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THE BENEFITS OF MANAGEMENT INFORMATION SYSTEM ON THE EFFECTIVENESS AND EFFICIENCY OF THE ONLINE BUSINESS

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Abstract-Along with the rapid growing technological advances in many areas of life, allowing the public to enjoy the convenience that is generated by the technology. One example of technology developed at this time is in the field of information technology. Today, information systems provide the communication and analytic power that firms need for conducting trade and managing business on a global scale. Controlling the far-flung global corporation-communicating with distributors and suppliers, operating 24 hours a day in different national environments, servicing local and international reporting needs-is a major business challenge that requires powerful information system responses. To become effective and profitable participants in international markets, firms need powerful information and communication systems. Information systems are needed to optimize the flow of information and knowledge within the organization and to help management maximize the firm's knowledge resources.This study aims to know how the online business achieves effectiveness and efficiency by using management information system. By using information system, how the online business can improve their business process. In this research, the researcher analysis several online business. Some of them already using information system and most of them are not using information system. From this online business, researcher finds some differences in their business process model. To analysis the problem of online businesses, researcher using business process model and information system to identify some aspects that affect the effectivity and efficiency of business process. This research shows thWat the online business that has been using information system can increase customer satisfaction, improved quantity and quality of information, improve operational efficiency and flexibility, improved quality of internal and external communications, improved quality of planning, and improved quality control and supervision. For the implementation, for the online business that not using information system can be start using information system and also re-engineering business process can help the online business to be more effective. By re-engineering business process, the cycle time of the business process can be reducing so the process could be more effective.

Keywords: Online business, Management Information System, Business process model, computer-based information systems.

Introduction

Along with the rapid growing technological advances in many areas of life, allowing the public to enjoy the convenience that is generated by the technology. One example of technology developed at this time is in the field of information technology.Today, information systems provide the communication and analytic power that firms need for conducting trade and managing business on a global scale. Controlling the far-flung global corporation-communicating with distributors and suppliers, operating 24 hours a day in different national environments, servicing local and international reporting needs-is a major business challenge that requires powerful information system responses.

Globalization and information technology also bring new threats to domestic business firms: Because of global communication and management systems, customers now can shop in a worldwide marketplace, obtaining price and quality information reliably, 24 hours a day. This phenomenon heightens competition and forces to play in open, unprotected worldwide markets. To

become effective and profitable participants in international markets, firms need powerful information and communication systems. Aside from that, currently time progress and technology development of internet use in Indonesia and the world in general continues to grow. Even has become lifestyle most of world population. Along with the increasing of the service users of the internet, getting cheaper and easier to get internet services, supported by increased productivity home industry that provides various products to marketed, business sale or purchase through internet it is certainly quite promising.

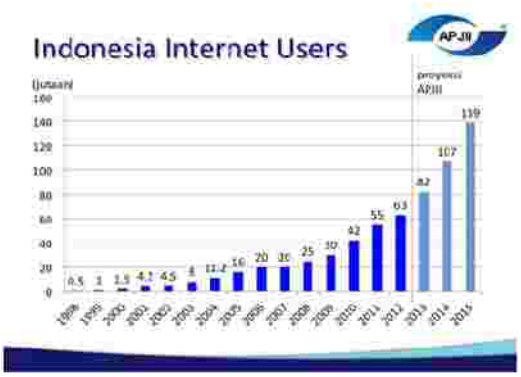

Figure 1.1 Indonesia Internet Users

The Association of Indonesian Internet Providers (APJII) said the number of Indonesian users has continued to growing each year and currently reaching 28% of the total population of around 248 million people (http://apjii.or.id/), as shown in figure 1.1 above. With the rapid growth of the internet users, Indonesia's e-commerce industry or mostly known by Online Shopping is expected to continue its rapid growth in the years ahead. Based on Blibli.com, Indonesia's e-commerce industry grows by 30 to 50 percent per year (www.indonesia-investments.com).

Online shopping is one of the most popular ways for consumers to shop. Even with different demographics, women, men, old, young, college students, office workers and housewife, they use the online shop as a means of their shopping. An increased in online shop industries shows the demand by consumers in online shop is high. Online stores can be accessed anytime during the 24 hours. Compared with stores that only operate during office hours. Moreover, it will require time and effort to reach the desired store. For the time being, shopping online has more value in the eyes of consumers to shop.

