

Conference Paper

Business Process Analysis and Improvement in Selling Process Using Business Process Modelling Notation (BPMN) at Locarvest

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Abstract

This research is conducted in Locarvest. Established in 2015, Locarvest is an online platform company that selling agricultural products based in Bandung. They see the importance of agricultural product for human and people who like to shop online as an opportunity for them to sell local agricultural products online. Currently, they have been developing a website to change their selling platform which will be launched soon in the late of July 2019. They assume that the website can create a simpler selling process. However, they do not have their written business process where many companies have become increasingly interested in business processes due to the need for effective and efficient activities (Dave, 2017). In here, the objectives of this research are to analyze and model the current business process of Locarvest and propose a new business process to solve Locarvest's current problem using the concept of Business Process Management (BPM) and the design is modeled using Business Process Modelling Notation (BPMN). To model the current business process, interview with the employees of Locarvest and observation in the office were conducted. The result of this paper is proposing some improvements within the business process by eliminating some activities and create some new activities for Locarvest. The design also has been approved by the employees of Locarvest.

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1. Introduction

Indonesia is an agricultural country that has many resources which can be utilized. According to Badan Pusat Statistik Indonesia (cited in Andoko & Aurelia Candida, 2018), the agricultural sector contributes 13.63% to the GDP in the second quarter of 2018. As we are now living in the era of technology and internet, everything is easy to obtain. According to Mubarak (cited in Virgawati, 2012), in Indonesia itself, the technology for agriculture have been developed. The increasing of e-commerce affects many companies established an online platform to sell agricultural products such as vegetable and fruit. In this case, Locarvest is one of those companies. They see the

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importance of agricultural product for people and people who like to shop online as an opportunity for them to sell local agricultural products online.

Established in 2015, at first Locarvest only sell agricultural product from the local farmers to the supermarket in Bandung. However, they just started to sell their products online in late 2018 via WhatsApp. At this time, they also stopped selling their products to the supermarket. As they see their competitors selling the products on the website and an application, lately, they have been developing a website to change their selling platform. They assume that a website will help them to create a simpler selling process where it is easier to use and decrease the processing time. The website will be launched in late July 2019.

However, Locarvest do not have their own written business process as a base for them to do the business where business process plays an important role in a business. From the definition itself, business process is a collection of activities where there are one or more of inputs that creates an output which creates and deliver value for the company's customer (Hammer & Champy, 2009). If an organization does not have a business process, the organization will run their business inefficient as it visualizes each activity including the actor who responsible for it. Therefore, the inefficient in business process will affect waste, mostly in time and money. Moreover, they cannot reach their goals. Quoted from Dumas, et al. (2013), the design and performance of processes affect both the quality of service perceived by the customer and the efficiency with which services are provided.

Many companies have become increasingly interested in business processes due to the need in effective and efficient business operations, strengthen organizations and reduce costs, where the process is the basic unit of business value within an organization (Dave, 2017). It helps organizations can make major changes to their way of doing business (Latvytė, 2013). Additionally, business process allows an organization to gain insight, optimize a process, reduce risk, and provides the framework to monitor, adjusting and controlling the output of a process (Cernauskas & Tarantino, 2009).

In here, Locarvest need to review and restructure their business process since they will change their selling platform to a website where there will be some changes within the process. With this, they can check whether the website will make the business process more efficient or not. This will improve their performance and create an efficient and effective process. As quoted by Paim et al (cited in Dave, 2017), monitor, measure, and improve the processes of a business is also important in order to survive in the current dynamic business world. Where business process is critical for a company to remain competitive on the market today as stated by Hiatt (cited in Lee & Chuah, 2001).

2. Literature Review

2.1. Agriculture

Agriculture divides into several categories from horticulture, livestock or poultry, floriculture, and aquaculture. According to Stats SA (cited in Tibesigwa, et al, 2016) horticulture consists of fruits and vegetables. Livestock consists of cow, sheep, chicken, etc. Floriculture divides into flowers, cut foliage, and bulbs (Gebreyesus, 2015). Meanwhile, aquaculture is about aquatic organisms (Diana, 2009). Agriculture faces many challenges that create some uncertainties. Aimin (2010) stated that climate and weather conditions to animal diseases, changes of prices in agriculture products to fertilizer and other input, and financial uncertainties to policy and regulatory risks are the uncertainty in agriculture.

2.2. Business process

According to Smith & Fingar (2003), business process is the complete and dynamically coordinated set of collaborative and transactional activities that give value to customers. Davenport (cited in Bititci & Muir, 1997) stated that business process as a structured set of activities designed to produce a specific output. And last one, Smida (2007) describes business process as an organized group of interrelated activities, which include one or more organizational units, the activities involve human, material, financial and capital consumption, and the value from the output for the customer.

There are eight characteristics of business process, which are large and complicated, dynamic, long-running, adjusted across borders within and between businesses and widely distributed, automated, IT processes, depends on and supports human intelligence and judgment, hard to visibly make (Smith & Fingar, 2003)

2.3. Business Process Management (BPM).

Business Process Management (BPM) is knowledge to see the performance of an organization that ensures they have consistent outcomes and takes advantage of improvement opportunities (Dumas, et al., 2013). It is one of methods, techniques, and tools to discover, analyze, redesign, execute and monitor business processes. The key idea of BPM is to focus on processes when organizing and managing work in an

organization. Besides, BPM is flexible to modify as the model use graphical and can be changed easily.

