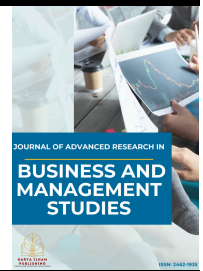




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Logistical-Enabled Services (LENS) and the Future of Urban Economies: Mapping Sustainable Growth Pathways for Malaysia

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ABSTRACT

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This research examines the role of Logistical Enabled Services (LENS) in supporting sustainable urban economies in Malaysia. The study addresses a gap in current literature, which often focuses only on either dedicated fleets or third-party fleets without considering how both models operate within the same urban ecosystem. A qualitative case study design was employed, using twenty semi-structured interviews with logistics managers, policymakers, gig drivers, and technology experts, complemented by document analysis. Thematic analysis shows that dedicated fleets provide consistency and brand control but require high fixed costs, while third-party fleets allow scalability but face issues of professionalism, regulatory uncertainty, and variable service quality. Findings highlight the importance of real-time tracking and data analytics in improving efficiency. The study concludes with recommendations for policies that can strengthen economic growth, enhance social equity, and promote sustainable logistics in Malaysia's urban centres

1. Introduction

Urban logistics has emerged as a central concern in today's rapidly urbanizing economies, where consumer demand for fast and reliable service is reshaping how goods and services move within cities. The expansion of e-commerce and on-demand platforms has intensified the need for logistics systems that are not only efficient but also sustainable and socially equitable [1,2]. In Malaysia, major metropolitan centers such as Kuala Lumpur, Penang, and Johor Bahru illustrate these challenges, where last-mile delivery complexities intersect with issues of congestion, limited infrastructure, and environmental sustainability [3,4].

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Existing studies have analyzed two dominant logistics models. Dedicated fleet systems provide firms with greater control over service standards and customer experience, although they demand high fixed investments in vehicles, maintenance, and workforce management [6,7]. By contrast, third-party or gig-based fleets offer flexibility and scalability at lower cost, but they often introduce risks such as variable service quality, weaker regulatory oversight, and uncertain worker protections [8,9]. Despite these contributions, much of the scholarship has focused on each model in isolation, resulting in limited understanding of how both coexist and interact within the same urban ecosystem [10].

This gap highlights the need for further research in Malaysia, where urban growth and digital adoption demand an integrated framework for logistical services. Few studies have systematically examined how dedicated and third-party fleets operate together, nor how mediating factors such as regulatory environments, workforce management, and technological adoption influence operational outcomes [11,12].

The purpose of this study is to investigate Logistical Enabled Services (LENS) in Malaysia by analyzing both dedicated and third-party fleet models, identifying their operational strengths and weaknesses, and evaluating how technology and policy shape their effectiveness. The research aims to develop an integrated framework that captures the interplay between logistical models, regulatory systems, and urban challenges.

The significance of this study lies in its contributions to policy, practice, and scholarship. Policymakers will benefit from evidence-based recommendations to support sustainable and equitable logistics systems. Practitioners will gain insights into balancing efficiency, costs, and workforce management. Academics will find value in the study's attempt to bridge a research gap and advance the theoretical discourse on urban logistics in emerging economies [13,14].

2. Background To The Research

2.1 Urban Development and Logistics in Malaysia

Over the past few decades, Malaysia has experienced a steady increase in its urban population, largely driven by economic growth and internal migration from rural to urban centres [1]. According to the Twelfth Malaysia Plan 2021–2025, nearly 78 percent of the population now resides in urban areas, with Greater Kuala Lumpur, Penang, and Johor Bahru standing out as leading metropolitan hubs [2]. This urban expansion has been supported by industrialization, inflows of foreign direct investment, and government initiatives that aim to position cities as corridors of economic development [15].

As urbanization accelerates, logistics and supply chain networks have become essential to sustaining economic activities and responding to rising consumer demand. In densely populated regions, the complexity of last-mile delivery has increased significantly, reflecting the rapid growth of e-commerce, the popularity of on-demand platforms, and greater expectations for fast and reliable services [3,16]. Malaysian logistics providers have adopted strategies such as multimodal transportation systems, warehouse automation, and digital platforms to connect carriers and consumers. However, the success of these strategies depends heavily on the maturity of infrastructure, including road connectivity, public transportation, and the integration of information and communication technologies into logistics operations [4].

Malaysia's aspiration to become a regional logistics hub is reinforced by its strategic geographic location, which provides access to key shipping lanes and regional markets in the Association of Southeast Asian Nations (ASEAN) [14,18]. This advantage supports cross-border trade but also intensifies the demand for strong logistical frameworks capable of managing transshipment activities

and international flows [7]. At the same time, urban logistics actors continue to face structural challenges that include severe traffic congestion in city centers, limited availability of parking and loading spaces, and growing environmental concerns linked to vehicle emissions [3,10].

Within this setting, the concept of Logistical Enabled Services (LENS) has emerged as a promising framework to address Malaysia's urban logistics challenges. LENS emphasizes the coordination of service provision through dedicated or third-party fleet management models and highlights the interconnection between technology adoption, regulatory systems, and private sector innovation [8,9]. By combining these elements, LENS offers potential pathways toward optimized delivery processes, stronger customer satisfaction, and balanced urban economic growth [14].

