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A R T I C L E I N F O

A B S T R A C T

In the second quarter of 2019, smartphone shipments in Indonesia reached the highest figure in history, which was 9.7 million units according to a market research Indonesia Digital Conference (IDC). The smartphone competition in Indonesia continues to increase drastically in 2018. Samsung survived on the top position with a market share of 25.4% followed by Xiaomi 20.5%, Oppo 19.5% and Vivo 15.9%. The four smartphone brands are the biggest market share smartphone in Indonesia. In this summary, this research will propose market share prediction for each smartphone brand in Surabaya up to 2023 using Markov Chain. This research will identify factors in the selection of smartphone brands. Then we will determine the weight of each factor using Analytical Hierarchy Process (AHP). Finding the right marketing strategy with the expectation that smartphone vendor can maintain and increase the volume of sales of its products so that it can reach the desired market share. The purpose of this research is to be able to provide suggestion for smartphone businesses in Surabaya.

1.   Introduction

The development of information and technology nowadays is so high demand (Ramadhani, Fathurohman and Fardani, 2020). It is able to change lifestyle of a community. Every

single activity which was previously done by conventional system, then has been changed by the digitalism in nowadays. The smartphone is one equipment to make community activity easier and faster than the conventional one. Almost everything can be done using a smartphone such as product marketing, ordering product, paying the bill of the product, and etc.

Smartphone has the same uses and functions as the computer. Smartphone also needs operating system in order to be able work as it is. As we know, OS Android is the famous operating system for smartphone. In Indonesia, Android smartphone market is increasing from time to time. In fourth quarter of 2018, Canalys research center reported that smartphone delivery to Indonesia reach 9.5 million units, which has shown 8,6% increment than the previous year. The total demand is 38 million units at the end of 2018. This is a new record due to a 17.1% increment since 2017 (Canalys, 2019).

The Covid-19 pandemic has forced so many organizations to undergo significant transformation, rethinking key element of their business processes and use of technology to maintain operations whilst adhering to a changing landscape of guidelines and new procedures (Dwivedi *et al.*, 2020). For example, an alternative information technology such as telemedicine, is integrated with smartphone applications is playing a key role in this Covid-19 pandemic era. Hence, this is a challenge and it must be faced by health care system in delivering patient care.

Figure 1 shows the market share of smartphone brands which has switching from one brand to another brand. The competition in smartphone industries is to keep the consumers from changing to another smartphone brand. In other words, brand switching happens. Hence, smartphone brand has each strategies to compete with another. Xiaomi has prefer minimum marketing promotion and little margin profit for the distributor. This strategies has aim to be able to supply its products with prices against competitive specifications to the market. Contradictorily, Oppo, and Vivo have strategy to make strides on the local scene with aggressive marketing campaigns and profitable profit margins for their distributors. In this competitive competition make market threated, directly increasing smartphone's market medium class because of the consumer want to change their smartphone brand.

The smartphone industries has compete each other to be excellent business in their custwasomer. They compete in order to fulfill customers' want and need. In Indonesia, previous research has mentioned that Samsung, Oppo, Xiomi, Vivo, and Advan are some smartphone brands which are high in demand (Natalia, 2019). In 2018, four rank of smartphone brand reach 80% in smartphone market than previous year. The detail data Samsung is in the first rank 25,4% market share, Xiaomi 20,5%, Oppo 19,5%, and Vivo 15,9%. Samsung is the biggest smartphone brand in the world, but is now threaten by the competitors. The main cause is due to smartphone brands from China which has stricken smartphone's market with good feature but still at affordable price. Samsung's consumers have no intention anymore to buy Samsung smartphone because they can get the same feature but in affordable price from another brand, then they are switching brand.
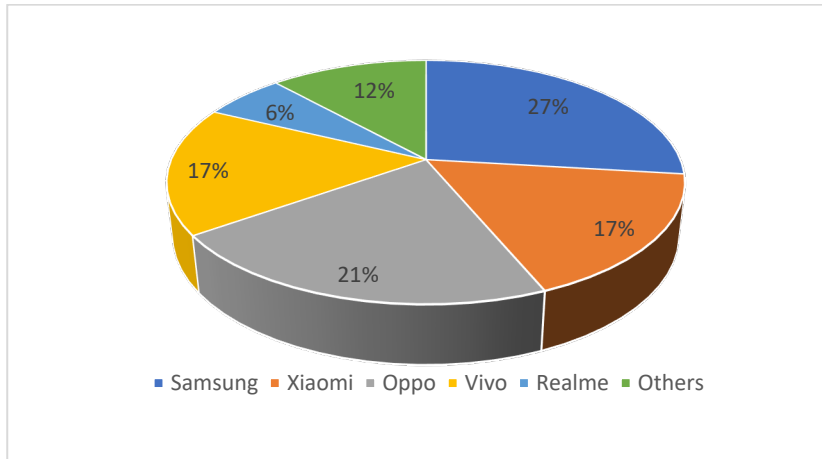
Figure 1 Market Share of Smartphone Brand in 2019 (Ref: Survey IDC 2019)

