Incentive Framework for Academic Publication Reviewer System

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ABSTRACT

The contemporary academic publishing ecosystem is impeded by structural constraints in cost management and incentive design. The peer review landscape relies predominantly on voluntary contributions. Reviewer compensation is typically non-transferable across publishers. Additionally, there is a lack of a centralized repository with transparent quality metrics. These inefficiencies lead to inconsistent expert assignment and persistent delays in preprint evaluation. To address these aforementioned challenges, this paper proposes a novel incentive framework designed as a shared infrastructure for academic publishers. We introduce a Reviewer Index (RV-Index) that synthesizes review quality, timeliness, and participation history to establish auditable reviewer tiers. Furthermore, a centralized clearinghouse manages guarantees, transferable benefits, and rewards, while a standardized API facilitates reviewer requests based on tiers and Service Level Agreements (SLAs). Lastly, the validations confirm the framework's soundness and its potential to enhance the quality and efficiency of the peer review ecosystem.

Keywords: *Academic Publication, Article processing charges, Incentive Framework, Pocket Reward, Reputation System, Reviewer-Index*

1. INTRODUCTION

The academic publishing ecosystem continues to face fundamental constraints regarding both cost and incentive design. Authors frequently incur significant expenses, such as conference registration fees, typically ranging from USD 500 to 1,000 to ensure their papers

are included in proceedings or major indices. Furthermore, Article Processing Charges (APCs) for open-access or hybrid journals often fall between USD 500 and 3,500, creating a substantial financial burden.

Additionally, peer review relies primarily on volunteer labor; even where compensation exists, it is rarely transferable across publishers or platforms. Moreover, the absence of a shared reviewer repository with transparent quality and domain indicators results in inconsistent expert allocation. A related challenge is the persistent "preprint gap," where high-quality manuscripts remain on preprint platforms due to cost barriers and the lack of a systematic preliminary validation mechanism, raising concerns about citation and scholarly reuse.

To alleviate these challenges, this paper proposes an incentive framework for an academic publication reviewer system that serves as shared infrastructure for a cross-publisher repository. The framework integrates a Reviewer Index (RV-Index) grounded in reputation system principles, combining outcome- and behavior-based indicators, such as review quality, timeliness, and participation history to define auditable reviewer tiers. It also incorporates a clearinghouse for managing transferable rewards across venues, along with a standard API and portal that allow publishers to request reviewers based on tiers and Service Level Agreements (SLAs). Additionally, we introduce a low-cost certified preprint review service to enhance the credibility of hosted manuscripts. Anticipated outcomes include shortened review cycles, consistent quality, increased transparency, and sustainable incentives, ultimately enabling certified preprints to be cited with greater confidence.

The remainder of this paper is structured as follows. Section 2 reviews the background and related work. Section 3 presents the framework design, including the RV-Index and the clearinghouse with standard APIs. Section 4 outlines the validation plan and identifies open issues for community feedback. Section 5 discusses the impacts, limitations, and implementation pathways.

2. BACKGROUND AND RELATED WORKS

The peer review process is a cornerstone of scholarly communication and serves as the primary mechanism to ensure the quality of published research. However, over the past two decades, the peer review system has been facing increasingly complex and escalating crises, driven by structural pressures and evolving dynamics within the academic community. This section reviews the relevant literature to examine the overall landscape and theoretical perspectives related to the problems and existing remedial approaches. The objective of this literature review is to identify critical knowledge gaps and to demonstrate how the framework proposed in this study can address these challenges. The details are as follows.

2.1 Crises and Structural Problems of Peer Review

A substantial body of recent literature describes the status of peer review as being in crisis **[1]**, a direct consequence of the publish-or-perish culture that has driven an exponential growth in manuscript volume. This phenomenon imposes an unsustainable burden on the system, leading to what is termed the "tragedy of the reviewer commons" [2], in which the collective resources, namely reviewers' time and expertise, are depleted beyond capacity.

