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MODEL OF INVENTORY PLANNING USING MONTE CARLO SIMULATION IN RETAIL SUPERMARKET WITH CONSIDER TO COMPETITORS AND STIMULUS STRATEGIES

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ABSTRACT
Retail Supermarket is a retail company that provides various types of products to meet the primary needs of the community or people, such as food needs, various cleaning products, snacks, beverages, cosmetics, and many others. The growing retail business requires continously managed in retail company to work more effectively and efficiently in order to be able to face intense business competition so that business continuity can be maintained. The continuity of the company can be maintained if it is managed properly and has proper planning and control. Proper and careful planning followed by good control will continuously make the company's goal of achieving maximum profit achievable. This study will provide a proposal for inventory planning model using the Monte Carlo simulation method by paying attention to competitors and stimulus strategies, which can be used to predict sales for the next period so that the amount of inventory can be planned properly.
Keywords : *Inventory Planning, Monte Carlo Method, Retail*

1. Introduction

In today's era, consumer needs for basic goods for daily use continue to increase (Prasetyowati, 2016). In addition, there is a shift in the pattern of people's behavior in shopping, which is not only to meet the needs of people's lives but also as an effort to have recreation and establish relationships. This condition causes a change in the orientation of the retail business from traditional retail, which does not focus on consumer convenience when shopping, to a modern retail business that prioritizes consumer convenience when shopping. This makes the modern retail business grow rapidly in Indonesia. Foster (2008) argues that retail is an activity directly trading services or products to final consumers for personal use, not resale (Xue et al., 2020).

The growing retail business requires retail company managers to work more effectively and efficiently in order to be able to face intense business competition so that business continuity can be maintained (Purwatinah, 2021). The continuity of the company can be maintained if it is managed properly and has proper planning and control. Proper and careful planning followed by good control will continuously make the company's goal of achieving maximum profit achievable (Tersine, 1994).

There are several things that need to be planned and controlled so that the company's continuity is maintained, such as capital, technology, labor, and especially inventory (Heizer and Render, 2015 and Indrajit and Djokroprono, 2005). According to Assauri (2016), inventory is a resource or item that is idle and is waiting for further processing in the form of product marketing or production activities.

Inventory is an important part of the company because if it does not have inventory, then the company will not be able to meet the needs for these goods or services. However, if the inventory of goods available is too large, there will be additional storage costs. For this reason, it is necessary to have inventory planning so that inventory is in balance, not excessive and not lacking, so that the company benefits from the inventory (Montororing and Nurprihatin, 2021). Inventory planning can be said to be effective if the company is able to provide sufficient inventory within a certain period, is able to anticipate price increases, the inventory storage costs incurred are low, and the capital investment in inventory can be consistent (Prasetyowati, 2019).

Retail supermarket is a company engaged in the retail sector and provides various types of products to meet primary human needs such as food needs, various cleaning products, snacks,

various beverages, cosmetics, and others. The products in these retail supermarkets commonly from several distributors with a weekly purchase time of once a week. The various types of products and brands that exist make retail supermarkets require good inventory management (Asana et al., 2020). This is because the preparation and formation of an inventory planning strategy is one of the important factors in determining the efficiency of a company (Fuertes et al., 2020).

Based on the above background, retail supermarket problems can be identified, namely excess inventory of some products caused by inadequate inventory management and having not considered external factors such as competitors and Stimulus strategy, so it is necessary to plan the right inventory so that the excess inventory of these products can be minimized (Leepaitoon, & Bunterngchit, 2019).

2. Literature Review

2.1 Inventory management

Inventory control is used in order to reduce the cost of procurement and storage of goods and to ensure that there will be no shortage of goods so that the profit generated by the company can be maximized (Montororing etc, 2022). According to Indrajit & Djokopranoto (2005), inventory management is an activity or activity that has a relationship with planning, implementing, determining, and monitoring the needs of goods so that operational needs are met appropriately and investment in inventory can be carried out optimally.