2.2 Emergence of Logistical-Enabled Services (LENS)

LENS expands upon traditional logistics by framing service and product providers in two distinct models:

2.2.1 Dedicated fleet model

The dedicated fleet model refers to a logistics arrangement in which a service provider owns and operates its own fleet of vehicles, usually employing drivers on a full-time basis. This arrangement allows firms to maintain direct operational control, as scheduling, driver training, and route optimization are managed internally [6]. Such oversight often translates into a consistent customer experience, since drivers can be trained to follow standardized service protocols and align with company values [19]. Additionally, organizational supervision of fleet operations provides better visibility of transportation costs and facilitates alignment between logistics activities and corporate objectives [7].

Despite these advantages, dedicated fleet ownership entails substantial financial and managerial commitments. Firms must bear the costs of procuring vehicles, maintaining fleets, providing insurance, and covering driver benefits, which increases overhead expenses [13]. Although these investments may achieve cost efficiency in cases of stable demand, they also reduce flexibility in volatile markets [6]. Demand fluctuations or sudden shifts in consumer behavior may result in underutilized assets and higher per-delivery costs [7]. Consequently, adopting a dedicated fleet model requires careful capacity planning, regular maintenance schedules, and continuous investment in training programs to maintain both reliability and brand reputation [19].

2.2.2 Third-party fleet model

The third-party fleet model involves outsourcing delivery or transport operations to external drivers and vehicles, typically operating on a part-time, gig, or on-demand basis. This structure creates a three-sided interaction between customers, service providers, and independent fleet operators [8]. A key advantage of this model lies in its flexibility and scalability. Service providers can adjust capacity in response to fluctuating demand without the burden of large capital investments in vehicle ownership or maintenance [13,20]. This adaptability makes the third-party model particularly suitable in dynamic urban markets, where consumer demand can change rapidly [22].

In addition, third-party arrangements expand economic opportunities within the gig economy by allowing drivers to choose their working hours and serve multiple platforms simultaneously [13]. From a business perspective, outsourcing reduces overhead costs related to vehicle acquisition,

insurance, and personnel, enabling companies to redirect resources toward areas such as technology adoption, marketing, or customer service improvement [7].

However, the decentralized nature of this model introduces challenges. Unlike dedicated fleets, third-party systems provide limited control over driver professionalism and service quality [6]. This lack of standardization can result in inconsistent customer experiences, ranging from punctuality issues to poor product handling, which may harm brand reputation [19]. Moreover, the reliance on gig-based workers raises concerns regarding driver retention, insurance coverage, and compliance with labor regulations, as legal frameworks often struggle to keep pace with platform-driven employment models [8]. For this reason, the third-party model requires clear policy guidelines, effective monitoring mechanisms, and performance evaluation tools to ensure sustainability [7,19].

Malaysia has seen rapid growth in both models, particularly in the food delivery and e-hailing industries. Some firms maintain proprietary fleets to protect brand integrity, while others rely heavily on crowdsourced drivers using personal vehicles [13,14]. This diversity underscores the complex landscape of Malaysian urban logistics, where businesses must navigate trade-offs between cost efficiency, brand reputation, and regulatory requirements [10].

2.3 Challenges in the Malaysian Context

Despite the growing importance of LENS, several challenges remain:

2.3.1 Regulatory framework

Malaysia's regulatory environment for urban logistics, particularly in the gig economy and on-demand sectors, remains in a state of transition, creating uncertainty for both local and international stakeholders [4]. Although existing legislation addresses broad issues such as vehicle licensing and insurance, the rapid growth of ride-hailing and third-party delivery services has exposed gaps in labor protection, data governance, and consumer safety. A central debate concerns the classification of drivers, specifically whether they should be treated as employees or independent contractors. This distinction carries significant implications for minimum wage rights, social security, and other employment benefits [8]. The lack of a clear and unified framework constrains innovation for established companies and also prevents smaller startups from scaling their operations sustainably.

2.3.2 Infrastructure limitations

Urban hubs such as Kuala Lumpur, Penang, and Johor Bahru face persistent challenges of traffic congestion, insufficient parking, and aging road networks, all of which negatively affect last-mile delivery performance [3]. These issues are further compounded by the increasing number of vehicles competing for limited road and curb space, which leads to delivery delays and inefficiencies. While government projects aim to expand road networks and improve public transportation, the rapid pace of urbanization continues to outstrip these initiatives, creating bottlenecks that logistics players must navigate [16]. As a result, companies are increasingly turning to route optimization tools and alternative modes of delivery, including motorcycles and bicycles, to maintain service levels in densely populated areas [1].

2.3.3 Workforce management

The reliance on third-party fleet models has created new labor concerns in Malaysia's urban logistics sector. Gig workers frequently lack access to employment benefits, job stability, and predictable working hours, which raises questions about labor rights and income security [8]. Although flexible arrangements allow drivers to set their own schedules and earn supplementary income, this flexibility often leads to high turnover as workers move between platforms in search of better pay and conditions [20]. For logistics providers, such volatility complicates workforce planning and quality control, frequently resulting in inconsistent service delivery and weakened brand representation [14]. Striking an effective balance between operational cost savings and fair labor practices therefore remains a significant challenge for the sector.

2.3.4 Technology adoption

The adoption of advanced digital tools such as real-time tracking systems, data analytics, and route optimization software is increasingly critical for improving efficiency in urban logistics [10]. However, technological uptake among Malaysian logistics providers is uneven. While larger firms are investing in sophisticated platforms to enhance operations, many small and medium-sized enterprises lack the financial and human resources required even for basic tracking systems [22]. This disparity undermines the development of an integrated and digitally enabled logistics ecosystem. Concerns regarding data security, high upfront investment costs, and resistance to organizational change also act as barriers to adoption [4]. Without stronger technological integration, the sector will continue to face limitations in reducing delivery times and meeting the growing expectations of consumers.

