Functional Design and Implementation Plan for Smart Library Data Services: Postprint

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Date: 2023-07-26T00:00:00+00:00

Abstract

[Purpose/Significance] This study explores the characteristics, functions, and implementation schemes of smart library data services, aiming to provide references and solutions for data value-added in the new era, library functional positioning, and the national development strategy of smart society.

[Method/Process] Based on an analysis of the concept and connotation of smart library data services, this paper derives the characteristics and functions of such services, proposes implementation schemes for smart libraries to develop data services, and examines the current challenges and key technologies involved.

[Results/Conclusion] The implementation schemes for smart library data services encompass: strategic planning formulation, smart space creation, smart platform architecture, and smart librarian cultivation. In the new era, the connotation of data has undergone fundamental transformations. Providing intelligent data services to users represents a crucial function of contemporary libraries and is essential for the innovative development of smart society and digital China.

Full Text

Preamble

Vol. 63 No. 7, April 2019. Functional Design and Implementation Plan for Smart Library Data Services. Xie Jinlan, Chang Chen. Tianjin Agricultural University Library, Tianjin 300384

Abstract

[Purpose/Significance] This paper explores the characteristics, functions, and implementation plans of smart library data services, providing references and

solutions for data value-added services in the new era, library function positioning, and the national development strategy of smart society. [Method/Process] Based on an analysis of the concept and connotation of smart library data services, this paper introduces the characteristics and functions of smart library data services, proposes an implementation plan for libraries to carry out data services, and studies the confusions and key technologies in developing data services in current smart libraries. [Result/Conclusion] The implementation plan for smart library data services includes: formulating strategic plans, building smart spaces, constructing smart platforms, and training smart librarians. In the new era, the connotation of data has undergone fundamental changes, and providing users with intelligent data services is an important function of current libraries and a need for innovative development in smart society and digital China.

Keywords: smart library; data service; connotation; characteristic; function; implementation plan
Classification Number: G250
DOI: 10.13266/j.issn.0252-3116.2019.07.007

In today's world, information technology is advancing rapidly, with digitization, networking, and intelligence developing in depth, completely transforming people's production and lifestyles. In particular, with the rapid development of new technologies such as online payment, mobile banking, production automation, and intelligent management systems, data has gradually replaced massive physical circulation and entity operation processes. While bringing convenience to people's production and life, it has also pushed people onto the fast lane of data-driven development, and society has entered a new era of datafication. Datafication further drives the intelligence of machines and networks, and intelligence brings wisdom. Therefore, human society is on the path toward a data-driven smart society. At the 19th National Congress of the Communist Party of China, General Secretary Xi Jinping made strategic deployments for "building a cyber power, digital China, and smart society," pointing out that with the development of science and technology, China has entered a new era of digital information. Building a healthy, civilized, and ecologically harmonious smart society is the new direction of social development in the new era [1]. On April 22, 2018, in his congratulatory letter to the opening of the first Digital China Summit, General Secretary Xi Jinping further proposed "accelerating the construction of digital China, which means adapting to China's new historical position in development, fully implementing new development concepts, fostering new momentum through informatization, using new momentum to promote new development, and creating new brilliance with new development" [2]. As a highland for data and information services, libraries have mature technological and resource advantages. They should keep pace with the times, seize the opportunities of development in the new era, build an ecological environment for smart library data services, and provide a broad stage for the rapid dissemination and value-added application of data, truly undertaking the social function of data services in the new era. Therefore, intelligent data services are the need

of the new era.

