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MORALITY BEFORE KNOWLEDGE

Closing the financial access gap: Pegadaian's hybrid strategy as a model for equitable economic inclusion

Triaswari Ayunandini[1,*], Asnia Sundari[1], Revie Nevilla Extin[1], Ririn Ayu Safitri[2], Afrizal Fauzi[3]

[1] *Department of Economic Education, Faculty of Teacher Training and Education, Universitas Lampung, Bandar Lampung, Lampung 34145, Indonesia;*
[2] *Department of Accounting, Faculty of Busines and Finance, Universitas Media Nusantara Citra, West Jakarta City, Special Capital Region of Jakarta 11520, Indonesia;*
[3] *Department of Management, Faculty of Economics and Business, Universitas Lampung, Bandar Lampung, Lampung 34145, Indonesia.*
*Correspondence: 2413031029@students.unila.ac.id

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ABSTRACT

Background: Digital financial transformation has not fully yielded functional financial inclusion, particularly among unbanked and underbanked populations in non-urban areas and underserved regions. Fully digital service approaches risk generating second-level digital divides stemming from limited digital literacy, infrastructural deficiencies, and low user trust. This study aims to analyze the implementation of PT Pegadaian's hybrid strategy in advancing substantive financial inclusion and equitable economic empowerment. **Methods:** This study employs a systematic literature review (SLR) following PRISMA guidelines via lens scholar. Of 1,337 identified articles, 26 met inclusion criteria and were analyzed through thematic analysis guided by the perspectives of substantive financial inclusion and distributive justice. **Findings:** Pegadaian's hybrid strategy implementation confronts three barrier clusters constituting a digitalization paradox: structural barriers within agent networks, urban-biased interfaces on digital platforms, and real-time O2O integration desynchronization. In response, this study formulates the equitable seamless hybrid framework (ESHF), integrating the reconstruction of agents' roles as financial literacy consultants, lite-mode platform optimization, and O2O synchronization grounded in the principle of *Hifz al-Mal*, with the potential to reduce information asymmetry and lower MSME capital costs. **Conclusion:** The ESHF model repositions hybrid strategy as a strategic instrument for institutionalizing economic justice through a high-tech, high-touch approach oriented toward distributive justice, rather than a mere operational-technical option. **Novelty/Originality of this article:** The originality of this study lies in the formulation of ESHF, which transcends conventional omnichannel approaches through the integration of user-needs-driven AI agent autonomy, lite-mode platforms, and O2O synchronization within the moral framework of *Hifz al-Mal*, offering a new interdisciplinary approach to the study of hybrid strategies in public financial institutions operating within developing economies.

KEYWORDS: digital financial services; hybrid strategy; pawnshop; public financial institution; substantive financial inclusion.

1. Introduction

The global digital financial transformation is accelerating at an uneven pace. In many developing countries, expanded access to technology does not automatically lead to functional financial inclusion; rather, it gives rise to a "second-level digital divide" that is, a

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gap no longer related to device ownership but to skills, trust, and patterns of productive technology use (Schmoelz et al., 2023; Labudová & Fodranova, 2024). This situation reflects the paradox of digitalization, where the expansion of digital access does not yield equitable benefits but instead gives rise to new forms of inequality among social groups with differing capabilities (Heeks, 2022). The development of digital infrastructure, which is concentrated in urban areas, means that rural and remote communities continue to face access limitations (Mpofu, 2024), while low digital literacy and trust in the system often prove to be more decisive factors than the mere availability of the technology itself (Sadik & Rahman, 2024). As a result, fully digital service strategies tend to be urban-biased and serve only those who are already prepared in terms of both infrastructure and capacity (Kerras et al., 2022).

Indonesia is no exception to this phenomenon. National internet penetration has reached 80.66% (APJII, 2025). Yet, the Financial Inclusion Index stands at only 80.51% (OJK, 2025), indicating that digital access has not yet been fully converted into productive use of financial services. The country's archipelagic geography, particularly in the 3T regions that frequently experience signal dead zones, further widens this gap. Globally, approximately 1.4 billion adults remain unbanked due to geographic and socioeconomic barriers, as well as low financial literacy (Elouaourti & Ibourk, 2024; Nadeem, 2024), and various studies confirm that digital infrastructure alone is insufficient without the support of institutional support capable of directly reaching communities (Ababio et al., 2024). This is where agent networks serve as a strategic last-mile delivery mechanism through their social and geographic proximity to the community (Anakpo et al., 2023; Siagian et al., 2022; Razak, 2023).

The effectiveness of an agent network is inextricably linked to an institution's ability to integrate physical and digital services. The success of digital transformation is influenced by perceived ease of use, perceived usefulness, and user trust in the security of the system (Odei-Appiah et al., 2022; Alnemer, 2022), which are generally achieved through omnichannel strategies and Online-to-Offline (O2O) models (Adelaja et al., 2024; Linh & Huyen, 2025). This approach must be geared toward substantive financial inclusion, not merely the formal availability of services, but tangible benefits for vulnerable groups (Nadeem, 2024; Elouaourti & Ibourk, 2024).

PT Pegadaian serves as a relevant case study for examining these dynamics. As of 2023, Pegadaian had developed more than 206,000 agents, a significant increase from 4,411 agents in 2018, and served approximately 24.9 million customers from the grassroots segment (Cendana et al., 2024). Its digital transformation continues to gain momentum, with an app that has been downloaded more than five million times and is projected to generate more than 34 million digital transactions by 2025. However, various reports still point to system disruptions, functional limitations of the app, and complaints from agents and customers, indicating the risk of channel misalignment in its implementation (Cendana et al., 2024).

