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WHERE IS MY PARCEL? A REVIEW OF CROWD LOGISTICS REVOLUTION IN MALAYSIA

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ABSTRACT

Purpose - This research aims to explore the crowd logistics concept and discover crowd logistics evolution in the Malaysia logistics industry.
Design/methodology/approach - Employs a systematic literature review approach by using PICo or mnemonic, which signifies 'P' (Population or Problem), 'I' (Intervention or Exposure) and 'Co' (Context).
Findings - This paper evaluates the evolution of crowd logistics in Malaysia starting with conventional logistics, the introduction of raid hailing, last-mile delivery, crowd logistic and the future of crowd intelligence. The history of crowd logistics expansion has become prominent with the integration of technology and existing infrastructure which allows greater flexibility, customization and efficiency in logistics and transportation delivery.
Originality/value – Addressing the crowd logistics revolution has shaped the development of future crowd logistics to be available in the supply chain and maximize the value creation in the Malaysia logistics industry.

1. Introduction

The e-commerce expansion has led to a change in logistics and supply chain management (Castillo et al., 2018). With its revolutionary business model, E-commerce is radically changing how consumers shop. With the emergence to fulfil customer satisfaction in the last-mile delivery sector, retailers are increasingly eager to adopt innovative delivery services such as crowdsourced delivery or crowd logistics. The service sector industry needs efficient logistics to achieve a higher value of supply chain (Carbone et al., 2017b), shorter lead time (Arslan et al., 2019), and sustainability (Carbone et al., 2017b; Melkonyan et al., 2020). Moving toward improving logistics services, most brick-and-mortar companies ventured into an online platform (Toy et al., 2020) or e-commerce to encourage transparency in the logistics process (Rai et al., 2018). An online platform such as last-mile and on-demand delivery ensures the parts and services have been delivered accurately to the customer. Crowd logistics delivery has a gain interest in the business, especially in last-mile delivery (Alharbi et al., 2022). Last-mile delivery is the transportation of goods to their final destination. It

takes into focus on speed and efficiency, in response to the constantly evolving market and the growing demand for seamless and convenient delivery experiences. This imperative for swift and reliable delivery is particularly relevant across a range of industries, but not limited to including e-commerce, food, and retail (Wang, 2018).

The emergence of e-commerce and the digital marketplace has shaped customers and developed a preference for speedy and complimentary shipping and competitive pricing (Chen & Chankov, 2018). This upward trend in delivery schedules challenges the ideal logistics and supply chain models. In order to satisfy the requests of consumers who seek economical and instantaneous delivery options, companies are now compelled to alter their tactics. The advent of e-commerce and the increase of digital marketplaces have altered the purchasing habits and preferences of consumers. Today's consumers expect free and speedy shipping options alongside competitively priced products, reflecting the changing landscape of the retail industry (Research and Markets, 2021). One way of solving the emerging and demanding services is by using crowd logistics, which can provide benefits to the environment and reduce last-mile delivery costs (Al-saudi, 2020; Seghezzi et al., 2020). The issues in last-mile delivery, such as timeliness (Bai et al., 2019; Bin et al., 2020; Davarzani & Norrman, 2015) and delivery speed (Bin et al., 2020; Dupljanin et al., 2019; Sampaio et al., 2019) are essential in the last-mile delivery context as achieving both in the traditional logistics would increase almost half of the overall logistics cost. As a result, there is a need to find novel solutions that enhance the effectiveness of last-mile delivery effectiveness and improve the overall logistics performance (Mangiaracina et al., 2019). Additionally, crowd logistics can enhance user experience in service delivery and provide job opportunities (Arslan et al., 2019). Crowd logistics include ride-sharing platforms, delivery services that utilize independent contractors, and other on-demand models that respond to a crowd of individuals to provide transportation and logistics services.

Crowd logistics is still a novel and emerging concept in Malaysia's logistics industry. Thus, the purpose of this research is to (1) explore the crowd logistics concept and (2) discover crowd logistics evolution in the Malaysia logistics industry. This research proceeds with an introduction to crowd logistics, where the understanding of basic concept was introduced globally and in Malaysia logistics industry. It is then followed by the methodology used in this research and a discussion on the evolution of crowd logistics in Malaysia logistics industry. Finally, a conclusion and future research are also presented at the paper's end.

This research contributes to the significance of the revolution of crowd logistics in Malaysia logistics industry perspective. This research theoretically aimed to provide further understanding of the growing crowd logistics concept, especially in Malaysia. This research also practically will serve as a guide and provide great assistance to academicians and practitioners on the evolution of crowd logistics application. This will also be beneficial to the policymakers with the crowd logistics evolution in understanding the basic concept of crowd logistics.

2. Literature Review

As aforementioned, crowdsourcing comes from the word 'crowd' (Howe, 2006), which brings into the definition of a group of ordinary people and 'sourcing' is a process and function delegation to a third party. Thus, crowdsourcing defines delegating processes or functions to a third party using the ordinary mass of people. Crowd logistics are also called crowd delivery, crowd shipping, cargo

hitching, crowdsourced distribution, or collaborative logistics. It is portrayed as a novel concept that enables travellers to utilize their surplus carrying capacity to deliver packages for others (Carbone et al., 2017b). Carbone et al. (2017b) pioneered the exploratory investigation and proposed an initial crowd logistics conceptualization. In general, crowd logistics aims to link people with specific logistical resources with those who require logistics services (Andreji & Jeremic, 2019). This concept has emerged in the logistics sector and eventually assisted logistics in becoming more efficient and reliable services.

