly designed by China Central Radio and Television Corporation and iFLYTEK belong to the cooperative research and development mode.

From the perspective of business format presentation, the technology companies represented by Sogou, iFLYTEK, Baidu and Xiangxin technology are the leaders in the research, development and layout of virtual anchor in China, and have established a relatively perfect product matrix system in the long-term deep cultivation and practice “Jixiaolan” of great wall new media and “Xibao” of Wuxi observation are representatives of independent research and development of media. Compared with other products supported by technology companies, it obviously has the disadvantage of slightly insufficient technology, but it also provides a useful experience reference for Chinese media to establish a practice platform for independent research and development of virtual anchor.

3. Smart empowerment and global layout: link analysis of virtual anchor IP development
In 1992, Stephenson described an artificial virtual space parallel to the real universe—“Metaverse”, in the science fiction Snow Crash. In this world, people participate in social life in a state of “digital Avatar” and create their own digital civilization\(^4\). In 2021, the listing of Roblox made the concept of “Metaverse” detonate the whole industry. 2021 is also known as the first year of “Metaverse”. Domestic and foreign Internet giants represented by Microsoft, Facebook, Apple, Tencent, ByteDance and NetEase have joined in the layout and construction of Metaverse. In the future, in the ecological system in which everything can be digitized, the virtual image will become the digital twin of human beings in the virtual world, participate in the Metaverse in an anthropomorphic personality and digital appearance, and become an important part of the Metaverse ecological system.

In this context, how the media layout the IP development of virtual image, how to pry the niche market of virtual anchor, and how to ensure the benign and orderly development of virtual anchor industry have become crucial issues.

3.1. Upstream: Shaping iconic features and giving emotional vectors

With the continuous deepening of media integration and the arrival of all kinds of virtual anchors, the first step to develop a successful virtual anchor IP for the media industry is to create iconic image roles and personality characteristics. On the one hand, it is a realistic move to deal with the tendency of assimilation and simplification of aesthetics of virtual anchors in the fierce media competition market to endow virtual anchors with unique personalized identification characteristics; on the other hand, it is also the key operation to enhance users’ cognitive identity and form group emotional resonance. For example, “CCTV boys”—Kang Hui, Sa Beining, Zhu Guangquan, Negemaiti, “Lipstick brother”—Li Jiaqi, “Constellation master”—Fellow Uncle, “Oriental gourmet lifestyle”—Li Ziqi and other characters share the common feature of distinctive personalized logo, and this unique character logo is the top priority to leverage the value of IP. Although the virtual anchor is not a human entity, as a digital twin created by human beings based on practical needs in the digital survival era, it should also be set with distinctive personalized identification characteristics and clear role function positioning to serve the digital space function division system.

A comprehensive analysis of the personality characteristics of existing virtual anchors reveals that the current image labels of virtual anchors are mainly “the world’s first......” and “based on......” (see Table 2), which lack distinctive personalized characteristics and characteristic image marks, and cannot form a competitive advantage and cultivate clear audience recognition and audience memory. Driven by AI algorithm, at present, the virtual anchor follows the operation logic of “input text” to “video generation”. The virtual anchor can report news in real time only by inputting text. Such an intelligent generation system can liberate human resources and improve work efficiency to the greatest extent. However, due to the lack of concrete emotional expression, the scope of the field in which the virtual anchor is good at broadcasting is limited. Generally, it is dominated by relatively neutral and objective news reports, such as the broadcasting of data-based and information release news\(^5\).

| Virtual anchor representative | Characteristics and identification |
|-------------------------------|----------------------------------|
| Xinxiaohao                    | The world’s first AI synthesis anchor, based on Qiu Hao |
| Xinxiaomeng                   | The world’s first AI synthetic female anchor, based on Qu Meng |
| Lias                          | The world’s first Russian synthetic anchor |
| Xinxiaowei                    | The world’s first 3D AI synthesis anchor, based on Zhao wanwei |
| Xiaoqing                      | The world’s First Multilingual AI virtual anchor |
| Shijian Xiaoni                | The first broadcast level intelligent interactive real person digital person in China, based on Chunni |
At present, the virtual anchor is still in the stage of weak artificial intelligence and cannot form continuous and high-quality interactive communication and emotional resonance with the audience, while human is just an emotional animal, with joy, sadness, fear, anger and joy. The lack of emotional function of the virtual anchor makes it unable to form a power of striking people and attracting resonance in visual presentation and narrative expression.