2 The Connotation, Characteristics, and Functions of Smart Library Data Services

2.1 The Concept of Smart Library and the Proposal of Data Services

With the rapid development of new technologies such as the Internet of Things, big data, and artificial intelligence, smart libraries have gradually become a hot topic in theoretical research and practical exploration in the library community. The so-called smart library is a modern library based on digital, networked, and intelligent information technology, characterized mainly by interconnection, efficiency, and convenience, with green development and digital benefits as its essential pursuits [3]. The concept of smart library was first proposed by scholars at Oulu University Library in Finland in 2003 [4], but it did not attract widespread attention from scholars until 2008 [5]. Yan Dong's "Smart Library Based on the Internet of Things" [6] in 2010 was one of the earliest domestic articles studying smart libraries. Since then, a large number of scholars have emerged, and the number of publications has increased year by year, opening a new stage of research on smart libraries from different perspectives. From the latest research trends, we can discover the latest developments in smart libraries. Currently, CNKI has included 110 relevant documents on smart library research in 2018. An analysis of the research topics of these documents reveals that most have begun to study the functions and construction of smart libraries, such as Chu Jingli et al.'s "Smart Libraries and Smart Services" [7], Wang Lan's "Preliminary Ideas on Building a Smart Library for Philosophy and Social Sciences" [8], and Chen Jin's "Architecture Planning of Smart Libraries" [9]. This shows that domestic research on smart libraries has moved from concept to reality. Some documents, combined with the sustainable development of libraries and the needs of social development in the new era, have begun to pay attention to the important role of data in the innovative development of smart libraries. For example, Yang Xinya proposed that "data is the foundation for the operation and development of library systems" [10]; Wang Shiwei believes that "smart data will become a new paradigm for computing power and algorithms" [11]; Rao Junli, from the perspective of library paradigm shift, concludes that "with the deepening development of digital libraries, they gradually enter into datafication, and then transition from datafication to intelligence" [12]. From this, we can see that data services will become the new direction for the sustainable development of smart libraries in the new era.

2.2 The Concept and Connotation of Smart Library Data Services

In the context of the new era, people's strong demand for data has become a new driving force for social development. Data is no longer just a quantitative expression of traditional numbers; its connotation is expanding. Numbers, text, video, audio, and images have all become data, and data has become synonymous with

information and a carrier of knowledge. The development and application of network information technology provide unlimited possibilities for the practical application of data in libraries. Currently, many business processes in libraries can provide services to users through data circulation: for example, by collecting and analyzing user behavior data to provide personalized information push services; through data control of seat reservation systems to provide seat or space reservation services for users. On the other hand, as the industry's research on smart libraries continues to deepen, scholars such as Yang Xinya, Rao Junli, and Wang Shiwei have gradually penetrated important viewpoints on data services into the innovative research of smart libraries. Data services will become a new trend in the innovative development of smart libraries. Therefore, intelligent data services are the need of the new era and a new direction for library innovation and development. The data services of smart libraries are the library's management model that should have the characteristics of integration, clustering, and collaboration. Liu Yaling believes that the symbiosis and integration of wisdom and virtue, and the unity of substance and function are the future development trends of smart libraries [17]; Rao Junli proposes that interconnection and sharing, green development, and smart services are characteristics of smart libraries; Dong Xiaoxia et al. advocate that smart libraries are a combination of perceptual intelligence and service intelligence [18]; Liu Libin believes that smart libraries have characteristics such as comprehensive perception, interconnection, green development, and smart service and management [19]. Li Xianzhi et al. believe that smart libraries are a smart collaborative body that integrates technology, resources, services, librarians, and users [20]. Xie Fang believes that smart libraries have the characteristics of advancement, openness, systematization, and intelligence [21]. Based on summarizing the viewpoints of other scholars and combining the connotation of data in the new era and the needs of social development, this paper believes that the basic connotation of smart library data services is: data-driven as the leading factor, technology integration as the support, with the goal of providing users with accurate and fast data resources and data products, by building an intelligent, networked, green, and inclusive data operation ecological environment, thereby promoting the rapid dissemination, regeneration, and value-added utilization of data resources, and promoting the collaborative sharing of data resources and data benefits for the people, truly undertaking the social function of library data services.

2.3 Basic Characteristics of Smart Library Data Services

2.3.1 Intelligence and Smartness Intelligence and smartness are important features of smart library data services. Intelligence includes not only intelligent data management and data delivery but also the application of smart facilities such as smart buildings, smart equipment, and smart spaces. Intelligence gives birth to smartness. Smart library data services not only provide users with smart data and data products but also include human wisdom activities based on data. Without human needs, libraries would lose their fundamental rea-

son for existence; without human wisdom, libraries cannot continue to operate. Therefore, when exploring the characteristics of smart library data services, it is more important to study the wisdom activities of people such as librarians and users, and to clarify that smart library services are a kind of intelligent and convenient wisdom activity that integrates people, space, and data based on clarifying user data needs.

