

**GROWTH PLAN IN OPERATIONAL DESIGN MANAGEMENT FOR PT. TRAFFIC LIGHT JAYA****Heru Kristanto<sup>1</sup>, Cheryl Marlitta<sup>2</sup>**

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ARTICLE INFO	ABSTRACT
<b>Received:</b> 5-05-2022	Traffic congestion is followed via way of means of more and more site visitors injuries. These are ruled by bike injuries, which also account for the best part of fatalities and essential injuries. Careless riding and unruly conduct via way of drivers are the primary reasons for injuries in Indonesia. Penelitian ini bertujuan untuk a coordinated attempt that can also additionally alleviate a metropolis's congestion is deemed necessary, especially in tackling busy and complicated intersections in the middle of the trouble to lessen losses. Research is carried out using qualitative research. It was concluded that The company must have good marketing and operational strategies to get more customers and maintain the business to keep it disrupting the times. The future challenge is very challenging for this business to set up a new strategy to meet market demands and globally transform. The presence of a 24-hour hotline to receive customer complaints I feel is one form of responsibility from the company. Building a laboratory seems to be needed shortly given the many demands in the three cities as a preliminary experiment. It is hoped that with good management operations, this business can dominate and be irreplaceable, given the purpose of establishing this company is to be a solution to the bottleneck and effectiveness of the government budget.
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*Corresponding Author:* Heru KristantoE-mail: [herukris@staff.ukdw.ac.id](mailto:herukris@staff.ukdw.ac.id)**INTRODUCTION**

According to the records from the UN Office for Disaster Risk Reduction, 7255 disaster events took place between 1998 and 2017 (Wallemaq, Below, & McClean, 2018). Natural disasters, technology-related incidents, terrorism events, and epidemics formed the majority of these disasters

The security, safety, order, and smoothness of site visitors have emerged as a huge predicament withinside the world's fourth maximum populous country (Saleh, 2018). While formerly Jakarta changed into the most effective metropolis related to sizable site visitor congestion, now different cities — including Bandung, Yogyakarta, Semarang, and Surabaya — additionally be afflicted by site visitor jams. Traffic congestion is followed via way of means of more and more site visitors injuries. These are ruled by bike injuries, which also account for the best part of fatalities and essential injuries (Widodo et al., 2020). Careless riding and unruly conduct via way of drivers are the primary reasons for injuries in Indonesia. In 2014, the police mentioned about 28,000 fatalities because of injuries on the streets and roadways of Indonesia. In that manner, approximately 12 deaths from site visitors injuries consistent with 100,000 people (Krajewski, Malhotra, Malhotra, Ritzman, & Krajewski, 2015). This could be very excessive in comparison to neighboring nations like Singapore (4.8) and Australia (5.2), and maximum researchers anticipate that site visitors' fatality numbers are nevertheless under-

mentioned. Based on cutting-edge trends, it's far predicted that during 2020, site visitor injuries in Indonesia will purpose 40,000 deaths consistent year. Besides inflicting deaths, deep trauma, and minor injuries, site visitor injuries additionally create sizeable belongings damage, and this parent is likewise increasing. In 2010, the overall national economic price reached 143 billion Indonesia rupiahs (roughly \$19 million); via way of means in 2014 it had nearly doubled, mountaineering to Rp. 250 billion. One of the clever metropolis factors is transportation and site visitors management. As the monetary price of congestion in essential cities (Jakarta and Bandung) is predicted as excessive as IDR 35 trillion (28 trillion in Jakarta and seven trillion in Bandung) each year, a coordinated attempt that can also additionally alleviate a metropolis's congestion is deemed necessary, especially in tackling busy and complicated intersections on the middle of the trouble to lessen losses.

## METHODS

To achieve this goal, research was carried out using qualitative research primary data source is an object or document originating from the raw material called "first-hand information" (Cooper, Schindler, & Sun, 2006). Primary data sources from this research the author does the focus group discussion with the founders of PT. Traffic Light Jaya.

