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AN ANALYSIS OF INVENTORY MANAGEMENT AT DAMN! I LOVE INDONESIA

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Abstract– Damn! I love Indonesia is a company engaged in fashion industry. It is a local clothing brand in Indonesia with Indonesian culture as a themed. They package the Indonesian culture with a modern or urban way. Damn! I love Indonesia's goal is to ignite the nationality and to embrace our identity. Besides that, this company purpose is to bring young generation to love and recognize Indonesian culture, as well as to recall the history of Indonesia. This company vision is to grow the sense of pride, love, spirit and patriotism of young generation of our country, and to ignite their nationalism, while the mission is to be a leading and a largest Indonesia urban brand in clothing and accessories industry. In running the business, Damn! I love Indonesia uses T-shirt as the main product to raise the sales. Compared to other product in Damn! I love Indonesia, T-shirt have the largest proportion about 70% of total sales. However, the existence of T-shirt is very important for Damn! I love Indonesia. At this time, Damn! I love Indonesia face the problem that deals with inventory management of T-shirt. This research is aimed for reviewing business process, finding the root cause of the problem occurred in Damn! I love Indonesia and create a solution map. Business process is used for identifying all the process that is been done in Damn! I love Indonesia. By describing each process, root causes of the problem can be made and analysed. There are four root causes occur in Damn! I love Indonesia. Those root cause are no market intelligence, promotion is not aligned to forecast, inaccurate forecast method, and vendor cannot fulfil order expectation. To solve those problems, there are some proposed solutions given. Those solutions made in form of solution map. The first solution is improving the market intelligence. Next problem can be solved by share promotion plan with production division. Using appropriate forecasting method and combine with subjective prediction will be the next solution. The last is making a new timeline and regulation for a vendor.

Keywords: Inventory Management, Forecasting, Business Process, Root Cause Analysis, Solution Map, Damn! I love Indonesia, T-shirt.

1. Introduction

Indonesia is an incredibly rich country. Indonesia has lot of different things. It is rich for its natural diversity, kindness and friendliness of the people and the most important thing is the culture. It is because of its culture, lot of businessman bring up the culture theme in every business they run to, no exception for Damn! I love Indonesia. Damn! I love Indonesia is a company who engaged their business in fashion industry. This company bring up the Indonesian culture on every product they have. The purpose is to ignite the nationality and to embrace our identity.

Inventory management take an important role in Damn! I love Indonesia because inventory forms a connection between production and sales of the product. Inventory is the most expensive asset in a company, therefore a company have to spend lot of money in managing the inventory. More than half of total cost incurred by the company spent for the inventory. The increase in the number of

consumers that cannot be predicted will lead to interminable inventory items or otherwise decrease the proportion of consumers who had predicted will cause stockpiling in the warehouse. Bad inventory management will bring loss for both company and customers. Therefore, setting a good inventory management system is really necessary.
The company have to pay more attention in improving inventory management to minimize cost and to increase revenue. Good inventory management will bring a positive impact for the company which is increasing operation activity in the company, as well as marketing and financial activities. Besides that, good inventory management will bring lot of customers and able to compete with the competitors.

A company cannot get inventory instantly in order to satisfy demand of customers. It takes time to produce the product. There are several processes that have to be done to obtain supplies of goods. It starts from ordering process, production, until the delivery process. It required different time for each product, depends on the product that going to be produced and the time needed for every product. Therefore, the setting of time must be considered to avoid stock out.

2. Literature Review

Inventory Management

Inventory management is activities employed in maintaining the optimum number of inventory item in order to maximize profit and satisfy the customer.
According to Heizer and Render (2006), inventories can be divided into 4 categories, they are:

1. Raw material inventory: have been purchased but not processed.
2. Work-in-process inventory is component or raw material that have been processed but not finished yet.
3. MRO inventory: Maintenance, repair and operating materials.
4. Finished – goods inventory: completed product awaiting shipment.

There are also four functions of inventory:

1. To "decouple" or separate various parts of the production process.
2. To decouple the firm form fluctuations in demand and provide a stock of product that will provide selection for customers.
3. To take advantage of quantity discounts, because purchases in large quantities may reduce the cost of goods or their delivery.
4. To hedge against inflation and upward price changes.

Lead Time

Lead time commonly used in manufacturing industry. Lead time is the time needed by the company to fulfil the order, or it is the time between placement and receipt of an order. It starts from the ordering time to finished product. It required different time for each product, depends on the product that going to be produced and the time needed for every product.

