# Last Mile Delivery Collaboration Proposal to Achieve Delivery Cost Efficiency in E-Commerce

Sutandi[1], Yuli Evitha[2], I Nyoman Purnaya[2]
[123]Logistic Management Study Program, Institut Ilmu Sosial dan Manajemen Stiami
Email : sutankindi@gmail.com, yuli.evitha@gmail.com, purnaya@yahoo.com

ARTICLE INFO

**Article history**
Received : 10 August 2021
Revised : 31 August 2021
Accepted : 3 September 2021

**Keywords**
Last Mile Delivery
Collaboration
Delivery Cost
Efficiency
E-Commerce

ABSTRACT

The E-commerce market in Indonesia has grown significantly in the last couple of years and proved by the emerging of key players in the e-commerce field. This phenomenon affects the improvement of the logistic sector which is one of the backbones of E-Commerce. According to the data, logistic sectors contribute 24% to Indonesia's gross domestic product (GDP) and 25% to logistic business income which is acquired from delivery services of E-Commerce goods (PwC, 2019). On the other hand, Indonesia is an archipelago country consisting of 17.500 islands with a width of 1.905-million kilometers square. With the geographical condition of Indonesia, it becomes a challenge for E-Commerce logistic industry practitioners. To overcome these problems, corporations should take actions such as system improvement and also collaboration to decrease distribution facility establishment cost, transportation facility establishment, cost-saving seen from distribution distances, total manpower, and lastly is improvement and maintenance system in each logistic corporation. To ensure success in collaboration, corporations should show commitment to the customers by giving the best and cheapest services in order to guarantee the success of the collaboration. Other things which can be done to achieve the success are by showing collaboration commitment to other E-Commerce logistic service providers by showing the willingness to share information and data about each other and lastly, the existence of collaborator whose or which responsible for connecting both parties, whether it is third party or information collaborating system.

## 1. INTRODUCTION

The E-Commerce market in Indonesia possesses a capitalization value of 21 billion USD or around Rp. 294 trillion and predicted to have an increase of 40 billion USD in 2022 (McKinsey, 2019). For the moment, there are five biggest marketplaces in Indonesia according to monthly visits in the second quartal of 2020 which are Shoppe (93,4 million visits), Tokopedia (86,1 million visits), Bukalapak (35,2 million visits), Lazada (22 million visits), and Blibli (19,3 million visits). Moreover, in 2016, logistic sectors contributed 24% of 24% to Indonesia's gross domestic product (GDP) and 25% to logistic business income which was acquired from delivery services of E-Commerce goods (PwC, 2019).

On the other hand, Indonesia is an archipelago country consisting of 17.500 islands with a width of 1.905-million kilometers square. With the geographical condition of Indonesia, it becomes a challenge for E-Commerce logistic industry practitioners. For example, delivering a product in a rural area or from west of Indonesia to east Indonesia is still relatively expensive. The cost component becomes another consideration for consumers before deciding on a transaction in E-Commerce. This is proved by PwC study in 2019 which showed that 72% of E-

Commerce consumers have the tendency to choose free delivery promotions when buying goods.

In the present condition, logistic service providers still operate on their own accord with their own resources and have not done delivery data integration regarding time and delivery locations. With the collaboration between each logistic service provider in suburban or rural areas which possess a low frequency of delivery service, this collaboration will increase the frequency and reduce the delivery cost by using economies of scale from several E-Commerce corporations when delivering the goods. In order to achieve that, a specific platform is required to connect logistic service providers, warehouse operators, and transportation service providers using sharing economic principles.

**E-Commerce**

Electronic commerce (E-Commerce) is defined as a process of buying and selling goods using the internet as the medium, or buying and selling process or goods exchange, services, and information through information networks including the internet (Turban, Lee, King and Chung, 2000, as cited in Suyanto, 2003a). According to Suyanto (2003b), E-Commerce possesses significant impacts on businessmen, consumers, and also society in general.

The E-Commerce industry in Indonesia, actually, has been growing since a long time ago. According to Badan Pusat Statistik (BPS) or Statistics Center Organization, E-Commerce in Indonesia has grown 17% in the last ten years. There are three models of E-Commerce business models which are often found in the market of E-Commerce such as C2C model (Consumer To Consumer), B2B model (Business to Business), and B2C model (Business to Consumers).