Although hybrid strategies are increasingly being implemented, the existing literature still frames them as purely technical issues (Suriansha, 2021; Azhari & Nawawi, 2025), while studies that view them as institutional mechanisms for addressing structural exclusion remain very limited. The "high-tech, high-touch" approach is relevant here, in that digital expansion must be accompanied by human intermediaries capable of building trust and bridging the gap between technology and the realities of marginalized communities (Wanof, 2023). Based on this gap, this study aims to analyze Pegadaian's hybrid strategy in integrating physical and digital services to support financial inclusion and equitable economic empowerment. Using a Systematic Literature Review (SLR), this study examines implementation barriers, formulates a strategic reorientation, and proposes the Equitable Seamless Hybrid Framework (ESHF) conceptual model as an institutional instrument for achieving a more inclusive and equitable economy.

2. Methods

2.1 Study design

This study employs the Systematic Literature Review (SLR) method, a research approach that is systematic, structured, transparent, and replicable, designed to identify, evaluate, and synthesize findings from previous studies relevant to a specific topic. The SLR method was chosen because it provides a comprehensive understanding of conceptual developments, empirical evidence, research trends, and research gaps regarding Pegadaian's hybrid strategy in integrating offline and online services. According to Snyder (2024), a systematic literature review allows researchers to systematically combine various research findings, resulting in a stronger and more objective synthesis of knowledge compared to a conventional literature review.

2.2 Data selection and analysis

The research was conducted in several main stages, namely: formulating the research questions; determining search keywords relevant to the research topic; conducting a literature search in the Lens Scholar database; establishing inclusion and exclusion criteria; conducting the article screening and selection process; assessing the eligibility of articles; and analyzing and synthesizing articles that met the criteria. The selected articles were limited to scientific publications from 2022 to 2026, in both Indonesian and English. They had a direct relevance to hybrid strategies, digital transformation, omnichannel services, and the integration of offline–online services in the financial services sector.

Table 1. Criteria for selected articles

Inclusion Criteria	Exclusion Criteria
Articles published between 2022 and 2026	Articles published outside the 2022–2026 period
This article has been peer-reviewed	This article has not been peer-reviewed
The articles journals indexed in Scopus and Sinta	The articles journal not indexed in Scopus or Sinta
Article written in English or Indonesian	Article is not written in English or Indonesian
The article covers topics related to pawnbroking, inequality, barriers, and financial inclusion	The topic of the article is not related to pawnshops, inequality, barriers, and inclusivity
Type of secondary research	This is not a type of secondary research

To ensure transparency and consistency in the literature selection process, this study uses the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines as its primary reference. These guidelines provide systematic guidance on documenting all stages of article search and selection, from identification, screening, and eligibility assessment to the determination of articles included in the review. Through the PRISMA flowchart, researchers can detail the number of articles obtained during the initial search phase, articles excluded due to duplication or irrelevance to the research topic, articles meeting eligibility criteria, and those ultimately used in the analysis. The application of the PRISMA guidelines also contributes to enhancing the transparency of research result reporting. It facilitates the replication of the study by other researchers, thereby making the obtained results more accountable.

Next, the selected articles were analyzed using thematic analysis to identify patterns, themes, and relationships among the research findings. The synthesis process involved comparing the results of previous studies, identifying similarities and differences in the findings, and examining their implications for the development of Pegadaian's hybrid strategy. To minimize potential bias, this study implemented detailed documentation of the article selection process, the use of consistent selection criteria, and a critical review of all selected literature, ensuring that the resulting synthesis possesses a higher level of validity and reliability. The following table presents the inclusion and exclusion criteria used in the literature selection process. These criteria serve as the basis for determining which articles qualify for analysis at each stage of the PRISMA framework, from screening to inclusion.

