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Construction of Library Reading Promotion Service Mode in AIoT Era

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Abstract: *AIoT (The Artificial Intelligence of Things) is an intelligent engine to promote the high-quality development of library reading promotion, which subverts the traditional reading promotion pattern. Libraries should adapt to the iterative update of new technologies, innovate the whole process organization of reading promotion, and reshape the reading promotion service system in the digital age. By analyzing the characteristics of library reading promotion service in AIoT era, interpreting SWOT environment, relying on the four-factor theory of information ecology, and starting with four elements of reading promotion resources-people-environment-technology, this paper constructs a reader-oriented library reading promotion ecological service mode in AIoT era, and gives service strategies, thus constructing a new pattern of AIoT reading promotion development and promoting the further development of reading promotion service.*

Keywords: *AIoT; Library; Reading promotion; Service mode*

Introduction

AIoT (The Artificial Intelligence of Things) = AI (Artificial Intelligence) + IoT (Internet of Things), as an important technology engine in the intelligent era, is giving birth to book senseless lending, navigation, ultra-clear film and television, intelligent study, intelligent venue, cloud classroom, precise push, robot service, intelligent security and regional service (Wei, Chen & Zhang, 2019) with its powerful cloud intelligence fusion capability. It has brought revolutionary development opportunities for the high-quality development of libraries-rich media service resources, intelligent service means, virtual perception scenarios, intelligent service modes and ubiquitous service places. With the upgrading of terminal equipment and intelligent, three-dimensional and networked intelligent application scenarios, it will continue to empower library reading promotion services, improve user experience, enhance in-depth service capabilities and accelerate the transformation of libraries into intelligent services (Cheng, Yu & Meng, 2019).

Reading promotion is an important practice to realize the reading value of the whole people, which has attracted great attention from scholars at home and abroad. Abroad, as early as the beginning of the 20th century, some organizations have launched library mobile services, such as Finland's mobile short message service (Pasanen, 2002), Europe and Japan's mobile bibliographic query service (Negishi, 2002), and Korea's mobile services such as online reservation, reminder of books borrowing and returning, and mobile phone inquiry of relevant library materials (Huang, 2004). Since 2014, the "Government Work Report" has written

"Reading for All" six times, and then a series of policies and regulations, such as the Law on Guarantee of Public Cultural Services and the Law on Public Libraries, have been promulgated one after another, which provides a strong guarantee for safeguarding and promoting the development of public cultural undertakings (Wang, 2020). The theory starts from the aspects of service mode (Jing, 2015), service quality (Yi, 2017) and service innovation (Tang, 2018), and analyzes the development trend of library reading promotion. However, there is a lack of research on the construction of ecological service model for reading promotion. This paper attempts to study the ecological service model of reading promotion from the perspective of information ecology, so as to provide theoretical basis for the reform of library reading promotion service.

Table 1. Read and promote policies and regulations (Wang, 2020)

Promulgation time	Name of regulation	Read promotional content
2017.03.01	Law of the People's Republic of China on Guarantee of Public Cultural Services	Support reading for all
2017.06	Regulations on the Promotion of Reading for All (Draft)	Guarantee citizens' basic reading rights
2018.01.01	Law of the People's Republic of China on Public Libraries	Give the public library the responsibility and mission to carry out reading promotion

Characteristics of Reading Promotion in AIOT Era

Mobile Reading

Under the AIoT environment, readers can access the library system through mobile devices such as mobile phones, PADs, Kindle readers, etc., and complete personal "information inquiry, book borrowing, resource access, browsing the latest information", etc. On April 23rd, 2021, World Reading Day, China Press and Publication Research Institute released the 18th National Reading Survey Report, which showed that the digital reading contact rate in China reached 79.4%. Digital reading has become the mainstream reading form in today's society. The library connects abundant academic resources with mobile devices, integrates mobile platforms, breaks the bottleneck of content (text, image, audio and video), and better guarantees fair access to knowledge and provides universal and equal reading services. By using the concept and technology of the Internet of Everything, AIoT innovates and extends the positioning of reading promotion service, and constructs a new information service mode and mobile resource system supported by information technology and aiming at knowledge service, space service and intelligent service, which will improve the performance, function, reliability, stability and supporting equipment of the digital information portal. Experiencing the ubiquitous mobile reading service will be an important position for reading promotion of libraries in the future.