E-Commerce potential in Indonesia becomes an attraction for investors from both, within the country and outside to place their money in Indonesia. Focus on logistic sectors mentioned before illustrate that there is diversification of delivery services with the appearance of a variety of logistic service providers. There are a variety of logistic delivery services or third-party logistics (3PL) exist in Indonesia. Corporations and consumers will be confused in choosing or selecting which services to use because there are too many choices offered. For the most part, E-Commerce in Indonesia suffers from geographical differences across regions or areas and infrastructure availability such as lack of public transportation, the complexity of Indonesia's geographical constitutions, and the underdeveloped roadways for two or four-wheel vehicles, trainways, and water-based vehicles which cause serious problems and inflict expensive delivery cost for sub-urban and remote area.

**Third Party Logistic (3PL)**

Courier business is basically a business of delivering goods or documents carried out by individuals or companies with delivery services from one place (sender) to another (recipient) (Somasundaram, Balasubramanai, & Krishnamoorthy, 2013, p. 108). Third party logistics (3PL) is a third-party courier service hired by the company in the process of shipping goods (logistics) with a specific purpose (Adebambo, Omolola, & Victor, 2016).

According to Adebambo, Omolola, & Victor (2016), the use of third party in corporations' logistic activity as the result of the capability to improve services to the customers, reduce the 'supply chain' costs at an economical scale, reduce capital requirements (because they do not have to buy their own transportation infrastructures), and are also able to increase the advantages for competition between companies and increase the company's profits.

**Last Mile Delivery**

Last mile delivery is one of the important functions in today's commercial corporations. Rationally, this process management plays an important role in the distribution of goods, efficiency, reliability of good support which is required for services. Manufacturers' product prices, logistics tools, and requirements for demand affect the choice of long-distance delivering methods, and as a result, its overall efficiency (Fillina-Dawidowicz & Postan, 2016). In several studies, it is explained that delivery costs influence the level of purchase. For example,

according to Istiqomah and Marlena (2020), free delivery promo and online customers rating are influencing the buying decision of customers with a percentage of 34,4% influence.

Last mile delivery is the last step of the delivery process which starts at the central distribution or 'hub', to the house' door of the end-user (de Souza, 2014). Last mile delivery is to deliver the package to the customers as fast as possible which is similar as shown in the figure of the E-Commerce logistics process below.

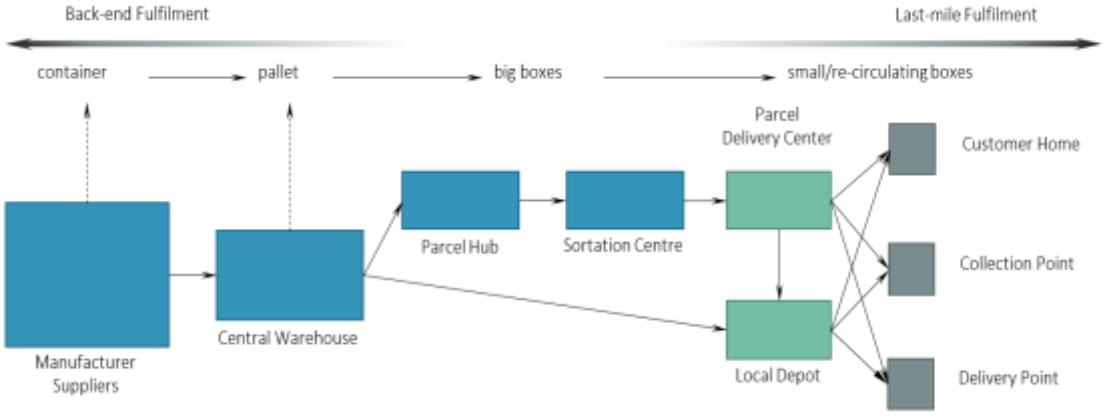


Figure 1. E-commerce Logistics Process
Source: Rodrigue J.P. The Geography of Transport Systems, 2017.

