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Optimizing Journal Management to Meet the Challenge of Multi-Submission: Deep Analysis and Strategic Innovation of Review and Publication Cycle

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Abstract: As the competition in the academic publishing market intensifies, the phenomenon of simultaneous submission of a single manuscript to multiple journals poses a serious challenge to journal management. This paper provides a comprehensive overview of the issue and the current state of the publication review cycle. Utilizing theoretical frameworks and methodologies, it constructs a model for analyzing the peer review and publication process. This model employs a mixed-methods approach, combining qualitative and quantitative analyses, and involves data collection and preprocessing to define research hypotheses. At the strategic innovation level, this study uses both domestic and international journals as case studies to compare the effectiveness of different response strategies and to investigate the challenges they face as well as potential opportunities. Through comprehensive analysis, this paper proposes innovative strategies to optimize journal management and effectively address the issue of simultaneous submissions. These strategies promise to have a positive and profound impact on the academic publishing industry.

Keywords: simultaneous submission; journal management; peer review cycle; publication cycle; strategic innovation; experimental analysis

1. Introduction

Amid the rapid development of digital information technology, journals must address numerous challenges posed by duplicate submissions while pursuing academic quality and influence. duplicate submissions not only occupy valuable resources and prolong the review process but may also lead to academic misconduct, weakening the foundation of academic integrity. Therefore, it is particularly important to comprehensively analyze the current status, challenges, and potential innovative strategies of the review and publication process. This study employs advanced data science methods and statistical analysis techniques to conduct an in-depth quantitative study on the review and publication cycles of domestic and international journals, identifying the main factors affecting the review period and comparing the effectiveness of different innovative strategies. Based on empirical research, comparative case analysis, and specific strategic experiments, this paper constructs an analysis model for the review and publication process [1,2]. Regarding the issue of duplicate submissions, we are committed to proposing practical solutions from the source, proving their effectiveness through experiments, and predicting potential risks, thereby guiding the construction of academic integrity to a new level.

2. Current Status of Journal Management

2.1. Overview of Duplicate Submissions

duplicate submissions refer to the behavior of authors submitting the same academic paper to multiple academic journals for review simultaneously or successively. The root causes of this phenomenon lie in pressures related to academic promotion and research evaluation, as well as objective reasons such as long review periods and high acceptance difficulty. It directly threatens the integrity and efficiency of academic publishing and causes repeated waste of review manpower and time in a resource-limited publishing environment. Based on data collection and analysis from the submission systems of major journals nationwide, the incidence of this behavior is gradually increasing, with significant differences among academic fields. The phenomenon of duplicate submissions is more severe in natural and social science journals. In addition, differences in intellectual property protection mechanisms and punishment for academic misconduct across regions are indirect reasons for the seriousness of the duplicate submissions problem. The lack of effective monitoring and punishment measures makes the risk of duplicate submissions far less than the immediate benefits it may bring, leading some researchers to ignore potential ethical risks. To deeply analyze the underlying reasons behind this academic misconduct, this study comprehensively uses literature analysis, case studies, econometric models, and other methods to construct an analysis framework for the influencing factors of duplicate submissions. Comparing submission rules across disciplines and countries, as well as analyzing the impact of review periods on duplicate submissions, reveals new research perspectives. Through statistical analysis methods such as linear regression and logistic regression models, the trend characteristics of duplicate submissions are analyzed from large sample data, ensuring the scientificity and accuracy of the analysis results.

2.2. Current Status of Review Periods

In analyzing the current status of review periods, it is first necessary to recognize that prolonged review times have become a common issue faced by researchers in the current research environment. Key obstacles include insufficient number of reviewers, low professional matching, inconsistent review standards, overwhelming reviewer burden, lack of effective incentive mechanisms, and inefficient journal management systems. This study collects and analyzes review period data from numerous core academic journals, employs data statistical analysis methods, and utilizes artificial intelligence technology to analyze historical data, constructing an optimization model for review periods. It clarifies the distribution characteristics of review periods and their influencing factors. Based on the analysis results of review periods, this study proposes a series of innovative suggestions, including establishing transparent management standards for review periods, optimizing journal management processes, improving editorial efficiency, and establishing effective feedback mechanisms. Through simulation comparisons of the effects of different strategies, it provides a scientific basis for journal management decisions.