An inventory control system is defined as a set of inventory control policies that determine how much inventory must be maintained by determining when orders to increase inventory will be placed and how many items must be ordered (Siregar etc, 2014).Meanwhile, according to Assauri (2016), inventory management has two functions, namely to build a system so that the flow of items in the inventory can be maintained and to make a decision on how many products to order and when the purchase order decision is made (Rubinstein and Kroese, 1981).

There are several things that inventory management must do for decisions to be effective (Frenkel, 2004):

a. Creating a system with the aim of maintaining the flow of inventory on hand and in the process of orders can be done with ease.
b. Produce reliable sales forecasts to identify potential forecast errors.
c. Capable of comprehending lead time and lead time variability.
d. Estimate the cost of holding inventory and the costs that will arise due to a shortage of inventory.
e. Create an inventory classification system.

2.2 Inventory management

There are several inventory functions that will increase the flexibility of the company's operations. The following are the functions of inventory:

a. To meet the anticipated consumer demand by providing product stock. This is done with the hope of maintaining customer satisfaction because the demand can be fulfilled.
b. to avoid stock shortages faced by the company. The cause of this stock shortage can be in the form of late delivery arrivals or an increase in demand.
c. Inventory is used to separate various stages of a product's manufacturing process.
d. Inflation and price changes are avoided.
e. To save money on purchases, buy in quantities that exceed your needs because shipping costs are lower when you buy in bulk.(Assauri, 2016).

2.3 Retail

The origin of the word retail is 'ritellier' in French, which means to cut or break into something smaller. In English itself, "retail" means "retail". According to Foster (2008) in the book Retail Business Management, retail is a device and a business activity that adds value to products by providing more services to consumers with the target of final consumers, not for

resale. Purwatinah (2021) defines retail as "all activities of selling goods or services directly to final consumers, and these goods or services are consumed individually, not for resale."

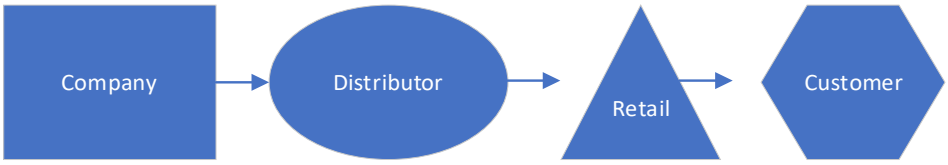

Fig 1. Product Distribution Line

Retail has the function of carrying out stocking, buying, selling, promotion, delivery, and payment to distributors, but does not resell to other retailers and does not produce goods.

2.4 Roles and Functions in Retail

Retail has a role as the last party in the production chain, starting from the supply of raw materials and then processing them into finished products for distribution to final consumers. In addition to the role, retail also has several functions, such as the following:

a. Merchandise supplyRetail sells various kinds of goods, be it food, clothing, books, stationery, and others from various brands. This retailer provides various price options for each product so that consumers have alternative choices according to their needs.
b. b. Make available stock.Retailers buy products from manufacturers or wholesalers in various variations to be stored and sold at one point of sale. The availability of stock of goods must be maintained so that when consumers need these goods, they are already available.
c. c. Retail or split sales.The factory produces the product and then packs it in cartons for distribution to distributors. Then the distributor will forward it to retail to be sold in units or pieces, with the aim of making it easier for consumers to buy a product based on their needs.
d. d. Providing services or goodsRetailers will provide information services regarding goods purchased by consumers, directly and indirectly, such as by showing goods or displays to make it easier for consumers to get the goods they need, listing prices on shelves or goods directly, keeping the store environment clean and explaining the benefits of the product.
e. increasing the value of products and services. Consumers need several products to meet their needs. If retail is able to provide products that consumers need, the products will increase in value. So, the role of retail in the value of products or services is very important.

2.5 Monte Carlo Technique

The term Monte Carlo method was introduced and it began to be used in real systems during World War II. S. Ulam and J. Von Neumann at the Los Alamos Scientific Laboratory introduced Monte Carlo, which was used to design nuclear protection. The problem at that time was too complicated to solve analytically and too difficult to solve experimentally. Then they solve this nuclear protection problem using a computer by generating random numbers. The word Monte Carlo comes from the city of Monte Carlo, which is the largest gambling city in the world. The word is called Monte Carlo because, basically, this method is like a gambling game (Sridadi, 2009; Luengo et al., 2020).