Therefore, in the future, in the process of product development and design, the virtual anchor should be endowed with distinctive identification characteristics and role positioning to create a unique IP “human design”. The second is to improve the accuracy and suitability of the virtual anchor in emotional expression through semantic analysis and emotion vector identification in product R & D and program setting, and machine training.

3.2. Midstream: Vertical and horizontal layout and operation management mechanism construction

In the whole chain of virtual anchor IP development, the most difficult but also the most critical part is how to open up diversified application scenarios based on the functions and positioning of the virtual anchor itself to ensure the smooth implementation of the value of virtual anchor IP development.

Specifically, the IP based development of virtual anchor can be constructed from two dimensions: vertical and horizontal.

Horizontally, as an innovative application product in the era of intelligent media, with the continuous maturity of technology, virtual anchor will serve multiple fields such as news reports, TV variety shows, sports events, education, science and technology and military with an increasingly humanized image and attitude: In order to support the reporting of epidemic prevention and control information across the country, iFLYTEK has opened the access to the virtual anchor “Xiao Qing” for free for many media organizations across the country to provide intelligent support for national epidemic prevention and control. CCTV has created the first sports virtual anchor to publicize CBA events and activate the vitality and vitality of sports events with AI technology. The virtual anchor of the children’s knowledge and science pendant category “Class Leader Xiao Ai”, positioned as a 12-year-old Leo schoolgirl, was not only invited to participate in the program Chinese Poetry Conference as a “little questioner”, but also disguised as a small expert in the dissemination of non-traditional heritage to participate in the CCTV children’s channel Bizarre program recording, spreading Chinese traditional culture to children nationwide. The virtual journalist “Xiaozheng”, developed specifically for covering aerospace topics and scenarios, is tasked with the function of covering China’s aerospace projects. The first virtual anchor from the Army’s 75th Group, “Junxiaobu”, is an innovative attempt to innovate red media propaganda and enhance military communication capabilities...

Vertically, a number of innovative application products have emerged under the policy guidance and careful layout of the media. However, from a national perspective, in addition to the effectiveness of the mainstream media in the application of virtual anchor, the county-level financial media platforms across the country are far from being able to develop and apply virtual anchor products to assist in basic news reporting due to various restrictions in terms of capital, technology and talents. As the forerunner of the virtual anchor layout, how to realize the effective grafting and sharing of advanced achievements, empower the intelligent experience and intelligent products to the construction of grass-roots media, and maximize the IP value of virtual anchor with long road resistance.

Paul Levinson believes that the application of technology generally goes through three stages: “Toy—Mirror—Art”[6]. At present, although the virtual anchor has been able to easily undertake the division of labor in human society in a variety of...
occasions and fields, its essence is still regarded as a practical tool, an object to be stared at and used, and there is still a large gap from the high-level goals such as the endowing of personalized characteristics, the construction of aesthetic interest and artistic emotional expression. In the future, the IP development of virtual anchor should gradually get rid of the instrumental perspective, and strive to improve the cultural content and aesthetic interest of virtual anchor from the aspects of image shaping, language communication, communication and interaction, audience class, application scene, cultural interest and so on.

In terms of the current application status of virtual anchors in various fields, virtual anchors still have many problems, such as unclear positioning, vague image, single personality and short life cycle. Many virtual anchors developed and designed can cause great repercussions at the beginning of their launch, but due to the lack of operation and management ability, many virtual anchors developed and completed with a lot of manpower and material resources have only become a hot concept gimmick, After completing this service, there was “no news”. In the process of IP development of virtual anchor, the most difficult but also the most critical link is how to ensure that the virtual anchor has a long-term life cycle, which is the key ability that the current R & D and operation personnel lack.

