

Mobile Knowledge Base Practice Based on WeChat Work: A Case Study of the China Academy of Information and Communications Technology (CAICT) (Postprint)

Authors: Cui Chao

Date: 2023-10-08T00:00:00+00:00

Abstract

[Purpose / Significance] In the mobile internet era, there is an expectation to obtain knowledge services through mobile terminals, with mobile knowledge platforms serving as important carriers and channels. As an internal communication and office tool for enterprises, WeChat Work has gradually become integrated into the WeChat ecosystem and has been adopted by an increasing number of organizations and institutions. [Method / Process] Taking the construction of the mobile knowledge base of the China Academy of Information and Communications Technology (CAICT) as an example, this paper analyzes application requirements, proposes a construction model combining “WeChat Work +Web APP”, provides a detailed introduction to the system design and implementation process of main functions, analyzes the system’s effectiveness, and summarizes relevant experiences. [Results / Conclusion] Based on practical experience, this study explores the adoption of the “WeChat Work +Web APP” model for building a mobile knowledge base. This model is characterized by rapid deployment, simple operation, high efficiency, and low cost, possessing universality and replicability, and provides valuable reference for other knowledge service institutions.

Full Text

Preamble

Practical Research on Mobile Knowledge Base Based on Enterprise WeChat — A Case Study of China Academy of Information and Communications Technology

Cui Chao
China Academy of Information and Communications Technology, Beijing 100191

Abstract

[Purpose/Significance] In the mobile internet era, people expect to access knowledge services through mobile terminals, making mobile knowledge platforms a critical carrier and channel. Enterprise WeChat, as an internal communication and office tool, has gradually integrated into the WeChat ecosystem and been adopted by an increasing number of organizations. **[Method/Process]** Taking the construction of CAICT's mobile knowledge base as a case study, this paper analyzes application requirements, proposes a "Enterprise WeChat + Web APP" construction model, details the system design and implementation of key functions, and evaluates system effectiveness while summarizing relevant experiences. **[Result/Conclusion]** From individual practice, this study explores the "Enterprise WeChat + Web APP" model for building mobile knowledge bases. This model offers rapid deployment, simple operation, high efficiency, and low cost, demonstrating universality and replicability that provides valuable reference for other knowledge service institutions.

Keywords: mobile knowledge base; Enterprise WeChat; construction model; CAICT

Classification Number: G250.7

Citation Format: Cui Chao. Practical Research on Mobile Knowledge Base Based on Enterprise WeChat: A Case Study of China Academy of Information and Communications Technology [J/OL]. Knowledge Management Forum, 2019, 4(4): 256-266 [citation date]. <http://www.kmf.ac.cn/p/179/>.

According to the 43rd "Statistical Report on China's Internet Development" released by the China Internet Network Information Center (CNNIC) in February 2019, by December 2018, China's internet user base reached 829 million, with mobile internet users accounting for 817 million (98.6% of the total). The expanding network coverage and lowered access barriers continue to drive this proportion upward. The report also indicates that among mobile internet applications, instant messaging has the highest usage rate at 780 million users (95.5% of mobile internet users) [1]. Mobile instant messaging has transformed people's lifestyles and work habits, becoming a crucial tool for interpersonal communication, information acquisition, and service operations. Enterprise applications like Enterprise WeChat and DingTalk provide essential online communication and information dissemination capabilities for organizational staff.

