

APPLICATION OF INVENTORY MANAGEMENT IN MSME DETAC CAFÉ

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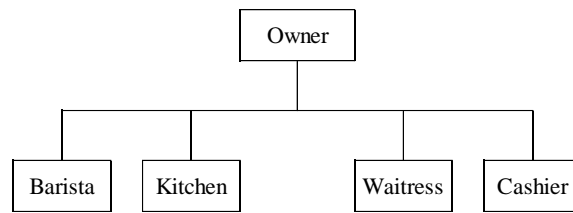
Abstract

This study aims to implement inventory management at MSME Detac Café in 2021 and 2022 using the EOQ, ROP, and SS methods. The results of data analysis are used to determine the optimal number of orders with the aim of dealing with uncertainty in demand as it is known that there is a possibility of fluctuating demand, so as to satisfy customer demand and minimize storage costs. Inventories that are calculated in this study are coffee beans, milk, cream, cheese, and tea. Based on the results of interviews with the owner, it shows that the MSME Detac Café inventory system is still not effective so that there is no stock storage cost efficiency. The results of this study indicate that the calculation used is able to reduce inventory costs in the form of storage and delivery costs for Detac Café. By implementing this inventory management, MSMEs can achieve a more efficient total inventory cost.

Keywords: *Economic Order Quantity, Reorder Point, Safety Stock, Management Supply Chain*

Introduction

Technological development are rapidly increasing and indirectly help lighten human workload. One way to increase effectiveness in running business operations is to implement a inventory management that takes into account optimal inventory (Han et al., 2016). Inventory is a company's wealth that has an important role in business operations, so companies need to carry out proactive management, meaning that companies must be able to anticipate existing conditions and challenges in inventory management to achieve the final goal, namely to minimize the total costs that must be incurred by the company for handling inventory. (Tuerah, 2014). Some examples of the use of technology such as recording purchases, sales and inventory to the application of the Economic Order Quantity (EOQ) calculation system. Detac Café was established on December 2, 2018 by Ms. Vivian. This cafe is engaged in the culinary field, namely food and coffee and non-coffee drinks. The café served western and local dishes and there are several other menu choices provided at this café. The location of this cafe is on Jl. Imperium Superblock, Baloi Park, Kec. Batam City, Batam City. The operational hours of this place are from 3PM to 10PM every day. The distribution of employees is as follows:



Picture 1.

Detac Café Organizational Structure Source: Detac Café 2021

The main problem faced by this Café is the inefficient supply of food stock at the Café so that several problems occur, namely the delivery of supplies requires a high cost but if ordered directly, the stock will be damaged if stored for a long time. At the end of 2019, the emergence of COVID-19 virus which is an infectious disease caused by the corona virus. This COVID-19 has had such an impact on the world's health, economy and social sectors that it was officially declared a pandemic on March 11, 2020. By the time this pandemic had spread to Indonesia, the Indonesian government was forced to implement Large-Scale Social Borders (PSBB) and the Enforcement of Restrictions on Community Activities in Indonesia (PPKM). The implementation of Community Activity Restrictions in Indonesia (PPKM) makes inventory unpredictable needed for cafe operations during PPKM so that it indirectly affects the time and cost of stock delivery. If you choose a faster delivery time, the shipping costs will also increase. These things make the company realize that this business operation is still exploring inventory control compared to other similar companies. The emergence of new businesses that are similar is one of the problems faced by this place because where customers usually visit this cafe, they switch to other cafes so that food stocks will remain. This is realized by the cafe owner, but so far the owner has not found the right method to deal with this problem so that it affects operational turnover. Detac Café does not implement effective and accurate inventory management so this project aim to analyze stock inventory using the web-based Economic Order Quantity (EOQ) and Reorder Point (ROP) method so that it can be implemented in this café. EOQ is the most economical number or volume of purchases to be made each time a purchase. The EOQ method seeks to achieve the minimum possible inventory level, by prioritizing lower costs and better quality. The author wants to analyze the nominal stock inventory that is suitable and can be implemented so that there is no problem with the number of café stock inventories. In this practical work, the methods that will be used are web-based Economic Order Quantity (EOQ), and Reorder Point (ROP).

The objectives to be achieved in this project are to implement the strategies that have been analyzed by the author, namely:

- a. Assist MSMEs in developing a more modern, accurate and regular stock inventory system.
- b. Calculating the number of purchases of stock inventory that is economical so that it faces uncertainty in demand as it is known that there is a possibility of fluctuating demand, so as to satisfy customer demand.
- c. Calculate the point of reordering stock inventory to know when orders must be reordered.