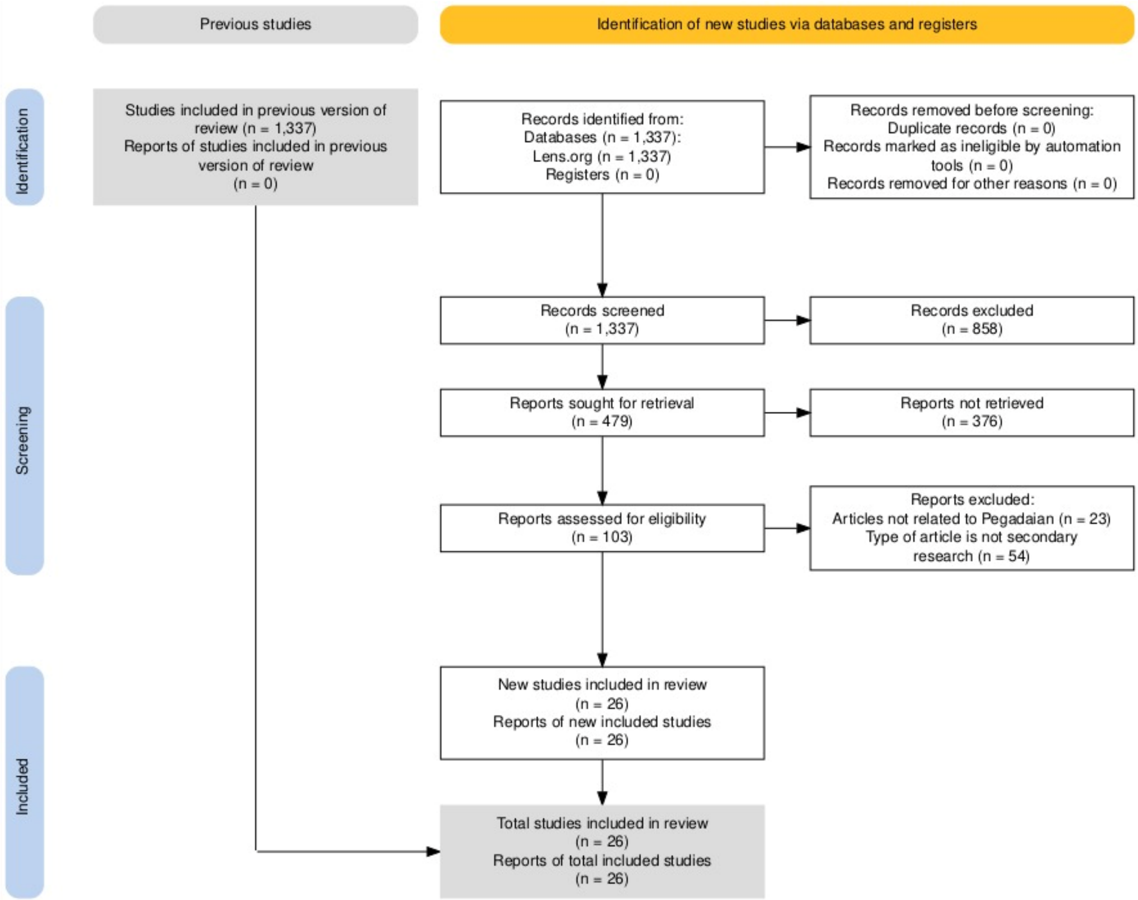

Fig. 1. PRISMA flow diagram

3. Results and Discussion

3.1 Synthesis of systematic review findings

The findings of the systematic review of 26 selected studies are presented in a synthesis matrix in Table 2. This matrix synthesizes the correlations between the operational barriers identified in Section 3.2 and the strategic reorientation directions discussed in Section 3.3. This synthesis of data serves as an empirical foundation for a critical analysis of gaps in hybrid services. It forms the basis for the formulation of the conceptual model, the Equitable Seamless Hybrid Framework (ESHF), at the end of this chapter.

Table 2. Literature review matrix

Author (Year)	Main Focus of the Research	Operational Obstacle (3.2)	Strategic Reorientation & Economic Equitable (3.3)
Pradnyasari et al. (2024)	Dissemination of the app and customer transaction interest.	Device exclusivity (Android only) and system lag (latency).	Cross-platform application development and server optimization to ensure equitable access.
Cendana et al. (2024)	Analysis of agent performance in the Kupang region.	The high rate of inactive agents (dormancy) and low work commitment.	Regular technical assistance and the implementation of more competitive incentive schemes.

Pebiyanti et al. (2023)	Service Communication Strategies in the Age of Disruption .	The common misconception that Pegadaian is only for pawning physical gold.	Repositioning agents as financial literacy consultants to diversify digital products.
Putra et al. (2023)	Information System Security Governance (COBIT 5).	The risk of cybercrime in transactions at the agent level.	Periodic information system audits (DSS05 standard) to protect customer assets.
Malik et al. (2025)	The effectiveness of digital talent in PDS services.	Barriers to technology adoption and technical issues during the login process.	Enhancing the digital skills of agents and standardizing platform stability.
Savitri (2021)	Operational audit of credit effectiveness.	Weak operational oversight of frontline staff (frontliners/agents).	Systematically strengthening operational audit mechanisms down to the agent level.
Zeliana et al. (2025)	Market penetration and product development strategies.	The lack of scientific documentation regarding the actual challenges faced by field agents.	Periodic strategic evaluations and documentation of obstacles as a basis for policy.
Rokhmah & Yahya (2022)	Online marketing readiness in the SME sector.	Agents' lack of knowledge about effective digital marketing strategies.	Transforming agents into digital facilitators to support the local economy.
Sutarjo & Nurlia (2022)	The effectiveness of using digital service apps to facilitate customer transactions.	Most customers still prefer to wait in line and conduct transactions manually at the branch. As a result, the digitalization goals have not yet been fully achieved.	Transforming a passive app into an active one through aggressive promotion of self-service features (bill checking and payment) to reduce transportation costs for customers in rural areas.
Azmi & Dharma (2023)	The implementation of digital service applications in pawn transactions within daily operations.	Technical challenges include operational network disruptions, frequent application errors, and a lack of adequate office computers.	Network stabilization and minimization of system errors to ensure operational fairness so that no customers are unfairly disadvantaged during the data transition.
Sinurat et al. (2022)	The Impact of Omnichannel Strategies on Customer Loyalty Through User Experience with Pawnshop Products.	The new digital process is limited to the initial booking stage, so customers still have to visit a branch for in-person verification, in addition to time restrictions on pickup and delivery.	Expanding the app's functionality beyond the booking stage and optimizing pickup services to ensure that busy, productive members of the community have equal access to these services.
Iriawan & Edyanto (2025)	The effectiveness of digital applications in improving customer service in regions with specific characteristics.	Challenges stemming from weak internet signals in remote areas and islands, an elderly customer base that is not tech-savvy, and field staff who are not yet proficient with the system.	Closing the digital skills gap through technology training for field staff and regular education for older afults, so that modernization does not create new forms of discrimination.
Pasaribu et al. (2023)	The Effect of Omnichannel Integration Quality on Repurchase Intent via the Mediating Role of Trust.	System connectivity alone is not enough to drive repeat transactions on its own without a deep sense of security in the O2O system.	Ensuring consistency, transparency in valuation estimates, and security across all channels to foster trust among the micro-community

