

Analysis Business Process of Package Delivery Services Using a Business Process Reengineering Approach at ABC Company

Yekti Condro Winursito*, Isna Nugraha, Lanang Adnanta Irsyiddin,
Bryan Reinaldo

Industrial Engineering Department, Universitas Pembangunan Nasional "Veteran" Jawa Timur, Surabaya

*Koresponden email: yekti.condro.ti@upnjatim.ac.id

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Abstract

Due to this fast growth in the logistics industry, the demand for high-speed and reliable delivery services is increasing. This paper is based on a qualitative case study in which the current delivery process at ABC Company is studied, and recommendations are provided for process improvement. Data were collected through observations, interviews, Value Stream Mapping (VSM), VOC, Voice of Business (VOB), and PICK Chart analysis. Based on the analysis, the eight types of waste and the Process Cycle Efficiency (PCE) of 25% were found, which refers to many non-value-adding activities. The most prominent problems were delay in delivery, damaged packages, wrong destination, incomplete address, and poor shipment verification. After improvement, the process was reduced from eight stages to four, and the lead time was decreased from 64 hours to 37 hours. Thus, it increased logistics process efficiency by approximately 42%. Value Stream Mapping has been instrumental in supporting process improvement, courier performance enhancement, and customer satisfaction.

Keywords: *courier operations, customer satisfaction, logistics efficiency, process improvement, value stream mapping*

Abstrak

Pesatnya pertumbuhan industri logistik telah meningkatkan kebutuhan akan layanan pengiriman yang efisien dan andal. Penelitian ini menganalisis proses pengiriman yang berjalan dan menyusun rekomendasi perbaikan proses di Perusahaan ABC menggunakan pendekatan studi kasus kualitatif. Pengumpulan data dilakukan melalui observasi, wawancara, *Value Stream Mapping* (VSM), *Voice of Customer* (VOC), *Voice of Business* (VOB), dan analisis *PICK Chart*. Hasil penelitian mengidentifikasi delapan pemborosan (*waste*) dan *Process Cycle Efficiency* (PCE) sebesar 25%, yang menunjukkan masih tingginya aktivitas yang tidak memberikan nilai tambah. Permasalahan utama meliputi keterlambatan pengiriman, kerusakan paket, kesalahan tujuan, alamat yang tidak lengkap, dan verifikasi pengiriman yang belum memadai. Usulan perbaikan berhasil mengurangi tahapan proses dari delapan menjadi empat serta menurunkan lead time dari 64 jam menjadi 37 jam, sehingga meningkatkan efisiensi logistik sekitar 42%. Temuan ini menunjukkan bahwa *Value Stream Mapping* efektif mendukung perbaikan proses, meningkatkan operasional kurir, dan memperkuat kepuasan pelanggan.

Kata Kunci: *efisiensi logistik, kepuasan pelanggan, operasional kurir, pemetaan aliran nilai, perbaikan proses*

1. Introduction

In today's digital era, the freight forwarding and delivery service industry is one of the most promising business sectors. During the COVID-19 pandemic, logistics services played a crucial role in supporting economic activities. The industry not only survived but also experienced significant growth due to changing consumer behavior, particularly the increasing use of e-commerce and delivery services [1]. Currently, the freight delivery industry is among the fastest-growing sectors in Indonesia, driven by advances in communication and information technology [2], [3]. According to Feriadi, Chairman of the Indonesian Express Delivery, Postal, and Logistics Service Companies Association (Asperindo), this growth is largely supported by the rapid expansion of the e-commerce market. Indonesia also has one of the largest e-commerce markets in Asia [4]. As a result, the demand for efficient and technology-based logistics and delivery services continues to increase [5].

ABC Company is a company engaged in freight delivery services in Indonesia. The company provides delivery services to urban, rural, and international destinations. In addition, ABC Company offers parcel pickup and fast delivery services to customers. Several advantages of ABC Company include guaranteed delivery to the destination address, competitive shipping rates, accessible service information, and a nationwide delivery network available through its official website [6]. To remain competitive in the increasingly intense logistics market, ABC Company must provide excellent service to its customers [7]. Various factors influence consumers when selecting and deciding to use a delivery service provider. One of the most important considerations is service quality. Service quality refers to a company's ability to meet customer needs and expectations through reliable and timely service delivery [8], [9]. Therefore, delivering high-quality service is essential to achieving maximum customer satisfaction and loyalty [3].