Therefore, it is an urgent and constructive project to establish a perfect operation mechanism and management system for the IP development of virtual anchor and improve the innovation and creativity ability and content planning ability of media staff.

3.3. Downstream: Cross platform resource integration and user stickiness cultivation

The accelerated landing of 5g application and the increasing maturity of artificial intelligence technology have brought opportunities and broad prospects for the IP development of virtual anchor. From the perspective of function, the past virtual anchor development generally aims to replace the real-time anchor to broadcast news in real time, and follows a one-way and popular communication logic, that is, to provide undifferentiated information services for all users. In October 2021, the digital human “Shijian Xiaoni” developed by Beijing Radio and Television Co., Ltd. Was unveiled at the second China Radio and television media integration conference. “Shijian Xiaoni” is an intelligent product focusing on user services, which can provide users with multiple scene services such as news broadcasting, living payment and reservation services through situational dialogue. It is reported that “Shijian Xiaoni” will gradually access the Beijing time client, provide users with uninterrupted intelligent interactive services 24 hours, and interact with tens of millions of users in real time to meet users’ needs for information quality and information interaction[7].

In the future, if we want to expand and extend the IP value of virtual anchor, we must be guided by user demands. On the one hand, we will improve the professional ability and quality level of virtual anchor in basic layers such as news reporting, education and popular science, TV variety, and on the other hand, we will fully activate and open up the closed-loop line between virtual anchor and diversified scenes such as content, social networking and services, so as to maximize the endogenous resources of various media and commercial platforms, Realize the effective connection, optimization and integration of resources of all parties.

At the beginning of 2021, Baidu Research Institute released the prediction of the top ten scientific and technological trends in 2021, which also said that in the future, digital people and virtual people will appear in large quantities and be applied in Internet, finance, e-commerce, medical and other industries on a large scale[8].

In essence, the update and launch of any product are based on user acceptance and user satisfaction. The IP development of virtual anchor must also take user touch and user acceptance as the
highest criterion. In 1989, Davis put forward the “TAM” (Technology Acceptance Model) theory, which scientifically explained the two factors that a new product is accepted by users: perceived usefulness and perceived ease of use. In recent years, with the continuous infiltration of artificial intelligence into all aspects of human social life and providing services for the renewal of thousands of industries and the improvement of production capacity, the acceptance of optimistic people to artificial intelligence has shown a growing trend. However, the “technology threat theory” of “artificial intelligence will inevitably replace mankind” and the ethical and moral disputes about artificial intelligence have never stopped. Therefore, how to maximize the positive value of virtual anchor between two sounds and disputes, and serve users with actual efficiency, so as to improve the useful performance of virtual anchor is a problem worth pondering.

In addition, from the perspective of perceived ease of use, in the process of IP development, in addition to focusing on the overall demands of mass users, the minority demands of the elderly and vulnerable groups should also be taken into account, so as to empower users’ intelligent life with concise, convenient, intelligent and considerate services. Especially with the rapid popularization of mobile Internet and the innovation of various intelligent products, users have unprecedented independent choice space and choice, and have higher and higher requirements for the quality of information and services, rather than just living in a corner.

American scholar Schramm conducted relevant research on audience TV program selection as early as 1950s, and extracted a classic formula: “Contingency ratio of choice = Guarantee of reward/Degree of effort”. In other words, when the relevant conditions are consistent, people will choose the most convenient and fastest way to obtain information. Therefore, the IP development of virtual anchor needs to comprehensively enhance its own intelligent advantages and dig deep into users’ demands. It is necessary to not only reduce users’ information contact cost as much as possible, but also deeply cultivate content and services, create product advantages and enhance users’ stickiness.