1.1 Overview of Institutional Repository (IR)

In recent years, institutional repositories have flourished across global industries and institutions, with related research, construction practices, and innovative applications thriving. Institutional Repository (IR), originating from the Open Access movement, is a platform for unified collection, centralized management,

long-term preservation, and utilization of an institution's internal and external knowledge achievements [2]. As of April 2018, over 3,500 IRs were registered on OpenDOAR, with the United States, United Kingdom, Japan, Germany, Spain, Italy, and France having the most registered institutions. Although China has fewer registered IRs, many institutions have built IR platforms to solidify and organize their knowledge outputs, promoting utilization and value-added transformation [3]. After more than a decade of development, China's IR practices have deepened across multiple industries, including education, research, transportation, aerospace, healthcare, software, electronics, chemical engineering, energy, geology, agriculture, counter-terrorism, equipment manufacturing, and publishing. Technically, tools and technologies such as DSpace, CRIS, text analysis and mining, full-text retrieval, linked data, intelligent recommendation, container virtualization, big data, blockchain, machine crawlers, and data visualization have been widely applied [4-5]. In terms of service utilization, through system integration and content consolidation, open online services such as real-time achievement acquisition, statistical analysis, knowledge mapping, big data analysis, and altmetrics are provided to users [6].

1.2 Overview of WeChat Ecosystem and Enterprise WeChat

The WeChat ecosystem is an operational model built by Tencent based on its user-friendly social software WeChat with massive market penetration. Participants include platform providers, application developers, merchants, consumers, and social users. These entities gradually form a circular ecological system through business operations, opinion expression, and commercial value realization. The WeChat ecosystem is essentially an open yet closed system, primarily comprising basic social functions, Moments, Official Accounts, Mini Programs, WeChat Pay, and Enterprise WeChat. Basic social functions enable communication between individuals and groups; Moments facilitates information sharing within personal networks; Official Accounts with vast creator and fan bases have evolved from pure content output to commercialized, professionalized traffic monetization; Mini Programs have rapidly grown into important commercial traffic portals through their lightweight application advantages [7]; WeChat Pay has penetrated all aspects of life, continuously extending payment scenarios and deepening its enterprise focus, making it an indispensable intermediary linking massive social users with financial services. Through software version iterations, Tencent has built a massive ecosystem—a broader and more innovative value network that has become increasingly mature and stable.

Enterprise WeChat, released by Tencent in April 2016, is a communication and office tool designed for enterprises. With a communication experience consistent with WeChat, rich OA applications, and the ability to connect with the WeChat ecosystem, it facilitates efficient enterprise communication and management. The software runs on iOS, Android, Windows, and Mac systems. Beyond chat functions similar to WeChat, Enterprise WeChat integrates internet calls

and email functions, while also supporting announcements, attendance, leave requests, and expense reimbursement within the application. In June 2017, Enterprise WeChat 2.0 was launched, migrating data and applications from the former Enterprise Account to Enterprise WeChat for unified management through its admin backend. Its WeChat plugin functionality integrates all capabilities of Enterprise Account, allowing employees to scan QR codes and receive enterprise notifications and use office applications within WeChat.

1.3 Application Overview of WeChat Ecosystem in Knowledge Base Services

Official Accounts and Mini Programs in the WeChat ecosystem have attracted widespread attention across industries upon launch. In libraries and information institutions, their applications primarily involve reading promotion, space reservation and seating systems, knowledge search and recommendation, event display, and communication and entertainment. Shandong Normal University Library developed Mini Programs for call number shelving games and book drifting, enhancing the entertainment value of user training and promoting nationwide reading respectively. Southwest Forestry University Library developed a book recommendation platform based on WeChat Mini Programs, pushing popular and new book catalogs to faculty and students, representing a meaningful exploration of reading promotion activities [8]. Xiamen University Library developed the “Lib Assistant” Mini Program to advance internal office operations from “automation” to “mobilization,” improving office efficiency [9]. Suzhou University of Science and Technology Library investigated and analyzed problems in WeChat platform operations and functional services from a user demand perspective, proposing measures such as user relationship maintenance, functional design improvement, reasonable push frequency and content arrangement, and enhanced communication and feedback [10]. Shanxi Agricultural University Library proposed a new information service model for university library Official Accounts, including multi-channel promotion, in-depth consultation services, refined push services, interactive information services, and creation of virtual exchange and learning spaces [11].

