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Desy Anisya Farmaciawaty, Ahmad Danu Prasetyo, Niken Larasati, Raka Achmad Inggis, Novialita Ayu C. Wibowo Putri, and Nur Budi Mulyono

Can Instagram Convince Information Users?

Romi Ilham and Cantika Sari Siregar

Motivation Differences Behind Knowledge Sharing Behaviour Among Instagram Food Bloggers in Bandung

Sofa Parihah Nurasiah and Anggara Wisesa

IPO Underpricing, Konservatisme Akuntansi, dan Sentimen Investor

Buddi Wibowo

Hubungan Kecerdasan Emosional, Tacit Knowledge Sharing, dan Perilaku Kerja Inovatif pada Pekerja Konstruksi di Jakarta

Bimmo Dwi Baskoro, Ella Anastasya Sinambela, dan Rahayu Mardikaningsih

Kesiapan Modal Insani Era Industri 4.0, Pada Industri Manufaktur, Perbankan dan Telekomunikasi

Achmad Fajar Hendarman, Astrid Alfina Primatasya, Azzahra Nabila Sufiadi, dan Veren Sonia

Determinant Indonesian Islamic Rural Bank's Characteristics on Implementing Financial Technology for Their Business

Ahsanul Hadi Priyo, Laily Dwi Arsyianti, and Ascarya

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Pricing Strategy and Pricing Determinant Factors in Sharing Logistics

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Abstract. *There is a significant change in our current business practices where the change leads the mainstream business practice into a new concept: Sharing Economy. In this research, the sharing economy will be narrowed down to a specific topic called sharing logistics. This research aims: (1) to identify the determinants that are perceived as a priority by customers in logistics service, (2) to explore the pricing method suitable for sharing logistic companies based on priority determinants, which are previously identified. To arrive at the objectives of the research, many works of literature were reviewed related to the matter of determinants and pricing strategies in the logistics service industry and related to the concept of sharing economy. Primary data was also collected through an interview with the expert of the leading logistic service company in Indonesia. In addition, the analytical hierarchy process (AHP) was conducted as well to find the proportion that represents determinants' priority based on the perspective of the customers of logistic service providers and academic researchers. Hopefully, by identifying the determinants that are perceived as a priority by customers in logistics service, and with its appropriate pricing method, companies that run their business in logistics sharing will have a proper pricing method guideline in the first place.*

Keywords: *Sharing economy, sharing logistics, pricing method, determinants of logistics service, analytical hierarchy process*

Abstrak. *Saat ini terdapat perubahan signifikan terhadap praktik bisnis yang mengakibatkan munculnya konsep baru yaitu Sharing Economy. Dalam penelitian ini, sharing economy yang akan diteliti dipersempit ke topik tertentu, yaitu sharing logistics. Tujuan dari penelitian ini adalah: (1) untuk mengidentifikasi determinan yang dipersepsikan sebagai prioritas oleh pelanggan dalam layanan logistik, (2) untuk mengeksplorasi metode penetapan harga yang sesuai untuk perusahaan sharing logistics berdasarkan determinan prioritas, yang telah diidentifikasi sebelumnya. Untuk sampai pada tujuan penelitian, dilakukan tinjauan literatur terkait dengan masalah determinan dan strategi penetapan harga di industri jasa logistik serta tinjauan terhadap konsep sharing economy. Pengumpulan data primer dilakukan melalui wawancara dengan pakar dari perusahaan jasa logistik terkemuka di Indonesia. Selain itu, metode analytical hierarchy process (AHP) juga dilakukan untuk mengetahui proporsi yang mewakili prioritas determinan berdasarkan perspektif pelanggan penyedia jasa logistik dan peneliti akademis. Diharapkan dengan mengidentifikasi determinan yang dianggap sebagai prioritas oleh pelanggan dalam layanan logistik, dan dengan metode penetapan harga yang tepat, perusahaan yang menjalankan bisnisnya dalam logistics sharing akan memiliki pedoman metode penetapan harga yang tepat.*

Kata kunci: *Sharing economy, sharing logistics, metode penetapan harga, determinan layanan logistik, analytical hierarchy process*

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Introduction

Sharing economy practices help lower the costs and aggressively seize the market and inarguable offer prices. Many terms have been cited to refer to the activities of sharing economies, such as collaborative consumption, collaborative economy, or peer economy. Referring to the common practices, sharing economy allows individuals and groups to make money from underused assets. Still, Yudoko, Mulyono, Prasetyo, Adhiutama, Lestari, & Farmaciawaty (2016) argued that there is no rigid definition of sharing economy.