According to Hammer and Champy, Business Process Reengineering (BPR) is the fundamental rethinking and radical redesign of business processes to achieve significant improvements in cost, quality, productivity, and service performance. The stages of BPR include value chain identification, business process analysis, and the design of new business processes [10]. BPR is often applied to improve operational efficiency because incremental improvements are not always sufficient to address outdated processes [11]. Package delivery delays were caused by repetitive and non-value-added activities [12]. Similarly, misrouted deliveries, excessive workloads, incorrect customer addresses, and lack of staff focus as the main causes of delivery delays [13]. Meanwhile, the customers were generally satisfied with ABC Company services [14]. Previous studies have demonstrated that Business Process Reengineering can improve service quality and operational performance in courier businesses through digital transformation and process [15]. Logistics service quality has also been shown to significantly influence customer satisfaction in courier and e-commerce services [16].

Customer satisfaction and loyalty are heavily determined by delivery timeliness, order accuracy, and the capability to handle customer issues [17]. Besides, efficiency of operation and satisfaction of customers can be enhanced with better supply chain and logistics management. Different from previous research, the current research adopts the qualitative research methodology using interview conducted at the Rungkut branch of the ABC Company. In particular, this research deals with business process improvement and service improvement to achieve higher performance sustainably [18].

ABC Company receives complaints about its service performance. The common complaints are late deliveries, damaged goods and deliveries to incorrect destinations. From the business point of view, the causes of the problems are non-conformity of shipment to shipping policy, lack of insurance of valuable shipments and fewer verification of delivery addresses that affect the efficiency of operations and the quality of service. Business Process Reengineering (BPR) is selected as the method to redesign existing processes in order to achieve operational excellence and reduction of operational cost, and improve customer satisfaction. BPR helps the company to become more responsive to market changes and customer needs. Thus, the entire examination of the existing business process of ABC Company is needed in order to find areas for improvements and design the future state process. Therefore, Surabaya branch of the ABC Company becomes the case study of this research.

2. Material and Methods

For the analysis and redesign of the package delivery business process in ABC Company, the research utilized the qualitative case study approach. To ensure organizational confidentiality, the research adopted anonymity for companies' names. This research approach helps gain insights into the current operational practice, identify problems in the process of business activities, and initiate a strategy of improvement through Business Process Reengineering (BPR).

The scope of this research is limited to business processes associated with the delivery of packages from the acceptance of orders and sorting of packages to delivery of packages. Data collection was conducted from both primary and secondary sources. The primary data were gathered through direct observation and semi-structured interviews. The direct observation was carried out over a period of one month at the branch of the ABC Company to gather an all-round idea of the package delivery process. The semi-structured interview included ten participants, five from the company (one operational supervisor, two operational employees and two couriers) and five customers having used the services of package delivery from the company. The secondary data were gathered from operational documentation, company's documents and literature on logistics management, service quality, lean operations and BPR.

This research was conducted through several systematic stages. First, there was a review of literature and a field investigation in order to understand the operational environment and identify the critical issues that influence the quality of service performance. Second, there was a process mapping in which all the

current business processes were mapped in order to get a clear picture of the business process from end to end. This allowed identifying and highlighting of bottlenecks, redundant activities, and other inefficiencies within the process, thus providing a basis for developing the best way to improve the service effectiveness.

Value Stream Mapping (VSM) is applied after the process mapping stage to conduct an end-to-end assessment of the business process of package delivery in order to determine the waste during the process. It is possible to differentiate between value added and non-value added activities and assess the process more comprehensively. The next step is analyzing the identified issues through the integration of Voice of the Customer (VOC) and Voice of the Business (VOB) approaches. The VOC approach is used to gather information about customers' expectations, complaints, and requirements. The VOB approach is used to identify business issues and constraints.

