

Postprint of Literature Review on Crowdsourcing Research in Chinese Libraries

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Abstract

[Purpose / Significance] To systematically review domestic research findings on library crowdsourcing, summarize the current research status, identify existing deficiencies, and propose future research directions that can be further explored, with the aim of providing references for subsequent related research. [Method / Process] Taking papers on library crowdsourcing research in China as the research object, analyzing their specific content, and summarizing the current research themes. [Results / Conclusion] The analysis reveals that current domestic research primarily focuses on several aspects: crowdsourcing of library service work, crowdsourcing of information resource construction, crowdsourcing of librarians, introduction to practical experiences of foreign library crowdsourcing, and critical reflections on library crowdsourcing. Most of such research remains at the theoretical discussion stage, with insufficient empirical studies and evaluation research on implementation effects, and a lack of comparative studies and introductions to failure cases. Future research should conduct in-depth discussions and studies based on the aforementioned deficiencies to expand research perspectives and enrich research content.

Full Text

Review on Library Crowdsourcing in China

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Abstract: [Purpose/significance] This paper systematically reviews research on library crowdsourcing in China, summarizing the current state of research, identifying deficiencies, and proposing directions for future inquiry to provide

references for subsequent studies. [Method/process] Taking papers on library crowdsourcing in China as the research object, this study analyzes their specific content and identifies current research themes. [Result/conclusion] The analysis reveals that current domestic research primarily focuses on crowdsourcing in library services, information resource construction, librarians, introduction of foreign library crowdsourcing practices, and critical reflections on library crowdsourcing. Most of these studies remain at the theoretical exploration stage, with insufficient empirical research and evaluation of implementation effects, and a lack of comparative studies and introductions to failed cases. Future research should conduct in-depth discussions to address these shortcomings, broaden research perspectives, and enrich research content.

Keywords: library; crowdsourcing; library service; information resources development

1 Introduction

The concept of “crowdsourcing” was proposed by Jeff Howe in June 2006, defined as companies or institutions outsourcing tasks previously performed by employees to an unspecified network of the public in a free and voluntary manner [1]. Its core idea is to leverage collective wisdom and strength to accomplish tasks that are difficult for individuals or institutions to complete [2]. Upon its introduction, the concept gained widespread practical application in the business world, yielding significant economic and social benefits. The crowdsourcing concept and its application models have likewise provided new research perspectives and directions for academic inquiry and professional development in the library sector. Related research is being actively pursued and has produced fruitful results, with several foreign libraries successfully implementing practical applications. This study seeks to systematically organize and synthesize relevant literature on library crowdsourcing in China, structure existing research findings, summarize the current state of domestic library crowdsourcing research, analyze and discuss its deficiencies, and thereby identify new directions for future research to enhance library crowdsourcing studies and enable research outcomes to better guide practical library crowdsourcing initiatives.

2 Research Themes and Current Status Analysis

On June 25, 2017, the author conducted a subject search in CNKI using “library” AND “crowdsourcing” as search terms, retrieving 98 relevant papers on library crowdsourcing, all published within the past seven years. These articles almost exclusively appeared in professional library and information science journals such as *Library Journal*, *Library and Information Service*, *New Century Library*, *Agricultural Library and Information Science Journal*, and *Library Science Journal*. To accurately identify the research themes of these documents, the author first processed the retrieved literature by eliminating irrelevant and duplicate documents. After thoroughly reading the articles and drawing on ex-

isting relevant research literature, combined with the actual situation of this study, the research topics on library crowdsourcing were divided into three major perspectives encompassing five major research themes. The specific research perspectives and themes are shown in Figure 1 [Figure 1: see original paper].

Figure 1 illustrates the mainstream research perspectives in current domestic library crowdsourcing research, namely service, resource, and reference/critical perspectives. The service perspective includes crowdsourcing of service work, encompassing several common library services as well as information literacy education. The resource perspective primarily includes two themes: information resources and human resources (librarians). The reference and critical perspective is divided into two aspects: introduction of foreign crowdsourcing practices and domestic critical reflection on crowdsourcing enthusiasm. The specific research content of each theme is detailed below.