Most crowd logistics focused mainly on the concept (Carbone et al., 2017b; Mladenow et al., 2015, 2016), crowd behaviour on perceived crowd logistics (Le & Ukkusuri, 2019; Rai et al., 2019, 2021; Wang & Jie, 2019) and simulation and mathematical model stage (Arslan et al., 2019; Chen & Chankov, 2018). There is no definite agreement on which performance measurement can be used to measure logistics performance (Wilding & Juriado, 2004). Consequently, even though crowd logistics is a well-known and widely-discussed concept in the industry, it is a new subject to be researched in academia and can empirically contribute to the body of knowledge (Carbone et al., 2017b; Frehe et al., 2017; Huang et al., 2020; Nagariya et al., 2020). Crowd logistics is also known as a new digital business relationship alternatives and solutions (Gonzalez et al., 2023; Michel et al., 2022) and facilitates stakeholder interactions.

2.1 Traditional vs Crowd Logistics

The difference between crowd logistics and traditional logistics is mainly in the engagement of crowds in the process. The distinctions fall under five categories: supply resources, rewards and initiative, decision-making, networking, and digital technology. Carbone et al., (2017a); Le & Ukkusuri (2019); and Pazour et al. (2016) explain the difference between traditional logistics and crowd logistics. From the *supply resources point of view*, traditional logistics require professional drivers with limited capacity to handle the logistics process. For crowd logistics, the drivers are usually freelancer drivers who partner with companies to perform the activities. Crowd logistics also have greater access to unused or underutilized resource capacities. Secondly, in the *incentive and control* section, a traditional logistics company have matched the unknown request with available resource, whereby most of the situation is under the company's control. While in crowd logistics, in addition to the traditional method, the suppliers and demand for resources are unknown. Thus, incentives based on mutual agreement are mainly required to attract demand and supply. In *decision making*, a crowd logistics decentralized decision-making contrary to conventional logistics, which gives full authority to its top-down power and a systematic allocation of resources. In addition, conventional logistics practice a static supply chain *network* and encourage few-to-many configurations. Also, a transaction in the supply chain only has limited participants, leading to a rigid and hard-to-adaption supply chain. While in the crowd logistics, an elastics supply chain is encouraged, having many-to-many configurations and the ability to share information and results with customers are practices making the crowd logistics adaptable and more resilient supply chain. Lastly, the obvious difference in *digital technology* is the use of mobile applications and websites between conventional and crowd logistics.

Tab. 1 Traditional vs. Crowd Logistics

	Traditional Logistics	Crowd Logistics
Supply resources	Professional drivers	Freelancer driver-partners
	Limited capacity	Greater access to unused or underutilized capacities
Rewards and Initiative	Under the company's control	The system's suppliers and demand for resources are both unknown.
	Pair unidentified demands with known resources	Incentives are required to attract both demand and supply
		Supply compensation can be controllable or flexible (mutual agreement with requesters)
Decision making	Centralized decision making (top-down)	Decentralized decision making
	Resources systematic distribution	
Networking	Unchanged supply chain network	Adaptable and adjustable supply chain network
	Few-to-many configuration	Many-to-many configuration
	Finite participants/transfer points/entry points simplify transactions	Sharing enables closer proximity to the end customer.
		Flexible and resilient supply chains
	Can result in inflexible and difficult-to-modify supply chains.	
Digital technology	E-commerce platform, enterprise resource planning system, and electronic data interchange	Website platform and mobile app site

Source: Adapted from (Carbone et al., 2017b; Le & Ukkusuri, 2019; Pazour et al., 2016)

2.2 Global Crowd Logistics

Customers' use of physical distribution and digital services has changed due to technology, according to a report from DHL in 2020. The e-commerce businesses have globally grown around 20% in 2019 and are expected to exceed 25% in 2020 and beyond. Besides, this industry's growth also has diversified choices, prices, and delivery convenience offered by the e-commerce business. Koponen & Rytsy (2020) interpret the e-commerce business as a communication platform that enables social presence to increase effective and responsive relationships. Consumers use mobile devices to communicate frequently in all aspects of their personal and professional lives. It is also growing in business because it is outsourced to the crowd, with the primary objective of delivering goods and services timely to the right people. It is also known as crowdsourcing (Mladenow et al., 2015).

Crowdsourcing is known for its approach to completing a task for a broad segment of the public or the crowd (Ranard et al., 2014). Another perspective of crowdsourcing is also explained by

Mladenow et al. (Mladenow et al., 2016) . It is a specialized form of outsourcing strategy with a generic operational structure, for instance, crowd finance, crowd voting, crowd searching, and crowdfunding. Al-saudi (2020) reveals that crowdsourcing occurrence explains a variety of strategies that share a prominent characteristic: which all concentrate on some of the crowd's contributors. However, the nature of these contributions can vary enormously (Seghezzi et al., 2020). Crowdsourcing is utilized by a variety of businesses and encompasses a variety of issues and fields. In logistics, services will engage the crowd and exploit crowdsourcing application principles in varied contexts. The rise of the last-mile delivery concept has recently given global opportunities for business ventures into this logistics segment. This emerges that on-demand last-mile delivery and crowd logistics become essential in today's business environment, considering factors when individuals cannot shop at a physical store (Samad et al., 2023).

