
Original Research Article

Practical path and countermeasures of digital transformation of university archives

Shuhan Guo¹, Jiayu Jian^{2,*}

¹ Shenzhen Polytechnic University, Shenzhen, Guangdong, 518000, China

² Shenzhen University, Shenzhen, Guangdong, 518060, China

Abstract: As an important resource bearing the development history and core information of the university, the digital transformation of university archives is a key link in the construction of smart campus, which is of great significance for improving management efficiency, promoting resource sharing and empowering teaching and scientific research. By expounding the connotation and significance of the digital transformation of university archives, this paper deeply analyzes the problems existing in the current digital transformation of university archives, and puts forward the path to promote the digital transformation of university archives from the dimensions of perfecting the top management mechanism, building the safety protection barrier of the whole process, and improving the efficiency of archives utilization, so as to provide reference for promoting the leap from "entity management" to "data management" of university archives management and help fully release the value of archives in school construction and social development.

Keywords: university archives; Digital transformation; energize

1. Introduction

Archives of colleges and universities are vivid records of the development track of colleges and universities, and contain rich information on education, scientific research and management, which is of great significance to school construction and social development. With the deep penetration of digital technology and the continuous promotion of smart campus construction, the shortcomings of traditional archives management model in information processing efficiency, resource sharing scope and service innovation ability are becoming more and more obvious. The digital transformation of archives has become the only way for colleges and universities to improve their governance ability, release the value of archives and serve the society. However, the digital transformation of archives is a systematic project involving technology integration, process reengineering and mechanism innovation, which faces many challenges in practice and seriously restricts the process and quality of transformation. In view of this, this study focuses on the practical path and countermeasures of digital transformation of university archives, aiming at exploring scientific and effective solutions through in-depth analysis of key problems in the transformation, and providing reference for promoting the modernization of university archives management.

2. Overview of digital transformation of university archives

Digital transformation of archives in colleges and universities refers to the process that colleges and universities use modern information technologies such as scanning, database, cloud computing, big data, artificial intelligence, etc. to comprehensively and systematically change the traditional paper-based archives management mode. Its essence is to realize the leap from "entity management" to "data management" and finally release the multiple values of archives ^[1].

The specific significance of digital transformation of university archives: First of all, for the internal management of universities, digital transformation can greatly improve the efficiency of archives management. Traditional paper file management needs a lot of manpower and material resources to sort out, store and search, and it is easy to cause information deviation due to human error. The digital transformation realizes the automation of the whole process of file collection, storage, retrieval and utilization by building a unified digital file management platform, and teachers and students can quickly obtain the required information with the help of keyword retrieval and other functions. At the same time, the accurate statistics and analysis function of digital archives provides data support for universities in discipline construction, teacher allocation, enrollment decision, etc., and promotes the transformation of management from experience-driven to data-driven. Secondly, in terms of resource sharing, digital transformation has broken the limitation of time and space and provided more convenient and real-time file information for teachers and students. University archives contain a large number of teaching cases, scientific research data and school history materials, which are difficult to be systematically integrated and deeply excavated in the paper state. After the digital transformation, the internal relationship between data in different fields can be found through the correlation analysis of massive archives information through big data technology, which will upgrade the archives from a simple "historical record" to a "decision-making think tank" and inject new kinetic energy into teaching reform and scientific research innovation. Finally, from the perspective of empowering social services, digital transformation has broadened the service boundary of university archives. In the past, the social utilization of university archives was mostly limited to the offline inquiry of specific institutions, and the service scope was limited. After the digital transformation, under the premise of complying with confidentiality norms, some archives resources can be opened through the Internet to provide support for government decision-making, academic research and public education^[2].

3. Problems in digital transformation of university archives

3.1. The management mechanism is backward, and the departments are not well coordinated

The digital transformation of university archives needs the cooperation of many departments, but in practice, the backward management mechanism and the poor coordination of departments make the digitalization of university archives always stay in the stage of "fragmentation". First of all, the digital transformation mechanism of university archives is missing. Most colleges and universities have not established a special management system for the digital transformation of archives, and there is neither a clear strategic plan nor a unified assessment and incentive mechanism^[3]. The digitalization of archives is often regarded as the "exclusive task" of archives, which has not been included in the overall information construction framework of schools, resulting in the lack of overall planning for the transformation work. Secondly, the traditional "decentralized management" model is difficult to adapt to the digital needs. The academic affairs office, personnel office, scientific research office and other departments involved in university archives have long formed the management inertia of "going their own way", and each department regards archives as "departmental resources" rather than the public information assets of the school. Under this mode, each department not only does its own thing in the standards and progress of file digitization, but also has a resistance to data sharing, resulting in the files of each department being always in a state of fragmentation. Finally, colleges and universities lack normalization mechanism, and rely on "temporary coordination meetings" or "official correspondence", resulting in a passive situation of "communicating only when encountering problems and solving one problem at a time", resulting in high communication cost and low efficiency.

