Strategy Research on Publisher Development of the AI Voice Reading Industry: Postprint

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Abstract

Grounded in industrial convergence theory, this article investigates audiobook publishing based on AI voice technology (TTS, ASR), systematically examines three industrial models of AI voice audiobooks—namely "content," "platform," and "technology"—analyzes the challenges faced by publishers in participating in the AI voice audiobook industry, and finally proposes recommendations and prospects for publishers developing AI voice audiobook businesses.

Full Text

Strategy Research on Publishers' Development of the AI Voice Reading Material Industry

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Abstract: Based on the "Industry Convergence Theory," this study examines AI voice technology (TTS, ASR) applications in audiobook publishing, systematically analyzing three industrial models for AI voice reading materials: "content," "platform," and "technology." The paper analyzes the problems faced by publishers participating in the AI voice reading material industry and finally proposes recommendations and prospects for publishers to develop AI voice reading material businesses.

Keywords: audiobooks; AI voice technology; voice economy; industry convergence theory

In recent years, China's AI voice technology has entered a period of rapid application deployment, achieving significant breakthroughs in emotional speech synthesis and natural language understanding compared to before 2016. Related enterprises both domestically and internationally have opened their voice

ecosystems, applying AI voice technology to various scenarios through "industry convergence" and achieving successful commercial applications in short video creation, virtual idols (anchors), intelligent customer service, smart education, smart automobiles, and other industries. The two major branches of AI voice technology—Text-to-Speech (TTS) and Automatic Speech Recognition (ASR)—are naturally suited for application in the publishing industry, which works primarily with text editing. In the rapidly developing "voice economy," publishers can apply AI voice technology to solve the problem of weak audio content production capabilities, quickly generating audio content that is difficult for human ears to distinguish from authentic recordings at extremely low cost, thereby gaining greater development space in the "industry convergence" of publishing, online audio-video, and AI.

Industrial Model Analysis of AI Voice Reading Materials from the Perspective of "Industry Convergence Theory"

The AI voice reading material industry is a product of "industry convergence." The European Commission's Green Paper defines industry convergence as the integration of three perspectives: industrial alliances, technical network platforms, markets, and industrial alliances and mergers.[1] Its core theoretical basis is that under the background of globalization and informatization in modern industries, new production elements—including new knowledge, new technologies, and new processes—continuously emerge to compensate for the shortcomings of traditional resource production factors or substantially reduce dependence on them.[2] Negroponte from MIT Media Lab used three overlapping circles to describe the technical boundaries of computing, printing, and broadcasting, arguing that the intersection of the three circles would become the fastest-growing and most innovative industrial direction.[3] Drawing on this approach, AI voice reading materials are situated at the intersection of the boundaries among publishing, online audio-video, and AI (see Figure 1 [Figure 1: see original paper]).

According to iResearch's "2021 China Online Audio Industry Research Report," China's online audio industry scale is expected to reach 22.9 billion yuan in 2022, with audiobooks still in a thriving development state and AI voice and human dubbing showing a parallel development trend. AI voice technology is one of the earliest branches of AI technology applied to human production and life, with speech synthesis (TTS) technology suitable for audio content generation and speech recognition (ASR) technology suitable for voice-based interaction. In the AI voice reading material industry, publishing, online audio-video, and AI derive their discourse power from "content," "platform," and "technology" respectively. Therefore, this section will classify the development models of the AI voice reading material industry according to this logic.

The "Content" Model: Enhancing Production Efficiency and Enriching Expression Forms

The "2020 China Online Audio-Visual Development Research Report" states through investigation and analysis that "sustainable supply of high-quality content should be the focus. No matter how distribution methods change, the principle of 'content is king' will not change." In the all-media era, "content" remains the core element, and audiobooks are just one of many content expression forms. Under the context of "the medium is the message," the transformation of content production and dissemination by technology that creates new media is an entropy-increasing process—that is, it develops from simple to complex and is irreversible. Publishers using AI voice technology to synthesize audio and create interactions has become an emerging inevitable trend. The significance of AI voice technology for audiobooks is similar to the transition from movable type to mechanical printing; it not only dramatically improves the production efficiency of audio content but also enriches the sound expression effects of content.

