User-Perceived Service Quality Evaluation of Archival Websites: An Empirical Study (Post-print)

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Abstract

[Purpose/Significance] This study conducts empirical research on service quality evaluation of provincial archival websites from the user perception perspective, providing theoretical support and empirical reference for improving the information quality, interface design, and service and interaction quality of archival websites. [Method/Process] Using SPSS 19.0, exploratory factor analysis was performed on valid samples from the questionnaire survey to construct an evaluation system for archival website service quality. The factor analysis method was employed to assign weights to the system, and finally, empirical analysis was conducted on four representative provincial archival websites. [Results/Conclusion] Through comparative analysis of the advantages and disadvantages in the construction process of provincial archival websites, this study provides necessary theoretical support for improving the service quality of archival websites.

Full Text

Preamble

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An Empirical Study on the Quality Evaluation of Archives Websites from the Perspective of User Perception

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Abstract

[**Purpose/Significance**] This paper conducts an empirical study on the evaluation of provincial archives website service quality from the user perception perspective, providing theoretical support and empirical references for improving information quality, interface design, and service interaction quality of archives websites. [**Method/Process**] Using SPSS 19.0, exploratory factor analysis was performed on valid questionnaire samples to construct an archives website service quality evaluation system. Factor analysis was then employed to assign weights to the system, culminating in an empirical analysis of four representative provincial archives websites. [**Result/Conclusion**] Through comparative analysis of strengths and weaknesses in provincial archives website construction, this study provides necessary theoretical support for service quality improvement.

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Archives websites serve as crucial channels for users to access archival and government information. The development and popularization of archives websites have provided users with a comprehensive, multi-angle service platform. As the pace of archival informatization accelerates, archives website functions are gradually improving, and service methods and concepts are transforming, forming a construction model that balances archival affairs and government affairs. This enables archives websites to fulfill both government information query and archival service functions.

By December 2016, China's internet user population had reached 731 million, with 42.99 million new users added throughout the year [1]. Faced with such a massive number of internet users, understanding the current status of archives website construction, evaluating their service quality, and identifying deficiencies from the user perception perspective can help better meet user needs and ensure that archives website services rapidly improve in a user-centered direction.

Existing research on archives websites is limited both domestically and internationally, with even fewer empirical studies on archives website service quality evaluation. M. Fang et al. [2] investigated the relationship between information richness and participant satisfaction in Taiwan's online archival management community, using structural equation modeling to examine how channel richness, information transparency, and archival accessibility affect brand image and trust, thereby constructing a user satisfaction model for online archival management communities. E. Yakel [3] explored the concepts, development, and testing of archival assessment tools, establishing five user-based evaluation indicators from the perspectives of researchers, archives websites, online retrieval tools, student researchers, and teaching support. H.J. Jang [4] evaluated the service status of national archives websites in the UK and US, established evaluation indicators for national archives websites, and proposed suggestions for South Korea's national archives website construction. Bian Zhaoling et al. [5] used

multidimensional scaling analysis to evaluate the information dissemination effectiveness of provincial archives websites. Hu Xiaoqing [6] constructed a digital archives information service quality evaluation model using analytic hierarchy process and fuzzy comprehensive evaluation, achieving a combination of qualitative and quantitative evaluation. Wang Chenxi et al. [7] built an archives website retrieval platform evaluation index system using analytic hierarchy process based on user experience, focusing on retrieval entry and result processing. Xie Sufang et al. [8] established a university archives website evaluation index system based on information architecture theory, using analytic hierarchy process to calculate index weights and derive a mathematical model for university archives website evaluation.

