

# The Effect of Corona's Impact on the Community's Economy In The Automotive Marketing Sector Using FIS

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## **Abstract**

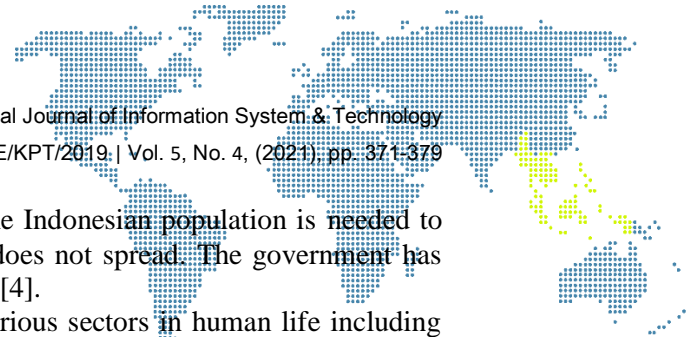
*Corona is very influential on the economy in Indonesia, especially in the marketing of Automotive Goods. At present, there is a very significant decline in turnover. This resulted in sluggish market prices and a lack of consumer interest in shopping due to declining economic conditions. The problem that occurs is the lack of marketing of goods, especially in the automotive sector. The purpose of this research is to study how to improve the marketing of goods in the automotive sector so that the economy can increase as much as possible. The research method used is descriptive qualitative method. In addition, the Mamdani method uses the AND operator to obtain an inference engine. The Mamdani method has four stages, namely Demand, Supply and Purchase and the output obtained is Income Value. using secondary data sources from research results, references and online news related to research. The results of this study obtained 3 inputs, namely, requests, offers and purchases, the final result obtained was a decision-making system in the form of smooth or not automatic marketing based on the data to be processed. inputs.*

**Keywords:** Corona Impact, Marketing, Mamdani Method, Quantitative Method, FIS.

## **1. Introduction**

The Corona virus developed initially in the Wuhan area which occurred on December 30, 2019 where the city issued a statement regarding the urgent notification of the treatment related to the Corona virus. The process of moving the Corona Virus is very fast so that there are 188 countries affected by this virus outbreak. The spread of this virus has spread throughout the world so that it has an impact on the economic decline in Indonesia, including in the fields of trade, tourism investment, aviation, shipping and other fields [1]. China is a country that sends the largest export goods in the world. The activities of sending goods both from within the country and abroad are carried out by the Chinese state, one of which is Indonesia. China is also the largest trading partner country owned by the Indonesian state. When the Corona 19 Virus first appeared, it had a very bad impact on the whole world, especially Indonesia. The impact of the Corona Virus is like falling prices. In addition, the impact of the Corona virus disrupted the process of the import and export sectors, hampered various sectors resulting in a very drastic decrease in tax returns [2].

Every electronic news broadcast explains that the Corona virus has increased in the number of cases that occur in a short time and requires a quick handler. or quarantine. According to the Law of the Republic of Indonesia Number 6 of 2018 Quarantine according to the Law of the Republic of Indonesia Number 6 of 2018 concerning Health Quarantine is the restriction of activities and/or separation of a person exposed to an infectious disease as stipulated in the legislation even though he has not shown any symptoms to prevent the possibility of spreading to the people around him. In addition, the government recommends that Indonesian residents travel back and forth on Eid al-Fitr to reduce the spread of the corona virus by determining access to flights and carrying out security by the authorities at the boundaries of the homecoming travel area [3]. To

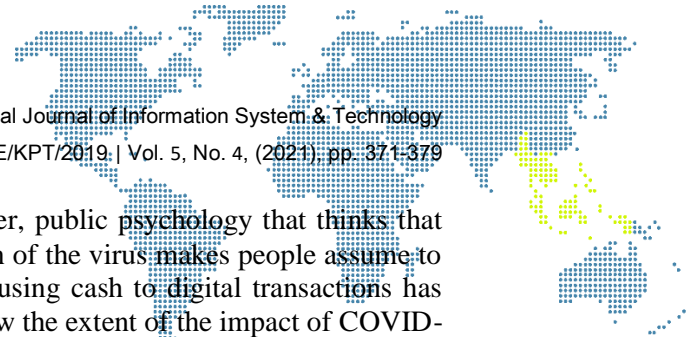


improve the economy in Indonesia, awareness of the Indonesian population is needed to maintain health protocols so that the corona virus does not spread. The government has issued a circular No. H.K.02.01/MENKES/202/2020[4].