Theoretical Foundation

Information System

An information system contains information about an organization and its surrounding environment. Three basic activities - input, processing, and output – produce the information organization need. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. Input captures or collects raw data from within the organization or from its external environment. Processing converts this raw input into a more meaningful form. Output transfers the processed information to the people or activities where it will be used. Information system also required feedback, which is output that is returned to appropriate members of the organization to help them evaluate or correct the input stage (Laudon & Laudon, 1998). Information systems are commonly divided into two broad categories: systems that support an organisation's business activities and systems that support managerial decision making.

Basic Concept of Management Information System

Management information system serves the management level of the organization, providing managers with reports and, in some cases, with on-line access to the organization's current

performance and historical records. Management information system can be defined as a set of interaction information systems responsible for collecting and processing data to provide useful information to all levels of management in the planning and control activities. (Rainer, Kelly and Cegielski, 2009). Typically, these systems are oriented almost exclusively to internal, not environmental or external, events. MIS primarily serve the function of planning, controlling, and decision making at the management level. Generally, these systems are dependent on underlying transaction processing systems for their data.

The quality of Information

Information can be said to have number of different characteristics that can be used to describe its quality. The differences between 'good' and 'bad' information can be identified by considering whether or not to has some or all of the attributes of information quality. Information quality is being divided into three basic categories: time, content and form.

Basic Concept of Business Process

According to Davenport (1990) Business processes can be defined as a set of activities, or work structure interrelated to solve a specific problem or that produce product or services (to achieve a particular purpose). Business processes refer to the manner in which work is organized, coordinated, and focused to produce a valuable product or service. A business process can be broken down into several sub-processes, which each of it have their own attributes, and also contribute to achieving the goal of the sub-processes. Analysis of business processes generally involves mapping processes and sub-processes up to the level of activities. Business processes are concrete work flows of material, information, and knowledge sets of activities. This definition falls into the technical-rational view of organizations, and the focus is on value-creating activities and their improvement. Business processes also refer to the unique ways in which organizations coordinate work, information, and knowledge, and the ways in which management chooses to coordinate work.

Supply Chain Management

A supply chain is a network that describes the flow of material from suppliiers through facilities that transform them into useful products and, fnally to distribution centers that deliver those products to customers. Supply chain management (SCM) is an integrated approacch to procuring, producing, and delivering products and services to customers; it includes the management of materials, as well as associated information and the flow of funds. Supply chain exist in both manufacturing and service industries. Their principal purpose is to create value for customers, and they are therefore an important component of the value chain (Raturi and Evans, 2005).

Consumer Analysis

Table 1. Gender

Gender	
Female	81%
Male	19%

Table 2. Age

Age	
20-29 years old	51%
30-39 years old	22%
< 20 years old	21%
> 40 years old	5%

Table 3. Occupation

Occupation	
College Student	36%
Private Company Employee	31%
Government Employee	14%
School Student	12%
House Wife	7%

Table 4. Frequency of shopping online (in 3 months)

Frequency of shopping online (in 3 months)	
1-3 times	49%
4-6 times	26%
> 10 times	18%
7-10 times	7%

Table 5. Media Used

Media Used	
Instagram	69%
Official website store	32%
Facebook	18%
Kaskus	14%
Twitter	12%
BBM	5%

Table 6. The Product did not Arrive on time

The product did not arrived on time	
Ever	79%
Never	21%

Table 7. The frequency the product did not come one time

The frequency the product did not come on time	
1-2 times	57%
3-5 times	28%
> 5 times	16%

Table 8. Products order did not Arrive

Products ordered did not arrive	
Never	59%
Ever	41%

Table 9. Occurrence frequency of products did not arrive

The occurrence frequency of products did not arrive	
1-2 times	63%
> 5 times	22%
3-5 times	15%

Table 10. Receive a defect product or different product with the ordered

Receive a defect product or different product with the ordered.	
Ever	57%
Never	43%

Table 11. Frequency of receiving the defect product

Frequency of receiving the defect or different product	
1-2 times	67%
3-5 times	26%
> 5 times	7%

Table 12. Customer response to the product that does not

Customer response to defect product or different product	
Change with the other product with free delivery cost	50%
Return the product and ask for refund money	46%
Not doing anything	13%

Table 13. Having run out of the product

Having run out of Stock	
Never	64%
Ever	36%

Table 14. Frequency having run out of stock

Frequency having run out of stock	
1-2 times	41%
3-5 times	16%
>5 times	0%

Table 15. Order product is easy to do

Order process is easy to do	
Yes	91%
No	9%

Table 16. The most desirable way of order

The most desirable way of order	
Fill out the form online	51%
LINE/BBM/WhatsApp/ KakaoTalk	44%
Message or Calls	5%

Table 17.Respond Time

Respond Time	
15-60 minutes	35%
4-6 hours	23%
> 24 hours	14%
1-3 hours	9%
7-12 hours	9%
12-24 hours	9%
< 15 minutes	1%

Table 18 Average time of the product delivery process

Average time of the product delivery process	
5-7 days	37%
2-4 days	36%
7-10 days	19%
> 10 days	6%
< 2 days	2%

Table 19. Most desirable delivery time

Most desirable delivery time	
2-3 days	68%
< 2 days	32%

Business Process Analysis

From the business process, we can see the difference between online shops that using information system and not using information system. And after that the effectiveness of the business process can be determined.