			for safe and equitable financial inclusion.
Oktaviani et al. (2025)	Social media strategies to increase the adoption of digital services at Sharia pawnshops.	The challenge of ensuring technology adoption among vulnerable segments of society and in areas with limited infrastructure.	Promoting equitable inclusion through regular digital literacy education to engage and give proportional priority to technologically marginalized groups.
Aldoghan, Mohammed & Mirzaliev, Sanjar (2025)	Adoption of digital banking and cybersecurity	Low awareness of cybersecurity and low trust in data security	Cybersecurity education and improving digital literacy
Firalya et al. (2024)	User Sentiment Analysis for Pegadaian Digital	Login issues, app bugs, and system downtime	Improved system stability and digital service quality
Avrianto & Murwenie (2024)	Evaluation of the PDS user experience	Poor app quality, network issues, and usability problems	Improved accessibility, system quality, and ease of use
Komantri (2026)	Fintech and financial inclusion	Uneven digital infrastructure, low digital literacy, and data security issues	Strengthening digital infrastructure, digital literacy, and omnichannel services
Dick et al. (2026)	Digital Transformation of Financial Services	System outages, login issues, complex navigation, and low platform reliability	Improved system quality, ease of access, and omnichannel integration
Jaya & Sudarma (2026)	Customer acquisition through PDS	Low digital literacy among customers and the dominance of conventional services	Continuous education and omnichannel service strategies
Maharani & Maharani (2026)	Trust in digital pawnbroking services	Low trust due to issues with data security, governance, and user experience	Enhancing data security, system stability, and inclusive application design
Mahendra & Maria (2024)	PDS Risk Management	The risk of OTP failure and disruptions to digital transactions	Strengthening system infrastructure and mitigating operational risks
Nikmah & Rohana (2025)	Using Tring! by Pegadaian	Verification challenges, low digital literacy, and concerns about app security	User support and ongoing digital education
Pradhipta et al. (2025)	Fintech scalability and financial inclusion	The digital literacy gap and infrastructure access in rural areas	Strengthening infrastructure and inclusive digital literacy programs
Salehaman et al. (2026)	The Digital Transformation of Pegadaian Syariah	Resistance from users with low digital literacy and human resource constraints	Digital education, human resource capacity building, and expanding service inclusion
Sandira et al. (2026)	The Tring! App User Experience	The interface does not yet fully meet user needs, security concerns, and low trust	User-centered design, hybrid services, and building user trustUser-centered design, hybrid services, and building user trust

Overall, the 26 selected studies reflect three interrelated thematic clusters: barriers within the agent network, weaknesses in digital platforms, and misalignment in O2O integration. These three clusters do not exist in isolation; rather, they exacerbate one another, thereby forming what this study refers to as the "digitalization paradox." An understanding of the interconnections among these clusters forms the basis for formulating integrative solutions within the ESHF model, rather than merely addressing problems in isolation.

3.2 Barriers to implementation in pegadaian's hybrid strategy toward an equitable economy

3.2.1 Structural barriers in the pegadaian agent network

Based on the results of a systematic review, it was found that although PT Pegadaian has an extensive network, operations at the agent level still face fundamental barriers. One of the main obstacles is the exclusivity of the digital ecosystem and device accessibility, as the Pegadaian Agent app is currently limited to the Android operating system. This situation automatically prevents potential partners using other platforms from joining the network. Additionally, the effectiveness of daily services is often disrupted by technical inefficiencies such as slow system performance (latency) and login issues, which lead to complaints from both agents and customers (Pradnyasari et al., 2024; Malik et al., 2025).

This structural problem is exacerbated by the high number of inactive agents, or the phenomenon of dormancy. Many agents are officially registered but are, in reality, not actively conducting transactions. This is triggered by a lack of regular technical support as well as a profit-sharing scheme that is considered less competitive compared to the magnitude of work risks and operational costs that must be borne by the agents themselves (Cendana et al., 2024). This low productivity is also closely related to a human resource gap, where many agents fail to educate customers about complex digital products. Consequently, a public misperception persists that Pegadaian's services are limited to physical gold pawnbroking alone, thereby preventing the full optimization of other hybrid service potentials (Pebiyanti et al., 2023; Pradnyasari et al., 2024). Finally, the massive expansion of agents into remote areas poses a serious risk of information security vulnerabilities. Without strict information system governance and adequate infrastructure monitoring, customer transaction data at the agent level becomes a weak point highly vulnerable to cybercrime threats (Putra et al., 2023).