Content Marketing

Joe Pulitzer (USA), founder of Content Marketing Institute and a world-leading content marketing expert,

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thinks that "content marketing" refers to the commercial marketing process of creating and delivering valuable and compelling content to attract realistic or potential target customers. Jefferson Tanton (UK) believes that valuable "content" is the key to the success of online marketing in the era of social media. Reading promotion is also marketing, which includes knowledge, space and service. Content is king-Reading promotion should pay attention to content quality and careful selection, and should include not only good book recommendation, but also all information related to promoting reading, such as book review, self-media articles, classic guide, celebrity introduction, reading source recommendation, new platform recommendation, resource introduction, lecture book fair notice, book club or reading community promotion, etc. The traditional paper media will be integrated with the information flow mode in the AIoT era, supporting the content development, improving the knowledge ecology, and giving full play to the new kinetic energy value of AIoT in the field of reading promotion.

Microservices

In the AIoT era, more and more libraries use the network communication effect of social media to publicize reading promotion activities, such as micro-reading on MicroBlog/WeChat platform. Twitter is a common service in MicroBlog abroad (Vassilakaki, 2015), and the Health Science Library of new york University uses Twitter as a communication tool to publish library resources, events and news (Cuddy, et al., 2010). Chongqing University Library took the lead in opening the MicroBlog platform in China in 2009 (Xu, 2018). Shenzhen Library first created WeChat WeChat official account in 2013 (Gan, 2016). In the AIoT era, reading and social interaction can be promoted by increasing the dimension of reading promotion service, expanding the knowledge audience, integrating the high viscosity of social reading of microservices and the production, exchange and sharing of high-quality content of traditional paper media, and then building an ever-expanding multi-level micro-reading ecosystem among individuals, groups and platforms.

APP Application

The library at your fingertips, is one of the practical derivatives in the development of communication network. As a third-party application, APP can realize mobile applications such as accessing, reading, sharing and marking library resources, which is the focus of the development of library reading promotion service in the future. In 2008, Columbia Public Library developed the first library APP (Gan, 2016). A survey conducted by Liu YQ scholars in 2015 showed that 8% of the 100 universities in North America provided APP services (Liu, 2015). In 2008, the National Library of China launched the "Handheld National Map" mobile Lib service, which can obtain mobile phone portal, MMS, mobile reading, application services, etc. (Zhou, 2016). In the AIoT era, libraries should grasp the technical advantages of intelligent terminal APP, such as convenience, creativity, interactivity and wide audience, integrate the collection resource system and various mobile services, and further expand the promotion of digital resources.

Rich Media Reading

Technology drive leads to media convergence and diversification. The forms of information dissemination and reception are undergoing dramatic changes. AIoT promotes a new media form, which is the beginning of

the Internet of Everything, breaks the boundary of the Internet of Things, and truly realizes the holographic intelligent intercommunication of "man-machine-object-environment". Reading—The reading rates of mobile phones, online, e-readers and PADs have all increased. More original, sinking and younger information dissemination forms such as "short video (Tik Tok and Aauto Quicker)", "live broadcast" and "flash" have become the mainstream of network communication. The library should constantly break through the traditional service concept of reading promotion, boldly innovate the activity mode, and make use of diversified and personalized media communication tools to expand the fresh vitality for the reading promotion service field of the library.

To sum up, the characteristic diagram of reading promotion in the "AIoT" era is shown in Figure 1.