Methods

Data collection technique

Data in the form of secondary data derived from records, books, and transactions such as invoices, receipts, and notes from Detac Café to produce website-based inventory reports. The data taken are payment receipts, sales and purchase notes, and product stock records from September 2021 to December 2021. The primary data used is to conduct interviews and observe by visiting the location. This observation is needed to obtain more information that is not obtained from interviews (Sofiyannurriyanti, 2017). The implementation of this website system has the main goal of achieving the minimum possible inventory level, by prioritizing low costs so that the total cost between storage costs and ordering costs is minimized (Rambita et al., n.d.). The following is the formula for calculating EOQ:

$$EOQ = \sqrt{\frac{2DS}{H}}$$

Description :

S = Cost per order

D = Amount of raw material requirement in one period

H = Storage cost of average inventory

Source: Fahzi & Suroto (2018)

ROP is the point at which another order must be held so that the arrival or receipt of the ordered goods is on time (Rachmawati et al., 2020). Reordering or ROP can be done in two ways, namely:

- a. Determine the amount of material or goods during the lead time plus a certain percentage.
- b. Determine the amount of material or goods used during the lead time plus the specified security inventory.

The formula for calculating ROP is:

$$ROP = D \times T + SS$$

Description :

SS = Safety stock

D = Average usage rate per day

T = Lead time

The design of the output activities carried out is by working with the owner to agree that the author will be the host in making the website. This design begins with applications that have been provided by the author such as inventory management reports, product stock reports, purchase and sales reports according to the format entered into the website at Detac Café. Making this system requires an estimated time of 1 month and the time to input all data starting from sales data, purchases, product stock and entering the formula takes approximately 1 month.

Implementation Stage

The implementation of practical work will be divided into several stages as follows:

- a. Preparation phase

The preparation stage begins with conducting an initial survey to find a practical work location, then conducting a procession of interviews with business

owners to find out information related to the business being run, then researching the problems that are being faced by business owners..

b. Implementation Stage

The implementation phase begins with the design of the preparation of improvements to the café inventory, as well as the application of website-based inventory management methods to the business. Seeking relevant information to assist in designing the preparation of inventory reports and documenting useful information. Then the project output design is carried out followed by the implementation, training, evaluation, and monitoring processes.

c. Assessment and Reporting Stage

The Assessment and Reporting stage starts from the process of preparing practical work reports, finalizing reports, evaluating and evaluating Practical Work by direct supervisors at the Practical Work location and evaluating by lecturers in the form of presentations or supervisor visits to locations and finally collecting hardcovers to BAAK.

Implementation Schedule

The implementation schedule for this practical work activity is presented in the following table.

Table 1.
Practical Work Implementation Schedule

No.	Activity Date	Description
1.	15 September – 29 September 2021	Looking for a location, making introductions and getting a practical work permit from Detac Café
2.	2 October – 10 October 2021	Melakukan tanya jawab untuk pengumpulan data dan rancangan solusi.
3.	10 October – 18 October 2021	Make project proposals.
4.	18 October – 27 October 2021	Designing inventory management system according to Detac Café.
5.	27 October – 16 November 2021	Implement systems and improvements.
6.	16 November – 17 December 2021	Prepare practical work reports.

Implementation Budget

Practical work on the preparation of application-based financial reports at Detac Café issues budgets, including:

Table 2.
Practical Work Implementation Budget

No	Activity Plan	Budget Type	Volume	Units	Unit	Total
1	Observation and interview	Consumption Cost	10	Times	Rp 50,000	Rp 500,000
		Transportation Cost	10	Times	Rp 50,000	Rp 500,000
		Internet Connection Design	10x3	GB	Rp 300,000	Rp 900,000

No	Activity Plan	Budget Type	Volume	Units	Unit	Total
2	Output Design	Website Design	1	piece	330,000	Rp 330,000
3	Outcome Implementation Assistance	Transportation Cost	10	Times	Rp 100,000	Rp 1,000,000
		Internet Connection Fee	10x3	GB	Rp 300,000	Rp 900,000
4	Report Generation	Consumable Shopping Costs (ATK)	1	Piece	Rp 870,000	Rp 870,000
TOTAL COST						Rp 5,000,000

Result and Discussion

Activity Implementation

The design of practical work activities in inventory based on applications at Detac Café is the application of the EOQ system and its reports. The following is the result of the design on Detac Café:

a. System Sign In

This page is an access, if the user and password match those in the database, the system will give a success message and if it doesn't match the system will display an error or failure message.