The characteristics of sharing economy in Indonesia, for instance, are fulfilled by GOJEK, Uber, and GrabBike in the form of "ride-sharing" services. In the ride-sharing sectors, they adapt a shared mobility system to overcome underused resources and reduce congestion. In this way, physical assets are shared as services using intermediary platforms, the convenient and instantaneous information exchange by apps. It mitigates the previous information barriers caused by the spatial deviation between customers and drivers (Wang, He, Yang, & Gao, 2016). Ridesharing can also be considered a two-sided market as platform operators cater to two inter-dependent customer groups – drivers and riders (Eisenmann, Parker, & Van Alstyne, 2006; Teubner & Flath, 2015).

In this research, the sharing economy will be focused on sharing logistics. A keyword that can be summarized for sharing logistics is "collaboration" (Thiengburanathum, Gonzalez-Feliu, Ouzrout, Chakpitak, & Bouras, 2010). By using a platform with advanced technology, the on-demand service sharing logistics will be on the market, filling the space of drivers and fulfilling the needs of customers to deliver their goods. The two distinct groups of users are the so-called two-sided market. According to Kung & Zhong (2017), two-sided platforms can take advantage of positive cross-side externality when many service providers in the platforms can attract more consumers and vice versa.

Hence, it is crucial to design a pricing system to provide sufficient incentives. As part of sharing economy, the important features of these two-sided markets are that prices optimally consider the externalities between the two sides of the market (Vasconcelos, 2015). The pricing design system must be a win-win for both consumers and service providers because pricing is important. However, it is largely neglected by managers in their companies and also by academicians in industrial marketing (Hinterhuber, 2004). One of the expected outputs of research in sharing logistics is the pricing method that is proper to be proposed for sharing logistic companies. The pricing method will be obtained after the determinant factors that play important roles in the logistic service are defined.

Due to these reasons, this research aims (1) to identify the determinants that are perceived as a priority by customers in logistics service, (2) to explore the pricing method to be proposed for sharing logistics companies based on priority determinants that have been previously identified.

In addition, this research makes several contributions to research and practices. This research extends the literature review related to logistics sharing by adding knowledge related to the determinant of logistics service and the pricing strategy in small medium enterprises in Indonesia. This research intends to help parties that are participating in sharing logistics practices to be able to develop their own pricing method. The literature review, methodology, findings, and conclusion will be presented below.

Pricing Strategy in Sharing Economy

According to Avlonitis and Indounas (2005), pricing methods are the explicit steps or procedures by which firms arrive at pricing decisions. In practice, managers in companies use three basic strategies such as cost-based, value-based, and competition-based pricing (Ceylana, Koseb, & Aydin, 2014).

A cost-based price strategy is a common strategy and easy to use. By using this strategy, the production cost of a product is counted. The price of a product is measured by adding a certain unit of profit to the sum of the cost items such as labor cost, supply cost, indirect expenses or general expenses (Verma, 2012; Eser, Isin, & Tolon, 2011); Kotler, Wong, Saunders, & Armstrong, 2005) & Ceylana et al, 2014).

A competition-based strategy is a strategy related to competitor price. Accordingly, this strategy is based on the assumption that the consumers evaluate products of a business organization according to the rivals' prices for similar products (Eser et al., 2011; Ceylana et al., 2014). Another strategy is value-based pricing. Value-based pricing is a technique that lies in the perception of consumers. In other words, value-based pricing, based on the value attached to a product by consumers, is a consumer-oriented pricing technique (Rao, 2011; Ceylana et al., 2014). In value-based pricing, business organizations use consumer's perceived value instead of the cost of the products or services. In this technique, marketing managers price the product or service with components.