2.1 Library Crowdsourcing Research from the Service Perspective

Service is the main thread running through library development, the core value of libraries [3], and the primary task of libraries. Simultaneously, library service is an eternal research topic for academic researchers. Therefore, as the concept and connotation of crowdsourcing gradually became clear and crowdsourcing models achieved certain development, academic researchers began to connect library services with crowdsourcing. Related research primarily focuses on specific library service work, including reference consultation services, subject knowledge services, reading promotion services, and information literacy education.

2.1.1 Reference Consultation Services Related research begins by discussing the current status and existing problems of library reference consultation services, analyzing the advantages, necessity, and feasibility of crowdsourcing in solving these problems, and proposing measures, strategies, processes, and key issues for implementing crowdsourced reference consultation services. Huo Jianmei explored several possible forms of combining university library digital reference consultation services with crowdsourcing, constructed a library digital reference consultation crowdsourcing service platform model, analyzed the roles and functions of various participants in the platform, and designed a six-step participation process for library digital reference consultation crowdsourcing services [4]. Bai Shisheng constructed a library digital reference consultation service model based on crowdsourcing service concepts from the perspectives of participating subjects, functional modules, and operation and maintenance mechanisms, while also proposing measures for public libraries to develop digital reference consultation crowdsourcing services from aspects such as service promotion, user incentives, and resource integration [5]. Huo Jianmei and Li Shuning conducted a survey research on introducing crowdsourcing models into university library digital reference consultation services based on the Delphi method, and combined with the survey analysis results, proposed strategies

for university libraries to develop digital reference consultation crowdsourcing services from aspects such as platform construction, user (participant) incentives, system improvement, and librarian functions [6]. Xue Hong discussed the five-stage process of implementing crowdsourcing in university library virtual reference consultation services (task issuer publishes task → contractor applies for task → contractor completes task → task issuer accepts task → user receives result), arguing that virtual reference consultation crowdsourcing should primarily include content such as answering difficult questions, recruiting personnel, developing consultation platforms, and constructing subject navigation databases and knowledge bases. This model needs to address key issues such as institutional management, establishing crowdsourcing communities, motivating users to participate continuously, and establishing quality evaluation systems [7]. Chen Xuejiao and Li Jinrui also proposed a crowdsourcing service concept for reader association participation in medical college library virtual reference consultation, and tentatively elaborated on its connotation, advantages, content, and key points [8].

2.1.2 Subject Knowledge Services Regarding crowdsourcing research on library subject and knowledge services, scholars have conducted studies from the perspectives of crowdsourcing's impact on subject services, mechanisms and countermeasures for subject services under crowdsourcing models, knowledge service content and processes based on crowdsourcing, and practical strategies. Gao Yuping discussed the impact of crowdsourcing on university library subject services from aspects such as the openness of subject service models, integration of subject resources, and maximization of resource value, and conducted theoretical discussions on the application of crowdsourcing in various aspects of university library subject service construction [9]. Zhang Ru and Zeng Yan first summarized the feasibility and model positioning of developing crowdsourced subject services in university libraries, then studied the university library subject service mechanism under crowdsourcing models from aspects such as subject service participating subjects oriented toward crowdsourcing, crowdsourcing content, and crowdsourcing processes, and finally proposed countermeasures for successfully implementing crowdsourced platform subject services from aspects such as platform construction, user incentives, supervision, and content quality control [10]. Hong Yue and Ding Xueshu discussed the content, process, and management of crowdsourcing model knowledge consultation services, arguing that combining crowdsourcing models with knowledge consultation services can solve or improve the dilemmas currently faced by university library knowledge consultation services [11]. Su Jing elaborated on existing models and problems of knowledge services in university libraries, and on this basis discussed the role, foundation, necessity, and feasibility of introducing crowdsourcing models into university library knowledge services, constructed a university library knowledge service model based on crowdsourcing, conducted detailed analysis and discussion of the model, and proposed implementation strategies [12].

