Enterprise Resources Planning

HW Assignment#2

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1. **Write a cover letter for the assignment summarizing the most conspicuous findings and explaining the process behind your research.**

The company we want to explore is 'Market Curly'. Market Kurly is an online fresh food vendor that delivers fresh ingredients through its own delivery system (full cold chain system). Market Kurly's introduces ‘saetbyeol delivery’ system firstly (= early morning delivery) that is deliver before 7 a.m. the next day. For ‘saetbyeol delivery’, Market Kurly has to order ingredients in advance through demand forecast. To accurately predict demand, Market Kurly uses ‘데이터 물어다주는 멍멍이 (데멍이)’ and it provides data such as sales, number of orders, and inventory in real time. In addition, Market Kurly solved various technical problems encountered in managing large orders and deliveries by introducing AWS Cloud. We would like to analyze the logistic process that enables early morning delivery among the processes of Market Kurly. Market Kurly currently manages the logistics process by adopting the DAS method. Among the DAS systems of Market Kurly, we found inefficient cases related to picking process. We introduce the ‘small zone’ which handles only one product order. The ‘small zone’ can solve the inefficiency and is worth investing in.

새벽배송 서비스 소비자 만족도 단위: 점

	종합 만족도	3대 부문 만족도			포괄적 만족도		
		서비스 품질	서비스 상품평가	서비스 체험	전반적인 만족도	기대 대비 만족도	이상 대비 만족도
쿠팡 (로켓프레시)	3.81	3.82	3.85	3.71	3.93	3.87	4.00
SSG닷컴 (쓱새벽배송)	3.76	3.80	3.88	3.72	3.86	3.74	3.81
마켓컬리 (샛별배송)	3.72	3.81	3.86	3.70	3.84	3.68	3.88
평균	3.77	3.81	3.86	3.71	3.88	3.76	3.90

자료=한국소비자원

Market Curly has achieved rapid growth through good product quality, fast delivery systems, and innovative logistics and distribution structures. However, considering that consumer satisfaction with the service was below average due to non-compliance with the arrival time of ‘saetbyeol delivery’, we believe that the logistics process improvement measures presented in our report will appeal to companies in the online food commerce market, including Market Kurly. And our analysis and improvement measures will enable these companies to better understand the factors involved in the logistics process and develop more cost-effective procedures that can be used nationwide.

2. Describe the company, its products, and its industry.

The company we chose is Market Kurly. When we actually used Market Kurly, we were interested in Market Kurly's good quality and fast delivery system, so we chose Market Kurly. Market Kurly is a small and medium-sized company that has grown very fast since it was founded in 2015. Market Kurly is an online fresh food vendor that leads the online food commerce market based on fresh ingredients and its own delivery system. Market Kurly has achieved rapid growth through good product quality, fast delivery systems, innovative logistics and distribution structures, and improved customer satisfaction and reliability. Market Kurly products deliver food quickly and freshly. For these products, Market Kurly introduced a full cold chain system that keeps the entire distribution process at the right temperature from the warehousing stage to the delivery stage. In addition, Market Kurly has built the 'saetbyeol delivery' system in Korea to deliver food until the next morning. Market Kurly's industry is e-commerce retailing, mainly ordering and distributing agricultural products and food products. We will focus on the logistics system that enables Market Kurly's fast delivery.

3. Describe the organizational structure and information systems.

Market Kurly is largely divided into finance/accounting, merchandising, marketing, operation, organization/infrastructure, platform development, creative, and customer communication, with CEO as the center, and each department is divided into teams with more detailed roles.

Market Kurly service is divided into two main types. The first is an e-commerce service that allows users to shop various products including fresh food through apps and the web. The second is a logistics service that delivers ordered goods to users through work and vehicles in the distribution center. Market Kurly has built a data storage / analysis platform that is commonly used in e-commerce and logistics to store and analyze various data including logs in real time. They also solved various technical problems faced in managing large orders and deliveries by introducing the AWS Cloud.

4. Describe the role of CIO and IT department in the organization.

There is no separate CIO in Market Kurly, and there are five C-level executives: Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Growth Officer (CGO), Chief Logistics Officer (CLO), and Chief Technology Officer (CTO).

