

A Sharia-Compliant Crowdsourcing Model for Public Transportation Management in the Sharing Economy Framework

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Abstract

This paper proposes a Sharia-compliant crowdsourcing model for public transportation management within the sharing economy framework. While digital platform-based mobility services have improved efficiency and service accessibility, conventional sharing economy models often generate ethical, contractual, and governance challenges, including labor exploitation, information asymmetry, and weak accountability. To address these limitations, this study develops a conceptual framework that integrates crowdsourcing theory, platform-based transport management, and Islamic economic governance. The proposed model positions passengers, drivers, and platform operators as co-producers of transportation services through real-time data sharing, participatory service evaluation, and collaborative decision-making. Sharia principles such as justice (adl), public interest (maslahah), mutual cooperation (ta'awun), and the prohibition of excessive uncertainty (gharar) are embedded through Sharia-compliant contracts, transparent revenue-sharing mechanisms, and institutional oversight. The model demonstrates how ethical governance can enhance trust, sustainability, and social legitimacy in shared mobility systems. By aligning digital innovation with Islamic moral economy, this study offers a novel theoretical contribution to transportation management, the sharing economy, and Islamic economic thought, and provides a foundation for future empirical testing and policy development.

Abstrak

Penelitian ini mengusulkan model crowdsourcing yang sesuai dengan prinsip syariah untuk pengelolaan transportasi publik dalam kerangka ekonomi berbagi (*sharing economy*). Meskipun layanan mobilitas berbasis platform digital telah meningkatkan efisiensi dan aksesibilitas layanan, model ekonomi berbagi konvensional sering menimbulkan berbagai tantangan etis, kontraktual, dan tata kelola, seperti eksploitasi tenaga kerja, asimetri informasi, dan lemahnya akuntabilitas. Untuk mengatasi keterbatasan tersebut, penelitian ini mengembangkan kerangka konseptual yang mengintegrasikan teori crowdsourcing, manajemen transportasi berbasis platform, dan tata kelola ekonomi Islam. Model yang diusulkan menempatkan penumpang, pengemudi, dan operator platform sebagai ko-produsen layanan transportasi melalui berbagi data secara real-time, evaluasi layanan yang partisipatif, dan pengambilan keputusan secara kolaboratif. Prinsip-prinsip syariah seperti keadilan (*adl*), kemaslahatan (*maslahah*), tolong-menolong (*ta'awun*), serta larangan terhadap ketidakpastian yang berlebihan (*gharar*) diintegrasikan melalui kontrak yang sesuai syariah, mekanisme pembagian pendapatan yang transparan, dan pengawasan kelembagaan yang memadai. Model ini menunjukkan bahwa tata kelola yang berlandaskan etika dapat meningkatkan kepercayaan, keberlanjutan, dan legitimasi sosial dalam sistem mobilitas bersama. Dengan menyelaraskan inovasi digital dengan ekonomi moral Islam, penelitian ini memberikan kontribusi teoretis yang baru bagi bidang manajemen transportasi, ekonomi berbagi, dan pemikiran ekonomi Islam, sekaligus menjadi landasan bagi pengujian empiris dan pengembangan kebijakan di masa mendatang.

Keywords:

Sharia-compliant transportation; crowdsourcing; sharing economy; public transportation management; digital platforms

Kata kunci:

Transportasi berbasis syariah; crowdsourcing; ekonomi berbagi; manajemen transportasi publik; platform digital

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1. Introduction

The rapid growth of digital platforms and collaborative consumption has reshaped how services are accessed and delivered, particularly in the transportation sector. The advent of the sharing economy; defined as a socio-economic system built around the sharing of underutilized resources through platforms has enabled new models of mobility that prioritize accessibility, flexibility, and efficiency over traditional ownership structures (Gulo, 2025). In public transportation, these dynamics have created opportunities to improve service delivery by harnessing community participation and leveraging technology for demand matching and resource optimization. However, while conventional sharing economy paradigms have been studied extensively in contexts such as ride-hailing and car sharing, their integration with broader public transportation management remains underexplored, particularly within value systems that extend beyond purely economic incentives.

In parallel, there is increasing recognition that digital innovations like crowdsourcing where tasks typically performed by centralized authorities are distributed among a large group of participants offer potential benefits for public policy and service delivery, including transportation systems (Sarjito & Mursidi, 2025). Crowdsourcing models can facilitate real-time data collection, foster community engagement, and enable adaptive responses to fluctuating transportation demands, which are critical for efficient public transport management. Yet, most existing frameworks focus on technological or operational efficiencies and pay limited attention to ethical, cultural, and normative frameworks that might guide the design and governance of such systems. This lacuna is particularly significant in contexts where ethical and religious values play a central role in shaping economic behavior and institutional legitimacy.