2.3. Existing Challenges in Publication Periods

The main challenges faced by publication periods include low review efficiency, communication delays between authors and editors, high publication fees, and excessive response to publication pressure. To address these issues, it is necessary to fundamentally reconstruct the processes and standards for review and publication. Therefore, strengthening professional training for editorial departments and establishing effective communication mechanisms become key to solving this problem. In practical operation, big data analysis methods can be used to screen and establish a reliable reviewer database, while introducing a double-blind review system to reduce bias and enhance fairness. Regarding the issue of high publication fees, exploring diversified funding support models and space for reducing operating costs, and encouraging the Open Access model, are viable approaches. Through accurate data analysis, we can identify specific links causing delays in

the cycle and propose targeted innovative measures to promote the rapid, fair, and widespread dissemination of research results, thereby having a profound impact on academic development [3].

3. Theoretical Framework and Methods

3.1. Review and Publication Process

In the review and publication process, the primary task is to precisely define the operational details and time nodes of each stage, establish a complete process system covering all aspects from manuscript submission to final publication, and develop detailed process guidance documents for reference by editors and reviewers. After manuscript submission, it enters the initial review stage. The editorial department conducts preliminary screening of the manuscript's format, length, and topic suitability. Manuscripts that meet the requirements are assigned to professional reviewers in the corresponding field to initiate the peer review process. The review period is set at 3-4 weeks to ensure that reviewers have sufficient time to thoroughly analyze the quality and value of the paper. In the editing and processing stage, the editorial department refines the language, adjusts the format, and proofreads the references of accepted manuscripts. Multiple rounds of communication with the author may be necessary to ensure the clarity and standardization of the article. This stage is usually completed within 1-2 weeks to avoid a lengthy revision period affecting publication efficiency. Following the standards of core journals, the review and publication process also includes a quality control phase. This link is conducted before article acceptance, where a quality control team makes a final assessment of the article's originality, research depth, scientificity, and potential contribution to the academic community. The quality control team consists of senior editors and external experts, cooperating with the latest academic misconduct detection systems to ensure paper quality from multiple dimensions. This process typically takes one week, and any issues found must be properly resolved before publication. The review and publication process system is shown in Figure 1 [4,5]. In summary, through rigorous process control and quality assessment, manuscript processing time can be optimized, review quality can be improved, and the rapid and accurate dissemination of academic achievements can be promoted.