The most evident problem is a shortage of qualified and willing reviewers. Journal editors report increasing difficulty in securing reviewers, with very low invitation acceptance rates [3], and many invitees simply ignore requests due to conflicting workloads and time pressures [4]. Faculty fatigue, particularly in the post-COVID-19 period, and a decline in academic personnel further exacerbate the situation.

Workload imbalance is another pressing concern. Studies indicate that only 10 – 20% of reviewers carry more than half of all review tasks which leads to reviewer fatigue [5], [6]. The consequences include delays and inefficiencies throughout the process. An analysis of more than 3,500 author experiences finds that the average time to complete the first review round can reach 13 weeks, with substantial variation across disciplines. Notably, delays arise not only from reviewers but also from inefficient editorial workflows, especially the excessive time to issue immediate rejection decisions (desk rejection), which is often longer than necessary [7].

Beyond quantitative issues, qualitative problems and mismatched expectations among stakeholders persist [8]. Clear differences exist in the perceived purpose of peer review. Early-career researchers expect developmental feedback to improve manuscripts, whereas editors and senior researchers view peer review primarily as a mechanism for decision-making and quality control. This perception gap [9] fuels dissatisfaction, particularly among early-career researchers, who report insufficient training, low confidence, and a sense that their reviewing contributions are undervalued [10].

Ultimately, the crisis threatens the foundation of science, namely academic integrity. The pressure to publish has contributed to the rise of questionable research practices, for example p-hacking and selective reporting, which the current peer review system is not sufficiently equipped to detect [11].

2.2 Incentive and Reward System Approaches

In response to the foregoing crises, a substantial body of literature has focused on designing incentive systems to stimulate participation and to raise the effort level and quality of reviews. Economic ideas have been proposed to create "costs" that screen out low-quality submissions, for example increasing submission fees or requiring authors to review other manuscripts in exchange [12]. A variety of monetary and non-monetary rewards have also been cataloged, including free access to databases, certificates of recognition, and invitations to join editorial boards [4], [13].

Incentive design is delicate and complex. Non-monetary rewards are often regarded as preferable, yet experimental evidence shows that such incentives, for example public acknowledgments, have negligible effects on reviewer behavior. More concerning, performance-contingent rewards can undermine intrinsic motivation and the sense of contributing to the commons [14], which is a primary reason reviewers agree to review in the first place [15]. Monetary incentives, although shown to reduce delays [16], raise concerns about bias and potential degradation of review quality [4], [17], [18].

Game-theoretic models indicate that, under normal conditions, the dominant strategies for both authors and reviewers tend toward defection, and that achieving cooperation requires sufficiently strong external incentives [19]. Studies suggest that open review can increase the effort of both authors and reviewers by strengthening reputational incentives [20]. In addition, mechanisms that combine peer rating with endogenous matching can create a market for quality, in which participants invest in their reputations to gain access to higher-quality counterparts in the future [21]. This perspective aligns with analyses that peer review is pulled between a gift economy, which relies on reciprocal exchange expectations, and economies of accumulation, which emphasize competition for reputation and academic capital [22].

2.3 Reputation Systems

Reputation systems are key mechanisms for building trust in decentralized environments where participants may not know one another. Such systems aggregate, process, and disseminate information about participants' past behavior to help others predict future behavior and decide whether to interact [23]. In the context of scholarly publishing, reputation systems can be employed to evaluate reviewers and to create effective incentives.