Market Kurly's IT department is largely divided into in-house system operations, in-house infrastructure (HW) operations, and external system operations. The in-house system operations manager mainly manages IT procedures and processes and supports the project IT part. The in-house infrastructure operations manager is responsible for in-house network / server operation and management, in-house infrastructure, and IT asset management. The external system operations manager operates the external system, establishes related policies, and deals with the database.

5. Pick up one of major business processes and describe it.

We chose the fast logistics process among the major processes of Market Kurly. The logistics process is largely divided into four as follows.

Inventory management

In order to enable Market Kurly's ‘saetbyeol delivery’, it is necessary to accurately predict demand and prepare necessary products in advance at the logistics center. Market Kurly's demand forecasting system predicts customer demand by collecting information from customers for logistics and quality control. Through this, it is possible to automatically process product orders to receive supplies from the production area.

Inspection and stacking of goods

Market Kurly operates products through direct purchase, a structure in which products are purchased directly from producers and taken inventory, rather than a platform that connects producers and sellers. Therefore, the inventory team pays particular attention to the 'quality' of the product. Therefore, when products prepared in advance arrive through demand prediction, Market Kurly's inventory team staff carefully inspect the quality of the products, and products with no issues and products with good overall quality are stored in the designated Market Kurly Logistics Center's storage and shelves.

Picking & Packing

Market Kurly's logistics center is a cross-docking center that does not store goods received as a logistics center, but delivers them immediately after classification or repacking. Through this, the rotation rate per unit area of the distribution center increases and it is not necessary to store product inventory for a long time, so it is possible to grasp inventory in real time.

In addition, Market Kurly is efficiently managing logistics through the Digital Assortment System (DAS) to respond to orders that have been driven just before the order deadline. DAS refers to a system that distributes the amount to be shipped by customer after peaking as a whole. DAS improves distribution speed and accuracy, reducing work time and work errors.

The basket containing all the customer's order goes to the packaging workstation and goes through the packing process.

Classification and shipment

Packed goods are classified by large area and moved to the factory, followed by detailed classification according to the delivery details of early morning delivery drivers

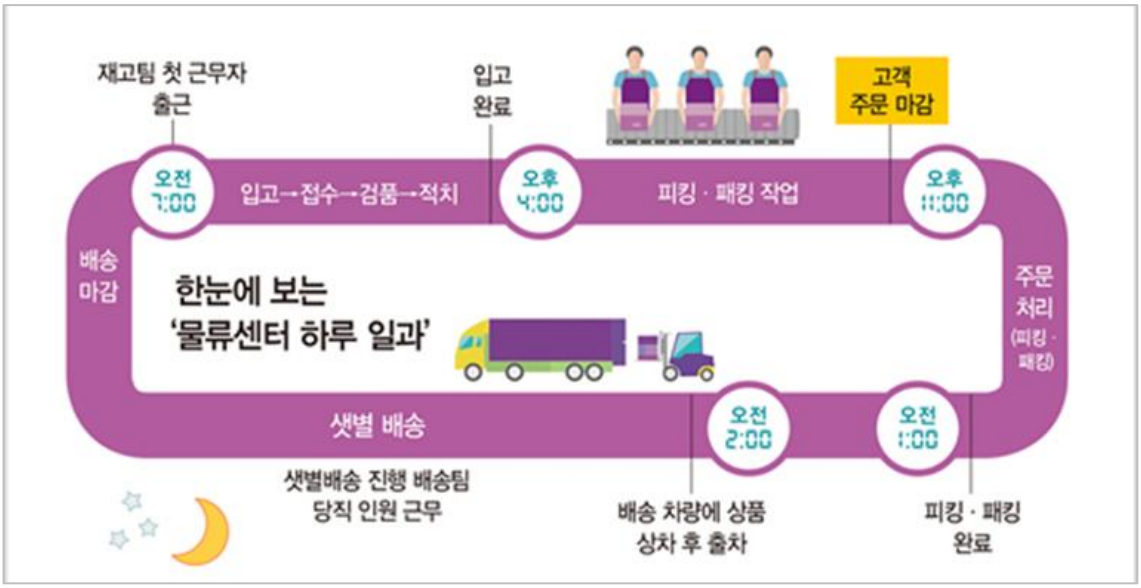
At this time, automatic routing is performed, for example, it is responsible for assigning products scheduled to be delivered tonight to the most appropriate vehicle and designing the delivery route accordingly.