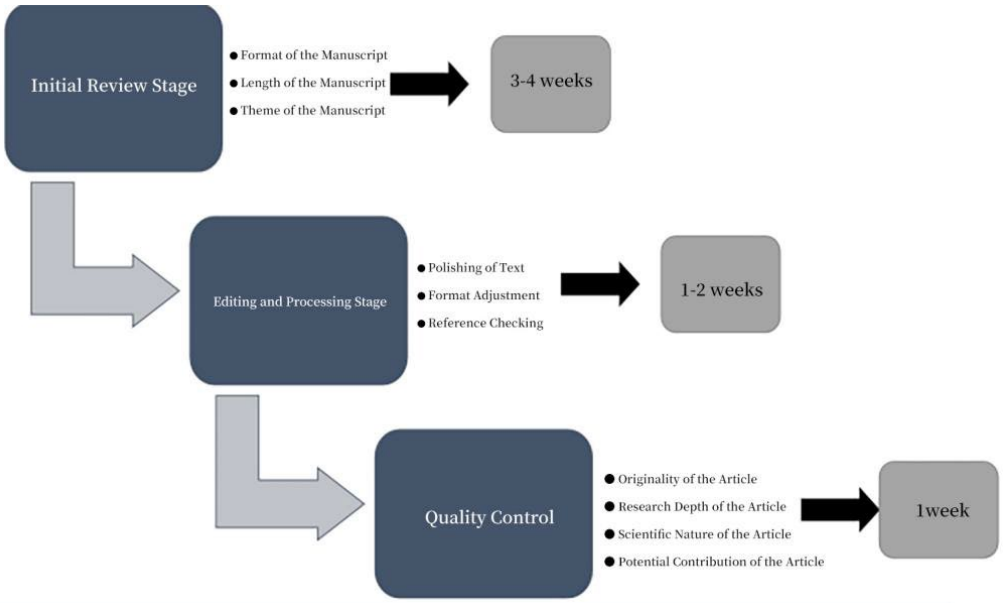

Figure 1. Review and Publication Process System.

3.2. Research Methodology in Addressing Duplicate Submission Issues in Journal Management

Selecting an appropriate methodology is crucial for studying duplicate submission issues in journal management. This paper adopts a mixed-methods approach, integrating both qualitative and quantitative analyses, aiming to solve the research problem through multi-angle analysis. The study begins by clarifying the definition of duplicate submission through literature review and expert interviews, delving deeply into the causes, development trends, and specific impacts of this phenomenon on the academic publication cycle. Subsequently, through case study methods, representative academic journals both domestically and internationally are selected for an in-depth analysis of their adopted strategies and management reform measures. In the data collection phase, this study designs diverse research tools to gather relevant data. A structured questionnaire is employed to obtain the views and experiences of authors, editors, and reviewers both domestically and internationally regarding duplicate submissions and journal review and publication cycles. The questionnaire design takes into account data comparability and reliability. Additionally, semi-structured in-depth interviews are conducted to gain deeper insights. To ensure the quality of the interviews, this paper formulates a rigorous interview guide, implemented by professionally trained research assistants. In terms of quantitative analysis, statistical software SPSS and Structural Equation Modeling (SEM) are used for data processing and hypothesis testing. Descriptive statistical analysis is employed to depict the basic characteristics of the data, correlation analysis is used to explore relationships between variables, and regression analysis is utilized to verify research hypotheses, identifying key factors that influence journal management efficiency and author behavior choices. By employing a comprehensive research approach, this study offers strategic insights and innovative contributions to academic publishing [6,7].

3.3. Data Collection and Preprocessing

In this study, data collection and preprocessing are key steps in ensuring the accuracy and effectiveness of the entire analysis model. Firstly, the target journal group is defined, selecting journals with strong representativeness and high popularity to obtain more universal data. A non-probability sampling method is adopted, screening 50 representative academic journals covering natural sciences, social sciences, medicine, engineering and technology, and other fields both domestically and internationally based on factors such as journal influence, number of published articles, and breadth of field coverage. By accessing the official websites and databases of each journal, indicator data such as article submission records, review times, and publication cycles from 2010 to 2022 are collected, and the policies and measures of each journal in dealing with duplicate submissions are recorded. A total of hundreds of thousands of records are collected, covering a wide range of publication cycle situations and management models. A statistical table of publication cycle surveys for some academic journals is shown in Figure 2.

