Jurnal Informasi dan Teknologi

https://jidt.org/jidt

2024 Vol. 6 No. 2 Hal: 47-52 e-ISSN: 2714-9730

Analysis of The Relationship Between Information System Management, Demand Management, Revenue and Profit Management in Logistics Industries

Arnold Sultantio Hutabarat[1]✉, Umi Setyorini[2], Dede Rustaman[3], Teguh Prakoso[4], Eva Yuniarti Utami[5]

[1]Institut Bisnis dan Informatika Kesatuan
[2]ITB YADIKA Bangil
[3]STAI Nida El-Adabi
[4]STIE Manajemen Bisnis Indonesia
[5]Universitas Sebelas Maret

arnold@stiekesatuan.ac.id

Abstract

This study aims to investigate the application of the philosophy in the land cargo transportation sector. Researchers researched two companies in this sector: a courier service company and a truck-based goods transportation company. Semi-structured interviews were conducted with both companies to understand more about their operations, including reservation policies, prices, clients, etc. We also paid two visits to the company. We processed the data using the MS Excel Office program. The research results revealed that the studied company, the courier service company, adhered to a rigid pricing structure without taking the year into account, while the goods transportation company set prices based on distance without using historical data or demand per period. Additionally, we discovered errors in data recording at freight transportation companies, leading to the loss of crucial information. We propose performance indicators for both sectors, drawing from indicators used in other industries. Freight companies create segmentation based on months of the year, days of the week, and distance groups to enable better pricing strategies. However, analysis of the indicator calculation graph shows that the company does not sometimes charge a proportional price per kilometer traveled and does not segment by periods of the year. Thus, it is advisable to implement these practices to maximize company revenue.

Keywords: Transportation, Courier Service Companies, Freight Forwarding.

1. Introduction

Revenue management is a strategic approach to optimizing revenue using information systems and appropriate pricing strategies. The main emphasis is on selling a unit of capacity to the right customer, in the right place, and at the right time. The first step in developing this concept is to conduct data analysis. This involves collecting and analyzing customer data, market demand, and other factors influencing pricing decisions. Next, customer segmentation is an important step. Understanding customer profiles and dividing them into appropriate segmentations enables companies to adjust prices according to the characteristics of each segment. Optimal pricing is also crucial to revenue management [1]. This involves setting appropriate prices for each customer segment, considering demand, time of day, and market conditions. Proper information systems, including revenue management software, are critical to monitoring and managing prices efficiently. Apart from that, capacity optimization is also an important step. Companies can optimize their available capacity by setting appropriate prices, promotions, and cancellation policies. Lastly, continuous evaluation and adjustment are necessary [2]. Monitoring performance and making strategy adjustments based on data analysis and the latest market conditions helps companies significantly increase their revenue by selling products or services to customers in the right place and at the right time [3].

The main goal of revenue management is to set prices according to forecast demand. Thus, customers who are sensitive to price increases and wish to purchase products in advance can do so at a profitable price. On the other hand, customers who are less sensitive to price increases and want to buy when there is higher demand can also do so without paying exorbitant prices [4]. This concept allows companies to set prices dynamically according to market conditions and customer preferences. By utilizing suitable information systems and conducting careful analysis of customer and market data, companies can set optimal prices for each situation. Implementing this strategy can help companies increase revenue by maximizing available capacity and attracting customers with prices that match the value they receive. Thus, revenue management becomes an effective tool for managing a business efficiently and generating optimal profits. Revenue management is a strategy that applies to almost all

Receipt: 16-11-2023 | Revision: 21-03-2024 | Publish: 13-04-2024 | doi: 10.60083/jidt.v6i2.529

sectors; however, its application is more effective in operations with specific characteristics [5]. The ideal operation for implementation has relatively fixed capacity, predictable demand, perishable inventory, adequate cost and pricing structures, and variable and uncertain demand. The cargo transportation industry is a very relevant sector with high growth potential in application. For example, the air cargo transportation sector has grown significantly [6]. The industry grew by 20% in 2020, driven by global economic expansion, increased industrial production, and growth in world trade. This projection is consistent with the estimated 5% annual growth over the next 30 years, indicating great potential for the air cargo transportation industry [7]. With operational characteristics suitable for the implementation, the industry can utilize this strategy to optimize its revenues by adjusting prices according to market conditions and varying demand [8].