Research shows that Enterprise WeChat has been applied in business operation systems, administrative office systems, performance evaluation systems, and party-building systems in industries such as public security, power supply, education, water conservancy, and healthcare. However, no precedent has been found for applying Enterprise WeChat to institutional knowledge services and knowledge base construction. This paper explores using Enterprise WeChat to build a mobile institutional knowledge base system, offering a new construction approach and model to provide useful reference for domestic IR construction peers.

2 System Requirements Analysis and Design Implementation

For researchers at scientific institutions, heavy workloads including investigations, experiments, testing, meetings, and business trips leave little time for systematic reading and grasping of external research progress and latest developments. Mobile terminals such as smartphones have become important channels for acquiring knowledge anytime, anywhere.

2.1 Requirements Analysis

For CAICT, the mobile knowledge base is a mobile module of the PC-side knowledge platform—an extension of knowledge content and service functions to mobile terminals. Overall, the network infrastructure must be modified to break the restriction of PC-side knowledge platforms being accessible only through internal networks. In terms of user base, the initial focus is on internal employees, with plans to gradually open to higher-level supporting units and social users, requiring consideration of user management and authentication system scalability. Content-wise, the focus is on providing research support knowledge such as institutional research outcomes, authoritative data, and industry dynamics, with edited 精华 portions being concise and suitable for quick reading. Functionally, beyond basic publishing, browsing, and retrieval functions, the platform should incorporate recommendation, subscription, and channel management features, combining universal services with personalized offerings. Operationally, multiple entry points should be provided, supporting scroll loading on list pages, waterfall flow reading of short texts, and online browsing of attachments to enhance user experience. Specifically, there are four main requirements:

2.1.1 Multi-Entry, Easy Access The PC-side knowledge platform is an intranet system accessible externally only via VPN, involving complex operations and speed limitations. The mobile knowledge base platform will break these restrictions, allowing users to access through multiple entry points and terminals anytime, anywhere. This is reflected in: (1) Network architecture: establishing a separate Web application server as an internet gateway to access internal networks through firewalls and call service layer applications and data; (2) Access entry points: besides accessing through mobile browsers by entering URLs, adding entry points in enterprise mobile collaboration (OA), Enterprise WeChat, and WeChat Enterprise Accounts to integrate user and authentication systems, enabling single sign-on or authorized access and eliminating the need to enter usernames and passwords for each visit; (3) Multi-terminal, cross-platform support: the mobile knowledge base platform must support Android and iOS devices, mainstream mobile browsers, common screen sizes and resolutions, and maintain good compatibility with browsers customized for different brands.

2.1.2 Secure Data Usage Since the mobile knowledge base platform contains large amounts of sensitive information such as research outcomes, special

reports, and client data, there are high requirements for data security and usage restrictions, including: (1) Careful selection of data accessible via mobile terminals, with physical isolation of sensitive data at the source; (2) Implementation of strict authentication systems with unified user management, linking and verifying user data from different entry points through primary keys to ensure all users must be authenticated before accessing the application system; (3) Restrictions on mobile page forwarding, verifying whether users clicking shared links have access permissions, prompting login or denying access; (4) Encryption of important data, providing only online browsing without direct file reading or downloading capabilities.

2.1.3 Personalized Knowledge Services Providing personalized proactive services based on user needs represents a new choice for innovative knowledge services, including: (1) Following: users can actively submit interest points expressed through keywords, optionally limiting knowledge types, with the system presenting relevant knowledge documents in real-time through full-text retrieval; (2) Recommendation: knowledge administrators can customize the most needed knowledge for specific departments or teams in the backend, or the system can proactively recommend latest knowledge by analyzing user browsing, retrieval, and following behavior preferences and their topics of interest; (3) Channel management: due to mobile terminal screen limitations, it is impossible to display all channels, so users can customize menus to add, delete, and sort multiple knowledge channels, displaying only the most needed channels to reduce redundant information interference and improve work efficiency; (4) Subscription: the system presents available knowledge content in journal product format for users to subscribe to, with periodic pushes delivered according to agreed reception methods after successful subscription.