Business Process

A business process or business method is a collection of related, structured activities or tasks that produce a specific service or product (serve a particular goal) for a particular customer or customers. It often can be visualized with a flowchart as a sequence of activities. In other word, business process is an activity or set of activities that will accomplish a specific organizational goal. It is a method for improving organizational efficiency and quality. A business process begins with a mission objective and ends with achievement of the business objective.

There are three types of business processes:
1. Management processes the processes that govern the operation of a system. Typical management processes include "Corporate Governance" and "Strategic Management".

2. Operational processes, processes that constitute the core business and create the primary value stream. Typical operational processes are Purchasing, Manufacturing, Advertising and Marketing, and Sales.
3. Supporting processes, which support the core processes. Examples include Accounting, Recruitment, Call centre, Technical support.

To make it simple in reading and understanding the business process, there are some symbols used to represent process in the company.

Symbol	Symbol Name	Symbol Description	Examples
	Activity	Show a process or action step. This is the most common symbol in business flowchart.	T-shirt production
	Decision	Indicates a question or branch in the process flow. It is used when there are two options (Yes/No).	Approve/Reject
	Delay/ Waiting	The Delay flowchart symbol depicts any waiting period in the process flow.	Purchase order
	Flow line (arrow, connector)	It is show the direction of the process flow.	

Root Cause Analysis

Root cause is a class of problem solving methods aimed at identifying the root causes of problems or events and resolve the problem and improve performance. It should be used as soon as a problem has been identified and the RCA process should not be delayed until a problem becomes too large and unwieldy.

There are lot of root cause analysis types in use today, but only three types of root causes analysis is commonly used:

1. Fish bone diagram: A fishbone diagram, which is also called an Ishikawa diagram, is a diagram used in quality control and product design. It is sometimes also referred to as a cause-and-effect diagram because it is designed to show the causes of specific events.
2. Current Reality Tree: a method for determining the root problems that affect the quality of the output of a business process. In a current reality tree, the worst thing that happened or almost happened is placed at the top. If the error did occur, the current reality tree does not have a prevention or recovery side.
3. Anova: anova is analysis of variance. It is the statistical technique for determining the degree of difference or similarity between two or more groups of data. It will determine the problem based on statistic calculation.

Forecasting

Forecasting is the art and science of predicting future events. Based on Heizer and Render (2008), a forecast is usually classified by the future time horizon, and it divided by three categories, there are:

1. Short – range forecast: this forecast has a time span of up to a year, but is generally less than three months.
2. Medium – range forecast: this intermediate forecast generally spans from three months to three years.
3. Long – range forecast: generally 3 years or more in time span for this forecast.

Forecasts also have characteristics. Those characteristics are:

1. Forecasts are always inaccurate and should include both expected value of the forecast and a measure of forecast error.
2. Long-term forecast are usually less accurate than short-term, because long-term forecasts have a larger standard deviation of error relative to the mean.
3. Aggregate forecasts are usually more accurate than disaggregate forecasts as they tend to have a smaller standard deviation of error relative to the mean.
4. The farther up the supply chain a company is, the greater is the distortion of information it receives.

There are also two general approaches to forecasting, Quantitative approaches and Qualitative approaches.

1. **Quantitative approaches**: It is an approach that employs one or more mathematical models than rely on historical data or causal variables to forecast demand. Quantitative approaches consists of two categories, there are:
   a. Time series models
   b. Associative models
2. **Qualitative approaches**: It is an approach that incorporates such factors as the decision maker's intuition, emotions, personal experiences, and value system. There are four different qualitative forecasting techniques:
   a. Jury of executive opinion
   b. Delphi method
   c. Sales force composite
   d. Consumer market survey

Newsvendor Model

The newsvendor (or newsboy or single-period) model is a mathematical model in operations management and applied economics used to determine optimal inventory levels. It is (typically) characterized by fixed prices and uncertain demand for a perishable product. Perishable product cannot be carried from one period to another. If the optimal inventory level is *q*, each unit of demand above *q* indicates lost. This model is adopted with the situation faced by newspaper vendor who must decide the quantity of the day's paper in order to face uncertain demand and knowing that unsold copies at the end of the day will be worthless.

3. Methodology

Store Visit

The initial step to do is visit the store. The purpose is to ask permission to the store manager and to make an appointment in order to do research in the store. Besides that, this step is very important to get closer to the store manager, so it will make author easier to collect the data, either through direct interview or collect from secondary data.