2.1.3 Reading Promotion Services For libraries, reading promotion services can attract readers, increase book borrowing rates, and enhance reader stickiness to libraries; for readers, reading promotion services can help them understand books and learn to read, thereby effectively promoting their absorption of knowledge nutrients from reading. Theoretical research and practical work on reading promotion have been conducted in China for many years, but many scholars believe its effectiveness is still not ideal. The emergence of crowdsourcing provides new ideas and perspectives for reading promotion service research and practice. Huang Jing explored the reasons for the unsatisfactory effectiveness of university library book recommendation services from three aspects: recommended book lists, student reader groups, and university library subjects and objects, and based on content marketing concepts, proposed the concept of book list curation, organically combining it with crowdsourcing of university library reading recommendation services, thereby proposing an innovative university library reading promotion crowdsourcing strategy and summarizing and prospecting its application and prospects [13]. Hu Yongsheng analyzed numerous problems and difficulties in university library reading promotion services, arguing that introducing crowdsourcing models into university library reading promotion services has certain necessity and feasibility, that implementing crowdsourcing models has foundations and conditions, proposed application paths for crowdsourcing models in university library reading promotion service work and crowdsourcing-based reading promotion service strategies, and discussed the practical significance and important role of introducing crowdsourcing models into university library reading promotion work [14]. Overall, current domestic research on crowdsourcing for reading promotion services primarily focuses on university libraries as research objects.

2.1.4 Information Literacy Education Current domestic research on crowdsourcing of library information literacy education primarily focuses on university library college student users. University libraries are the literature information guarantee centers of higher education institutions, possessing unique advantages in information resources, professional talents, technical equipment, and many other aspects, and playing an irreplaceable role in college student information literacy education [15]. Therefore, university libraries are the main battleground for college student information literacy education. Related research mostly analyzes the advantages, feasibility, and necessity of crowdsourcing in library information literacy education, or discusses crowdsourcing strategies, practical explorations, and specific implementation details for information literacy education based on analysis of current domestic information literacy education status, existing problems, and causes. Song Jiali and Cheng Jiejing believe that introducing crowdsourcing models into user information literacy education has many advantages such as promoting cooperation, integrating resources, reducing costs, and improving efficiency, and they also propose crowdsourcing strategies for user information literacy education from four subject perspectives: government departments, education

circles, library circles, and information industry circles [16]. Xiao Jianrong and Zhao Jingming conducted preliminary explorations on the organization and management of college student information literacy education crowdsourcing models, and using college student crowdsourcing project entrepreneurship as an example, analyzed how to utilize the knowledge and skills of internet users to collect new ideas and solve specific information literacy education problems under crowdsourcing models [17]. Wu Jun and Han Li elaborated on the characteristics and advantages of crowdsourcing, and based on analysis of existing problems in current domestic information literacy education, proposed concepts for implementing crowdsourcing model-based information literacy education in domestic university libraries from aspects such as comprehensively permeating information literacy education concepts, establishing cooperative online information literacy education platforms, developing embedded information literacy education, constructing information literacy education evaluation systems with Chinese characteristics, and strengthening information literacy education team building [18]. Xiao Jianrong summarized the main existing teaching forms of information literacy education, conducted practical explorations on the organization, implementation, and management of information literacy education crowdsourcing models using university library freshman orientation education as an example, and concluded that university libraries can introduce crowdsourcing concepts and models to innovate existing information literacy education methods [19]. Based on the above analysis, current domestic related research primarily focuses on crowdsourcing research for university library college student information literacy education, and whether it can be further extended to public library public information literacy education crowdsourcing or data literacy crowdsourcing research is worth attempting.

2.2 Library Crowdsourcing Research from the Resource Perspective

2.2.1 Information Resource Construction Crowdsourcing Information resources are the foundation for libraries to realize service functions and the prerequisite for doing service work well. The importance of collection construction for libraries is self-evident. Crowdsourcing provides new research ideas for library information resource construction. Related research mainly includes the following themes.

- (1) “Characteristic” resources and “characteristic” database construction. Under the digital environment, characteristic information resource construction is one of the important contents of library digitalization processes and also one of the effective ways to improve library service quality and enhance library service targeting. However, due to the constraints of many objective factors, the characteristic information resource construction effectiveness of most libraries is still not ideal. Against this background, crowdsourcing provides a new perspective for library characteristic resource construction. Related research begins by discussing the current status and existing problems of library characteristic information resource

construction, analyzing the advantages, necessity, feasibility, importance, and significance of crowdsourcing in solving these problems, and then proposes specific application plans, main content and methods, effective measures and paths, countermeasures or strategies for library characteristic information resource construction under crowdsourcing models. Yang Yanhong discussed the main content and methods of characteristic database construction from aspects such as library characteristic database topic selection, page design, data collection and database building, promotion and application, and resource error correction, and clarified the problems and countermeasures of applying crowdsourcing to characteristic database construction [20]. Liu Qianning and Chen Yanfen proposed effective measures and paths for the crowdsourcing mechanism of university library urban agriculture characteristic resource construction from aspects such as librarian capabilities, system construction, and resource control and revelation [21]. Guan Fuying and Li Shuning, based on detailed analysis of foreign library crowdsourcing practice projects, proposed crowdsourcing countermeasures for domestic library characteristic resource construction, including paying attention to selecting appropriate resources, selecting appropriate crowdsourcing project platforms, and using appropriate incentive mechanisms [22].