The evolution of technology, especially with the emergence of electronic commerce, has significantly changed buyer behavior and directly impacted increasing order volumes in the courier sector. Electronic commerce allows consumers to make purchases online quickly and conveniently without going to a physical store. This has led to a rapid surge in the goods retailers ship to consumers [9]. With increasing order volumes, the courier industry must be able to manage and deliver goods efficiently and on time. This requires good revenue management strategies, especially in setting prices in line with variable and uncertain demand. Apart from that, technology also plays an essential role in improving courier operational efficiency [10]. Information systems and revenue management software can assist couriers in managing orders, monitoring delivery status, and optimizing fleet use to reduce costs and increase customer satisfaction. Thus, the evolution of technology, particularly in electronic commerce, has brought about significant changes in the courier sector, driving growth in order volumes and the need to implement effective revenue management strategies to manage the challenges associated with changing buyer behavior and increasing order volumes [11].

The growth of the e-commerce sector has driven an increase in order volume in the courier sector and the land transportation sector. This is caused by the e-commerce company's need for external company services to deliver goods to consumers [12]. As e-commerce expands, retailers must prepare their transportation networks for expected fluctuations in online sales growth. To address these fluctuations, retailers can collaborate with transportation and courier service providers, who can adjust their fleet capacity to changing demand. Retailers can use revenue management strategies to adjust shipping prices to varying demand, thereby minimizing transportation costs and enhancing operational efficiency [13]. Aside from that, retailers can also use technology to improve transportation management efficiency. Integrated information systems can assist in order management, delivery monitoring, and inventory management, allowing retailers to respond quickly to fluctuations in demand. Thus, the e-commerce sector not only has a positive impact on the courier sector but also encourages growth and innovation in the land transportation sector, as well as encouraging companies to develop adaptive and efficient strategies for dealing with the expected fluctuations in online sales growth [14].

This research is particularly relevant given the increasingly important role of the land transport sector in addressing the growth of e-commerce and the need for effective revenue management. In analyzing this sector from a revenue management perspective, several unique characteristics differentiate it from other means of transportation that need to be considered [15]. First, most land transportation fleets have a fixed capacity, so capacity and price management become more crucial. Second, the demand for ground transportation services can vary greatly depending on the season, day, or time. Third, external factors such as traffic conditions, government regulations, and weather conditions can influence land transportation operations and must be considered. It is essential to evaluate how freight transport companies manage their capacity and prices to deal with varying demand fluctuations when implementing it. This research's theoretical and empirical approaches will provide valuable insight into the effectiveness of implementing it in improving the performance of land transportation companies. Thus, this research has great potential to contribute to developing better revenue management strategies in the land transport sector [16].

The application of revenue management in the transportation sector has focused more on air cargo transportation, with several studies also covering maritime, rail, and, to a lesser extent, truck transportation. However, no studies have specifically applied to the messaging sector, an essential reason for conducting this study to fill the literature gap [17]. Although these sectors have similar characteristics that can help us understand the application in transportation, messaging has specific differences that must be considered and addressed differently. In the context of the messaging sector, several factors need to be considered in implementing it, such as variations in demand depending on the season, day, or time; external factors such as road conditions, government regulations, and logistics policies; as well as fleet availability, which may be limited, need to be considered in adjusting prices to demand [18]. We hope this study will enhance our understanding of how the concept implementation can boost efficiency and profitability in the messaging sector. Apart from that, this study can also be a basis for developing more effective revenue management strategies for dealing with demand fluctuations in this sector.

2. Research Methods

A study evaluated the application of revenue management in the land transportation sector, focusing on two companies: a courier service company and a truck-based goods transportation company. Both companies send files in MS Excel containing total orders per month and year but do not store specific information about deliveries made. Due to this limited information, the possibility of exploiting the results based on the variables in this case study is limited. Apart from that, other limitations are that both companies are subcontracted by different courier companies that cannot meet their demands, and they have annual contracts that make it difficult to manage. Semi-structured interviews were conducted with both companies to understand more about their operations, including reservation policies, prices, clients, etc. We also visited the trucking company twice to address their queries and gather additional information. The company sends reports in PDF format corresponding to the annual performance reports that each subsidiary must prepare and send to the head office. We processed the data using the MS Excel Office program. Nevertheless, the results of this research will provide a better understanding of the application in the land transportation sector, even considering the limitations in data collection and processing.