The impact of the Corona 19 Virus occurs in various sectors in human life including the tourism sector, the tourism sector can be said to be the largest sector in donating visas to Indonesia, the tourism sector has experienced a very drastic decline affected by the corona virus [5]. The Covid-19 pandemic has resulted in various problems in everyday human life, one of which is having a negative impact on the economy in the tourism and MSME sectors, one of which is the affected village, namely Bongkasa Pertiwi Village [6]. According to Ni Ketut Elly Sutrisni's research, Covid-19 has caused an economic shock, affecting the economy of individuals, households, micro, small, medium and large companies, and even affecting the country's economy with local, national, and even global scope.

According to the results of the presentation [7]. get what they need and want by creating, offering, and freely exchanging products and services of value with other parties, for a managerial definition, marketing is often described as the art of selling products. Kotler (2007:10), Consumer Behavior Gerald Zaltman and Melanie Wallendorf describe in Mangkunegara (2002: 3) that: "Consumer behavior is the actions, processes, and social relationships that individuals, groups, and organizations carry out in obtaining, using a product. products or other, services, and other resources". Marketing (marketing mix) is an activity in marketing that is carried out in an integrated manner. This means that this activity is carried out simultaneously between the elements in the marketing mix itself without any support from other elements. The elements in the marketing mix consist of product (product), price (price), location (place), promotion (promotion), so that each element requires a separate strategy. However, these elements will still be related to strategies for other elements, such as (Kasmir, 2014: 186): 1). product strategy; 2). Pricing strategy; 3). Location strategy and lay out; 4). Promotion strategy[8].

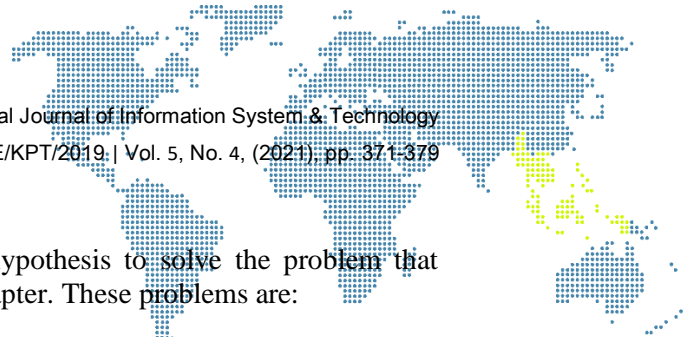
Entrepreneurs believe that COVID-19 has had a major negative impact on the Indonesian economy. The reason is that COVID-19 has disrupted the industrial production chain so that business turnover is not smooth, while the obligations of entrepreneurs must continue to run. As a result, many employees were forced to lose their jobs due to layoffs. The value of the rupiah continued to weaken sharply, while the stock market was inflamed as the composite price index (JCI) was corrected deeply. This further reinforces that the Indonesian economy will continue to slow down. Several efforts continue to be made by the government to deal with the spread of the COVID-19 virus, including implementing Large-Scale Social Restrictions (PSBB) in stages in areas that are indicated to accelerate the spread of the Covid-19 virus. The implementation of PSBB at least has a significant impact on community activities. The PSBB continues, but the necessities of life during the PSBB period must always be met. Therefore, many people end up using e-commerce to shop for various needs. The use of e-commerce also implements the government's call to limit the use of cash or paper. A number of supermarkets or supermarkets are also currently providing digital services. In addition, Bank Indonesia has also closed services that involve social interaction. Temporarily closed transactions, namely, cash payment system services, which include: mobile cash services both in cities and 3T regions (underdeveloped, frontier, and outermost) throughout Indonesia, damaged currency exchange services and clarification of counterfeit money by the public and banks. Not only Bank Indonesia, PLN is also trying to prevent the spread of COVID-19, one of which is by appealing to the public to make online payments to minimize physical contact between customers and officers. So that electricity payments can be made anywhere without having to go to the PLN office, one of which is through a digital wallet application (E-Wallet). The use of e-wallet is indeed very easy for people to make transactions, especially to limit the use of cash or paper. Although there has been no official notification, including from the World Health Organization (WHO) that cash can