Basically, the Monte Carlo method is a method that leads to the solution of numerical and physical problems using random number selection in calculations (Sridadi, 2009; Naim and Doronianto, 2020). Hutahaean (2018) argues that the Monte Carlo method is a statistical sampling technique that is useful for estimating the right solution to quantitative problems. This method will randomly calculate the value of the uncertain variable that appears and is done repeatedly (Law and Kelton, 2000; Lucic et al., 2020).

This random calculation process involves past data variables. Repeated calculations are carried out with the aim of obtaining a probability distribution of the model to be simulated. By using the Monte Carlo method, it is expected that companies can make the right and appropriate

decisions (Safitri etc, 2020). The following are the steps in carrying out the Monte Carlo method (Oh and Berger, 1992).

a. Calculate the probability distribution of the previous demand data.
b. Calculate the cumulative probability distribution.
c. Determine the random number interval of each variable and then generate as many random numbers as needed.
d. View demand on real data to find out the simulation of demand for a product.

3. Research Methodology

In this study, we used descriptive research with a quantitative approach. This study analyzes the retail supermarket inventory data and then proper inventory control will be carried out by considering external factors such competitor and stimulus strategy, so that XYZ Retail Supermarket products can be readily available without shortage or excess stock. The research method flowchart is shown in Figure 1 as follows.

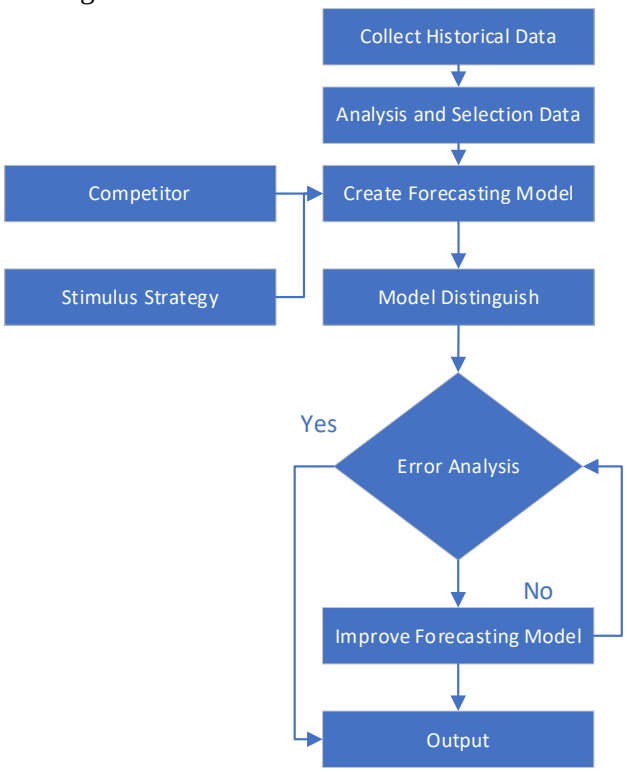

Fig 2. Research Flowchart

4. Model Development

Purchase prediction calculations using the Monte Carlo method will use Lingo 18.0 software. The simulation model to predict this purchase is done by creating 12 period that will describe inventory for 12 months by limiting external factors such as competitors and stimulus strategy. In addition to buying predictions, this model will determine the most optimal profit.

This Influence Diagram is useful for describing the design model used so that the decision variables of a system are clearly described.