2.3.2 Online and Networked Organization Complete data online and integrated network organization are the most basic characteristics of smart library data services. Only with sufficient and complete data online can libraries build interconnected data networks, achieve intelligent and profound data services, and provide a foundation for data value-added and innovation. In the new information environment, users not only need complete data resources but also need relevant knowledge networks around these data resources to quickly build the required cognitive system in the massive data environment, thereby systematically studying or applying the required data. Fine-grained, networked data organization and smart service models can meet user needs. Currently, various intelligent technologies can be integrated into all aspects of data services, providing powerful technical support for complete data online and networked data resources. The networking of smart library data resources is conducive to efficient interconnection between data resources and data products, provides possibilities for breaking data barriers and eliminating regional data imbalances, and through machine learning and computing, builds knowledge graphs to automatically extract and construct relevant data and knowledge structures that meet user needs in data services, providing users with profound data resources or data products, such as smart database construction, data hosting, and cross-domain hybrid data warehousing. This enhances the ability of smart libraries to use data, provides decision support for institutions, governments, or individuals, taps potential users, and promotes the reuse or innovation of data.

2.3.3 Green and Precise The networked data organization and intelligent data management of smart libraries not only effectively associate and uniformly manage available data in libraries to support precise and personalized data services but also revitalize and utilize raw data in smart libraries through data organization and data mining, creating data service chains and a green service ecological environment. This promotes the transformation of available library data from dispersed to intensive, from heterogeneous to unified, effectively overcoming the drawbacks of fragmented management, decentralized administration, and redundant construction in resource layout, which plays an important role in improving the utilization rate of library data resources, saving costs, purifying the environment, and enhancing the service level of libraries. Therefore, smart library data services also have the important characteristics of precision and greenness.

2.3.4 Collaborative and Inclusive In the era of data information, collaborative management is one of the most effective and sustainable ways to achieve data value-added and rapid circulation. With the application of new technologies such as the Internet of Things and artificial intelligence, libraries can not only achieve collaboration among various internal elements but also achieve cross-regional, cross-industry, and even global collaboration. The networked and intelligent data organization of smart libraries provides possibilities for collaborative perception and efficient interconnection. Collaboration promotes clustering, and clustering brings inclusiveness, which is consistent with the concepts of cross-boundary sharing and innovation-driven development in the new era. Libraries have made many attempts in collaborative development, such as building BBS, WeChat, Weibo, third spaces, library alliances, and other virtual and physical communication venues for collaborative wisdom exchange activities among members, thereby promoting the rapid dissemination and utilization of data within libraries and the industry. At the same time, under the call of digital China and smart society, as a highland of information services, libraries should expand their service fields with the concept of activating data, activating knowledge, integrating into society, and serving society. They should not be limited to the transformation of individual libraries but should go beyond the internal library environment, integrate the strength of different regions and social institutions, build a data service community, form a "big library" environment such as regional service chains and data service ecosystems, and further expand and extend the scope of library smart services. The intelligence, collaboration, clustering, and inclusiveness of smart library data services promote each other, among which collaborative management is based on intelligent perception, extensive interconnection, and cluster development [23]. Therefore, collaboration and inclusiveness are important characteristics of smart library data services.

2.4 Main Functions of Smart Library Data Services

2.4.1 Breaking Data Barriers and Promoting Data Value-Added The main function of smart library data services is to break data barriers, comprehensively revitalize all available data, and achieve data value-added. The application of big data technologies such as data mining and data analysis in smart libraries provides network and intelligent superposition support for knowledge discovery and association [22]. Currently, various intelligent technologies can be integrated into all aspects of data services, providing strong technical support for complete data online and networked data resources. The networking of smart library data resources is conducive to efficient interconnection between data resources and data products, provides possibilities for breaking data barriers and eliminating regional data imbalances, and through machine learning and computing, builds knowledge graphs to automatically extract and construct relevant data and knowledge structures that meet user needs in data services, providing users with profound data resources or data products, such as smart database construction, data hosting, and cross-domain hybrid data warehousing. This enhances the ability of smart libraries to use data, provides decision

support for institutions, governments, or individuals, taps potential users, and promotes the reuse or innovation of data.

2.4.2 Building Data Networks and Creating Profound Data Products
In the era of data information, users face massive fragmented data resources and hope to directly obtain data resources or knowledge systems based on personal knowledge points. They even want to obtain support for exploration, discovery, and analysis based on massive data in their field and are unwilling to search and 甄别 among massive data. In terms of real-time performance, users want to obtain the latest and real-time updated data resources. In short, users want to obtain profound knowledge systems on required topics and data resources in diversified carrier forms related to their cognitive systems through libraries, so as to facilitate breadth and depth expansion. In smart library data services, the networked data organization and widespread application of new technologies such as artificial intelligence make precise data services possible. For example, with the help of technologies such as big data, Internet of Things, and artificial intelligence, precise collection and analysis of user information and behavior data can be achieved. Using semantic web, machine learning, data analysis tools, etc., all available data in the library's central database can be analyzed and associated. According to user needs, intelligent provision of data relationship graphs, structural charts, and other precise and personalized data supply services can be provided [24].