be a vector for transmission of COVID-19. However, public psychology that thinks that cash is not clean can be a bridge for the transmission of the virus makes people assume to switch to digital payments. The shift of society in using cash to digital transactions has recently become interesting to study, in order to know the extent of the impact of COVID-19 on consumer behavior in the use of mobile payment services, one of which is e-wallet. Mobile payment services are indeed increasingly popular along with the increasing use of smartphones by up to 70% in the last five years in Indonesia. Moreover, there are more choices of cardless e-wallet applications for transactions. Based on data from Bank Indonesia, 38 e-wallets have been officially licensed. In 2018, e-wallet transactions in Indonesia reached USD 1.5 billion and are predicted to continue to increase [9].

Research results [10] Micro, small and medium enterprises (MSMEs) that are vulnerable in dealing with COVID-19 will experience a greater decline in income than the corporate segment. The magnitude of the risk of bankruptcy in micro-enterprises has made the micro-business segment suffer the biggest impact of the decline in revenue due to the impact of this covid-19 related to the supply and demand side as well as movement restrictions. The Financial Services Authority (OJK) responded to this by providing relaxation to banks so that they could carry out restructuring, namely providing delays for payment of principal and interest or reducing interest rates that could be felt directly by the public. The government implements four ways, namely, the interest subsidy program for ultra micro and micro, small and medium enterprises (MSMEs), a fund placement program to ensure banking liquidity to be channeled to the real sector, a working capital loan guarantee program for MSMEs, and a capital granting program. work for cooperatives, especially in the labor-intensive sector. The development of the industrial sector is directed at increasing the progress and independence of the national economy as well as the welfare of the people, strengthening the national economic structure and encouraging regional development as well as equitable distribution of development results. In this paper, it is directed at the small industrial sector in Kerek District, Tuban Regency, especially in the Gedog batik industry where the small industry plays a very important role in the community around Kerek District, Tuban Regency, namely between sources of regional income and employment.

According to the Coordinating Minister for Economic Affairs, Airlangga Hartarto, Indonesia's economic growth rate can be influenced by China's economic growth. If the Chinese economy slows down by 1-2%, it will have an impact on the Indonesian economy declining by 0.1-0.3% on the Indonesian economy (katadata.co.id, 7 February 2020). Restrictions on the entry and exit of goods from and/or to China as well as the number of businesses or factories being closed due to the corona virus outbreak have disrupted the Chinese economy. Considering that China is a country whose economy is very influential in the world, this will certainly have an impact on the economies of other countries that are trading partners, one of them is Indonesia. China is Indonesia's main trading partner and the country of origin for Indonesia's largest non-oil and gas imports and exports. Total exports to China in 2019 reached USD25.85 billion, while imports reached USD44.58 billion (katadata.co.id, February 7, 2020). However, based on data released by BPS, non-oil and gas exports in January 2020 decreased compared to December 2019. This decline occurred in most of the main destination countries, one of which was China which reached USD211.9 million or decreased by 9.15%. Meanwhile, the value of non-oil and gas imports in January 2020 also declined. The total value of non-oil and gas imports during January 2020 was USD9,670 million, a decrease of USD313.5 million or a decrease of 3.14% compared to December 2019. This was due to the decline in the value of non-oil and gas imports from several major countries, one of which was China from USD4.07 billion. to USD3.94 billion, down 3.08% [11].