3. Results and Discussion

Regarding courier service companies that subcontract to logistics delivery companies, courier capacity management is critical in optimizing company efficiency and profitability. The company has three types of couriers: primarily independent couriers who take orders through the app, a small number of self-employed or contracted couriers, and contracted couriers who have a fixed capacity. Independent couriers using logistics delivery applications can be considered to have variable capacity. They can activate or deactivate when there is a high demand for order delivery. On the other hand, contracted couriers are deemed to have a fixed capacity, as searching for, interviewing, and contracting new couriers is not straightforward. When all the couriers are busy, and additional orders arrive, they must reject them. Courier capacity management must pay attention to changing demand patterns. When demand is high, companies should be able to activate more independent couriers or increase the working hours of contracted couriers. In contrast, companies must reduce unnecessary capacity when demand is low to avoid unnecessary costs. Thus, companies can maximize available resources and increase customer satisfaction by guaranteeing on-time delivery.

Regarding freight transport companies, there is a capacity difference between subsidiaries acting as transport agencies. The subsidiary transport company has its truck fleet and fixed capacity. They do not accept additional orders if all trucks are distributing cargo and additional orders arrive. On the other hand, the subsidiary agency does not have its own truck fleet or fixed contracts with truck suppliers. They announce their service requests through the platform, search for available truck drivers, and negotiate prices. Their capacity depends on the supply of trucks during that period.

Regarding freight transport companies, there is a capacity difference between subsidiaries acting as transport agencies. The subsidiary transport company has its truck fleet and fixed capacity. They do not accept additional orders if all trucks are distributing cargo and additional orders arrive.

On the other hand, the subsidiary agency does not have its own truck fleet or fixed contracts with truck suppliers. They announce their service requests through the platform, search for available truck drivers, and negotiate prices. Their capacity depends on the supply of trucks during that period.

In the context of different demands, courier service companies need a strategy that can respond to both types of demand efficiently. Fixed demand allows for better planning and enables companies to optimize their capacity use. On the other hand, variable demand requires flexibility and a quick response to meet customer needs. Companies can manage expectations and ensure consistent service by having fixed contracts in place for all clients. Using applications from other companies for day-to-day operations is a standard industry strategy, allowing companies to focus on efficient service and delivery. By recording order quantities and using spreadsheets to predict future demand, companies can be better prepared to manage capacity and plan better service strategies. Improving internal information management systems to manage order data more effectively can be an excellent step to improving operational efficiency. The yearly increase in orders shows a positive growth trend for courier service companies.

Although the number of clients they work with varies from year to year, growth in the shipping sector as a whole has increased the number of inquiries. This reflects the importance of this sector in the shipping ecosystem and the potential for future growth. With a better understanding of these trends, companies can continue to optimize their operations to address the ever-increasing surge in demand. They can use historical data to predict future trends and prepare better strategies to respond to customer needs. This could involve increasing capacity, improving operational efficiency, or even diversifying services to meet the evolving needs of their customers. By taking advantage of the growth of the delivery sector, courier service companies can continue to grow and develop in an increasingly dynamic delivery ecosystem. Order patterns with clearly defined periods of low, medium, and high demand provide valuable insights for courier service companies. The strongest and most

increasing demand occurs from August to December yearly, with peak demand occurring in August. This month, collaboration with particular clients increased demand to 5000 deliveries. Downtrends typically occur in August, often a holiday with lower demand. Companies can plan and manage their resources more efficiently with a clear understanding of these demand patterns. They can increase capacity during busy periods to accommodate spikes in demand while at the same time reducing capacity during low periods to save on operational costs. This strategy can help companies improve operational efficiency, maximize revenue during busy periods, and reduce costs during low periods.

