

Research on Innovative Development Paths for Library Services in Local Social Science Academies under the Data Intelligence Environment

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ABSTRACT

With the rapid development of data intelligence technologies, libraries in local social science academies are facing unprecedented opportunities and challenges. This paper aims to explore innovative development paths for library services within the context of a data intelligence environment. By analyzing the characteristics of current data intelligence technologies and their impact on library services, this paper proposes several specific development paths, with the intention of providing a reference for service innovation in libraries of local social science academies.

KEYWORDS

Data Intelligence; Local Social Science Academies; Libraries.

1. DEFINITION OF DATA INTELLIGENCE

Data Intelligence refers to a concept grounded in big data and artificial intelligence (AI) technologies, aimed at processing, analyzing, and mining vast amounts of data to extract valuable information and knowledge. Its definition can be elaborated from several perspectives: (1) Technological Foundation, Big Data Engine Data Intelligence relies on a big data engine, which serves as the foundational infrastructure for processing and analyzing large volumes of data. This encompasses technologies such as machine learning and deep learning, which are employed for intelligent analysis and data mining. (2) Core Processes, It involves preprocessing the collected massive datasets through cleaning, organizing, and transforming them to ensure data accuracy and usability. Statistical methods and data mining techniques are utilized to extract valuable information and patterns from the data. Based on these analyses, relevant business knowledge and insights are further distilled. (3) Application Scenarios, Through model establishment, solutions to existing problems are sought, including predictive analytics and risk assessment. Data-driven decision support is provided to enterprises and organizations, facilitating the formulation of more scientific and rational business strategies. By leveraging historical and real-time data, future trends and changes can be forecasted, thus providing references for long-term planning. (4) Value Realization, By automating and optimizing data processing and analysis, manual intervention is reduced, leading to enhanced operational efficiency. Data-driven decisions are more objective and scientifically grounded, which helps to mitigate decision-making risks and improve decision quality. Data Intelligence offers businesses new insights and innovative opportunities, contributing to the transformation and upgrading of business models. (5) Development Trends, With the continuous advancement of big data and AI technologies, Data Intelligence will increasingly integrate these technologies, elevating the level of intelligent data processing and analysis. The application domains of Data Intelligence will continually expand,

extending from traditional sectors such as finance and e-commerce to emerging areas like healthcare, education, and smart cities. As Data Intelligence technologies mature and application scenarios broaden, their value to enterprises and society will be more fully realized.

2. CHARACTERISTICS OF DATA INTELLIGENCE TECHNOLOGY

As a product of the integration of big data and artificial intelligence technologies, Data Intelligence exhibits several notable characteristics. The primary features of Data Intelligence technology are as follows:

2.1. Integrative and Differentiated Nature

Data Intelligence technology is capable of processing comprehensive data from multiple endpoints, industries, and sources, facilitating holistic data integration. Compared to data intelligence analysis based on singular sources, big data intelligent analysis shows significant differentiation in aspects such as data origin, structure, generation time, application context, and coding protocols. This differentiation enables Data Intelligence technology to address more complex data environments effectively.

2.2. Shareability and Interconnectivity

Shareability: Big data technology can break down information silos, streamline information flow channels, activate the latent value of data, and promote a unified, efficient, and interconnected layout for data and resource sharing across various industries and departments. This shareability enhances data utilization and value.

Interconnectivity: Data Intelligence technology constructs data ecosystems that facilitate interconnectivity among different data sources, enabling data to flow freely and be shared across various systems and platforms.

2.3. Accuracy and Reliability

Accuracy: Multi-source data integration centered around big data can enhance the systemic nature of data content, ensuring the completeness and reliability of data sources. This accuracy forms the foundation for making precise decisions and predictions using Data Intelligence technology. **Reliability:** Data Intelligence technology employs advanced data processing and analytical algorithms to ensure the reliability of analysis and prediction outcomes. Furthermore, by leveraging authoritative, legitimate, and multi-source primary data resources, the results of multi-source data intelligent analysis maintain a level of authority in both content display and data publication.

2.4. Technicality and Innovativeness

Technicality: Data Intelligence technology encompasses various advanced techniques, including big data processing, machine learning, and deep learning, making it a highly technology-intensive field. The application of these techniques allows Data Intelligence technology to process massive datasets and extract valuable information and insights. **Innovativeness:** Data Intelligence technology continually drives technological and application innovation. By introducing new algorithms and models, it consistently enhances the accuracy and efficiency of data analysis and predictions. Additionally, Data Intelligence technology fosters the emergence of new business formats and models, injecting new momentum into economic development and social progress.

2.5. Real-time Processing and Dynamism

Real-time Processing: Data Intelligence technology can process and analyze data in real-time, promptly identifying and addressing issues. This capability ensures Data Intelligence technology maintains competitiveness in rapidly changing market environments.

Dynamism: Data Intelligence technology can dynamically adjust and optimize data processing and analysis strategies to adapt to variations in different scenarios and requirements. This dynamism endows Data Intelligence technology with greater adaptability and flexibility.

2.6. Visualization and Interactivity

Visualization: Data Intelligence technology employs visualization techniques to present complex analytical results in an intuitive and comprehensible manner, assisting users in better understanding and utilizing data.