## 2. Research Methodology

From initial observations in come up with a hypothesis to solve the problem that needs to be solved as outlined in the introductory chapter. These problems are:

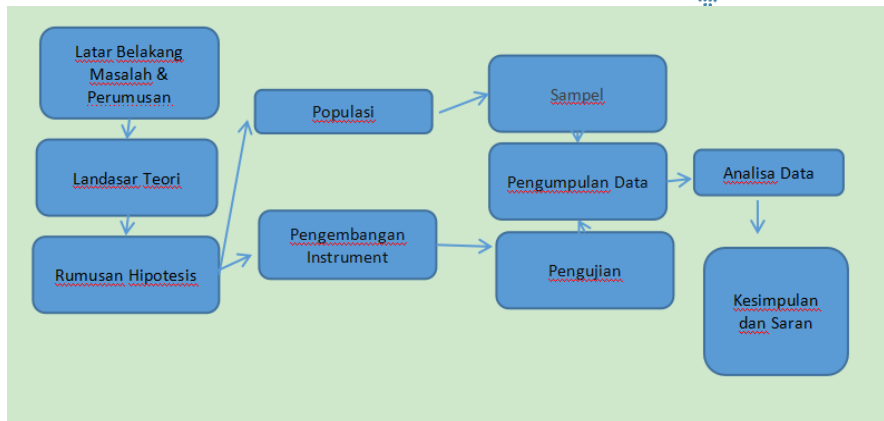


Figure 1. Framework

As with conventional sets, there are several operations that are specifically defined for combining and modifying fuzzy sets. The membership value as a result of the operation of 2 sets is often known as fire strength or  $\alpha$ -predicate [12]. There are 3 operators created by Zadeh, namely :

a) AND operator

This operator is related to the intersection operation on the set.  $\alpha$ -predicate as the result of operation with AND operator is obtained by taking the smallest membership value between elements in the sets concerned.

$$A \cap B = \min(\mu_A[x], B[y]) \quad (1)$$

b) Operator OR

This operator is related to the union operation on the set.  $\alpha$ -predicate as the result of the operation with the OR operator is obtained by taking the largest membership value between elements in the sets in question.

$$A \cup B = \max(\mu_A[x], B[y]) \quad (2)$$

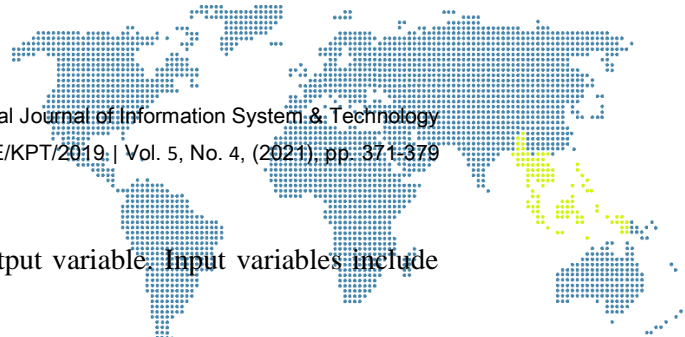
c) NOT operator

This operator is related to the set complement operation. The formula is:

$$A' = 1 - \mu_A[x] \quad (3)$$

Increased when testing the Mamdani fuzzy control method which gave counterintuitive results when applied to fuzzy modeling for linguistic expressions such as “small, very large”, etc. Later, it has even been proven that Mamdani's method in this case cannot work in principle. Fuzzy / linguistic model from the beginning was developed using formal logic. However, the original formulation based on the predicate version of, so called, fuzzy logic with the evaluated syntax turned out to be untidly satisfactory. The new formulation that uses a high-level mathematical fuzzy logic language is much more appropriate and transparent [13]. The set is a collection or collection of objects that have certain properties in common. The fuzzy set is a further development of the concept of sets in mathematics. The fuzzy set is a range of values, each value has a membership degree between 0 to [14]. In the crisp set, the membership value of an item x in a set A, which is often written as  $A[x]$  has two possibilities, namely [15]:

1. One (1), which means that an item is a member of a set.
2. Zero (0) which means that an item is not a member of a set



### 3. Results and Discussion

This research has three input variables and 1 output variable. Input variables include Demand, Supply, Purchase. Can be seen below:

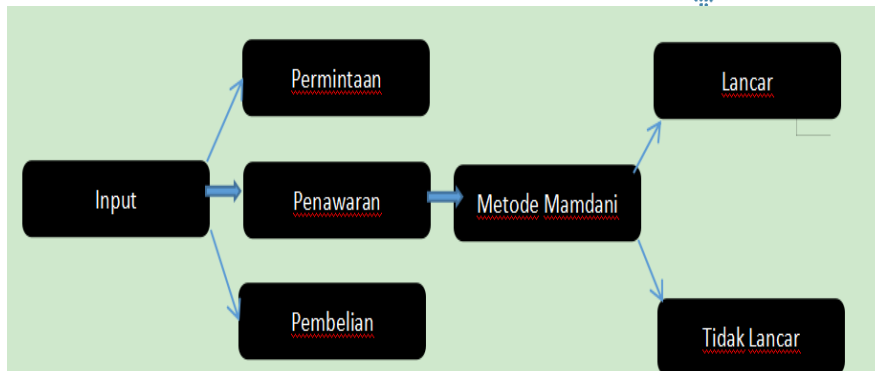


Figure 2. Fuzzy Variable Flow

Table 1. Fuzzy set

Fungsi	Variable	Universe of Conversation
Input	Request	0 - 800
	Offer	0 - 120
	Purchase	0 - 2500
Output	Decision	[0 1000]

Table 2. Fuzzy set domain

Variable	Set Fuzzy	Domain
Request	A little	[0 40 50]
	Currently	[45 55 65]
	Lots	[60 70 80]
Offer	Low	[0 4 6]
	Currently	[5 7 9]
	Tall	[8 10 12]
Purchase	A little	[0 150 175]
	Currently	[162 187 212]
	Lots	[200 225 250]
Decision	Not smooth	[0 25 50]
	Fluent	[50 75 100]

After determining the variables to be used, the next step is to determine a linear equation with each fuzzy variable used Fluent.

a) Request variable membership degree function

The descending linear membership degree function is used to represent the Slight fuzzy set and the ascending linear membership degree function for the Medium fuzzy set. The triangular membership degree function is used to represent high fuzzy sets. The form of representation.

$$\mu_{\text{Lots}} [x] = \begin{cases} 1 & ; \quad x \leq 40 \\ \frac{50-x}{50-40} & ; \quad 40 \leq x \leq 50 \\ 0 & ; \quad x \geq 50 \end{cases}$$

$$\mu_{\text{Currently}} [x] = \begin{cases} 0 & ; \quad x \leq 45 \text{ atau } \geq 65 \\ \frac{x-45}{55-45} & ; \quad 45 \leq x \leq 55 \\ \frac{65-x}{65-55} & ; \quad 55 \leq x \leq 65 \end{cases}$$



$$\mu \text{ A little } [x] = \begin{cases} 0 & ; & x \leq 60 \\ \frac{x-60}{70-60} & ; & 60 \leq x \leq 70 \\ 1 & ; & 70 \leq x \leq 80 \end{cases}$$

b) Offer variable membership degree function

The descending linear membership degree function is used to represent the low fuzzy set and the ascending linear membership degree function for the Medium fuzzy set. The triangular membership degree function is used to represent the High fuzzy set. The form of representation.