As per the results of Value Stream Mapping (VSM), Voice of Customer (VOC), and Voice of Business (VOB) analysis, different improvements initiatives have been generated and analyzed through the PICK Chart approach. As a result, each improvement initiative has been prioritized according to its potential impact and implementation feasibility. In turn, the chosen improvements have been incorporated into a BPR strategy and used for designing a new package delivery process. During the process redesign phase, emphasis has been put on elimination of non-value adding actions, simplification of process flow, improvement of information communication, and enhancing operational responsiveness. Due to the redesigned process, increased efficiency can be achieved and the optimal performance of the business can be ensured in the long run.

Finally, in the last step, a comparative analysis of "as-is" and "to-be" business processes is done. Through this step, overall impact of each improvement initiative on process efficiency, quality of services, reduction of waste, and overall performance of the process can be both analyzed and validated. All outcomes are benchmarked to make sure that all the objectives of the business have been met and maximum value has been delivered to the customers. Finally, a "to-be" business process will be designed in order to implement delivery operations in a lean, flexible, customer-oriented and high performing manner at ABC Company.

3. Results and Discussion

Business Process Reengineering of Package Delivery Services

Business Process Reengineering (BPR) strategy is used to make the process of delivery of packages effective and efficient [10]. The whole process of business reengineering is consistent with the vision, mission and corporate values of the organization. As a result, all initiatives for improvement become a part of the strategic goals of the business. In other words, the delivery process is transformed in such a way that it allows providing better, faster, safer and customer oriented services. At the same time, operational deficiencies, failures and complications of the process are eliminated thus ensuring high level of excellence, customer value creation and business performance [11], [15].

ABC Company strives to be one of the top and trusted logistics companies. For this purpose, customer satisfaction, operational excellence, continuous improvement and responsible attitude towards the business are regarded as key corporate values. Thus, the process of delivery of the packages is chosen to be the focal point of the Business Process Reengineering (BPR) process, as the quality of service, delivery and customer satisfaction depend on the efficiency of this process.

Existing Package Delivery Business Process

In the present package delivery process in the case of ABC Company, operational flow throughout the entire process cycle is ensured by seven major stakeholders which include customer, administrative staff, agent, branch office, warehouse, courier and recipient respectively. The process starts with the submission of package for delivery to the administrative staff by the customer. Thereafter, the administrative staff receives the package and ask for details of destination address of the package from the customer. When the customer has supplied the required details of destination address, administrative staff enter the information of the shipment in the system and create a tracking number. Tracking number is then provided to the customer through shipment receipt.

After registration process, the shipment information is communicated to the agent. At the agent's level, all the received packages are collected and sorted out before delivering them to the branch office. Upon reaching the branch office, all packages undergo the sorting process based on destination address. After sorting process, packages are transferred to the warehouse for further operations.

At the warehouse, goods inspection process is conducted on the packages. After the inspection process, packages are shipped to the destination branch. When the package reaches the destination branch,

a sorting process is conducted to determine the next delivery process. After the sorting process, a decision making process is conducted to identify whether the destination area falls within the coverage of the nearest branch. If it is found not to fall within the coverage of the nearest branch, the package is delivered to the nearest branch; otherwise, the package is sent to the final delivery stage. Afterwards, the package is assigned to the courier who handles delivery process in that particular coverage area. Finally, the package is delivered to the recipient.

In the current package delivery process, multiple package transfers, multiple handling operations, and double sorting processes still constitute the workflow of the end-to-end process. Package movements will go through agents, branches, warehouses, and couriers, causing multiple handovers at all stages. In addition, routing of packages is based on the coverage area of the branch, which means that when the delivery area is not covered, package movements are redirected to the nearest branch. As a result, lead times of the process will be increased, the complexity of the process will be increased, and resources will not be used efficiently. On the other hand, there is the existence of non-value-added activities in the existing process, meaning that customer value cannot be maximized to the fullest extent. In such a way, there is the presence of BPR opportunity to improve the end-to-end process flow by increasing operational efficiency, eliminating waste, and enhancing the customer experience [16], [17].