3.2. The security risks are prominent and the data protection pressure is high

Although the digital transformation of university archives brings great convenience to the management of university archives, security risks and data protection pressure run through the whole life cycle of data generation, transmission, storage

and use, which brings great challenges to the digital transformation of university archives. From the risk of file information leakage, because the sensitive information contained in university files is various and complex. Once these files are digitized and separated from the physical isolation of physical files, they will face multiple risks of leakage in network transmission, system storage, authority calling and other links. Similarly, data storage and backup are also facing huge security risks. For example, unexpected situations such as server hardware failure, computer room fire or flood may directly lead to the damage or loss of locally stored digital files; Attacks by ransomware and malicious software may lead to the destruction or theft of file information, resulting in the leakage of core data in colleges and universities. In addition, the pressure of compliance has also aggravated the difficulty of archives data protection in colleges and universities. With the implementation of the Data Security Law, Personal Information Protection Law and other laws and regulations, colleges and universities have stricter compliance requirements for the collection, storage, use and transmission of archival data. For example, the handling of students' personal information needs to meet the principle of "minimum necessity", and the digitization of classified scientific research files needs to meet the national confidentiality standards. If it is not handled properly, it may not only face administrative punishment, but also lead to legal disputes^[4]. However, in practice, some colleges and universities lack a professional compliance review mechanism because of the irregular digital process, which leads to the deviation between data processing behavior and regulatory requirements, which invisibly increases the compliance risk and protection pressure.

3.3. The utilization efficiency is not high, and the service value needs to be tapped

The essence of digital transformation of archives is to break through the bottleneck of "static storage" and realize "dynamic service resources". However, at present, the archival information of colleges and universities is not combined with the teaching, scientific research, management and the needs of teachers and students, and there are some problems such as low utilization of archival information and insufficient service value: First, the archival information retrieval experience is poor and the cost of obtaining information is high. At present, the file retrieval system in most colleges and universities has a single function, only supports the accurate matching of basic keywords, and information such as name and student number must be completely consistent to be retrieved, which cannot meet the needs of full-text retrieval, fuzzy retrieval or multi-dimensional combined retrieval. Even the interface of archives information retrieval system constructed by some colleges and universities is relatively old, and the retrieval steps are complicated. Users need to jump to the page several times and select the classified catalogue to complete the retrieval, which leads to the low utilization rate of archives information retrieval. Second, the service scene is limited and the coverage is narrow, which restricts the release of file value. At present, the digital application of university archives is mostly trapped in a single framework of "passive query". What teachers and students can contact is mostly the inquiry of basic information, such as school registration certificate, report card, faculty resume, etc. This service mode stays at the level of "only responding to needs" and lacks the consciousness and action of actively intervening in core businesses such as teaching, scientific research and management. In terms of coverage, the file service failed to cover the diverse needs of different groups and failed to provide support for the teaching activities of teachers and students in colleges and universities^[5].

4. The path of digital transformation of university archives management

4.1. Improve the top management mechanism and strengthen departmental coordination and overall planning

It is necessary to build solutions from the system level: first, we should improve the top-level design, incorporate the digitalization of archives into the overall planning of the smart campus of the school, clarify the phased goals and responsibilities of each department, establish an assessment mechanism, and link the indicators such as data sharing rate

and standard implementation with departmental evaluation and fund allocation to strengthen overall planning. Secondly, it is necessary to break the inertia of decentralized management, and the archives should unite with various departments to formulate unified digital standards, covering file formats and metadata rules, and enhance execution through multi-department participation in examination and approval; At the same time, the model of "school-level platform+department node" is constructed, and it is clear that the ownership of data belongs to the school and the right to use it belongs to the department, which not only ensures centralized control, but also retains the autonomy of the department and eliminates sharing concerns. Finally, it is necessary to innovate the collaborative mechanism, set up a fixed collaborative office, hold weekly coordination meetings and build an online system to realize online task tracking and problem feedback; Standardize the process for high-frequency scenes, clarify the division of labor and nodes, reduce the communication cost, and push all departments to change from "passive cooperation" to "active cooperation" to solve the fragmentation dilemma^[6].