BPM is a revival of BPR, as indeed BPM adopts the process-centered view on organizations (Dumas, et al., 2013). As Goldkuhl & Lind (2008) stated, BPM has its origin from business process reengineering – BPR as it was first introduced by Hammer (1990); Davenport and Short (1990). Compared to BPM, Business process re-engineering (BPR), is focused on the integration of process management and radical improvement of the process. BPR is primarily concerned with planning and organizing the process. By contrast, BPM provides concepts, methods, techniques, and tools that cover all aspects of managing a process—plan, organize, monitor, control—as well as its actual execution. (Dumas, et al., 2013).

2.4. Business Process Modelling Notation (BPMN)

Business Process Modelling Notation (BPMN) is a method for modeling a business process that enables Business Process Management (BPM). BPMN is developed by Object Management Group (Permatasari, et al., 2018). The model is simple and easy to understand as the goal of BPMN itself is to provide a notation that understandable for all business users, also business analysts who produce initial drafts for technical developers to implement the technology that carries out the processes. (Owen & Raj, 2003).

Even it simple and easy to understand, it has lots of event types. Before to use it, people need to understand and study those event types. People who uncommon with these things will find difficulties in reading the symbols. In BPMN, each stakeholder is represented on the horizontal lane known as the swim-lanes. Meanwhile, the activities in BPMN represented as rounded rectangles. If a subprocess is present throughout the process, a small sign at the base of the rectangle is represented. Diamond shapes represent control nodes (called gateways) and a rectangle folded at one corner shows a document. Activities and control nodes are connected through arcs (known as flows) which determine the execution order (Dumas, et al., 2013; Dave, 2017).

3. Methodology

To gather the data, the author performed in-depth interviews with the employees in Locarvest and observation at the headquarter of Locarvest in order to know the current condition within the company so the author could model the business process. To

support the data, the author used secondary data by collecting archival records from Locarvest such as sales and suppliers.

As stated before, the author will use BPM as a concept to do the research. The author follows the phase in BPM in order to answer the objective of the research. According to Harmon (cited in Dave, 2017), there are five phases in Business Process Management (BPM).

Planning a process redesign - In this phase, a problem within the process is posed. Processes that are relevant to the issue to be addressed are identified, defined and interrelated where there will be a design of the existing condition business process that provides an overview of the processes. In here, the author will use Bizagi Modeler software in modeling the business process.

Analyze the existing process - In this phase, problems related to the current process are identified. The author also gives an explanation of the problems that may occur and the impact of each problem.

Design new process - In this phase, the new design of the improvement process will be made to solve the problems within the company. There will be an improvement for each of the problems, also the comparison of the new design and existing process.

Resource development for the new process - From the new design of the business process, the company can know the resources needed and the actors who have the responsibility for each activity.

Managing new process implementation - In this phase, the changes in the activities in the business process are prepared and performed. When an error occurred, corrective action is taken by monitoring the new design of the business process.

4. Findings and Arguments

4.1. Planning a Process Redesign

After doing several times of interview with several employees of Locarvest, the author chose the selling process from a customer buy a product until they receive the product as the selected business process. This process is the main activity which is very important to the company where the main activity in Locarvest is selling agricultural products.

In selling their products, Locarvest have been using a pre-order system. This because they have pre-order products and agricultural products are their main product. They have to serve the products in a fresh condition where agricultural products cannot last

long. The pre-order conducts three times in a week every two days. This because they still have a low quantity of sales where they cannot order to suppliers in a low quantity.

From the description above, the author created detail activities within the selling process of Locarvest. The current business process of Locarvest is modeled using Business Process Modelling Notation (BPMN)'s software, Bizagi Modeler. The selling process of Locarvest can be seen in Figure 1. The order preparation which is a sub-process from the selling process can be seen in Figure 2. Also, bank transfer sub-process can be seen in Figure 3.