In the face of two types of demand behavior, freight companies can develop more sophisticated strategies to optimize their operations. Companies can use a more formal contract-based approach for steady demand from clients who have used their services for several years. They can offer long-term contracts at pre-agreed prices, providing stability in bookings and payments. Meanwhile, companies can adopt a dynamic model that takes advantage of technology and fleet flexibility for variable demand that requires urgent delivery. They can use intelligent fleet management systems to quickly direct couriers or empty trucks to locations that need service. Additionally, they can leverage data analytics to predict demand spikes and strategically position their fleet before demand increases. With this approach, companies can optimize fleet use, increase operational efficiency, and increase customer satisfaction by providing responsive and reliable service.

Perishable inventory is an essential part of revenue management in the analyzed sectors. For instance, the hotel industry measures inventory based on the number of rooms per night. Hotels must manage their inventory carefully, considering factors such as demand levels, room prices, and other factors influencing room availability. In the courier sector, courier availability times are critical. This time includes, among other things, transfer time, delivery time to the customer, and waiting time between giving instructions to pick up another order. Ideally, couriers should have sufficient demand to deliver orders anytime, grouping these requests by route to maximize the number of deliveries. By leveraging historical data and the right analytical tools, courier companies can improve operational efficiency and increase revenue by managing courier availability times more effectively. To develop this concept further, courier companies can consider using technology such as route optimization algorithms to optimize courier trips and reduce waiting times. Additionally, they can expand their understanding of demand patterns by analyzing long-term trends and identifying factors influencing demand fluctuations. As a result, companies can develop more innovative strategies to manage courier inventory and optimize resource usage.

The logistics department is essential in managing deliveries efficiently, especially in reducing unproductive waiting times between assigning orders to couriers and subsequent orders. We can minimize courier waiting times and reduce operational costs by optimizing delivery routes and intelligently managing order assignments. You can implement a strategy of grouping orders based on similar locations and times. As a result, couriers can pick up orders with efficient routes and minimal waiting time. Technology, such as logistics applications or order management software, can significantly help plan optimal delivery routes and manage order assignments efficiently. With this approach, companies can increase customer satisfaction by reducing delivery times and providing more responsive service. In messaging, efficient management can also improve a company's reputation and expand market share because customers prefer service providers who can provide fast and reliable service.

Time management of truck availability becomes critical for freight transport companies with their fleet of trucks, as any underutilization can lead to revenue losses. Therefore, companies must manage their truck fleet efficiently to ensure the trucks are always active and transporting loads according to their capacity. Using technology to track the location and status of trucks in real time is one strategy that companies can implement. With accurate information about truck positions, companies can plan efficient delivery routes and optimize truck usage. Apart from that, companies can also carry out routine maintenance to prevent unexpected damage and train truck drivers to maximize the use of their trucks. With this approach, companies can reduce potential losses due to downtime and improve their overall operational efficiency. By maximizing truck availability times and optimizing their use, companies can increase their revenues and strengthen their position in the market.

In this context, courier service companies can also consider strategies focusing on customer segmentation and price differentiation. First, companies can use historical data to identify order patterns from regular and variable customers. With a better understanding of order behavior, companies can tailor pricing offerings more appropriately to each type of customer. For example, to maintain customer loyalty, companies can offer attractive discounts or service packages to repeat customers who tend to order regularly. Second, companies can also utilize the method to manage truck fleet capacity and availability more effectively. Companies can set more efficient delivery schedules by analyzing demand patterns and using route optimization algorithms to avoid gaps or excess capacity. This can help companies reduce operational costs and increase delivery efficiency.

Furthermore, companies can use this method to identify new business opportunities. For example, companies can identify new demand trends or untapped potential customers by analyzing order data. By leveraging it to optimize pricing strategies, manage capacity, and identify new opportunities, courier service companies can improve their operational performance and overall profitability.

Careful management is required to ensure operational efficiency for courier service companies that rely on contracted delivery drivers. One strategy can be implemented using a reward system focusing more on delivery performance than just hours worked. For example, companies can provide additional bonuses or incentives to drivers who deliver orders quickly or with a higher order quantity. In this way, drivers will be more motivated to prioritize the efficient delivery of orders. In addition, companies can also consider introducing a more structured performance reporting and evaluation system for drivers. With this system, companies can monitor driver performance in more detail, including the number of orders successfully delivered, delivery times, and customer satisfaction. With this information, companies can provide more timely feedback to drivers and identify areas where they can improve their performance. When it comes to fixed and variable costs, companies must conduct careful analysis to understand how these costs impact their profitability. Companies must account for variable expenses per truck in their pricing to ensure that they cover their operational costs and also account for a decent profit. Companies may also consider strategies to reduce their fixed costs, such as using technology to optimize operations or negotiating more favorable contracts for office space rental. With effective management of fixed and variable costs, companies can increase their profitability and strengthen their position in the courier services industry.