As logistic sharing will adopt the sharing economy system, which is related to the pricing strategies based on the sharing economy concept, few pieces of literature describe some pricing strategies used by the ride-sharing services. Horpedahl (2015) explained that Uber and Lyft use a form of dynamic pricing called "surge pricing" in contrast to the fixed pricing in traditional taxicab based only on mileage and time.

Prices can be adjusted upward from the base rate when the quantity of demands exceeds the number of supplies. Sometimes, the price is multiples of the base rate. It is also argued that dynamic pricing provides an incentive for more drivers to get on the road or to go to specific areas and an incentive for consumers to wait until busy times have passed (Hall, Kendrick, & Nosko, 2015).

Several studies were conducted to analyze the impact of surge pricing in several platforms. Banerjee, Riquelme, & Johari (2015) found that surge pricing underperformed the optimal static pricing with two schemes. It is a threshold-based dynamic pricing approach where the price was adjusted discretely and exclusively based on the number of available vehicles in the queue. Another study from Cachon, Daniels, & Lobel (2017) showed that surge pricing would work well with the current strategy of the platform if the platform charges a fixed commission percentage and yields results that close to the optimal contract where the platform dynamically determines both the price (for the customers) and the wage (for the drivers). Therefore, applying surge pricing of platforms will increase the profit, but the impact on consumer surplus is ambiguous. Both studies used the assumption that customers are only sensitive to price when they request a ride (Zha, Yin, & Du, 2017)

Based on the studies above, we have found another pricing strategy that would be beneficial for platforms and also customers. Kung and Zhong (2017) determined that there are three pricing strategies usually employed by platform delivery in the sharing economy. Those are membership-based pricing strategy, transaction-based pricing strategy, and cross-subsidization strategy. In a membership-based pricing strategy, the platforms in sharing economy experience losses in every transaction, but they will charge every consumer a fixed membership fee at the beginning of each membership period. Within this strategy, the platform will only obtain profits from membership fees (Kung & Zhong, 2017). The scheme works if users pay a set of membership fees upfront and utilize the platform at a certain time of the membership period.

On the other hand, a transaction-based pricing strategy charges a per-transaction fee, but it is not a fixed fee (Wang et al., 2016). Consumers will sign up for the platform for free, and the platform will generate profit from every transaction the consumers have made with the platforms.

This also means that fees are charged based on usage. The users or service providers will pay the platform each time they use the platform services, but it is only for successful transactions. The third strategy in sharing economy is the cross-subsidization strategy. This means that platform will subsidize the service providers or drivers with the exact amount collected from the consumers in each transaction and earns revenues only from membership fees (Kung & Zhong, 2017). This is applied to both customers and drivers, particularly to groups whose demands are more price sensitive (Vasconcelos, 2015).

This research has been conducted as follow-up research for previous logistics sharing research conducted by Yudoko et al. (2016) that constructed a conceptual framework for small medium enterprise to enhance or predict the best strategies for each stakeholder in the context of logistics sharing schemas. From the previous studies discussed above, the pricing strategy was determined for ride sharing services, general industries, and platform deliveries. In our research, we explore the pricing method propose for sharing logistics companies based on priority determinants by customers and academician.

Research Methodology

To do this research, first, we need to define the customers' determinants that relate to logistics services. It is important to explore customers' determinants that relate to logistics services since they will influence the companies' decisions in providing various logistics services. These determinants can be acquired either through literatures, expert's opinions (practitioners), or the customers themselves. In this research, we identified the determinants through literatures and expert opinion (practitioner) instead of customers because the practitioner has more expertise in this area due to his jobdesk, the literatures are the essence of knowledge from various sources, and to avoid biases from the customers.

The determinants in logistics services can be derived from the determinants of performance measurements in logistics services. Bowersox, Closs, & Cooper (2002), described that there are several determinants of quality for performance measurement. They are (1) Damage frequency, (2) order entry accuracy, (3) picking/shipping accuracy, (4) document/invoicing accuracy, (5) information availability, (6) information accuracy, (7) number of credit claims and (8) number of customer returns. The interview with the expert resulted in several determinants that relate to logistics service. They are (1) distance/network, (2) volume/size, and (3) waiting time. The expert is a practitioner from PT. Go-Box Indonesia, which is one of the major logistic service providers in Indonesia.