1. Business Process of Sweetvl Shop

The business process of the Sweetvl Shops in figure 1.2 showing the flow of the data and information starting from the customer order until delivering order.

The first process is customer ordering data in Website. The waiting time in ordering process is 15 minutes. While waiting for the order process, the customer can doing the payment by ATM transfer to the account number that has been informed in the website page. After the administrator confirming the payment using internet banking, the product process can continue to the next process. After record all of consumer data and order data, the product data in website will be updated. After that, the customer order will be sent to the inventory. In this process, there are two alternatives. The first alternative, if the products are run out the stock then they have to purchase the order from the supplier. The processing order by the supplier takes 4 days. After that they delivering the products to Indonesia within 10 days. The second alternative is if the products are available in the inventory, then they can continue to processing the order. The next process is packing the products that take 1 day. The next day all of the products are deliver to courier and then they delivering the products to the customers.

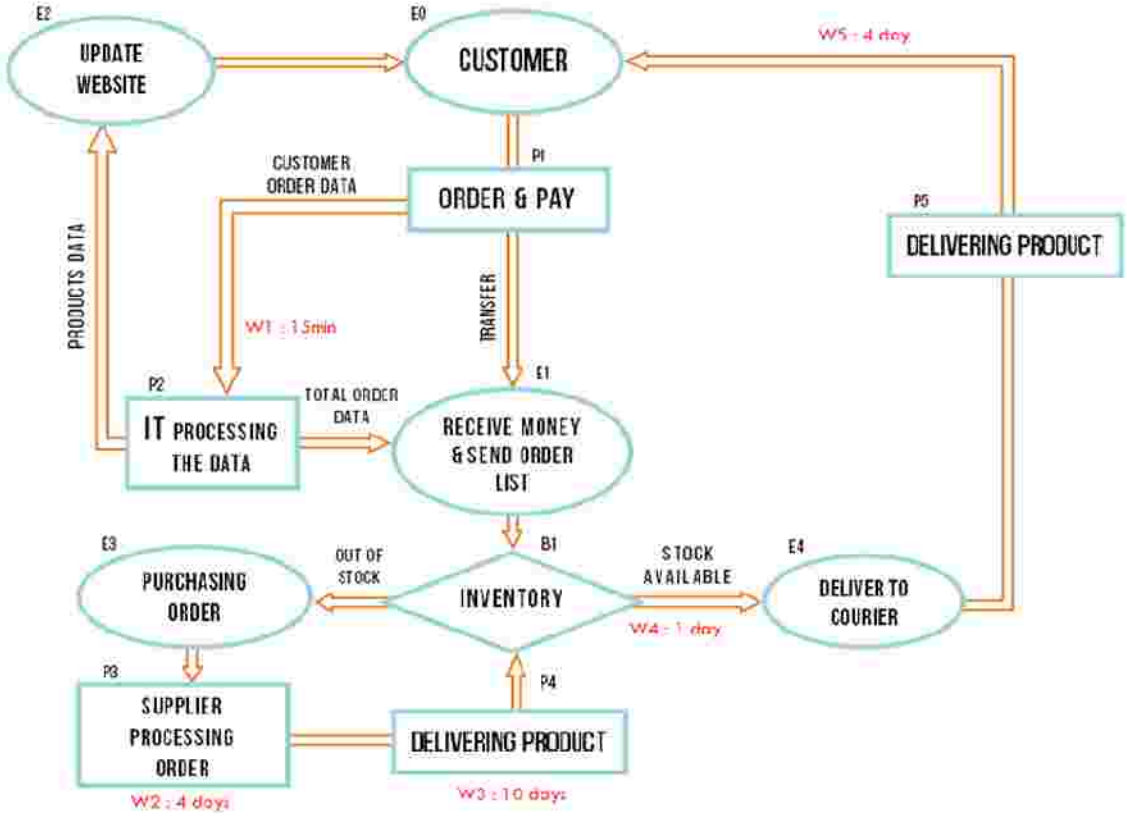

Figure 1.2 .Business process of Sweetvl Shop

From the business process the total cycle time can be calculated by adding all the waiting time (W) that given in the business process in figure 1.2 above.