2.4 Problem Statement

The rapid proliferation of on-demand services in Malaysia's major urban centers, including food delivery, e-hailing, and courier platforms, has surpassed the development of integrated logistics strategies needed to manage them effectively [23]. Some service providers operate dedicated fleets to maintain direct oversight of delivery operations, while others depend heavily on third-party or crowdsourced drivers. This fragmented logistics landscape often leads to overlapping routes, inconsistent service quality, and underutilized vehicle capacity. As a result, operational costs increase and customer satisfaction declines [24]. The inability to ensure reliability and efficiency in such a competitive environment places businesses at risk of losing their market advantage, especially as consumers now expect not only speed and convenience but also sustainability and fairness in labor practices [25].

From a broader academic perspective, empirical research on the interaction between dedicated and third-party fleets in Malaysian urban contexts remains scarce [10]. There is limited systematic analysis of how these logistics models affect cost efficiency, route optimization, driver welfare, and regulatory compliance. The lack of a cohesive and well-defined policy framework further compounds these challenges. Service providers struggle to comply with evolving labor laws, vehicle licensing requirements, and safety regulations in a marketplace increasingly shaped by digital platforms [4]. Addressing these gaps is essential not only for improving operational performance but also for guiding policymakers, enhancing workforce development, and supporting sustainable urban planning in Malaysia's fast-growing metropolitan regions.

2.5 Research Questions

1. What logistical-enabled service (LENS) models are most prevalent in Malaysian urban environments?
2. How do differing logistical fleet ownership structures (dedicated vs. third-party) affect operational efficiency, service quality, and cost management?
3. What are the key challenges and opportunities associated with implementing LENS in Malaysia's urban centers?
4. How can policymakers and stakeholders optimize LENS frameworks to address labor concerns, regulatory issues, and infrastructural limitations?

2.6 Research Objectives

1. To identify and classify the key LENS models in Malaysia's urban environment.
2. To evaluate the impact of different fleet ownership structures on operational efficiency, cost, and service quality.
3. To investigate the main challenges and opportunities in implementing LENS in Malaysia.
4. To propose policy recommendations and strategies for more efficient and equitable LENS models.

2.7 Hypotheses

1. H1: Service providers employing dedicated fleets exhibit higher consistency in delivery times than those relying on third-party fleets.
2. H2: Third-party fleet models yield lower overhead costs but face higher variability in service quality.
3. H3: Regulatory ambiguity in Malaysia negatively influences the efficiency of LENS implementation.
4. H4: Greater adoption of real-time technology solutions correlates with improved LENS operational outcomes.

2.8 Conceptual Framework

The Figure 1 below is a conceptual framework illustrating how the two primary Logistical-Enabled Services (LENS) model interacting with key mediating factors such as Regulatory Environment, Technology Adoption, and Workforce Management to influence a series of Operational Outcomes (e.g., efficiency, service quality, costs, and labor conditions). This framework draws upon the study's hypotheses, thematic findings, and relevant literature.

The dedicated fleet model refers to a system where the service provider owns and operates its own vehicles, which allows greater control over service protocols and ensures more consistent delivery times, although it also involves high capital costs and the risk of underutilized assets [6].

In contrast, the third-party fleet model relies on outsourcing deliveries or transportation to external drivers, often working part-time or within the gig economy, providing flexibility, lower fixed costs, and scalability to meet fluctuating demand, but also introducing risks such as inconsistent driver professionalism and variable service quality [8].

Several mediating and moderating factors influence the effectiveness of these models. The regulatory environment, including evolving policies on driver classification, insurance, and labor protections, plays a critical role in shaping operational decisions [4]. Technology adoption,

particularly real-time tracking, route optimization, and data analytics, can improve operational efficiency and service quality, although cost remains a significant barrier for smaller firms [10]. Workforce management also exerts strong influence, as recruitment, training, and retention practices affect service consistency, brand reputation, and labor outcomes [14].

Operational outcomes are determined by the interaction of these factors. Efficiency is reflected in delivery times, optimized routes, and effective vehicle utilization [7]. Service quality is assessed through consistent delivery performance, customer satisfaction, and brand perception [19]. Costs involve balancing capital expenditures against variable expenses while ensuring overhead reduction and profit margins [6]. Labor conditions are equally significant, as stability of employment, provision of benefits, and driver retention shape the long-term sustainability of logistics services [7].

By mapping out these interrelationships, the framework demonstrates how both fleet models (dedicated and third-party) operate under similar mediating or moderating pressures (regulatory, technological, workforce) to yield distinct operational outcomes in Malaysia's urban environment. The flexibility, costs, and control trade-offs in each model can be better understood through this integrated lens, informing strategic decisions for policymakers, industry practitioners, and researchers [8].