Douyin began testing a "video listening" function similar to audiobooks in April 2022, converting audio-visual content into audio playback mode, allowing users to continue listening even when the screen is locked or when switching to the background. Simultaneously, content creators can use AI voice synthesis tools to quickly convert their written content into audio content. For example, writer, poet, and short video creator Xuyi uploads poems synthesized with AI voice technology to the Douyin platform, and their likes are approximately 200 times higher than his ordinary graphic works. Additionally, online audio platforms such as Ximalaya and Fanqie Changting have launched large quantities of audiobooks synthesized by AI voice technology, including classic works such as the "Four Great Classical Novels." This demonstrates that publishers can use AI voice technology to convert their specialized text content into audio content and upload it to various online platforms, achieving not only low cost, high efficiency, and good results, but even better communication effects than text content.

The "Platform" Model: Building Converged Media Territory and Enhancing Communication Effectiveness

Network audiobooks today feature both mobility and companion characteristics, showing obvious advantages in scenario usage.[4] Therefore, online reading platforms such as WeChat Reading, Duokan Reading, and Fanqie Free Novels almost all have built-in voice synthesis plugins to achieve the "text-to-speech" listening function. Compared with the long production cycle of human audiobooks—planning, recording, post-production, and review—and the production cost of 5,000-15,000 yuan per hour, platforms' listening functions using AI voice synthesis technology can achieve real-time synthesis with near-zero marginal cost and without paying copyright fees. On digital reading platforms, using listening functions based on AI voice synthesis technology is becoming the choice of most

people. For example, on the WeChat Reading platform, the number of listeners for the bestseller "Those Things About the Ming Dynasty" on a given day (May 10, 2022) accounted for approximately one-quarter of the total number of readers. Whether users adopt the listening function is related to book type; novels often have higher usage rates, while computer science books have lower usage rates.

AI voice technology is not limited to digital reading platforms. Platforms such as the Q&A community Zhihu and news media Caixin have also comprehensively adopted AI voice technology. In the context of converged media and the voice economy, these platforms, originally specialized in graphic content, have introduced technology to quickly build their own audio communication capabilities at relatively low cost. For instance, Caixin launched an AI anchor "AI Caixiaoxin" based on AI voice synthesis technology on its platform. The broadcasting experience is close to that of a human anchor. In addition to introducing AI voice technology in "Caixin FM," users can switch to the AI broadcast interface in the upper right corner when reading any article. AI voice technology not only helps Caixin achieve converged media innovation but also enhances its communication effectiveness and enriches its profit model, allowing users to experience content services in more scenarios and pay for customized AI voice functions.

The "Technology" Model: Diversifying Reading Scenarios and Humanizing Interactive Experiences

In 1995, Don Norman proposed "User Experience" at the CHI Conference, defining it as "the perceptions and responses that arise from the use of or participation in a product, service, or system."[5] The quality of experience design affects the success or failure of a product. In 2011, Apple launched the voice assistant Siri, after which voice interaction was adopted by more and more hardware products. From AI speech recognition to AI speech synthesis, a complete set of voice interaction methods oriented toward multiple scenarios and humanization is formed, suitable for application in the interaction and generation of audiobooks.

The market offers a dazzling array of hardware products related to audiobooks based on AI voice technology. By usage demand, there are reading robots for children's education (such as Luka Baby Reading Machine), e-readers for digital reading (such as iFLYTEK e-books), and scanning translation pens for reading translation (such as Youdao Dictionary Pen). By usage scenario, there are smart speakers for home use (such as Xiaodu Smart Speaker), in-vehicle smart screens for automobiles (such as Huawei Smart Screen), and VR reading for virtual reality (such as Chimera Reader). Through these reading devices embedded with AI voice interaction functions, users experience more diversified reading scenarios, and humanized experience design enables audiobook reading anytime and anywhere, allowing users to experience more diversified reading scenarios.