2.1.4 Integration with Third-Party Applications Although the mobile knowledge base platform provides independent mobile APP services, integration with existing or mainstream internet APPs is necessary for promotion and user habit considerations, including: (1) Integration with enterprise mobile collaboration (OA): adding mobile entry points in mobile collaboration based on the same user group for single sign-on access, or pushing the latest knowledge information from the mobile knowledge base platform to OA through interface calls, with the mobile knowledge base platform also able to call OA workflows; (2) Integration with WeChat/Enterprise WeChat: using open API interfaces to integrate authentication systems, providing subscription and group push services for knowledge products (collective term for various information monitoring reports and data reports presented in electronic journal format) and message interaction services for internal organizational users, bypassing Official Account restrictions on push content and frequency; (3) Integration with enterprise email systems: through SMTP protocol, injecting knowledge product content into email bodies as static code, enabling editing and maintenance of different email user groups for targeted product pushes.

2.2 Construction Mode Selection

Whether to purchase standardized market products or develop independently depends on actual scenarios and business requirements [12]. Section 2.1 described CAICT's overall requirements and typical application scenarios for the mobile knowledge base platform. Market research revealed no existing products that could fully meet these needs, making independent development the necessary path. The selection of construction mode must follow principles of applicability, reliability, standardization, scalability, and security, comprehensively analyzing advantages and disadvantages of various modes based on actual needs [13].

2.2.1 Comparison of Mobile Development Modes Currently, there are four mainstream mobile application types: Native APP, Web APP, Hybrid APP, and WeChat Mini Programs. Native APP refers to native programs generally dependent on specific operating systems, with strong interactivity and extensibility, being a complete APP where all UI elements, data content, and logical frameworks must be installed on mobile terminals. Web APP refers to applications developed using HTML5+APP frameworks, essentially Web-based applications designed for mobile browsers that can run cross-platform on various smartphones without installation, reading data from the cloud each time the APP is opened. Hybrid APP refers to hybrid Apps that are partially native and partially Web, using a development model that embeds HTML5 applications into native containers, requiring download and installation, with some functions running on devices and others on the Web [14]. WeChat Mini Programs are mobile applications running within WeChat, similar to Web APPs in development, consisting of server and client sides, with the server providing data through APIs and the client composed of frameworks, components, and APIs uniformly provided by WeChat, adhering to the “use and go” concept without requiring installation [15]. These four approaches each have advantages and disadvantages in development and maintenance, distribution and acquisition, user-friendliness, cross-platform capability, and hardware access, as detailed in Table 1 .

2.2.2 Determination of “Enterprise WeChat + Web APP” Model

Through the previous section's requirements analysis, it is clear that CAICT has unique business and functional requirements for mobile knowledge base platform construction. Market research shows no 完全符合需求的产品, necessitating customized development based on existing PC-side products and services. The construction mode must comprehensively consider functional requirements, user base, data volume, development and deployment, and cost investment.

From a functional requirements perspective, the basic functions are timely publishing, display, query, and browsing of knowledge data, supplemented by personalized needs such as recommendation, subscription, and following. From a design and implementation perspective, the complexity is low and does not require hardware devices like cameras or GPS, thus eliminating the need for

Native APP or Hybrid APP modes. From a user base perspective, the current system is only for internal use, making the open Mini Program mode unsuitable, with a total user base of approximately 4,000 and relatively low access frequency and volume compared to internet applications, thus not requiring high performance that Web APP mode cannot meet. From a data volume perspective, CAICT's PC-side knowledge platform currently has hundreds of thousands of data entries occupying over 6TB of storage, making Native APP mode unsuitable for such data scale. From a development and deployment perspective, to meet internal users' personalized needs, customized development content requires rapid deployment and launch, and Web APP mode offers relatively lower cost control when using self-raised funds and public bidding for third-party vendor assistance. From a mobile adaptation and experience perspective, HTML5 technology can well meet requirements.