## RESULTS AND DISCUSSION

### A. FINDING AND DISCUSSION

Smart Traffic Light is a company that offers efficiency and time-based technology innovation to its customers (Papa & Lauwers, 2015). Therefore, this is a service company that aims to provide solutions to recurring problems that its target customers might havenamely congestion, losses from congestion, and other impacts. Main activitiescarried out at PT. Traffic Light Jaya can be as follows;

1. Do other maintenance work
2. Availability of 24-hour complaints
3. Research new technology and innovation

Such a company will have detailed records of the repair work carried out on theproduct in the field.

#### 1 . Key Partnerships Joint-Ventures:

Another thing you can develop is a joint venture in a new business. Both partners can have a common interest in this matter, the Government (Department of Transportation) in developing the country's transportation side. Therole of the partner, in this case, is the primary funder and that brings together the market (Luturlean & SE, 2019). The partner advertises and facilitates products up to the realm ofcompany development.

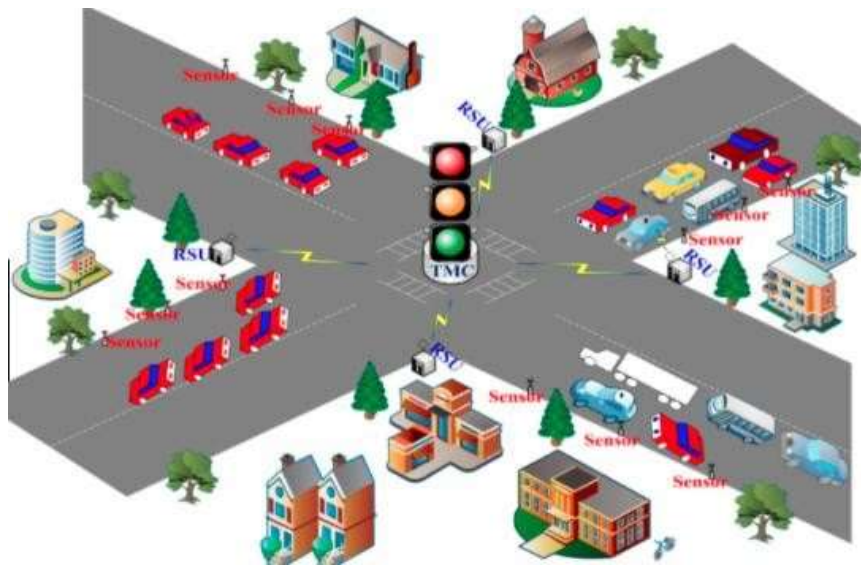
#### 2. Cost Structure

The most important are the maintenance of tools and servers, salaries of fieldtechnicians, research funds for the advancement of technological innovations, and the application of new methods (Stergiou & Psannis, 2017). The most expensive key activity is the production area. These include Selection of product and design, Production Control, Quality and Cost Control, and Maintenance and Replacement of Machines. And of the key resources is Intellectual resources. it takes a great deal of time and expenditure to develop.

As is well known, in the ICT business (Perera, Ingirige, Ruikar, & Obonyo, 2017). This business model is very promising if itis accompanied by good management operations and can also always bring innovation to the community. Given that in Indonesia this business is still very rare.

- a. Introductory phase, since Smart Traffic Light starts at the end of 2018, Although this April is still in the stage of making tools, we as the founder and management got lots of feedback from the customers (Le, Le Tuan, & Tuan, 2019). Assisted by theTransportation Department data, it is easier for us to communicate with roadusers. Several regular presentations with the Department of Transportation, technicians, and lecturers have been carried out to