Business Process Mapping Using Value Stream Mapping (VSM)

Value Stream Mapping (VSM) technique will be used to identify operational waste and determine how efficient the current package delivery process is. Using the Value Stream Mapping (VSM) technique, process activities, waiting times, process bottlenecks, and process failures will be collected throughout the entire package delivery process [19]. As indicated in Figure 1, the current package delivery process involves several process activities starting from package collection, transportation, sorting, and warehouse handling to final distribution of the package. Using this process mapping technique, the process flow, processing times, waiting times, and process waste will be identified; this way, areas that can be improved in the current business process through Business Process Reengineering (BPR) will be established.

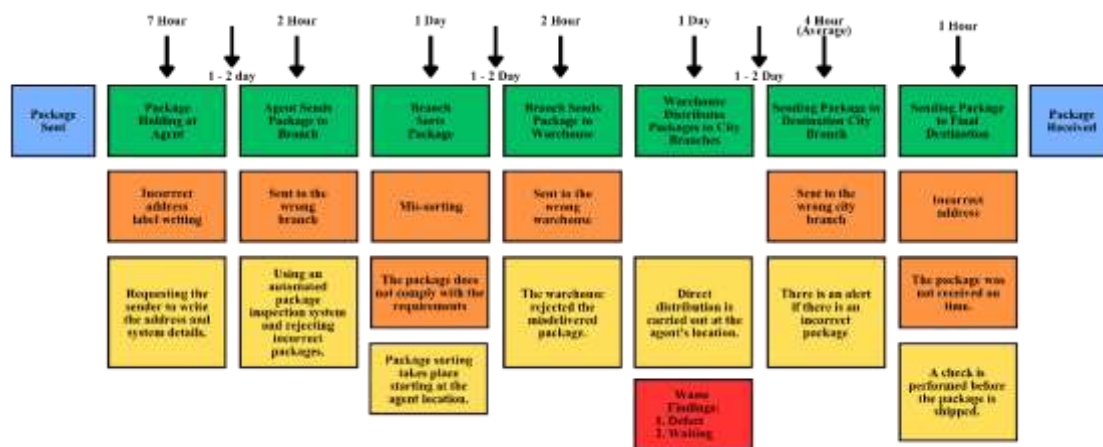


Fig 1. Value Stream Mapping of the Existing Package Delivery Process

Source: Author's document (2026)

With the help of Value Stream Mapping (VSM), there were eight instances of waste identified, captured, and highlighted in the current package delivery process. All of them were then further classified into two main types of waste, namely defects and waiting. Defects were identified seven times, and waiting once. In the category of defects, major operational problems include package misrouting, wrong destination addresses, sorting problems, routing problems at the warehouse, and delivery service mismatching. In the waiting category, delays are seen in package sorting and package allocation. The longest delays occur at package sorting and package allocation, and each takes about 24 hours. Therefore, lead time was increased, process responsiveness decreased, operational agility reduced, customer value under-realized, and operational performance did not reach its maximum.

Process Performance Measurement

KPIs for the current business process include total waiting time, process time, Process Cycle Efficiency (PCE) and the distribution of waste among others.

- Total Waiting Time

Two major waiting activities include:

Package sorting at the branch facility = 24 hours

Package allocation at the warehouse facility = 24 hours

Therefore, the overall waiting time will be:

$$24 + 24 = 48 \text{ hours}$$

- Process Time

The value-added process time is determined through the summing up of all activities that are directly linked with customer value. Following the Value Stream Mapping analysis, all value-added activities are mapped, captured, validated and tagged as activities that directly add value to the delivery service. Value-added activities include: package collection at the agent takes 7 hours; package transfer from the agent to the branch takes 2 hours; transfer from the branch to the warehouse takes 2 hours; transfer to the destination branch takes 4 hours; transfer to the destination agent takes 1 hour. All value-added activities are then aggregated, compiled, and calculated as a baseline metric to enable more accurate benchmarking, measurement, and optimization of the overall value-added process time. Therefore, the total value-added process time was calculated as follows:

$$7 + 2 + 2 + 4 + 1 = 16 \text{ hours}$$

- Process Cycle Efficiency (PCE)

So, to check how efficiently the process is running, the PCE value is calculated using the formula below:

$$PCE = \frac{\text{Value Added Time}}{\text{Total Lead Time}} \times 100\%$$

$$PCE = \frac{16}{64} \times 100\%$$

$$PCE = 25\%$$

Hence, a PCE of 25% means that only a quarter of the total process time is adding value to the customer. This implies that the other 75% are wasted through waiting or doing tasks that do not impact service quality. Hence, the current delivery process is inefficient.