Picture 2.

Login Menu on Detac Café Inventory Management System Website Source: Processed secondary data (2021)

b. Available application menus

In the home menu, there are details of the company profile, namely the company name and company address. Before entering the inventory data, there are also several dashboard sections such as master data where there are various customer, supplier, product, and transaction data, namely purchases and sales. The method uses EOQ calculations, reports include stock, purchases, sales and EOQ, and user management includes user data and logon buttons.



Picture 3.

Dashboard Menu Website Inventory Management Detac Café. Source: Processed secondary data (2021)

Activity Outcome

No	EOQ	Tanggal	Bulan	Nama Barang	Stok Awal	Stok Akhir	Permintaan	EOQ	Lead Time	POSP	Total Biaya
1	6	2021-12-08	September	Biji Kopi	10000	17000	15	6	7	9	523042
2	6	2021-12-08	September	Teh	10000	10000	10	6	7	6	340000
3	6	2021-12-08	September	Ajwa	10000	10000	20	6	7	13	400000
4	6	2021-12-08	September	Melk	10000	10000	8	6	7	8	280000
5	6	2021-12-08	September	Makanan	10000	10000	7	6	7	6	300000
6	6	2021-12-08	September	Enging	10000	1100	20	6	7	13	307500

Picture 4.

Detac Café Stock Report Source: Processed secondary data (2021)

In Picture 4. above, there are 6 products that have been recorded in this system with a total stock of 150 products, and with the product code BR in the form of goods. In addition, there are results of calculations using EOQ and Reorder points on the website which will be displayed in Picture 5., which are as follows:

No	EOQ	Tanggal	Bulan	Nama Barang	Stok Awal	Stok Akhir	Permintaan	EOQ	Lead Time	POSP	Total Biaya
1	6	2021-12-08	September	Biji Kopi	10000	17000	15	6	7	9	523042
2	6	2021-12-08	September	Teh	10000	10000	10	6	7	6	340000
3	6	2021-12-08	September	Ajwa	10000	10000	20	6	7	13	400000
4	6	2021-12-08	September	Melk	10000	10000	8	6	7	8	280000
5	6	2021-12-08	September	Makanan	10000	10000	7	6	7	6	300000
6	6	2021-12-08	September	Enging	10000	1100	20	6	7	13	307500

Picture 5.

September 2021 EOQ Report on Detac Café Source: Processed secondary data (2021)

In Picture 5. it can be seen that the EOQ report in September contained an several products whose stock is running low and EOQ will be carried out, so that some products such as coffee beans have 15 requests so that the EOQ becomes 6, and the rop is at 9 with the total cost of Rp. 523,042, - and other products are also calculated in the system.

No	EOQ	Tanggal	Bulan	Nama Barang	Stok Awal	Stok Akhir	Permintaan	EOQ	Lead Time	POSP	Total Biaya
1	6	2021-12-08	Oktober	Biji Kopi	10000	10000	15	6	7	9	492711
2	6	2021-12-08	Oktober	Melk	10000	10000	12	6	7	7	331341
3	6	2021-12-08	Oktober	Makanan	10000	10000	13	6	7	6	295000
4	6	2021-12-08	Oktober	Melk	10000	10000	12	6	7	6	300000
5	6	2021-12-08	Oktober	Enging	10000	1100	22	6	7	13	335486

Picture 6.

October 2021 EOQ Report on Detac Café Source: Processed secondary data (2021)

In Picture 6., there is an October EOQ report where 5 products will be reordered with a certain number of products to minimize costs to be incurred by the company. One of the products that will be reordered is milk with 12 requests so that the emergence of EOQ 6 with reorder point 7 with a total cost of Rp.331,341. Meat product also has a demand for 22 products, resulting in an EOQ 7 with reorder points for 13 products with a total cost of Rp. 335,486 as well as other products. After doing the EOQ in October, there is November in Picture 7.:

ID EOQ	Tanggal	Bulan	Nama Barang	Stok Awal	Stok Akhir	Persediaan	EOQ	Last Time	Persediaan	RP	Total Biaya
1	2021-12-26	November	BH Hiji	10000	10000	0	4	7	8	43171	
2	2021-12-26	November	Tan	10000	10000	0	4	7	8	10000	
3	2021-12-26	November	Susu	10000	10000	14	6	7	8	30000	
4	2021-12-26	November	Haji	7000	7000	0	2	7	4	22000	
5	2021-12-26	November	Haji	10000	21000	0	2	7	2	22000	
6	2021-12-26	November	Daging	10000	9100	20	7	7	10	30000	

Picture 7.