2.4.3 Cluster Sharing and Promoting Data Benefits for the People
President Xi has made "digital China, smart society" a national development strategy for data benefits for the people in the new era, which is also the new direction for smart library data services. In smart library data services, the characteristics of intelligence, networking, greenness, and inclusiveness have all laid a solid foundation for data benefits for the people. The implementation of data benefits for the people should be carried out from three aspects: collaborative sharing of data resources, social responsibility, and demand discovery. Collaborative sharing is the foundation and guarantee of cluster development. In its data services, smart libraries continuously expand and improve the scope and quality of library data resources by building a grand data service center library, further promoting the breadth and depth of library data services, thereby promoting the continuous improvement of library social service levels and their data usage capabilities. At the same time, attention should be paid to the sharing of individual data resources because many personal data have high reusable value, such as government and scientific research data. Through data hosting, personal data can be integrated into the data center and associated to build data association graphs, thereby attracting more people to join the library data service cluster and revitalizing more sunken data to achieve knowledge innovation. Smart libraries make full use of their data integration advantages to continuously discover data needs in related fields, promote data sharing, expand user groups, and build data service communities to promote data benefits for the

people and social innovation, better fulfilling their social responsibilities.

2.4.4 Creating a Fusion and Symbiotic Smart Service Environment
The application of new technologies such as the Internet of Things and artificial intelligence not only realizes the interconnection of library buildings, equipment, data, and people, opening up convenient operation channels for the collection, management, dissemination, and application of various data but also realizes the fusion and symbiosis and cross-boundary association of various available data in libraries by building a central data resource library, providing rich data reserves for personalized and precise data services. The fusion and symbiotic data service environment promotes libraries to become smarter and more intelligent, which is of great significance for data updates and timely grasping of user data needs. The fusion mainly relies on semantic web technology. By building a powerful data network community, it not only meets users' precise data needs but also integrates users' behavior data into the library network system to provide users with more personalized data and data products. At the same time, the application of virtual reality technology can build simulations of data usage environments, which is beneficial for users to experience and understand the effects of data usage earlier, predict and solve many problems arising in large-scale use and promotion, and the new smart data service environment can provide users with comprehensive data online services.

3 Development Confusions and Key Technologies of Smart Library Data Services

Currently, smart library data services are in the development and exploration stage, and they will encounter many development confusions in the implementation process, such as the construction of smart resources and the cultivation of smart talents, which need to be gradually solved in practical applications.

3.1 Data Privacy and Completeness Issues

Data is a carrier of knowledge and privacy. Smart libraries need diversified and multi-source data to achieve precise and convenient data services. One of the current confusions of smart data services is the openness of data resources by individuals and institutions, especially the authorization of personal data and privacy protection issues. Although current technologies such as data mining have been widely applied and open sharing has become a consensus, issues such as data completeness and privacy infringement during data use remain a difficult problem in library data resource construction. In response to data privacy protection issues, libraries should formulate data security usage strategies from the aspects of reader privacy management, authority settings, legal norms, technology application, and protection awareness to solve the problems of data privacy protection and completeness in data services [25-26].

3.2 The Transformation of Unstructured Data

With the emergence of social media, libraries have begun to use WeChat, Weibo, QQ, and other social media platforms for data collection and transmission. The data generated on these social media platforms may be video, images, or text. The processing of these unstructured data or behavioral data poses a huge challenge to data analysis and data mining and is also a pain point for smart library data services. With the development of information technology and the operation of a unified standard data management mechanism for smart libraries, the best solutions will also be provided for the transformation of unstructured data.

3.3 Cluster Collaboration Issues

Concepts such as clustering, alliance, collaboration, and inclusiveness run through library data services. To achieve a high degree of sharing of data resources, although libraries have made many attempts in cluster collaboration, truly achieving cluster collaboration and ecological alliances of smart library data services and data service ecological chains is still a distant vision and development trend for libraries. Under the principles of public welfare, efficiency, and collaboration, further research and exploration are needed from the aspects of legislation, systems, talent, and technology [27].

3.4 The Lack of Smart Data Talents

Currently, the development of smart library data services is on the road of innovative development driven by data and technology, but library smart and data processing talents cannot meet the needs of their development. With the cultivation of national talents and the training of existing library talents, this problem will be effectively solved.