The authors' prior foundational work proposed a reputation framework for email senders that computes reputation scores from multiple factors [24], [25], [26]. The same principles can be adapted to reviewer systems by constructing richer reputation models. Benlahbib and Nfaoui [27] demonstrate the aggregation of multidimensional review attributes, for example usefulness, timeliness, sentiment, and assigned scores, into a single reputation value. This is directly applicable to assessing reviewer quality. In addition, mathematically robust approaches such as the beta probability distribution, a Bayesian-based method, can be used to rank tacit expertise of employees in organizations [28], which is analogous to inferring the true reviewing skill of article referees. The effectiveness of reputation mechanisms has been shown in citizen science projects, where a "karma" system for filtering participant contributions reduced overall output error by more than half [29]. This suggests that implementing a reviewer reputation system, such as the proposed RV-Index, can materially improve the quality of peer review processes. To increase sophistication and effectiveness, one may consider second-order reputation, in which an individual's score depends not only on their own actions but also on the reputation of those with whom they interact [30]. In this setting, performing reviews for highly reputable journals or authors could positively affect a reviewer's score more than usual.

Designing reputation systems must account for several critical requirements, especially in sensitive domains such as healthcare. These include adaptability to changing behavior, fairness to new users, compatibility across diverse contexts, reliability, and, most importantly, privacy and security. The system must resist attacks including unfair ratings, collusion, and Sybil attacks.

To address these privacy and security requirements, blockchain has been proposed as a promising solution. A blockchain can serve as a transparent and immutable distributed ledger for permanently storing auditable reputation data. Moreover, combining advanced cryptographic techniques, such as secure multiparty computation (SMC), with blockchain can preserve the privacy of evaluation data even in adversarial-majority settings [31].

2.4 Summary of Gaps in the Literature and Research Direction

The comprehensive literature review reveals that, despite numerous efforts to address the problems of peer review, most solutions remain fragmented and unable to resolve structural issues sustainably. Many studies highlight the critical need for tangible recognition, yet there is no shared infrastructure that makes rewards portable. Furthermore, while the concept of reviewer quality is widely discussed, an auditable and

standardized metric is still lacking.

To synthesize these findings and establish the research direction, Table 1 outlines the critical gaps identified in current literature and maps them directly to the core components of the proposed Incentive Framework.

In summary, this study does not propose a single isolated tool, but rather an integrated architecture that interlinks economics (incentives), measurement (metrics), and standardized workflows. The detailed design and operational mechanics of this proposed architecture will be extensively presented in the next section

Table 1 *Mapping of Literature Gaps to the Proposed Framework Components*

Identified Gap in Literature	Current Limitations	Proposed Solution in This Framework
1. Lack of Standardized Incentives	Rewards are confined within individual journals. Non-monetary incentives fail to sustain long-term motivation [32].	**Clearinghouse:** Creates a neutral, centralized entity to manage auditable rewards, converting diverse publisher benefits into transferable Universal Points.
2. Absence of Widely Accepted Quality Metrics	No standardized, transparent index for evaluating reviewer performance equitably across different publishers.	**RV-Index:** Establishes a transparent, multidimensional quality index with a time-decay mechanism to ensure fairness and responsiveness to current performance.
3. Long Review Cycles & Reviewer Overload	Delays in the review process and reviewer fatigue continue to pose major challenges without a holistic mitigation strategy.	**RV-Index & Workflow:** Identifies active and efficient reviewers accurately, while the integrated incentive mechanism motivates timely task completion.
4. Fragmented Technological Solutions	Existing tools (e.g., AI filters, isolated databases) address specific issues but lack an interoperable economic layer.	**Standard API/Portal:** Provides a transparent and interoperable interface for journals to seamlessly access the reviewer repository and the reward ecosystem.

3. FRAMEWORK DESIGN AND ARCHITECTURE

This chapter describes the architecture and operational processes of the proposed Incentive framework for Academic Publication Reviewer System. The goal is to create a peer review ecosystem that is efficient, transparent, and sustained by meaningful incentives for all stakeholders. The proposed framework consists of three core modules that collectively serve as the central mechanism for managing rewards and benefits. These components are interconnected through a standard portal and API, ensuring interoperability and transparency. The framework adopts a cloud-native microservice architecture with asynchronous message queuing. This design allows the API to act as a resilient buffer, enabling dynamic scale-out for elasticity. Consequently, it is theoretically capable of handling high-frequency requests and workload spikes without data loss during simultaneous multi-publisher adoption. The details are as follows.