There are many factors for a customer to choose the smartphone; price, brand, interface and properties are the most influential factors affecting the actual choice between brands (Karjaluoto *et al.*, 2005). Şahin, Kitapçi and Zehir, (2013) conducted a study on the development of a theoretical framework based on previous research to investigate the relationship between switching cost with satisfaction, trust, and commitment to a brand. These three factors have a significant positive effect to switching cost.

Figure 2. Competition of Market share of Smartphone Industries in 2020

Figure 2 shows the decrease in some of smartphone industries market as the effect of Covid-19 pandemic era. Vivo is the first ranked of low-end and midrange market of smartphone. Vivo focuses on marketing strategy, then it wins the market. This phenomena as the brand switching of smartphone is a problem. This problem can be solved by Markov Chain Method. Markov Chain Method is used to predict the brand switching of smartphone among Samsung, Xiaomi, Oppo, and Vivo. Based on research (Bairagi and Kakaty, 2016), which used Markov Chain to explain brand loyalty of consumers towards the different brands of beverages. Then, the homogeneous Markov Chain model is used to explain the brand loyalty and to find out the long-term probabilities of market share of these brands. Markov Chain Method/model will show the long-term forecast brand dominate the future market share.

In this previous research also used Game Theory in order to know the proper marketing strategy for Samsung brand. It purposed that Samsung brand will survive and enhance the sales of volume to face the new normal era. Based on research of (Yuni, Rusdiana and Isnardi, 2018), which used Game Theory to determine marketing strategy coffee café in Banda Aceh, the result showed that to get optimum profit then marketing strategy has to consider product, location, and infrastructure. Another research (Anggraini, Mujib and Putra, 2017), use fuzzy logic in game theory to determine marketing strategy of Alfamart and Indomaret. The result of research showed the important attribute to be have is the comfort for people who buy the product. The two researches above show that game theory method is powerful to determine the proper strategy to against the competition of market.

The implementation of Markov Chain based data mining model could be used to predict customer's lifetime value. The customer lifetime described in to the current and future customer of a brand, which include an estimation of lifetime length, future purchasing behaviour and the profit associated with each behaviour of the customer (Cheng *et al.*, 2012). Markov Chain could be developed into four models which include a homogeneous Markov model, a time-varying Markov model, a new extended time-varying Markov model and a novel Markov model. Researcher need to be more understanding about industries, market conditions, and trends, then identify appropriate assumptions and implement the most suitable mode (Chan, 2015).

In this research, several assumptions has been made such as there is no change with the policy, the respondent are user of the smartphone Samsung, Xiaomi, Oppo, and Vivo, the respondent was fulfilled the questionnaire with their understanding and deep knowledge in using the smartphone Samsung, Xiaomi, Oppo, and Vivo brands. This research was also based on consumer behaviour.