Comprehensive analysis shows that Web APP development mode can satisfactorily meet CAICT's mobile knowledge base platform construction needs. To compensate for Web APP's shortcomings in user discovery and message interaction, the Web APP knowledge base will be integrated with existing Enterprise WeChat, adopting dual authentication combining PC-side identity authentication system with Enterprise WeChat authentication, adding mobile knowledge base platform entry points in the Enterprise WeChat Workbench, and using Enterprise WeChat message interfaces for knowledge content push and service information interaction. With the integration and interoperability of Enterprise WeChat, WeChat Enterprise Accounts, and WeChat, the mobile knowledge base platform should be integrated into the WeChat ecosystem to achieve anytime, anywhere knowledge services.

2.3 System Function Design

Through business requirements analysis and development mode comparison, the "Enterprise WeChat + Web APP" construction mode was determined, combining Enterprise WeChat's internal communication and dissemination advantages with Web APP's rapid development and deployment advantages to compensate for Web APP's poor interactivity. This approach designs a mobile knowledge base system convenient for query, acquisition, subscription, and push [16]. The overall architecture is shown in Figure 1 [Figure 1: see original paper].

The main functional modules of the mobile knowledge base system are briefly described as follows: (1) Content Management: manages site-wide columns, templates, and content creation, modification, publishing, and revocation, serving as the platform's knowledge repository; (2) Login Authentication: adopts dual authentication of PC-side identity authentication and Enterprise WeChat to provide fast, effective authentication for legitimate users from different entry points; (3) Text Mining: through natural language extraction, analysis, and processing, establishes industry tag libraries to achieve automatic classification and indexing, improving retrieval efficiency; (4) Content Layout: organizes knowledge data from the content management system according to certain tem-

plates and standards for push to specific users through Enterprise WeChat/email interfaces; (5) Copyright Protection: encrypts original files to provide online browsing and encrypted downloads, preventing diffusion and loss of important knowledge; (6) Full-text Retrieval (“What can I find”): includes site-wide retrieval and channel retrieval, allowing users to retrieve full-site data through titles, body text, and attachments on the homepage search box, with results displayed by relevance ranking and highlighted hit words when locating specific channels; (7) Knowledge Recommendation (“What the system gives me”): by default recommends latest global ICT insights, hot field monitoring analysis and brand data reports, and internal soft science research outcomes, allowing users to delete uninteresting content, with the system recording operations to gradually form knowledge lists matching user habits; (8) Hot Following (“What I actively follow”): users can add “follow points” based on needs, with the system providing matching content; (9) Subscription and Push (“What else I want to receive”): provides knowledge product lists for user selection, with options to receive latest knowledge products via WeChat/Enterprise WeChat or email; (10) Channel Management (“I want to be different”): due to mobile terminal screen limitations, users can personalize menu settings to add, delete, and sort multiple knowledge channels, displaying only interesting channels to reduce redundant information interference.

2.4 System Implementation

In platform development, the Web APP portion uses HTML5+JAVA, featuring rapid development and deployment, low cost, and quick response. For the Enterprise WeChat portion, Tencent Cloud provides relatively concise development frameworks, basic components, and APIs that support diverse programming languages. Based on requirements scenarios and overall design, mobile knowledge base construction covers network and infrastructure architecture, data integration, functional modules, UI design, and system security. Due to space limitations, this chapter only introduces Enterprise WeChat-based user authentication and message push, and several functional modules that best embody the characteristics of this mobile knowledge base.