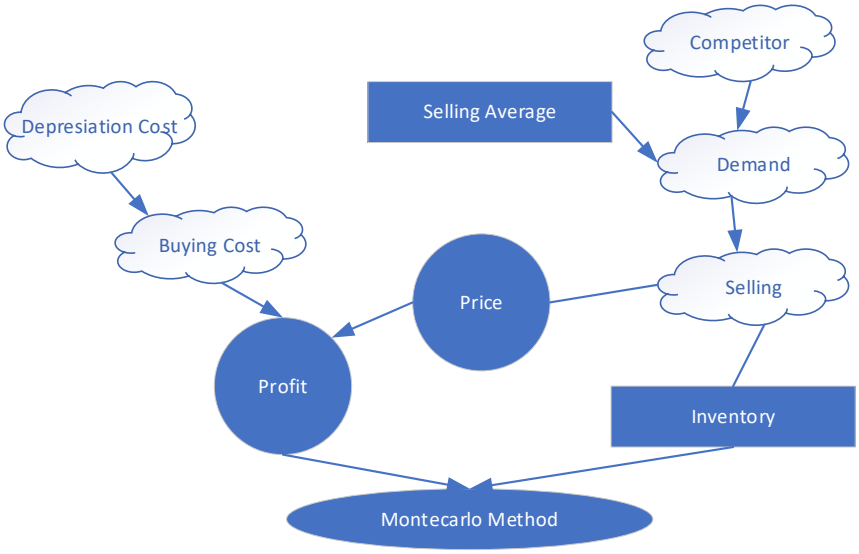

Fig 2. Influence Diagram for Model Development

Model Notation

Z_s	Standard normal random variable
U_s	Uniform random variable
QRAND	quasi random number
MeanObs	Observation average
SDObs	Observation standard deviation
Dep_s	depreciation in scenario to s
$Totdemand_s$	Total demand in scenario to s
$Demand_s$	Consumer Demand in scenario to s
$Stim_s$	Stimulus demand in scenario to s
Meanstim	Average demand stimulus
SDStim	Standard Deviation Stimulus Demand
$Depr_s$	Demand depreciation in scenario s
MeanDeprs	Average demand depreciation
Profit	Profit earned
Sprice	Selling price
Sales	Sales Amount
Stock	Amount of stockpile
Pcost	Product Purchase Price

Model Component

The scenario will result in a standard normal on the request by freeing the variable to take a positive or negative value.

$$\sum_{s\ldots k}^{s} FREE\ Z_s \quad \forall\ s = 1 \ldots k \qquad (1)$$

$$FREE = Demand_s \quad \forall\ s = 1 \ldots k \qquad (2)$$

Arbitrarily choose a seed for the quasi-random number generator and generate a uniform random variable for each scenario;

$$U = QRAND\ (1000) \qquad (3)$$

Random variables follow the cumulative standard normal probability distribution.

$$U_s = F(Z; Meanobs, SDObs) = \frac{1}{SDObs\sqrt{2\pi}} \int_{-\infty}^{Z} e^{\frac{(Z-MeanObs)^2}{2\ SDObs^2}}\ dx \quad \forall\ s = 1 \ldots k \qquad (4)$$

Exponential Cumulative Distribution Function for Depreciation for each scenario that occurs, where the average value of depreciation follows a normal distribution.

$$Dep_s = F(MeanDeprs; Z_s) = \begin{cases} \int_0^{Z_s} \lambda e^{-\lambda Z_s}\, dt = 1 - e^{-\lambda Z_s}, for\ Z_s \geq 0 \\ 0\ for\ another\ Z_s \end{cases} \quad \forall s = 1 \dots k \qquad (5)$$

Generate consumer demand in scenario s by considering external factors, namely a stimulus strategy to boost demand and demand depreciation due to external factors.

$$Demand_s = Max\big(0, Meanobs + (SDObs\ x\ Z_s)\big) - Deprs_s \quad \forall s = 1 \dots k \qquad (6)$$

Total demand is obtained from the amount of demand in period s added by the stimulus in period s given by the company. The amount of the stimulus strategy in each period is determined by the company and the amount is converted into the number of products.

$$Totdemand_s = Demand_s + Stim_s \quad \forall s = 1 \dots k \qquad (7)$$

The stimulus strategy in period s is calculated from the average stimulus issued by the company which is converted to product units plus the standard deviation of the stimulus multiplied by the probability value of the normal distribution in period s..

$$Stim_s = Meanstim + (SDStim\ x\ Z_s) \quad \forall s = 1 \dots k \qquad (8)$$

Depreciation in period s is calculated from the average depreciation/loss experienced by the company which is converted to product units plus the standard deviation of the stimulus multiplied by the probability value of the exponential distribution in period s.