2.   Literature Review

According to Kotler & Keller, (2010), namely the market is a collection of buyers and sellers money transacts a product or group particular product. Marketing is a social process in which individuals and groups get what they need and want by creating, offering and freely exchange products of value with others. Role Today's marketing doesn't just deliver products or services to hands consumers but also how the product or service can provide satisfaction to customers by making a profit. Target of marketing is attracting new customers by promising superior value, setting prices interesting, distribute products easily, promote effectively and retaining existing customers while maintaining the principles satisfaction customer. Marketing management is an attempt to plan, implement (which consists of organizing activities, directing, coordinating) as well as supervising or controlling marketing activities in an organization in order to achieve organizational goals efficiently and effectively. In In the marketing management function, there is an analysis activity, namely analysis carried out to find out the market and its marketing

environment, so that$_{ii}$can be obtained how big the opportunity to seize the market and how big$_{ii}$threats to be faced.

Marketing management is a process$_{ii}$planning and execution of thinking, pricing, promotion and$_{ii}$channeling ideas, goods and services to create exchanges that$_{ii}$meet individual and organizational goals (Laksana, 2008).

Brand

A brand is$_{ii}$a name, term, symbol, design, or a combination of the four, which identifies$_{ii}$sellers' products and differentiate them from competitors' products. So that$_{ii}$The real brand problem cannot be separated from product diversity, quality, design, product, shape$_{ii}$products, packaging, sizes and services owned by companies that$_{ii}$need to have a certain brand to be able to distinguish it from other products. Furthermore, the brand is actually a seller's promise directly$_{ii}$consistently provide certain features, benefits, and services to customers$_{ii}$buyers / consumers.

By setting clear brand of each product produced for different quality, design$_{ii}$different, and different forms with different brands, will$_{iii}$determine their respective positions in the market and at the same time will determine the$_{ii}$also the level of loyalty to the brand from different consumers$_{ii}$also.
Through a brand that$_{ii}$known and introduced to the desired product, then consumers will not$_{ii}$difficult to get the product in any distribution network that$_{ii}$owned by the company (Angipora, 2002).

Conditions for choosing a brand (Brand)
However$_{ii}$The brand that has been chosen has an influence on the smooth sales of$_{ii}$products produced so that each company should be able to choose$_{ii}$and clearly define brands that can make an impression$_{ii}$positive.

One thing that $_i$it is most important to note that the brand owned must be protected for$_{ii}$used exclusively by the owner whenever and wherever, where$_{ii}$determined to have a certain meaning that can be conveyed to the$_{ii}$consumer.

Importance of Brand (Brand)
For companies listing the brand on each product produced will have a function and$_{ii}$uses include:
    a. To make it easier for consumers$_{ii}$in identifying products or services that are able to meet

       needsand desire.

    b. Brands can help too$_{ii}$make buyers more confident and believe in getting quality$_{ii}$the same

       product if they repurchase.

    c. Brand indirectly helps companies control the market, because buyers are basically

       buyers$_{ii}$or consumers do not want to be compared by one product with another

       product$_{ii}$another.

    d. Reduce price comparison$_{ii}$of two kinds of goods with different brands.'

Brand Policy and Strategy

Basically every companies / manufacturers have a number of policies and strategies in choosing and determine the brand of each product, namely:
a. Using your own brand determined by the company

b. Sell products with using the brands of its brokers (distributors and large customers) who will

buy and resell the resulting product.

Factors Influencing Smartphone Selection

1. Innovation Service (Innovative Services)

   Definition of service quality is centered on efforts to meet the needs and consumer desires as well as the accuracy of delivery to balance consumer expectations. Kotler (2012) defines service quality as any activity or benefit offered by a party to other party and is essentially intangible, and does not produce possession of something. Parasuraman et al., (1988) defined service quality as a reflection of consumers' evaluative perceptions of services received at a certain time. Based on From some of the definitions of service quality above, it can be seen that: There are two main factors that at the same time affect the quality service, namely the expected service (expected service) consumers and services received or perceived (perceived service) by consumers or perceived outcomes.

2. Multimedia

   In smartphone products, the multimedia context is manifested in various forms such as image quality, sound, graphics in smartphones. Quality multimedia in a smartphone is determined by the ability camera to record data properly. Great camera capabilities is in the smartphone to record a moment well will complete the perfection of a smartphone.