$$Cycle\ Time = W1 + W2 + W3 + W4 + W5$$
$$= 15m + 5760m + 14400m + 1440m + 5760m$$
$$= 27375\ minutes$$
$$Total\ Cycle\ Time = 456\ hours\ 15\ minutes$$

From the calculation above, the total cycle time of Sweetvl Shop is 456 hours 15 minutes or about 20 days. That cycle time is included purchasing order from Korea. If the product stock is available in the inventory then the W2 and W3 are not included in total cycle time

$$Total\ Cycle\ Time = W1 + W4 + W5$$
$$= 15m + 1440m + 5760m$$
$$= 7215\ minutes$$
$$Total\ Cycle\ Time = 120\ hours\ 15\ minutes$$

So the total cycle time if there is ready stock is 120 hours 15 minutes or about 6 days.

Business Process of Allaakita Store

The business process of Allaakita Store in figure 4.21 above showing the flow of the data from customer order until delivering process. The first process is customer ordering product to the administrator via chatting media LINE, BlackBerry Messenger (BBM), or WhatsApp. The waiting time for the ordering process is 6 hours. Allaakita store did not record the order in all the time. In one day they responding to customer order from 7.00 pm until all of the order recorded. So the customers who order at the afternoon have to wait until they respond the order. After that all of the orders and customers data are listed in one paper. After they record the order, the customer can continue to payment process by ATM transfer. For the payment confirmation process the administrator need to contact each of the customer and ask for the payment invoice. The recording order from the customer is a crucial process in this business. Because they have to record it manually, they have to extra be careful in listing the order because there are a lot of probabilities of the order missed or skipped. The waiting time for record all of the order and confirming the payments are 1 day. The next process is recapitulating all of the record data. The data from the manual lists are input to the computer. This process also important because the data are input manually.

The data must be accurate so the product can be produced according to the order. The recapitulating process takes 1 day. And after that, the order report sent to the inventory. In this process there are two alternatives. The first alternative if the stocks are available in the inventory then they can continue to the next process. The second alternative is, if the products are not available in the inventory they have to ordering the product from the factory. Then the factory producing the product in 14 days. After that, the products are delivering to the warehouse. The delivery process takes 2 hour. If all of the products arrive in the warehouse, they will recheck the product according to the order list and packing the product. The re-check and packing process take 1 day. The next day, all of the products are delivering to the courier and then continue to the last process. The delivery process takes 4 day in normal day. The delivery times are flexible. It depend on how far the location and depend on some situation. But the average time is 4 days. From the business process of the Allaakita Store, the total cycle time can be calculated by adding all the waiting time (W) that given in the business process in figure 1.3

$$Total\ Cycle\ Time = W1 + W2 + W3 + W4 + W5 + W6 + W7$$
$$= 6h + 24h + 24h + 336h + 2h + 24h + 96h$$
$$Total\ Cycle\ Time = 512\ hours$$

From the calculation, the total cycle time of Allaakita Store is 512 hours or about 22 days. This cycle times is including producing process. If the products are available, the time cycle would be shorter because the W4 and W5 not included in the calculation. So the total cycle time is 174 hours or about 8 days.