Sharia principles, which emphasize fairness, transparency, cooperation (*ta'awun*), and the avoidance of harm (*maslahah*), offer a compelling normative foundation for reimagining shared transportation systems. Scholars have suggested that sharing economy models can align with Islamic economic ethics through contracts such as *ijarah* (leasing), *musyarakah* (partnership), and *ju'alah* (reward for services), provided that issues like ambiguity (*gharar*) and exploitation are effectively mitigated (Wijayanti, 2025). Moreover, in the context of online transportation, ethical considerations around rights and obligations of service providers and users from a Sharia perspective have been examined, highlighting the need for governance structures that protect stakeholders while ensuring fair and just outcomes (Achmad, 2024).

Against this backdrop, the present paper introduces a conceptual model that synthesizes crowdsourcing and sharing economy principles within a Sharia-compliant framework for public transportation management. By integrating normative Islamic ethics with participatory mechanisms and digital platform governance, this model seeks to address both operational inefficiencies and ethical concerns in managing public transport systems. In doing so, it advances the literature on sustainable and culturally grounded transportation management and provides a foundation for future empirical validation and policy design.

2. Method

This paper uses a conceptual research design to construct a theoretical model of Sharia-compliant crowdsourcing for public transportation management within the sharing economy. Conceptual research is appropriate when the objective is to develop or refine theoretical frameworks through rigorous synthesis of existing scholarly work, as recommended in methodological literature (Sale & Carlin, 2025). Conceptual frameworks help clarify constructs and relationships and serve as building blocks for future empirical investigation.

The main methodological technique is systematic literature synthesis. Relevant peer-reviewed journals and authoritative books from fields such as transportation management, sharing economy, crowdsourcing, and Islamic economics were reviewed to extract essential constructs and normative principles. A conceptual integration process organized these constructs into thematic clusters that reflect managerial and ethical dimensions of the model.

In qualitative research design texts, Creswell and Creswell (2018) emphasize the importance of aligning research questions with the appropriate type of inquiry and integrating theory with literature review to build cohesive frameworks.

Finally, the model was developed through theory integration and framework building, combining insights across disciplines into a coherent structure of propositions and relationships. This aligns with recommendations for conceptual scholarship that encourages explicit theorization and linkage of constructs to advance academic discourse and practical relevance (Sale & Carlin, 2025; Creswell & Creswell, 2018). As a result, the proposed model provides a theoretically grounded foundation for subsequent empirical testing and policy application.

3. Result and Discussion

3.1. The Proposed Sharia-Compliant Crowdsourcing Model

The proposed Sharia-compliant crowdsourcing model reconceptualizes public transportation as a participatory, digitally coordinated service system that integrates crowdsourced operational inputs with Islamic ethical governance. In transportation systems, crowdsourcing has been shown to improve flexibility, responsiveness, and service quality by leveraging real-time contributions from distributed users and providers (Elhenawy et al., 2021). Within this model (see figure 1), crowdsourcing is not merely a technical tool for matching trips but functions as an adaptive managerial mechanism through which passengers, drivers, and community contributors co-produce mobility services, enabling continuous refinement of routes, schedules, and service performance.



Figure 1. Sharia-Compliant Crowdsourcing Model for Public Transportation

At the center of the model is a digital coordination platform that connects multiple actors—passengers, vehicle owners or drivers, public transport operators, and supervisory bodies—within an integrated service ecosystem. Research on shared mobility demonstrates that platform-based coordination enables access-oriented transport services that reduce reliance on private ownership and enhance system-wide efficiency (Machado et al., 2018). When applied to public transportation, such platforms allow crowdsourced information on demand, congestion, and service quality to be aggregated and translated into operational decisions, supporting a more responsive and inclusive transport system (Veeneman, 2019).

What differentiates this model from conventional sharing economy platforms is the embedding of Sharia governance into all economic and managerial relationships. Islamic economic principles emphasize justice (adl), public welfare (maslahah), cooperation (ta’awun), and the prohibition of excessive uncertainty (gharar) and exploitation (Juhro et al., 2025). In the proposed framework, these principles shape digital platform rules, contractual arrangements (e.g., ijarah and musyarakah), and revenue-sharing mechanisms so that value

creation and risk distribution remain transparent and equitable. Consequently, crowdsourcing becomes not only a means of operational coordination but also a normatively grounded governance structure that promotes trust, accountability, and social sustainability in public transportation within the sharing economy.