Problem Identification

The second step taken is formulating a problem that occurs in Damn! I love Indonesia that related to inventory management system. After talking with the store manager, then the author can identify problems that are occurring and assessing existing information in Damn! I love Indonesia, which will be the topic of this research. Problem to be addressed is inventory management T-shirt, because T-shirt is the main product of Damn! I love Indonesia. In addition, T-shirt has the biggest portion of

total sales. Problem happened when Damn! I love Indonesia cannot fulfil customer demand because of inaccurate forecast, therefore overstock and lost sales happened.

Literature Review

Literature review takes a very important role in doing this research, especially in processing and analysing data. Therefore, to support this research, the author will take some of the theoretical basis from the book, journal, and web. There are several operation book that author used, for instance Operation Management and Supply Chain Management. In addition, author also applies some journal and data from the internet that may be related to inventory management system.

Data Gathering

In conducting this research, there are two types of data that needs to be collected. There are primary and secondary data. The primary data gathered when conducting the interview and come directly to make observations in the store. Interview will be done with the store manager of Damn! I love Indonesia. Data collected from the interview are problem faced by Damn! I love Indonesia, organizational structure, etc. Moreover, another way to collect the primary data is to make an observation. Observation will be done by the author in the store located in Level One Grand Indonesia shopping centre, Jakarta. Primary data aims to be able to know the inventory management system, business process, supply chain strategy and any other information that relevant to problem faced by Damn! I love Indonesia.

Furthermore, secondary data will be gathered from company's file. Data collected is in form of company profile, organizational hierarchy, sales data, historical data, and stock data.

Data Analysis

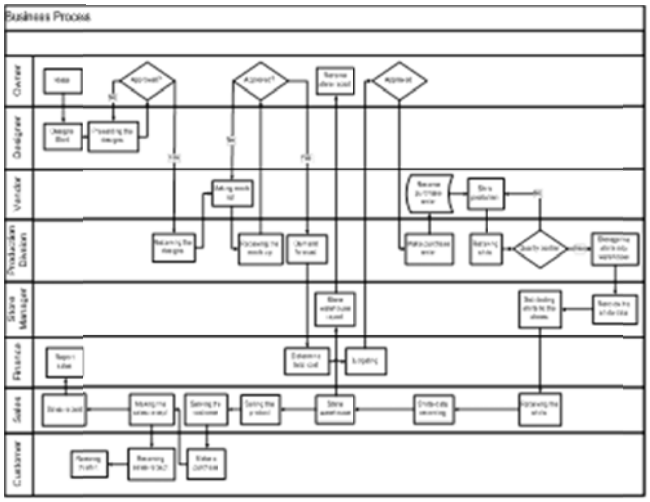
After gathered all the data, the next step to do is to analyse and process the data. This data is analysed and processed based on the business process. After that author will used business process data to find the root causes of the problems in Damn! I love Indonesia. Furthermore, find the core problem from the root cause analysis that is already made. Then, make a solution map to solve the problem.

Conclusion and Recommedation

From all the data that have been analyzed, the conclusion will be generated. This conclusion is use as the research objectives and also for answer the research question. Conclusion will be written down later and followed by some recommendation in order to increase company performances and to improve overall inventory and production in both Damn! I love Indonesia and vendors.

4. Data Analysis

Business Process



Design Process

The business process is initiated by the owner who gave the idea and innovation forwarded to the design team and implemented in the form of drawing or picture. Because Damn! I love Indonesia is an Indonesia culture campaign company, so the whole design must be related with Indonesia. Basically, the idea of the design come from Indonesia culture or history, for instance picture of *Lima Pandawa*(Arjuna, Bhima, Nakula, Sahadeva, Yudhishthira), Indonesia patriots edition, Soekarno edition, Proclamation edition, Bali girl, Ronggeng dancers, and much more. After implementing the designs, design division providing result designs to the owner. If the owner has not been satisfied, design team have to fix it. It takes at least 2 times to present it to the owner until owner satisfied. However, design that have been made sometimes is not be used, it is because the result are not good or it is not suitable with owner expectation. Decision makers fully controlled by the owner. Owner decided which design will be selected and produced. Designs that have been approved by the owner are proceed to the next process, which is production process.