Courier service companies have several attractive advantages for their clients, especially regarding delivery flexibility without sacrificing reliability. Its business clients seek the most economical delivery systems, and the company fulfills this need by offering efficient and reliable services. To clarify, the company's clients are not end clients but rather subcontractors of larger companies. Therefore, you must be able to determine the price correctly in advance and negotiate it when signing the contract. In the air cargo sector, freight forwarders negotiate contracts annually and maintain price stability. When managing revenue in a messaging business like the company's, it's crucial to remember that it prioritizes flexibility without compromising reliability. This is an essential strategy for attracting business clients seeking an economical yet reliable delivery system. A larger company subcontracts it, so setting the price and negotiating it accurately during contract signing is crucial. This allows the company to secure reasonable profits and maintain client satisfaction. Like forwarders in the air cargo sector, companies also face annual contracts with clients. This implies that a fixed price in the contract precludes any potential price variations until the contract's expiration. As a result, it is critical to set prices appropriate to market conditions and long-term client needs. It can optimize its revenue management strategy to increase operational efficiency and profitability by paying attention to these factors.

Focusing on high-quality service and reliability is key to winning customer trust in the freight transportation industry. Companies must prioritize tracking technology and providing transparent information to customers so they can follow the status of their cargo in real time. This increases customer satisfaction and strengthens the company's reputation for providing reliable service. The right revenue management strategy must take into account customer characteristics and preferences. Customers with less important loads requiring short-distance transportation tend to be more price-sensitive. Therefore, companies can adjust prices for this segment to remain competitive.

On the other hand, customers with essential loads requiring high reliability are more willing to pay higher prices for quality-assured services. For this segment, companies can offer special service packages or delivery guarantees, which can increase revenue. It is also essential to maintain long-term relationships with loyal clients. Stable, predictable pricing for these clients is crucial in maintaining a good working relationship. Based on previous year periods or load characteristics, proper price segmentation can help companies set fair and competitive prices. Clear communication about price changes or additional policies is essential so clients feel valued and well-informed. By understanding customer characteristics and maintaining good cooperative relationships, companies can develop effective revenue management strategies, increase customer satisfaction, and strengthen their position in the industry.

4. Conclusion

The research results lead to several conclusions. Despite significant economic growth, the messaging sector has not been widely implemented. Second, although there is research in the cargo sector, not much of it focuses on the definition of performance indicators but instead on its specific dimensions. Third, the messaging and cargo transportation sectors have a high potential for the application, given their characteristics and conditions that meet the requirements. In the context of the companies studied, courier service companies have a rigid pricing structure and do not consider the year, while freight transportation companies have price ranges based on distance without utilizing historical information or demand per period to set prices.

Furthermore, we discovered errors in data recording at freight transportation companies, leading to the loss of crucial information. We propose performance indicators for both sectors, drawing from indicators used in other industries. Freight companies create segmentation based on months of the year, days of the week, and distance groups to enable better pricing strategies. However, analysis of the indicator calculation graph shows that the

company does not sometimes charge a proportional price per kilometer traveled and does not segment by periods of the year. Thus, it is advisable to implement these practices to maximize company revenue.

References

[1] Asastani, H., Harisno, Haris, V., & Spits Warnars, H. L. H, "Factors Affecting the Usage of Mobile Commerce using Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT)," 2018, https://doi.org/10.1109/INAPR.2018.8627003

[2] Bahaddad, A. A, "Evaluating M-Commerce Systems Success: Measurement and Validation of the DeLone and McLean Model of IS Success in Arabic Society (GCC Case Study)," Journal of Business Theory and Practice, vol. 5, no. 3, pp. 156–193, 2018.