4. Conclusions

In the era of oral communication, human beings rely on body elements such as body movements and facial expressions to spread information in a small range; the invention of characters makes human beings break through the dimension of geography and body, and can rely on bark, cloth, paper and other carriers for long-distance information transmission; the invention of broadcasting is a great leap in human history, which liberates the burden of both hands and feet, and can realize the wide-ranging diffusion of information only by speaking. Today, we are in a virtual world constructed by digital symbols. The virtual image designed and created by human beings replaces human beings to bear the burden of information dissemination. The human body has been liberated unprecedentedly, and the division and separation between communication activities and physical body have been realized. As Katherine Hayles said: “The represented body appears on one side of the computer screen as flesh and blood, and the reproduced body is generated in the electronic environment through language and semiotic marks.”[9] The innovation and evolution of technology constantly promote human beings to break through the shackles of the real world, and make the body constrained and suppressed by the social division of labor and work system obtain unprecedented degrees of freedom. Human communication is struggling, swinging and hesitating between “embodiment” and “disembodied”[10].

Objectively speaking, the derivation and evolution of media project the great course and historical track of the development of human society, represent a new way of social connection, production and communication, and build a new social criterion and value system. The birth and development of virtual anchor has changed the communication pattern of “people, people and people” in the past so-
cial communication system. The digital image based on the digital mirror world has become an important participant and builder in the communication chain, expanding the existing perceptual boundary and imagination space of human society. At present, the developed virtual anchor has taken the lead in multiple fields such as news, education, aerospace, military, variety show, dance, performance and talk show, showing the unlimited prospect and future potential of virtual anchor. After the development, the virtual anchor has significant advantages in low marginal cost, high marginal benefit and strong controllability. In the future, with the help of multiple synchronization of capital, technology and market, virtual characters are expected to bring more possibilities and imagination to human society through effective IP development and layout.

Conflict of interest

The authors declare no conflict of interest.

References

1. David G. Mirror worlds. USA: Oxford University Press; 1993.
2. Kaiwen Kaili yanjiang quanwen: Jingxiang shijie, xiayidai shuzi wenming pingtai (Chinese) [Full text of Kevin Kelly’s speech: Mirror world] [Internet]. 2019. Available from: https://36kr.com/p/1723753267201.
3. Xuni zhuchiren “Xiaolong” yangshi shanggang, gaoshenjia tiaozhan Sun Xiaomei (Chinese) Virtual host “Xiaolong” works for CCTV and challenges Sun Xiaomei with high value [Internet]. [updated 2004. Available from: https://www.chinanews.com/news/2004/2004-11-18/26/507283.shtml.
4. Stephenson N. Snow crash. Guo Z (translator). China: Sichuan Science and Technology Press; 2009.
5. Guan Y, Lv X. AI xuni zhubo de juxianghua qingggan biaoda shuzi yanjiu (Chinese) [Research on representational emotion expression design of AI virtual anchor. Media 2020; (23).
6. Levinson P. The essential Levinson. He D (translator). China: China Renmin University Press; 2007.
7. Dewai No.5. “Shijian Xiaoni” zheng he neng jiaohu shuziren ruhe neng rang Beijing shijain APP “huo” qilai? (Chinese) [“Shijian Xiaoni” intelligent interactive digital man: Let Beijing time app live] [Internet]. 2021. Available from: https://www.sohu.com/a/495035206_120442234.
8. Zhongbang! Baidu yanjiuyuan fabu 2021 nian shida keji qushi yuce (Chinese) [Big news! Baidu Research Institute released the prediction of top ten science and technology trends in 2021] [Internet]. 2021. Available from: https://baijiahao.baidu.com/s?id=1688817899804673098&wfr=spider&for=pc.
9. Heller C. Why we become post humans: Virtual bodies in literature, information science and cybernetics. Liu Y (translator). China: Peking University Press; 2017.
10. Shao P, Yang Y. AI xuni zhubo yi zhuchiren jushen chuanbo (Chinese) [AI virtual anchor and host specific communication]. China Radio & TV Academic Journal 2020; (6): 71–74.