3.2.2 Technical barriers and weaknesses of pegadaian's digital platforms

Pegadaian's digital transformation, implemented through the Pegadaian Digital Service (PDS) platform and the Tring! Super App has not yet been fully realized. Based on a literature review, the most consistent technical barrier identified relates to the application interface, which is considered not user-friendly. Confusing navigation flows create obstacles for customers with low digital literacy, making it difficult for them to access services independently (Maharani & Maharani, 2026; Komantri, 2026; Sandira et al., 2026). This situation is exacerbated by system instability characterized by recurring technical glitches, such as failed login processes, slow application performance, and downtime during peak hours. In the context of financial services, such disruptions not only hinder transactions but also fatally undermine customer trust in the platform's reliability (Mahendra & Maria, 2024; Nikmah & Rohana, 2025; Maharani & Maharani, 2026).

Accessibility gaps also pose a significant structural barrier, particularly for users in non-urban areas. Current digital platforms still tend to be "urban-biased," requiring stable internet connections and high-spec devices, so that vulnerable groups in remote areas face difficulties in accessing financial inclusion (Salehaman et al., 2026; Pradhipta et al., 2025). On the other hand, concerns regarding personal data protection and low digital risk literacy remain dominant factors hindering usage, consistently driving negative customer reviews (Nikmah & Rohana, 2025; Al-Doghan & Mirzaliev, 2024). Finally, issues regarding the platform's relevance to the younger generation were identified. The features within the PDS app are considered not yet fully meeting the expectations and digital lifestyles of young users; if not addressed promptly, this risks causing Pegadaian to lose potential market share in the future (Avrianto & Murwenie, 2024; Dick et al., 2026). Overall, the technical barriers on Pegadaian's digital platform do not exist in isolation; rather, they reinforce one another and form a systemic layer of barriers for the very segments of society that most need inclusive financial services.

3.2.3 Discrepancies in Online-to-Offline (O2O) integration

Online-to-Offline (O2O) integration is a tangible manifestation of Pegadaian's omnichannel strategy, where system discrepancies have been shown to hinder the effectiveness of on-site services directly. This lack of synchronization is clearly evident in the ineffective use of the PDS application, as the majority of customers still prefer to wait in line and conduct transactions manually at outlets, resulting in the digitalization targets not being fully achieved (Sutarjo & Nurlia, 2022). This behavior is not merely a reflection of old habits but rather a rational response by customers to previous negative experiences with an unstable digital system, where a single transaction failure is enough to cause customers to lose trust and revert to manual channels, which are perceived as more reliable and predictable. These operational issues are exacerbated by technical challenges and limitations in on-site support facilities, such as daily network disruptions, frequent application errors, and a lack of adequate office computers, which ultimately degrade the quality of hybrid service provided to customers (Azmi & Dharma, 2023).

In addition to these facility-related obstacles, the limited features of the Kredit Cepat Aman (KCA) product also restrict the new digital process to the initial booking stage, meaning customers must still visit a branch in person to complete the physical verification of the goods, compounded by operational time constraints on the pickup-delivery service (Sinurat et al., 2022). These challenges are even greater in island regions or remote areas due to weak internet signals, an elderly customer segment not yet accustomed to technology, and the internal readiness of field staff who are not yet proficient in operating digital systems (Iriawan & Edyanto, 2025). Consequently, although channel integration has proven to enhance customer trust, this technological connectivity is not yet strong enough to directly drive repeat transactions without the mediation of a deep sense of security, indicating that the integrated system is not yet fully perceived as seamless in supporting their O2O experience (Pasaribu et al., 2023).

3.3 Strategic reorientation toward an equitable economy

3.3.1 Reconstruction of the pegadaian agent network

To address these various operational challenges, a normative strategic reorientation is needed to realize the principle of an "Equitable Economy." The first strategy must focus on the democratization of technology and strengthening platform reliability. To achieve "Access Equity", Pegadaian must provide a cross-platform application that can be used stably across various devices. Server stability is an absolute prerequisite for rebuilding the trust of marginalized customers, particularly in areas with low connectivity that are highly sensitive to transaction failures (Pradnyasari et al., 2024; Malik et al., 2025).

Furthermore, the role of agents must be reconstructed from merely being administrative payment counters to becoming financial literacy consultants for local communities. Through regular guidance and outreach, agents are empowered to serve as the vanguard in educating the public about the diversification of digital products, thereby helping to shift narrow public perceptions and achieve higher-quality financial inclusion (Pebiyanti et al., 2023; Cendana et al., 2024). Specifically, this redefinition of the agent's role means that agents no longer merely facilitate transactions, but also actively identify customers' financial needs, explain which products best suit their circumstances, and guide first-time users through the digital onboarding process for app-based services. In the context of rural communities, where there is still a high level of trust in face-to-face interactions, the presence of trained and knowledgeable agents is a key factor in determining whether a customer will actively and consistently use financial services.

Therefore, investing in agent capacity building is not merely an operational expense but a strategic investment in building a substantial and sustainable foundation for financial inclusion. In terms of protection, in accordance with the principle of ḥifẓ al-māl (protection of assets), companies must conduct periodic information system audits to ensure the security of customer assets. The use of innovative technologies such as AI or IoT to assist with self-assessment processes at the agent level is also essential to reduce transportation costs for rural customers who have previously had to travel to branch offices solely for physical verification (Putra et al., 2023). Finally, the reorientation of the incentive scheme must be carried out fairly, with a greater focus on the sustainability of rural micro-agents businesses. Simplifying registration bureaucracy and providing equitable rewards are expected to enhance agents work commitment and minimize the risk of agents becoming inactive in the future (Cendana et al., 2024). This is consistent with the findings of Sandi et al. (2025), who confirm that performance-based compensation systems have been shown to increase productivity by up to 30% while reducing turnover rates; thus, the reorientation of the Pegadaian agent incentive scheme is not merely an operational agenda, but a long-term strategic investment in building a network of active, loyal, and empowered agents.