**Collaboration**

Collaboration can be described as a coordinated activity carried out by an organization within the scope of business relationships to generate or result in mutual benefits (Wuet et al., 2014). Chang (2016) stated that supply chain management is a form of managing relationships, information, and materials through the synchronization of the flow of goods and information from upstream to downstream. Supply chain management activities can take the form of an integrated activity, mutually sharing information, cooperation, the same goal and the same focus on serving customers, integration processes, and partnership to build and maintain long-term relations (Mentzer et al, 2001; Min et al., 2007).

In line with the definition undergoing, collaboration in the supply chain is defined as a way of connecting two or more supply chain elements in building commitment and maintaining a relationship process with strategic goals, where they use their core capabilities to deal with changes and emerging challenges (Bowersox, 1995). Three concept dimensions of supply chain collaboration are information sharing, decision synchronization, and incentive alignment (Simatupang & Sridharan, 2005). The application of the three dimensions can be seen in the study conducted by Stefani & Sunardi (2014) which shows that the collaboration of two parties by providing feedback to each other, or positive suggestions in order to result in the improvement of quality and also able to analyze the problems faced by both corporations together.

The purpose of this study is to propose the last mile delivery collaboration concept for the cost efficiency of E-Commerce delivery both locally and nationally with a collaboration model approach. Then it is hoped that by the emerging suggestions of the last mile delivery collaboration concept, they can be implemented by the logistics service providers in providing services for the customers and also to be able to be developed into further research about the suggested model.

Academically, this research is expected to help explain more clearly the collaboration model of E-Commerce logistics service providers that are currently happening and in the future. Practically, this research is expected to provide benefits through the analysis presented in the business world, and then this research is expected to provide a new reference for E-Commerce logistics service providers in running their business to the future.

Jurnal Logistik Indonesia Vol.5 , No.2 , Oktober 2021, pp. 130-137
E-ISSN 2621-6442

## 2. METHODOLOGY

The type of this paper is descriptive qualitative research. The writer will identify the current business process and added by the data collections such as cost, time, and a total of deliveries, locations of deliveries, and also warehouse capacity which will then be analyzed. The next is to identify the factors which influence the success of the collaboration of E-Commerce logistic service providers. The writer will then analyze those factors and formulate some collaboration suggestions for improvement as stated in the figure below:

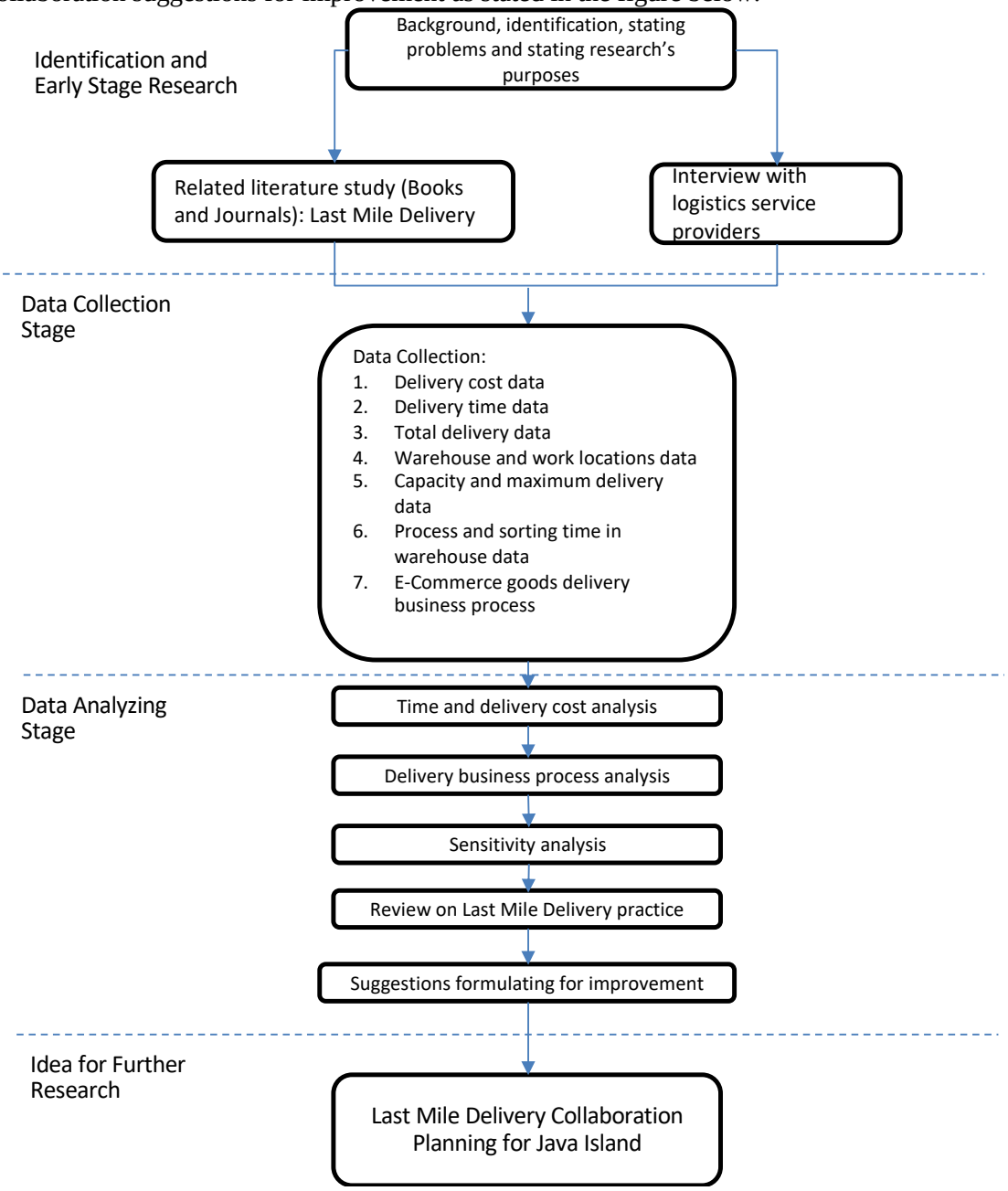


Figure 2. Research Methodology

## 3. RESULTS AND DISCUSSION

In operating the business, E-Commerce logistics service providers are still individual-oriented in giving service to consumers. Based on the overall view of consumers, cost efficiency still can be achieved if there exist collaboration between E-Commerce logistics service

providers especially for remote area. Challenges in the implementation of Last Mile Delivery strategy to improve goods delivery efficiency are listed as below:

1. Last Mile Delivery challenges in high-cost E-Commerce logistics

   One of the reasons why Last Mile Delivery is considered an important part of E-Commerce logistics is because the constituency of the total delivery cost is only around 28% (5). Furthermore, consumers' demand for same-day delivery will increase the cost for corporations to deliver the goods. Even worse than that, E-Commerce corporations should also face inconsistent demands, such as buying frequency spikes during the holidays.

2. Lack of Transparency
   Transparency has become a crucial element for any business. Consumers want to know where the exact location of their goods or package and when will it arrive at them. Facing these problems, a lot of businesses, especially 3PL, start to create tracking codes. This tracking code enables consumers to see where their goods are through the sense of visibility provided by the corporations. However, this is not enough for modern consumers who are accustomed to monitoring their goods in real-time. Simply put, they want to track and monitor the whole stage or process of Last Mile Delivery.
3. Lower Efficiency Level
   Consumers will always be the primary reason for the improvement in efficiency in E-Commerce logistics. There are other challenges which are accompanied by the need for higher efficiency, and one more thing – faster delivery time. The on-demand business model has reached almost all industries that want to ensure services and goods are delivered as fast as a flash of lightning, and also online retails which are in the same situation. Long-distance delivery will help to improve efficiency in the whole process of the supply chain.

Technology is the key aspect in Last Mile Delivery and same-day delivery. It plays a crucial role in making sure that the goods being delivered are automated to the right person, at the right time, and in the correct area or location. Technology is also capable of helping in efficiency improvement significantly and reducing the total time of delivery. E-Commerce corporations can do the following suggestions to overcome those problems mentioned before:

1. Demands Categorization

   Demands categorization consists of formulating several independent clusters based on optimization, such as minimizing cost to be presented, maximizing service level, or the combination of both. These formulations are important in the case of low-value goods delivery and low-priority customer categorization. Customers' categorization which is optimally combined with the correct transportation assets allocation will improve cost efficiency in Last Mile Delivery.