4 Implementation Plan for Smart Library Data Services

Smart library data services are in a smart library environment, oriented by data needs, making full use of technology and human wisdom to provide users with accurate and convenient data resources and data products. The implementation plan includes the following five aspects:

4.1 Formulating Strategic Plans

Currently, the development of smart libraries is still in the initial and exploratory stage, and overall planning and design are the first steps to do a good job in data services. Good strategic planning and layout should combine the library's own development status and service strength, clarify the functional positioning and long-term development of data services from a macro perspective, and reorganize internal business links from a micro-strategic perspective. For libraries with strong strength, they can formulate a long-term smart service strategic

plan according to the needs of social development in the new era for data services, apply cutting-edge artificial intelligence technology and high-end data analysis tools, and carry out overall business layout, while incorporating leading and driving the development of weaker libraries into the planning scope. For libraries with average or weak strength, they can formulate phased target plans for the implementation of smart library data services, carry out corresponding business layouts according to the plans, and also cluster and develop with well-implemented smart libraries to build a smart data service collaborative community, thereby improving the data service level of smart libraries.

4.2 Selecting and Applying Technologies

Smart library data services are an innovative development model with strong technical and practical characteristics. Whether it is the construction of smart libraries or the management of their data resources, information technology has strong support and guarantee functions. Therefore, in the implementation of smart library data services, the first step is to select and apply new technologies and software categories. Looking at the industry's research on smart library technology applications and the needs of smart library data services, the key technologies that should be mainly applied in the architecture of smart library data service models include: the Internet of Things, artificial intelligence, cloud computing, RFID, big data, Zigbee, virtual/augmented reality, 3D printing, wearable devices, QR codes, and other technologies. These new technologies have different focuses in different operating environments and interact with each other to jointly support the operation of smart library data services.

4.3 Building Smart Spaces

The construction of smart spaces is the integration of environment, resources, and people to minimize users' cognitive load as much as possible. The space construction of smart library data services is to make full use of new technologies to integrate library buildings, facilities, and third spaces, creating a virtual-real combination and mutually associated data network community that jointly provides a continuous stream of real-time updated data resources for the smart library's data center. The specific implementation process includes: first, installing electronic display screens in different locations of the library building, built-in RFID chips, sensors, locators, etc., to achieve automatic push of library user flow, seat reservation, environmental data, and other library data resources, as well as building structure navigation and library geographical location positioning, while built-in monitoring equipment achieves safety monitoring of library service spaces; second, equipping intelligent management systems to achieve collection and analysis of reader behavior data; third, making full use of intelligent equipment such as self-service borrowing and returning servers, intelligent robots, and wearable devices to provide users with intelligent and smart service experiences; fourth, creating intelligent maker spaces to provide users with intelligent information literacy training and virtual-real

combined situational use experiences, thereby enhancing users' interest in using the library. At the same time, environmental factors such as library structural layout, temperature, lighting, and humidity should also be suitable. Special seats for special groups can be set up, striving to fully reflect the intelligent, convenient, and humanized smart characteristics of library data service spaces while fully considering users' core needs for data.

4.4 Constructing Smart Platforms

A smart data platform is a whole where technology, personnel, data, and services interact and are associated with each other, among which complete data resources are an important factor in building a smart data platform.

4.4.1 Architecture Route and Planning According to the intelligent, networked, green, and collaborative service characteristics of smart library data services, the platform should be architected along the route of comprehensiveness, sharing, interconnection, and ease of use in system architecture, with strong advancement and openness in selection and application. Comprehensiveness means that data collection strives to be comprehensive, and all data is integrated into the central database for reserve after isomorphic processing; sharing means that data resources are open and shared within a specified range after system processing; interconnection means that the platform is not only fully connected with all intelligent management systems within the library but also connected with alliance institutions or personal databases; ease of use means that data service applications strive to be simple and convenient, and through identification with various application systems, users' cognitive load is minimized as much as possible. The intelligent data platform of smart library data services is called the smart library data platform [28], as shown in Figure 1 [Figure 1: see original paper].

4.4.2 Architecture Process and Framework System An intelligent and collaborative data platform is the key to smart library data services. The smart data platform is a whole where technology, personnel, data, and services interact and are associated with each other.