Forecasting

Forecast initially discussed by the Board of Directors subjectively. They take a random quantity number for each size. Quantity number was subjectively taken. For instance, the size S, XL and XXL early produced as many as 5 dozen, while size M and L produced as many as 10 dozen. Having produced as much as the amount specified, Board of Directors and subordinates began to plot the historical data for at least 6 months. The last month sales and stock opname data will be the guidance for determining the next forecast.

Planning and Purchasing

In this step, Damn! I love Indonesia ask the vendor to make mock up before produce it in a large quantities. Quality and cutting of the T-shirt become main consideration for Damn! I love Indonesia. Quality which becomes main consideration for Damn! I love Indonesia is in the form of colour and pictures printed on a T-shirt. For example is the image must suitable to the design which given by design team. After the mock up approved by the owner, finance division began to make budgeting for T-shirt production. Budgeting adapted to the forecast has been determined for each T-shirt. The next production will be adjusted by the number of inventory remaining.

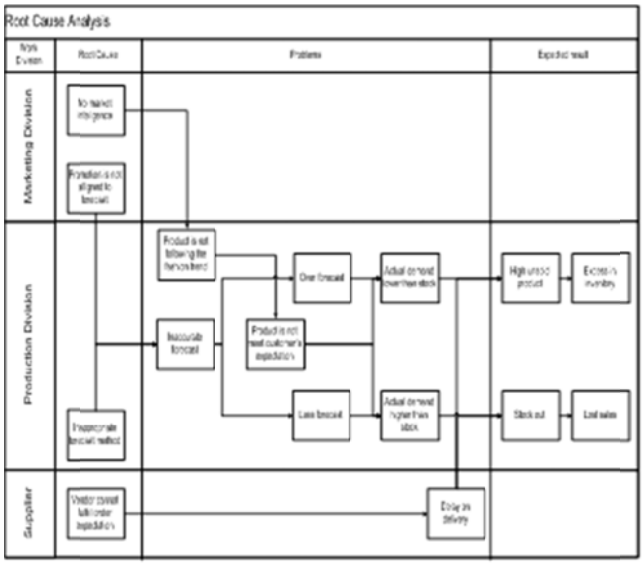
Delivery and Storage

There are 2 parts of delivery process. First is delivery process from vendor to Damn! I love Indonesia's warehouse, and second is delivery process from warehouse distributed to the stores. T-shirt that has been produced sent directly to the warehouse by the vendor. Shipping is included packaging. After that, production division do the quality control. The defect T-shirt that not pass the quality control will be returned to the vendor for repair, while the T-shirt that pass the quality control will be recorded and distributed directly to 3 Damn! I love Indonesia stores in Jakarta, and 1 store in Surabaya by the production division. Quantity T-shirt for each store will be divided based on the sales turnover.

Consumption

In each store, salesperson will receive the T-shirt, make the data record and put it in store warehouse. Besides that, they are also responsible for serving the customers and record every purchase. When a customer has decided to buy the product, sales person will make a receipt, and then give a copy of receipt and product to the customer. Receipt is then used to assess the financial and record the remaining inventories to reduce mistakes. Furthermore, the sales record will be use by financial division to make sales reports for owner and operation division to forecast the next order

Root Cause Analysis



No market intelligence

Damn! I love Indonesia do not have market intelligence, therefore, the product offered by Damn! I love Indonesia is not following the fashion trend. Because company has no information in market, then product Damn! I love Indonesia is not in accordance with customer needs or market. Product which does not accordance with the market identify that actual demand is lower than stock or actual demand is higher than stock. Actual demand lower than stock cause high unsold product which lead to excess in inventory, while the actual demand higher than stock cause stock out and resulting in lost sales.

Promotion is not aligned to forecast

Promotion is not aligned to forecast causes inaccurate forecast. The inaccurate Forecast causes two things, which is over forecast and less forecast. When forecast is too much, actual demand can lower or higher than stock, similarly when forecast is too little. However, both will lead to excess in inventory and lost sales like mention in previous paragraph.