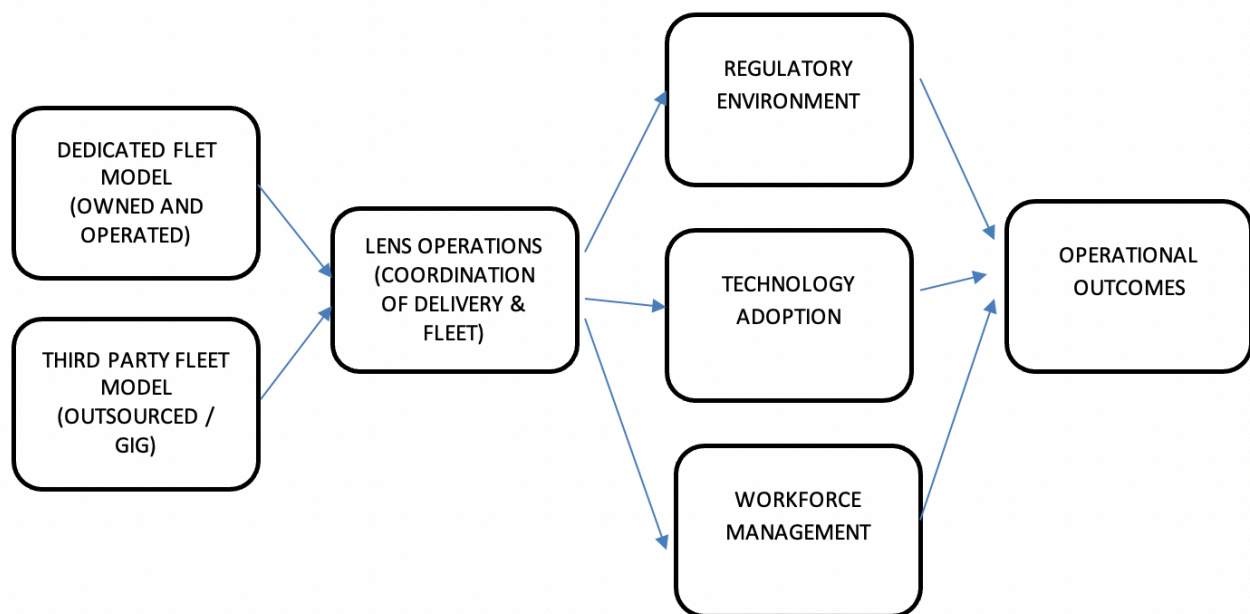


Fig. 1. Integrated Logistical-Enabled Services (ILENS) framework for urban environments

2.9 Justification for the Research

2.9.1 Practical relevance

The findings of this research will inform industry stakeholders such as logistics firms, service providers, and policymakers of the most efficient LENS models. By shedding light on operational challenges and successes, this study can guide strategic planning and policymaking to foster economic growth and sustainability.

2.9.2 Academic contribution

Existing literature on urban logistics has primarily focused on traditional supply chain structures or emerging gig-economy models in isolation [3,22]. This research bridges that gap by offering an

integrated LENS framework that addresses both dedicated and third-party fleet usage in an urban Malaysian context.

2.9.3 Societal impact

Given the rising importance of on-demand services, the study's insights could help strike a balance between economic efficiency, fair labor practices, and consumer satisfaction. By presenting an evidence-based analysis, the research could contribute to socially responsible and sustainable logistics models.

3. Research Methodology

3.1 Research Design

A qualitative research approach was chosen to capture the nuanced perceptions and experiences of stakeholders involved in LENS. Qualitative methods are well-suited to explore complex social phenomena, such as the interplay between service providers, customers, and third-party fleets in an evolving regulatory environment [16].

3.2 Data Collection Methods

3.2.1 Semi-structured interviews

Twenty key stakeholders, including logistics managers, drivers, policymakers, and consumers, were selected through purposive sampling, and semi-structured interviews guided by a protocol based on the research questions and objectives were conducted to allow flexible yet focused discussions on LENS dynamics [19].

3.2.2 Document analysis

Policy papers, company reports, and secondary data from Malaysian industry associations were reviewed to complement and validate the interview findings [4].

3.3 Data Analysis

The interview data were transcribed and coded to identify recurring themes through thematic analysis, and NVivo software was used to manage and systematically analyze the qualitative data, while the findings were triangulated with document analysis to enhance credibility and reliability [16,26].

3.4 Delimitations of Scope

This study is geographically focused on urban centers in Malaysia, particularly Kuala Lumpur, Penang, and Johor Bahru, as these cities demonstrate the highest levels of logistical activity. Although the proposed framework can be applied to different sectors such as food delivery, ride-hailing, and e-commerce, the study emphasizes generating broad insights that can be generalized rather than focusing on sector-specific cases. The scope of stakeholders is limited to service providers, fleet owners and drivers, policymakers, and end consumers, while recognizing that other groups such as insurance providers and technology vendors may also play a role in shaping the LENS ecosystem.

3.5 Key Assumptions

The study assumes that the regulatory environment, including existing legislation and policies, will remain relatively stable throughout the data collection period. It also assumes that participants provide honest and accurate responses based on their experiences and perceptions. Furthermore, the study presumes that the themes and insights identified are transferable to other major Malaysian urban contexts that share similar socioeconomic and infrastructural conditions.

4. Data Analysis And Discussion

4.1 Thematic Insights

To capture the intricacies of Logistical-Enabled Services (LENS) in the Malaysian urban context, this study employed a thematic analysis of qualitative data gathered from 20 participants, labelled P1 through P20 [4]. These individuals were drawn from diverse backgrounds, including logistics managers, policy advisors, part-time and full-time drivers, as well as consumers and technology vendors. The semi-structured interviews delved into various dimensions of LENS, allowing themes to emerge organically from participants' experiences and perspectives [18]. The findings are organized under four key themes: (1) Operational Efficiency, (2) Service Quality and Customer Satisfaction, (3) Regulatory Challenges, and (4) Technological Integration.