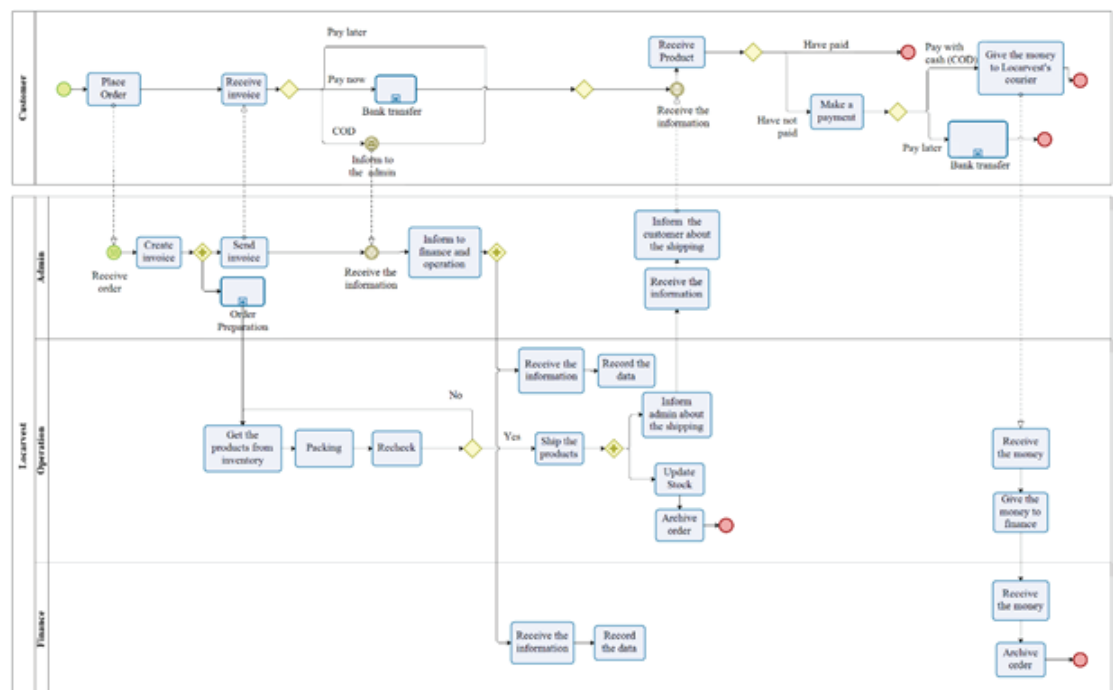


Figure 1: Locarvest' Selling Process.

4.2. Analyze the Existing Process

From Figure 1, 2, and 3, the author found out there are several problems within the selling process in Locarvest as follows.

First, Locarvest actually have two payment methods which are bank transfer and cash on delivery (COD). But some of the customers did not tell Locarvest if they want to COD yet did not make a payment until the pre-order closed (pay later activity. However, Locarvest still prepare the products and send those products to the customers.

Second, Locarvest do the re-order to suppliers twice with only two hours different time, at 3 p.m. for confirmation and 5 p.m. for giving the final order. By doing it twice means that the time is not used efficiently in the business process. But sometimes the suppliers