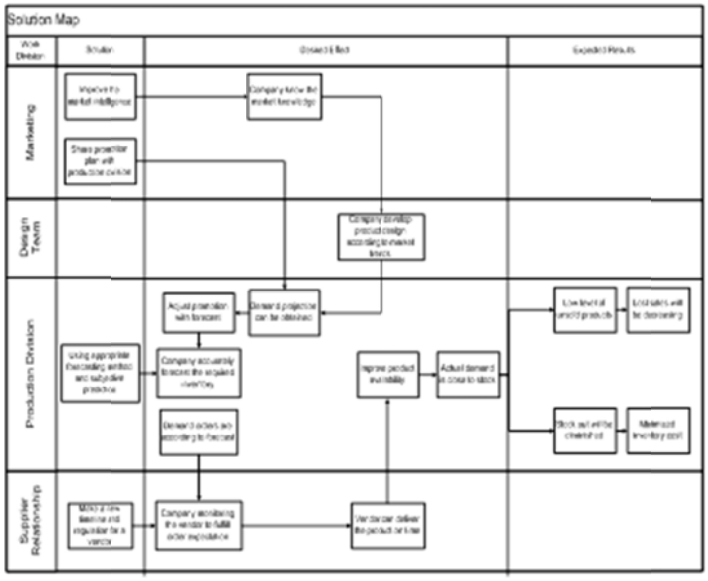
Inappropriate forecast method

Forecast is still based on subjective prediction, because the existing human resources do not have capability to determine the suitable forecast method. The explanation for the root cause is the same as already described above. Moreover, this root cause will result in high unsold product that causes in excess inventory and lost sales caused by stock out.

Vendor cannot fulfil order expectation

Problem from this root cause is only delay on delivery. Delay in delivering a product will cause high unsold product in the store or it could also cause a stock out. It will also lead to excess in inventory and lost sales.

Proposed Solution



Improve the market intelligence

Now, Damn! I love Indonesia did not have the market intelligence. Market intelligence needed to know information related to company's markets such as market opportunity and market penetration strategy. Besides, other purpose is to know information about how customers know the products offered by Damn! I love Indonesia and what they expected. Strategy that can be used by Damn! I love Indonesia to improve market intelligence is push demand. It means that Damn! I love Indonesia pushed demand from supplier to the customer, so that information is just pushed toward the buyer. In addition, the dissemination of the questionnaire could also help the company in getting information about demand and product desired by the market. When the information has been collected, then the market intelligence develops into market knowledge and Damn! I love Indonesia is able to meet customer demand and develop products. Products developed according to the trend and information obtained. Moreover, when all the information gathered, company is able to projecting the demand. When demand already projected, then the company can accurately forecast the required inventory. It is because company can predict the number of T-shirt that will be produce.

Adjust the promotion with forecast

In the fashion industry, promotion takes an important role and has a huge impact on sales and it needs to be calculated as the base of forecast. If both promotion and forecast are already in line, demand projection can be obtained. After acquiring the demand projection, then Damn! I love Indonesia can accurately forecast the required inventory. After that, the company only monitors the vendor until actual demand is close to stock. If the actual demand is close to stock, the company will get two expected results. Reduction in both levels of unsold product and stock out will be the expected results.

Using appropriate forecast method

As has been discussed previously, forecast is important in a company, especially company who runs their business in retail business. Therefore, every month Damn! I love Indonesia determine the number of T-shirt that have to be order. In making a forecasting, Damn! I love Indonesia need some data. Those data are inventory and sales data, and also last purchase order data. Inventory and sales data are used to project demand in the future, whereas last purchase order data is used to determine the trend or model of T-shirt, not the quantity of T-shirt to be ordered. In addition to the data, they are also still use subjective prediction. It is because Damn! I love Indonesia are still using subjective prediction, sometimes the forecast was not according to what is expected, and it became the problem faced by Damn! I love Indonesia.

Moreover, in order to have a good approximation, the third possible solution for inappropriate forecast is Damn! I love Indonesia should using appropriate forecasting method. There will be two models of time-series forecasting to be compared to find out the most suitable forecast. Those two models are moving average and simple exponential smoothing. To simplify the calculation, the sample will be taken from the Soekarno Edition T-shirt. By using both moving average and simple exponential smoothing and compare the MAD to see the error, Damn! I love Indonesia proposed a solution. Future values are predicted by looking the past values. The remaining stock in the warehouse indicate that demand is greater than sales. However, since Damn! I love Indonesia does not have data on demand, so assume that demand is equal to sales and any other variables assumed to be ignored. By calculate the forecast, the expected result is to reduce stock out and have a low unsold product. Calculation of both forecast models will be explained below.