In this research, there are only several determinants that will be selected and transformed into a questionnaire. The determinants are selected based on the related properness of each determinant to the characteristics of logistics sharing that will be assessed by our target respondents. The respondents were asked to compare pairs of two determinants and score them based on their importance in the questionnaire. Respondents had to rate the importance of one endpoint compared with another on a scale ranging from 1 up to 9. Number 1 reflects equal importance of the two endpoints, and number 9 reflects extremely more importance of one endpoint over the other. An example of pairwise comparison is shown in Figure 1.

AHP models are based on a comparative judgment of the alternatives and criteria (Grady, He, & Peeta, 2015). Therefore, AHP is a useful approach for evaluating complex multi-criteria alternatives involving subjective judgments (Huang et al., 2008). The objective of using an Analytic Hierarchy Process (AHP) is to reduce complex decision problems in a systematic and analytic manner by addressing each aspect of the failure in the hierarchy to help the analysis to identify the preferred alternative (Khaira & Dwivedi, 2018).



Figure 1.
Example of Pairwise Comparison

The respondents of the questionnaire are 22 experts in the industry of logistics. However, we do not involve any experts that work within the companies of logistics service providers. We define the experts into two main categories: (1) academic researchers that has supply chain management and logistics management expertise and (2) customers of logistics service providers. We believe that both respondents will give a better and unbiased perspective of what kind of determinants should be optimized in the logistics service industry.

The output of the questionnaire will then be analyzed to find the priorities ranking of each determinant using the Analytical Hierarchy Process (AHP) method, a multi-criteria decision-making method in which factors are arranged in a hierarchic structure (Saaty, 1990).

The formula in determining the contribution value is given as follow:

$$\text{contribution value}_i = \left(\prod_{j=1}^n \text{rank}_{i,j} \right)^{\frac{1}{n}}$$

where $i, j = 1, 2, \dots, n$ and $i \neq j$

The i -th determinant's contribution value is the multiplication of all compared importance value index of other determinants towards the i -th determinants assigned by the respondents.

The contribution values were then normalized to obtain the eigenvectors. The weight (the eigenvector) of each determinant will be perceived as a priority by customers in logistics service.

The AHP method is very common to use if we want to look for the priority of each factor. To use this method, we need to define the problem first and create the structure of the decision hierarchy. After that, we need to construct a set of pairwise comparison matrices and use the judgment of experts who, in this study, are academic researchers and customers of logistics service providers to determine the priorities scales and the weight for each priority. (Saaty, 2008). To be able to use this method, we also need to ensure that the consistency ratio (CR) or the inconsistency level is fulfilled for some factors more than 5 (in this study, we use nine factors) in which the consistency ratio must remain under 0.10 (Saaty, 2008).

Using this method, the questionnaires rated the relative priority between each determinant. However, we only included the variables and did not include the alternatives, which are the characteristics of the AHP process. Several reasons underlying our method not to include the alternatives were: (1) Most of the companies do mixed-method instead of one fix method so that there is no one rigid alternative to be chosen, and (2) the respondents will be overwhelmed (resulting in a bias answer) to rate more than five pricing methods in respect to each determinant. Therefore, the output of the questionnaires is only the proportion of each determinant, which represents its priority, from the perspective of the respondents. The calculation of priority's weight or eigenvector and CR was performed using the software package of Expert Choice 11.

A separate analysis of the pricing method was done by the authors based on the result of prior questionnaires. The priority of each determinant was evaluated to find the proper pricing method to be applied in the logistics service industry, including the sharing logistics.

Results and Discussion

Determinants of Logistic Service Providers

From the literature review results, the determinants in logistic service can be divided based on the offered service from a logistic company, such as the logistic service and the quality of the logistic service (Figure 2). The logistic service that the company offers can be categorized into network distance for delivering the goods and how much volume/size that customer is able to send their package. This result is obtained from an interview with the manager of one of the leading logistic service companies, PT Go-Box Indonesia. Network distance and volume/size are the main services that logistic service providers offer to the customer.