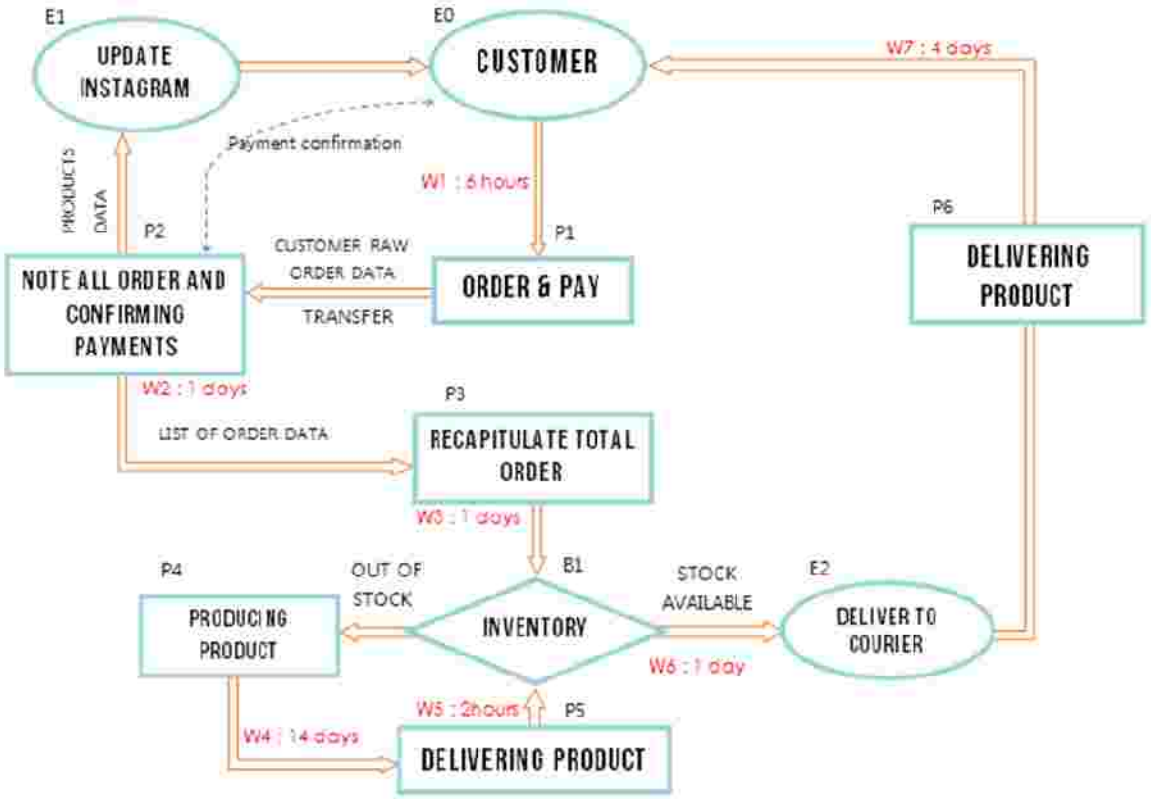

Figure 1.3 Business Process of Allaakita Store

Problem Analysis

- Sweetvl Shop
  - *Delivery process*

    In delivery process from their supplier in Korea sometimes the products did not arrive on time because of the products are being detained at customs. If this happened, the other process would be delay. The other problem is in the delivery process to customers. The delivery times are sometimes longer than normal times because of the address location that hard to find, so they did not delivery the product. In this case, they have to delivering the product again. Sometimes, the delivery cost can be longer because of some condition like in national day or there are transportation problem, then the product could be more than a week. This problem can decrease the customer satisfaction.
  - *Defect Product*

    The other problem is defect product. Sometimes, there are defect products in their inventory. The stock keeper need to controlling all of the products so the defect product did not mixed with the other product. If the stock keeper did not carefully control the inventory, the customers could get the defect products. In that case, the defect product can be change with the other product and the delivery cost paid by the online shop.

- Allaakita Store
  - *Delivery process*

    The first problem that often happens is the delivery time to the customer is longer than normal. Or if the courier can not find the address location so the product will be sent back to the warehouse. And this common problem that happened to almost all of the online shops. In the questionnaire data also show that 79% of respondent ever experience it. In other time, there are cases where the products are stolen in the delivery process and the courier did not

responsible. If this happen, then the online shops should deliver other product to the customer. This problem is being the biggest concern not only for the seller but also for the customer. This problem can reduce customer satisfaction level and also increase the cost.

- Product Material
  The other problem is the materials not available in supplier. If the material not available, then they can not produce the product so the whole business process can not be proceeding.
- Defect Product
  The other problem is defect product. They have to control each process in production stage to prevent defect product.
- Ordering Process
  By using chatting media for ordering, there are several disadvantages for the online shop. If there is too much order in one day sometimes it makes the chat application being hang or not responsive. If the administrator did not be careful, there is probability the data being deleted accidentally. So the administrator has to inform their customer to re-order. And in this case sometimes there are some customers who did not receive the information so they did not ore-ordering.
- Data Accuracy
  And the last problem is in recording data. If there is miscalculation or some order are missed or skipped, it would affect the production process. The products could be less than the order number or they produce too much product comparing to the order. And this problem will affect the cost of producing products.

Supply Chain of Sweetvl Shop

Sweetvl Shop is using pull-based supply chain where the products are manufactures or procures based on specific customer request or also known as “built to order” model. This strategy also known as Just-In-Time (JIT) Manufacturing. Firstly, Sweetvl Shop opens a pre-order for the customer to order the products in a certain time. At the end of pre-order period, they recapitulate the orders and then them purchasing the orders to the supplier. But sometimes there are also customers who cancel their purchase so the products that already purchased will be stored in the warehouse to be ready stock product. By using this supply chain method they can prevent excess or deficiency in the purchase of products to the suppliers. But to use this system they need to build a good relationship with suppliers and provide integrated data according to the customer order.