3. Product Design

   Product design as a management tool for translating results research and development activities carried out before into a real design that will be produced and sold by making a profit. One of the most important management functions in all organizations is to ensure that inputs various organizational resources produce products or services that are properly designed or produce outputs that can satisfy customer desires. For produce outputs that are appropriate and in accordance with the customer desires, it is necessary to have a product design.

4. Brand (Product Branding)

   Kotler and Keller (2010) defines a brand as a name, term, sign, symbol or designs or a combination of them intended to identify the goods or services of one seller or group of sellers and to differentiate them from competitors' goods or services. Definition brand according to Trademark Law no. 15 of 2001 is a sign in the form of pictures, names, words, letters, color schemes, or combinations of these elements which have the distinguishing power and used in trading goods or services. Based on some of the definitions of the brand above, it can be concluded that: A brand is a set of identities that distinguish one product with other products which in turn signal to consumers about the source of the product, and protect consumers and producers from competitors who are trying to deliver identical looking products.

5. External Influence (Outside Influence)

Many factors influence consumer choice of a productᵢᵢ*smartphone*. Karjaluoto, et al., (2005) in their research resulted inᵢᵢthat the external factors that influence consumers on the purchaseᵢᵢsmartphone products, among others, are salesperson recommendations, recommendations forᵢᵢfriends and recommendations from company employeesᵢᵢconcerned.

6. Price (Value for Money)

Stanton (2012) definesᵢᵢprice as the amount of money needed to obtainᵢᵢa number ofᵢᵢcombination of a product and the accompanying service. Kotler (2010) defines price as the amount of money thatᵢᵢcharged to obtain a product or service. Based on several definitions of the price, it can be concluded that the price ofᵢᵢis the compensation that must be burned by the individual to be able to consumeᵢᵢa product or service. Price is the only element of the marketing mix that generates revenueᵢᵢor revenue for the company. Price is an element of the marketing mix that is flexible, ᵢᵢmeaning can be changedᵢᵢquickly. Consumers will usually choose or buy products at competitive or low prices.

7. Reliability (Reliability)

Reliability is the level of constraint of a product or the consistency of the reliability of a productᵢᵢin its operational processes in the eyes of consumers (Kotler, 2010). Reliability aᵢᵢproduct is also a measure of the likelihood that a product will notᵢᵢbroken or failedᵢᵢin a certain period of time. A productᵢᵢis said to have high reliability when it can attract the trust of consumers regarding the quality of reliabilityᵢᵢa product. Dimensions of performance and reliabilityᵢᵢAt first glance they are almost the same but have clear differences. Reliability shows the probability of the product runningᵢᵢfunction. Based on this, it can be concluded thatᵢᵢreliability relates to the probability or probability of aᵢᵢgoods perform their functions successfully within a period of timeᵢᵢcertain . Thus reliability is a characteristicᵢᵢwhich reflects the probability or probability of the level of success in the use of the goods.

Markov Chain Method

Markov chainᵢᵢis a mathematical technique commonly used to makeᵢᵢmodels of various systems and business processes. This technique can be usedᵢᵢto predict future changes inᵢᵢdynamic variables on the basis of changes in the variablesᵢᵢdynamic in the past. This technique can also analyze events in theᵢᵢfuture mathematically.
Chain modelᵢᵢMarkov chain was developed by a Russian expert AA Markov in 1906. The initial application of Markov chains was in the physical sciences andᵢᵢmeteorology. This technique was first used to analyze and predict the behavior of gas particles in a closed container and predict weather conditions.

As aᵢᵢoperations research tools in managerial decision making, chainᵢᵢMarkov has been widely applied to analyze brand switching in marketing, account calculations, car rental services, sales planning, problemsᵢᵢinventory, machine maintenance, queues, stock market price changesᵢᵢand hospital administration. (Operational Research, Enny Ariyani, 2010).

3. **Method**

a. **Data Collection**

The data collected in this study is primary data obtained from respondents' answers through a questionnaire distributed through Google form.

b.   Questionnaire Instrument

1.   Preparation of questionnaire

In this study, the data collection tool used was a questionnaire. The questionnaire (can be seen in Appendix I) which is composed of several parts, namely:

Questionnaire 1 contains questions about identity, segmentation, and switching of smartphone brands used by respondents.