Interactivity: Data Intelligence technology offers a rich set of interactive features, allowing users to engage with data through interactive interfaces, exploring inherent patterns and correlations within the data.

3. PATHWAYS FOR LOCAL SOCIAL SCIENCE INSTITUTE LIBRARIES TO INNOVATE SERVICES USING DATA INTELLIGENCE TECHNOLOGY

3.1. Cultivating a Big Data Mindset

First and foremost, it is essential to establish and nurture a big data mindset, recognizing the significant role that data intelligence technology plays in enhancing the quality and efficiency of library services. This includes understanding the value of data resources and how to leverage this data to optimize service processes and improve user experiences.

3.2. Building an Intelligent Service Platform

To effectively implement data intelligence technology, libraries should focus on constructing intelligent service platforms. These platforms can integrate various data sources and employ advanced analytical tools to facilitate more personalized and efficient services for users.(1) **Knowledge Service Recommendation Platform:** Utilizing artificial intelligence technologies such as machine learning and natural language processing, an intelligent book recommendation system can be developed. By analyzing users' reading histories and preferences, the system can provide personalized book resource recommendations. Additionally, by incorporating knowledge graph technology to uncover interconnections between knowledge data, a knowledge network can be established, offering more precise and in-depth knowledge services.(2) **Enhancing Search Efficiency:** Optimizing the search engine to improve the accuracy and relevance of search results is essential. Big data analytics can be employed to analyze user search behaviors, refine search algorithms, and enhance search efficiency. Furthermore, introducing an intelligent Q&A system that provides interactive question-and-answer services based on natural language understanding can significantly elevate user experience.

3.3. Integrating Heterogeneous Information Resources

It is crucial to construct innovative development pathways and safeguarding mechanisms for library services within a big data environment, addressing challenges related to the integration of heterogeneous information resources, coupling relationships, ontology applications, and interoperability in ontology construction. Leveraging visualization analysis and data mining

algorithms from big data technologies, libraries can extract, search, analyze, store, and share resources from disparate libraries, optimizing the utilization of information resources.

3.4. Providing Personalized Services

Focusing on user needs, libraries should proactively offer personalized services tailored to specific requirements. Utilizing personalized information retrieval systems, libraries can conduct heterogeneous database searches based on user requests, delivering comprehensive information services. By harnessing modern information, web, and communication technologies, libraries can provide customized information services; for instance, users can specify their information needs online, with the tailored content sent directly to their email addresses.

3.5. Strengthening the Construction of "Smart Community" Platforms

Drawing on experiences from the development of "smart communities," libraries can utilize big data, blockchain, cloud computing, and other technologies to create a comprehensive, interconnected, and fully functional library big data resource center platform. This platform can integrate social service resources, such as local social interactions, fresh e-commerce, and domestic services, into the library's service offerings, providing users with more convenient and comprehensive services.

3.6. Reinforcing Security Measures

Establishing a safeguarding mechanism for enhancing library service capabilities and quality is essential to ensure the security and reliability of service resources. Compliance with national information security management regulations is critical, involving stringent measures across network monitoring, technical upgrades, virus mitigation, and consulting services to prevent and address disruptions and invasions from abnormal information sources.

3.7. Deepening Data Analysis and Application

By employing big data technologies to analyze user reading behaviors and preferences, libraries can uncover potential service demands and market opportunities. Intelligent data mining, text analysis, and knowledge discovery techniques can be utilized to monitor user needs and changes, providing data support for the continuous optimization of library services.

REFERENCES

- [1] Lu, Q.L. (2023). Analysis of the Implementation and Construction of Smart Library Service Approaches. *Library Science Journal*, 45(04), 86-91. DOI: 10.14037/j.cnki.tsgxk.2023.04.008.
- [2] Liu, Y.Y. (2023). Service Innovation and Development of Libraries in the Era of Big Data. *Canhua (Upper)*, (12), 116-118.
- [3] Wang, L. (2024). Analysis of Resource Optimization Strategies in Libraries Based on Big Data Intelligence Technology. *Electronic Technology*, 53(07), 284-285.
- [4] Du, J. (2024). Construction and Development of Intelligent Libraries. *Information Systems Engineering*, (07), 90-93.
- [5] Jiao, R. (2023). The Organic Integration of Artificial Intelligence and Smart Library Construction. *Cultural Industry*, (35), 70-72.
- [6] Yao, C.Y. (2023). Analysis and Insights on the Practice of Promoting Smart Reading Services in Libraries in the Age of Artificial Intelligence. *Library Research*, 53(06), 11-18.
- [7] Qin, Y.J. (2023). Development Strategies and Practices of Library Decision-Making Services in the Era of Big Data. *Qaidam Development Research*, (03), 58-63.
- [8] Sun, D.N. (2022). Research on the Optimization of Information Resource Allocation in S University Library (Master's Thesis). *Shenyang Aerospace University*. DOI: 10.27324/d.cnki.gshkc.2022.000600.

- [9] Zhang, Y.X. (2023). Research on the Application of Big Data Technology in Digital Library Information Services (Master's Thesis). Heilongjiang University. DOI: 10.27123/d.cnki.ghlju.2023.001936.