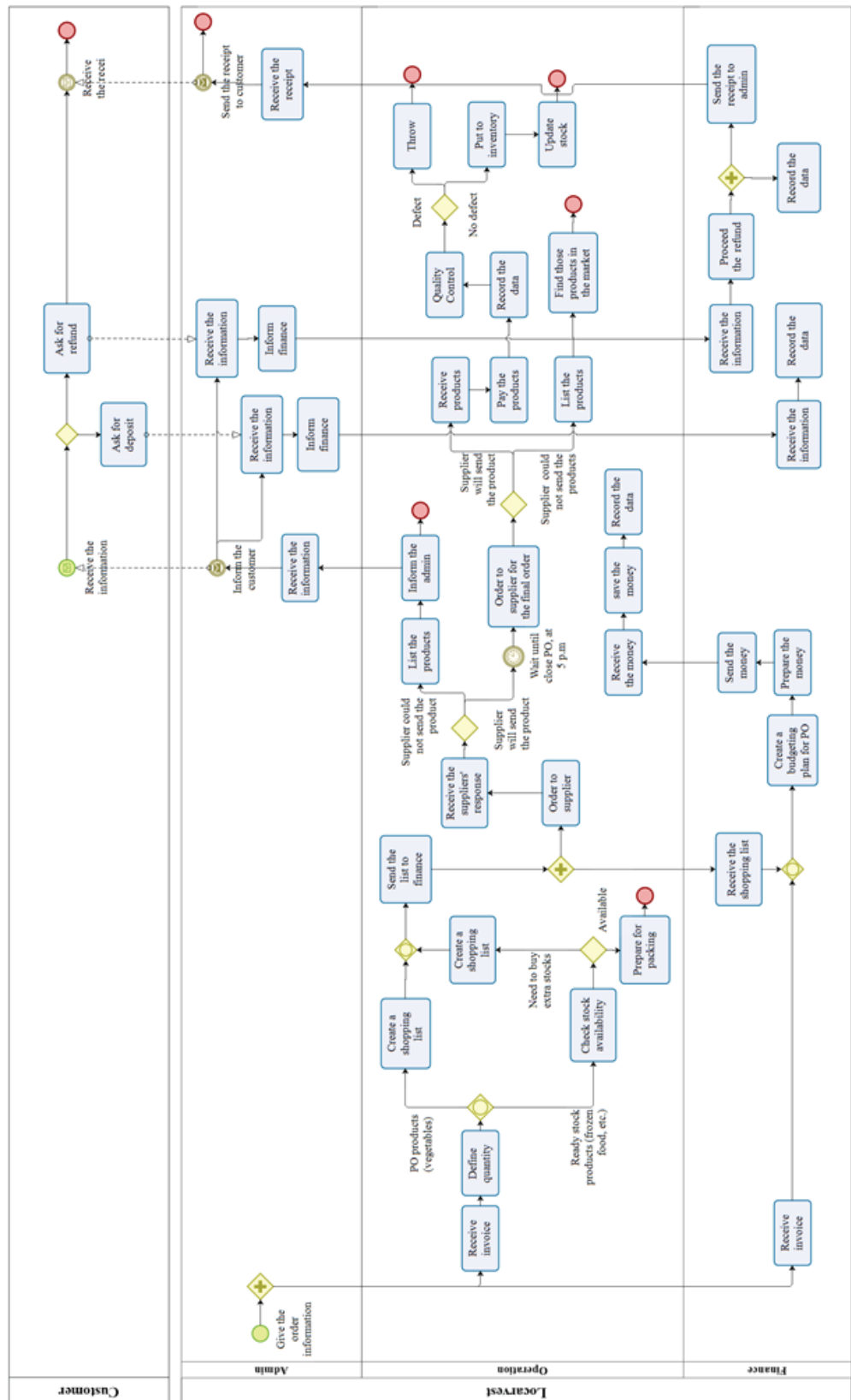


Figure 2: Order preparation sub-process.

could not send the products which make Locarvest have to cancel the order from a

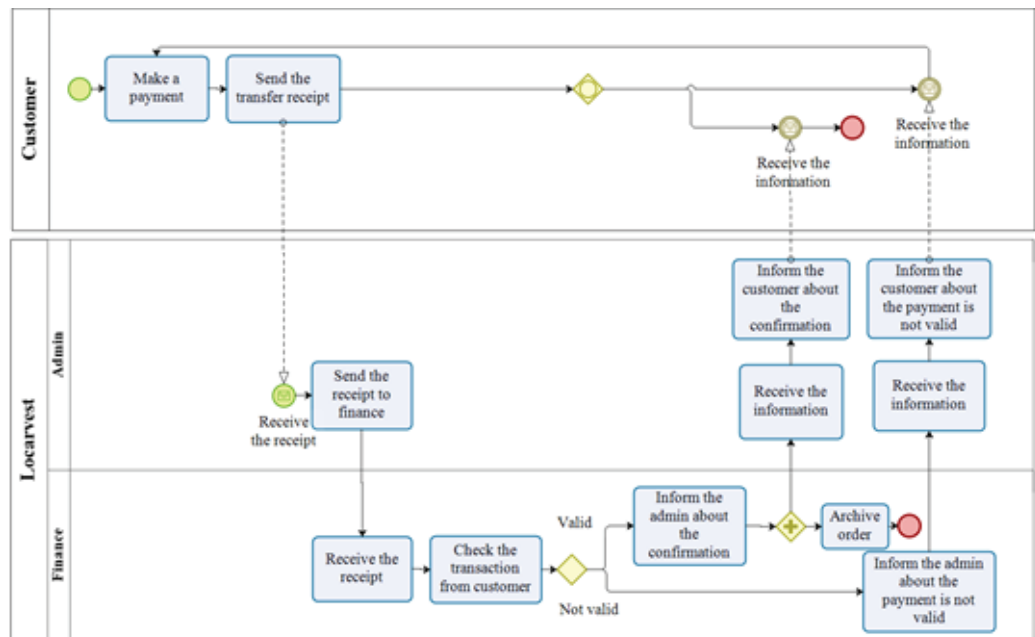


Figure 3: Make a payment using bank transfer sub-process.

customer who buys those products. In here, the customers can choose whether they want a refund or deposit the money for next purchase. The employee stated that it happens because the uncertainties in the field such as weather and plant diseases that make the farmers could not do the crop.

Third, the distribution of information between the workers is poor. When one division wants to share some information to another division, they communicate only using a messenger application. It may create bias information. When a division wants to give any information to a customer, they have to inform the admin first then the admin will tell the customer or vice versa. Also, when they archive an order, both operation and finance do this task which creates double records. This creates many distribution nodes within the business process which making an unnecessarily delay in distribution of information and resulting in complexity links.

Not only those problems, but Locarvest have also been developing a website to change their selling platform. With this changing, they could not cancel the order from customer easily and the customer could not make a payment after receiving the product. Besides, with their new website, the system can be a help for Locarvest in simplifying in distributing the information and recording the data.

4.3. Design New Process

Table 1 shows the problems within the process and the possible improvement for each problem.

TABLE 1: Recommendations for current business process.

Problem	Improvement
There are several customers did not make a payment until they receive the product without notifying the admin and Locarvest did not cancel the order	Eliminate the pay later activity. If the customer has not paid the products until the pre-order time end, Locarvest will cancel the order.
Locarvest do order to suppliers twice with only two hours different time. However, sometimes the suppliers could not send the products when they do the first order	Eliminate the first order activity and add ask the supplier about the available products before open for pre-order
The distribution of information is too complex between customers and Locarvest or between divisions	As Locarvest have been developing a new website, the website can be a system that can automatically notify the information when there is an order, make a payment, shipping the products, etc.
Recording and storing data is done manually and there is duplicate data that made by other division	With the system of the new website, recording and storing data can be done automatically

The new model of the selling process can be seen in Figure 4. While the improvement for the bank transfer payment method sub-process can be seen in Figure 5. The additional sub-process which is order cancellation can be seen in Figure 6. And order preparation sub-process which can be seen in Figure 7.