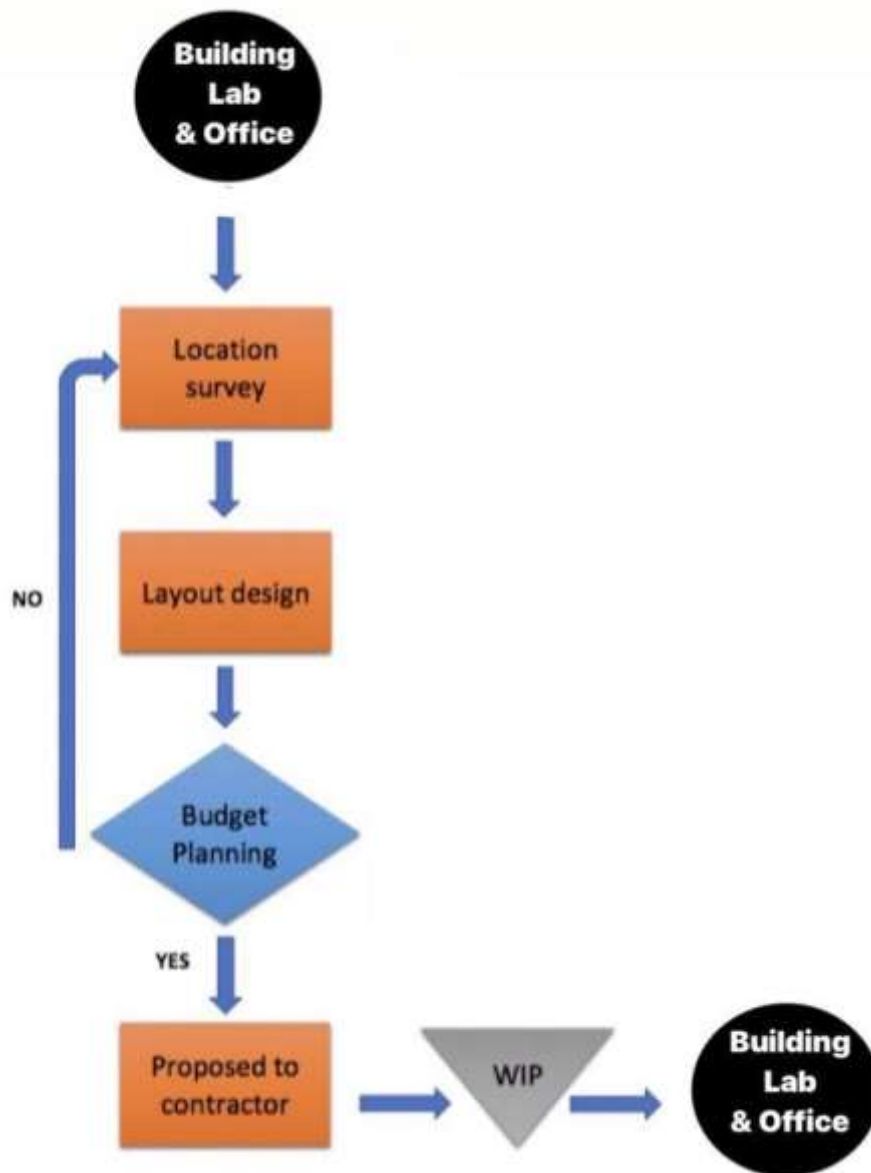
always be up-to-date. The company just needs to set aside a large enough budget for RnD so that the product launching will be the answer to people's problems.



**Picture 1. Smart Traffic Light schema**

- b. Growth phase, after funds from the Department of Transportation went down to move in trying various kinds of sensors can be more flexible and multiply technicians to make prototypes (Greer, Fraser, Hicks, Mercer, & Thompson, 2018). With the success of the prototype, Dishub's trust is increasing so that it is entrusted in the future as this product is implemented in two neighboring cities namely Surakarta and Wonogiri.
- c. Maturity phase, PT. Traffic Light Jaya hasn't reached this phase yet, because of meet its problems. Due to periodic funding proposals, prioritize the research sector.
- d. Phase of decline, PT. Traffic Light Jaya still trying to get capital and location (Laboratorium) to help this business develop.