Problems Faced by Publishers in Participating in the AI Voice Reading Material Industry

Alfonso and Salvatore propose that "industry convergence" generally goes through three stages: technology convergence, business and management convergence, and market convergence. These stages are both sequentially connected and may be mutually reinforcing synchronously.[6] Simultaneously, achieving "industry convergence" requires meeting four conditions: technology convergence, business convergence, market convergence, and improvements in the institutional and environmental aspects of industrial regulation.[7] Based on these stages and conditions of "industry convergence," this paper constructs a problem framework for publishers developing the AI voice reading material industry (see Figure 2 [Figure 2: see original paper]) and analyzes in detail the key problems faced by publishers in developing AI voice reading materials from three aspects: system and environment, business and management, and technology and market.

[Figure 2: see original paper]

Copyright System: Current Copyright Law Not Fully Applicable, Increasing Industry Development Uncertainty Copyright law is a product of printing technology, and its emergence and development have always been closely linked to technological progress, manifested in the continuous increase of copyright objects and the continuous enrichment of work utilization methods.[8] Secondary creation of works based on AI voice technology still falls into a fuzzy category under China's current copyright law. Whether AI voice synthesis infringes on the performance rights or reproduction rights of works, what legal differences exist between real-time and non-real-time voice synthesis, whether audio works completed by AI voice technology have copyright, and who owns the copyright of works created by AI voice technology imitating a specific human voice? These issues have not yet formed a legal consensus. Due to the lack of clear legal definitions, publishers are more likely to encounter economic disputes in the process of producing and operating AI voice reading materials, and the lagging copyright system adds enormous risks to this business.

IP Frenzy Destroys Original Ecology, Comprehensive Copyright Resource Database Construction Lacks Sustained Momentum The concept of "content industry" is a result of "industry convergence." With the development of information technology and the popularization of the Internet, information content's dependence on carriers has greatly decreased, and content exists in multiple media forms. In response to this change, regions and countries such as Europe, Canada, and Australia first proposed the concept of "content industry."[9] The core of the "content industry" is IP, around which various cultural product capital industry operations can be conducted, including film and television adaptation, game development, music creation, animation, secondary creation of literary works, and peripheral derivative development,

thereby generating greater economic benefits.[10] Audio works, as a content form expressed through sound, have been incorporated as an important part of the IP ecological industry. However, against this background, publishers are finding it increasingly difficult to obtain authors' full copyright authorization, mainly because publishers lack the capability for full copyright operation, or because high-quality IPs have already had other rights granted before publication. For publishers, high-quality IP is both a core resource and a scarce resource, around which multiple economic benefits can be developed. However, when signing new books, publishers can often only obtain book publishing authorization, and the lack of capability to build a comprehensive copyright database is like "cooking without rice" for publishers developing AI voice reading material businesses.

Human Resources: New Business Urgently Needs New Technical Talents, Backward Management Exacerbates Vicious Cycle The development of new businesses requires continuous investment of substantial professional human resources. Although technological progress improves work efficiency, the application of new technologies also places higher demands on human quality. The traditional publishing industry is a knowledge-intensive industry that gathers a large number of excellent editorial talents, but in the digital information era, the importance of technology and operations is increasingly prominent. Issues such as lack of innovation in corporate culture, rising human resource costs, and lack of incentives in human management make it difficult for traditional publishers to attract new types of talents while causing the loss of existing excellent talents, creating a vicious cycle over time. The "China Enterprise Recruitment Salary Report" for the fourth quarter of 2021 released by Zhaopin shows that the average salary in the publishing industry is 9,073 yuan per month, ranking 35th among 48 industry categories, overall in the middle-to-lower stream. In the context of a highly marketized human resource environment, salary is becoming a decisive factor in career choice, and publishers' attractiveness to talents is gradually declining. The production and operation of AI voice reading materials require talents with technical foundations and operational experience, and the recruitment and training of such talents require publishers to continuously invest substantial costs.