Due to the increased volume and delivery, the industry needs to be prepared to manage the said increment, impacting the logistics and transportation industry (Research and Markets, 2021). One way of solving the emerging and demanding services is by using crowd logistics, which can reduce delivery costs and benefit the environment (Al-saudi, 2020; Seghezzi et al., 2020). The issues in last-mile delivery, such as timeliness (Bai et al., 2019; Bin et al., 2020; Davarzani & Norrman, 2015) and delivery speed (Bin et al., 2020; Dupljanin et al., 2019; Sampaio et al., 2019) are essential in the last-mile delivery context as achieving both in the traditional logistics would increase almost half of the overall logistics cost. As a result, new solutions are discovered to enhance delivery efficiency and overall logistics performance (Mangiaracina et al., 2019).

2.3 Crowd Logistics in Malaysia

Over the past few years, Malaysia's logistics sector has experienced growth due to various contributing factors, such as enhanced logistics infrastructure, rising freight volumes, and a structural shift towards e-commerce (Ministry of Transport Malaysia, 2015; Tan & Cheong, 2018). The Ministry of Transport (MOT) Department of Malaysia's Logistics and Trade Facilitation Masterplan 2015-2020 reported that this is the masterplan's current edition. The emergence of the e-commerce phenomenon has caused a change in consumer buying behaviour and expectations, leading to anticipation for prompt and costless shipping, along with competitive pricing (Chen & Chankov, 2018). The rigorous demand for deliveries poses a challenge to traditional logistics and supply chain models. As a result, companies must adapt their strategies to meet consumers' needs by offering cost-effective and prompt delivery services. A typical example of these latest business models is Uber, Grab, ZeptoExpress, Foodpanda, NinjaVan, Lalamove, Grabfood, Zoom, FoodValet, and many more (Research and Markets, 2020). In the same vein, an empirical study by Haron et al. (2023) highlighted three main themes in accordance to the perspective of crowd logistics in Malaysia. The first one is the operation management, followed by resource management and lastly, technology and communication management.

The remarkable surge in growth and demand is bound to significantly affect the logistics and transportation sector, requiring companies to be well-equipped to handle higher volumes and meet elevated delivery standards (Research and Markets, 2021). Crowd logistics presents a potential solution for meeting the demands of emerging services, as it has the ability to decrease the last-mile delivery cost and promote environmental advantages (Al-saudi, 2020; Seghezzi et al., 2020). The issues in last-mile delivery, such as timeliness (Bai et al., 2019; Bin et al., 2020; Davarzani & Norrman, 2015) and delivery speed (Bin et al., 2020; Dupljanin et al., 2019; Sampaio et al., 2019) are essential

in the last-mile delivery context as achieving both in the traditional logistics would increase almost half of the overall logistics cost. Therefore, a search for innovative solutions can improve the effectiveness of last-mile delivery and overall logistics performance (Mangiaracina et al., 2019), especially in Malaysia.

With the emergence of crowd logistics, Malaysia's logistics market has become more technologically friendly. Crowd logistics involves the use of technology platforms to connect businesses or individuals that required resources that can provide transportation services with individuals or small businesses. This enables the creation of an on-demand delivery network that can be easily mobilized to meet the needs of businesses and consumers.

3. Methodology

This section explain the method used in retrieving articles regarding crowd logistics in Malaysia. In order to access the relevant articles for this paper, the author used a systematic literature search called PICo to find the articles. PICo is a mnemonic that signifies 'P' (Population or Problem), 'I' (Interest), and 'Co' (Context). Following that, a crowd logistics evolution content analysis also being performed to offer significant literature related to crowd logistics. The next section will also describe the research questions involved.

3.1 Research Question Formulation

In developing the research question, Lockwood et al. (Lockwood et al., 2015) suggested using the PICo mnemonic that signifies 'P' (Population or Problem), 'I' (Interest) and 'Co' (Context). It is also supported by Shaffril et al. (Shaffril et al., 2021) that the use of the PICo method in formulating the research question can assist the researcher in gathering information on the topic more accurately. This study included three major aspects of PICo as part of the review based on the concept, the logistics industry (Population), crowd logistics capabilities (Interest), and Malaysia (Context). Thus, this enabled the author to formulate the research questions for this study; (1) "What are the crowd logistics definition, concept and application in the logistics industry?" and (2) What is the crowd logistics evolution in Malaysia logistics industry?".

3.2 Systematic Searching Strategies

This paper uses systematic literature searching recommended by Shaffril et al. (2021) to gather information on the crowd logistics concept. Based on the research question, the authors outline four keywords for the literature search. This includes crowd logistics capabilities, the logistics industry, Malaysia crowd logistics, and systematic review. To enrich these keywords, the authors used an online thesaurus, for instance, thesaurus.com, past studies' keywords, Scopus' keywords, and expert opinion for words alternatives. In expanding the keyword, authors use similar keywords to crowd logistics, for instance, crowdsourcing logistics, crowd-logistics, collaboration logistics, on-demand delivery, on-demand logistics, last-mile logistics, review, systematic literature review, and systematic review. This research includes only English language articles and selected subject areas, as in Tab. 1. These keywords were combined in two main databases: Scopus, Web of Science and one supporting

database: Google scholar, from 2015 until 2021. The result of including and excluding criteria is summarized in Tab. 1.