6. Describe the relationship between all functional areas and the process.

If demand is predicted for insufficient inventory using past order data accumulated in the Data center, SCM orders the product in advance and A/F records accounts payable. When the ordered product arrives, the SCM inspects the product on its own and places the inspected product in the Warehouse.

When a customer order is created, marketing & sales confirms the order, and then SCM checks if the stock is sufficient. After that, if the stock is sufficient, A/F checks the customer's credit card and processes the payment if the card is valid. Then, marketing & sales generates the order, and A/F subtracts the inventory. In the warehouse, a general form is created, picking, packing, and classification are performed. After that, A/F invoice and SCM starts shipping.

7. **Analyze activities involved in the process and kinds of data needed by the process (as-is analysis). Any problems?**



Receiving, inspection, and stacking of goods - 7 a.m. inventory team

Market Kurly's inventory team's inspection work is handled by regular Market Kurly employees to increase the reliability of quality confirmation. Employees of the inventory team generally inspect products randomly when they come in, and conduct a full inspection of expensive products. After the inspection, the product is stacked, and the next morning, it is inspected randomly again, and basically inspected twice. The inspection work is carried out differently each time according to the seasonal inspection guide based on the historical data accumulated when the item enters.

Picking and packing - 4 p.m. to 1 a.m. the next day

The principles of logistics center operation are 'flexibility' and 'speed'. Market Kurly has maximized productivity by adopting the DAS (Digital Assortment System) method, a system that can handle multiple orders at once. For example, it is a very inefficient way for one employee to pull a cart and pick it up per customer order. On the other hand, the DAS method is a method in which multiple orders are grouped together to be picked by the staff in charge of each product and products are distributed by customer order in the DAS zone.

Place several 'empty baskets' in the DAS zone. Each basket contains products that will go to ‘one’ customer. DAS picks several to hundreds of different items to be delivered to multiple customers at once. This process is called batch picking.

Each picker holds a general form with an order assigned to the computer system, looks at the lot number written in the general form, checks the product name once again, and picks it in the basket as much as the amount written. After that, if the number of picked items (picked items for a total of 200 orders) is raised to the conveyor belt, the baskets move to the DAS zone and go through classification according to each line number. The classification worker takes the product out of the overall picked basket and scans the barcode. Then a number appears on the electronic display with a light, and he looks at the number and puts in the quantity allocated to each customer's basket. When a basket, that is, all goods to be delivered to a customer, enters, and the electronic display displays END, the picking and classification of goods to be delivered to a customer is completed.

When the basket with the END mark goes down to the packing workstation through the conveyor belt, there is a product where packing workers perform "primary packaging" according to the manual of the workstation. After that, the products are packed in a box that meets the specifications and packed according to the seasonal packaging method. Finally, when the employee attaches the invoice, the taping worker finishes the packaging. Products that have been packaged are classified by region by pallet, first classified as large areas with alphabets, such as A, B, C, and D, and moved to the factory. At the factory, detailed classification of packaged products is followed according to the shipping details of the delivery drivers.