4.1.1 Theme 1: Operational efficiency

All participants (P1–P20) emphasized that operational efficiency remains a foundational concern in both dedicated and third-party fleet models. Across the board, they identified congestion, driver scheduling, and route optimization as critical pain points for successful urban logistics. Participants managing or overseeing dedicated fleets (e.g., P2, P9, P13) noted that their direct control over vehicle deployment often resulted in tighter scheduling and reduced downtime, consistent with prior studies on fleet ownership strategies [3]. However, participants relying on third-party arrangements (P5, P6, P10) discussed the challenge of coordinating ad-hoc drivers while maintaining real-time visibility over delivery operations [5]. A number of participants from both groups (P1, P3, P7, P11, P14, P16, P18, P20) highlighted the importance of dynamic resource allocation, stressing that tools like predictive analytics and live tracking significantly enhance operational agility [17]. Still, some respondents (P4, P8, P12, P15, P17, P19) underscored the constraints of infrastructure and traffic conditions in major Malaysian cities, which frequently undermine even the most optimized delivery schedules [8,19].

4.1.2 Theme 2: Service quality and customer satisfaction

Service quality emerged as a prominent theme in discussions with all participants (P1–P20). From the perspective of participants working with dedicated fleets (P1, P4, P7, P12, P15, P19), uniform driver training and brand-specific protocols were perceived as vital for ensuring consistent interactions with end customers [20,21]. Nonetheless, those leveraging gig or part-time drivers (P2, P3, P6, P9, P11, P13, P17) recognized the advantages of scaling up capacity but conceded that variable driver professionalism sometimes led to complaints about tardiness or product handling [6]. Meanwhile, participants in policy advisory or consumer roles (P5, P8, P10, P14, P16, P18, P20) placed

considerable weight on metrics like delivery timeliness, driver courtesy, and transparent communication, emphasizing how these factors directly affect user satisfaction and loyalty [22]. Several respondents also pointed out that negative experiences with one driver or courier could tarnish the reputation of an entire platform, heightening the stakes for effective quality control [25].

4.1.3 Theme 3: Regulatory challenges

All participants (P1–P20) acknowledged regulatory challenges as a pivotal hurdle in optimizing LENS within Malaysia's urban areas. Those in logistics management roles (P1, P3, P9, P14, P17) cited the lack of a unified legal framework for gig-based operations, which complicates the classification of drivers and exposes service providers to labor disputes [22]. Policymakers and policy advisors (P5, P6, P11) discussed the government's ongoing attempts to balance innovation with consumer protection, highlighting the tension between fostering a competitive environment and ensuring fair labor practices [29]. Drivers themselves (P2, P4, P12, P16, P19) frequently voiced concerns about inconsistent insurance coverage and unclear guidelines for employment benefits, which can deter new entrants and reduce driver retention [25]. Meanwhile, participants in consumer or advocacy roles (P7, P8, P10, P13, P15, P18, P20) underscored the broader social implications of weak regulations, noting that inadequate policies could contribute to underpayment of gig workers and heighten safety risks for both drivers and customers.

4.1.4 Theme 4: Technological integration

The necessity for technological integration resonated strongly across all participants (P1–P20), who recognized that real-time tracking systems, data analytics, and mobile applications serve as catalysts for improved efficiency and service quality [10]. In particular, those operating large-scale or tech-oriented firms (P2, P6, P9, P14, P17, P20) expressed that investments in enterprise resource planning (ERP) and route optimization software significantly reduced wasted driver hours and improved on-time deliveries [5]. However, some participants from smaller organizations (P3, P4, P7, P13, P16) pointed out that the costs of advanced technology can be prohibitive, particularly when coupled with the difficulty of training part-time drivers to effectively use new platforms [6]. Driver participants (P1, P5, P8, P10, P11, P12, P15, P18, P19) similarly noted that while app-based interfaces facilitate transparent payment and performance tracking, technological glitches or limited network coverage can hamper efficiency in congested urban settings [8]. Overall, the consensus among all respondents is that continued digitization remains crucial for addressing Malaysia's evolving urban logistics challenges, though disparities in resources and expertise currently limit uniform adoption.

4.2 Discussion of Findings

This section synthesizes the thematic insights gleaned from the 20 participants (P1–P20) with the four hypotheses proposed earlier. Each hypothesis is analyzed in light of participant arguments and counterarguments, highlighting the nuanced realities of Logistical-Enabled Services (LENS) in the Malaysian urban context.

4.2.1 Hypothesis 1 (H1) : Service providers employing dedicated fleets exhibit higher consistency in delivery times than those relying on third-party fleets

Several participants managing or working with dedicated fleets (P2, P9, P13, P15, P19) endorsed the notion that companies owning their vehicles and employing full-time drivers achieve more consistent delivery times. They attributed this reliability to factors such as standardized driver training, uniform service protocols, and direct oversight of maintenance schedules [3]. For instance, P9 noted that a dedicated fleet model “allowed us to plan routes days in advance” and “ensured drivers adhered to company timelines,” reducing variations in delivery intervals [6]. P2 and P19 similarly emphasized that dedicated drivers were more accountable to management directives, leading to stricter adherence to expected delivery windows and fewer delays due to driver unavailability.