2. Self-Collection Mechanism
   To achieve higher efficiency in Last Mile Delivery through Self-Collection mechanism will result in:
   a. Fewer delivery locations;
   b. Optimized truckloads because of consolidation of orders, and reducing the number of trips;
   c. There will be no waiting time for taking cash in the store;
   d. Minimalize uncertainty (such as time to open the store, etc.).
3. Milk-Run Approach of Delivery
   Fourth party milk run concept utilizes the provided capacity by LSP which possesses routes and networks available throughout retrieving and delivering locations.
4. Route Optimizing

Jurnal Logistik Indonesia Vol.5 , No.2 , Oktober 2021, pp. 130-137
E-ISSN 2621-6442

Achieving higher efficiency in Last Mile Delivery through dynamic delivery route planning.

5. Technology Use which facilitates smooth and open communications between delivery officers and customers, such as:
   a. Real-time monitoring of delivered goods or package
   b. Automation of priority selection, scheduling, and allocations by using Last Mile Delivery logistics application which is solid and supported by Artificial Intelligence and machine learning technology.
6. Redesigning Supply Chain Networks

   By redesigning the e-commerce distribution network, logistics service providers will get maximum profit. This will increase efficiency and reduce delivery costs by collaborating resources (resources, network, and information data) that are owned with the principle of sharing economics for sub-urban areas and Eastern Indonesia.

**Supply Chain Collaboration**

According to Simatupang & Sridharan (2005), the concept of supply chain collaboration can be categorized into three dimensions that inter-relate to each other: information sharing, decision synchronization, and incentive alignment. The application of the dimensions can be seen in the table below:

Table 1. Application of the Dimensions of Supply Chain Collaboration

| Collaboration Dimensions | Applications |
|---|---|
| **Information sharing** | 1) Quality and quantity of received product checking<br>2) Changes of delivery schedule |
| **Decision synchronization** | 1) Received product quantity<br>2) Term of delivery<br>3) Term of payment |
| **Incentive alignment** | 1) agreement regarding orders in larger quantities |

By involving all the application of the supply chain collaboration dimensions, it is hoped that it will be able to reduce the establishment of distribution facilities, procurement of facilities transportation, delivery cost savings in terms of delivery distance, number of workers, and lastly is the development and maintenance of the system from logistics corporations.

Last mile delivery provides a good chance for E-Commerce corporations to make their services faster, transparent, and efficient. Moreover, with the optimization of long-distance delivery, E-Commerce corporations can also cut unnecessary costs, build their brand better, and increase customers' good experiences. The last mile delivery will always ea n important part of every E-Commerce and logistics corporation in the present and also near future. Thus, if corporations want to be successful and able to overcome problems such as market competition and uncertainty, they have to utilize last mile delivery which is innovative with the intervention of technology. Principles of collaborations are:

1. The company's commitment to providing maximum service with increase company profits and lower prices for consumers.
2. Commitment to collaboration with other e-commerce logistics service providers.
3. Willingness to share information and data on e-commerce logistics service providers.
4. There are collaborators who bridge this, be it a third party or a collaborative information system.

## 4. CONCLUSION

It can be concluded that there are problems in last mile delivery collaboration for E-Commerce such as transparency, additional cost, and efficiency. To overcome those problems, corporations should take actions such as system improvement and also collaboration in order to decrease distribution facility establishment costs, transportation facility establishment, cost-saving on improvement, and maintenance system in each logistic corporation.

Corporations should show their commitment to the customers by giving the best and cheapest services in order to guarantee the success of the collaboration. Other things which can be done to achieve the success are by showing collaboration commitment to other E-Commerce logistic service providers by showing the willingness to share information and data about each other and lastly, the existence of collaborator whose or which responsible for connecting both parties, whether it is third party or information collaborating system

## References

[1] Abdulsyani. (1994). Sociology: Schematics, Theory and Applied. Jakarta: Bumi Aksara.