But, with the supplier that is in the Korea, it takes quite a long time for the products arrive to the customer because of the long distance and long distribution process. So the production is very reliant on suppliers and if the products are not delivers on time, the entire production schedule can be delayed. And because of the products are according to the customer order, there is no backup product that available to meet unexpected orders. There is a little room for the error when the minimum inventory available for reworking defective products.

Supply Chain of Allaakita Store

For Allaakita Store, they are using pull-based supply chain which is they producing the product based on customer request. This strategy can save more cost and eliminating excess inventory. But as they online business growing, the demands are increasing. With the high demand, the order products become more varied. Because their products are shoes where the orders are so varied with size, color and models are different for each customer, the producing process also become more difficult. So they will end up producing more product than the order in case there is unexpected order or there is defect product

Information System Analysis

The attributes to analyzing the quality of information are time dimension, content dimension, form dimension and additional characteristic.

- *Timeliness*
  Timeliness means the information should be available when needed. Sweetvl Shop are using computer based information system which is automatically record the data from consumer, while Allaakita Store record the data manually at one particular time. That means Sweetvl Shop timeliness is better than Allaakita Store. It shows that computer-based system has advantage in timeliness.
- *Accuracy*
  The information must be accurate because the information that contains errors has only limited value to the business. Both online businesses have a different point in accuracy considering their information system. Computer-based information is more accurate in recording the data than manual information system. Because in manual information system there are probability of human error that makes the data did not accurate. So, Sweetvl Shops has more accurate information than Allaakita Store.
- *Relevance*
  The information supplied should be relevant to a particular situation and should meet the information needs of the recipient. All of the information needed from the customer must be provided. Sweetvl Shop that using online form in ordering process has particular terms in ordering. The order form has obtained all of the information needed. For Allaakita store the ordering system is using chatting media. The customer sending the order using the format given. So both online businesses have relevance information even though they using different system.
- *Clarity*
  Clarity means the information should be presented in a form that is appropriate, and located specifically so the recipient should be able to find the information quickly and be able to understand the information easily. For Sweetvl Shop, because they using computer based information system all the data recorded automatically and easy to understand. The data can be processing easily using computer. Different with Allaakita Store that processing the data manually, that depend on the manager that listing the data so they have to make basic format for the data so the information would be easy to understand. And also by listing the order manually there is probability of the list missing or slipped. So the information of Sweetvl Shop is more clary than Allaakita Store.
- *Detail*
  The information from each online business has a different detail level. Sweetvl Shop that using online form has to make detail form to get detail information. But because of the system is one way system (there is no interaction between administrator and customer) there is a possibility that the information given are not detail. While for Allaakita Store that using chatting media for ordering, can get more detail information from the customer because there are interaction between the customer and administrator. So if they need more information, they can easily asking the customer. This method is more effective in collecting detail information from customer. So, Allaakita Store has more detail information than Sweetvl Shop.
- *Order*
  The order of information is important. Especially, in online business there is a lot of customer. The administrator should record the data in correct order to be fair. For Allaakita Store, they have to respond each customer according to time order. For Sweetvl Shop, the information is recorded automatically based on the time order so it is easier than manual process.
- *Reliability*
- Another attribute of information quality is reliability. Reliability is an important aspect for online business because the business is virtual so it is important for the online shops to build trust in their customer. The important point in reliability is communication. That is why a lot of online shop using chatting media for order process so they can communicate directly with the seller in that way the customer can trust the online shop. That also proofed in the questionnaire analysis that 44% respondents choose to using chatting media for ordering product because in that way, they can communicate directly with the seller. For Sweetvl Shop, even though they using online

form, they also put their contact number in website for customer if they want to communicate with the administrator. From the observation at the website page and instagram account of the online shops the two online shops using original photo as their product display that means the two online shops are being honest for their customer by not manipulated the product picture or using picture from Google or taking picture from another online shops. Another way to show their reliability is by giving testimony from the customer that ever shopping in their online business. In this way, other customer can trust their online shop.

Recommendation

1. Sweetvl Shops

- To become a reliable online shop, make sure that your site is secure. The easiest way to do this is to encrypt the website. Encryption is when it protects anything
- that site user submitted through web. Encryption prevents eavesdropping. The encryption also replaces the site protocol from "http://" become "https://" ("s" for secure)

Figure 1.4 New Supply Chain Strategy of Sweetvl Shop

Create a "Privacy Policy" for the website. A "privacy policy" is a policy that is a promise from website to all users who frequent it that their personal information will be protected.