3.1 Workflow for Author-led Preprint Certification

This process introduces a new service through which authors can directly request quality assessment of their manuscripts from the framework before dissemination on preprint platforms, thereby enhancing the credibility of the work. The workflow is illustrated in Fig. 1 and consists of sequential steps designed to ensure quality assurance and safeguard all parties:

3.1.1 Step 1: Initiation and Payment, the author, acting as the request side, submits the manuscript along with a low upfront service fee (not more than USD 150). This advance payment serves two purposes: (a) it guarantees compensation for reviewers, mitigating default risk, and (b) it functions as a preliminary quality filter to encourage authors to evaluate the readiness of their work before submission.

3.1.2 Steps 2–5: Review and Revision, the framework, serving as an intermediary, selects reviewers according to tier and domain expertise, then forwards the manuscript for evaluation. Reviewers return detailed feedback through the system, enabling authors to revise the manuscript and resubmit it as the final version.

3.1.3 Steps 6–8: Approval and Digital Certification, Reviewers verify the correctness of the final manuscript (equivalent to camera-ready format) and provide final approval. Upon approval, the system generates a review record with a digital signature embedded into the

manuscript file, certifying that it has undergone a standardized and auditable evaluation process.

3.1.4 Steps 9–12: Publication and Closing, The certified manuscript is disseminated by the author on the chosen preprint platform or scholarly repository. In parallel, the author provides feedback on review quality, which is used to update the reviewer's RV-Index. Finally, the framework releases the escrowed compensation to the reviewer's account, thereby completing the transaction.

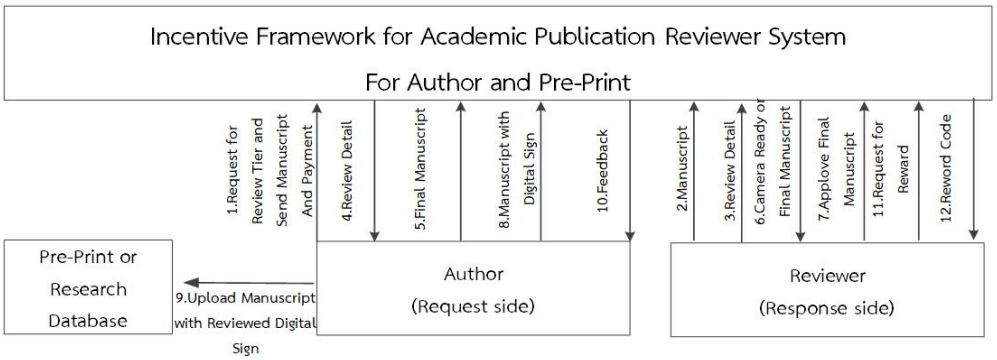


***Fig. 1** Workflow for Author-led Preprint Certification*
(Note: RV = Reviewer Index; UP = Universal Points)

3.2 Workflow for Publisher-led Peer Review

This process is designed to integrate with existing workflows of publishers and academic conferences in order to improve efficiency and transparency in reviewer procurement, as illustrated in Fig. 2. The steps are as follows.

3.2.1 Steps 1–3: Request and Allocation, After the author submits a manuscript through the publisher's standard system, the publisher sends a reviewer request to the framework via the central portal, specifying desired attributes such as tier and service-level agreement (SLA) requirements. The system replies with a list of suitable reviewers together with a request code for tracking.

3.2.2 Steps 4–7: Review and Decision, The publisher uses the provided information to contact reviewers and dispatch the manuscript for evaluation. Review results are returned to the publisher for use in editorial decision-making and notification to the author.