The company has a goal to have its production place, as Laboratorium. This step will help this business become more productive and professional. Moreover, the customer will be easier to get this product and make a contract. This project could be done more less than a year, because there are several things to be completed including the survey of the location, dealing with the landlord and the legality of building an Office / Laboratorium, and also deciding on the store design with the architect/contractor. Nevertheless, it depends on the budget, if the budget is insufficient, this business must find another place. As a result, at the end of the year PT. Smart Traffic Light can be predicted to have their own Laboratorium / Office.



Picture 2. Smart Traffic Light"s Flow Chart Planning on Building Lab & Office

## B. EXISTING PLAN AND ACTIVITIES

Regardless of the location, PT. Traffic Light Jaya actually could be an independent business and develop by giving more attention to their loyal customers, economic changing, sociographic and demographic, technology, politics, and others. Also, needs to be developed in the system and organizational structure. This development can use certain techniques to design new products. Several techniques can be used, including strong design, modular design, CAD (computer-aided design), CAM (computer-aided manufacturing), virtual reality technology, value analysis, and product that impact environmentally friendly (Raza, Patle, & Arya, 2012). In environmentally friendly designs, there are several objectives :

1. Make the day of Road user effective
2. Not stuck in traffic as usual
3. Save fuel
4. Reducing air pollution
5. Support the government's go-green program
6. Reducing government losses in the congestion sector

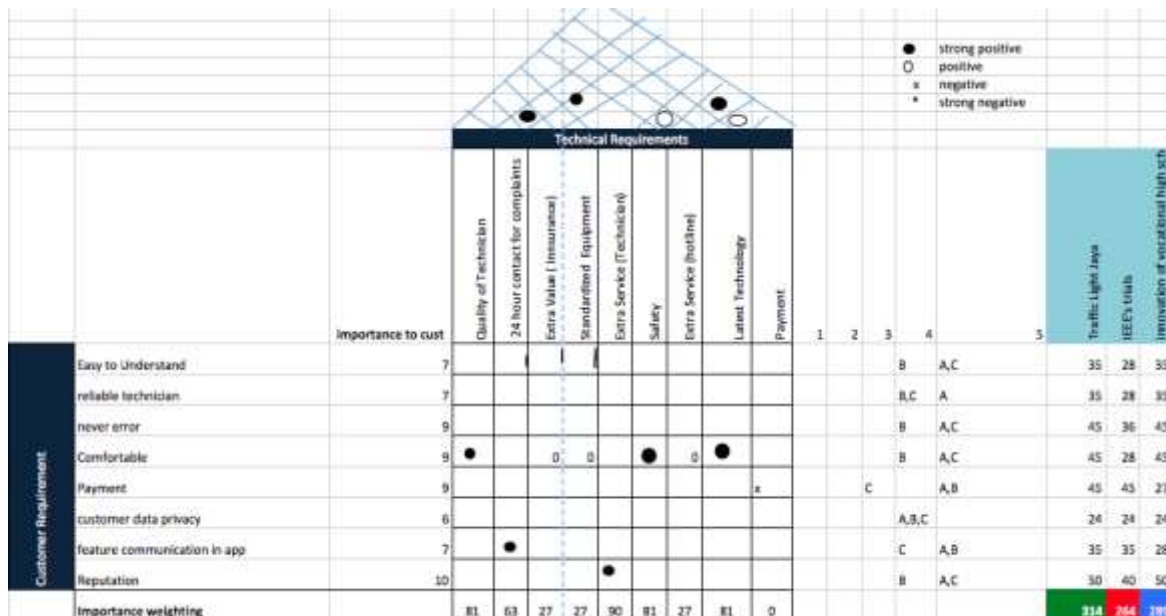
1. Quality Function Deployment

Quality Function Deployment (QFD) is concerned with determining what will satisfy the customer and translating the customer's desires into the targeted design (Ginting, Ishak, Malik, & Satrio, 2020a). The idea is to understand customer desires and introduce alternative process solutions. This information is then integrated into constantly changing product designs. QFD is used at the beginning of the design process to help determine what can satisfy customers and where the quality of business is spread.