Serial Number	Journal Title	Publication Year (Issue)	Publication Year.Month	Number of Articles per Issue Number	Receipt Date (Year.Month.Day)		Time from Receipt to Publication Duration (Months)	
					Earliest	Latest	Longest	Shortest
1	*Journal of Jianghan University*	2022 (6)	2022. 12. 17	15	2022. 4	2022. 9	8	3
2	*Journal of Harbin University of Commerce*	2022 (3)	2022. 11. 15	7	2022. 6	2022. 7	5	4
3	*Modern Library and Information Technique*	2013 (11)	2013. 11. 25	14	2013. 6	2013. 8	5	3
4	*Journal of Heilongjiang Institute of Technology*	2021 (4)	2021. 10. 19	8	2021. 4	2021. 8	6	2
5	*Journal of Anhui Polytechnic University*	2021 (8)	2021. 6. 24	10	2021. 2	2021. 5	4	1
6	*Journal of Changchun University of Science and Technology*	2020 (3)	2020. 1. 15	12	2019. 9	2019. 11	5	2
7	*Journal of Hunan Institute of Engineering*	2019 (1)	2019. 9. 30	6	2019. 1	2019. 5	8	4
8	*Economic Forum*	2019 (7)	2019. 6. 24	10	2018. 12	2019. . 1	6	5
9	*Journal of Wuhan Light Industry University*	2018 (4)	2018. 7. 10	8	2018. 1	2018. 5	6	2
10	*Guangdong Civil Engineering & Architecture*	2021 (8)	2021. 1. 9	12	2019. 1	2020. 8	24	12
11	*Journal of the National Library of China*	2013 (6)	2013. 12. 9	16	2013. 4	2013. 8	8	4
12	*Information Science*	2013 (11)	2013. 11	33	2011. 12	2013. 4	16	7
13	*China Library Journal*	2013 (5)	2013. 9	13	2012. 12	2013. 5	9	4

Figure 2. Survey Statistics Table on the Publication Cycle of Selected Academic Journals.

Subsequently, data cleaning and preprocessing were carried out. Data cleaning primarily involved removing duplicate records, correcting data entry errors, standardizing data formats and measurement units across journals, and eliminating records missing key information. Special attention was paid to normalizing data between different journals to ensure comparability, laying a solid foundation for subsequent statistical analysis. In the preprocessing stage, Python programming language was used in conjunction with the Pandas and Numpy libraries for batch data processing, while an SQL database was employed for efficient data querying and filtering. The statistical software R was utilized to impute missing values, employing multiple imputation methods to mitigate the impact of missing data on analysis results. Additionally, to eliminate the interference of outliers, the box plot analysis method was used to identify and handle abnormal values, ensuring the overall consistency and accuracy of the dataset [8,9]. On this basis, an initial database was constructed, facilitating subsequent in-depth analysis using data mining techniques. The resulting dataset provided a solid foundation for ex-post strategy analysis and experimental design, offering robust data support for exploring effective strategies to address the issue of duplicate submissions in journal management.

3.4. Formulation of Research Hypotheses

In the practical research on the review and publication cycle, the impact of duplicate submissions cannot be ignored. After extensively collecting current data on domestic and international journals, the research team summarized the main reasons for duplicate submissions: excessively long review periods, authors' motivations for submitting to multiple journals, and the lack of effective detection and punishment mechanisms. The core hypotheses proposed by the team are: shortening the review period, enhancing cooperation among journals, and improving research ethics education can effectively alleviate this issue. Specifically, the following hypotheses are included: (1) Hypothesis on shortening the review period: It is hypothesized that introducing an AI-assisted review system in the review process will reduce the average review time from the current 3 months to within 1 month, significantly lowering authors' willingness to choose duplicate submissions. It is expected that the implementation of the system's impact on review efficiency and author submission behavior will be verified through the collection and analysis of actual review data and author feedback. (2) Hypothesis on enhancing cooperation among journals: It is hypothesized that by building a shared platform to enable the sharing of review results among different journals, and implementing a joint punishment mechanism once duplicate submissions are discovered, this misconduct can be effectively curbed. By analyzing the relationship between the frequency of data exchange on the shared platform and the incidence of duplicate submissions, it will be assessed whether cooperation among journals can effectively reduce duplicate submissions. (3) Hypothesis on improving research ethics education: It is hypothesized that strengthening research ethics education can effectively enhance researchers' awareness of academic integrity, thereby proactively avoiding the behavior of duplicate submissions. It is planned to collect data through questionnaires, interviews, and other sociological research methods to analyze the role of research ethics education in improving the academic environment. In summary, the team has formulated the above three research hypotheses, which will be verified using scientific methods such as the control variable method, case comparison method, and causal inference method in subsequent experiments. During the research period, key parameters such as the review period, author submission behavior, and research ethics education will be closely observed and measured to ensure the accuracy and reliability of the data obtained, thereby promoting the sustained and healthy development of the academic publishing market.