Furthermore, for value-added service, companies rule their service quality. The service quality can be divided into several factors, such as on-time delivery, zero damage when goods are received by recipient, order accuracy/perfect order, picking or shipping accuracy, document/invoicing accuracy, information accuracy, and waiting times from picking up the goods from the sender if the logistic companies offer this service. Several providers in the logistic service industry have implemented quality-focused services. This quality-focused service also can be implemented to help service providers differentiate their business and have a competitive advantage to win the market. From the AHP analysis distributed to 22 respondents, respondents chose Damaged Zero Delivery as the first priority for them. It means that they want the goods still in good condition when they arrive at recipients.

The second priority is order accuracy/perfect order. It means that the goods that the recipients receive are the same product that the sender sent to them. The next factor that customers chose is picking or shipping accuracy, which means the goods are delivered to the precise address of the customer.

On-time delivery is in the fourth-order of customer perception. In this case, this means that after respondents chose several packages of the service delivery for instance, One Day Service or Regular services, these different services provide different arrival times. Still discussing time, several service providers also offer to pick up the package that the customer will send to the recipient, and respondents will count the waiting time whether it is tolerable or not for the respondents. Yet, both time factors can be considered less important for respondents. Other quality service providers offer such as document/invoicing accuracy. In logistic service companies, it is important to provide accurate invoicing to help customers tracking their delivered goods. The bottom two that customers undesired or perceived unimportant by respondents are the main services that logistic companies provide.

Based on this result, it can be concluded that respondents have turned into the quality-focus rather than the main services that logistic companies provide. The respondents are more likely benefit-seeking. The weighting scheme from the AHP analysis is shown in Table 1. The inconsistency rate for the AHP analysis is 0.03. Therefore, we can safely conclude that the judgment is consistent. The preference from respondents can help companies to design a suitable pricing strategy for logistic service. In this study, we will use this proportion to design the pricing method for sharing logistic services.