2.4.1 User Authentication CAICT uses an Identity Server (IDS) for user management and authentication, enabling cross-domain single sign-on and unified identity management across various application systems, providing integration frameworks and convenient secondary development interfaces for third-party collaborative applications [17]. The mobile side adopts dual authentication of IDS and Enterprise WeChat, organically combining both to ensure data security and restricted diffusion while providing multiple access channels including domain access, Enterprise WeChat Workbench entry, and WeChat Micro Workbench entry. Specifically: (1) When users access the application through WeChat/Enterprise WeChat, the system calls the Enterprise WeChat API to obtain an access_{token}, verifies user existence, requests user information, and obtains an authorization code to complete authentication (Enterprise WeChat

authorization interface shown in Figure 2 [Figure 2: see original paper]); (2) When users directly access the homepage through mobile browsers, authentication is performed directly through IDS, redirecting to the system homepage after passing (IDS login interface shown in Figure 3 [Figure 3: see original paper]); (3) When users access non-homepage pages through browsers (shared links), the application verifies the access source, then redirects the request, validates parameter legitimacy in the Enterprise WeChat backend, and presents the page to users after passing.

2.4.2 Knowledge Subscription and Push Enterprise WeChat provides a “Message Push - Send Application Message” API interface supporting third-party applications to send text messages, graphic messages, audio/video messages, file messages, and other types [18]. Web APP mode has inherent deficiencies in message interaction, which are compensated by integrating Enterprise WeChat’s message push module to achieve knowledge push for the mobile knowledge base. The process involves three steps: (1) Encode and list all subscribable knowledge products for users; after successful subscription, user information enters the corresponding product group, the system sends a subscription success notification, and unsubscription removes the user from the group in real-time (product subscription interface shown in Figure 4 [Figure 4: see original paper]); (2) Develop a layout module to organize graphic knowledge content, arranging data to be sent into pushable content templates; (3) After layout completion, select push groups or individuals, call the message sending interface to send the layout content to the Enterprise WeChat backend, which then pushes to designated users to complete knowledge product push services (message receiving interface shown in Figure 5 [Figure 5: see original paper]).

2.4.3 Hot Following The system establishes a “Following” module for personalized user configuration. Users can set follow points based on needs, defined by names and descriptive keywords, with each user able to set multiple follow points and select knowledge scope (adding follow points shown in Figure 6 [Figure 6: see original paper]), with options to add, delete, and modify follow points. Added follow points are presented as tags; clicking any tag retrieves the latest data list for the follow point through combined retrieval (follow point knowledge list shown in Figure 7 [Figure 7: see original paper]), and long-pressing the tag deletes it.

2.4.5 Channel Management Clicking the “+” button on the right side of the menu bar enters the “Channel Management” interface (shown in Figure 8 [Figure 8: see original paper]), where channels in “My Channels” are displayed in the menu bar. Clicking the “Maintain” button or long-pressing channel tags enters the channel maintenance interface, allowing users to drag, add, remove, and sort “My Channels.” For system promotion, the “Recommendation,” “Following,” and “Subscription” channels are locked. Newly added channels automatically enter “More Channels,” with latest additions to “My Channels”

distinguished by different colors and a “new” icon (channel maintenance operation interface shown in Figure 9 [Figure 9: see original paper]). The system provides default channels and records each user’s custom selections and sorting for display in the menu bar.

3.1 System Effectiveness

CAICT’s Enterprise WeChat-based mobile knowledge base system project completed public bidding in June 2018, launched trial operation in November, and obtained software copyright registration in June 2019. The system offers convenient access, rich resources, simple operation, and stable operation, receiving high user evaluation. Achievements include:

First, providing a useful and user-friendly knowledge base. Integrating Web APP into Enterprise WeChat offers diverse entry points and convenient access. By integrating IDS authentication with Enterprise WeChat authentication, the system provides seamless access experience while ensuring data control, integrating the originally isolated system into the WeChat ecosystem. Users can access through mobile browsers, WeChat, or Enterprise WeChat, leveraging social attributes to significantly reduce promotion costs. Additionally, personalized follow point customization and channel management give users opportunities to actively express knowledge needs and interact with the system, meeting user needs while improving system efficiency.