- (2) “Regular” resource construction. Existing research mainly focuses on the impact of crowdsourcing on library digital resource construction, application and architecture of digital resource crowdsourcing models, and countermeasures to ensure the quality and effectiveness of library literature resource construction. Bai Suhong believes that crowdsourcing has impacts on library digital collections such as breaking their organizational boundaries, stimulating public enthusiasm and creativity, promoting business process innovation, reducing digital resource construction costs, and improving construction efficiency, and elaborates on the application of crowdsourcing in library digital collection construction from aspects such as digital resource procurement, digital resource construction, digital resource processing, and post-stage consultation services [23]. Zhang Weidong and Han Xiaodong discussed the constituent elements and architecture of the crowdsourcing model for library, archive, and museum (LAM) institution digital resources, and through in-depth analysis of foreign LAM institution crowdsourcing practice projects, explored key issues in LAM institution digital resource crowdsourcing models such as crowdsourcing task establishment, crowdsourcing platform selection, and crowdsourcing user incentives [24]. Wang Lin and Zhong Yongwen believe that reader recommendation and patron-driven acquisition (PDA) provide a foundation for crowdsourcing in library literature resource construction, and propose a series of crowdsourcing countermeasures that can ensure controllable library literature resource construction and obtain high-quality usage effects, including preset document control, reader grading, reader information literacy education, regular statistics and feedback, and establishing

after-sales guarantee systems with suppliers [25].

- (3) “Special” resource construction in digital libraries. With the arrival of the big data and Internet+ era, digital libraries continue to develop, and user needs, information sources, and forms have all undergone tremendous changes. To meet users’ personalized information needs, text construction of image resources and construction of network visual object resource databases have entered the business scope of digital libraries. However, libraries still face numerous obstacles and deficiencies in construction and services in these areas, and crowdsourcing models with many advantages are considered to have broad application prospects in library emerging information resource collection and acquisition. Fu Yue’ an studied issues related to implementing crowdsourcing in text construction of image resources, primarily exploring its process. He argued that target projects should first undergo professional evaluation, then appropriate crowdsourcing text construction strategies and specific implementation methods should be selected, followed by evaluation of crowdsourcing text processing results. Each process also uses relevant cases as templates to explore specific implementation details and operational points. Finally, he proposed measures and suggestions for crowdsourcing text construction quality control from aspects such as comprehensively analyzing tasks, finding appropriate volunteers, improving crowdsourcing platform usability, and providing necessary operational guidance [26]. Zhang Tingting et al. analyzed the construction mechanism of digital library mobile visual search resource libraries, proposed the concept of obtaining new visual resources through crowdsourcing models, concepts, and methods, constructed a digital library MVS (mobile visual search) crowdsourcing model, and conducted detailed discussions and thorough analyses of the model from aspects such as task design, user incentive mechanisms, and result quality control. They also compared traditional models with crowdsourcing models from aspects such as visual resource collection methods, collection costs, participation time of library staff, and value embodiment, highlighting the many advantages of crowdsourcing models while also proposing prospects for subsequent research [27]. Additionally, there are research topics such as metadata crowdsourcing and text construction crowdsourcing applications in domestic ancient book database construction [28].

2.2.2 Library Librarian Crowdsourcing Human resources are one of the core resources of libraries [29], and librarians are indispensable roles for libraries to carry out various tasks. The enhancement of library service capabilities, improvement of business levels, and innovation in management methods all cannot be separated from librarians. With the continuous deepening and expansion of library crowdsourcing research and practical applications, it is necessary for libraries to establish specialized positions for crowdsourcing librarians [30]. Therefore, research on library librarian crowdsourcing has entered researchers’