[2] Adebambo, S., Omolola, O., & Victor, A.D. (2016). Analysis of outsourching logistics service and customer satisfaction in manufacturing companies in south western nigeria. European Journal of Logistics, Purchasing and Supply Chain Management 4(1), 1-10

[3] Chang, W. et al.(2016) 'Supply chain integration and firm financial performance: A meta-analysis of positional advantage mediation and moderating factors', European Management Journal, 34(3), pp. 282–295. doi: http://dx.doi.org/10.1016/j.emj.2015.11.008.

[4] *de Souza, R.; Goh, M.; Lau, H.C.; Ng, W.S.; Tan, P.S. Collaborative Urban Logistics—Synchronizing the Last Mile. Procedia Soc. Behav. Sci. 2014, 125, 422–431, doi:10.1016/J.SBSPRO.2014.01.1485.*

[5] Filina-Dawidowicz, L., & Postan, M. (2016). Optimal inventory control for perishable items under additional cost for deterioration reduction. LogForum, 12(2).

[6] Istiqomah M., Marlena N. The effect of free shipping promos and online customer ratings on fashion product purchasing decisions. JOURNAL OF MANAGEMENT - VOL. 12 (2) 2020, 288-298.

[7] *McKinsey "The Digital Archipelago: How Online Commerce is Driving Indonesia's Economic Development", 2018.*

[8] Perdana YP. Supply Chain Integration: A Resource-Based Theory Overview. 1st Conference on Industrial Engineering and Halal Industries (CIEHIS) Industrial Engineering Study Program, Faculty of Science and Technology, UIN Sunan Kalijaga Yogyakarta 2019 ISSN 2715-5382308.

[9] *Petrovic, O.; Harnisch, M.J.; Puchleitner, T. Opportunities of mobile communication system for applications in last-mile logistics. In Proceedings of the 2013 IEEE International Conference on Advanced Logistics and Transport (ICALT), Sousse, Tunisia, 29–31 May 2013;*

[10] *Ranieri, L, Digiesi S, Silvestri B and Roccotelli M. A Review of Last Mile Logistics Innovations in an Externalities Cost Reduction Vision, 9 March 2018, MDPI.*

[11] *Rodrigue, J-P, (2017) (ed) The Geography of Transport Systems, Fourth Edition, London: Routledge. 440 pages. ISBN: 978-1-138-66957-4.*

E-ISSN 2621-6442

[12] Simatupang, T. M., & Sridharan, R. (2005). The Collaboration Index: A Measure for Supply Chain Collaboration. International Journal of Physical Distribution and Logistics Management, 35(1), 44-62.

[13] Somasundaram, R., Balasubramani, R., & Krishnamoorthy, V . (2013). Customer behaviour of courier service in erode district. Indian Journal of Research 2(1), 108-110.

[14] Stefani, V., & Sunardi, O. (2014). The Role of Dependency, Commitment, Trust, and Communication, on Supply Chain Collaboration and Company Performance: Preliminary Study. Unit Research and Knowledge, School of Business and Management ITB, 322-333.

[15] Sugiyono. 2008. Metode Kuantitatif, Kualitatif, dan Riset R&D Quantitative, Qualitative, and R&D Research Penerbit Alfa Beta, Bandung.

[16] *Suyanto, Muhammad. 2003a. Multimedia Tools to Improve Competitive Ability. Yogyakarta: Andi Publisher*

[17] *Suyanto, Muhammad. 2003b. Advertising Strategy on the World's Top E-commerce Companies. Yogyakarta : Andi Publisher*

[18] *Wang, Y.; Zhang, D.; Liu, Q.; Shen, F.; Hay Lee, L. Towards enhancing the last-mile delivery: An effective crowd-tasking model with scalable solutions. Transp. Res. Part E 2016, 93, 279–293.*

[19] Wu, I. L., Chuang, C. H. and Hsu, C. H. (2014) 'Information sharing and collaborative behaviors in enabling supply chain performance: A social exchange perspective', International Journal of Production Economics. Elsevier, 148, pp. 122–132. doi: 10.1016/j.ijpe.2013.09.016.