Evaluating archives website service quality can clearly identify current strengths and weaknesses in construction, playing an important role in improving service quality and guiding improvement directions. From the service provider's perspective, service quality means the degree to which service attributes comply with organizational regulations; from the user's perspective, it means the degree to which service meets or exceeds expectations [9]. User-perceived service quality refers to cognitive information generated during product use, representing users' real feelings when using a product. It stems from the gap between users' perceived expectations and actual experience. Network service quality is generally obtained through user perception—that is, network users' real feelings about a website reflect its actual service quality. Therefore, to obtain users' genuine experiences with archives websites, using questionnaire surveys to capture user perception information from the user perspective is the most effective method for archives website service quality evaluation and plays an indispensable role in improving service quality.

Based on the above analysis, existing research lacks comprehensive and systematic evaluation of archives website service quality. From the user perception perspective and based on data investigation, this study selects four representative provincial archives websites for evaluation and comparison from multiple angles including service, website construction, and information content.

2. Evaluation Index System for Archives Website Service Quality from the User Perception Perspective

2.1 Basis for Constructing the Evaluation Index System

To construct the evaluation index system, we distributed 442 questionnaires and employed exploratory factor analysis with multiple orthogonal rotations, revising the preliminary system twice to obtain the archives website service quality evaluation index system (see Table 1). Using this system for empirical research to evaluate and score specific websites further verifies its scientific validity and applicability.

The evaluation index system includes five primary dimensions: System Func-

tion and Technical Conditions, Information Form Value Construction, Interface Design and Organization, Information Content Value Construction, and Service and Interaction, comprising 48 secondary indicators.

2.2 Determination of Index Weights

We used factor analysis to determine the weights of secondary indicators in the archives website service quality evaluation system, a method widely applied across disciplines for determining weights in various evaluation systems. Tian Shuicheng et al. [10] used factor analysis to establish an indicator system for miners' unsafe behavior influencing factors and determine weights at each level. Liu Bin [11] used factor analysis to determine weights for green supplier evaluation indicators. Based on the above, using factor analysis to determine evaluation index system weights is a scientific and universally applicable research method. Therefore, we employed this method to determine the weights for the archives website service quality evaluation index system.

Based on 442 questionnaires from our preliminary research, we used dimensionality reduction-factor analysis to determine index system weights. Index weights were calculated by using the variance contribution rate of principal components as weights to compute the weighted average of coefficients for each indicator across principal components, followed by normalization. According to the variance contribution rates of five principal components and their loading coefficients, the linear coefficient calculation formula for indicators is:

$$Z_i = \frac{T_i}{\sqrt{e_i}} \quad (i = 1, 2, \ldots, 48; j = 1, 2, \ldots, 5)$$

where Z_i represents the loading of secondary indicators on primary indicators, T_i represents the corresponding eigenvalue, and e_i represents the principal component coefficient of secondary indicators.

This yields the linear combination relationships of the five principal components. The comprehensive scoring model for all indicators was then obtained by weighting and averaging the coefficients of each indicator across the five principal component linear combinations. Since the sum of all indicator weights should equal 1, the coefficients in the comprehensive scoring model were normalized using:

$$E_i = \frac{e_i}{\sum_{i=1}^{48} e_i} \quad (i = 1, 2, \ldots, 48)$$

where E_i represents the weight value of secondary indicators and e_i represents the principal component coefficient of secondary indicators. The resulting weight values for the archives website service quality evaluation index system are shown in Table 2 .

3. Empirical Study

3.1 Sample Selection and Evaluation Process

3.1.1 Sample Selection To verify the scientific validity and universality of the archives website service quality evaluation system from the user perception perspective, and to comprehensively examine differences in service quality between northern and southern provincial archives websites, we selected two provincial archives websites from each region as empirical samples. Provincial archives websites have longer development histories, higher service levels, and more mature construction, making them suitable for testing the operability and application value of the evaluation system. Based on evaluation results, we can summarize advantages and disadvantages in northern and southern provincial archives website construction. The four sample websites are shown in Table 3 .