field of vision. Sheng Fang analyzed the connotation and characteristics of library crowdsourcing librarians from the perspective of building open libraries, elaborated on the background of crowdsourcing librarians' emergence, discussed the main responsibilities of crowdsourcing librarians, divided them into three levels: entry-level crowdsourcing librarians engaged in task publishing work, junior crowdsourcing librarians engaged in task decomposition work, and senior crowdsourcing librarians engaged in project management work, and finally discussed matters needing attention in implementing library crowdsourcing librarian mechanisms from aspects such as publishing platform selection, stimulating user innovation enthusiasm, and guiding and supervising the crowdsourcing process [31]. Subsequently, Sheng Fang et al. proposed the crowdsourcing librarian system, compared the similarities and differences between crowdsourcing librarians and Librarian 2.0, highlighted the unique features of crowdsourcing librarians, and discussed key steps for crowdsourcing librarians to implement crowdsourcing projects from aspects such as project selection, task decomposition, incentive and review mechanism formulation, publishing platform selection, crowdsourcing process guidance and supervision, and knowledge management and utilization. They also explored the important role and significance of crowdsourcing librarians in enhancing user stickiness to libraries, making library tacit knowledge explicit, and transforming library core capabilities toward knowledge services [30]. Zhu Lijun conducted research on the crowdsourcing model of student librarians at Inner Mongolia University of Science and Technology Library. Survey data indicated that student librarians have strong cooperative willingness with the library, demonstrating that the student librarian crowdsourcing model has possibilities for implementation and development. The author also conducted comparative analysis between student librarian crowdsourcing and non-crowdsourcing models, with results showing that student librarians under the crowdsourcing model demonstrate better self-discipline, independence, and innovation in practical library work, and can better play a bridging role between users and the library. Based on the survey results, the author proposed strategies for university libraries to develop student librarian crowdsourcing services [32].

2.3 Library Crowdsourcing Research from Reference and Critical Perspectives

2.3.1 Reference: Introduction of Foreign Library Crowdsourcing Practices The concept and model of crowdsourcing have received widespread attention and rapid development in foreign library circles, achieving good results with many successful practical application cases. Numerous domestic scholars have also conducted summaries and introductions of these cases. The introduction of advanced foreign library crowdsourcing experience can provide certain references for domestic library crowdsourcing research and practice, while also injecting fresh blood and providing new perspectives for domestic library management, service work, and library science research.

Introductions of successful foreign library crowdsourcing practices primarily focus on European and American regions, mainly because these regions are world leaders in library crowdsourcing research and practical applications. Related research analyzes the current status and characteristics of foreign library crowdsourcing practice project construction, summarizes their successful experiences, and discusses what domestic libraries can learn. Li Shuning and Zeng Shan introduced in detail foreign library crowdsourcing practice projects in areas such as collection solicitation and organization, OCR (optical character recognition) error correction for digital resources, and digital resource organization and description. They discussed obstacles and coping strategies for domestic libraries to introduce crowdsourcing models for digital collection construction [2]. Liu Li primarily introduced successful application cases of foreign library characteristic database crowdsourcing construction using European and American regions as examples, and elaborated on the specific practices of foreign library crowdsourcing theory from three stages of database construction (preliminary: resource collection and organization; intermediate: resource organization and description; later: resource review and error correction). Based on this, she analyzed foreign library crowdsourcing projects from aspects such as crowdsourcing project content selection, platform construction, and participant incentive mechanisms, and proposed relevant countermeasures that domestic libraries can adopt for characteristic resource construction using crowdsourcing models [33]. Dongfang comparatively analyzed the connections and differences between crowdsourcing and outsourcing, introduced typical application cases of library crowdsourcing projects in countries such as the United States and Australia, and discussed the experiences and enlightenment of foreign library crowdsourcing applications for domestic libraries to introduce crowdsourcing models [34]. Guan Fuying and Li Shuning introduced application cases of characteristic resource construction crowdsourcing projects in libraries in the United Kingdom, Australia, and other countries, analyzed three main implementation methods of foreign library crowdsourcing projects (resource indexing, text entry or error correction, and participation in metadata scheme definition), believed these crowdsourcing projects have characteristics such as simple tasks, valuable or interesting content, requiring manual intervention, and huge quantities, discussed and analyzed them, and finally proposed relevant countermeasures that domestic libraries can adopt for characteristic resource construction using crowdsourcing models [22].