$$Depr_s = MeanDeprs_s + (SDDeprs\ x\ Dep_s) \quad \forall s = 1 \dots k \qquad (9)$$

Objective Function

Maximize average profit over all scenarios;

$$MAX = Profit \qquad (10)$$

Profit in scenario s calculates the cumulative price of the product multiplied by sales in period s minus the purchase price of the product multiplied by the number of stocks.

$$Profit = \frac{\sum_{s..k}^{s} SPrice\ x\ Sales_s - Pcost\ x\ Stock)}{s} \quad \forall s = 1 \dots k \qquad (11)$$

Constraint

Can only stock an integer number.

$$Stock \in \mathbb{Z} \quad \forall s = 1 \dots k \qquad (12)$$

Cannot sell more than stock & nor more than demand.

$$\sum_{s \dots k}^{s} Sales_s \leq Stock \quad \forall s = 1 \dots k \qquad (13)$$

Demand at scene s must be greater than sales at scene 2.

$$Sales_s \leq Demand_s \quad \forall s = 1 \dots k \qquad (14)$$

No demands < 0 allowed.

$$Demand_s > 0 \quad \forall s = 1 \dots k \qquad (15)$$

5. Model Testing & Analysis of Results

A. Data Testing

In Tabel 1 is data stock for hand sanitizer product at swalayan ritel. The data is for 2 years from Februari 2020 to Januari 2022.

Tabel 1 - Stock at Swalayan Ritel XYZ

Period	Hand Sanitizer		GAP
	Stock	Sales	
Feb-20	480	560	15
Mar-20	495	560	28
Apr-20	550	440	19
May-20	485	560	27
Jun-20	520	600	7
Jul-20	510	640	21
Aug-20	520	440	17
Sep-20	420	540	29
Oct-20	520	540	40
Nov-20	480	440	38
Dec-20	545	640	38
Jan-21	570	560	47
Feb-21	490	480	57
Mar-21	560	560	48
Apr-21	490	600	69
May-21	485	440	66
Jun-21	475	440	63
Jul-21	510	560	59
Aug-21	460	560	60
Sep-21	445	440	61
Oct-21	520	440	54
Nov-21	470	480	56
Dec-21	560	440	65
Jan-22	490	600	57
Total	12050	11009	1041
Mean	503	459	44
SD	37	44	19

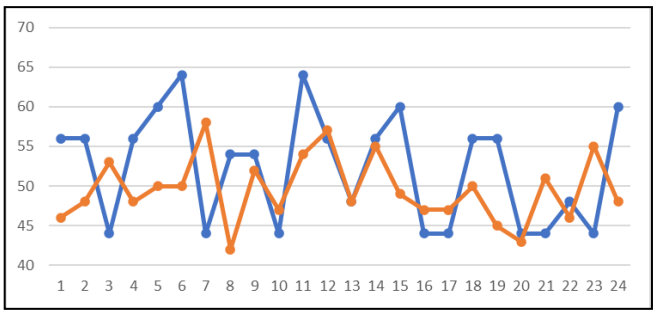

Fig 3. Graph of Purchase and Sales of Hand Sanitizer

Table 1 shows the remaining inventory data each month during the period February 2020–January 2022. Based on Table 1, it can be seen that in several periods there was an excess of stock. This can lead to a decrease in company profits due to high storage costs.

One of the causes of excess inventory is that the company's inventory management is not appropriate and has not paid attention to external factors that may occur. Ramadan, etc (2020) cites external factors that affect the success of a company, such as suppliers, technology, competitors, and consumer tastes. Some of the external factors that affect this retail self-service sale are new competitors and stimulus strategy. Of course, with this new competitor the retail supermarket cannot control the market anymore. This will affect sales volume because more or less potential customers will switch to these competitors. In addition, there are stimulus strategy that the customer will attract to buy the product. As a result, there are some products experiencing excess inventory. Therefore, it is necessary to plan product inventory by considering external factors in this retail supermarket.