Questionnaire 2 contains an assessment of smartphone brands based on strategic attributes.

Questionnaire 3 contains the importance or not of an attribute as a smartphone purchase preference. Here the respondents are asked to provide an assessment of the importance of the influential attributes.

2.   Distribution of questionnaire

The distribution of the research questionnaire used the random sampling method, which is distributed randomly using the Google form via the link https://bit.ly/Preferensimereksmartphone which is distributed using social media for respondents who live in the Surabaya City Area as primary data and direct distribution in several places, including Plaza Marina, World Trade Center (WTC Surabaya) and several stores which sell the smartphone's pulse in the Surabaya area.

Based on data from the population census of the Surabaya area in 2010, the population of reached 2,756,667 people. So, by using the Slovin equation, the minimum sample that must be taken is 400 respondents.

Initial Questionnaire

Initial questionnaires were distributed by distributing 30 questionnaires randomly to be used as material for the validity and reliability of the questionnaire. After validity and reliability tests, data attribute questions that were found invalid and reliable were deleted or replaced.

Test of Validity

The validity test of the initial questionnaire was conducted using internal validity, where the criteria used were derived from the test tool itself and each variable of each strategy was correlated with the total value obtained from the product moment r coefficient. With a confident level of 5%, and N = 30, then the value of r table is 0.349. From the results of the validity test above, it can be concluded that all the variables used are valid, because the result from formula r > r table. Namely by comparing the correlation numbers of all variable items, with the r value from the product moment table.

Test of Reliability

The initial questionnaire reliability test was conducted on 30 questionnaires. The reliability test was conducted to determine whether the data collection instrument used was reliable because it was

able to show relatively the same results when used again in similar research. The way to find reliability for all items is to correct the correlation numbers obtained. In this study the calculations were carried out with the help of SPSS 16.0 software (can be seen in the attachment). From these results it can be seen that Cronbach's alpha is 0.759 > 6, so the questionnaire is said to be reliable. Because all the attributes of the questionnaire are valid and reliable, all attributes can be used for further distributing questionnaires.

4.   Results and Discussion

Markov Chain

The calculation using the Markov Chain Method consists of 3 steps, namely compiling a transition probability matrix, calculating the possibility of market share in the future period, and finally determining equilibrium conditions or stable market conditions.

Creating the transition probability matrix

The transition probability matrix is prepared based on data on brand switching obtained from the questionnaire data section 1. From this data, data can be compiled in the form of a table describing the brand switching behavior carried out by 410 respondents for 4 other smartphone brands and brands, namely as follows:

Table 2
The changing of smartphone brand

Brand	First Period	Used to					Change to					Second Period
		Samsung	Xiaomi	Oppo	Vivo	Others	Samsung	Xiaomi	Oppo	Vivo	Others	
Samsung	136	0	7	15	8	6	0	23	26	15	13	93
Xiaomi	63	23	0	15	8	18	7	0	11	10	7	92
Oppo	89	28	11	0	16	15	15	15	0	10	16	103
Vivo	45	15	10	10	0	7	8	8	16	0	4	51
Others	77	13	7	16	4	0	6	18	15	7	0	71
	410											410

Based on table 2 the changing of Smartphone Brands - Acquiring and Switching, consumers who stay on the product of their choice either in the first or second period can be calculated as follows:

Example: Samsung
The number of respondents in the first period = 136
Number of respondents who switched to the Xiaomi brand = 23
The number of respondents who switched to the Oppo brand = 28
Number of respondents who switched to the Vivo brand = 15
Number of respondents who switched to other brands = 13

So that the number of respondents who stay on the product of choice is:
Number of periods 1 - (number of switching to Xiaomi + Number of switching to Oppo - Number of switching to Vivo)
= 136 - (23 + 28 + 15 + 13) = 57

In the same way, results are obtained for other brands:
Xiaomi = 28
Oppo = 33
Vivo = 9
Others = 31

From the calculations above, the results of the calculations can be displayed as follows:

		Initial				
		Samsung	Xiaomi	Oppo	Vivo	Others
next	Samsung	57	7	15	8	6
	Xiaomi	23	28	15	8	18
	Oppo	28	11	33	16	15
	Vivo	15	10	10	9	7
	Others	13	7	16	4	31
		136	63	89	45	77

Table 3:
Calculation of transition probability matrix

Brand	Samsung	Xiaomi	Oppo	Vivo	Others
Samsung	$\frac{57}{136} = 0,419$	$\frac{7}{63} = 0,112$	$\frac{15}{89} = 0,169$	$\frac{8}{45} = 0,178$	$\frac{6}{77} = 0,078$
Xiaomi	$\frac{23}{136} = 0,169$	$\frac{28}{63} = 0,445$	$\frac{15}{89} = 0,169$	$\frac{8}{45} = 0,178$	$\frac{18}{77} = 0,234$
Oppo	$\frac{28}{136} = 0,206$	$\frac{11}{63} = 0,175$	$\frac{33}{89} = 0,371$	$\frac{16}{45} = 0,356$	$\frac{15}{77} = 0,195$
Vivo	$\frac{15}{136} = 0,11$	$\frac{10}{63} = 0,159$	$\frac{10}{89} = 0,112$	$\frac{9}{45} = 0,2$	$\frac{7}{77} = 0,09$
Others	$\frac{13}{136} = 0,095$	$\frac{7}{63} = 0,112$	$\frac{16}{89} = 0,179$	$\frac{4}{45} = 0,089$	$\frac{31}{77} = 0,403$

Then the probability matrix become this:

Brand	Samsung	Xiaomi	Oppo	Vivo	Lainnya
Samsung	0,419	0,112	0,169	0,178	0,078
Xiaomi	0,169	0,445	0,169	0,178	0,234
Oppo	0,206	0,175	0,371	0,356	0,195
Vivo	0,11	0,159	0,112	0,2	0,09
Lainnya	0,095	0,112	0,179	0,089	0,403

2.   Calculating the probability of market share

Data collection and processing began in July 2020, so July 2020 is designated as the first period for calculating market share. The average time interval for purchasing a smartphone by respondents in the Surabaya City area is 6 months (calculation in the attachment) so that market share predictions are displayed for market share prediction data every 6 months. The market share of

each brand in the first period (July 2020) was obtained by dividing the number of respondents for each smartphone brand by the total number of smartphone respondents in the first period (July 2020), the calculation is as follows:

1. Samsung $= \dfrac{136}{410} = 0{,}331$

2. Xiaomi $= \dfrac{63}{410} = 0{,}153$

3. Oppo $= \dfrac{89}{410} = 0{,}217$

4. Vivo $= \dfrac{45}{410} = 0{,}109$

5. Others $= \dfrac{77}{410} = \underline{0{,}187} +$

$$1$$

The calculation of the possible market share for each smartphone brand in the second period can be obtained by multiplying the probability matrix with the market share matrix for the first period as follows:

Brand	Samsung	Xiaomi	Oppo	Vivo	Others		Market share in first period		Market share in second period
Samsung	0,419	0,112	0,169	0,178	0,078	X	0,331	=	0,226
Xiaomi	0,169	0,445	0,169	0,178	0,234		0,153		0,224
Oppo	0,206	0,175	0,371	0,356	0,195		0,217		0,251
Vivo	0,11	0,159	0,112	0,2	0,09		0,109		0,124
Others	0,095	0,112	0,179	0,089	0,403		0,187		0,173

3.   Determine the equilibrium condition

To determine the condition of market stability (equilibrium) in the market share of each smartphone brand, Microsoft Excel software is used. The results of market share predictions for several periods until market stability (equilibrium) can be seen in the following table:

Table 4:
The market share prediction of smartphone brand during ready state

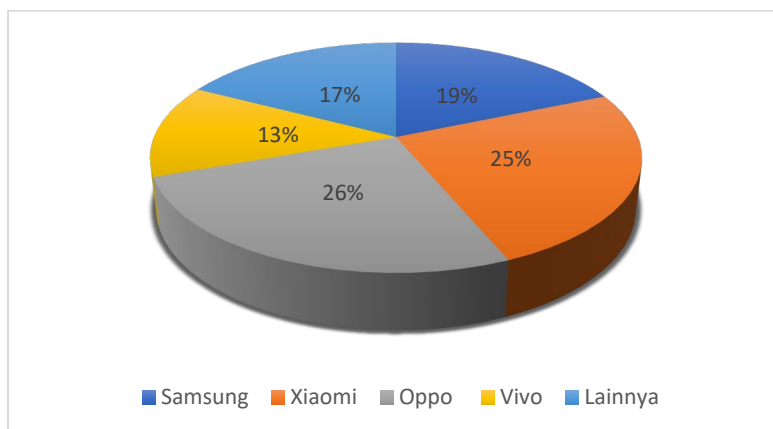| No	Period	Samsung	Xiaomi	Oppo	Vivo	Others
1	July 2020	0,331	0,153	0,217	0,109	0,187
2	January 2021	0,226	0,224	0,251	0,124	0,173
3	July 2021	0,197	0,243	0,256	0,129	0,172
4	January 2022	0,189	0,248	0,258	0,130	0,173
5	July 2022	0,187	0,249	0,258	0,131	0,173
6	January 2023	0,186	0,250	0,258	0,131	0,173
7	July 2023	0,186	0,250	0,258	0,131	0,173

Figure 3 Diagram of market share smartphone brand during steady state condition in 2023

From Table 4. above, we get the market stability condition for each smartphone brand, namely Samsung = 0.186; Xiaomi = 0.250; Oppo = 0.258; Vivo = 0.131; Others = 0.173. Based on the results of the calculation of market share predictions using the Markov Chain Method, it was found that the share of Samsung brand smartphones continued to decline in each period of the following period, while vendors from China continued to experience an increase in market share while other products continued to decline each period. Until the condition of market stability, Xiaomi was able to outperform Samsung, Oppo increasingly threatened the position of Samsung and Vivo continued to experience an increasing trend even though it was somewhat slow. Furthermore, the right marketing strategy will be determined for Samsung to be able to reclaim the peak of smartphone market share in the Surabaya City using the Game Theory method.

4.   The changing of market share

        The Covid-19 pandemic has an impact on smartphone business players. The decline in trading activity moved linearly with the decline in the economy of the people. If seen in Figure 5.5 below, it is evident that a decrease in the market share of each smartphone was observed. This is evidenced by the comparison of the predicted value of market share at steady state conditions taken from the results of previous research (Ramadhan & Nuha, 2019) with current research.
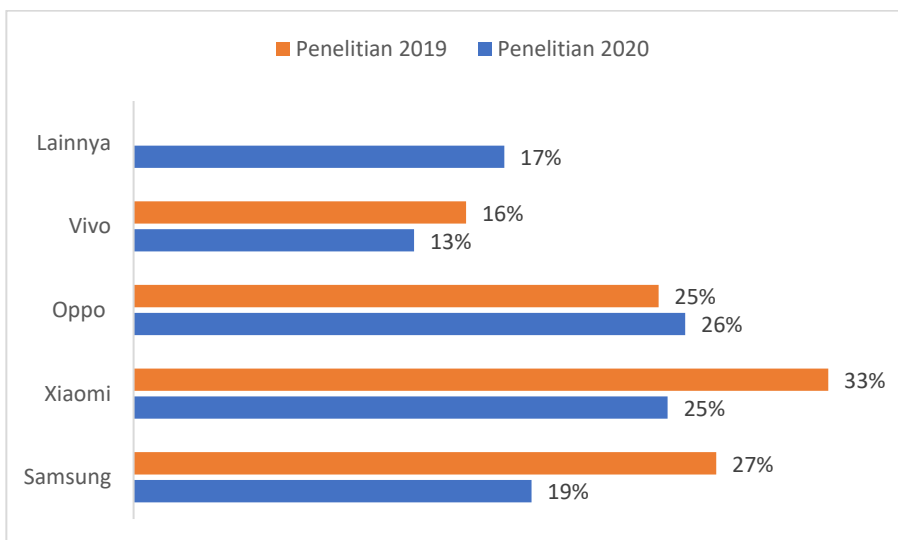
Figure 4: The changing of market share in smartphone brand at Surabaya, East Java Province, Indonesia