However, participants using or overseeing third-party fleets (P5, P6, P10, P14, P17) offered instances where part-time or gig drivers could match delivery efficiency during off-peak hours or in low-traffic zones [22]. P5 explained that “crowdsourced drivers, when incentivized correctly, can quickly fulfill urgent orders,” echoing research indicating that third-party networks can be agile in meeting fluctuating demand [5]. P10 also observed that certain platform-based operators utilize advanced route optimization software and dynamic driver allocation, resulting in punctual deliveries comparable to dedicated fleets [17]. These counterexamples suggest that while dedicated fleets generally uphold higher consistency, under specific conditions, third-party models can be equally reliable.

4.2.2 Hypothesis 2 (H2) : Third-party fleet models yield lower overhead costs but face higher variability in service quality.

Participants across stakeholder groups (P2, P3, P6, P9, P11, P13, P16) widely agreed that third-party fleet models enable companies to reduce substantial capital expenditures in vehicle purchase, maintenance, and insurance [22]. P6 and P13 recounted how outsourcing fleets allowed them to shift cost burdens to individual drivers, freeing corporate resources for marketing and technology investments. Additionally, P2 observed that “rather than buying 20 vans, we just pay a small platform fee for every delivery,” which highlights the attractive pay-per-use dynamic for scaling companies [21].

Despite the acknowledged cost savings, participants also highlighted drawbacks in service quality. P1, P7, P11, P18, and P20 pointed to inconsistent driver professionalism as a recurring issue in the gig-based ecosystem. P11 stressed that “drivers operate under varying standards; some are highly motivated, while others just see it as a side job,” potentially leading to tardiness or suboptimal customer service [8]. However, P16 countered that certain third-party platforms implement rigorous driver rating systems, thus mitigating service quality concerns. Likewise, P1 noted that brand-conscious companies sometimes impose their own training modules on freelance drivers to reduce variability. These counterarguments suggest that while third-party models generally involve greater service quality fluctuations, platform-based oversight and tailored training can partially offset these risks [6].

4.2.3 Hypothesis 3 (H3) : Regulatory ambiguity in Malaysia negatively influences the efficiency of LENS implementation.

A substantial number of participants (P1, P3, P9, P14, P17, P19) strongly supported the view that regulatory uncertainty impedes optimal LENS practices, echoing prior analyses of Malaysia’s evolving transport policies [27]. P1 and P3 lamented inconsistent guidelines regarding driver classification, stating that “it’s unclear whether gig drivers are employees or independent contractors,” an

ambiguity that complicates labor rights, insurance coverage, and tax obligations [22]. P14 further asserted that this uncertainty undermined the adoption of large-scale third-party fleets, as providers feared future legislative changes might invalidate current business models or impose hefty penalties.

On the other hand, some respondents (P5, P8, P11, P12, P16) argued that while regulations are indeed evolving, the Malaysian government has made strides in clarifying ride-hailing and delivery frameworks, such as imposing clear requirements for vehicle inspections and driver screenings [28]. P16 highlighted recent regulatory efforts that differentiate between small-scale freelancers and professional fleet operators, thus reducing confusion about insurance liabilities and licensing. Nonetheless, P20 insisted that these policies do not fully address gig drivers' social protections, indicating the need for more robust labor regulations. Overall, while there has been progress in policy-making, the prevailing sentiment supports the view that regulatory ambiguity remains a significant barrier to seamless LENS adoption in Malaysia.

4.2.4 Hypothesis 4 (H4) : Greater adoption of real-time technology solutions correlates with improved LENS operational outcomes.

Most participants (P2, P6, P9, P14, P17, P20) underscored that the integration of real-time technology is integral to enhancing LENS performance, consistent with prior literature [29]. P9 emphasized how app-based dispatch systems "help us identify idle drivers" and "assign them jobs in nearby areas," cutting down waiting time and boosting overall productivity [30]. P2 and P14 added that real-time data analytics facilitated better decision-making for peak-hour demand management, enabling more efficient distribution of resources and reducing operational bottlenecks.

Nevertheless, several participants (P3, P4, P7, P13, P16, P18, P19) offered a more cautious perspective, citing the financial and training burdens associated with implementing sophisticated systems. P3 noted that "many smaller firms lack the funds to invest in advanced tracking technology," a limitation that may stall widespread adoption [6]. P7 and P16 also observed that part-time drivers can be resistant to adopting multiple apps or complicated interfaces, undermining the benefits of real-time solutions if not carefully managed. Despite these hurdles, the consensus remains that as costs decline and user familiarity increases, the adoption of digital platforms will be key to improving urban logistics efficiency in the long run [8].

5. Conclusion

The findings of this study underscore the multifaceted nature of Logistical-Enabled Services (LENS) within Malaysia's urban environments. Both dedicated and third-party fleet models serve critical roles in delivering goods and services, yet each faces unique operational, regulatory, and socio-economic challenges. In light of these insights, this section provides policy recommendations aimed at promoting sustainable growth, protecting labor rights, and enhancing service quality. These recommendations are grounded in the study's thematic analysis, aligning with relevant academic and industry literature.