3.2 Core Constructs of the Model

The proposed model is built on four interrelated core constructs: public transportation management, crowdsourcing participation, digital platform coordination, and Sharia governance. Public transportation management refers to the planning, organizing, and controlling of transport services to ensure accessibility, reliability, and efficiency for the public. In a sharing economy environment, public transport no longer operates as a closed system but becomes part of a broader shared mobility ecosystem, where different actors and modes are coordinated through digital platforms (Machado et al., 2018; Veeneman, 2019). This construct (see figure 2) emphasizes service integration, adaptive routing, and responsiveness to demand fluctuations.

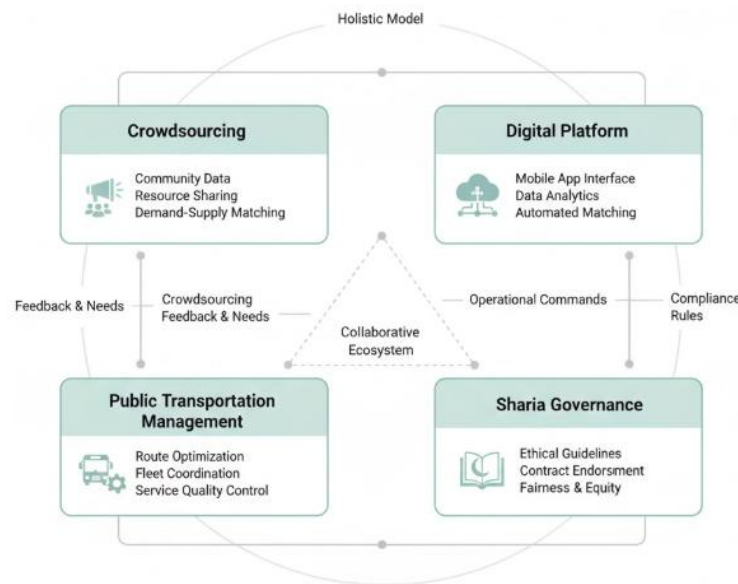


Figure 2. Core Constructs of the Sharia-Compliant Transport Model

Crowdsourcing participation represents the involvement of passengers, drivers, and community members in providing information, resources, and services that support transport operations. Prior studies show that crowdsourcing in mobility systems enables real-time data collection, distributed problem solving, and improved service quality through user feedback and supply contributions (Elhenawy et al., 2021). In the proposed model, crowdsourcing extends beyond operational inputs to include participatory oversight and co-creation, allowing stakeholders to influence decisions about routes, schedules, and service standards in a continuous and decentralized manner.

Digital platform coordination functions as the integrative mechanism that links all actors and processes. Platform-based shared mobility systems aggregate demand and supply, process crowdsourced information, and translate it into actionable operational decisions, thereby enhancing system-wide efficiency and accessibility (Machado et al., 2018; Martinez et al., 2024). Within the model, the platform not only performs algorithmic matching but also embeds governance rules, contract management, and transparency features that ensure accountability among users, drivers, and operators.

Finally, Sharia governance provides the normative and regulatory backbone of the model. Islamic economic principles such as *adl* (justice), *maslahah* (public benefit), *ta'awun* (mutual cooperation), and the avoidance of *gharar* (excessive uncertainty) define how transactions, risk

sharing, and revenue distribution are structured (Juhro et al., 2025). Through Sharia-compliant contracts like *ijarah* and *musyarakah*, the model ensures that crowdsourced participation and platform coordination do not lead to exploitation or opaque practices. Instead, these mechanisms align economic incentives with social welfare, reinforcing trust and ethical accountability across the shared mobility ecosystem.

3.3 Theoretical Mechanism of the Model

The proposed model operates through a triadic mechanism that links crowdsourced intelligence, platform-based coordination, and Sharia-compliant governance to improve public transportation performance. In digitally mediated mobility systems, crowdsourcing enables the continuous capture of dispersed, real-time information from users and service providers such as trip demand, service disruptions, and route preferences transforming it into collective intelligence for operational decision-making (Brabham, 2013). This bottom-up flow of information reduces information asymmetry and allows transport managers to make adaptive, data-driven adjustments to schedules, fleet deployment, and service quality.