c.   Developing of Strategy Stage

To develop the strategy of marketing mix, here we use AHP method to get the rank as priority through the alternative attribute that we have.
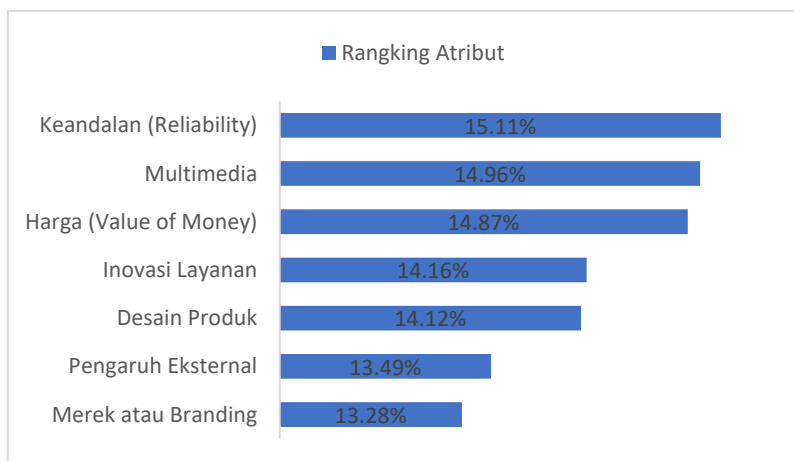

Figure 5 Attribute rank of Smartphone brand making decision

Based on the results of the questionnaire data processing that has been obtained, in general, the attribute that is the main proportion of smartphone is reliability (reliability). Reliability (reliability) in purchasing a smartphone can be categorized into the durability of smartphone products against benefits and product service life. Then, multimedia factor is also a consideration for customers in choosing a smartphone brand. The components of multimedia that are often sought after by the public are camera quality, screen resolution quality and speaker quality. The multimedia attribute is a high enough consideration for the customer than the price attribute. This is due to the need for

features that can be used by smartphone users to document valuable moments or activities that can be used as social media content.

There are four other attributes that customers still consider when choosing a smartphone, namely service innovation, product design, external influences, and branding. Service innovation is defined as distribution service, warranty service, and warranty duration provided. Then the attribute with the lowest level of selection of smartphone purchasing factors is brand / branding. However, the public must have understood, a smartphone that is branded must be accompanied by good quality.

5. Conclusion

Based on the results of the validity and reliability test stages, which are the initial stages to test the feasibility of the questionnaire, it is found that 30 questionnaires that have been distributed in the early stages can be declared valid and reliable. After that, questionnaires were distributed using a sampling technique with a minimum sampling size of 400 respondents. By distributing from various places and regions in Surabaya that took into account the characteristics of the respondents who were able to fill out the form, 410 respondents were obtained. Obtained market stability conditions for each smartphone brand, namely Samsung = 0.186; Xiaomi = 0.250; Oppo = 0.258; Vivo = 0.131; Others = 0.173. Based on the calculation of market share predictions using the Markov Chain Method, it was found that the share of the Samsung brand smartphone continued to decline from one period to the next period, while Chinese vendors continued to experience an increase in market share while other products continued to decline in each period. Until the condition of market stability, Xiaomi was able to outperform Samsung, Oppo increasingly threatened the position of Samsung and Vivo continued to experience an increasing trend even though it was somewhat slow.

For the opportunity to develop the research, this research can be developed by adding additional tools to see the ranking of each attribute that becomes the customer's preference in choosing a smartphone brand. It is hoped that this research can provide managerial implications for smartphone business players from both manufacturing, distributor and retail's point of view.
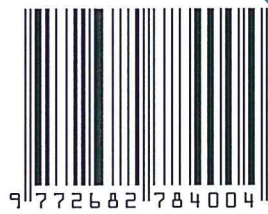
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