3.2.3 Steps 8 and 10: Confirmation and Reward Allocation, Upon completion, the publisher submits performance feedback for the reviewers and a reward-confirmation code back to the framework. The system records the information and allocates rewards to reviewers in the form of Universal Points.

3.2.4 Steps 6 and 9: Supplementary Mechanisms for Reviewers, The framework includes additional mechanisms to protect reviewer interests:

3.2.4.1 Step 6 Follow-up for Reward: If there is a delay in reward confirmation from the publisher, reviewers can use this channel to check status.

3.2.4.2 Step 9 Redeem for Reward: Reviewers can redeem all accumulated points in their accounts for benefits designated by the clearinghouse at any time.

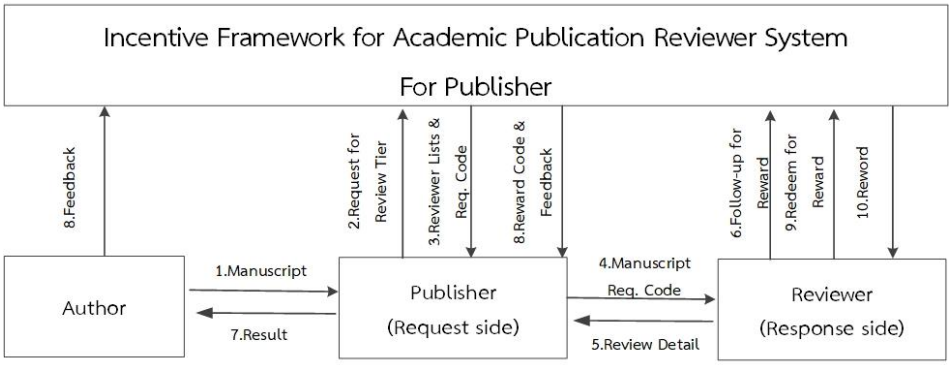


Fig. 2 *Workflow for Publisher-led Peer Review*
(Note: SLA = Service Level Agreement; UP = Universal Points; RV = Reviewer Index)

3.3 Reviewer Index (RV-Index) and Tiering

The Reviewer Index (RV-Index) serves as the central mechanism for assessing reviewer quality and establishing transparent standards across publishers and platforms. It is designed as a portable, comparable score synthesized from multiple dimensions, including quality, timeliness, engagement, contextual signals, policy factors, and second-order reputation. The final index score is computed as a weighted sum of these attributes, as defined in Equation (1):

$$\boldsymbol{RV_i = \omega_Q \widetilde{Q_i} + \omega_T \widetilde{T_i} + \omega_E E_i + \omega_C C_i + \omega_P P_i + \omega_{SOR} SOR_i} \quad (1)$$

To ensure fairness and accurately reflect current capability, the system applies an exponential time-decay mechanism that emphasizes recent performance over historical data. The calculation for time-decayed attribute scores is expressed in Equation (2):

$$\widetilde{x_i} = \frac{\sum_t e^{-\kappa \Delta t} x_{i,t}}{\sum_t e^{-\kappa \Delta t}} \quad (2)$$

For the tiering mechanism, the framework adopts a dual-layer approach by integrating the internal RV-Index with external reputation signals, such as verified academic impact or prior editorial roles. The overall reputation score used for categorizing reviewers into auditable tiers is calculated as shown in Equation (3):

$$\boldsymbol{Rep_i = wRV_i + (1 - w)Z_i} \quad (3)$$

To mitigate cold-start issues and score volatility, the framework employs Bayesian updating with pre-defined priors. These act as a statistical anchor, providing the necessary prior strength to prevent extreme swings from early reviews. The RV-Index thus evolves gradually, converging to the reviewer's true performance level as evidence accumulates, ensuring both fairness and resilience to outliers.