2.3.2 Critical Reflection: Calm Thinking on Library Crowdsourcing

Enthusiasm Crowdsourcing is a double-edged sword for libraries. While researchers see the bright prospects and huge advantages of crowdsourcing, they have also noticed the challenges and problems that crowdsourcing may bring to libraries. Zhao Rongying and Wang Xinyu believe that crowdsourcing has disadvantageous factors such as form over substance and insufficient professional knowledge of participants, as well as threat factors such as possible communication barriers between libraries and contractors causing work obstacles and “ownership” disputes. They also analyzed its opportunity factors and advanta-

geous factors, and on this basis constructed a SWOT matrix. From this matrix, they concluded that libraries' advantages in using crowdsourcing models outweigh disadvantages, and opportunities outweigh threats. They also summarized the effectiveness and experience of typical successful crowdsourcing implementation cases in foreign libraries, and proposed coping strategies and measures to avoid disadvantages and threats arising from libraries introducing crowdsourcing models [35]. Dong Meixiang believes that university libraries introducing crowdsourcing models have disadvantages such as insufficient influence of crowdsourcing concepts, limited crowdsourcing project selection, and insufficient funds for crowdsourcing business promotion, as well as threats such as blurring library professional boundaries, affecting library service quality, and causing librarian career crises. She also analyzed the positive effects of university libraries introducing crowdsourcing models, arguing that university libraries should leverage advantages, utilize opportunities, overcome disadvantages, and avoid threats, and proposed promotion strategies for university libraries to introduce crowdsourcing models in the future [36]. Guo Yanzhi believes that crowdsourcing thinking will make librarians' professional boundaries more blurred, threaten the core competitiveness of libraries, and cause librarians' responsibility absence, making librarians' career prospects more worrying. The author also believes that librarians' roles will present diverse forms such as library and information specialists, value specialists, crowdsourcing specialists (decision-making, supervision, technology), and grassroots groups under the premise of professional legal and institutional guarantees for librarians' professional qualifications [37]. Qiao Yaming et al. analyzed the limitations and unavoidable problems of crowdsourcing in actual library work from aspects such as crowdsourcing implementation supervision, incentive systems, and quality control [38].

From the above analysis, although library crowdsourcing will bring certain impacts to library-related work, we should not avoid it due to fear of problems. We should see the unprecedented opportunities that crowdsourcing models bring to libraries and boldly carry out reforms and innovations.

3 Research Review

Although domestic library crowdsourcing research started relatively late, it has achieved relatively fruitful research results. From the summary of these research results in the previous sections, it is evident that the research covers a wide range of topics, almost covering all aspects. However, it is also not difficult to see that domestic library crowdsourcing research still has many deficiencies and problems, and there remains considerable room for research in this area.

3.1 Highlights of Current Research

Through the above analysis, the following prominent highlights can be identified in current domestic library crowdsourcing research:

- (1) Crowdsourcing has been well integrated with multiple library tasks. Re-

search themes are relatively broad. From the previous summary and analysis, current research involves multiple themes such as library services and information resource construction, almost covering all aspects. It can be seen that academic researchers can grasp many aspects of how crowdsourcing can benefit library work and propose suggestions for multiple library tasks under crowdsourcing thinking.

- (2) Although current research focuses on analyzing the positive effects of library crowdsourcing, discussions on its negative effects have emerged. Crowdsourcing has many advantages and huge potential, and has achieved successful practical applications in foreign libraries, so domestic scholars have extensively discussed its positive effects. However, with the continuous deepening of research, some analyses of its negative effects have emerged, indicating that academic researchers have developed rational thinking about the library crowdsourcing enthusiasm.
- (3) Localization strategies for crowdsourcing applications have been proposed based on theoretical analysis combined with foreign successful practice cases. Although current research is mostly theoretical discussion, various scholars have proposed some localized crowdsourcing application countermeasures by combining existing problems in certain library tasks, or successful foreign practices, or based on their own logical analysis, providing certain references and guidance for domestic libraries to introduce crowdsourcing models. However, the feasibility of these strategies still needs further practical testing.