After designing the new process, the author comparing the existing process and the new design of the business process. The author compares the total elements within the design that calculated from the Bizagi Modeler software which can be seen in Table 2 and 3.

TABLE 2: The total elements of existing process.

Actor	Events	Gateways	Sub-Process	Tasks	Overall
Customer	13	6	2	9	30
Locarvest	16	16	1	71	104
Overall	29	22	3	80	134

According to Table 2 and 3, the new design has less of total tasks and activities within the process than the existing process, both for Locarvest and customers. In the new design, the total tasks for the customer are 7 tasks and 27 for overall, while the total tasks for Locarvest are 54 tasks and 83 for overall. Meanwhile, in the existing process design, the total tasks for the customer are 9 tasks and 30 for overall, while the total

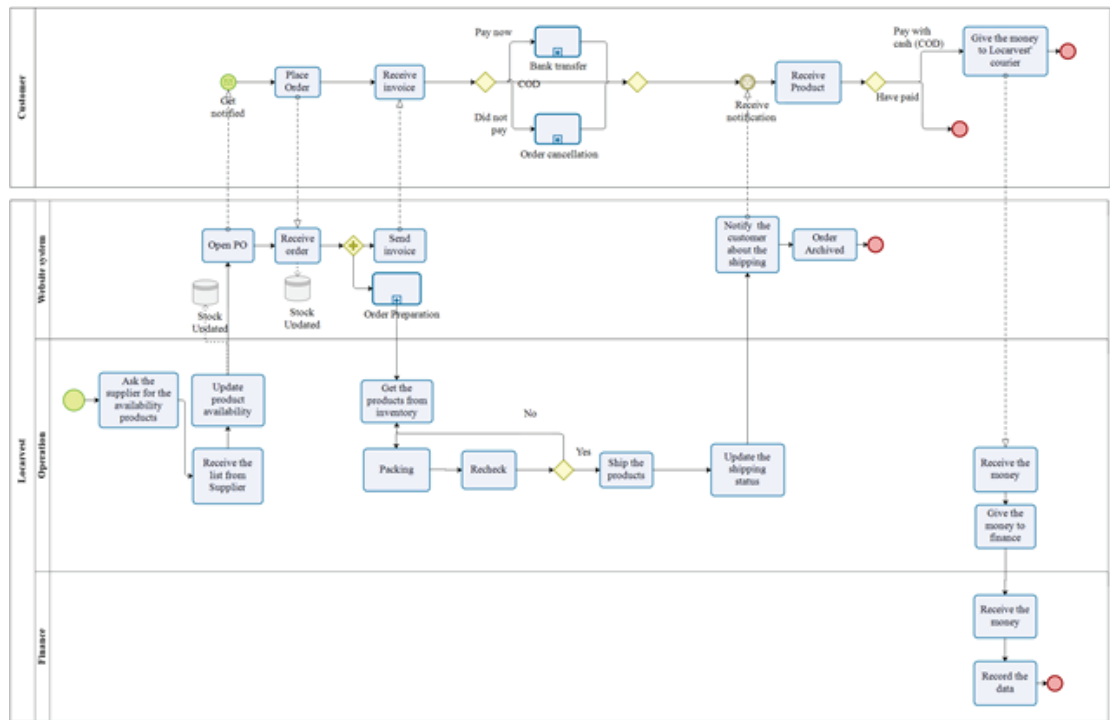


Figure 4: The improved selling process of Locarvest.