3.3.2 Optimization of the pegadaian digital platform

To achieve an equitable digital service transformation, a strategic reorientation is needed that focuses on optimizing the platform based on the needs of marginalized users. The primary normative strategy is to redesign the application interface to make it simpler and easier to understand for all demographics, including older people. Ease of use must be a development standard, as it has been proven to directly contribute to increased customer comfort and loyalty (Sandira et al., 2026; Komantri, 2026). Additionally, strengthening the backend infrastructure is an urgent strategic step to ensure system stability and minimize the risk of downtime. The implementation of systematic risk management based on ISO 31000:2018 is necessary to establish accountable uptime standards for the public (Mahendra & Maria, 2024; Maharani & Maharani, 2026).

In an effort to achieve equitable access for communities outside urban areas, the development of a lightweight version of the app that remains functional under limited internet conditions must be a priority. This technical measure needs to be supported by public education programs targeting rural customers to improve their digital risk literacy (Salehaman et al., 2026; Pradhipta et al., 2025). Platform security and risk education must go hand in hand to build customer trust through sustained cybersecurity campaigns (Al-Doghan & Mirzaliev, 2024; Nikmah & Rohana, 2025). Ultimately, the digital transformation of the Pegadaian platform should not completely replace physical services but should instead be directed toward an inclusive hybrid service model. Integration between digital and in-person channels allows for flexibility for the younger generation while still providing the support needed by traditional customer groups (Dick et al., 2026; Sandira et al., 2026; Jaya & Sudarma, 2026). Thus, the optimization of Pegadaian's digital platform is not merely a technical upgrade, but rather an institutional commitment to ensuring that no segment of society is left behind simply because of their limited access to technology.

3.3.3 Synchronization of integrated online-to-offline (O2O) services

To create an ideal O2O workflow, the alignment of PT Pegadaian's entire omnichannel system must be directed toward achieving equitable economic inclusion for all segments of society, unhindered by geographical or social status barriers. This effort begins by transforming the passive use of the app into active engagement through intensive outreach regarding self-service PDS features such as bill checking and payment transactions, which tangibly provide economic equity for customers in rural areas by reducing transportation costs to branch offices (Sutarjo & Nurlia, 2022; Azmi & Dharma, 2023). This equitable access is further strengthened through network stabilization, minimization of app errors, and the expansion of KCA product functions beyond the booking stage, accompanied by the optimization of goods pickup services so that productive members of the community with limited time can still enjoy equal and flexible access to financial services (Azmi & Dharma, 2023; Sinurat et al., 2022).

Furthermore, the principle of economic justice is realized by reducing the digital divide through technology training for field staff and regular digital literacy education programs for vulnerable segments, such as older people in areas with limited signal coverage, so that system modernization does not create new discrimination but is able to include all segments of society proportionally (Iriawan & Edyanto, 2025; Oktaviani et al., 2025). The integration of these channels must ultimately ensure consistency, transparency in valuation, and security across all channels so that the trust of micro-customers grows strong. Through this approach, the integrated O2O ecosystem is no longer merely a tool for commercial transactions. Still, it transforms into a tangible model of financial inclusion that is safe, equitable, and fair for all segments of society (Pasaribu et al., 2023). Moreover, optimal O2O synchronization has long-term implications that go beyond mere operational efficiency. When customers in remote areas complete digital transactions without any obstacles, that positive experience gradually builds cumulative trust. Trust that grows from real-world experiences is far stronger and more enduring than trust built solely through marketing campaigns. In the long run, this is what will encourage customers not only to repeat transactions but also to expand their use of other financial products offered by Pegadaian. In other words, the success of O2O synchronization is not merely an indicator of technical success but also a reflection of the extent to which Pegadaian has succeeded in transforming its status from a mere service provider into a trusted financial partner for grassroots communities.

3.4 Formulation of the Equitable Seamless Hybrid Framework (ESHF) Conceptual Model

The formulation of the Equitable Seamless Hybrid Framework (ESHF) model is a strategic synthesis designed to bridge the gap between implementation barriers on the ground and the ideal vision of a strategic reorientation toward an equitable economy. As illustrated in Figure 1, this model is not intended merely as an update to technical procedures, but rather as a comprehensive and systemic institutional orchestration. Transformation within the ESHF framework views the adoption of technology not as an end in itself, but as a means to build a financial ecosystem guided by the moral values of the Ethical Shield: *Hifz al-Mal* (protection of assets). This principle serves as a crucial ethical foundation for public financial institutions such as Pegadaian to ensure that every step in the digital transformation process remains focused on protecting the assets of marginalized customers. In the digital age, where the risks of cybercrime and predatory financial practices (such as illegal online loans) are on the rise, this moral framework ensures that technology acts as a shield that safeguards people's dignity and economic resilience, so that digital progress does not come at the expense of the public trust that has been built over more than a century.