Tab. 1 Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Timeline	2015-2021	2014 and earlier
Document Type	Articles	Book, chapter in a book
Language	English	Non-English
Subject area	Social science, transportation	Medical, environmental science, geography, and other non-social science studies

4. Analysis

4.1 History of Crowd Logistics in Malaysia

The history of crowd logistics started in the early 2000s when (Howe, 2006) introduced the term and concept of sharing economy. The development of crowd logistics started with the ride-sharing platform in the late 1990s through the early 2000s. Previously, the early days of ride-sharing provided a new dimension in the era of promoting the sharing economy (Schor, 2016). Onwards, we can also see the growth of companies such as Uber and Lyft (Langley & Leyshon, 2017) in the early days of the sharing economy era. The early years has recognized Uber as the first organization which introduce ride-hailing services that connecting drivers with the passengers by using a platform. This initial example has paved the way for ride-hailing services to emerge and developing for on-demand transportation and delivery services.

Afterwards, with the emergence, more organizations in Malaysia are willing to offer other types of services related to on-demand delivery, for instance food delivery and parcel delivery. The influence of crowd logistics across the nation has increased as a result of this circumstance. Additionally, it is also vital to highlight the transportation and logistics industry has profited from this expansion. With the deployment of new technologies and several platforms that facilitate crowd logistics, the development of crowd logistics has become more prominence. Companies like Grab and Lalamove have started experimenting with the new technologies such as electric bikes and scooters. Gdex also has started supporting its eco-friendly vehicle by introducing eco-motorcycle during delivery. These activities can improve efficiency and reduce costs for moving goods and services.

Overall, crowd logistics development in Malaysia has been primarily propelled by expanding local and international companies, broadening services offered, and integrating advanced technologies. In the past, logistics and supply chain management were typically carried out by large, hierarchical organizations responsible for coordinating the flow of goods from the origin to the destination. As the concept of crowd logistics still in the early growth state (Samad et al., 2023), more empirical evidence should be carried out for the crowd logistics to evolve.

4.2 Evolution of Crowd Logistics in Malaysia

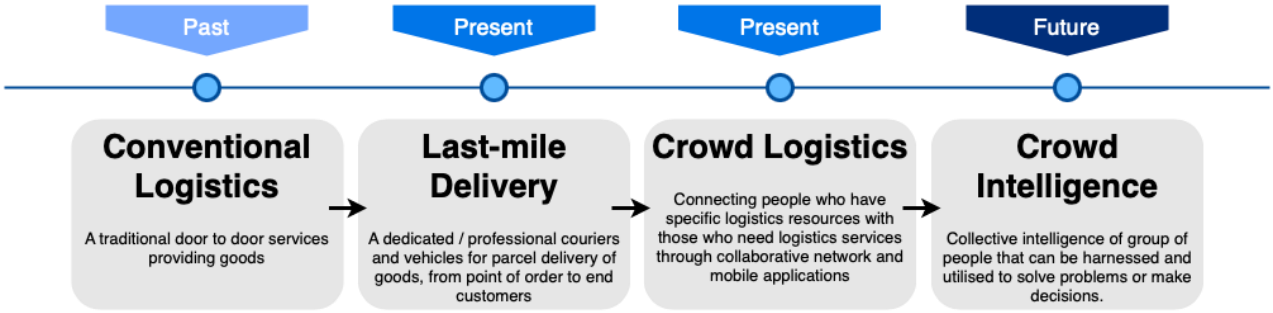

Fig.1 Crowd Logistics Evolution in Malaysia

Fig.1 represents crowd logistics evolution in Malaysia. Like most services, logistics generally starts in the traditional logistics setting, where logistics aims to ensure the movement of goods and services at the location by integrating maritime, air, and land transport modes (Zuraimi et al., 2013). It is then followed by a last-mile delivery service, the last leg of the goods' movement to its destination. Then, with the help of the crowd, crowd logistics evolve and efficiently connect people with the logistics service they need through technological advancement. Crowd logistics also relies heavily on the collaboration and decentralized network of individuals and small businesses to do the delivery.

In conventional door-to-door services, the operations include transferring goods, services, and information to the desired recipients. This allowed goods to be delivered without considering when goods arrived. Besides, traditional logistics settings also require professional drivers to manage the logistics activities in the supply chain (Carbone et al., 2017a; Le et al., 2019). In Malaysia, traditional logistics has historically been carried out by large, hierarchical organizations responsible for managing the flow of goods and materials within the country and worldwide. This has been the delivery method for a long time, and still being used up till now. The delivery can be measured using Logistics Performance Index (LPI) introduced by the World Bank, and Malaysia has jumped 15 ranks from 41th to 26th worldwide for overall score (Arvis et al., 2023). This proved that the capability of logistics operation in Malaysia can be improved with accurate and effective strategies.