November 2021 EOQ Report on Detac Café Source: Processed secondary data (2021)

In Picture 7., there is an November EOQ report where 6 products will be reordered. One of the products that will be reordered is cream with 3 requests so that the emergence of EOQ 2 with reorder point 2 with a total cost of Rp.229,665. In addition to cream, meat also has a demand for products of 25 items so that EOQ 7 appears with reorder points of 15 products with a total cost of Rp. 356,368 as well as other products. After doing the EOQ in November, there is December in Picture 8. :

ID EOQ	Tanggal	Bulan	Nama Barang	Stok Awal	Stok Akhir	Persediaan	EOQ	Last Time	Persediaan	RP	Total Biaya
1	2021-12-26	Desember	BH Hiji	10000	17000	10	6	7	7	17000	
2	2021-12-26	Desember	Tan	10000	10000	10	5	7	8	10000	
3	2021-12-26	Desember	Susu	10000	10000	17	7	7	10	30000	
4	2021-12-26	Desember	Haji	7000	7000	7	2	7	4	24000	
5	2021-12-26	Desember	Haji	10000	21000	0	2	7	2	22000	
6	2021-12-26	Desember	Daging	10000	9100	21	7	7	10	30000	

Picture 8.

December 2021 EOQ Report on Detac Café Source: Processed secondary data (2021)

In Picture 8. above, there is an EOQ report in December 2021 with a total of 6 products that will be EOQ and reorder points. Cheese with a total demand of 7 products so that the emergence of EOQ as much as 2 with product reorder points with a total cost of Rp.884,627. The total cost according to Detac Café in September–December 2020 before EOQ was Rp. 10,963,382, while if you had done EOQ in the period September–December 2021 it was Rp. 7,774,898. So there is a savings of IDR 3,188,484.

Activity Implementation

The process of implementing this output is the process of how to record product stock and use the EOQ calculation data that is in the website-based inventory management application design system. These stages are carried out from the form of information system design to the formation of a website. The following is the process of implementing the system on MSMEs::

1. Beginning (20 September – 17 October 2021)

The author conducted a survey visiting partner locations and asked for permission to carry out practical work. Conducting interviews with owners about the problems experienced by SMEs. The author designs an inventory management system in accordance with the needs of MSME business activities.

2. Initial implementation (18 October – 02 November 2021)

The system that has been designed then explains the function of inventory management and software to MSMEs to users, starting from the functions and

benefits of this system. Implementation of training on the use of website-based inventory management applications for MSMEs.

3. Improvement (02 November – 16 November 2021)

The author designs a complete inventory management system which will then be used by users from SMEs. Repair errors that occur in the system, as well as smarten system.

4. Final Implementation (15 November - 22 November 2021)

After all systems have been designed and ready to be fully implemented, the authors submit the system and re-explain from the beginning and explain some of the additions that have been designed to the system. Then the author ensures that the owner has understood the process of entering data into the system and also supervises the user while working with the system.

Post-Implementation Stage

The results of implementing this website-based inventory management system have a positive and effective influence on cafes in managing product stock inventory, so that if there are products that are out of stock, EOQ can be done on the website and will minimize the costs that will be incurred by shop owners. With this inventory management website, it is easier for shop owners to monitor and record stock of goods with technology without manually using a book.

Conclusions

Detac Cafe is one of the MSMEs which in its business activities have not implemented inventory management in MSME operations. Recording of stock of goods is still done manually and is usually recorded in a book. That way, business owners have not explored clear information about inventory management. Based on this, the authors carry out practical work that can provide the output of activities, namely designing a website-based inventory management system that can be applied in Detac Café. The implementation of this system has resulted in positive feedback for business owners. With this system, the owner will get information on the calculation of Economic Order Quantity (EOQ) and Reorder Point (ROP) for Detac Café's stock of goods accurately and clearly. That way the owner can determine what steps and decisions will be taken related to his business activities.

There are suggestions based on the results of research that has been carried out with the aim of improving the process in conducting this report, namely:

1. For academics purpose where further practical work can contain the output of other report activities, so that they can know clearly and in detail related to business reports. By adding the output of other activities, both in the field of financial, marketing or human resources. So that it will produce a variety of practical work outcomes.
2. It is hoped that Detac Café will continue to implement a website-based inventory management system. This will increase the accuracy and transparency of activities at Detac Café.

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