3.4 Clearinghouse and Reward Conversion

The clearinghouse functions as a neutral economic layer that aggregates diverse forms of compensation and converts them into Universal Points (UP) for use across different platforms. To guarantee equity, the framework incorporates a difficulty multiplier based on field-specific scarcity or manuscript complexity. The difficulty-adjusted effective reward is determined via Equation (4):

$$\boldsymbol{\Phi(Reward) = r_\$ V_k M_{difficulty}} \quad (4)$$

Furthermore, to maintain economic stability and prevent point inflation, the clearinghouse enforces a policy-driven limit on monthly point accumulation. This mechanism reduces structural imbalances across disciplines, with the monthly accumulation cap defined in Equation (5):

$$\boldsymbol{UP_{i,month} = \min\left(\sum UP_{i,t}, Cap_{monthly}\right)} \quad (5)$$

Across different publishing settings, the Clearinghouse acts as a neutral intermediary to standardize exchange rates, converting diverse publisher benefits into portable Universal Points (UP). Supported by a standardized API, this ensures reviewers can seamlessly transfer and redeem rewards across various platforms. However, because organizational needs and reward values differ significantly between high-tier and regional publishers, the Clearinghouse also supports a consensus-driven valuation model. This allows for

necessary policy negotiations and tiered exchange rates, ensuring equitable point allocations across different academic venues.

All symbols, parameters, and variable definitions utilized in the aforementioned equations are summarized in Table 2. Based on the architecture and mathematical models presented in detail in this section, Section 4 (Framework Validation) focuses on analytical validation to demonstrate the effectiveness of the proposed framework. This validation will show that the designed mechanisms can enhance the efficiency of the peer review ecosystem, specifically through queueing models to evaluate the impact on waiting times, and probabilistic models to confirm the stability and fairness of the RV-Index.

Table 2 *Nomenclature of Symbols and Parameters.*

Symbol	Description
RV_i, Rep_i	Final Reviewer Index score and Overall reputation score for tiering
$\widetilde{Q}_i, \widetilde{T}_i, E_i$	Time-decayed Quality, Timeliness, and Engagement scores
C_i, P_i, SOR_i	Contextual signals, Policy factors, and Second-order reputation
Z_i, w	External reputation factor and its balancing weight
$\omega, \kappa, \Delta t$	Normalized dimension weights, Decay constant, and Elapsed time
Φ(Reward)	Difficulty-adjusted effective reward
$UP_{i,t}, UP_{i,month}$	Universal Points earned at review event *t* and monthly total
$r_{\$}, V_k, M_{difficulty}$	Base reward rate, Task value, and Difficulty multiplier
$Cap_{monthly}$	Maximum allowable accumulated Universal Points per month

4. FRAMEWORK VALIDATION

In this section, we present the validation methodology and analytical results for the proposed framework. The focus is on architectural and design validation, which is a standard research methodology in software engineering and systems theory. The objective is to demonstrate logical rigor, internal consistency, and stability of the incentive mechanisms as designed in theory. This validation evaluates the blueprint of the system to ensure that no structural vulnerabilities exist prior to empirical testing with real users, which will be conducted in subsequent research phases. The following table summarizes the application of well-established mathematical theories employed to validate each major component of the framework, as shown in Table 3.

Table 3 *Analytical Validation Mapping of Framework Components*

Validated Function	Applied Theory	Rationale
3.1 Workflow for Author-led 3.2 Workflow for Publisher-led	Queuing Model	Queueing theory analyzes workload accumulation and waiting time, enabling validation that both workflow types reduce overall review cycle time.
3.3 Reviewer Index (RV-Index)	Probability Model	The use of Bayesian updating and Beta distribution provides statistical rigor and probabilistic justification for RV-Index calculations, ensuring fairness, credibility, and stability.
3.4 Clearinghouse	Mechanism Design	The clearinghouse specifies auditable conversion and portability of rewards across venues, providing enforceable rules for issuance, redemption, and transfer with traceability.