Operational Capability: Converged Publishing Increases Complexity of Content Production and Dissemination, Full-Platform Operation Difficult to Manage Converged publishing requires publishers to have the capability of "one-time production, multiple processing, multi-functional services, and multi-carrier (channel) dissemination," with each corresponding link requiring professional human resources with technology or experience. Multi-functional services and multi-carrier (channel) dissemination mainly refer to "full-platform operation capability." After AI voice reading materials are produced, they enter the operation stage. Different from traditional book distribution, AI reading materials without physical existence belong to content service products, where content quality and service experience jointly determine their

reading experience value in readers' minds. Moreover, their communication capability is unrelated to the number of copies (print runs) but related to the platforms and media of dissemination, and content on full-platform operations often achieves better communication effects. Corresponding to full-platform operation capability is a larger operation team, and each additional dissemination platform or medium requires a multiplicative increase in operational human resource investment. AI voice reading materials are just one of many content forms, and small and medium-sized publishers cannot afford full-platform operation for them.

Platform Monopoly: Super Platforms Suppress the Industrial Chain, Publishers Lack Discourse Power In October 2021, the "Anti-Monopoly Law of the People's Republic of China (Amendment Draft)" underwent its first review, marking the first amendment to the Anti-Monopoly Law in 13 years and releasing a strong regulatory signal to combat platform monopolies. Benefiting from China's tolerant and prudent regulatory attitude toward new business forms and models, the Internet and artificial intelligence industries have developed rapidly, and several platforms with monopolistic advantages have formed in the industrial chain segments of AI voice reading material content distribution and technical support. Super platforms' market power is too strong, seriously endangering fair market competition and technological innovation. Strengthening supervision of digital platforms from legislation (amendment) to law enforcement has become a global consensus.[11] Numerous small and medium-sized publishers and book companies are being suppressed by powerful platforms in the industrial chain. In the upstream of the industrial chain, platforms Yuewen and Jinjiang control IP output, iFLYTEK basically holds a monopolistic position in AI voice technology services, and digital distribution platforms for audiobooks are also basically within the sphere of influence of tech giants such as "BAT." Small and medium-sized publishers and book companies basically have no discourse power in front of super platforms.

Industrial Collaboration: Tech Giants Extend Upstream and Downstream in the Industrial Chain, Matthew Effect Emerges in the Industry Converged publishing has changed content production, accelerated technology integration, enriched dissemination channels, and increased service types, leading to increasingly complex division of labor and collaboration throughout the industrial chain. Publishers in the middle of the industry will face more difficult industrial collaboration problems. AI voice reading material industrial collaboration requires upstream and downstream coordination and complementary advantages in the industrial chain. The traditional cooperation model between publishers and technology platforms is basically that publishers provide content, technology companies provide technical support, and platforms provide traffic. However, as technology platforms implement content ecosystem strategies, their businesses begin to expand upstream and downstream, attempting to control the entire industrial chain process to obtain greater economic profits. For ex-

ample, through its layout in the content ecosystem, Tencent has obtained full industrial chain capabilities for AI voice reading materials from IP to production to distribution. The AI voice reading material industry has shown a Matthew effect of resources in the industrial chain during its initial development stage, and publishers are being marginalized in the process of industrial collaboration.

Optimization Paths for Publishers' AI Voice Reading Material Products

The "CHESS Strategy" is a classic model of "industry convergence theory," explaining the measures enterprises need to take to achieve converged development. In "CHESS," "C" stands for creative integration, "H" for horizontal organizational structure, "E" for establishment of industry standards, "S" for economies of scale and scope, and "S" for systematic focus on processes. Based on the "CHESS Strategy," this paper constructs a model for publishers' converged development of the AI voice reading material industry (see Figure 3 [Figure 3: see original paper]) and elaborates on specific path strategies to help the publishing industry and high-tech industries intersect, penetrate, and reorganize on the basis of technological and institutional innovation, forming a new content industry form.