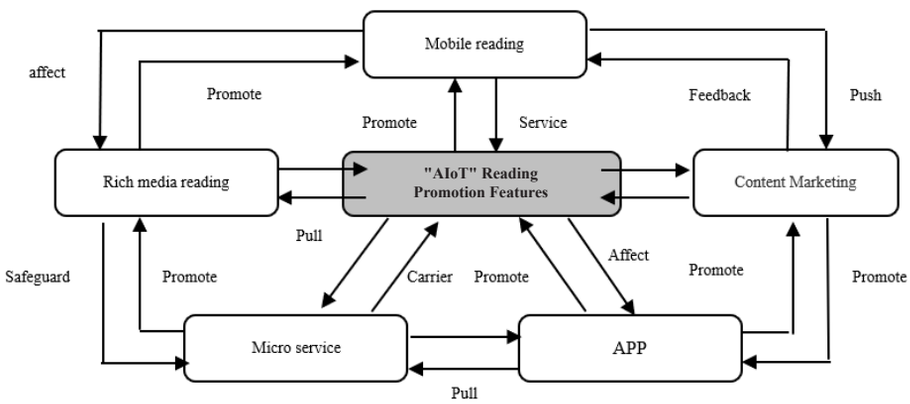


Figure 1. Characteristics of reading promotion in the "AIOT" era

SWOT Analysis of Reading Promotion in AIOT Era

Technology is a "double-edged sword". Reading promotion should make full use of the advantages and shortcomings of AIoT to improve risk prevention and control. This paper intends to use SWOT situation analysis method, that is, Strength, Weakness, Opportunity and Threat, to analyze the internal and external environment of reading promotion in the AIoT era, and then provide ideas for formulating the development strategy of reading promotion.

Strength

With the update and iteration of information technology, the AIoT era has brought about greater information throughput, faster information transmission rate, higher data compatibility, stronger data transmission bandwidth and lower internet access delay. Meanwhile, high-quality images, audio and video files, film and television works, high-definition document APP and cloud storage services will all be realized in the AIoT era. The increasing popularity of mobile phones, netbooks, tablet PCs and Kindle has changed users' information utilization habits and improved readers' reading experience.

Weakness

In the AIoT era, the deployment of ultra-dense heterogeneous networks-the increase of bandwidth and the

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increase of transmission power of base stations-led to the reduction of network coverage. Therefore, in order to achieve the same coverage, the number of base stations must be increased and the deployment time lengthened. In addition, with the high-speed data receiving, sending and processing capabilities, the power consumption of the network infrastructure has greatly increased. Although the transmission algorithm of the receiving, sending and processing capabilities is more comprehensive, the security problem cannot be ignored.

Opportunities

Facing the AIoT with a wide audience and the Internet of Everything, the library focuses on the requirement of "all-round empowerment of technology", improves information governance, strengthens technical support, and realizes data-driven digital transformation with innovative applications. The library strengthens the ability of digital innovation in technology and system, so as to realize the flexible allocation of information resources, the remote monitoring of intelligent devices, the deep learning of complex neural networks, the dynamic collection of intelligent spatial information, and the rapid transmission of high-definition literature, film and television.

Threat

In the intelligent age of AIoT, libraries are faced with the shortcomings of "the rule of data"-data confirmation and capitalization are faced with obstacles, and the freer circulation of data is subject to the shortcomings of imperfect rules such as privacy protection and authority allocation. At the same time, the high-end chips, basic algorithms and core software behind data processing need to strengthen independent public relations. The complexity and maturity of technology and the security and stability of library applications are the difficulties of reading promotion in the AIoT era (Wei, 2019). According to the above analysis, the SWOT environment analysis diagram of reading promotion in AIoT era is as follows.