- Waste Distribution

The Value Stream Mapping analysis indicated that there are eight wastes occurring consisting of seven defects and one waste of waiting. Thus, the percentage distribution of waste is:

1. Waste Defect Percentage

$$\text{Defect Percentage} = \frac{7}{8} \times 100\% = 87,5\%$$

2. Waste Waiting Percentage

$$\text{Waiting Percentage} = \frac{1}{8} \times 100\% = 12,5\%$$

In essence, the most common operational problems involve more than package waiting. Processing errors such as wrong sorting, data entry mistakes, and improper handling of packages are the most disruptive.

Root Cause Analysis Based on Voice of Customer (VOC) and Voice of Business (VOB)

Considering customer feedback, the most frequent complaints concern delayed deliveries, damage to the package, or wrong shipments. As for customers' requirements, they expect packages to be delivered on time, without damaging, and to the correct recipient. Additionally, the company faces various challenges including inconsistent contents of packages, absence of insurance on numerous shipments, and often missing information about customers' addresses. Such factors add to the workload of the team, to the risks, and eventually result in an unstructured delivery process.

Combining the findings of VOC and VOB, it becomes obvious that the problem occurs due to poor skills of the personnel responsible for the check of addresses, inadequate personnel, inefficient check of packages, insufficient control, and lack of automation tools for decision-making. All these problems are associated with the defects detected during VSM. Thus, it is necessary to fix them first in order not to disrupt the process of delivery [3], [7].

In essence, following the identification of the root cause of inefficiency, all improvement options are assessed against PICK Chart in order to determine the best option based on the ease of implementation and impact on business operations [11].



Fig 2. PICK Chart for Improvement Prioritization
Source: Author's document (2026)

As for the Challenge category, it includes such actions as the development of intelligent systems for monitoring deliveries, an automatic address verification system, as well as shipment insurance that is integrated into the system. To put it briefly, these actions may have a great impact, however, they will be quite difficult to implement. Moreover, they will require significant resources and effort. In this regard, based on the analysis using the PICK Chart, the most urgent action among BPRs is the action falling into the Implement category because it is easier and less complicated to implement.

So, considering the research findings, it turns out that package delivery procedure at ABC remains extremely complex. There is lots of movement, there are multiple sorts of packages performed repeatedly, and data checks remain imprecise. In general, mistakes become more frequent and packages reach customers late. Thus, VSM reveals that defects-related waste is 87.5%. In other words, the main issue is not in delays but in ineffective quality control system. PCE equals 25% meaning that most of the actions related to package delivery are ungrateful for customers [15], [19].

In general, the proposed BPR focuses on solving the above-discussed problems. There is simplification of the workflow, elimination of extra actions, package checking becomes simpler, and courier competencies are improved. After redesigning, the number of actions that are included in package

delivery process, which initially consisted of eight steps, gets reduced to four. It allows reducing the excessive and burdensome workload, streamlining processes and making them less time consuming.

Considering the results, one may see that the new flow has huge potential in streamlining the process, reducing the risk of errors, and allowing delivering packages quicker. In addition, customers would become satisfied with the process that would become simple and fast. Hence, implementation of the BPR model would help ABC deliver packages more quickly and effectively [16], [18].

Comparing Business Processes

First of all, it is important to mention that the main goal of this stage is to compare the old and the new process according to the BPR principles. To be more exact, the changes which are going to be made in the operation have been borrowed from the Implement quadrant of the PICK Chart because it is very realistic and has a great impact on operations. Comparison is going to be made concerning process flow, elimination of non-value-added activities (NVA) and the potential level of improving in terms of operational efficiency while preserving the quality of service provided.