Then, the last-mile logistics emerge afterwards, where this typology offers business-to-consumer (B2C) parcel delivery services (Risher et al., 2020). This logistics activity required dedicated couriers and vehicles for parcel delivery of goods and services. It transports both from the point of origin to the end customer. Most small and medium (SME) companies in Malaysia have their business in a shop lot or a standalone building, where loading and unloading goods for their daily operation, especially those in the urban area is a hassle. Last-mile delivery can be complex and challenging, particularly in urban areas where traffic congestion and the lack of available parking can make it difficult to deliver goods efficiently. However, the revolution of technological advancement to connect businesses and consumers who need goods to be delivered is introduced, increasing the efficiency of the logistics process. This is where the logistics innovation such as crowd logistics appeared in the industry and offer seamless delivery for more efficient operation. The willingness of crowd workers to continue delivery in the logistics operation offers economic benefits that motivate them to continue participating in crowd logistics activities (Nguyen et al., 2023).

Following through, with the advent of technology platforms and the development of the gig and sharing economies, a new model for logistics and supply chain management has emerged: crowd logistics. Crowd logistics relies on the participation of many individuals or small businesses, who can

be quickly mobilized to meet the changing needs of businesses and consumers. By leveraging a crowd's collective intelligence and resources, crowd logistics can be more efficient, flexible, and cost-effective than traditional logistics networks. The greater flexibility on crowd logistics has accommodated several businesses and individuals to perform jobs outside regular business hours. Additionally, the use of crowd storage in assisting the logistics service also beneficial to crowd logistics by providing extra space for the ease of logistics operation (Stanković et al., 2023).

Lastly, towards the future of logistics and sharing economy, crowd intelligence, with the composition of Internet-on-Vehicle (IoV) and Internet-on-Things (IoT), has been widely discussed (Saglietto, 2021; Wang, 2020). Crowd intelligence is the collective intelligence of a group of people, which can be harnessed and utilized to solve problems or make decisions (Shit, 2020). It should also be noted that crowd intelligence is the central core of the crowd cyber system. The future of crowd intelligence will likely be closely tied with the developing of new and emerging technologies and the interconnectedness of people and devices. Furthermore, with the increasing use of technology and the internet, crowd intelligence is becoming more accessible and easier to implement. Crowd intelligence is anticipated to be used in broader applications, including problem-solving, decision-making, innovation, and prediction (Saglietto, 2021). In Malaysia, the applicability of crowd intelligence in logistics sector is scarce, as digitalization on logistics in Malaysia still at the basic level, which highlighted the direction between digital strategies and industry transformation is not ascertained (Kafi et al., 2022).

The evolution of crowd logistics will anticipate to continue in the upcoming years as new technologies and business models emerged. The industry is also expected in responding to changing customer needs and market conditions. Some trends that may shape the evolution of crowd logistics future include the increasing use of artificial intelligence and machine learning, the growth of on-demand services, and the focus on sustainability and environmental responsibility. In general, the development of crowd logistics has the potential to fundamentally transform how goods are transported and distributed, especially in urban settings where conventional logistics can be prohibitively expensive or inefficient. However, the future of crowd logistics also faced several challenges and uncertainties, for instance the impact on traditional logistics industries, regulatory and governance elements in crowd logistics. Thus, it is crucial for practitioners and researchers to take full advantage of the opportunities and highlight the challenges that may arise.

5. Conclusion and Future Research

This research identified crowd logistics concept in terms of definition, concept, benefit, and the use of crowd logistics in the Malaysia logistics industry. In addition, this paper also described the evolution of logistics in Malaysia from introductory of conventional logistics to predicting the future of Malaysia logistics industry. This review demonstrates crowd logistics as a cost-effective, agile, versatile, and diversified logistics operation that can supersede the traditional logistics setting. Nowadays, most customers demand speed and accuracy in delivery, and crowd logistics is one of the best options for businesses to venture into, depending on the technological advancement capability of the business.

Additionally, this paper indicates a review of crowd logistics and its capabilities, which can guide other researchers and practitioners in identifying and reviewing the availability of crowd logistics services in the industry. Furthermore, based on the evolution mentioned, practitioners and

academicians can also take advantage of measuring their company's logistics performance to achieve high market share and competitive advantages. The author's viewpoint provides a unique perspective on how traditional logistics has developed and challenges researchers and managers to unleash the crowd logistics' future potential. Besides, the environmental aspect of crowd logistics should also be considered beneficial to the industry, especially the need to reduce gas emissions, minimize transportation's environmental impact and support the adoption of sustainable and green logistics practices.

The trend and development of crowd logistics are emerging, especially in the technological advancement aspect, where the current logistics industry is growing exponentially. A case study approach is recommended to gain a thorough understanding of the crowd logistics concept and assess its value to the Malaysian logistics and transportation industry. As technology is taking its role in the development and evolution of crowd logistics, it is expected that the rise of artificial intelligence and machine learning with the steady growth of on-demand services in the years to come. Furthermore, as stated in the discussion, a crowd intelligence perspective on research is also required to undertake future research. The continued adoption of technology can also optimize the crowd logistics process to be more efficient and cost-effective, especially in moving goods and materials. Therefore, a new and holistic crowd logistics consideration in the future should be monitored, where the significance of a business is determined not only by macroeconomic factors but also by its potential worth for stakeholders and the interdependence of business relationships among them.