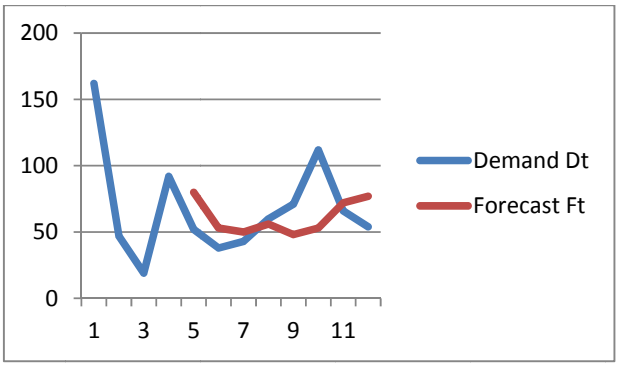
- Moving Average
  This model uses a number of historical data to generate a forecast. A 4-month moving average will be used to summing the demand during the past 4 months and dividing by 4. Formulation of simple moving average is expressed as

$$\text{Moving average} = \frac{\Sigma \text{ Demand in previous } n \text{ periods}}{n}$$

n = number of periods in the moving average

Forecasting of Soekarno Edition T-shirt using Moving Average Model

Period (t)	Demand (Dt)	Level (Lt)	Forecast (Ft)	Error (Et)	Absolute Error (At)	Squared Error (MSEt)	MADt
1	162						
2	47						
3	19						
4	92	80					
5	52	53	80	28	28	784	28
6	38	50	53	15	15	497	21
7	43	56	50	7	7	349	17
8	60	48	56	-4	4	265	13
9	71	53	48	-23	23	316	15
10	112	72	53	-59	59	843	23
11	66	77	72	6	6	727	20
12	54	76	77	23	23	704	21
13			76				
14			76				
15			76				
16			76				



Comparison between Demand and Forecast using Moving Average

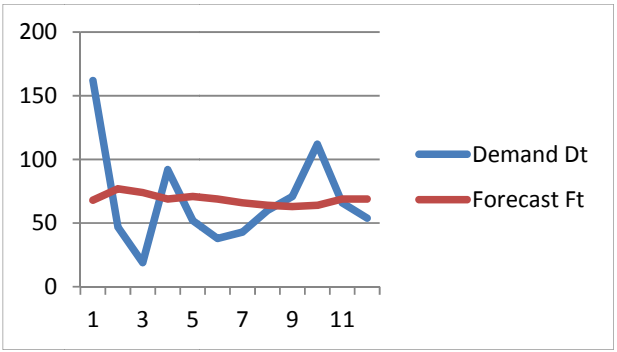
- Simple Exponential Smoothing

  The simple exponential smoothing method is appropriate when demand has no observable trend or seasonality. It is because demand has been assumed to have no observable trend or seasonality, initial estimate of level, Lo, is taken to be the average of all historical data. Given demand data for Periods 1 through *n*, formulation is as follow:

$$Lo = \frac{1}{n}\sum_{i=1}^{n} Di$$

Forecasting of Soekarno Edition T-shirt using Simple Exponential Smoothing

Period (t)	Demand (Dt)	Level (Lt)	Forecast (Ft)	Error (Et)	Absolute Error (At)	Mean Squared Error (MSEt)	MADt
		68					
1	162	77	68	-94	94	8836	94
2	47	74	77	30	30	4880	62
3	19	69	74	55	55	4275	60
4	92	71	69	-23,2	23,2	3341	51
5	52	69	71	19	19	2746	44
6	38	66	69	31	31	2451	42
7	43	64	66	23	23	2177	39
8	60	63	64	4	4	1906	35
9	71	64	63	-8	8	1701	32
10	112	69	64	-48	48	1760	34
11	66	69	69	3	3	1600	31
12	54	67	69	15	15	1485	29
13			67				
14			67				
15			67				
16			67				



Comparison between Demands and Forecast using Simple Exponential Smoothing

To determine the best forecast model, those models are compared by using Mean Absolute Deviation (MAD). This value is computed by taking the sum of the absolute values of the individual forecast errors and dividing by numbers of period (*n*):

$$MAD = \frac{\Sigma \mid Actual - Forecast \mid}{n}$$

From the above calculation, it can be seen that MAD's value of moving average model is lower than MAD's value of simple exponential smoothing. From the result, moving average model is preferred. It is because, moving average model has less MAD's value and it reflects the less forecasting error. With a small error, company expected that demand is equal to stock. However, this model can only be used during the normal season. By using moving average model, trend and seasonal change does not consider.