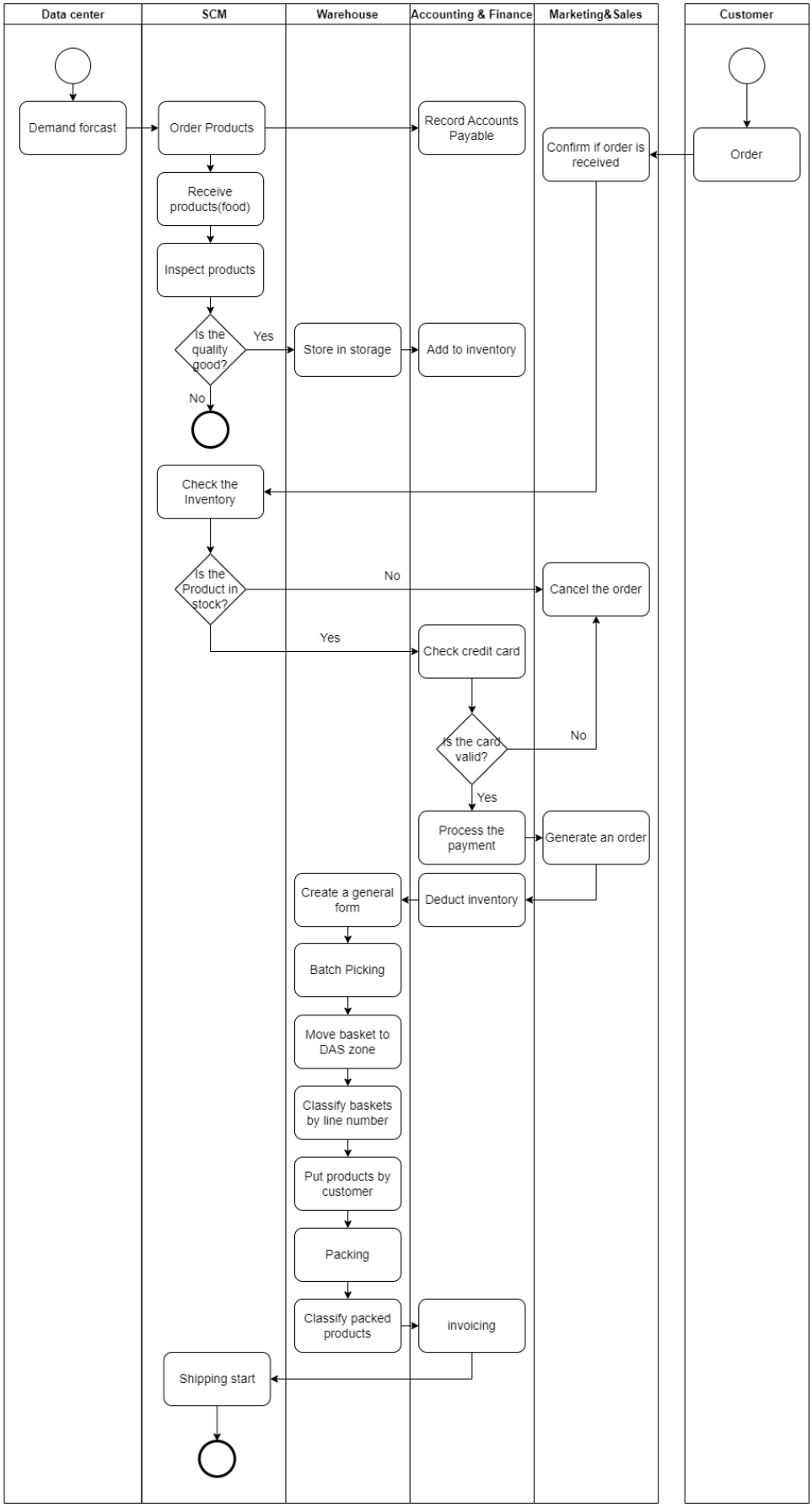
In this process, real-time data (data such as sales, number of orders, and inventory) received by employees are used to adjust manpower in logistics warehouses.

Shipping begins after loading the product into the delivery vehicle - 2 a.m. to 7 a.m.

70-80% of Market Kurly delivery drivers work in fixed areas and the rest operate flexibly depending on the situation on that day. Each delivery driver handles an average of 90 to 120 orders per day. The delivery team can flexibly set the placement of delivery drivers and delivery routes every day through real-time analysis data.

➔ Problem: 200 orders are picked at once when using the DAS method, so if only one product is included in one order, inefficiency may occur during the picking process.

8. Draw a process map for the chosen processing system.



9. Explain the information systems regarding the process; how well is it being done? Any special features?

Market Kurly has been able to manage large orders and deliveries by introducing the AWS cloud. When a customer completes a payment through the web or app, an order is created in AWS Auroa DB, and the order is allocated through a computer system. According to the allocation of 200 orders, a general form containing the location and number of items will be created.

In addition, Market Kurly uses '데이터 물어다주는 멍멍이 (데멍이)' to accurately predict demand based on past order data. Predicting demand has the advantage of not only reducing logistics costs but also responding to explosive demand.

Market Kurly's data experts send real-time sales, number of orders, and inventory to all employees through '데멍이' every 30 minutes, and also give specific guidelines such as "What time and what percentage discount should be bet to run out of today's products." Based on this data, the logistics team adjusts manpower, and the delivery team organizes dispatch.

10. What changes in the business process and information systems do you think will improve the chosen processing system? If appropriate, make suggestions for improvement (to-be analysis).