The limitation of this article is that the population only looks at the angle of crowd logistics in Malaysia. No generalization can be made due to its population selection. Thus, it is recommended that this revolution access can be done in a broader context, considering the Asian Pacific region or global crowd logistics solutions and practices.

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References

Al-saudi, A. (2020). *Crowd Logistics Delivery Determinants: A Stated-Preference Survey*. *Cic*, 431–440.

Alharbi, A., Cantarelli, C., & Brint, A. (2022). Crowd Models for Last Mile Delivery in an Emerging Economy. *Sustainability (Switzerland)*, *14*(3), 1–20. https://doi.org/10.3390/su14031401

Andreji, M., & Jeremic, M. (2019). Crowd logistics - a new concept in realization of logistics services. *4th Logistics International Conference*, 170–179.

Arslan, A. M., Agatz, N., Kroon, L., & Zuidwijk, R. (2019). Crowdsourced delivery—a dynamic pickup and delivery problem with ad hoc drivers. *Transportation Science*, *53*(1), 222–235. https://doi.org/10.1287/trsc.2017.0803

Arvis, J.-F., Ojala, L., Shepherd, B., Ulybina, D., & Wiederer, C. (2023). Connecting to Compete 2023: Trade Logistics in an Uncertain Global Economy - The Logistics Performance Index and Its Indicators. In *Connecting to Compete 2023: Trade Logistics in an Uncertain Global Economy - The Logistics Performance Index and Its Indicators*. https://doi.org/10.1596/39760

Bai, J., So, K. C., Tang, C. S., Chen, X., & Wang, H. (2019). Coordinating supply and demand on an on-demand service platform with impatient customers. *Manufacturing and Service Operations Management*, *21*(3), 556–570. https://doi.org/10.1287/msom.2018.0707

Bin, H., Zhao, F., Xie, G., Huang, L., Wang, H., Zhu, R., & Jiang, L. (2020). Crowd-Sourcing a Way to Sustainable Urban Logistics: What Factors Influence Enterprises' Willingness to Implement Crowd Logistics? *IEEE Access*, *8*, 225064–