[3] A. Muktamar B, C. S. Lumingkewas, and A. Rofi'i, "The Implementation of User Centered Design Method in Developing UI/UX", *Journal of Information System, Technology and Engineering*, vol. 1, no. 2, pp. 26–31, Jun. 2023

[4] Blaise, R., Halloran, M., & Muchnick, M, "Mobile Commerce Competitive Advantage: A Quantitative Study of Variables that Predict M-Commerce Purchase Intentions," *Journal of Internet Commerce*, vol. 17, no. 2, pp. 96–114, 2018, https://doi.org/10.1080/15332861.2018.1433911

[5] Ainun, N., & Jefriyanto, J. (2023). Development of Kirchoff's Law Drawing Tools to Improve Student's Science Skills in Learning Process of Direct Flow Circuits. *JISTE (Journal of Information System, Technology and Engineering)*, *1*(2), 32–37.

[6] DeLone, W. H., & McLean, E. R, "The DeLone and McLean model of information systems success: a ten-year update," *Journal of Management Information Systems*, vol. 19, no. 4, pp. 9–30, 2023.

[7] Delone, W., & McLean, E, "Information Systems Success Measurement," *Foundations and Trends in Information Systems*, vol. 2, pp. 1–116, 2016, https://doi.org/10.1561/2900000005

[8] Ramdani, H. T., Ainun, N., & Muktamar B, A. (2023). Implementation of Progressive Web App on Dropship Data Management Application to Anticipate Product Order Errors. *JISTE (Journal of Information System, Technology and Engineering)*, *1*(2), 38–42.

[9] Sudirjo, F., Violin, V., Hutabarat, A. S., Indriani, L., & Utami, B. (2023). The Application of Extended Expectation-Confirmation Model to Identify Influencing Factors Digital Loyalty for Mobile-Based Travel Platform. *Jurnal Sistim Informasi dan Teknologi*, 162-166.

[10] Hartini, T., Judijanto, L., & Setyorini, U. (2023). Analysis Of The Influence Of Growth Opportunities, Company Size And Financial Difficulties Risk On Accounting Conservatism Of Potentially Bankrupt Manufacturing Companies In Indonesia. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(6), 2698-2703.

[11] Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D, "Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model," *Information Systems Frontiers*, vol. 21, no. 3, pp. 719–734, 2019.

[12] Sukirman, S., Azlina, Y., Kespandiar, T., Wibowo, T. S., & Setyorini, U. (2023). The Role of Brand Awareness and Integrated Marketing Communication on Consumer Purchase Decision of Online Travel Consumers. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(3), 792-797.

[13] Subiyakto, A., Ahlan, A. R., Putra, S. J., & Kartiwi, M, "Validation of information system project success model: A focus group study," *SAGE Open*, vol. 5, no. 2, 2015, 2158244015581650.

[14] Dewi, L. K. C., Efendi, B., Margery, E., Hutabarat, A. S., & Diawati, P. (2023). Analysis Of The Influence Of Service Quality, Brand Image And Branch Office Location On Banking Customer Decisions In Money Saving In Indonesia. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(6), 2811-2816.

[15] Magalhaes, A. D. J., Sopwandin, I., & Bakri, A. A. (2023). Online Training Application Design with Website-Based Blended Learning System Method. *JISTE (Journal of Information System, Technology and Engineering)*, *1*(2), 43–48.

[16] Taiwo, A. A., & Downe, A. G, "The theory of user acceptance and use of technology (UTAUT): A meta-analytic review of empirical findings," *Journal of Theoretical & Applied Information Technology*, vol. 49, no. 1, 2013.

[17] J. Jefriyanto, N. Ainun, and M. A. A. Ardha, "Application of Naïve Bayes Classification to Analyze Performance Using Stopwords", *Journal of Information System, Technology and Engineering*, vol. 1, no. 2, pp. 49–53, Jun. 2023.

[18] Tarhini, A., Alalwan, A. A., & Algharabat, R. S, "Factors influencing the adoption of online shopping in Lebanon: an empirical integration of unified theory of acceptance and use of technology2 and DeLone-McLean model of IS success," *International Journal of Electronic Marketing and Retailing*, vol. 10, no. 4, pp. 368–388, 2019.