We are trying to improve the picking process among the business processes of Market Kurly. Market Kurly's computer system automatically bundles 200 orders each to create a general form containing the number of items. This general form contains the number and location of the items needed for each category throughout 200 orders, regardless of the order number. The DAS system using the general form enables quick picking. However, we have found a process that can be improved in this process.

The current process seems to be very efficient, but it can be inefficient because the picking is done by limiting the amount of orders rather than the amount of items. For example, a consumer orders only one item. Even if there are 10 orders for one single item out of 200 orders, it is a very inefficient process. So we are going to create a 'small zone' to handle one product order separately to solve this inefficiency.

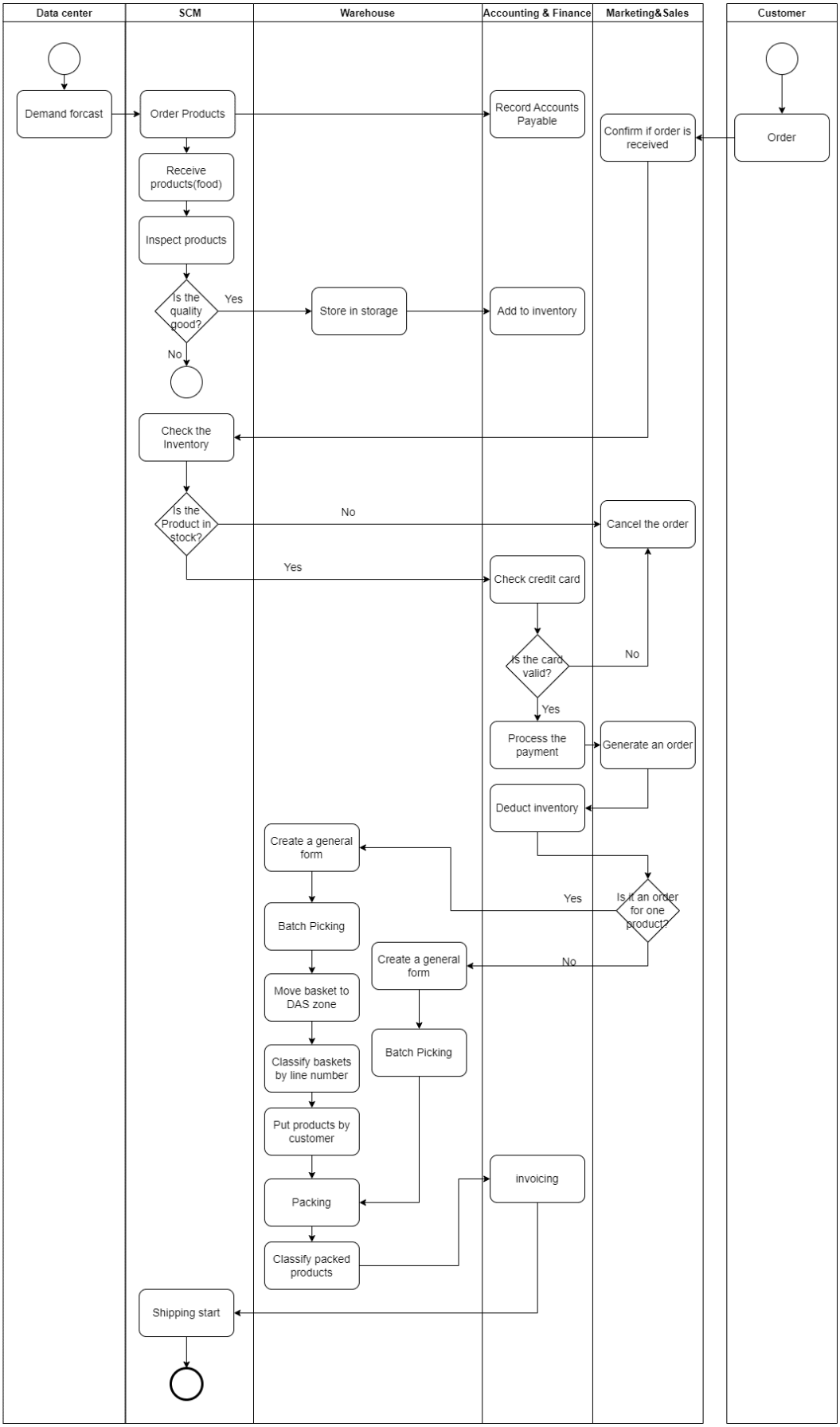
In the past, it is a similar principle to supermarket's five or less product payment lines. This is a method of picking only one product order in a small zone completely separated from the DAS zone. In Small Zone, 20 orders for one product are grouped together and 20 items are brought at a time. These 20 picked items are divided by each order in the Small Zone (because

it is an order of one product, employees only need to put one in each order without having to check the quantity of each order, saving time) It has the advantage of not having to provide a space to pack separately because it goes to the same packing zone as the DAS zone.