QFD tool is a quality house (Ginting, Ishak, Malik, & Satrio, 2020b). House quality is a graphic technique to explain the relationship between customer desires and products or services. Only by establishing this relationship, I can develop products and processes with the features customers wants. This application of relationships is the first step in developing a world-class production system. To make a quality home, seven basic steps are including;

- a. Get to know customer desires.
- b. Identify how the product/service will satisfy the customer's desires.
- c. Connect the customer's desires with how the product will be made to meet the customer's desires.
- d. Recognize the relationship between how much to the company.
- e. Create a level of importance.
- f. Competitive product evaluation
- g. Desired technical attributes

From this theory PT. Traffic Light Jaya made simple differentiation from its competitors, including the latest technology, good service & the latest innovation. This business has the vision to become an important role in overcoming traffic jams and helping the government to streamline the budget. PT. Traffic Light Jaya is still willing to innovate more on its products. PT. Traffic Light Jaya does not have a competitor in Indonesia. Therefore, PT. Traffic Light Jaya has a big potential in this market to give a more positive impact in Indonesia.



Target value		Available in Big Cities	Expanding to Another city	Adding new service	Pay Later (In The Future)	Extra Service (Technician)	Reduce government budget	Develop a better team (Technician & Researcher)	
Technical evaluation	1		C,B	A,B	C, A,B				A
	2	C					C		B
	3	B		C	C	A,B			C
	4					C			
	5	A	A	A,B			A,B		
	A	405	68	135	27	90	243	135	1103
	B	243	63	135	27	90	243	135	936
	C	162	63	81	81	90	324	54	855

Picture 3. House of Quality Function Deployment for PT. Traffic Light Jaya

**2. GROWTH PLAN**

In the first year, The marketing strategy will be implemented in PT. Traffic Light Jaya

- a. **Sales promotion**, Making a lower-priced package for purchasing large quantities.
- b. **Publicity**, Cooperate with Ministry Of Transportation.
- c. **Interactive Marketing**, Creating a social media page to make it easier for customers who want to know about innovation information. 24 hours hotline if there is any complaint.

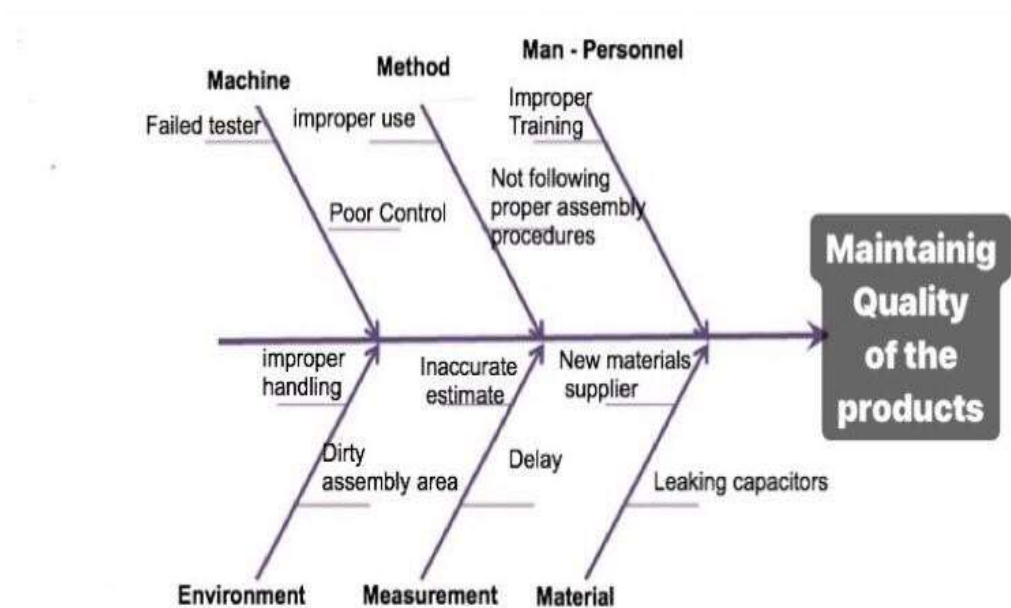
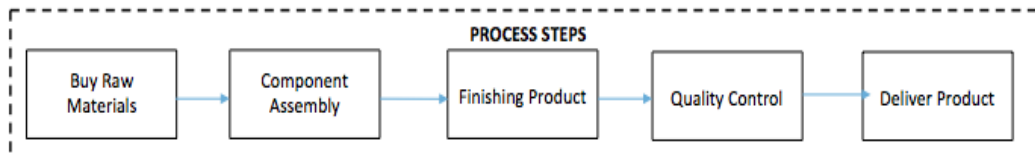
**3. Implementation and Market Analysis**