3.1.2 Evaluation Process (1) Method for Obtaining Evaluation Values. This study focuses on obtaining evaluation index data for the four provincial archives websites. Data from the user perception perspective is typically obtained through interviews or questionnaires. Users develop perceptual understanding of each evaluation indicator during website use. While individual user perceptions may deviate from actual conditions, objective measurements can be obtained when the sample size reaches a certain value [12].

This study used questionnaire surveys to collect user evaluation data, tracking 103 users (all Jilin University students) using the four provincial archives websites. Data collection required users to continuously use the four sample websites and ultimately provide objective scores. Therefore, survey participants had to be trackable for extended periods. We selected Jilin University students as our tracking survey subjects, using their feedback as final evaluation values. Based on users' specific ratings of the four provincial archives websites, we calculated weighted average scores for each indicator and total scores, analyzed each website's indicator scores to identify strengths and weaknesses, and compared scores across the four websites to obtain comparative results.

(2) Questionnaire Design. Based on the archives website service quality evaluation index system, we designed an empirical survey questionnaire comprising 48 closed-ended questions about secondary indicators to collect user-perceived quality data. The questionnaire used a 6-point Likert scale for scoring each indicator, with users responding based on their usage experience and perceptions. These responses served as data samples for the empirical study.

3.2 Data Results

This study used scores from 103 provincial archives website users who continuously used the sample websites from May 16 to June 15, 2017. First, we calculated the average of each indicator's evaluation values from the 103 users. Using the known weights of the evaluation index system, the total service quality score was calculated as:

$$Y = E_1 \cdot R_1 + E_2 \cdot R_2 + \cdots + E_{48} \cdot R_{48}$$

where Y represents the total service quality score and E_i represents the weight of secondary evaluation indicator R_i.

The weighted average of evaluation scores was then used as the final evaluation result for provincial archives website service quality, as shown in Table 4 .

3.3 Discussion and Analysis

Based on Table 4, we obtained the overall ranking of the four provincial archives websites' service quality. Table 5 shows that the service quality differences among the four websites are not significant. Tianjin Archives Website scored highest overall, while Guangdong Archives Information Network scored relatively low. Regionally, northern and southern archives websites each have strengths in different areas, with no clear superiority in overall service quality.

3.3.1 System Function and Technical Conditions Analysis of the four provincial archives websites' system function and technical condition scores is shown in Figure 1 [Figure 1: see original paper].

Figure 1 reveals that user perceptions of website technical conditions show: overall, the four archives websites have similar scores for website stability, security, transmission speed, and compatibility. All four websites scored highest on website stability and relatively lower on website compatibility, indicating high user satisfaction with stability and particularly outstanding performance in this area. From the system function perspective: retrieval result accuracy and completeness scored highest and were quite similar, suggesting well-developed retrieval functions in provincial archives websites. Sharing and help functions scored lower and showed less variation, indicating these are not construction priorities and user satisfaction is moderate. Across the four websites, Zhejiang and Tianjin Archives Websites scored higher on all indicators, Inner Mongolia Archives Information Network scored mid-range, and Guangdong Archives Information Network scored lower, showing uneven functional construction levels with room for improvement.

3.3.2 Information Form Value Construction Analysis of information form value construction scores is shown in Figure 2 [Figure 2: see original paper].

Figure 2 shows that user perceptions of information form value indicate: the four websites scored relatively high on information clarity and timeliness of updates, suggesting good performance in these areas. Other indicators had similar scores, indicating average and consistent construction levels with room for improvement. Overall differences among the four websites were minimal, with Guangdong Archives Information Network scoring slightly lower but with

no significant differences, reflecting consistent information form construction levels across provincial archives websites.

3.3.3 Interface Design and Organization Analysis of interface design and organization scores is shown in Figure 3 [Figure 3: see original paper].

Figure 3 reveals that user perceptions of interface design and organization show: overall, the four websites had relatively average scores across indicators without large variations, as user aesthetics and preferences regarding interface design and link structure are highly subjective. Guangdong Archives Information Network scored notably low on interface language diversity; our actual use confirmed it does not provide multilingual functionality, indicating that language diversity affects some users.