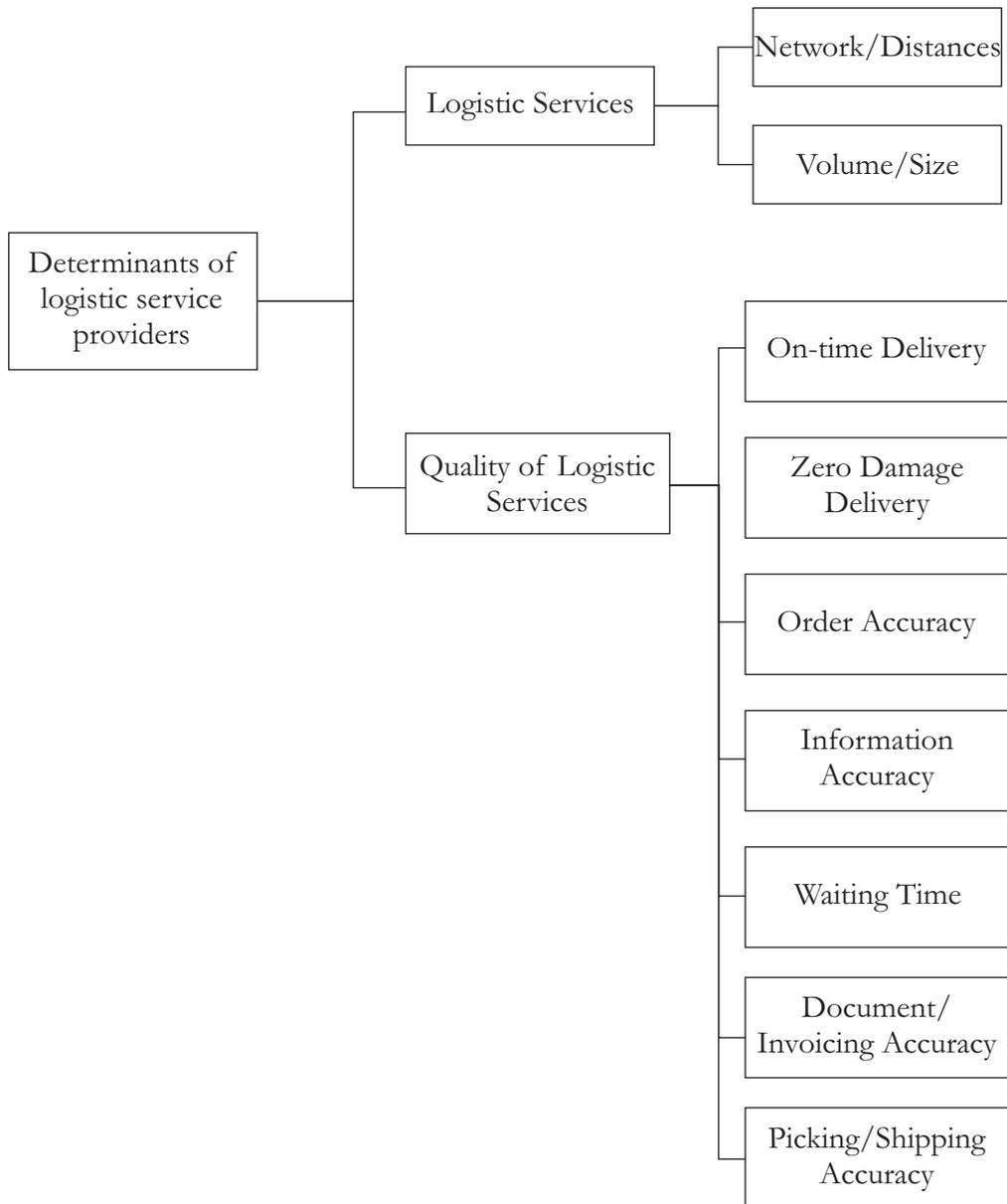


Figure 2.
Determinants of Logistic Service Providers

Table 1.
Proportion Result of Sharing Logistic Service

Determinant Factors	Weight	Rank
Damaged Zero Delivery	0.263	1
Order Accuracy/Perfect Order	0.160	2
Picking or Shipping Accuracy	0.143	3
On-time Delivery	0.106	4
Waiting time	0.086	5
Information Accuracy	0.094	6
Document/Invoicing Accuracy	0.085	7
Network Distance	0.037	8
Volume/Size	0.025	9
Total	0.999	

Pricing Strategy

To generate the pricing strategy for sharing logistics, the data that contains priorities in using logistic services can be used to help to identify suitable pricing strategies. Three basic pricing strategies that are usually used by companies are cost-based, value-based, and competition-based pricing. The cost-based price strategy used production cost to determine the price. The value-based pricing used consumer perceived value to determine the price, and the competition-based pricing which used the assumption that the consumers evaluate products of a business organization according to the rivals' prices for similar products.

The data taken from interviews and AHP analyses shows that customers are more likely to focus on quality/ value-added services rather than main services. Based on those three basic strategies, the pricing that can be implemented in sharing logistics is value-based pricing which use consumer's perceived value instead of the cost of the products or services as the pricing base. This pricing strategy is common to use in the service sector. The pricing strategy will be determined by consumers' perceived value towards the service that service logistics provide. By way of the strategy, the customers' needs and perceptions shape this pricing structure.

In this case, we found that in order, the customer give more value to damaged zero delivery, order accuracy, picking or shipping accuracy, on time delivery, waiting time, document or invoice accuracy. Network distance and volume or size become the last priority for the respondent. Value-based pricing lures consumers to use the service or trust company because those companies can help them find what they need and want and translate it into a product.

Conclusion

This research has identified several determinants in logistics service that are perceived as priorities by customers. Based on their priority, the determinants are: (1) damage zero delivery, (2) order accuracy/perfect order, (3) picking or shipping accuracy, (4) on-time delivery, (5) waiting time, (6) information accuracy, (7) document/invoicing accuracy, (8) network distance and (9) volume/size. The priorities imply that customers focus on the quality of the service rather than the main services. Therefore, we might infer that the customers are benefit-seeking. Thus, the pricing method that can be proposed for sharing logistic companies is value-based pricing. Hopefully, by identifying the determinants that are perceived as a priority by customers in logistics service, and with its appropriate pricing method, companies that run their business in logistics sharing will have a proper pricing method guideline in the first place. Further research may be needed to be done to breakdown the value-based pricing method into a generic framework that can help companies to develop their own customized pricing method.

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