If Market Kurly takes charge of one product order in Small Zone, DAS Zone, which handles 200 orders at a time, will be able to process orders much faster and more efficiently.

Suppose there are 10 orders for one product out of 200 orders processed by DAS Zone. At this time, if 10 orders for one product are processed in the small zone, the DAS zone will be able to process 10 orders other than one product order, which is efficient. (The number of products processed at once increases.) If this process is repeated 20 times, 200 orders will be made, and the overall form creation and batch picking work can be reduced once. This reduces the time required for picking.

11. Draw a new activity flow for a re-engineered processing system.



12. Finally, identify benefits from the improvement in the business process and information systems and determine ROI.

Benefits from the improvement (Running the small zone)

- Picking process is faster and more orders can be processed during the same time.
- Labor costs can be reduced because it takes less time even if the same number of orders are processed

ROI (Return on Investment)

Currently, Market Kurly has an average of 130,000 orders per day, and Market Kurly has four logistics centers, so it processes 32,500 orders per day per center.

Of the 200 orders processed at once in the DAS zone, 10 are orders for one product, and the average number of products per order is 5.

- Orders processed by one DAS zone employee per hour: 20 cases
- Orders processed by one small zone employee per hour: 30 cases

Current situation (DAS zone only):

A total of 162.5 (=32500/200) general forms are created per day

The distribution center is open for 9 hours (4 p.m. ~ 1 a.m)

→ Handling 3611(=32500/9) orders per hour -> Need 180.5 (=3611/20) employees per hour

→ Create a general form 18.05 (=162.5/9) times per hour

→ It takes 3.3(=60/18.05) minutes to process one general form

If Small Zone exists:

- 1625(=32500/20) one product orders per day
- Small Zone: 180.5(=1625/9) orders per hour -> Need 6(=180.5/30) employees per hour
- DAS Zone: 154.3 (= 30875/200) general forms are created per day

→ Reduce the 8.2(=162.5-154.3) general forms per day through Small Zone

→ Reduce DAS zone operating hours by 27(=8.2×3.3) minutes

Return: Reduce DAS zone labor costs -> 180.5×27/60×9160 = 744,021 won saving

Investment: Small Zone labor cost + space usage cost

(Small zones do not require installation of special facilities, only need space)

Small Zone labor cost (per day): 6*9*9160=494,640

Space usage cost (cost of purchasing land): 50*1,100,000 (land price per pyeong in Gochon-eup, Gimpo) = 55,000,000 when the small zone is 50 pyeong

ROI (1 year) = 271,567,665/(180,543,600+55,000,000)=1.153

→ It's worth investing in and making improvements.

References

https://helloworld.kurly.com/blog/market-kurly-service-architecture/

https://aws.amazon.com/ko/blogs/korea/korean-grocery-delivery-market-kurly/

https://byline.network/2019/09/23-59/

https://hong-yu.tistory.com/3

https://www.saramin.co.kr/zf_user/jobs/view?rec_idx=38008786

https://clomag.co.kr/article/2746

https://skdt.co.kr/%EC%9C%A0%ED%86%B5%EC%97%85%EC%9D%80-%EB%B9%85%EB%8D%B0%EC%9D%B4%ED%84%B0%EB%A5%BC-%EC%96%B4%EB%96%BB%EA%B2%8C-%ED%99%9C%EC%9A%A9%ED%95%A0%EA%B9%8C/

http://news.bizwatch.co.kr/article/consumer/2020/06/12/0022

https://post.naver.com/viewer/postView.naver?volumeNo=30797094&memberNo=52183782

https://www.sisain.co.kr/news/articleView.html?idxno=34031

https://byline.network/2019/09/23-59/

https://www.fnnews.com/news/202201101749404164

https://dbr.donga.com/article/view/1203/article_no/9670

https://www.m-i.kr/news/articleView.html?idxno=824514

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