In every business, there is always a competitor, even though the business is very innovative, competitors will always try to match or provide cheaper prices with quality that is not much different or even the same as the efforts they want to emulate. Regarding the price, the company has a middle to upper price, due to the company's motto that is prioritizing quality. Where playing business in the upper class or commonly known as Blue Ocean is not easy, because the company has to convince the customers.

**4. Quality Control**

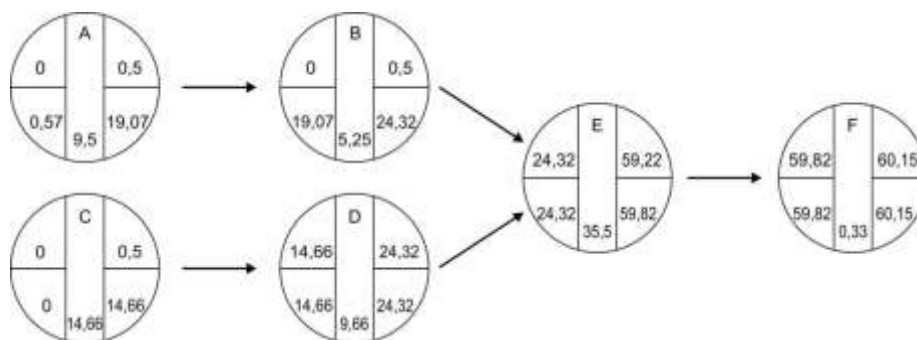
To maintain the quality of a product, make some analysis to define the problem using the Fish Bone and SIPOC Tools, using fishbone and SIPOC tools will minimize defects of products.

SUPPLIER	INPUTS	PROCESS	OUTPUTS	CUSTOMERS
Jaya Plaza (electronic component)	Coding	MAKING Smart Traffic Light Products	Products that are ready to launch	Department of Transportation
Sukabumi Stores (others electronic component)	Data communication		Road Users	
Telkom network	Internet			



Picture 4. Project Title: Critical Path „BUILD THE SMART TRAFFIC LIGHT LAB“

Grouping	active	Code	Predecessor	a	m	b
	Planing for size location	A	-	1	2	3
	Sketch the lab	B	A	1	1	2
	Find the handyman	C	-	2	3	4
Processing	Buy the basic material	D	C	1	2	4
Construction	Build the research room	E	D, B	6	7	9
Finishing	Checking and detailing	F	E	0	0	2



Picture 5. Critical Path: CDEF

**5. Estimated completion within a period of 60,19 days rounded to 62 days.**

CPM provides the following benefits:

1. Provide a graphical display of the flow of activities of a project,
2. Predict the time needed to complete a project,
3. Shows which activities flow is important to be considered in maintaining the project completion schedule.
4. Picture. Trend Analysis 'demand for smart traffic light products'

By looking at the increasing trend, the company is increasingly convinced that more efficient laboratory construction can fulfill demand in the future. With the availability of sufficient land to store materials, the company is optimistic that the company can penetrate the market of all city traffic jams in Indonesia, not just three trial cities like the current contract.