NEWSVENDOR MODEL

Measuring expected overstock and expected understock:

In measuring expected overstock and understock, we consider following inputs:

Co : Cost of overstocking by one unit, Co = C – S
Cu : Cost of understocking by one unit, Cu = P – C
CSL* : Optimal cycle service level
O* : Corresponding optimal order size

Below are the formula used to measure expected overstock and expected understock:

$$CSL^* = \text{Prob}(\text{Demand} \le O^*) = \frac{p-c}{p-s} = \frac{Cu}{Cu+Co} = \frac{1}{1+\left(\frac{Co}{Cu}\right)}$$

$$O^* = F^{-1}(CSL^*, \mu, \sigma) = \text{NORMINV}(CSL^*, \mu, \sigma)$$

$$\text{Expected overstock} = (O-\mu)\, Fs\left(\frac{O-\mu}{\sigma}\right) + \sigma fs\left(\frac{O-\mu}{\sigma}\right)$$
$$= (O-\mu)\, NORMDIST\,[(O-\mu)/\sigma, 0, 1, 1] + \sigma \text{NORMDIST}\,[(O-\mu)/\sigma, 0, 1, 0]$$

$$\text{Expected understock} = (\mu - O)\,[1 - Fs\left(\frac{O-\mu}{\sigma}\right)] + \sigma fs\left(\frac{O-\mu}{\sigma}\right)$$
$$= (\mu - O)\,[1 - NORMDIST\,[(O-\mu)/\sigma, 0, 1, 1] + \sigma\, \text{NORMDIST}\,[(O-\mu)/\sigma, 0, 1, 0]$$

In this case we have:

Data on Demand

Period (t)	Demand/ week	Demand/ month	Demand/ 3 months	Remaining stock
14	47	92	182	34
15	14			
16	21			
17	10			
18	22	52		
19	19			
20	8			
21	3			
22	17	38		
23	7			
24	4			
25	10			
26	18	43	174	38
27	9			
28	7			
29	6			
30	3			
31	17	60		
32	29			
33	11			
34	3			
35	23	71		
36	35			
37	8			
38	5			
39	47	112	232	32
40	24			
41	16			
42	11			
43	14			
44	27	66		
45	18			
46	13			
47	8			
48	22	54		
49	17			
50	11			

51	4			

From data above, here is the calculation using newsvendor model:

Newsvendor Calculation

Period 1	
Price (P) per unit	175000
Cost (C) per unit	75000
Salvage Value (S)	40000
Co	35000
Cu	100000
M	816
Σ	121,28
CSL*	0,74
Q*	894,30
Expected overstock	97
Expected understock	19
Expected profit	156502867

Below is the current condition of overstock data and profit:

Current Overstock Data

Period (t)	Demand	Remaining stock	Total
1	162	12	96
2	47		
3	19		
4	92	34	
5	52		
6	38		
7	43	18	
8	60		
9	71		
10	112	32	
11	66		
12	54		

To calculation the current profit, the formula used is total product sold times price per unit.
Current profit = 816 x 175000 = Rp. 142800000

Make a new timeline and regulation for a vendor

The last problem that occurs in Damn! I love Indonesia is vendor cannot fulfil orders expectation. In addition to the internal factors of the vendor itself, unclear timeline and regulation become the main factor that cause a vendor cannot fulfil the orders. Therefore, solution for this problem is Damn! I love Indonesia make a new timeline and regulation for a vendor. Timeline is created so that the

vendor can produce in a chronological order. In addition, the timeline are used to know what milestones to be achieved and to know the time schedule. In addition to the timeline, Damn! I love Indonesia must also create new regulation. Regulation is made to enforce the rules. The form of regulation that created by Damn! I love Indonesia is in the form of self-regulation. It is made to prevent unseen externalities and reduce risk. When the timeline and regulation has been created and filled by the vendor, then a company only needs to monitor the work flow of vendors in fulfilling order expectation. When the order is fulfilled in accordance with the timeline and the regulation has been made, there is no more delay in delivery of goods.

On time delivery can improve product availability. It reflects a company's ability to fill a customer order out of available inventory. When customer order arrives and product is not available, stock out will happen. Improve in product availability makes the actual demand closer to stock. When there is no gap between actual demand and stock, then there will be two expected results. Those expected results are level of unsold product will decrease and stock out will be diminished. When level of unsold product reduced, then lost sales will decrease as well as when stock out diminished, inventory cost can be minimized. In addition, below is the proposed timeline made for vendor.