225075. https://doi.org/10.1109/ACCESS.2020.3044921
Carbone, V., Rouquet, A., & Roussat, C. (2017a). The rise of crowd-logistics: a new way to co-. *Journal of Business Logistics, 38(4),* 238–252.
Carbone, V., Rouquet, A., & Roussat, C. (2017b). The Rise of Crowd Logistics: A New Way to Co-Create Logistics Value. *Journal of Business Logistics*, *38*(4), 238–252. https://doi.org/10.1111/jbl.12164
Castillo, V. E., Bell, J. E., Rose, W. J., & Rodrigues, A. M. (2018). Crowdsourcing Last Mile Delivery: Strategic Implications and Future Research Directions. *Journal of Business Logistics*, *39*(1), 7–25. https://doi.org/10.1111/jbl.12173
Chen, P., & Chankov, S. M. (2018). Crowdsourced delivery for last-mile distribution: An agent-based modelling and simulation approach. *IEEE International Conference on Industrial Engineering and Engineering Management*, *2017-Decem*(1), 1271–1275. https://doi.org/10.1109/IEEM.2017.8290097
Davarzani, H., & Norrman, A. (2015). Toward a relevant agenda for warehousing research: literature review and practitioners' input. *Logistics Research*, *8*(1). https://doi.org/10.1007/s12159-014-0120-1
Dupljanin, D., Mirkovic, M., Dumnic, S., Culibrk, D., Milisavljevic, S., & Sarac, D. (2019). Urban crowdsourced last mile delivery: Mode of transport effects on fleet performance. *International Journal of Simulation Modelling*, *18*(3), 441–452. https://doi.org/10.2507/IJSIMM18(3)481
Frehe, V., Mehmann, J., & Teuteberg, F. (2017). Understanding and assessing crowd logistics business models – using everyday people for last mile delivery. *Journal of Business and Industrial Marketing*, *32*(1), 75–97. https://doi.org/10.1108/JBIM-10-2015-0182
Gonzalez, J. N., Garrido, L., & Vassallo, J. M. (2023). Exploring stakeholders ' perspectives to improve the sustainability of last mile logistics for e-commerce in urban areas. *Research in Transportation Business & Management*, *49*(June), 101005. https://doi.org/10.1016/j.rtbm.2023.101005
Haron, N. R. H., Lee, K. L., & Nawanir, G. (2023). Assessing the Viability of Crowd Logistics for Last-mile Delivery : Case Studies in Malaysia Logistics Industry. *E-Academia Journal*, *12*(1), 62–73.
Howe, J. (2006). The Rise of Crowdsourcing. *Wired Magazine*, *14*(06), 1–5. https://doi.org/10.1086/599595
Huang, L., Xie, G., Blenkinsopp, J., Huang, R., & Bin, H. (2020). Crowdsourcing for sustainable urban logistics: Exploring the factors influencing crowd workers' participative behavior. *Sustainability (Switzerland)*, *12*(8), 1–20. https://doi.org/10.3390/SU12083091
Kafi, M. A., Melan, M., Saifudin, A. B. M., Loon, C. K., Zainuddin, N. Bin, & Abualrejal, H. (2022). Digitalization of freight transport and logistics industry in Malaysia. In *International Conference on Intelligent Technology, System and Service for Internet of Everything, ITSS-IoE 2022*. https://doi.org/10.1109/ITSS-IoE56359.2022.9990962
Koponen, J. P., & Rytsy, S. (2020). Social presence and e-commerce B2B chat functions. *European Journal of Marketing*, *54*(6), 1205–1224. https://doi.org/10.1108/EJM-01-2019-0061
Langley, P., & Leyshon, A. (2017). Platform capitalism: The intermediation and capitalization of digital economic circulation. *Finance and Society*, *3*(1), 11–31. https://doi.org/10.2218/finsoc.v3i1.1936
Le, T. V., Stathopoulos, A., Van Woensel, T., & Ukkusuri, S. V. (2019). Supply, demand, operations, and management of crowd-shipping services: A review and empirical evidence. *Transportation Research Part C: Emerging Technologies*, *103*(April), 83–103. https://doi.org/10.1016/j.trc.2019.03.023
Le, T. V., & Ukkusuri, S. V. (2019). Crowd-shipping services for last mile delivery: Analysis from American survey data. *Transportation Research Interdisciplinary Perspectives*, *1*, 100008. https://doi.org/10.1016/j.trip.2019.100008
Lockwood, C., Munn, Z., & Porritt, K. (2015). Qualitative research synthesis: Methodological guidance for systematic reviewers utilizing meta-aggregation. *International Journal of Evidence-Based Healthcare*, *13*(3), 179–187. https://doi.org/10.1097/XEB.0000000000000062
Mangiaracina, R., Perego, A., Seghezzi, A., & Tumino, A. (2019). Innovative solutions to increase last-mile delivery efficiency in B2C e-commerce: a literature review. *International Journal of Physical Distribution and Logistics Management*, *49*(9), 901–920. https://doi.org/10.1108/IJPDLM-02-2019-0048
Melkonyan, A., Gruchmann, T., Lohmar, F., Kamath, V., & Spinler, S. (2020). Sustainability assessment of last-mile logistics and distribution strategies: The case of local food networks. *International Journal of Production Economics*, *228*(January), 107746. https://doi.org/10.1016/j.ijpe.2020.107746
Michel, S., Bessouat, J., & Bootz, J.-P. (2022). Possible futures of crowd logistics : results of a strategic foresight study. *Journal of Business & Industrial Marketing*, *September*. https://doi.org/10.1108/JBIM-12-2021-0548
Ministry of Transport Malaysia. (2015). Logistics and Trade Facilitation Masterplan (2015-2020). In *Ministry of Transport Malaysia*. http://www.mot.gov.my/en/Penerbitan Rasmi/Executive Summary Logistics and Trade Facilitation Masterplan.pdf
Mladenow, A., Bauer, C., & Strauss, C. (2015). Crowdsourcing in logistics. *IiWAS '15: Proceedings of the 17th International Conference on Information Integration and Web-Based Applications & Services*, 1–8. https://doi.org/10.1145/2837185.2837242
Mladenow, A., Bauer, C., & Strauss, C. (2016). "crowd logistics": The contribution of social crowds in logistics activities.

International Journal of Web Information Systems, *12*(3), 379–396. https://doi.org/10.1108/IJWIS-04-2016-0020

Nagariya, R., Kumar, D., & Kumar, I. (2020). Service supply chain: from bibliometric analysis to content analysis, current research trends and future research directions. *Benchmarking*, *28*(1), 333–369. https://doi.org/10.1108/BIJ-04-2020-0137

Nguyen, N., Tran, T. H. H., Luu, T. T. D., & Vu, T. D. (2023). Crowdshippers' intentions to continue participating in last-mile delivery: A study in Vietnam. *Asian Journal of Shipping and Logistics*, *39*(3), 48–56. https://doi.org/10.1016/j.ajsl.2023.06.004

Pazour, J., Siebrecht, K., Spector, B., & Parker, B. (2016). *Crowdsourcing and Collaborative Warehousing & Logistics Session Agenda & Introductions*. https://www.slideshare.net/flexe_inc/ crowdsourcing-and-collaborative-warehousing-and-logistics-werc-presentation

Rai, H. B., Verlinde, S., & Macharis, C. (2018). Shipping outside the box. Environmental impact and stakeholder analysis of a crowd logistics platform in Belgium. *Journal of Cleaner Production*, *202*, 806–816. https://doi.org/10.1016/j.jclepro.2018.08.210

Rai, H. B., Verlinde, S., & Macharis, C. (2019). The "next day, free delivery" myth unravelled: Possibilities for sustainable last mile transport in an omnichannel environment. *International Journal of Retail and Distribution Management*, *47*(1), 39–54. https://doi.org/10.1108/IJRDM-06-2018-0104

Rai, H. B., Verlinde, S., & Macharis, C. (2021). Who is interested in a crowdsourced last mile? A segmentation of attitudinal profiles. *Travel Behaviour and Society*, *22*(August 2020), 22–31. https://doi.org/10.1016/j.tbs.2020.08.004