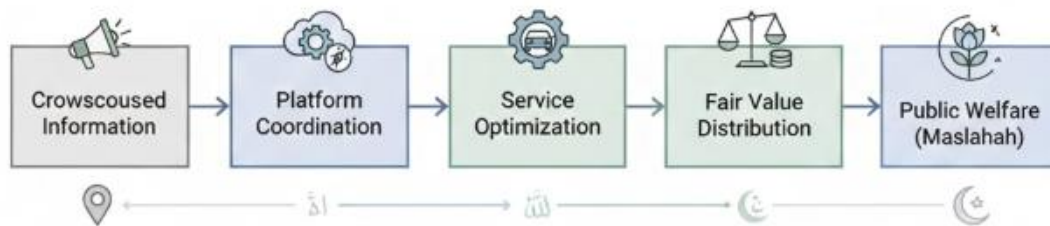


Figure 3. Theoretical Mechanism of Sharia-Based Crowdsourced Transportation

Platform coordination translates this crowdsourced intelligence into actionable system-wide outcomes. Digital platforms act as orchestrators that algorithmically match demand and supply, integrate multiple transport modes, and facilitate peer-to-peer and operator-to-user interactions (Parker et al., 2016; Vargo et al., 2017). Within public transportation, such orchestration improves network efficiency by minimizing idle capacity, shortening waiting times, and enhancing coverage through dynamic routing and service integration. Moreover, platform governance enables continuous feedback loops—ratings, complaints, and usage data—that reinforce service quality and accountability across the mobility ecosystem.

Sharia governance provides the normative and contractual infrastructure that shapes how these technological efficiencies are realized and distributed. Islamic economic theory requires that value creation be aligned with justice (*adl*), public interest (*maslahah*), and mutual cooperation (*ta’awun*), while prohibiting excessive uncertainty and exploitation (Khan, 2013; IFA, 2024). When embedded into platform rules and contracts (e.g., *ijarah* for service provision, *musyarakah* for partnership), Sharia governance ensures that algorithmic coordination and crowdsourced participation do not lead to unfair risk transfer, opaque pricing, or labor precarity. Consequently, the model’s mechanism converts digital efficiency into ethically governed collective value, strengthening trust, participation, and the long-term sustainability of public transportation within the sharing economy.

3.4 Comparison with Conventional Sharing Economy Models

Conventional sharing economy models in transportation exemplified by ride-hailing and peer-to-peer vehicle sharing are primarily organized around platform capitalism, where digital intermediaries extract value by orchestrating market exchanges between drivers and riders (Parker et al., 2016; Srnicek, 2017). These platforms emphasize scalability, price optimization, and algorithmic control to maximize efficiency and profit. While such systems have expanded mobility access and reduced transaction costs, they have also been associated with labor precarity, opaque pricing, and asymmetric power between platforms and service providers (Rosenblat & Stark, 2016; Schor, 2020).

In contrast, the proposed Sharia-compliant crowdsourcing model embeds transportation

services within a normatively governed sharing ecosystem. Instead of prioritizing platform rent extraction, the model aligns economic coordination with Islamic principles of justice (adl), public benefit (maslahah), and mutual cooperation (ta'awun) (Juhro et al., 2025; IFA, 2024). Whereas conventional platforms often treat drivers as independent contractors with limited protection, Sharia-compliant arrangements use contracts such as ijarah (service leasing) and musyarakah (partnership) to ensure transparent obligations, shared risks, and equitable revenue distribution. This contractual architecture mitigates information asymmetry and excessive uncertainty (gharar), which are frequently criticized in algorithm-driven pricing and task allocation systems.

Another key distinction lies in governance and accountability. Conventional sharing economy models rely on reputation systems and platform-defined rules that may be unilaterally changed, leading to concerns over fairness and due process (Rosenblat & Stark, 2016). The Sharia-compliant model introduces a Sharia governance layer including ethical standards, supervisory oversight, and rule-based contracts that constrains opportunistic behavior by both platforms and participants. This creates institutional trust beyond ratings and algorithms, reinforcing stakeholder confidence and long-term participation (Khan, 2013).