**6. Inventory Management**

The problem that faces right now is the Inventory Management system (Atnafu & Balda, 2018), as of now this business adopts the Fixed-order quantity model in ordering or stocking the raw materials for the products. One of the reasons why needs to keep a supply of inventory is to take advantage of economic purchasing order size, and the decisions need to be taken by considering the carrying costs, ordering costs, and shortage costs. There are several things to be considered on deciding the reorder point (when to order), and the total cost or quantity for the materials (how many to order). The equation that will be used to calculate the total Quantity IS

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

Where D is the Annual Demand, S is the Ordering Cost, and H is the holding cost. However, to calculate the Reorder Point or when is the time to order the materials or stock is  $R = dL$  where d is the Average Daily Demand and L is the Lead Time on ordering the materials. The formula to calculate the annual cost that is needed to be spent in a year for the demand

$$TC = DC + \frac{D}{Q}S + \frac{Q}{2}H$$

Where C is Cost per Unit, and Q is Quantity.

But by this time, when a company has just only operated for several months there are not enough data for the required numbers of data (30 data or a year) to do the calculation on estimating the number of Optimal Order Quantity, the Reorder Point, and also the Annual Total Cost. Therefore, this subject is really important and useful for the sake of the company's journey, in the long run, hence the calculation and estimation can be done after it has enough data to be processed and analyzed.



## 7. Analysis of Employment Additions

The method used: the method of work sampling by L.H.C. Tippett. Determine the normal time & standard time for workers in making goods. Example An engineer can work 80% of the time at a factor rating of 100%. The engineer can roughly make 4 products within 6 months. Provided reserve time for 10% of total work time. Normal working time & standard work time for each product unit

Answer:

$$\begin{aligned} \text{NT} &= (\text{total time}) (\% \text{ works}) (\text{RF}) / \text{product unit} \\ &= 259,200 \text{ minutes} \times 0.80 \times 1.00 / 4 \\ &= 51,840 \text{ minutes} / \text{unit of product (864 hours)} \end{aligned}$$

## 8. Quantity Discount

Note: This calculation is based on estimation (holding cost, considering that the company has not been running for a year) and supplier field data. Based on the demand that was proposed by the Transportation Agency, it is estimated that the company has material requirements of 40 units/year. Message fee of Rp. 500,000 / order. Estimated the save fee is 20% of the material purchase price. The supplier offers a special offer for the procurement of these materials in the form of discounted prices. The conditions are as follows:

➤ >50 pieces = 8,750,000

➤ 10-49 pieces = 9,000,000

1. >50 pieces :c = 8,750,000

$$H = 0,2 \cdot 8,750,000 = 1,750,000$$

$$\text{EOQ} = \sqrt{2 \cdot 40 \cdot 500,000 / 1,750,000} = 4,780$$

$$\text{TC} = 40 \cdot 8,750,000 + 1,750,000 \cdot (4,780 / 2) + 500,000 \cdot (40 / 4,780) = 358,366,600$$

2. 10-49 pieces ;c = 9,000,000

$$H = 0,2 \cdot 9,000,000 = 1,800,000$$

$$\text{EOQ} = \sqrt{2 \cdot 40 \cdot 500,000 / 1,800,000} = 4,714$$

$$\begin{aligned} \text{TC} &= 40 \cdot 9,000,000 + 1,800,000 \cdot (4,714 / 2) + 500,000 \cdot (40 / 4,714) \\ &= 458,522,600 \end{aligned}$$

Conclusion: Based on the above calculation, it is certain that point A will be selected because it has the smallest cost.

## CONCLUSION

The company still needs to develop to compete with the competitors (who are engaged in the same field). This business must meet the needs between effectiveness and price of its customers. Must have a good marketing and operational strategy to gain more customers and keep the business sustained in a disruptive era. The future challenge is very challenging for this business to arrange a new strategy to meet market demand and global change. All the operations management tools are useful for the demand for services in Indonesia.