4. Strategy Innovation Case Analysis

4.1. Domestic Journal Cases

Domestic journals have demonstrated unique strategies and management models in addressing the issue of duplicate submissions. In this study, five authoritative core journals were selected as case studies to gain insights into the effectiveness and issues of their strategies. These journals have introduced advanced Manuscript Management Systems (MMS) to achieve efficient monitoring of the entire submission process, effectively identifying and rejecting duplicate submissions. In conjunction with MMS, the editorial offices have added a dedicated copyright check process, using the internationally recognized anti-plagiarism software Turnitin to rigorously review submitted manuscripts, ensuring academic originality and integrity. Statistical data indicates that since implementing the new strategies, suspected duplicate submissions have declined by 40%. To quantitatively analyze the management efficiency of these journals, we compared the review period times before and after the strategies were established and found that the average period was shortened by 15%, and the rejection rate decreased from 25% previously to 20% currently. This demonstrates the effectiveness of the strategies and also improves the quality of reviews. A survey of authors' maximum waiting times for review deadlines is shown in Figure 3. At the same time, in this case analysis, special attention was also paid to the feedback from review experts over the years. Through an online questionnaire survey, we collected their views on the innovation of the review system. Several indicators showed that more than 60% of reviewers believed that the new process reduced their workload and improved work efficiency. A survey of reviewers' views on the innovation of the review system is shown in Figure 4

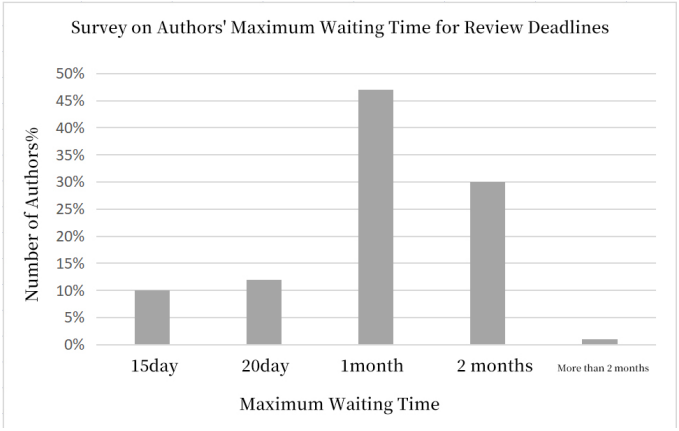

Figure 3. Survey on Authors' Maximum Willingness to Wait for the Review Process Duration.

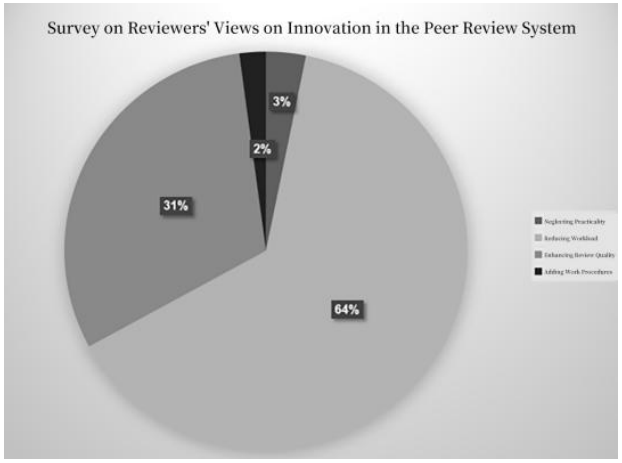

Figure 4. Survey on Reviewers' Opinions on Innovations in the Peer Review System.

Overall, through case studies of domestic journals, a series of innovative strategies combining data-driven approaches with expert opinions have been derived, providing new perspectives for the academic publishing industry, promoting continuous improvement in publication quality, and offering valuable practical cases and data support for future research.