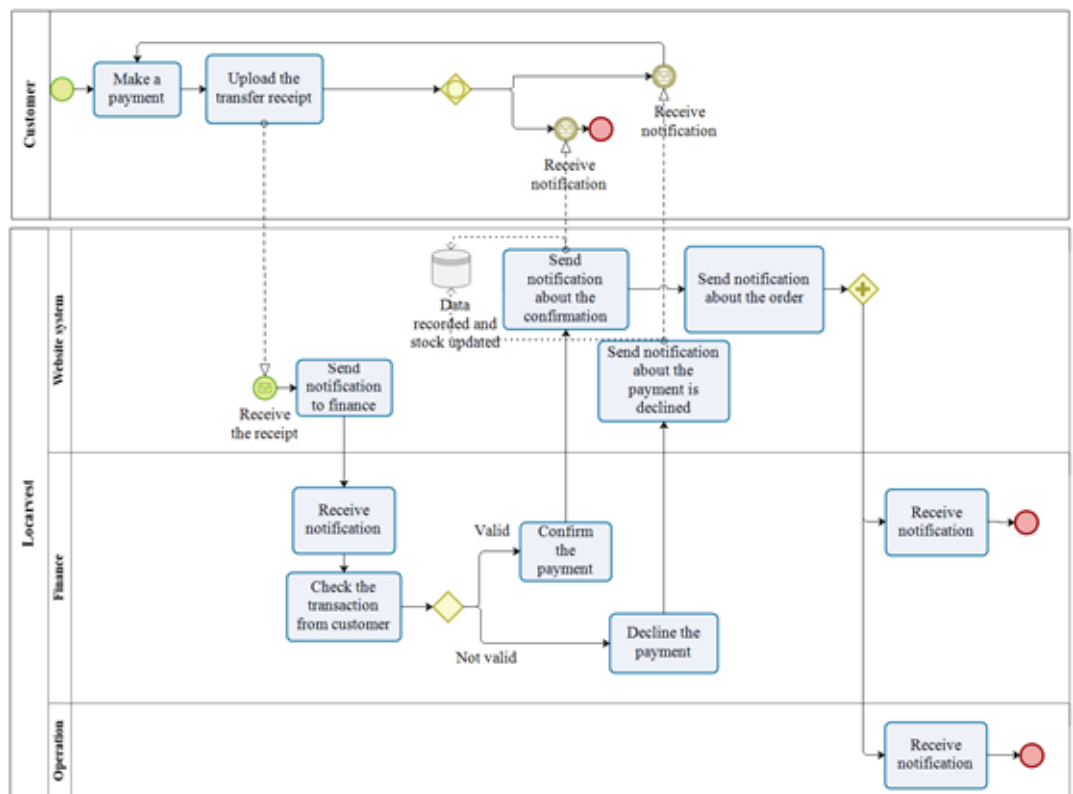


Figure 5: Make a payment using bank transfer sub-process (improved).

tasks for Locarvest are 71 tasks and 104 for overall. It means the new design of the business process is more efficient.

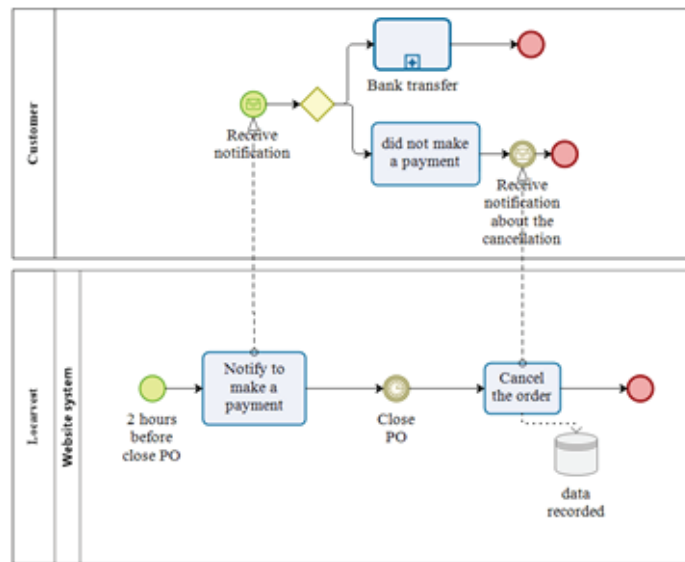


Figure 6: Order cancellation sub-process (improved).

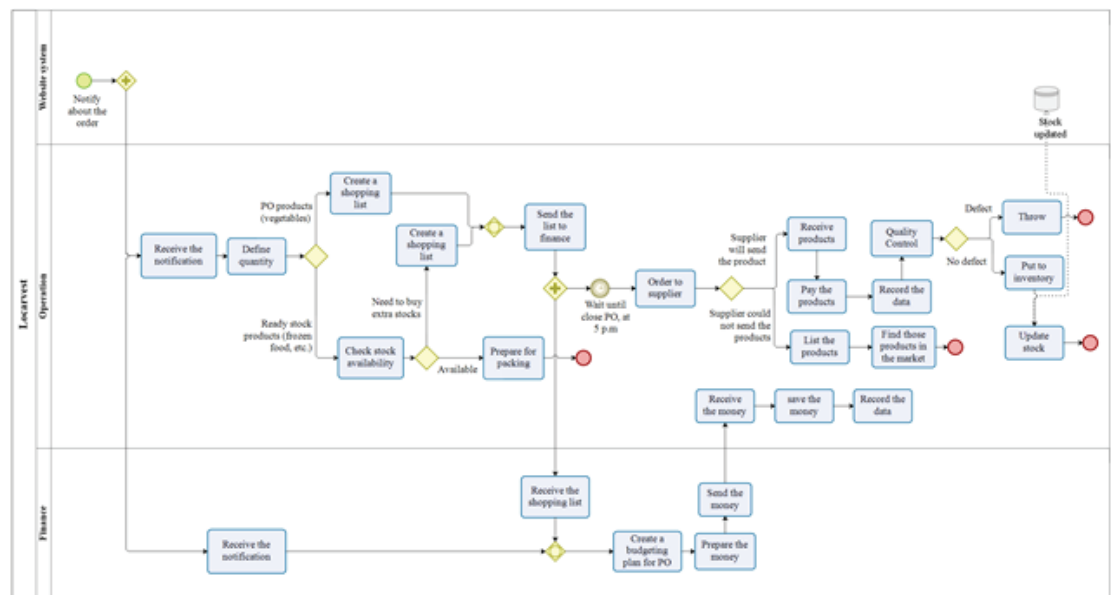


Figure 7: Order preparation sub-process (improved).