[Figure 3: see original paper]

Development Iterativization: Phased Product Optimization to Enhance Effectiveness and Efficiency

Publishers' content production rhythm is slower compared to other emerging media, mainly producing high-quality content suitable for deep reading. A book takes from several months to several years from topic selection to distribution, and version updates occur on an annual basis or may not be updated at all. However, the information era changes rapidly, content has strong timeliness, and readers' preferences and demands drive continuous content optimization and iteration. Technology updates also require content forms and dissemination methods to continuously improve and iterate. For AI voice reading materials, under conditions where publishers lack content production experience and AI voice technology is not yet fully mature, publishers need to accumulate production experience and adapt to technology upgrades through content product iteration to produce content products that continuously meet readers' new demands. Compared with the traditional waterfall development model that aims to complete a complete system project, the iterative approach divides the project goal into easily executable small tasks according to logical structure. Through iterative development, AI voice reading materials can be quickly brought to market, and then the system can be continuously iterated based on user feedback, adding new functional modules to achieve high-quality, high-efficiency AI voice reading materials. For example, CITIC Academy built by CITIC Publishing Group since 2017 initially focused on digital reading. After multiple iterations

and introducing iFLYTEK's AI voice technology, it has now developed into a full-form, systematic multimedia knowledge service platform including text, audio, and video, with a large number of readers choosing to pay for audiobooks generated by AI voice synthesis technology.

Operational Differentiation: Leveraging Long Tail Effect and Differentiated Competition with Headline Premium Products

Currently, human-narrated audiobooks still dominate the market. Taking Ximalaya, the platform with the largest market share of audiobooks, as an example, although it has launched a large number of audiobooks generated by AI voice technology, the headline works at the top of the rankings are all recorded by well-known anchors, with voice actors highlighted as selling points in the titles. Moreover, in the fields of knowledge payment and vertical content, the role of major influencers is difficult to replace. The delicate auditory experience of emotional expression and more free secondary creation in human-narrated audiobooks are difficult for AI voice technology to achieve in the short term. Therefore, the commercial path for AI voice reading materials requires a differentiated strategy, leveraging its advantages of low cost, short cycle, and rapid mass synthesis to focus on middle-waist and long-tail works. This strategy happens to align with the Long Tail Effect.

Fanqie Changting, a new entrant in the online audio track focusing on free audio, has gained competitive advantages by actively introducing AI voice technology. In its content classification, "Human Narration" and "AI Narration" are presented side-by-side as important category tags, and "AI Narration" is approaching "Human Narration" in three important indicators: number of audiobooks, number of listeners, and rating scores. Publishers should categorize their reserved IP resources, autonomously producing or authorizing third parties to record headline IPs into premium human-narrated audiobooks, while low-cost, mass-producing AI voice reading materials from middle-waist IPs to achieve Pareto Optimality.

Business Platformization: Building Content Distribution Platforms to Promote Comprehensive Operations

In the Web3.0 era that emphasizes information integration and value distribution, publishers urgently need to build autonomous content distribution platforms to grasp initiative and reduce dependence on super platforms. Currently, publishers have two main paths to build platforms: first, developing mini-programs using social media traffic portals; second, building websites (Apps) platforms relying on content, services, and brands. The first path has advantages such as low promotion cost, low development threshold, no need for user downloads, good operation experience, and strong web page display compatibility,[12] but while leveraging social media traffic, it also deepens dependence on them, with disadvantages such as deep entry points, simple functions, instability, and poor content dissemination effects. The "2021 Mini-Program Internet

Development White Paper" released by the Aldzs Research Institute shows that the number of mini-programs across the entire network has exceeded 7 million, with WeChat mini-program developers exceeding 3 million and mini-program DAU exceeding 450 million; daily usage frequency increased by 32% year-over-year, while active mini-programs increased by 41%.[13] Among them, publishers such as People's Literature Publishing House, Zhonghua Book Company, and Higher Education Press have launched mini-programs. Overall, mini-programs are more suitable for publishers to optimize services and promote content payment. The second path is more difficult for small and medium-sized publishers and is not suitable for all types of publishers, requiring them to have the ability to provide irreplaceable services or products. However, its advantages are also obvious; the establishment of a website (App) platform will strengthen their moat. For example, China University MOOC under Higher Education Press is a successful case, and it uses AI speech recognition technology to quickly generate subtitles for audio-video content. However, building an autonomous content distribution platform does not mean abandoning platforms controlled by Internet giants. On the contrary, publishers should strengthen their full-platform operation capability for AI voice reading materials, which is not only conducive to enhancing communication effectiveness but also helps curb the monopoly of super platforms.