$$\mu \text{ Low}[x] = \begin{cases} 1 & ; & x \leq 4 \\ \frac{6-x}{6-4} & ; & 4 \leq x \leq 6 \\ 0 & ; & x \geq 6 \end{cases}$$

$$\mu \text{ Currently}[x] = \begin{cases} 0 & ; & x \leq 5 \text{ atau } \geq 9 \\ \frac{x-5}{7-5} & ; & 5 \leq x \leq 7 \\ \frac{9-x}{9-7} & ; & 7 \leq x \leq 9 \end{cases}$$

$$\mu \text{ Tall } [x] = \begin{cases} 0 & ; & x \leq 8 \\ \frac{x-8}{10-8} & ; & 8 \leq x \leq 10 \\ 1 & ; & 10 \leq x \leq 12 \end{cases}$$

c) Purchase variable membership degree function

The descending linear membership degree function is used to represent the Slight fuzzy set and the ascending linear membership degree function for the Medium fuzzy set. The triangular membership degree function is used to represent multiple fuzzy sets. The form of representation.

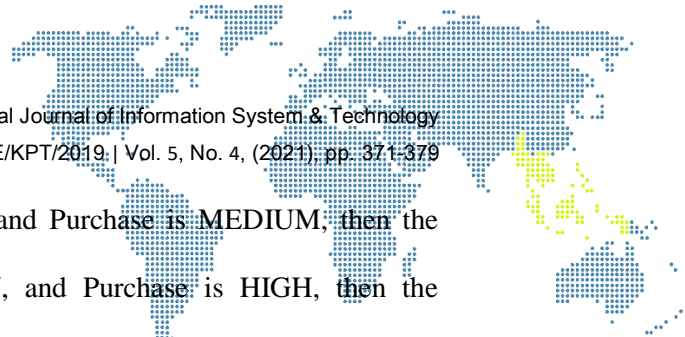
$$\mu \text{ A little } [x] = \begin{cases} 1 & ; & x \leq 150 \\ \frac{175-x}{175-150} & ; & 150 \leq x \leq 175 \\ 0 & ; & x \geq 175 \end{cases}$$

$$\mu \text{ Currently } [x] = \begin{cases} 0 & ; & x \leq 162 \text{ atau } \geq 212 \\ \frac{x-162}{175-162} & ; & 162 \leq x \leq 175 \\ \frac{212-x}{212-175} & ; & 175 \leq x \leq 212 \end{cases}$$

$$\mu \text{ Lots}[x] = \begin{cases} 0 & ; & x \leq 200 \\ \frac{x-200}{225-200} & ; & 200 \leq x \leq 225 \\ 1 & ; & 225 \leq x \leq 250 \end{cases}$$

d) Inference Machine

- 1) If the demand is LOTS, and the supply is HIGH, and the purchases are LOTS, then the result is CURRENT
- 2) If Demand is MEDIUM, and Supply is HIGH, and Purchases are MANY, then the Result is CURRENT
- 3) If the demand is LITTLE, and the supply is HIGH, and the purchase is LOTS, then the result is CURRENT
- 4) If there is a lot of demand, and medium supply, and a lot of purchases, then the result is CURRENT
- 5) If Demand is LITTLE, and Supply is LOW, and Purchase is A LOT, then the Result is CURRENT
- 6) If Demand is HIGH, and Supply is HIGH, and Purchase is MEDIUM, then the result is CURRENT
- 7) If the demand is LOTS, and the supply is HIGH, and the purchases are SMALL, then the result is CURRENT
- 8) If Demand is LITTLE, and Supply is LOW, and Purchase is LOTS, then the result is NOT CURRENT



- 9) If Demand is LITTLE, and Supply is LOW, and Purchase is MEDIUM, then the result is NOT CURRENT
- 10) If Demand is LITTLE, and Supply is LOW, and Purchase is HIGH, then the Decision Result is NOT CURRENT
- 11) If Demand is LITTLE, and Supply is MEDIUM, and Purchase is LITTLE, then the result is NOT CURRENT
- 12) If Demand is LITTLE, and Supply is HIGH, and Purchase is MEDIUM, then the result is NOT CURRENT
- 13) If Demand is LITTLE, and Supply is HIGH, and Purchase is LITTLE, then Decision Result is NOT CURRENT

e) Defuzification

Defuzification is the last step in the Mamdani method. To obtain the results of defuzification, a search for the value of x is carried out. The search process is:

- 1) If it is known that the Variable Demand value x Demand is 65, Supply value x 28 and Purchase value x 215, then the search results can be seen below:

$$\begin{aligned} \mu_{A \text{ little}} [65] &= (c-x)/(c-b) \\ &= (65-62)/(65-45) \\ &= 3/20 \\ &= 0,15 \end{aligned}$$

$$\begin{aligned} \mu_{\text{Currently}} [65] &= (x-a)/(b-a) \\ &= (70-65)/(70-60) \\ &= 5/10 \\ &= 0,5 \end{aligned}$$

$$\mu_{\text{Lots}} [65] = 0$$

- 2) If it is known that the supply variable has a value of x demand for 65, supply has a value of x 28 and a purchase has a value of x 215, then the search results can be seen below:

$$\begin{aligned} \mu_{\text{Many}} [8] &= (c-x)/(c-b) \\ &= (9-8)/(9-7) \\ &= 1/2 \\ &= 0,5 \end{aligned}$$

$$\begin{aligned} \mu_{\text{Currently}} [8] &= (x-a)/(b-a) \\ &= (10-8)/(10-8) \\ &= 2/2 \\ &= 1 \end{aligned}$$

$$\mu_{\text{Low}} [8] = 0$$

- 3) If it is known that the Purchase Variable with the value of x Demand is 65, the Offer value is x 28 and the Purchase value is x 215, then the search results can be seen below:

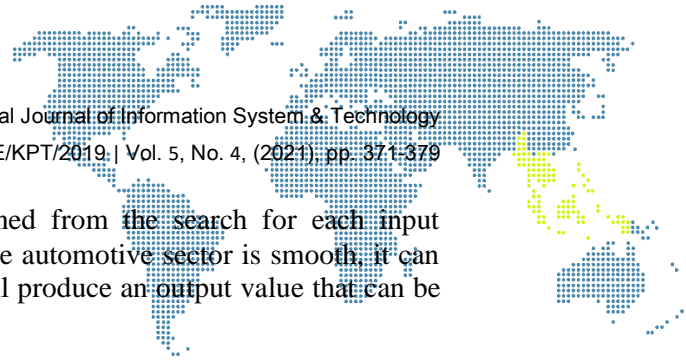
$$\begin{aligned} \mu_{A \text{ little}} [65] &= (c-x)/(c-b) \\ &= 0 \end{aligned}$$

$$\begin{aligned} \mu_{\text{Currently}} [65] &= (x-a)/(b-a) \\ &= (215-200)/(225-200) \\ &= 15/25 \\ &= 0,6 \end{aligned}$$

$$\mu_{\text{Lots}} [65] = 0$$

Results Overall search value X

- a. Medium Demand Variable = (0.5), Many(0.15)
- b. Medium Supply Variable = (1), High (0.5)
- c. Multiple Purchase Variable = (0.5)



From the search above, each  $x$  value is obtained from the search for each input variable. To find out whether or not marketing in the automotive sector is smooth, it can be entered into a triangle formula, processed and will produce an output value that can be used as a decision-making system.

#### 4. Conclusion

Based on the results of the completion of the case of the spread of the impact of Corona, it can be concluded that:

- a) Due to the Corona Virus, the marketing of automotive goods has decreased, it can be seen from the lack of demand, supply and purchase.
- b) Mamdani's fuzzy logic can be used as a decision-making system by setting input variables consisting of requests, offers and purchases. To find out the output results, just enter the  $X$  value based on the fuzzy set that has been obtained.
- c) In order to get better results, the Mamdani method can be developed into other methods to obtain maximum results.

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