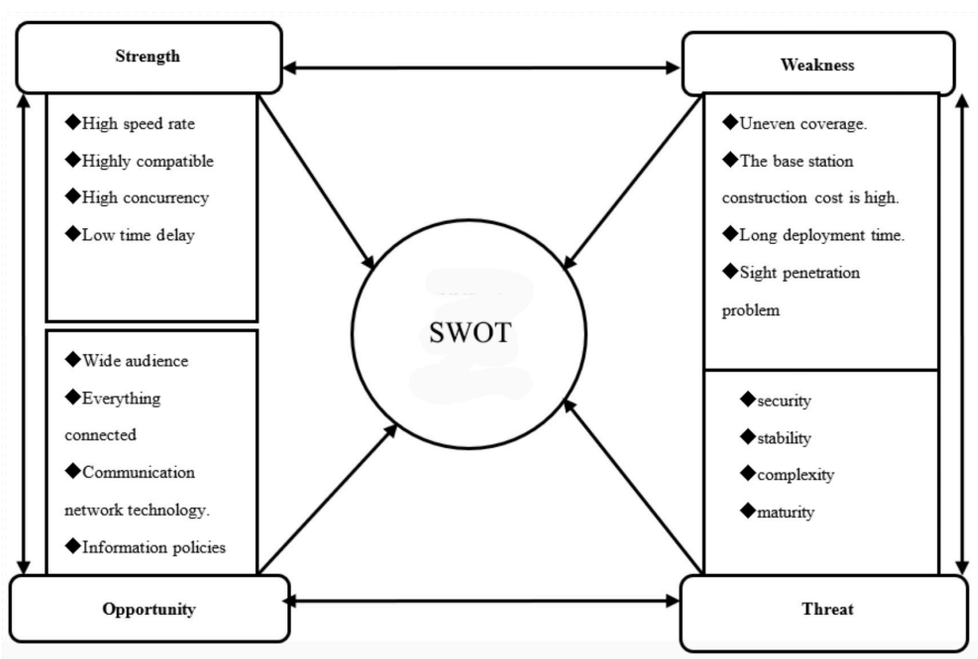


Figure. 2 Schematic diagram of SWOT environment analysis of reading promotion in AIOT era

Research on Library Reading Promotion Service Mode in AIOT Era

With the integration of AIoT enabling media, library reading promotion service should break the traditional thinking mode and inertia path. This paper integrates the theory of information ecology, that is, the information ecosystem consists of four factors: information, information person, information environment and information technology. In the AIoT era, the library reading promotion service model is composed of four elements: reading promotion resources, reading promoters, reading promotion environment and reading promotion technology, and then the reader-oriented ecological service model of library reading promotion is constructed.

Reading Promotion Resources

The resources for reading promotion refer to the library's literature resources (paper and electricity literature resources, special collection resources, OA resources), space platform, institutional knowledge base, knowledge service items, reading culture brands and readers' reading literacy, etc. "Content is king"-Content is an important component of reading promotion, and high-quality content promotion will help to improve users' experience and perception, and then improve reading promotion effect. L.Solomon (2016), D.Fichter and J.Wisniewski (2014) all mentioned that libraries need to strategically create and provide content resources in a sustainable, efficient and eye-catching manner, which can become a powerful tool for marketing library services. In-depth reading promotion based on "content marketing" should focus on processing, organizing and mining the content, and then form a knowledge map, integrate the essence of the book, and create a knowledge-based promotion service (Ma, et al., 2020)

Reading Promoters

Reading promoters include two aspects: the subject of reading promotion (Who will promote reading)—librarians, who take readers' needs as the starting point, try their best to produce and promote reading products that can effectively meet and guide readers' needs, so that they can develop reading habits, improve reading quality and reading ability, solve problems in reading methods and skills, improve reading effects, and help readers digest and absorb reading materials to achieve reading goals. The object of reading promotion (To Whom)—the reader, not only the objects of reading promotion, but also the active participants in creating reading value in libraries. To do a good job in reading promotion, it is necessary to understand the types of readers, their individualized and differentiated reading needs, reading preferences and reading purposes. Teaching reading methods, activating reading EQ, developing special reading promotion projects, compiling reading plans and so on, and finally realizing "teaching people to fish" (Li, 2013).

Reading Promotion Environment

With the deep integration of technology and library reading promotion scenes, the era of all-media communication has arrived. In order to enhance the attraction of library space environment to readers, the concept of Information Commons and the theory of "third space" have attracted much attention. Physical space: architectural innovation, mainly from the library architectural style, space design, cultural landscape

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and decoration application, etc. to reshape the reading promotion space (Chen, et al., 2015). Virtual space: Under the situation of normalization of epidemic prevention and control, reading promotion space has gradually changed from "offline" to "online", and more high-quality cultural promotion services have entered the "cloud" and become mainstream. "5G+AR" will realize intelligent service and intelligent experience of venues. By actively applying new technologies, we can create "new products" in reading and open up a broader development space for library reading promotion in accurate, shared and intelligent services.

Reading Promotion Technology

In the AIoT era, driven by multiple technical elements such as cloud computing, artificial intelligence, VR/AR, blockchain, and digital twinning, multi-source media is converging and developing, and intelligent recommendation, user portrait, knowledge map, scene embedding and virtual reality based on the integration of sight, hearing and touch will become the mainstream forms of reading promotion. Libraries should better understand the development trend of media convergence, pay attention to the three-dimensional, interactive and experiential integration of traditional media and emerging media, and realize "traditional media (newspapers, posters, radio) – micro media (MicroBlog, WeChat, Tencent) – short video (TikTok, Aauto Quicker, Flash) – multi-source media (APP, Applet, QR Code)", etc. Digital technology has greatly promoted and optimized the form of reading media, and "information integration applications" such as browsers and yellow-page Internet will become important promotional media that affect reading behavior in the AIoT era. According to the above analysis, the schematic diagram of library reading promotion service mode in AIoT era is obtained, as shown in Figure 3.