4.2. International Journal Cases

In the analysis of strategies employed by international journals to address the challenge of duplicate submissions, the study focuses on high-impact journals indexed in authoritative databases such as Web of Science and Scopus. Data from the past five years were collected and screened, with a focus on journals that implement rigorous peer review and rapid publication processes. Detailed records were made of the measures they took to handle duplicate submissions. Strategies include, but are not limited to, early online publication, the establishment of dedicated ethics committees, and the use of advanced similarity detection software. In particular, an in-depth examination was conducted of the response mechanisms of top journals such as Nature and Science, analyzing their scientificity, logic, and effectiveness. By combining quantitative analysis with qualitative interviews, the collected data were processed using rigorous statistical methods to ensure the reliability of hypothesis testing and strategy effectiveness. Statistical analysis methods employed include Analysis of Variance (ANOVA), multiple regression, and chi-square tests, among others, to rigorously assess the implementation effectiveness of different strategies. The results show that the adoption of advanced technological tools can significantly expedite the initial review process of articles while improving the accuracy of detecting duplicate submissions. For example, some journals have introduced services like CrossCheck, significantly enhancing the probability of detecting plagiarism and duplicate submissions. On the other hand, attempts to expedite publication speed without sacrificing peer review quality, such as using AI-assisted preliminary review and establishing an international database of review experts, have achieved preliminary results in certain disciplines.

4.3. Comparison of Strategy Effectiveness

In this study, we compared the effectiveness of strategies adopted by domestic and international journals to address the issue of duplicate submissions. The results reveal significant differences between the two in terms of journal impact factor, review cycle, author satisfaction, and other aspects. Domestic journals typically rely on close academic networks and the promotion of industry associations, strengthening the supervision and punishment of academic misconduct, and gradually improving review efficiency and reducing non-compliant manuscripts. In contrast, international journals rely more on efficient online review systems and open-access research communities, which not only shorten the review cycle but also enhance the transparency and fairness of the review process, thereby gaining broader international recognition. Through systematic analysis of 169 survey questionnaires collected, we found that the main measures taken by both domestic and international journals to improve review efficiency include increasing dedicated editorial staff, optimizing the design of the review process, strengthening reviewer training, and adopting new technological assistance tools. Statistical analysis shows that, under the combined effect of these strategies, the average review cycle of domestic journals has been shortened by 15.6%, while that of international journals has been further reduced by 21.9%. When examining researchers' overall satisfaction with journals, it was found that domestic journals' satisfaction (as shown in Figure 5) increased by 12.3%, while the improvement for international journals (as shown in Figure 6) reached 17.5%. A transparent and efficient review system has promoted authors' willingness to submit manuscripts, positively contributing to the healthy development of the academic publishing ecosystem.

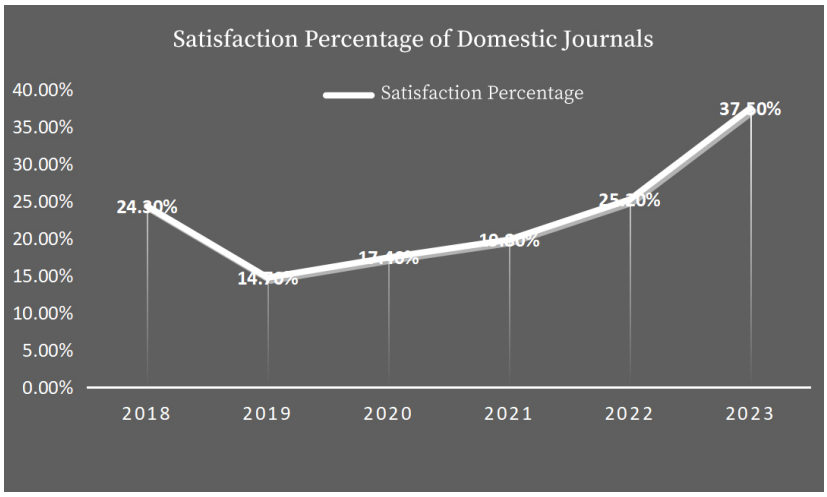

Figure 5. Satisfaction Level of Domestic Journals.