- Keep the website up to date with the data of available stock
- Make a testimonial page in the Website so the customer can trust the shop
- Active customer feedback and incorporation in product improvement
- Make product information available to the customer through website from the supplier
- Improve the inventory controlling process to prevent defect products and quality checks at every level
- Change the supply chain system from pull-based supply chain to base stock system which is a combination of pull based supply chain an push based supply chain.

So, they have a base stock and safety stock for unexpected demand. By implementing base stock system the online shop not only reduce inventory but also improve customer service.

- In the business process there is some repetition process that actually can be cut out from the business process. With reducing some event or process the cycle time can also be reduce. The re-engineering business process can be seen in figure 1.4 below with the total cycle time 456 hours or 19 days and for cycle time excluding producing process is 120 hours or 5 days. By applying this new business process, the business process is reducing by 1 day.

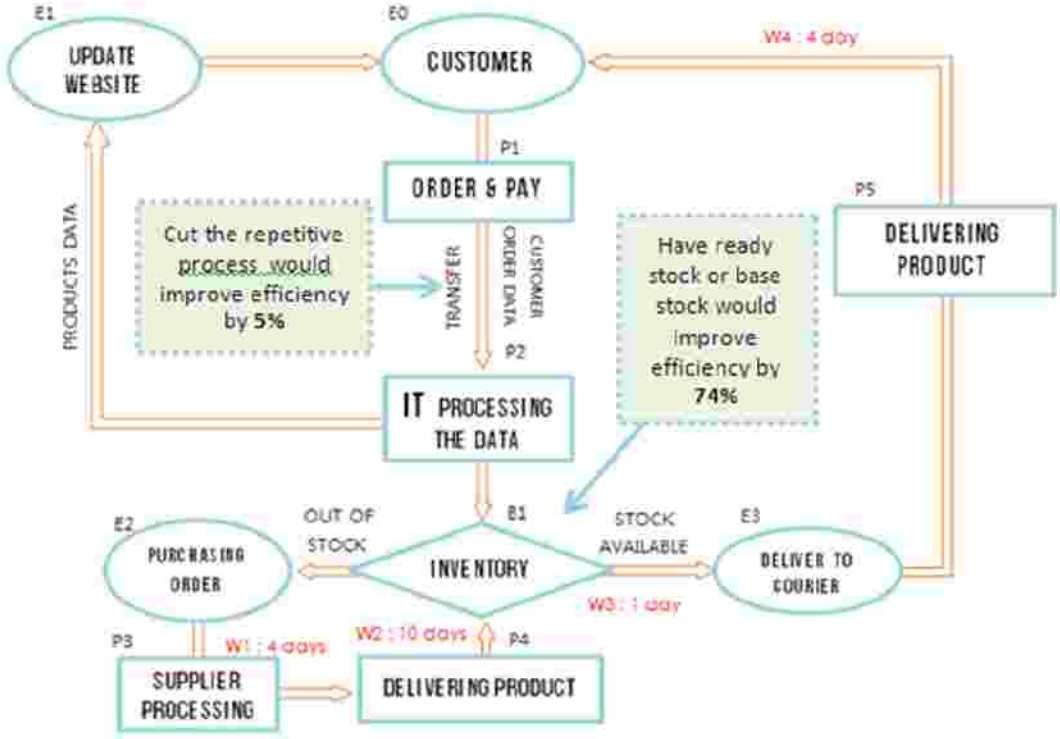

Figure 1.5 Reengineering Business Process of Sweetvl Shop

2. Allaakita Store

- The first recommendation for Allaakita store is to implementing Information System in their business. Allaakita Store does not need to make a website. They can still using Instagram as their media but they can use Google docs for their order process. With using Google docs they can easily record all the data without missing some data. The data can be more accurate, and easy to understand.
- Using internet banking to confirm the payment so they did not have to contact the entire consumer. With using internet banking the process can be simpler.
- Change the supply chain strategy from pull-based supply chain to push-based supply chain because of the large number of demand. First the company should make market forecast based on historic data to determine how much products they should producing. After producing the products then they can open the order based on the product available. Push system will offer economic scale for the manufacture because theoretically can produce products supply in a one time and also can provide supply for next period.