In addition, customer satisfaction is a priority, therefore will continue to innovate and try to provide the best service to consumers. The presence of a 24-hour hotline to receive customer complaints I feel is one form of responsibility from the company. Building a laboratory seems to be needed shortly given the many demands in the three cities as a preliminary experiment. It is hoped that with good management operations, this business can dominate and be irreplaceable, given the purpose of establishing this company is to be a solution to the bottleneck and effectiveness of the government budget.

## BIBLIOGRAPHY

- Atnafu, Daniel, & Balda, Assefa. (2018). The impact of inventory management practice on firms' competitiveness and organizational performance: Empirical evidence from micro and small enterprises in Ethiopia. *Cogent Business & Management*, 5(1), 1503219.
- Cooper, Donald R., Schindler, Pamela S., & Sun, Jianmin. (2006). *Business research methods* (Vol. 9). McGraw-hill New York.
- Ginting, Rosnani, Ishak, Aulia, Malik, Alfin Fauzi, & Satrio, M. Riski. (2020a). Integration of kansei engineering and quality function deployment (qfd) for product development: a literature review. *IOP Conference Series: Materials Science and Engineering*, 1003(1), 12020. IOP Publishing.
- Ginting, Rosnani, Ishak, Aulia, Malik, Alfin Fauzi, & Satrio, M. Riski. (2020b). Product development with quality function deployment (QFD): a literature review. *IOP Conference Series: Materials Science and Engineering*, 1003(1), 12022. IOP Publishing.
- Greer, Liz, Fraser, Janet L., Hicks, Drennan, Mercer, Mike, & Thompson, Kathy. (2018). *Intelligent transportation systems benefits, costs, and lessons learned: 2018 update report*. The United States. Dept. of Transportation. It's Joint Program Office.
- Krajewski, Lee J., Malhotra, Manoj, Malhotra, Naresh, Ritzman, Larry, & Krajewski, Lee. (2015). *Operations management*. Pearson Education, Limited.
- Le, Duc Nha, Le Tuan, Loc, & Tuan, Minh Nguyen Dang. (2019). Smart-building management system: An Internet-of-Things (IoT) application business model in Vietnam. *Technological Forecasting and Social Change*, 141, 22–35.
- Luturlean, Bachruddin Saleh, & SE, M. M. (2019). *Strategi Bisnis Pariwisata*. Humaniora.
- Papa, Enrica, & Lauwers, Dirk. (2015). Smart mobility: Opportunity or threat to innovate places and cities. *20th International Conference on Urban Planning and Regional Development in the Information Society (REAL CORP 2015)*, 543–550.
- Perera, Srinath, Ingirige, Bingunath, Ruikar, Kirti, & Obonyo, Esther. (2017). *Advances in Construction ICT and e-Business*. Routledge, Taylor & Francis Group.
- Raza, Khalid, Patle, V. K., & Arya, Sandeep. (2012). A review on green computing for eco-friendly and sustainable it. *Journal of Computational Intelligence and Electronic Systems*, 1(1), 3–16.
- Saleh, Lalu Muhammad. (2018). *Man Behind The Scene Aviation Safety*. Deepublish.
- Stergiou, Christos, & Psannis, Kostas E. (2017). Recent advances delivered by Mobile Cloud Computing and Internet of Things for Big Data applications: a survey. *International Journal of Network Management*, 27(3), e1930.
- Wallemacq, Pascaline, Below, Regina, & McClean, Denis. (2018). *Economic losses, poverty & disasters: 1998-2017*. United Nations Office for Disaster Risk Reduction.
- Widodo, Kuncoro Harto, Parikesit, Danang, Dewanti, M., Basalim, Said, Purwoto, Hengki, Nugroho, Deni Prasetio, & Perdana, Yandra Rahadian. (2020). *Logistik Perkotaan di Indonesia*. UGM PRESS.