Operationally, the ESHF model works by mapping all the Implementational Frictions identified on the left side of the diagram as the primary issues that must be resolved. These obstacles which range from the fragmentation of agent networks and urban-biased digital platforms to the system synchronization paradox are processed through a "transformation engine consisting of three gears that mesh simultaneously." The essence of this process is the creation of a truly seamless service, where the boundaries between the speed of digital services and the reliability of physical services disappear. The first cog in the system, the AI-Powered Agency, grants assessment autonomy to field agents through the use of artificial intelligence to streamline the physical verification process that has long hindered service speed in remote (3T) areas. From a sociocultural perspective, this technology strengthens social capital by transforming the role of agents from mere transaction counters to "financial literacy consultants." Agents serve as cultural interpreters who bridge the complexity of digital algorithms into human interactions that elderly customers and rural communities easily understand. This "high-tech, high-touch" approach ensures that modernization does not lead to social alienation but, on the contrary, deepens the penetration of substantial financial inclusion.

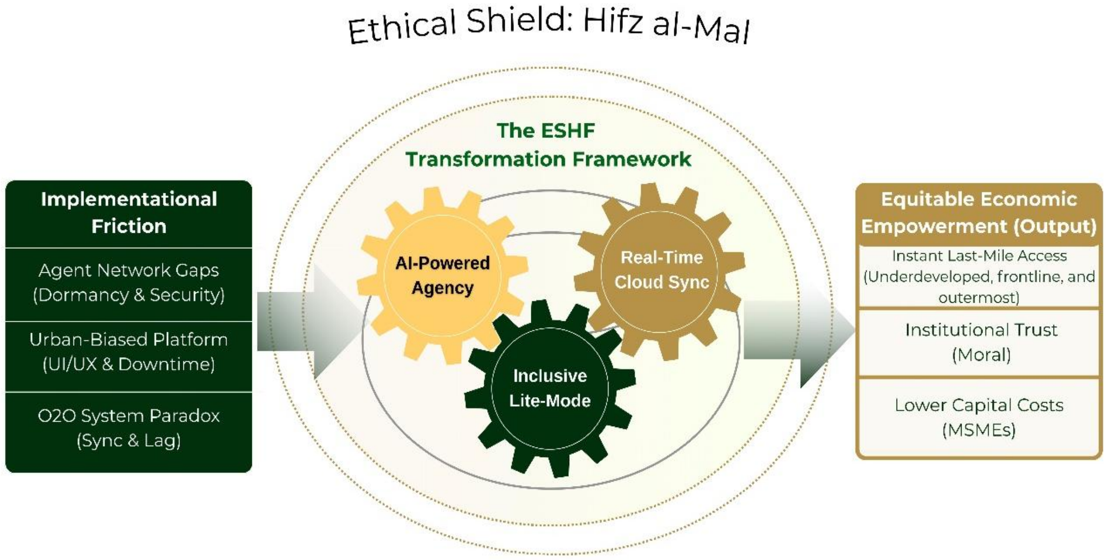

Fig. 2. The equitable seamless hybrid framework (ESHF) for pegadaian's transformation.

This first gear is driven simultaneously by the second gear, Inclusive Lite-Mode, which focuses on optimizing the digital platform interface so that it remains adaptable in areas with limited signal coverage and device availability. This strategy technically breaks down the urban bias that has long served as a barrier for vulnerable groups. Meanwhile, the third component, Real-Time Cloud Sync, acts as the integration anchor that ensures all transaction data between online and offline channels is synchronized instantly. To provide a more technical explanation of how the framework works,

Table 3 presents a systematic mapping of how each innovation in the ESHF model addresses the specific challenges identified in the early stages of the research. This table provides an operational framework linking problem clusters in the field (input), strategic interventions through the ESHF pillars (process), and the economic equity targets to be achieved (output). The mapping in Table 3 shows that each cluster of problems cannot be resolved through a single intervention. Obstacles in the agent network, for example, cannot be sufficiently addressed by technological upgrades alone if a non-competitive incentive scheme continues to keep the agent dormancy rate high. Similarly, the lite-mode platform, which is designed for non-urban areas, will only function optimally if real-time cloud synchronization also runs smoothly. It is this interdependence among the pillars that makes the ESHF not merely a list of technical recommendations, but rather a system that requires simultaneous and coordinated implementation across all institutional levels.

Table 3. Mapping of ESHF Model Innovations in Addressing Hybrid Strategy Challenges

Problem Clusters (Input)	ESHF Strategic Innovation (Process)	Goals of Economic Justice (Outputs)
Agent network		
1. Device Exclusivity and System Limitations. 2. High Rate of Inactive Agents (Dormancy). 3. Knowledge Gaps and Public Misconceptions 4. Information Security Vulnerabilities.	1. Democratization of Technology and Platform 2. ReliabilityTransforming Agents into Financial Literacy Consultants 3. Strengthening Security Governance and Asset Protection (*Hifz al-Mal*) 4. Reorienting the Equity-Based Incentive Scheme	1. Removing physical verification barriers for Disadvantaged, Frontier, and Outermost (3T) regions 2. Promoting active financial inclusion for low-income communities 3. Ensuring equitable access to financial services