4.1 Operational Efficiency via Queueing Theory

We validate the operational impact of the incentive framework by using a multi-server queueing model. In this model, the submission of manuscripts acts as the arrival process, and reviewers function as parallel servers. The proposed incentives are designed to accelerate the reviewers' service speed. The simulation results demonstrate that under stable system conditions, even a modest improvement in the review speed produces a significant, nonlinear reduction in both the average waiting time and the total time a manuscript

spends in the system. This efficiency gain is particularly pronounced when the system is operating near its maximum capacity. Both the Author-led and Publisher-led scenarios confirm this performance improvement, as illustrated in Fig. 3 and Fig. 4, respectively.

4.2 Reviewer Index Validity via Bayesian Updating and Time-Decay

To ensure fairness and accuracy, the Reviewer Index is computed using a time-decay mechanism that prioritizes recent performance. As a reviewer completes more tasks, this exponential decay function assigns progressively higher importance to their latest reviews while gradually reducing the impact of older historical data. Fig. 5 visualizes how these weights are distributed across consecutive review events. Additionally, Fig. 6 illustrates the raw, per-event scores for quality and timeliness prior to the final aggregation. Together, these findings verify that the time-adjusted metrics and the final Reviewer Index remain highly responsive to recent changes in a reviewer's behavior while maintaining overall statistical consistency over time.