B. The Monte Carlo Simulation with Lingo

This Monte Carlo uses Lingo 18.0 software with a random number of seeds for each product 10,000 times. Purchase prediction for 12 periods using the Monte Carlo simulation method.

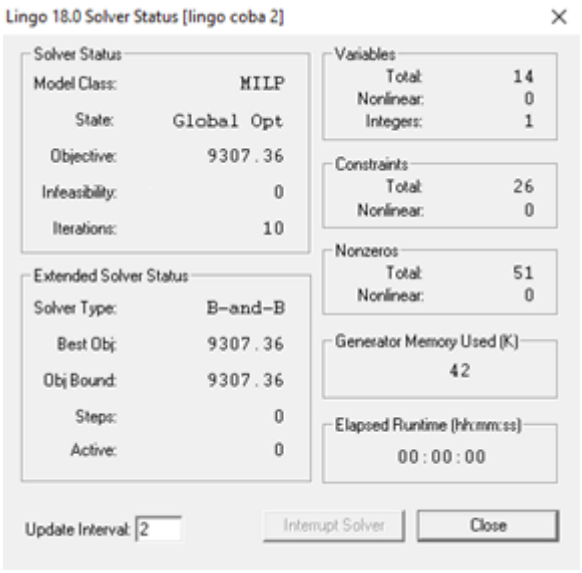

Fig 4. Optimal Solution by LINGO

Based on the calculation results of the Monte Carlo method using Lingo 18.0 software, it can be seen that the best objective or maximum profit is 9307,358. The calculated sales prediction will be used as the basis for purchasing products from distributors. The following is a product purchase prediction:

Table 2 - Sales Prediction for 12 Month

Month	Sales Prediction
Feb-22	173
Mar-22	187
Apr-22	200
May-22	206
Jun-22	206
Jul-22	206
Aug-22	206
Sep-22	206
Okt-22	206
Nov-22	206
Des-22	206
Jan-23	206

6. Conclusion

Based on the research that has been done, it can be seen that the company profit using the Monte Carlo method is 9307,36. This method can be applied by Retail Supermarkets in determining inventory because this model already consider depresiation by competitor and added stimulus strategy for sales increase. This method can help companies determine the optimal amount of inventory and the number of orders by predict sales in the future. For further research, researchers are expected to consider other factors that have not been considered in this study.

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References

A. M. Law and W. D. Kelton, Simulation Mode*lling and Analysis*, USA: Mcgraw-hill, 2000.

Asana, I. M. D. P., Radhitya, M. L., Widiartha, K. K., Santika, P. P., & Wiguna, I. K. A. G. (2020, February). Inventory control using ABC and min-max analysis on retail management information system. In *Journal of Physics: Conference Series* (Vol. 1469, No. 1, p. 012097). IOP Publishing.

Assauri, S. (2016). *Manajemen Operasi Produksi*. Jakarta: Rajawali Pers.

Foster, B. (2008). Retail Managemen. 1st ed. Bandung: Alfabeta

Frenkel, D. (2004). Introduction to Monte Carlo Methods. Computational Soft Matter: From Synthetics Polymers to Proteins, Vol.23, ISBN 3-00-012641-4, pp.29-60.

Fuertes, G., Alfaro, M., Vargas, M., Gutierrez, S., Ternero, R., & Sabattin, J. (2020). Conceptual framework for the strategic management: a literature review—descriptive. *Journal of Engineering*, 2020.

Heizer, J., & Render, B. (2015). *Operation Manajemen*. Jakarta: Salemba Empat.

Hutahaean, H. D. (2018). Analisa metode *Monte Carlo* untuk memprediksi tingkat kehadiran mahasiswa dalam perkuliahan (studi kasus: STMIK pelita nusantara). *Journal Of Informatic Pelita Nusantara*, 3(1).

Indrajit, R. E., & Djokropranoto, R. (2005). *Manajemen Persediaan*. Jakarta: Grasindo.

Lucic, A., Haned, H., & de Rijke, M. (2020, January). Why does my model fail? contrastive local explanations for retail forecasting. In *Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency* (pp. 90-98).