IP Productization: Conducting Marketing with Product Thinking, Harmoniously Coexisting with Distribution Platforms

The term "product manager" has frequently appeared in the editorial and publishing field in recent years. The introduction of product managers into the publishing industry is a product of "industry convergence" and an inevitable requirement of internal operational mechanisms.[14] Although there are different divisions of labor between book marketing specialists and book product managers, the success of bestsellers requires book product managers to fully consider marketing impact throughout the entire closed loop from topic development to after-sales service. The product creation process of AI voice audiobooks also needs to fully consider marketing links, both to maximize the commercial value of IP and to enhance the sustained influence of IP. Large platforms such as WeChat, Douyin, and Ximalaya provide more effective channels for the dissemination of AI voice reading materials, and the relationship between publishers providing IP content and platforms providing traffic is one of harmonious coexistence. The "2021 China Online Audio-Visual Development Research Report" shows that Ximalaya's user penetration rate reaches 67.1%, firmly occupying the first tier of the online audio industry, with an average monthly active user base of 268 million across all terminals. Therefore, publishers developing AI voice reading materials, like human-narrated audiobooks, need to increase content distribution on online audio platforms such as Ximalaya FM, and this does not conflict with building autonomous content platforms. "Industry convergence" not only changes market structure and industrial performance at the micro level but also changes a country's industrial structure and economic growth mode at

the macro level.[15] Content publishing and AI technology can reduce enterprise costs and serve as an important method and means for innovation in traditional industries, conducive to the transformation and upgrading of the publishing industry structure and improving national cultural competitiveness.

Technology Servicization: Win-Win Cooperation with Technology Enterprises, Supporting Servicization of Technology Products

The foundation of "industry convergence" is technological progress and deregulation. Li Jin, General Manager of Global Technology Services at Alibaba Cloud, proposed that "the path from technology to product, and then from product to service, is the only way for all technology enterprises." A new economic form of industrial Internet is taking shape, reshaping and transforming the industrial chains of various vertical industries. The publishing industry should actively utilize technology service products provided by information technology and Internet platforms, increasing the proportion of technology production factors in its content production, and enhancing publishers' productivity through technological innovation. Current technology product servicization is showing characteristics of technology platformization, cloudification, standardization, and foundationization, as well as service integration, diversification, personalization, collaboration, and cross-industry features. "Industry convergence" has changed the competitive and cooperative relationships among enterprises. Open platforms such as iFLYTEK, which focus on AI voice technology, achieve win-win cooperation with various industries including publishing by providing technology service solutions. Technology applied to AI voice reading materials needs to have capabilities in audio sampling and encoding, speech recognition database matching, speech-to-text, long text understanding, emotional speech synthesis, and automated post-production. Each of these capabilities requires advanced technology reserves. For example, emotional speech synthesis needs to match text emotion with voice emotion and add pauses, stress, intonation, and speech rate effects that conform to human language habits. Excellent synthesized speech can exceed human ears' ability to distinguish voice emotions. Currently, emotional speech synthesis remains an industry challenge, with the emotional differentiation of commercial AI voice synthesis technology basically at eight types or fewer. This demonstrates that AI voice technology has extremely high technical thresholds, making win-win cooperation between publishers and technology enterprises and support for technology product servicization an inevitable choice. For example, People's Education Press cooperated with iFLYTEK to develop AI voice reading materials such as teaching platforms, online learning, and electronic schoolbags.

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Note: Figure translations are in progress. See original paper for figures.