Second, promoting knowledge service innovation. The mobile knowledge base extends the internal PC-side knowledge platform to mobile and external networks, allowing users to access the knowledge base anywhere with internet access without VPN operation inconvenience or speed limitations, facilitating knowledge “ammunition” for business and research activities anytime, anywhere, and further promoting knowledge achievement sharing and utilization, providing great convenience for branch, stationed, and traveling colleagues. Using message push functions to proactively deliver knowledge to users saves time in searching and acquiring information, enabling fragmented time reading.

Third, significantly increasing actual user numbers. From trial operation launch in November 2018 to end of May 2019, total visits exceeded 30,000, with noticeable increases in knowledge platform user visits, showing an overall upward trend (except for February due to Spring Festival and holidays) (shown in Figure 10 [Figure 10: see original paper]). Eleven knowledge products were pushed in over 150 issues (shown in Table 2), with cumulative email subscriptions reaching 6,563 person-times and WeChat/Enterprise WeChat subscriptions reaching 6,518 person-times, covering all business departments.

3.2 Experience Summary

CAICT’s PC-side and mobile knowledge base platforms were constructed in multiple phases with clear goals and implementation steps. After years of ex-

ploration and practice, a unique style and model have been formed, yielding valuable experiences and lessons:

- (1) **Construction Approach:** Mobile knowledge base platform construction should not be rushed. It should start from actual user needs, requiring accumulation of certain user bases and data, as well as cultivation of usage habits over time. Additionally, it should maintain continuity with the PC-side, as mobile knowledge base construction aims to provide more service channels, though some functions and operations on mobile cannot replace the PC-side.
- (2) **Construction Mode:** When selecting products, one should not blindly trust vendors' claims about mature products and accept them wholesale. When developing independently, one should not blindly choose a single development mode. The most expensive or newest is not necessarily the best. The choice should be based on actual business needs, comprehensively considering and boldly innovating construction modes. CAICT's "Enterprise WeChat + Web APP" model, tested through practice, can provide relatively high-quality mobile knowledge services for its users and offers significant reference value for similar institutions.
- (3) **Security Issues:** Today, cybersecurity and data security are red lines. Providing stable and reliable knowledge services to specific user ranges in an open network environment requires significant effort in network architecture, software localization, application systems, and permission authentication, properly handling the relationship between "preservation" and "utilization." In system construction and operation, the principle of "no classified information online" must be maintained, with technical treatments such as data encryption, version protection, anti-forwarding, and anti-screenshot for sensitive data, and third-party information security level protection assessments when necessary.
- (4) **System Compatibility is Crucial:** Web APP is essentially designed for mobile browsers. With rapid development of intelligent terminals today, mobile phones and PADs have diverse models, screen sizes, aspect ratios, and resolutions. Android platform-based customized operating systems have various browser versions and kernels, making perfect compatibility with all browsers and devices impossible. Development should support mainstream devices from major manufacturers with high market share, with testing on as many devices as possible, which directly affects final user experience.

4 Conclusion

Based on its PC-side knowledge platform and through comprehensive analysis and comparison, CAICT established the "Enterprise WeChat + Web APP" model to build a mobile knowledge base system serving research and research management. This integration of institutional knowledge bases into the WeChat

ecosystem represents a meaningful exploratory practice that positively promotes “closed” institutions’ opening of knowledge services and provides reference for similar research institutions’ knowledge base construction.

Due to limitations in business scenarios, content development, and system construction modes, the mobile side can only serve as a beneficial supplement to the PC-side knowledge platform, with significant room for improvement in functionality, stability, interactivity, content expansion, and user experience. This paper aims to stimulate discussion, hoping to exchange ideas with industry peers to jointly enhance the construction and service levels of institutional mobile knowledge bases.