Leepaitoon, S., & Bunterngchit, C. (2019). The application of Monte Carlo simulation for inventory management: A case study of a retail store. *International Journal of the Computer, the Internet and Management, 27*(2), 67-83.

Luengo, D., Martino, L., Bugallo, M., Elvira, V., & Särkkä, S. (2020). A survey of Monte Carlo methods for parameter estimation. *EURASIP Journal on Advances in Signal Processing, 2020*(1), 1-62.

Montororing, Y. D. R. & Nurprihatin, F. (2021). Model of Quality Control Station Allocation With Consider Work In Process, and Defect Probability Of Final Product. *IOP Conference Series: Journal of Physics vol 1811* (IOP Publishing Ltd)

Montororing, Y. D. R., Widyantoro, M., Muhazir., A. (2022). Production Process improvements to minimize product defects using DMAIC six sigma statistical tool and FMEA at PT. KAEF. *IOP Conference Series: Journal of Physics vol 2157* (IOP Publishing Ltd).

Naim, M. A., & Donoriyanto, D. S. (2020). Pengendalian Persediaan Obat di Apotek XYZ Dengan Menggunakan Metode *Monte Carlo*. *Jurnal Manajemen Industri dan Teknologi*, 1.

Oh. M.S. and Berger. J.o (1992). Adaptive Importance Sampling In Monte Carlo Integration. Journal Of Statistical Computation And Simulation. 41. 143-168.

Prasetyowati, E. (2016). Aplikasi Simulasi Persediaan Teri Crispy Prisma Menggunakan Metode *Monte Carlo*. *JUSTINDO (Jurnal Sistem dan Teknologi Informasi Indonesia), 1*(1).

Purwatinah, A. (2021). *Pengelolaan Bisnis Ritel*. Jakarta: Grasindo.

Ramadan. H.,Gio. P. U., & Rosmaini. E. (2020). Monte Carlo Simulation Approach To Determine The Optimal Solution Of Probabilistic Supply Cost. Journal of Research in Mathematics Trends and Technology. Vol.2 No.1. 1-6

R. J. Tersine. (1994). Principles of Inventory and Materials Management, 4th Ed., USA: Prentice Hall, Inc

R. Y. Rubinstein and D. Kroese, Simulation and the Monte Carlo Method, New York: John Wiley & Sons, 1981.

Safitri, D., Dahdah, S. S., & Andesta, D. (2020). Penerapan Metode *Monte Carlo* Pada Perencanaan Jumlah Produksi Pestisida (Studi Kasus: PT. Petrokimia Kayaku Plant Cair 1). JUSTI (Jurnal Sistem dan Teknik Industri), 1(1), 96-100.

Sridadi, B. (2009). Pemodelan dan Simulasi Sistem. Bandung: Informatika.

Siregar, L., Herlina, L., & Kulsum. (2014). Pengendalian Persediaan Bahan Bak di PT. ABC Dengan Model Q Back Order Menggunakan Metode *Monte Carlo*. Jurnal Teknik Industri Untirta.

Xue, X., Dou, J., & Shang, Y. (2020). Blockchain-driven supply chain decentralized operations–information sharing perspective. *Business Process Management Journal*.

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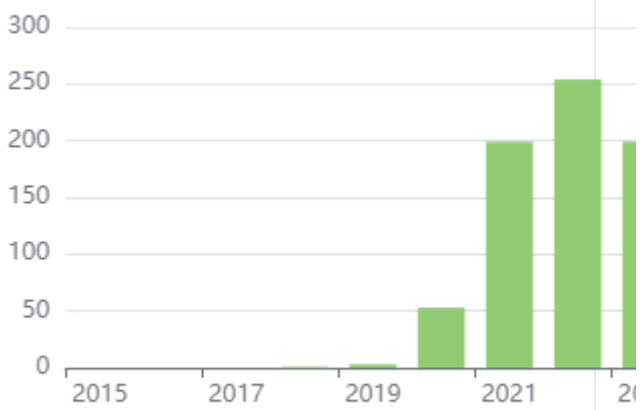

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