Comparison the Existing System with Proposed System

No	Aspects	Existing System	Proposed System
1	Forecasting	Damn! I love Indonesia did not use forecasting method in calculating the future demand. They use subjective prediction in taking decisions. Subjective prediction was decided based on the season and interest of the customer with the products offered. Because Damn! I love Indonesia using subjective prediction, then Damn! I love Indonesia still having overstock and under stock in inventory management.	It is because Damn! I love Indonesia did not use forecasting method in calculating the future demand, so the system offered to Damn! I love Indonesia is calculated forecast demand using forecasting method. Forecasting method used is the moving average and simple exponential smoothing. After calculating using forecasting method, next is comparing MAD (Mean Absolute Deviation). A small MAD indicates a less error. Therefore, in this case, moving average is preferred because it has a smaller number of MAD compared to a calculation result using simple exponential smoothing.
2	Overstock	Seen from the sales of Soekarno edition T-shirt for a year, overstock still happen in Damn! I love Indonesia. This result is related to error in forecasting. Along the year, overstock happened in Damn! I love Indonesia for about 96 with total sales as much as 816.	A system offered to calculate expected overstock is newsvendor model. As we can see, the overstock for current condition is lower than what was expected, but the optimal level result using newsvendor is higher than current result. So, for overstock using newsvendor is better compared to the current condition.
3	Understock	Understock also happen in Damn! I love Indonesia. Usually, understock occurs in a peak season when the number of demand is more than the amount of product	The system used to calculate understock is also newsvendor model. Since current understock data is not available, so understock result cannot be compared.

		offered.	
4	Profit	Total product sold times price per unit is a formula used to get a current profit result. In a year, profit gained by Damn! I love Indonesia is about IDR 142800000.	After calculating the expected profit, it can be conclude that expected profit using newsvendor model have a better result compared to current profit. it has a significant change about IDR 13702867.
5	Supplier relationship	In production, Damn! I love Indonesia orders the products from the vendor. The time for ordering the T-shirt is really important. Production delays are the obstacle for Damn! I love Indonesia. Delay occur in both number of production volume and due date. For example is production time will takes a month longer when vendor cannot finish it on time.	To avoid delay in product delivery, Damn! I love Indonesia make a timeline and regulation for a vendor. Form of regulation that created by Damn! I love Indonesia is in the form of self-regulation. It is made to prevent unseen externalities and reduce risk. With a new timeline and regulation, Damn! I love Indonesia is expect that delivery delay can be reduced.

5. Conclusion

To be able to survive in the retail business, a company must have unique products and different from others. Therefore, Damn! I love Indonesia offered unique products with a different theme. Damn! I love Indonesia raised Indonesian culture theme as a part of their business. With this theme, Damn! I love Indonesia be able to satisfy a demand customer.

In addition to being different, the most important thing in fulfilling a request from customer is the inventory. In running a business, company need to provide the product in accordance to fulfil the needs and desire of consumers. The existence of an inventory is required in every company, because a company cannot get the inventory instantly, and it takes time to produce it. Therefore, Damn! I love Indonesia needs a good inventory management system in order to satisfy the needs of the customers. Besides that, inventory management is also needed in order to increase the effectiveness and efficiency, as well as to maximize profit and minimize cost.

In fulfilling the demand, Damn! I love Indonesia have to set a good inventory management. Besides that, Damn! I love Indonesia also have to consider the optimal number of inventory needed by the company. This is necessary because having lot number of inventories will spend lot of money and it cause overstock, otherwise, having little number of inventory will cause lost sales and lost revenue because customer cannot have a product they are looking for. Usually, they cannot get the design, size or colour that suit to their needs due to lack of supply of the product. This condition will bring negative impact for the company. As a result, customer will go to another store so that Damn! I love Indonesia will lose the potential buyer.

This research is focused in improving inventory management. There are two types of data collected, primary and secondary data. Primary data gathered from interview and direct observation while secondary data gathered from company files. Besides both primary and secondary data, identifying a root cause analysis is really necessary. Root cause analysis gathered from Business Process and problems analysis faced by Damn! I love Indonesia. Four main problems faced by Damn! I love Indonesia, they are lost sales, overstock, inaccurate forecast, and delivery delay. After identify the

problems, company make a root cause analysis. Generally, there are three main problems that can be identified from root cause analysis.

After finding out the root cause of the problem that occurred in Damn! I love Indonesia, next step to do is proposed the solution. In order to make the solution easier, first is make a solution map. Solution map is made to ease author in mapping solution based on root cause and symptoms. After that, prove the expected result in solution map using newsvendor model.

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