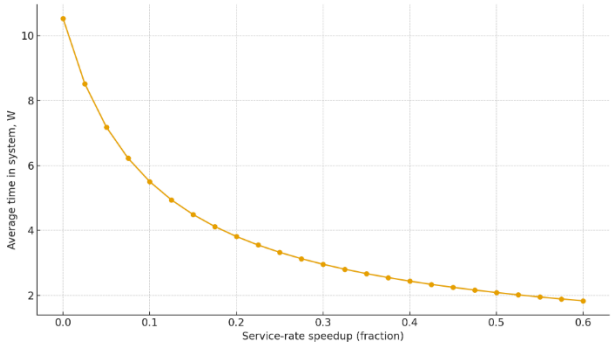


Fig. 3 *Queueing Model: System Time vs. Service Rate (Author-led)*

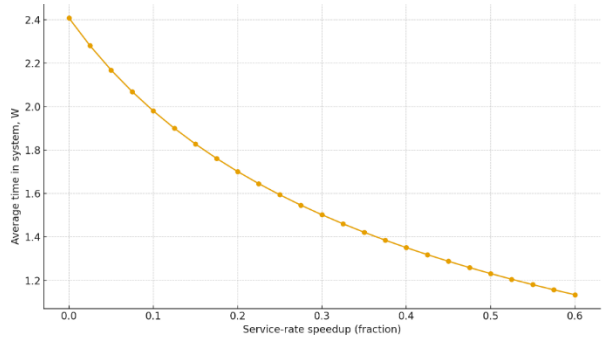


Fig. 4 *Queueing Model: System Time vs. Service Rate (Publisher-led)*

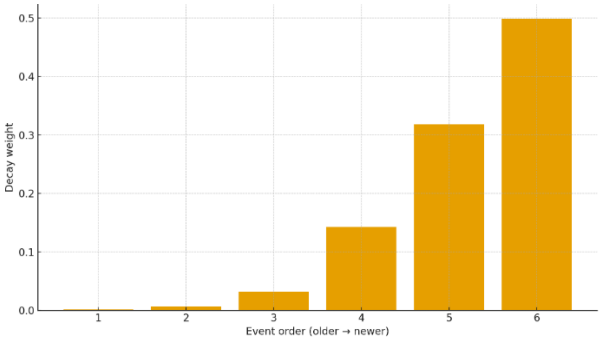


Fig. 5 *Time-Decay Weights by Event Recency*

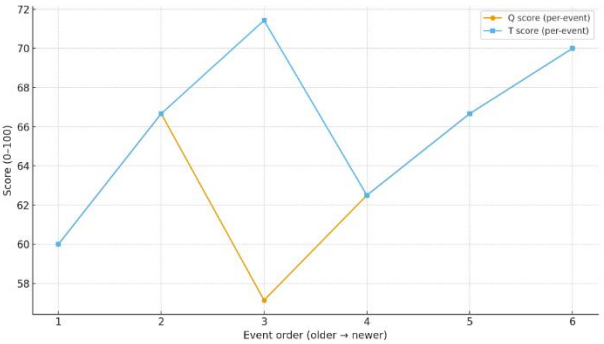


Fig. 6 *Example Per-Event Scores for Quality (Q) and Timeliness (T)*

4.3 Reward Governance via a Clearinghouse

We implement reward governance with per-task rewards, lateness penalties, monthly caps, and redemption mechanisms. Analytical simulations demonstrate that enforcing a maximum accumulation cap effectively prevents point inflation, while redemption immediately removes outstanding credit. Consequently, these mechanisms successfully stabilize the incentive economy over time without the need for complex, resource-heavy interventions.

4.4 Session Summary

Across the queueing analysis, time-decay validation, and clearinghouse control simulations, the analytical evidence consistently supports the theoretical soundness and operational stability of the proposed framework. These validations indicate that the designed mechanisms are effective and demonstrate readiness for real-world implementation. The overall conclusions, potential impacts, and future deployment pathways are discussed in the next section.

5. CONCLUSIONS

This paper proposes a novel incentive framework for academic peer review that is designed to address systemic issues of fairness, transparency, and sustainability. By integrating a multi-dimensional RV-Index and a Clearinghouse for auditable reward conversion, the framework establishes a robust and interoperable infrastructure. The theoretical validity of this architecture was rigorously examined in Section 4. Queueing analysis confirmed that the framework can improve operational efficiency by reducing review cycle times (Fig. 3 and Fig. 4). The fairness and recency of the RV-Index are ensured by exponential time-decay mechanisms, which keep the index responsive to current performance (Fig. 5 and Fig. 6). Collectively, these validations confirm the framework's soundness and its potential to enhance the quality and efficiency of the peer review ecosystem. As an immediate next step, this research will proceed with a large-scale survey of 500–1,000 participants from diverse academic communities (e.g., IEEE, ACM, COPE) to establish content validity and calibrate key system parameters, such as RV-Index weights and difficulty multipliers. Furthermore, to comprehensively evaluate the ecosystem's long-term sustainability, future studies will incorporate game-theoretic utility analysis, gamification mechanisms grounded in Self-Determination Theory (SDT), blockchain-based security architectures, and economic stability simulations for reward governance. The feedback and subsequent evaluations will be used to refine the model and strengthen its potential for widespread adoption.

Finally, the framework is designed with a microservice architecture to support flexible implementation pathways. Publishers, institutions, and other organizations can choose to adopt the full end-to-end system or implement selected modules (e.g., RV-Index, Clearinghouse) that interoperate through standard APIs. This modularity ensures that the framework can be progressively integrated into the existing ecosystem, delivering collective benefits while preserving interoperability and auditability. However, real-world implementation presents certain practical and structural challenges. First, key system parameters, such as RV-Index weights and difficulty multipliers, require precise calibration. To address this limitation, future deployment necessitates a large-scale survey involving 500 to 1,000 participants from diverse academic communities to ensure stability and widespread acceptance. Secondly, establishing a centralized reward economy requires complex policy negotiations among participating publishers. Because publishers differ significantly in reputation, resources, and operational needs, standardizing the valuation of rewards remains a critical challenge. For example, determining whether tasks performed for high-impact journals should yield different Universal Points (UP) weighting than those for regional venues is a key issue that must be addressed. To resolve this, future iterations of the Clearinghouse must develop a consensus-driven valuation model or a tiered exchange rate system that accommodates these disparities equitably.

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