3.2 Deficiencies of Current Research

After systematic review, current domestic library crowdsourcing research mainly has the following deficiencies:

- (1) Insufficient empirical research. Currently, domestic library crowdsourcing research is mostly theoretical discussion, with very scarce empirical research, only a few isolated studies. Chen Chong et al. conducted an empirical study on users' participation willingness and influencing factors in book review crowdsourcing using the Beijing Normal University Library as a case study, using questionnaire surveys to demonstrate the feasibility of using crowdsourcing models to solve library book review resource construction problems, and proposed suggestions and strategies to attract users to participate in book reviews and improve book review system functions [46]. Huo Jianmei and Li Shuning conducted survey research on introducing crowdsourcing models into university library digital reference consultation services based on the Delphi method [6]. These few empirical studies have produced highly targeted conclusions and suggestions. Therefore, future research should conduct in-depth empirical research based on existing theoretical studies, drawing on relevant research results from the business field, to propose more persuasive conclusions.

- (2) Insufficient evaluation research. How effective is the implementation of library crowdsourcing? This requires evaluation, so the construction of library crowdsourcing effect evaluation indicators is an urgent problem that needs to be solved. Comprehensive library crowdsourcing implementation effect evaluation indicators or evaluation indicators from the perspectives of various participating parties can be constructed using empirical research methods such as expert surveys and analytic hierarchy processes, laying a foundation for future library crowdsourcing implementation effect evaluation. Library science is a discipline combining theoretical research and practical application, so the construction of library crowdsourcing effect evaluation indicators should be completed through sincere cooperation between academia and the profession. The academic community must first recognize the important value of this research area and participate in research on related issues, while the professional community should also attach importance to the practical significance of establishing evaluation indicators. In short, both researchers' theoretical scientific perspectives and practitioners' specific practical experience should be integrated to make these indicators more feasible and objective [47].
- (3) Scarce introduction of failed cases. When researchers introduce advanced foreign library management and service experiences, they mostly adopt a learning attitude, hoping to provide certain references for the construction and development of domestic libraries, enabling domestic library services to reach a higher level. This undoubtedly injects new blood and provides new perspectives for domestic library management, service work, and library science research, and library crowdsourcing research is no exception. Research on foreign library crowdsourcing experience introduction believes that domestic libraries should learn from these advanced experiences to provide users with higher quality services, thereby achieving better library development. From the summary of related research, current introductions to foreign library crowdsourcing practical applications are all successful cases, which undoubtedly creates the illusion that crowdsourcing will always succeed. Therefore, while introducing successful foreign library crowdsourcing cases, some failed cases should also be appropriately excavated and introduced, thereby learning from successful experiences and absorbing lessons from failures, with more rational consideration of library crowdsourcing, enabling libraries to more rationally introduce crowdsourcing concepts and implement crowdsourcing models. Moreover, almost no one has explored the obstacles and constraint factors in implementing library crowdsourcing models, which is also a direction for future research.
- (4) Lack of comparative research. The previous summary found that current domestic library crowdsourcing research mostly uses university libraries as research objects, with few studies on public libraries, and comparative studies between them are even rarer. Therefore, subsequent research should focus more on public library crowdsourcing, and on this basis con-

duct comparative studies on crowdsourcing in different types of libraries. Different types of libraries have different tasks, natures, service objects, and user needs, so their service content and service projects will inevitably differ. Therefore, crowdsourcing research on different types of libraries cannot be treated uniformly and should be distinguished. Comparing similarities and differences in various aspects can further enable comparative research on crowdsourcing for different business and service projects, making library crowdsourcing research more targeted.

4 Conclusion

The essence of crowdsourcing is mass innovation, which aligns with China's current national strategy of "mass entrepreneurship and innovation" that is being vigorously promoted. Libraries introducing crowdsourcing concepts and models can stimulate participants' creativity, allowing "grassroots" creativity to be reflected in various aspects of library services and management work. Academic researchers can also leverage the momentum of crowdsourcing to produce a series of extremely valuable research results. However, it is regrettable that current library crowdsourcing research mainly remains at the theoretical discussion stage, primarily using qualitative research methods, with relatively limited research scope. Moreover, some existing studies have basically similar research ideas and processes, with high article similarity.

Crowdsourcing concepts and models have important theoretical significance and practical value for libraries. While summarizing current domestic library crowdsourcing research results, this study points out existing deficiencies and problems in current research, hoping to attract attention and reflection from academia and the profession, and to provide certain enlightenment and reference for subsequent research. Of course, this study also has deficiencies. The thematic classification of library crowdsourcing research is a subjective classification based on the author's existing knowledge structure after fully reading the literature, and the thematic classification may be somewhat biased. In the future, quantitative thematic clustering, thematic evolution, and other visual analyses can be attempted.

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