Ranard, B. L., Ha, Y. P., Meisel, Z. F., Asch, D. A., Hill, S. S., Becker, L. B., Seymour, A. K., & Merchant, R. M. (2014). Crowdsourcing--harnessing the masses to advance health and medicine, a systematic review. *Journal of General Internal Medicine*, *29*(1), 187–203. https://doi.org/10.1007/s11606-013-2536-8

Research and Markets. (2020). *The Malaysian Last-Mile Logistics Market, 2020*. https://www.researchandmarkets.com/reports/5141721/the-malaysian-last-mile-logistics-market-2020?utm_source=CI&utm_medium=PressRelease&utm_code=jhv6r6&utm_campaign=1435301+-+Malaysia+Last-Mile+Logistics+Market+and+Competition+Benchmark+2020&utm_exec=joca2

Research and Markets. (2021). Global Freight and Logistics Markets 2020-2025 with COVID-19 Impact Analysis. *Research And Markets*, 2025. https://www.globenewswire.com/news-release/2020/10/05/2103445/0/en/Global-Freight-and-Logistics-Markets-2020-2025-with-COVID-19-Impact-Analysis.html

Risher, J. J., Harrison, D. E., & LeMay, S. A. (2020). Last mile non-delivery: consumer investment in last mile infrastructure. *Journal of Marketing Theory and Practice*, *28*(4), 484–496. https://doi.org/10.1080/10696679.2020.1787846

Saglietto, L. (2021). Bibliometric analysis of sharing economy logistics and crowd logistics. *International Journal of Crowd Science.* https://doi.org/10.1108/IJCS-07-2020-0014

Samad, T. A., Ganguly, K. K., & Das, D. (2023). Towards a framework for development of crowd logistics: Paving the way for sustainable logistics. *Computers and Industrial Engineering*, *176*(May 2021), 109008. https://doi.org/10.1016/j.cie.2023.109008

Sampaio, A., Savelsbergh, M., Veelenturf, L., & Van Woensel, T. (2019). Crowd-Based City Logistics. In *Sustainable Transportation and Smart Logistics: Decision-Making Models and Solutions*. Elsevier Inc. https://doi.org/10.1016/B978-0-12-814242-4.00015-6

Schor, J. (2016). Debating the Sharing Economy. *Journal of Self-Governance and Management Economics*, *4*(3), 7. https://doi.org/10.22381/jsme4320161

Seghezzi, A., Mangiaracina, R., & Tumino, A. (2020). ' Pony express ' crowdsourcing logistics for last-mile delivery in B2C e-commerce : an economic analysis. *International Journal of Logistics: Research and Applications*, *0*(0), 1–17. https://doi.org/10.1080/13675567.2020.1766428

Shaffril, H. A. M., Samah, A. A., & Kamarudin, S. (2021). Speaking of the devil: a systematic literature review on community preparedness for earthquakes. *Natural Hazards*, *108*(3), 2393–2419. https://doi.org/10.1007/s11069-021-04797-4

Shit, R. C. (2020). Crowd intelligence for sustainable futuristic intelligent transportation system: A review. *IET Intelligent Transport Systems*, *14*(6), 480–494. https://doi.org/10.1049/iet-its.2019.0321

Stanković, A., Andrejić, M., Pajić, V., Kilibarda, M., & Djurdjević, D. (2023). A Novel Survey-QFD-WASPAS Methodological Approach for Designing Crowd Storage Platforms: A Case Study of Serbia. *Sustainability (Switzerland)*, *15*(10). https://doi.org/10.3390/su15107929

Tan, Y., & Cheong, Y. L. (2018). Logistics in Malaysia Market overview and M&A trends. In *PricewaterhouseCoopers (Pwc)* (Issue October).

Toy, J., Gesing, B., Ward, J., Noronha, J., & Bodenbenner, P. (2020). Logistics Trend Radar 5th edition. In *DHL Customer Solutions & Innovation*.

Wang, M. (2018). Impacts of supply chain uncertainty and risk on the logistics performance. *Asia Pacific Journal of Marketing and Logistics*, *30*(3), 689–704. https://doi.org/10.1108/APJML-04-2017-0065

Wang, M. (2020). Assessing logistics capability for the Australian courier firms. *International Journal of Logistics Systems and Management*, *37*(4), 576–589. https://doi.org/10.1504/IJLSM.2020.111827

Wang, M., & Jie, F. (2019). Towards a Conceptual Framework for Managing Supply Chain Uncertainty and Risk in the Australian Red Meat Industry: A Resource-Based View Approach. *2019 IEEE 6th International Conference on Industrial Engineering and Applications, ICIEA 2019*, 714–722. https://doi.org/10.1109/IEA.2019.8714803

Wilding, R., & Juriado, R. (2004). Customer perceptions on logistics outsourcing in the European consumer goods industry. *International Journal of Physical Distribution and Logistics Management*, *34*(8), 628–644. https://doi.org/10.1108/09600030410557767

Zuraimi, A. A., Yaacob, M. R., & Ibrahim, M. D. (2013). Logistics Development in Malaysia East Coast Region: Infrastructure, Constraints and Challenges. *International Journal of Trade, Economics and Finance*, *4*(5), 325–330. https://doi.org/10.7763/ijtef.2013.v4.310