Table 1. Comparison between Conventional Sharing Economy Models and the Sharia-Compliant Crowdsourcing Transport Model

Dimension	Conventional Sharing Economy Model	Sharia-Compliant Crowdsourcing Transport Model
Core Objective	Profit maximization and platform growth	Public welfare (maslahah) and sustainable mobility
Governance Structure	Algorithm-driven and platform-centric	Sharia-based governance with ethical and institutional oversight
Contractual Basis	Standardized digital user agreements	Sharia-compliant contracts (ijarah, musyarakah, ju'alah)
Risk Allocation	Risks largely borne by drivers and service providers	Risks and returns shared fairly among stakeholders
Pricing Mechanism	Dynamic pricing driven by market demand and algorithms	Fair pricing based on transparency and ethical principles
Labor Relations	Gig-based with weak protection	Partnership-oriented with moral and contractual safeguards
Information Transparency	Limited transparency of algorithms and revenue sharing	Transparent operational and financial disclosure
Role of Users	Passive consumers	Active contributors through crowdsourcing and feedback
Social Impact	Often increases inequality and precarity	Promotes inclusion, trust, and social justice
Sustainability Orientation	Secondary to growth and profitability	Integral to ethical and public-interest objectives

Finally, with respect to public transportation objectives, conventional sharing economy platforms often operate in tension with mass transit by diverting demand, increasing congestion, and externalizing social costs (Veeneman, 2019). By contrast, the Sharia-compliant crowdsourcing model is explicitly designed to complement and strengthen public transport, using crowdsourced inputs and platform coordination to improve coverage, reliability, and inclusiveness in line with social welfare goals. Thus, while both models leverage digital platforms and peer participation, the proposed framework transforms the sharing economy from a profit-centric marketplace into a value-based public mobility system.

3.5 Sharia Governance and Ethical Control Mechanisms

Sharia governance in the proposed model functions as a multi-layered ethical control system that regulates platform operations, contractual relations, and stakeholder behavior in crowdsourced public transportation. In Islamic economic systems, governance is not limited to legal compliance but extends to ensuring that all economic activities conform to the principles of justice (adl), transparency, and public interest (maslahah) (Dusuki & Abdullah, 2007; IFA, 2024). Applied to platform-based mobility services, this implies that algorithmic rules, pricing mechanisms, and service allocation must be designed to avoid exploitation, excessive uncertainty (gharar), and unjust enrichment, while promoting mutual cooperation (ta'awun) and trust.

A key mechanism of Sharia governance is the use of Sharia-compliant contracts to structure relationships among platform operators, drivers, and users. Contracts such as *ijarah* (service leasing), *musyarakah* (partnership), and *ju'alah* (performance-based reward) define rights, obligations, and risk-sharing arrangements in a transparent and equitable manner (Khan, 2013; Juhro et al., 2025). By embedding these contracts into digital platform rules, the model ensures that revenue distribution, service obligations, and dispute resolution are governed by clearly defined ethical and legal standards rather than opaque algorithmic decisions. This reduces information asymmetry and enhances accountability across all participants.

Figure 4. Sharia Governance and Ethical Control in Crowdsourced Transportation

Furthermore, institutional Sharia supervision through Sharia boards, audits, and compliance monitoring provides an additional layer of oversight that strengthens trust and legitimacy. Prior research shows that effective Sharia governance improves stakeholder confidence and reduces moral hazard in Islamic financial and organizational systems (Dusuki & Abdullah, 2007; IFA, 2024). Within a crowdsourced transportation platform, such oversight ensures that technological innovation does not undermine ethical integrity. As a result, Sharia governance transforms the platform from a purely transactional marketplace into a morally regulated public service infrastructure, supporting long-term sustainability and social acceptance of shared mobility systems.

4. Conclusion

This study has developed a Sharia-compliant crowdsourcing model for public transportation management within the sharing economy framework by integrating shared mobility, digital platforms, crowdsourcing, and Islamic economic governance. The model positions public transportation as a platform-mediated and community-driven system in which passengers, drivers, and institutions collaboratively generate, share, and utilize operational information to improve service delivery. By embedding crowdsourced intelligence into digital coordination, the framework enhances flexibility, efficiency, and responsiveness in managing public transport networks.

A central contribution of the model lies in the incorporation of Sharia governance as a normative and institutional foundation. Unlike conventional sharing economy platforms that are primarily driven by profit and algorithmic control, the proposed framework aligns platform operations with Islamic principles such as justice (adl), public welfare (maslahah), mutual cooperation (ta'awun), and the avoidance of excessive uncertainty (gharar). Through Sharia-compliant contracts, transparent revenue-sharing mechanisms, and ethical oversight, the model ensures that digital innovation in transportation supports fairness, trust, and social legitimacy alongside operational efficiency.

Overall, the model demonstrates that crowdsourcing and platform-based coordination, when governed by Sharia principles, can provide a sustainable and inclusive approach to public transportation management. This conceptual framework offers a new theoretical pathway for integrating moral economy with digital mobility systems and provides a foundation for future empirical research and policy experimentation. By bridging technological efficiency with ethical

governance, the study contributes to the advancement of transportation management, sharing economy theory, and Islamic economics.

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