(1) Data Collection Layer. The data collection layer mainly collects heterogeneous data generated in real-time by equipment, space, environment, and third parties. The specific collection schemes are: first, pasting RFID tags and sensing systems on equipment, equipped with wireless positioning and access control to achieve collection of equipment data, thereby realizing real-time asset positioning, equipment maintenance, inventory, and anti-theft; second, collection of space and environmental data, installing sensing devices inside and outside the library space to real-time perceive spatial and environmental factors such as temperature, humidity, and lighting, providing effective data references for management decision-making and adjusting according to needs; third, using automation technology and data

mining and other data processing tools to automatically collect user behavior data and social data on WeChat and Weibo platforms; fourth, using automation systems to automatically collect data from third-party production systems such as website platforms, seat reservation registration systems, office automation systems, building intelligent management systems, and traffic information systems. The data collection layer makes full use of new technologies such as big data and artificial intelligence, and its automation and intelligence fully reflect the wisdom of data collection.

(2) Data Management Layer. Various data objects collected by the data collection layer are processed through technologies such as data mining, data analysis, data cleaning, and data screening according to certain standards and specifications, and then fused, clustered, and integrated into the central database. Data in the central data resource library can be associated through various methods such as classification algorithms, association analysis, and artificial intelligence, and can be provided to users or institutions in visual forms such as graphs and charts. Through association with user data, precise and personalized data push services can be provided for users. Libraries can also draw association graphs or chart images by associating service data, reader flow data, collection data, and space data over a certain period to achieve management of different venues, evaluate readers' diversified needs, and count collection visits. The most important function of the data management layer is to intelligently match the data stored in the central data resource library to achieve data value-added and meet users' precise and personalized data needs. The classification algorithms and intelligent association of data management are the greatest embodiment of the platform's intelligence.

(3) Data Service Layer. Providing effective data services for users is the main purpose of building a smart library data service platform. The data services of smart libraries not only provide users with effective data resources, customized data products, and decision support but also include: providing personal or institutional scientific data management services for scientific research users; providing personalized customization, data monitoring, and project planning services for users by understanding their personal data through data-driven and data analysis tools; coordinating with relevant departments to formulate standards for scientific research achievement evaluation, building relevant data exchange platforms, and providing data services such as digital humanities and supplementary measurement for academic testing to support scientific research management; providing data platform services such as data marketing, e-commerce, WeChat public accounts, and open education [29].

4.5 Training Smart Librarians

Smart librarians play an important role in smart library services. Especially in the era of data information, facing the rapidly changing network environment,

they are not only required to be proficient in certain information technologies and able to complete the application and maintenance of intelligent equipment but also to have strong independent innovation and keen perception and reception capabilities for new knowledge. With the continuous improvement of smart library data services, the establishment of data librarian positions has become an important standard configuration for library data services. Data librarians in the new era should not only have good data processing capabilities such as data analysis and data mining but also have data service capabilities to meet users' precise needs. The cultivation of smart librarians in smart library data services includes: first, establishing strict selection criteria for smart librarians, conducting key training through various mechanisms according to job requirements, and refining the training models for smart librarians; second, in terms of talent introduction, strengthening the investigation and highlighting the introduction mechanism for compound talents; third, building a smart librarian exchange platform and establishing a reasonable incentive mechanism and management system to improve the innovation ability and work enthusiasm of smart librarians [30].

Under the development background of "digital China, smart society," it has spawned the application demand for data services in a smart environment. As a highland of information services, libraries should keep pace with the times, make full use of the widely interconnected, collaboratively perceived, and cluster-developed service environment of smart libraries, and promote the rapid dissemination, regeneration, and value-added utilization of data resources. This will push smart libraries onto the fast lane of data services, providing accurate and fast data resources or data products for the development of digital China and smart society, and truly undertaking the social responsibilities that libraries should have in the new era.

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Author Contributions

Xie Jinlan: Responsible for article conception, design, and writing; Chang Chen: Responsible for data investigation and collation.

Abstract: [Purpose/significance] This paper is to explore the characteristics, functions and implementation of smart library data service, and provide reference and solutions for data value-added, library function positioning and national development strategy of smart society in the new era. [Method/process] Based on the analysis of the concept and connotation of smart library data service, the characteristics and functions of smart library data service are introduced, the implementation plan of smart library data service is proposed, and the confusion and key technologies of developing data service in current smart library are studied. [Result/conclusion] The implementation plan of smart library data service includes: formulating strategic plans, building intelligent space, constructing intelligent platform and training intelligent librarians. In the new era, the connotation of data has changed fundamentally, providing intelligent data services for users is an important function of the current library, and also the need for the innovative development of smart society and digital China.

Keywords: smart library; data service; connotation; characteristic; function; implementation plan

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