

Research on the integration and utilization of library intelligence resources in the era of big data

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Abstract: This article primarily explores the amalgamation and use of library intelligence resources in today's big data age. Initially, it delves into the distinct attributes of both the big data era and library intelligence resources, and signifies the hurdles faced when integrating and utilizing these resources due to big data phenomena. Additionally, this manuscript delves into the amalgamation and application methods of library intelligence resources, which encompasses data collection and merging, data preservation and management, and data examination and use. Then, through case studies, this paper expounds the integration and application of library information resources in other industries under the background of big data era. In conclusion, implementing strategies and proposals such as enhancing data acquisition and administration skills, fortifying the capacity for data analysis and application, as well as broadening collaborative and sharing frameworks, is recommended to bolster the effective blending and utilization of library intelligence resources.

1. Introduction

In the era of big data, libraries serve as important venues for knowledge sharing and information services, facing challenges and opportunities presented by vast amounts of information. The integration and utilization of library intelligence resources are crucial for enhancing library service capabilities and user satisfaction. This study aims to explore effective methods for integrating and utilizing library intelligence resources in the era of big data, to improve the efficiency and quality of information services and meet the diverse knowledge needs of users. Through literature review and case analysis, this study will examine and summarize current methods and strategies for integrating and utilizing library intelligence resources, providing useful guidance and insights for libraries. However, libraries in the era of big data are also faced with unique characteristics and models, which need continuous exploration and innovation. This study will explore the methods of incorporating and leveraging library intelligence assets in the big data age using a case study, and present appropriate recommendations.

2. Characteristics and challenges of library intelligence resources in the era of big data

2.1. Characteristics of the era of big data

2.1.1. Large amount of data

In the big data age, data volumes are immense to the point where conventional methods of processing and analysis are insufficient. Data from different sources such as text, pictures, sound and video, whether structured or unstructured, is constantly being generated and accumulated. This surge in data magnitude presents significant challenges and opportunities for data handling and examination.

2.1.2. High diversity

Data in the era of big data has great diversity, because these data sources are wide and diverse. This diversity includes data in different formats, data in different domains, and data from different channels and platforms. This diverse data provides comprehensive and richer information for further in-depth analysis and insight.

2.1.3. Fast update speed

In the age of massive data, information refreshes at an incredibly rapid pace. Data produces and changes very fast, even in real time. The extensive use of technologies such as social media, IoT devices, sensors, etc., results in data being updated at a more rapid pace^[1]. This accelerated data update process needs to be matched by an equally fast-paced approach to data management and analytics to ensure timely access to the latest information and insights.

2.2. Characteristics of library intelligence resources

2.2.1. Diversity

The intelligence resources in the library collection include various types of information, such as books, journals, newspapers, dissertations, audio and video. The variety of resources available in libraries provide insights and data across numerous subjects to cater to the unique demands of individuals. The vast selection of information resources allows users to gather necessary details from multiple perspectives and sources, promoting comprehensive research and learning.

2.2.2. The dispersion

Various publishers, authors, institutions, and channels provide intelligence resources, which are disseminated across different platforms and geographic locations. This decentralized nature of information requires users to search and access in different places to get the various intelligence resources they need across different channels. Libraries need to take corresponding measures to integrate and unify these scattered resources in order to provide a more convenient and efficient way of access and use.

2.2.3. Redundancy

Intelligence resources may have redundant or repetitive content in different publications and platforms. The cause could be varying works by the same writer, dissimilar editions of publications, or duplicated material from multiple publishers. For libraries, reasonable resource selection and

de-processing are needed to provide clearer and more effective intelligence resources. At the same time, users also need to have a certain information retrieval ability to identify and select the most appropriate resources to avoid redundant waste of time and energy.

2.3. Challenges to the integration and utilization of library intelligence resources in the era of big data

2.3.1. Data diversity and dispersity

Various intelligence resources are acquired through distinct sources, formats, and channels, challenging the library to devise ways to amalgamate and streamline these disparate and decentralized sources. This is to ensure easier, more streamlined access and utilization methods are available. By establishing comprehensive databases, libraries can integrate intelligence resources from different sources together, and provide unified search and access interfaces. At the same time, libraries can also meet the diverse needs of users by providing resources in various formats, such as electronic books, digital archives and online journals.

2.3.2. Data management and storage

Libraries must allocate substantial resources for the development and upkeep of robust data management systems due to the hefty and increasing quantity of data. These systems guarantee secure storage and enduring access to intelligence resources. By adopting cloud computing and distributed storage technologies, Libraries can improve data management's efficiency and reliability by utilizing a virtualized environment to store data. In addition, libraries must develop a corresponding data backup and recovery system to effectively deal with data loss or damage.

2.3.3. Data Privacy and security

An extensive amount of personal and confidential information, ranging from borrowing records, search history, to individual details of numerous users, is found in big data. Libraries need to take corresponding measures to protect users' personal privacy and data security. This includes encrypted data transmission and storage, monitoring and defense against network attacks, and regular data security drills^[2]. Concurrently, it's necessary for libraries to adhere to all pertinent laws, rules, and ethical standards in order to verify the legitimacy and adherence of their data usage.