  This can retrench the change-over between products and minimalize the disruption cause by damage machine.This strategy also possible for Allaakita Store which has a warehouse that can store a large amount of products.
- By using the Google docs for recording the data, and using internet banking to confirm the payment process, the business process can be change to be simpler also can reduce the total

cycle time. The new business process also including push-based supply chain. The new business process can be seen in figure 5.2 below. In the new business process there are some event and process that has been cut out from the old business process. The total cycle time of the new business process is 434 hours or 19 day. By implementing the new business process, the total cycle time is reduce by 3 days. This business process model also can be implemented for DeerLuhan Shop, Fashionholic Shop, Imethbrown Shop, and Mustika Boutique by adapting each producing process time.

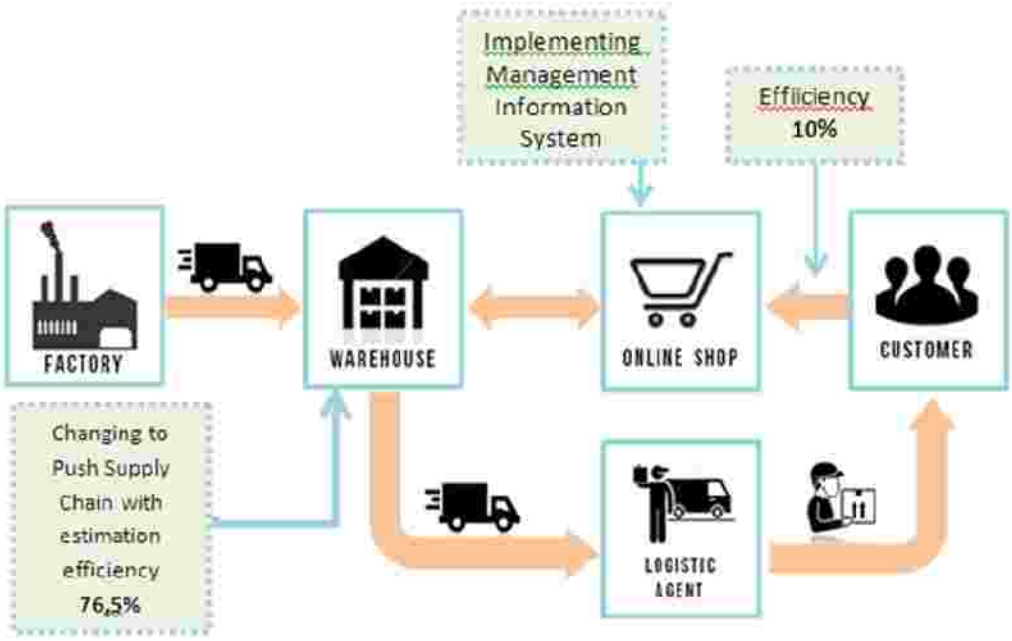

Figure 1.6 New Supply Chain Strategy of Allaakita Store

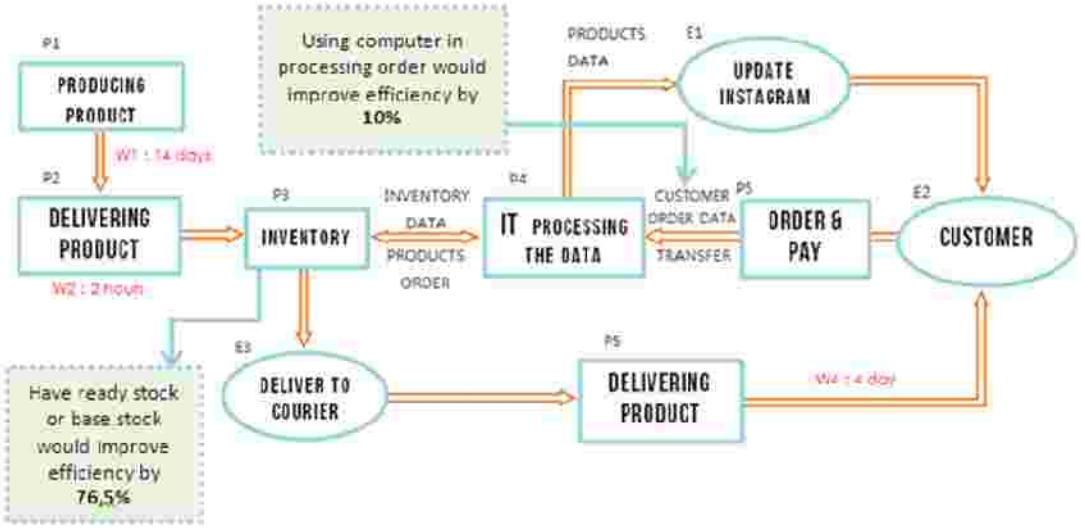

Figure 1.7 Reengineering business process of Allaakita Store

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