To begin with, it should be mentioned that the current process of delivering packages in ABC Company includes eight major steps: package reception, package collection, delivering it to the branch, sorting, entering the warehouse, sorting, package redistribution and delivering it to the customer. Some steps, however, are useless; for example, sorting and relocation of packages cause the necessity of routing packages, additional handling and lead time increase. Also, the division of responsibilities among agents, branches and warehouses has been made very poorly.

The redesigned process includes four major steps, such as package reception, package sorting and checking at the agent, appointing of the courier and delivering of packages to the customer. Firstly, the role of the agent has been extended as he is responsible for checking and sorting packages from the very beginning in order to eliminate roundabouts. Secondly, couriers are appointed according to their delivery areas, which means that package redistribution is minimized.

Speaking about comparison of these processes, it should be noted that the redesigning process was very successful in terms of minimizing the number of steps from eight to four. It means that the longest and repetitive steps were eliminated and merged into the process which is more efficient. Efficiency of the process can be calculated according to the following formula.

$$\text{Process Stage Reduction Efficiency} = \frac{8 - 4}{8} \times 100\% = 50\%$$

In other words, the number of steps involved in the process has been cut in half. Shorter distribution channels have been created, which will help streamline the communication process between the teams as well as speed up decision-making. In order to determine the length of the new process, each stage is subdivided into more specific operations. These are presented in the table below. In order to facilitate process time analysis, the four re-engineered processes were further segmented into six activity levels as shown in Table 1 below. The parcel receiving and verification process involves two processes; parcel receiving and verification. The sorting and transportation process involves sorting of parcels and transportation to the destination branch. The system verification and courier assignment process involves system verification and courier assignment, while destination distribution management and delivery process involves destination distribution management and delivery of parcels.

Table 1. Operational Activities and Estimated Processing Time After Business Process Reengineering

Activity	Time (Hours)
Parcel receiving and verification at the agent	6
Parcel sorting at the agent	7
Transportation to the destination branch/hub	3
System verification and courier assignment	2
Delivery to the recipient's address	3
Destination distribution management	16
Total	37 hours

Sumber: Author's document (2026)

Efficiency Calculation

$$\text{Efficiency} = \frac{64 - 37}{64} \times 100\% = 42\%$$

The redesigned process will result in the substantial decrease in the overall delivery time to 37 hours from 64 hours. It implies that 27 hours will be saved on average, meaning that 42% efficiency is gained in the context of time management. The process will be streamlined by eliminating the previously useless sorting process and reducing the number of package transfers, as well as involving the agents properly at the initial stage.

4. Conclusion

Overall, this research analyzed the package delivery process at ABC Company and identified the factors contributing to operational inefficiency and delivery delays. Eight different types of waste were detected: seven related to processing defects to processing defects (such as damage, misdelivery), and one – related to excess waiting times. The Process Cycle Efficiency (PCE) was 25%, thus the majority of time spent on package delivery was spent on activities which didn't add value. As for VOC and VOB analysis, the most common problems are as follows: delays, damaged packages, losses, incorrect addresses, uninsured packages, and inappropriate content.

Based on the results obtained in PICK chart assessment, the following priorities of improvement have been identified: the early package classification, courier skills training, and improvements in address verification procedures to enhance their accuracy. Speaking about the suggested model of BPR, it simplified the delivery process greatly and reduced its stages from eight to four. That is why the waiting time was reduced from 64 to 37 hours, which means savings in about 27 hours or 42% of efficiency increase. In other words, this redesigned process will help to improve operation and service delivery and increase customer satisfaction.

Essentially, the area of research in this paper is still rather narrow because it concerns only one company and only the package delivery process within this company. Moreover, the suggested process redesigning model hasn't been implemented yet. That is why this process redesigning model should be either implemented in practice or analyzed in terms of modeling/cost benefit analysis. Also, the potential integration of digital technologies and logistics should be taken into consideration.

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