Digital Platform		
1. An Application Interface That Is Not User-Friendly 2. System Instability and Technical Glitches 3. Accessibility Gaps in Non-Urban Areas 4. Potential Cybersecurity Issues and Low Digital Risk Literacy 5. The Platform's Relevance to the Younger Generation Is Not Yet Optimal.	1. Redesigning the App Interface Based on Artificial Intelegence (AI) User Needs 2. Strengthening Technical Infrastructure and System Stability 3. Adapting the Platform for Users in Non-Urban Areas (Lite Mode) 4. Strengthening Cybersecurity and Digital Risk Education 5. Transforming the Platform into an Inclusive and Relevant Digital Ecosystem	1. Ensuring the security of vulnerable customers' assets through digital ethics 2. Eliminating technological barriers for the elderly and rural communities 3. Mitigating the risk of financial loss due to system failures
Online-to-Offline (O2O) Synchronization		
1. Apps Are Available, but Transactions Are Still Primarily Conducted Through Manual Channels 2. Digital Services Are Not Yet Fully Optimized Due to Technical and Infrastructure Challenges, as Well as Feature Limitations 3. Digital Literacy Gaps and Variations in Infrastructure Readiness Across Regional Segments 4. Channel Integration Has Not Yet Automatically Driven Repeat Transactions	1. Transition from Passive App Usage to Consistent Active Usage 2. Technical System Stabilization, Facility Provision, and Optimization of O2O Workflows 3. Promoting Equitable Digital Inclusion through Regular Education and Training 4. Building Integrate d Channels Centered on Trust	1. Reducing the cost of capital for MSMEs through integrated system efficiencies 2. Ensuring equitable distribution of economic benefits across the entire community 3. Building inclusive and fair institutional trust

Through the comprehensive analysis presented in Table 3, it is clear that the ESHF model offers an integrative solution capable of transforming structural barriers into opportunities for well-being. The success of this hybrid strategy ultimately has a direct correlation with the economic resilience of MSME actors in Indonesia. The operational efficiency resulting from the synchronization of an integrated system enables Pegadaian to redistribute economic benefits in the form of more affordable capital costs or interest rates for low-income communities. For microentrepreneurs, access to affordable and secure capital is an absolute prerequisite for survival and growth amid fluctuations in the global market. Thus, the ESHF model not only contributes to the achievement of the Sustainable Development Goals (SDGs) but also offers a roadmap for financial institutions in developing countries (the Global South) to lead a digital transformation that is not only technically advanced but also equitable, resilient, and deeply rooted in the real sociocultural needs of their communities.

4. Conclusions

This study concludes that PT Pegadaian's hybrid strategy serves as a crucial institutional mechanism for bridging substantial financial access gaps in Indonesia, moving beyond superficial digitization toward equitable economic inclusion. The findings reveal a "digitalization paradox" in which the expansion of access is hampered by structural friction within the agent network, urban-biased digital platform interfaces, and a lack of real-time synchronization in Online-to-Offline (O2O) operations. These barriers prevent the unbanked population in 3T regions from transitioning toward active, functional financial participation.

The original contribution of this research is the formulation of the Equitable Seamless Hybrid Framework (ESHF), a context-sensitive model that redefines the synergy between physical and digital channels. Unlike conventional models that focus on operational efficiency, the ESHF prioritizes distributive justice by integrating AI-based self-assessment autonomy for field agents and a "lite-mode" digital interface for areas with minimal infrastructure. Under the moral framework of *Hifz al-Mal* (protection of wealth), this study emphasizes that institutional trust and data security are absolute prerequisites for financial inclusion in developing economies.

This study concludes that a synchronized hybrid ecosystem creates a transformative pathway for marginalized groups. The ESHF model demonstrates that when O2O integration is seamless, it reduces transaction costs and information asymmetry, thereby lowering the cost of capital and interest rates for MSME actors. These findings underscore that a hybrid strategy is not merely a technical choice but a strategic instrument for institutionalizing economic justice through a "high-tech, high-touch" approach.

In conclusion, this study promotes the hybrid strategy as a model for sustainable and equitable economic development. The ESHF framework provides an interdisciplinary solution to structural exclusion in the digital age. While offering a strong conceptual foundation, this study paves the way for future empirical research to measure the socio-economic impact of ESHF implementation on tangible poverty reduction. The success of transforming the Pegadaian hybrid model serves as a critical benchmark in achieving meaningful universal financial inclusion for the entire community.

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Author Contribution

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The authors declare no conflict of interest.

Declaration of Generative AI Use

During the preparation of this work, the authors used Grammarly to assist in improving grammar, clarity, and academic tone of the manuscript. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication.

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Biographies of Authors

Triaswari Ayunandini, Department of Economic Education, Faculty of Teacher Training and Education, Universitas Lampung, Bandar Lampung, Lampung 34145, Indonesia.

- Email: 2413031029@students.unila.ac.id
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Asnia Sundari, Department of Economic Education, Faculty of Teacher Training and Education, Universitas Lampung, Bandar Lampung, Lampung 34145, Indonesia.

- Email: 2413031040@students.unila.ac.id
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Revie Nevilla Extin, Department of Economic Education, Faculty of Teacher Training and Education, Universitas Lampung, Bandar Lampung, Lampung 34145, Indonesia.

- Email: 2413031027@students.unila.ac.id
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Ririn Ayu Safitri, Department of Accounting, Faculty of Busines and Finance, Universitas Media Nusantara Citra, West Jakarta City, Special Capital Region of Jakarta 11520, Indonesia.

- Email: coverinbyririn@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Afrizal Fauzi, Department of Management, Faculty of Economics and Business, Universitas Lampung, Bandar Lampung, Lampung 34145, Indonesia.

- Email: 2411011144@students.unila.ac.id
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A