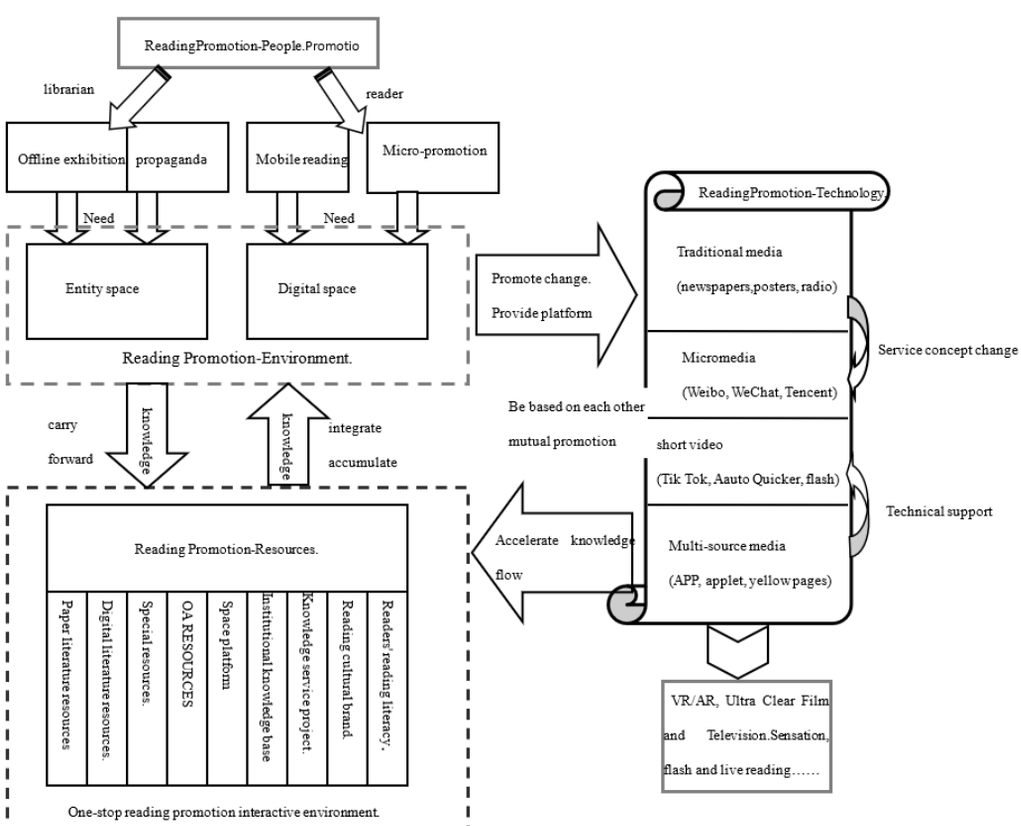


Figure 3. Schematic diagram of library reading promotion service mode construction in AIOT era

Reading Promotion Service Strategy in AIOT Era

In the AIoT era, libraries should cooperate with all sectors of society to build a new reading ecosystem that is faster, more personalized, more accurate and more efficient in exchanging knowledge, thoughts and feelings.

Strengthen Deep Reading and Improve Reading Literacy

Attenuation of reading patience is an important feature of the evolution of Chinese people's reading behavior in the digital age (Li, 2013). Due to the weakening of reading patience and lack of ideological depth, the problems of fragmented reading and shallow reading are highlighted. Although the number has expanded and the reading rate has increased, the problems of uneven readers' quality and extremely complex structure cannot be ignored. In the environment of the Internet of Everything and virtual space, readers' weaknesses in traditional reading environment, such as unwillingness to read and being bad at reading, will be further amplified, resulting in more contradictory negative emotions. "Guiding digital reading to return to rationality and promoting the depth and knowledge of digital reading are important tasks of digital reading promotion in libraries" (Li, 2017). The library should publish and design "reader-centered" reading promotion, so as to better attract readers with low information literacy, and make more efforts in enriching reading connotation, promoting excellent reading and classic reading. Accurate planning, meticulous implementation, meticulous organization and exquisite presentation, dig deep into the excellent books in the library, guide them to contact with in-depth reading materials, stimulate interest in in in-depth reading, gradually cultivate reading habits and enhance reading literacy.