4.2. Build security barriers to improve data protection capabilities

In order to effectively promote the digital transformation of university archives, universities need to build a security protection system covering the whole life cycle of data: First, establish a classified security management and control mechanism. According to the sensitivity of archives, the security levels are divided, and differentiated protection strategies are formulated for different levels: "local encrypted storage+physical isolation" is adopted for highly sensitive archives to limit network transmission; Implement "cloud encrypted backup+authority dynamic management" for general files. At the same time, strictly implement the principle of "minimum necessity" to reduce the risk of leakage from the source. The second is to strengthen the technical protection ability of the whole process. In the process of data generation, standardize outsourcing scanning service, sign confidentiality agreement and supervise the whole process, and use watermark technology to mark the source of scanned documents; SSL/TLS encryption protocol is used uniformly in the transmission link, and digital signatures are added for key data to prevent tampering^[7]; The dynamic authority management system is introduced in the use link, and the access authority is automatically allocated according to the user's identity and purpose. The third is to improve the compliance management and review system. The archives management departments of colleges and universities sort out the digitalization process in accordance with the Data Security Law and the Personal Information Protection Law, and make clear the operation norms of scanning, storage and sharing. Regularly carry out compliance audits, focusing on checking metadata integrity, permission setting compliance, outsourcing service qualification, etc., establishing rectification accounts for problems found, and timely rectification.

4.3. Improve the efficiency of file utilization and tap the potential of data services

The first is to upgrade the intelligent retrieval system and lower the threshold of utilization. Introduce natural language processing and semantic analysis technology to build a "full-dimensional retrieval engine". At the same time, the retrieval interface and process are simplified, and the design of "one-stop search box+intelligent classification recommendation" is adopted, so that users can directly obtain results without manually selecting the directory and inputting keywords, thus reducing page jumps. The second is to expand the scene service and actively embed the core business. The archives management department of colleges and universities breaks the "passive inquiry" mode and constructs a "teaching-scientific research-management" full-scene service system: facing teaching, sorting out the archives data such as curriculum outlines, excellent teaching plans and student achievement distribution over the years to form a "teaching resource package" for teachers to prepare lessons for reference; For scientific research, integrate historical project files and achievements transformation records in the same field to generate a "scientific research trend map" to provide data support for the selection of new topics; For service management decision-making, by analyzing enrollment files, employment data, teacher structure, etc., a "school quality analysis report" is formed to help optimize specialty setting and talent introduction strategy.

The third is to accurately match diverse needs and expand service coverage. Establish a "user demand database", collect the specific demands of teachers and students on file services through questionnaires and symposiums, and formulate service plans by classification: develop a "self-service platform for student status files" to support online application for academic qualifications, printing transcripts, and querying reward and punishment records; For teachers, provide "scientific research file tracking service" and automatically associate the approval documents, fund records and achievement certificates of their participating projects; For alumni groups, open a "remote file access channel" to simplify the file transfer process in different places. At the same time, evaluate the service effect regularly, and dynamically adjust the service focus through user satisfaction survey and data statistics to ensure that the file value covers all kinds of groups on campus.

5. Concluding remarks

In a word, the core of the digital transformation of university archives lies in breaking the time and space restrictions and departmental barriers of traditional archives management through digital technology, and realizing the value transition of archives from "static preservation" to "dynamic empowerment". At present, there are many problems in the process of digital transformation of archives in colleges and universities. To solve these problems, colleges and universities need to promote them in a systematic way: at the strategic level, the digitalization of archives should be incorporated into the overall development plan of colleges and universities, and a collaborative mechanism should be constructed; On the technical level, it is necessary to build a strong data security defense line and improve the utilization efficiency through intelligent means; On the service level, starting from the needs of teachers and students, we should expand the scene application of archives in teaching, scientific research and management, so that archival data can truly become a "source of wisdom" to support the development of schools. In the future, with the deepening of the construction of smart campus, the digital transformation of university archives will play a greater role in preserving school history, supporting scientific decision-making and serving social development, and provide a solid archival information guarantee for the modernization of higher education.

About the author

Shuhan Guo (March 1992-), female, Shenzhen, Guangdong, master's degree graduate, assistant researcher, head of archives management business, research direction: archives management, human resource management.

Jiayu Jian (January, 1996 -), male, master's degree graduate, counselor, research direction: ideological and political education.

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