References

- [1] The 43rd Statistical Report on China’s Internet Development [EB/OL]. [2019-03-10]. <http://www.cnnic.net.cn/hlwfzyj/hlwzxbg/hlwtjbg/201902/P020190318523029756345.pdf>.
- [2] Gong Yinong, Zhu Ming. Investigation on the Current Status of Institutional Repository Construction in China [J]. Digital Library Forum, 2018(9): 20-28.
- [3] Zhao Guorong. Knowledge Graph Analysis of China’s Institutional Repository Research (2004-2018) [J]. Shanxi Library Journal, 2019(1): 68-73.
- [4] Gong Xiaoyang, Liu Xiao, Shao Bo. Implications of CRIS Technology Development and Application for Chinese University Institutional Repository Construction [J]. Library Science Research, 2019(10): 38-44, 67.
- [5] Wei Zhiqin, Tu Yan. Research on “Knowledge Management + Blockchain” Enterprise Institutional Repository Construction [J]. Journal of Chengdu Aeronautic Polytechnic, 2019, 35(1): 15-18.
- [6] Ma Sipei. Institutional Repository: A Service Innovation Platform for Libraries [J]. Library Science Research, 2017(2): 58-63.
- [7] NetEase E-commerce. Jisu Application: “2018 Mini Program Ecological Evolution Report” [EB/OL]. [2019-06-10]. <http://www.100ec.cn/detail-6460453.html>.
- [8] Zhu Yuqiang. Application Practice of WeChat Mini Programs in Library Mobile Services—Taking Book Drifting Mini Program as an Example [J]. New Century Library, 2018(9): 66-70.
- [9] Chen Junjie, Wu Mingjie, Zhang Xiaojing, et al. New Possibilities and Practice Priorities of WeChat Mini Programs for Library Internal Office Automation—Taking Xiamen University as an Example [J]. Library Science Research, 2018(4): 30-39.
- [10] Hu Anqi, Ji Shunquan. Research on Operation Strategies and Functional Design of University Library Official Account Platforms Based on User Needs—Taking Suzhou University of Science and Technology Library as an Example [J]. Library Science Research, 2018(8): 27-32.

- [11] Yang Libing, Cao Ruiqin. New Information Service Models of University Library Official Accounts in the New Era [J]. Agricultural Library and Information Science Journal, 2018, 30(5): 175-179.
- [12] Pang Xinting, Huang Hualin. Design of Enterprise Knowledge Base System [J]. Modern Computer (Professional Edition), 2017(18): 61-66.
- [13] Lin Na. Exploration of Enterprise Knowledge Base Construction Models [J]. Science and Technology Information, 2017, 15(18): 130-131, 133.
- [14] Zhao Xiaodan, Tao Ran. Comparison and Analysis of Four Mobile Application Development Modes [J]. Intelligent Computer and Applications, 2018, 8(1): 72-75.
- [15] Long Zheng. Design and Implementation of Book Recommendation Frontend Based on WeChat Mini Programs [J]. Inner Mongolia Science Technology and Economy, 2018(8): 71-73.
- [16] Chen He, Zhou Shaobin, Lin Jing, et al. Application Practice and Analysis of WeChat Mini Programs in Institutional Repository Services—Taking Xiamen University Institutional Repository as an Example [J/OL]. Information Theory and Practice, 2019[2019-06-14]. <http://kns.cnki.net/kcms/detail/11.1762.G3.20190610.0905.002.html>.
- [17] Enterprise WeChat. Internal Development Identity Verification API [EB/OL]. [2019-04-03]. <https://work.weixin.qq.com/api/doc#90000/90135/91020>.
- [18] Enterprise WeChat. Internal Development Message Push API [EB/OL]. [2019-04-03]. <https://work.weixin.qq.com/api/doc#90000/90135/90235>.

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

Source: ChinaXiv — Machine translation. Verify with original.