TABLE 3: The total elements of new design.

Actor	Events	Gateways	Sub-Process	Tasks	Overall
Customer	12	5	3	7	27
Locarvest	15	13	1	54	83
Overall	27	18	4	61	110

The author also calculates the time of the process. The time is for one-time implementation of the pre-order. The time for each activity is based on the assumption from the company that has given to the author. The time comparison between the existing process and the new design can be seen in Table 4 and 5.

TABLE 4: Time Analysis of Existing Process.

Activity	Actor	Time (min.)	Quantity	Total Time (min.)
Selling Process of Locarvest				
Create invoice about the customer's order	Admin	2	17 orders	34
Send invoice to the customer	Admin	2	17 orders	34
Inform about the list of COD customers	Admin	2	1	2
Receive the information about the COD customers	Operation and finance	1	1	1
Record the data about the COD customers	Operation and finance	1	1	1
Record the data about the order	Finance	1	1	1
Get the products from the inventory	Operation	1	122 Pieces	122
Pack the products based on the order list	Operation	5	17 orders	85
Recheck the packed orders	Operation	2	17 orders	34
Ship the products to customers	Operation	360	1	360
Inform the admin about the shipping	Operation	1	1	1
Receive the information about the shipping	Admin	1	1	1
Inform the customer about the shipping	Admin	1	17 orders	17
Update stock after shipping the products	Operation	20	1	20
Archive order	Operation	20	1	20
Receive the money from the COD customers	Operation	1	4	4
Give the money to finance	Operation	3	1	3
Receive the money	Finance	1	1	1
Archive order	Finance	20	1	20
Total time (min.)				761
Order Preparation Sub-Process				
Send information about the order to operation and finance	Admin	5	17 orders	85
Receive the information about the order from admin	Operation and finance	1	17 orders	17
Check stock availability for ready products	Operation	1	17 orders	17
Define quantity	Operation	5	1	5
Create a shopping list for the pre-order products and for ready stock products that not available in inventory	Operation	1	1	1
Send the shopping list to finance	Operation	1	1	1
Receive the shopping list	Finance	1	1	1
Create a budgeting plan for the pre-order	Finance	10	1	10
Prepare the money	Finance	5	1	5
Send the money to the operation	Finance	1	1	1

Activity	Actor	Time (min.)	Quantity	Total Time (min.)
Receive the money	Operation	1	1	1
Save the money from the finance	Operation	1	1	1
Record the data of receiving money from the finance	Operation	1	1	1
Order to supplier the out of stock products and the list of pre-order products at 3 p.m. (2 hours before close pre-order)	Operation	5	1	5
List the products that the suppliers could not send	Operation	10	1	10
Inform the admin to tell the customer about the cancellation	Operation	1	1	1
Receive the information about the cancellation order	Admin	1	1	1
Inform to the customer about the cancellation order	Admin	1	2 customers	1.7
Inform the finance about the decision from the customer	Admin	1	1	1
Receive the information from admin	Finance	1	1	1
Proceed the refund	Finance	2	2 customers	3.4
Send the receipt to admin	Finance	1	2 customers	1.7
Receive the receipt from finance	Admin	1	2 customers	1.7
Send the receipt to the customer	Admin	1	2 customers	1.7
Record the data about the refund and the customer who wants a deposit.	Finance	3	1	3
Give the supplier the final order at 5 p.m. (close order)	Operation	5	1	5
Receive the products	Operation	5	12 suppliers	60
Pay the products	Operation	2	12 suppliers	24
Record the data after paying the products	Operation	2	12 suppliers	24
Do the quality control after receiving the products from a supplier	Operation	1	122 orders	122
If there is no defect, store the products in the inventory or throw if the defect	Operation	0.5	122 orders	61
Updating stock	Operation	10	1	10
If the supplier suddenly could not send the product and Locarvest have to send the products to customers, list the products	Operation	2	1	2
Find those products on the list in the market	Operation	10	1	10
Total time (min.)				496.2
Make a Payment Using Bank Transfer Sub-Process				
Send the receipt to finance	Admin	1	14 customers	13.6

Activity	Actor	Time (min.)	Quantity	Total Time (min.)
Receive the receipt	Finance	1	14 customers	13.6
Check the transaction from the customer	Finance	2	14 customers	27.2
Inform the admin about the customer whether the payment is confirmed or not	Finance	1	14 customers	13.6
Receive the information about the customer whether the payment is confirmed or not	Admin	1	14 customers	13.6
Inform the customer	Admin	1	14 customers	13.6
Total time (min.)				95.2
Total overall time (min.)				1352.4
Total overall time (hours)				22.54

TABLE 5: Time Analysis of New Design Process.