Adhere to Continuity and Strengthen Reading Policy Guidance

At present, the reading situation is as follows: "shallow reading", "light reading" and "extensive reading" are obvious, while "deep reading" such as classics, literature and knowledge reading is lacking. Reading promotion is also to attract readers to do short-term and festive activities. In the AIoT era, with the increasing demand for asynchronous and diversified reading, the government should take promoting reading for all as a national strategy, and increasing investment in public culture and education is the fundamental policy to promote reading. We should strengthen the awareness of reading rights, try our best to eliminate "reading discrimination" and "reading barriers", strengthen the construction of grassroots reading organizations, improve the long-term effectiveness and synergy of reading promotion, and enhance the enthusiasm of organizations from all walks of life to participate in publicity and promotion (Li, 2013).

Establish Multiple and Compound Reading Space

AIoT new technology drives new reading. Reading promotion should constantly break through the traditional service space, extend the tentacles of reading service and broaden the radius of promotion service, such as setting up multiple reading promotion alliance points and forming a "one-kilometer reading circle" such as library–school–community–cafe–enterprise, so as to effectively improve the efficiency of promotion service; Build a multi-dimensional and three-dimensional "panoramic" reading exhibition hall and an online cloud platform; The personalized space of combination of virtual and real, dynamic and static can meet the needs

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of different people's hierarchical promotion services, and constantly improve the innovative, green, open and shared new normal of reading promotion construction under the new technology. AIoT has brought technical advantages to the space service of reading promotion. Establishing a multi-dimensional and complex knowledge space and building a "reading promotion service community" can better meet readers' multi-level and diversified reading needs.

Implement All-Media Reading Promotion

The development of media integration in AIoT era has changed readers' habit of reading information, and broke the traditional propaganda of single paper literature. Libraries should conform to the changing trend of reading media, expand information flow, pursue reading value and optimize communication channels (Li, 2013). Developing new reading service, focusing on the reading life cycle of production (enlightenment), sequencing (organization), transmission (promotion), consumption (accumulation) and decomposition (innovation), presents the diversity of content and form: increasing various resource types, resource supply modes and access modes. Pay attention to interesting, trendy, classic and professional reading. Promote with new media: micro-video, flash, applet, MicroBlog, WeChat, etc. Strive to be rich in quantity, diverse in types and guided by high-quality products. Create an immersive reading experience based on new technologies such as AIoT, full-motion video, hologram, etc., and lead the new reading trend with technological innovation, cultural innovation and industrial innovation.

Create Reading Promotion Service Brand

With the enhancement of brand awareness, a large number of successful cases of introducing "branding" into reading promotion activities have emerged in many libraries at home and abroad. For example, one of the most influential reading promotion brands is the "One Book, One City" activity initiated by the United States in 1998 (Wang, 2021). In 2006, the Reading Promotion Committee was established in library society of china, which achieved a series of important academic achievements and good social influence, gradually formed its scale and brand, and helped the whole people to read. In the AIoT era, when libraries build reading promotion brands, they focus on the following aspects: strengthening reading promotion brand awareness and improving reading promotion level; Strengthen multi-dimensional brand marketing and improve brand awareness; Strengthen scientific brand management, and enhance brand building power, influence and appeal.

Conclusion

Creating, transmitting and realizing the value of cultural communication is the key to improve the core competitiveness of reading promotion, which determines the direction of library's strategic efforts. Technical level is the key breakthrough of reading promotion service. The thorough perception, comprehensive interconnection, deep integration, collaborative operation and intelligent integration brought by AIoT technology are the intelligent engines to promote the high-quality development of library reading promotion. Through the advantages of information technology industry, we can reshape the construction mode of reading promotion, innovate the organizational form of reading promotion, promote the deep integration of information technology and reading promotion, accelerate the construction of high-quality library reading

promotion service system in AIoT era, and accelerate the transformation of intelligent service in the whole library industry.

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