5.1 Clarifying the Regulatory Environment

A recurring theme among participants was the lack of a unified policy framework for defining driver status, insurance coverage, and safety obligation [22,29]. Policy measures that clearly distinguish between full-time employees, independent contractors, and part-time gig workers could mitigate legal ambiguities, thereby reducing conflicts around labor rights and insurance liabilities

[25]. For instance, the government could institute tiered licensing that sets different requirements for occasional, part-time, and full-time drivers. This system would recognize the diverse working patterns found in LENS operations, while also ensuring that gig workers have baseline protections such as access to social security benefits and simplified insurance schemes [1,22]. The establishment of collaborative policy task forces would further promote dialogue and consensus-building on evolving regulatory issues [2,21].

5.2 Strengthening Technological Integration

Given the strong consensus on the value of real-time tracking, route optimization, and data analytics for operational efficiency, policymakers could offer targeted incentives to small and medium-sized enterprises (SMEs) adopting logistics-enabling technologies [9,17]. Such financial support would help level the playing field between established players and newcomers, fostering a more inclusive digital ecosystem. In tandem, public-private partnerships could champion training initiatives aimed at enhancing digital literacy among drivers and operators, ensuring that technology adoption does not outpace the workforce's capacity to adapt [8,10]. Encouraging open data standards for traffic and infrastructure information would also enable more advanced route planning and congestion management, benefitting both dedicated and third-party fleets [11,30].

5.3 Improving Workforce Management and Driver Welfare

The variability in driver professionalism and working conditions presents a significant risk to the sustainability of LENS models in Malaysia. A balanced approach to workforce management could involve multi-stakeholder agreements that detail minimum wage thresholds, code of conduct, and clear guidelines for driver deactivation or penalties [12,25]. Government interventions could likewise mandate that platform-based companies provide a minimum level of occupational accident insurance, bridging the gap between traditional employment benefits and the gig economy's flexible structure [13,22]. Dedicated fleets can benefit from standardized training modules and performance evaluations, while third-party operators may implement rating systems that incentivize drivers to maintain professional standards. Ensuring fair compensation and transparent dispute resolution mechanisms would ultimately enhance service quality and foster greater trust among drivers, service providers, and consumers alike [5][14].

5.4 Enhancing Infrastructure and Urban Planning

Infrastructure limitations such as traffic congestion, inadequate parking, and restricted loading zones remain formidable barriers to efficient last-mile delivery [8]. Policymakers can address these challenges through comprehensive urban planning initiatives that incorporate dedicated loading/unloading bays, clearly marked e-hailing zones, and optimized traffic signaling systems [15,17]. Integrating LENS considerations into city-level master plans would allow transport authorities to more proactively accommodate the rising demand for on-demand services. Public agencies may collaborate with logistics stakeholders to pilot projects focusing on alternative delivery methods such as cargo bikes, electric scooters, or parcel lockers especially in densely populated areas [16,21]. These innovations can alleviate congestion, lower emissions, and minimize negative externalities on urban communities.

In summary, the rapid expansion of on-demand services and urban logistics in Malaysia necessitates policy frameworks that balance economic dynamism with social responsibility. By

clarifying regulatory boundaries, incentivizing technology adoption, and prioritizing driver welfare, policymakers can create an ecosystem where both dedicated and third-party fleet models can thrive [5,17]. Equally crucial is the concerted effort to align urban infrastructure development with emerging logistical demands, thereby reducing inefficiencies and improving overall service quality [29]. Going forward, collaboration among government bodies, industry players, and academic institutions will be essential to sustain innovation and equity in Malaysia's evolving LENS landscape.