Activity	Actor	Time (min.)	Quantity	Total Time (min.)
Selling Process of Locarvest				
Ask the suppliers about the availability of products	Operation	5	1	5
Update product availability	Operation	10	1	10
Open Pre Order	Website system			0
Receive the order	Website system	0.5	17 orders	8.5
Send invoice to the customer	Website system	0.5	17 orders	8.5
Get the products from the inventory	Operation	1	122 pieces	122
Pack the products based on the order list	Operation	5	17 orders	85
Recheck the packed orders	Operation	2	17 orders	34
Ship the products to customers	Operation	360	1	360
Update the shipping status	Operation	1	17 orders	17
Notify the customer about the shipping status	Website system	0.5	17 orders	8.5
Order archived	Website system	0.5	17 orders	8.5
Receive the money from COD customers	Operation	1	4 customers	4
Give the money to finance	Finance	3	1	3
Receive the money from the courier	Finance	1	1	1
Record the data	Finance	10	1	10
Total time				685
Make a Payment Using Bank Transfer Sub-Process				

Activity	Actor	Time (min.)	Quantity	Total Time (min.)
Receive the receipt	Website system	1	14 customers	13.6
Send notification to finance	Website system	0.5	14 customers	6.8
Receive notification	Finance	0.5	14 customers	6.8
Check the transaction from the customer	Finance	2	14 customers	27.2
confirm or decline the payment	Finance	1	14 customers	13.6
Send notification about the confirmed or declined payment	Website system	0.5	14 customers	6.8
Total time (min.)				74.8
Order Cancellation Sub-Process				
Notify the customer to make a payment 2 hours before close pre-order	Website system	0.5	1	0.5
If the customer has not yet made a payment, cancel the order	Website system	0.5	1	0.5
Total time (min.)				1
Order Preparation Sub-Process				
Notify about the order	Website system	0.5	1	0.5
Receive notification about the order	Operation and finance	0.5	1	0.5
Check stock availability for ready products	Operation	1	17 orders	17
Define quantity	Operation	5	1	5
Create a shopping list for the pre-order products and for ready stock products that not available in inventory	Operation	1	1	1
Send the shopping list to finance	Operation	1	1	1
Receive the shopping list	Finance	1	1	1
Create a budgeting plan for the pre-order	Finance	10	1	10
Prepare the money	Finance	5	1	5
Send the money to the operation	Finance	1	1	1
Receive the money	Operation	1	1	1
Save the money from the finance	Operation	1	1	1
Record the data of receiving money from the finance	Operation	1	1	1
Order to supplier	Operation	5	1	5
Receive the products	Operation	5	12 suppliers	60
Pay the products	Operation	2	12 suppliers	24
Record the data after paying the products	Operation	2	12 suppliers	24

Activity	Actor	Time (min.)	Quantity	Total Time (min.)
Do the quality control after receiving the products from a supplier	Operation	1	122 pieces	122
If there is no defect, store the products in the inventory or throw if it defects	Operation	0.5	122 pieces	61
Updating stock	Operation	10	1	10
If the supplier suddenly could not send the product and Locarvest have to send the products to customers, list the products	Operation	2	1	2
Find those products on the list in the market	Operation	10	1	10
Total time (min.)				363
Total overall time (min.)				1123
Total overall time (hours)				18.73

According to Table 4.7 and Table 4.8, the new design has a faster time than the existing process. The total time of the new design is 18.73 hours. Meanwhile, the total time of the existing process is 22.52 hours. It means the new design is four hours faster than the existing.

4.4. Resource Development for the New Process

With the new design of the business process, some activities are changed or eliminated. However, all the employees of Locarvest must adjust to the new business process. The employee’s activity within the business process may be eliminated, but they have to remember that there are also several new activities. For operation team, they have a new activity which is asking the suppliers before opening the pre-order and ensure to list them, then update to the website. This may be easy, but this one is important as this activity is happened to start the pre-order. For finance team, they have to ensure to confirm the payment on the website’s system once they receive the payment from the customer immediately or the customer ends up complaining. The actor who experienced changes the most in this new design is the admin as the admin no longer have a responsibility within the selling process. This because almost all the admin’s jobs are taken by the website system and the rest is eliminated.

4.5. Managing New Process Implementation

Locarvest can actually perform the new process when they launch their new website as the improvement of the business process was made based on considering they want to change the selling platform to a website. As the website has not yet launched, the

employees should understand the whole new process and what the different from their past business process. This would help them to minimize errors when they launch the new website later.

In order to keep the business process on the track, Locarvest must constantly monitor the process. Here, the author has given the file of the business process in Bizagi Modeler software format. The author also has explained how the software works. If they have an error in their process, they can modify it using the software.

5. Conclusion

According to the current business process in the selling process of Locarvest, the author found four problems and provide an improvement for each problem. The improvements are eliminating some activities and create some new activities. Those new improvements make the new process more efficient as it has fewer tasks and faster time. The company have agreed to the improvement that the author has given. They stated that the improvements are feasible to be applied in their process. Therefore, to optimize the process, Locarvest should change their current business process with the improvements that the author has given. All the employees within the company should understand well the new business process and what its different from the old process, so they can maximize their performance along with increasing the company's performance.

For further research, a deeper analysis of the business process is may needed. With deeper analysis, another problem could be found. Using another concept and method other than the concept of Business Process Management (BPM) and the method of Business Process Modelling Notation (BPMN) can also be done. The researcher can make a comparison between the method. With making a comparison, the researcher may know which method would be suited for the company's current condition.

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