2.3.4. Data quality and accuracy

The variety and scattering of intelligence resources can potentially lead to issues with data quality and precision. So as to offer a dependable source of information, it's necessary for libraries to perform data cleansing and filtering, rectify inaccuracies and fill in gaps in data. Using techniques like data validation and editing can enhance the quality and exactness of intelligence resources. In addition, libraries can also cooperate with relevant institutions and organizations to jointly improve the level of data quality and accuracy.

2.3.5. Data analysis and mining

In the vast reservoir of information, there exists a plethora of valuable insights. By investing in the appropriate technology and human resources, libraries can create teams for data analysis and mining, alongside training professional data analysts and mining specialists. Through the application of data analysis and mining technology, libraries identify users' information needs and provide users with personalized and accurate information services. Simultaneously, by analyzing the usage and impact

of intelligence resources, the library can enhance decisions related to resource procurement and user service.

3. Integration and utilization mode of library intelligence resources

3.1. Data acquisition and integration

In the face of diversity and dispersed intelligence resources, libraries need to carry out data collection and integration work. Libraries can obtain intelligence resources from different sources by cooperating with publishers, subscribing to various digital journals and databases, and establishing digital archives. At the same time, the library can also actively collect user feedback and needs, and obtain users' comments and suggestions on intelligence resources through social media, questionnaires and other methods. The library, by gathering and combining this information, can gain insight into the users' information requirements and tastes, allowing it to deliver customized and precise services.

3.2. Data storage and management

Libraries face difficulties in data storage and management due to the immense volume of data and its continuous growth. To securely store and ensure sustained access to intellectual resources, libraries must develop proficient data management systems, incorporating storage devices, databases, and data backup. The adoption of cloud computing and distributed storage technologies for data storage in a virtualized environment can enhance the efficiency and dependability of data management in libraries. Simultaneously, the library must also devise suitable strategies for data backup and recovery to avoid loss or damage of data^[3].

3.3. Data analysis and utilization

In the age of extensive data, it is crucial for libraries to master data analysis and application in order to derive essential details from their vast intellectual assets. By employing data analysis and mining techniques, libraries can assess users' information requirements and behavioral tendencies to offer bespoke and precise services. Simultaneously, the library has the potential to enhance resource procurement and customer service choices through an analysis of intelligence resource usage and impact. By making use of data analysis, libraries can gain a deeper understanding of user needs and, as a result, offer superior intelligence resources and services.

4. Case study on the integration and utilization of library intelligence resources in the era of big data

In this age of extensive data, numerous libraries are proactively tackling the issue of data disparity and distribution. They are furnishing users with enhanced and more accessible services through the consolidation and usage of intelligence resources^[4]. What follows is an empirical analysis of how a library can amalgamate and exploit these resources in the big data age.

4.1. Case background

A university library is confronted with an array of informational resources like e-books, scholarly journals, databases and digital archives. They must overcome hurdles related to diversity of data, its management and storage, ensuring its privacy and security, maintaining its quality and accuracy, as well as its analysis and mining.

4.2. Solution

Data collection and integration: Libraries work with major publishers and database suppliers to purchase digital resource licenses, such as e-books, digital journals and databases, to integrate intelligence resources from different sources. At the same time, the library also uses social media, questionnaires and other ways to actively collect users' feedback and needs, to further understand users' evaluation and suggestions on intelligence resources.

Libraries have devoted considerable resources to developing a proficient data management system for the storage and handling of data. They utilize cloud computing and distributed storage technologies to house informational resources in a virtual environment, enhancing both the efficiency and reliability of managing data. To assure the safe storage of and consistent access to these informational resources, libraries have also implemented strategies for data backup and recovery.

To safeguard patrons' personal privacy and data security, libraries have enacted numerous protective measures. These include data encryption during both transmission and storage, implementation of network surveillance and protective strategies, and regular execution of data security practice exercises to reinforce user data security. Additionally, libraries adhere to all appropriate laws, regulations, and ethical standards to guarantee legal and compliant data use.

The library takes definitive steps for enhancing the precision and quality of intelligence resources by conducting data cleaning and screening processes. These involve correction of errors and filling gaps in missing data, making use of techniques like data validation and proofreading. Collaborations with pertinent institutions and organizations are also leveraged to boost the accuracy and quality of the library's data.

Data analysis and utilization: libraries have the ability of data analysis and mining, and obtain valuable information and insights from massive intelligence resources. By investing in relevant technology and human capital, including establishing teams for data analysis and mining and training specialists in these areas, they have enhanced their capabilities. Leveraging data analysis and mining tools, the library is able to identify user information requirements and behavioural tendencies. This allows for the delivery of tailor-made and precise services.

The university library, in the age of big data, effectively amalgamates and leverages information resources through the mentioned solutions. This enables it to offer more streamlined and effective services, fulfilling user requirements and continuously enhancing the decision-making procedures for resource acquisition and user services.