3.3.4 Information Content Value Construction Analysis of information content value construction scores is shown in Figure 4 [Figure 4: see original paper].

Figure 4 shows that user perceptions of information content value indicate: no significant differences in indicator scores across the four websites, suggesting generally good information content construction. Information understandability scored slightly higher, indicating high user satisfaction. Overall differences were minimal, with Guangdong Archives Information Network scoring relatively lower but with no significant differences, reflecting consistent information content construction levels across provincial archives websites.

3.3.5 Service and Interaction Analysis of service and interaction scores is shown in Figure 5 [Figure 5: see original paper].

Figure 5 reveals that user perceptions of service and interaction show: service completeness scored relatively high, indicating that archives websites focus on providing diverse service types that basically meet user needs. Interaction type comprehensiveness scored lower, suggesting limited consideration of comprehensive interaction during construction, with most websites showing single interaction types. Other indicators had similar scores without significant differences. Overall differences among the four websites were minimal, with Guangdong Archives Information Network scoring relatively lower.

In summary, the four provincial archives websites each have strengths and weaknesses in different areas. Comprehensive service quality improvement requires leveraging advantages, addressing disadvantages, and mutual learning.

This study constructed an archives website service quality evaluation index system from the user perception perspective and used factor analysis to assign weights. Empirically, we selected four representative provincial archives websites, tracked 103 users' experiences, and validated the evaluation system through their ratings. Results demonstrate the system is highly operable and universally applicable, guiding archives website service quality improvement.

Based on the analysis, we recommend improving archives website service quality from these perspectives:

1. **Focus on retrieval types and methods**: For general users, retrieval by archival number is too professional and difficult, generating dissatisfaction. Adding keyword retrieval, full-text retrieval, and fuzzy retrieval is crucial for service quality improvement.

2. **Improve shared links**: Current archives websites show insufficient attention to shared links, with dead, invalid, or blank links common. Websites should improve link settings by considering user needs and providing reasonable quantities of effective shared links.

3. **Enhance information form value**: Archival content is the most important and essential factor determining archival value, and users' primary needs come from content [13]. While information content value satisfaction is high, information form value construction is less ideal, particularly regarding novelty and 趣味性. Archives websites should use new technologies to present information, as quality information construction provides continuous momentum for service quality improvement.

4. **Strengthen interaction functions**: As online service entities, archives websites should emphasize communication with users, listening to opinions, and promptly addressing issues. Currently, insufficient attention, limited interaction methods, and delayed responses are common problems. Websites should expand interaction methods, use technical support for interaction functions, and add service staff to complete timely user interactions.

This study only selected four provincial archives websites and 103 tracked users, representing a relatively small sample size. Future research should increase the number of tracked users to make user perception data more persuasive and introduce foreign archives websites as empirical samples to further validate the universality of the evaluation system and guide service quality improvement.

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Author Contributions:

Deng Jun: Proposed the overall research framework;
Sheng Panpan: Responsible for paper writing and data analysis;
Wang Ruan: Responsible for data collection;
Shen Yong: Responsible for data collection.

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Abstract: [Purpose/significance] This paper makes an empirical study on the evaluation of the service quality of provincial archives websites from the perspective of user perception. It can provide theoretical support and empirical references for the improvement of information quality, interface design and interaction quality of archives websites. [Method/process] An exploratory factor analysis was carried out on the valid samples of the questionnaire with the help of SPSS 19.0. First, this paper constructed the service quality evaluation system of archives websites. Second, it used the factor analysis method to assign weights to the system. Finally, it made an empirical analysis of four representative provincial archives websites. [Result/conclusion] This paper gets the advantages and disadvantages of the provincial archives websites' construction process through the comparative analysis and provides the necessary theoretical support for the quality improvement of the archives websites.

Keywords: user perception; archives website; service quality

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