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References

- [1] Department of Statistics Malaysia (DOSM). *Population and Housing Census of Malaysia 2020*. 2021.
- [2] Economic Planning Unit (EPU). *Twelfth Malaysia Plan (2021–2025)*. Prime Minister's Department, 2021.
- [3] Gharib, A. 2019. "Urban Logistics Challenges in Developing Countries: A Case Study of Kuala Lumpur." *International Journal of Urban and Regional Research* 43, no. 4: 1208–1225.
- [4] Ministry of Transport Malaysia. *National Transport Policy*. 2020.
- [5] Amer, A., S. H. M. Jani, I. Ibrahim, and N. A. Abd Aziz. 2019. "Brand Preferences in Muslimah Fashion Industries: An Insight of Framework Development and Research Implications." *Humanities & Social Sciences Reviews* 7, no. 1: 209–214. <https://doi.org/10.18510/hssr.2019.7125>.
- [6] Blauwens, G., P. De Baere, and E. Van de Voorde. *Transport Economics*. 6th ed. Kogan Page, 2016.
- [7] Coyle, J. J., C. J. Langley, R. A. Novack, and B. J. Gibson. *Supply Chain Management: A Logistics Perspective*. 9th ed. South-Western Cengage Learning, 2013.
- [8] Chang, T., and R. Tork. 2021. "Evaluating the Role of Gig Economy in Shaping Logistics Innovation: A Southeast Asian Perspective." *Journal of Transport and Development* 15, no. 3: 227–243.
- [9] Yong, C. S., Z. Ahmad, and M. Othman. 2021. "The Rise of E-Hailing Services and the Regulatory Response in Malaysia." *Transport Policy and Governance* 9, no. 2: 45–57.
- [10] Kumar, S. 2020. "Impact of Digitalization on Logistics Performance: An Emerging Economy Perspective." *Asian Journal of Logistics* 12, no. 2: 56–78.
- [11] Ibrahim, I., A. Amer, and F. Omar. 2011. "The Total Quality Management Practices and Quality Performance: A Case Study of Pos Malaysia Berhad, Kota Kinabalu, Sabah." *International Conference on Business and Economic Research*.
- [12] Johan, Z. J., I. Ibrahim, N. A. Jamil, S. M. M. Tarli, and A. Amer. 2019. "Lean Production Determinant Factors in Malaysia Paper Manufacturer Industry." *International Journal of Supply Chain Management* 8, no. 2: 977–982.
- [13] Stephany, A. *The Business of Sharing: Making It in the New Sharing Economy*. Palgrave Macmillan, 2015. <https://doi.org/10.1057/9781137376183>.
- [14] Rahmat, A. K., I. Ibrahim, A. R. S. Senathirajah, and A. D. Zainudin. 2023. "The Determinant Factors of Green Office Layout towards Employee Workplace Productivity." *International Journal of Professional Business Review* 8, no. 4: 8. <https://doi.org/10.26668/businessreview/2023.v8i4.932>.
- [15] World Bank. *Malaysia Economic Monitor: Expanding Opportunities*. 2022.
- [16] Creswell, J. W. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 4th ed. SAGE Publications, 2014.
- [17] Rodrigue, J. P. *The Geography of Transport Systems*. 5th ed. Routledge, 2020. <https://doi.org/10.4324/9780429346323>.
- [18] Ibrahim, I., and H. S. Jaafar. 2016. "Adopting Environment Management Practices for Environment Sustainability: A Proposed Model for Logistics Companies." *Asian Business Research* 1, no. 1: 70–74. <https://doi.org/10.20849/abr.v1i1.28>.
- [19] Yin, R. K. *Qualitative Research from Start to Finish*. 2nd ed. The Guilford Press, 2015.
- [20] Amer, A., M. K. Mat, M. A. A. Majid, S. H. M. Jani, and I. Ibrahim. 2019. "Brand Love Co-Creation in Digitalized Supply Chain Management: A Study on Framework Development and Research Implications." *International Journal of Supply Chain Management* 8, no. 2: 983–992.
- [21] Ibrahim, I., A. F. M. F. Ismail, A. Amer, and S. H. M. J. Jani. 2019. "The Effectiveness of Mass Marketing Communication as a Digital Logistics Tool in Promoting a New Online Public Service Platform." *International Journal of Supply Chain Management* 8, no. 4: 177–185.

- [22] Ibrahim, I., A. K. Rahmat, N. F. Mokhtar, A. Amer, I. A. Halin, and N. R. Masrom. 2020. "A Conceptual Framework of Halal Green Supply Chain Management (HGSCM)." In *2020 11th IEEE Control and System Graduate Research Colloquium (ICSGRC)*, 361–365. IEEE. <https://doi.org/10.1109/ICSGRC49013.2020.9232483>.
- [23] Jaafar, H. S., N. Nasir, R. Mohd-Ali, A. H. Aluwi, and A. K. Rahmat. 2009. "An Analysis of the Institutional Framework of the Commercial Vehicle Rebuilt Industry in Malaysia."
- [24] Jalil, S. A., S. S. R. Shariff, A. K. Rahmat, S. A. S. Z. Abidin, and N. N. A. Nizar. 2021. "A Simple Multivariate Time Series Analysis Examining the Effect of Technological Advancement, Gross Fixed Capital Formation and Renewable Energy on Malaysia's Decarbonization." In *2021 IEEE 11th International Conference on System Engineering and Technology (ICSET)*, 246–251. IEEE. <https://doi.org/10.1109/ICSET53708.2021.9612570>.
- [25] Jamaluddin, Z., and A. K. Rahmat. 2022. "Artificial Intelligence Technology in Travel, Tourism and Hospitality: Current and Future Developments." In *Technology Application in Aviation, Tourism and Hospitality: Recent Developments and Emerging Issues*, 169–177. Springer Nature Singapore. https://doi.org/10.1007/978-981-19-6619-4_12.
- [26] Braun, V., and V. Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3, no. 2: 77–101. <https://doi.org/10.1191/1478088706qp063oa>.
- [27] Nasir, S., M. H. Zulfakar, and A. K. Rahmat. 2021. "Determinants of Preferred Export Logistics Gateway in Malaysia Halal Product Industry." *International Journal of Academic Research in Accounting, Finance and Management Sciences* 11, no. 1. <https://doi.org/10.6007/IJARAFMS/v11-i1/9823>.
- [28] Perera, A. A. S., A. K. Rahmat, A. Khatibi, and S. F. Azam. 2022. "Reliability Assessment of Indicators Measuring the Impact of Enterprise Risk Management on Performance of Higher Education Institutions in Sri Lanka." *Asian Journal of University Education* 18, no. 1: 300–303. <https://doi.org/10.24191/ajue.v18i1.17252>.
- [29] Sundram, V. P. K., I. Ibrahim, M. M. Esa, and N. N. M. Azly. 2019. "The Issues in Order Picking and Packaging in a Leading Pharmaceutical Company in Malaysia." *International Journal of Supply Chain Management* 8, no. 6: 1055–1061.
- [30] Zailani, Q. N. N., V. P. K. Sundram, I. Ibrahim, and A. R. S. Senathirajah. 2023. "Plan-Do-Check-Act Cycle: A Method to Improve Customer Satisfaction at a Municipal Council in Malaysia." *International Journal of Professional Business Review* 8, no. 4: 3. <https://doi.org/10.26668/businessreview/2023.v8i4.931>.