5. Strategies and suggestions on the integration and utilization of library intelligence resources in the era of big data

5.1. Improve the data acquisition and management capabilities

In the big data age, it becomes imperative for libraries to regularly upgrade their data collection and management skills to more effectively incorporate and make use of intelligence resources. To achieve this goal, the library can take the following measures. First, libraries can strengthen their cooperation with publishers and database providers. Update the license agreements regularly to get the latest electronic resources. This guarantees the library is equipped with the most recent books, journals, and databases to cater to the information requirements of its users. Secondly, the library can actively carry out the data collection work. Actively collect users' feedback and needs through social media, questionnaires and other methods^[5]. Thus, we can promptly comprehend the information needs and preferences of our users, thereby offering them services that are more tailored to their individual needs. At the same time, the library also needs to invest resources to establish an efficient data management system. By embracing technologies like cloud computing and distributed

storage, the secure preservation and ongoing availability of intelligence assets can be guaranteed. This approach enhances the proficiency and dependability of data administration, enabling the library to more effectively consolidate and utilize information resources. In addition, libraries can also use data analysis technology to discover and tap the potential information value. By embracing technologies like cloud computing and distributed storage, the secure preservation and ongoing availability of intelligence assets can be guaranteed. This approach enhances the proficiency and dependability of data administration, enabling the library to more effectively consolidate and utilize information resources^[6].

5.2. Strengthen the ability of data analysis and utilization

In the age of extensive data, it's imperative for libraries to actively enhance and cultivate their data analysis and mining capabilities, to extract valuable insights and information from voluminous intelligence resources. First, the library can set up a dedicated data analysis and mining team to recruit professional data analysts and mining experts. In the age of extensive data, it's imperative for libraries to actively enhance and cultivate their data analysis and mining capabilities, to extract valuable insights and information from voluminous intelligence resources^[7]. Additionally, they should possess expertise in their domain, comprehending the requirements for information and patterns of user behavior within the library sector. Furthermore, libraries could allocate resources toward pertinent technologies and tools which facilitate data analysis and mining. This may encompass tools for data visualization, platforms for business intelligence, and algorithms for machine learning, among others. These technologies and tools can help libraries transform big data into meaningful information, revealing patterns and trends in user needs. Through data analysis, libraries can understand users' tendencies and preferences, provide personalized recommendations and suggestions, and predict future needs. In addition, libraries can also analyze the use and impact of resources using data analysis tools and methods. This can help libraries to better optimize resource procurement and allocation, and improve resource utilization. By analyzing users' behavior patterns, the library can understand users' preferences for different types of resources and provide users with more accurate resource recommendations. In addition, libraries can also apply the data analysis results to the decisions of user services, such as conducting customized training courses and thematic promotion activities^[8].

5.3. Expand cooperation and sharing mechanisms

In the era of big data, libraries should actively expand cooperation and sharing mechanisms to better integrate and utilize intelligence resources and provide better services. On the one hand, libraries can establish alliances or networks with other libraries to share intelligence resources and data. By collaboratively creating a database and digital archives, the library can amalgamate resources from diverse partners to shape a more inclusive and expansive information database. This allows users to more effortlessly access and use different resources. In addition, cooperative libraries can jointly plan exhibitions, lectures and other activities, provide a wider platform for academic exchange, and promote the complementarity and sharing of resources^[9]. On the other hand, libraries can also establish partnerships with research institutions and educational institutions. Through cooperation with academic research institutions, the library can have access to the latest academic journals, papers and research data, providing users with timely and authoritative academic resources. Partnering with educational establishments can assist libraries in comprehending the informational needs of both students and educators, and allow them to alter their resource acquisition and service plans accordingly. Furthermore, libraries can also set up partnerships with businesses and industry associations, gather expert knowledge and data, and offer their users a wider range of resource

support. In the process of expanding the cooperation and sharing mechanism, libraries should also actively promote the construction of data standardization and sharing platform. Libraries can participate in the development of data standards to ensure the smooth exchange and integration of data across partners. At the same time, the library can coordinate resources from all parties, establish a sharing platform or a shared database, and provide a unified access interface, so that users can more easily search and use intelligence resources. Libraries can optimize the use of external resources, circumvent duplicate procurement and resource wastage, and enhance the assimilation and effectiveness of utilized intelligence resources by broadening their collaboration and resource sharing mechanisms. Partnering with other entities can contribute to greater expert knowledge and technical assistance, enhance the library's capabilities in data analysis and extraction, and more effectively satisfy the information requirements of their users. Ultimately, the library will have the capability to offer a more extensive and varied range of information resources, enhancing the service experience for users^[10].

6. Conclusion

In the big data age, libraries are crucial in furnishing individuals with vital information resources and intellectual backing. To stay relevant and competitive in this swiftly transforming landscape, it's essential for libraries to consistently evolve and adjust to emerging technology advancements. Through the incorporation and application of big data, libraries can deliver higher precision and tailored services, thereby assisting users in effectively meeting their intellectual requirements. Concurrently, it is crucial for libraries to prioritize the safeguarding of user privacy and information security, thereby ensuring the sensible utilization of big data. Through continuous exploration and innovation, libraries can continue to play an important role in the era of big data and provide people with high-quality information services.

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