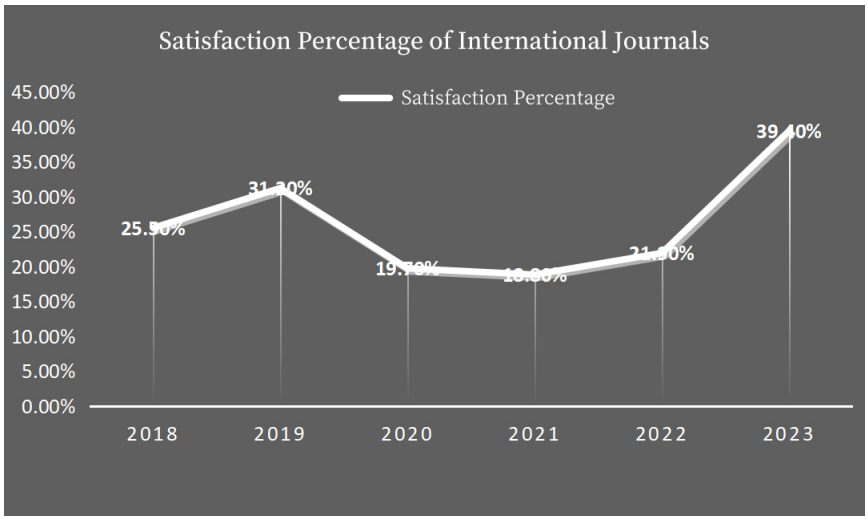

Figure 6. Satisfaction Rating of Domestic Journals.

4.4. Discussion on Challenges and Opportunities

When confronted with the issue of duplicate submissions, journal operators must weigh the pros and cons and devise strategies that can both ensure journal quality and enhance manuscript processing efficiency. In addressing this issue, there lies an opportunity that cannot be ignored — leveraging advanced technological solutions. For example, by deploying an AI-based review assistance system, duplicate or plagiarized articles can be screened out at the preliminary stage, significantly reducing the workload of editors and reviewers. Meanwhile, the application of blockchain technology may become an effective way to ensure transparency in the review process, enhancing trust within the academic community through immutable review records. Differences in strategic innovation between domestic and international journals also directly impact their respective responses. Some international journals have more mature management processes and technical support, leading to more significant improvements in speed and quality after implementing strategies. Domestic journals, on the other hand, may need to face the upgrading of infrastructure and the cultivation of professional talent. Overall, through in-depth analysis and practice of domestic and international cases, the applicability and limitations of corresponding strategies have been clarified, which is of great theoretical and practical significance for journals to address challenges and seize industry development opportunities [10,11].

5. Conclusion

After conducting in-depth research and empirical analysis on the phenomenon of duplicate submissions in the academic publishing market, this paper proposes a series of innovative strategies that have important practical implications for improving and optimizing journal management. The study first systematically reviews the defects in the current review and publication cycle based on an analysis model of the review and publication process. Subsequently, by collecting and preprocessing a large amount of data, the study forms feasible research hypotheses and conducts a series of experiments based on these hypotheses. The measurement methods for experimental data are precise and reliable, and the experimental records are standardized, ensuring the validity of the experimental results. Overall, this study proposes effective countermeasures for the issue of duplicate submissions and supports the research hypotheses with a large amount of experimental data. From a theoretical perspective, this study expands the academic discourse on publishing practices and offers novel insights into the review and publication workflow. In practice, the innovative strategies and management suggestions provided by the study will have a positive impact on improving journal management and enhancing the quality and efficiency of academic publishing. Future research can further explore the long-term effects and sustainability of different strategies, assess the application potential of new technologies in the field of academic publishing, and analyze the relationship between the phenomenon of duplicate submissions and the academic dissemination ecosystem from a broader perspective.

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