SEGMENTATION K-MEANS CLUSTERING MODEL WITH SPSS PROGRAM CASE STUDY CUSTOMER THE PARK MALL SAWANGAN

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Abstract

In a transitioning word, specially in mall property industry, a winning strategy comes from anticipating with people needs and desires, understanding them in the most holistic way possible. The 7P marketing mix refined by Booms and Bitner in 1981 which consists of elements of Product, Price, Place, Promotion, People, Physical evidence, Processes and additional Partnerships, is a tool for analyzing existing market conditions in more depth. In addition, to meet customer wants, needs, and satisfaction refers to the market environment, both external and internal. This research succeeded in modeling customer segmentation based on clustering data mining techniques with K-Means analysis using the SPSS program. Based on the analysis results obtained, there are 3 clusters, namely clusters: consumptive customer, potential customer, and standard young customer. From the results of this study, we get the personas that emerge as a result of this clustering analysis, and identify the needs, desires, and preferences of the cluster that is formed. We choose to develop tactic 8Ps marketing mix for cluster potential customer.

Keywords: Cluster Analysis, K-Means, SPSS, Marketing Mix

Introduction

Sawangan is the main residential area in the city of Depok which is located in the south of Jakarta. It is bordered by South Tangerang in the north and Bogor in the south, both of which are major cities in Jakarta. The Park Sawangan introduces a delightful new retail destination with a total area of 52,000 square meters in a dynamic n lingkunga. It is home to large department stores, modern supermarkets, medium-sized tenants, cinemas and restaurants that together present an interesting lifestyle curation. Changing the future of retail, the main goal aims to meet the greater demands on shopping, leisure and entertainment options in Depok and its surroundings.

Strategically located on the main road of Cinangka Raya in sawangan district of Depok city in the southern part of Jakarta. Its proximity and clear visibility benefit daily commuters, as the road is easily accessible to and from Tangerang, Bogor, Depok and Jakarta. It has majorenants such as H &M, Lulu Hypermarket, Uniqlo, Cinema XXI and Matahari Department Store as well as other tenants who have a reputation and reach on a national scale.

Online Value Proposition is one of The Park Mall Sawangan's strategiesto achieve its target. By knowing what customers want and what is avoided or become a customer complaint by identifying the persona of customers who come to the mall, the management of The Park Mall Sawangan can compile a marketing mix strategy of "8Ps" for customers who come. What needs to be maintained from the marketing strategy that has been carried out, what needs to be stopped because of the failed marketing strategy and anything that needs to be started in the new marketing strategy to increase the number and transactions of customers who come to the mall.

In this journal, the author conducted an analysis of "Segmentation K-Means Clustering Model With SPSS Program, Case Study Cutomer The Park Mall Sawangan". Clustering means grouping objects based on information found in data that describes objects or their relationships. The goal is that objects in one group must be similar to each other but different from objects in another group. The purpose of clustering is to group observations into equal groups based on the observed variables. It is commonly used in marketing to divide customers into different homogeneous groups, known as market segmentation. Cluster analysis can also beused to identify newly entered individuals or samples.

Some examples of clustering methods are: K-means clustering, fuzzy/C-means clustering, and Hiearrichical clustering. The K-Means method is used in the type "Exclusive Clustering". K-means clustering is one of the simplest algorithms that uses the "unsupervised learning" method to breakthe known clustering problem, turningthe entire dataset into a k cluster.
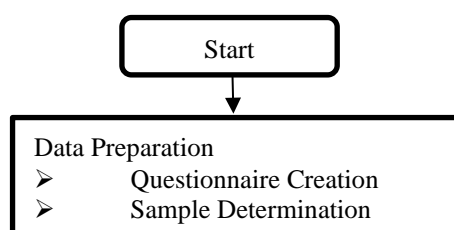
One of the most useful techniques in business analysis for the analysis of consumer behavior and its categorization is customer segmentation. Using clustering techniques, customers in similar ways, goals, needs and behaviors are grouped together into homogeneous clusters. Customer Segmentation in this case is customers or visitors of The Park Mall Sawangan. Individuals vary in terms of behavior, needs, desires and characteristics and the main purpose of the grouping technique is to identify different types of customers and segment the individual base into groups of similar profiles so that the marketing target process can be carried out more efficiently.
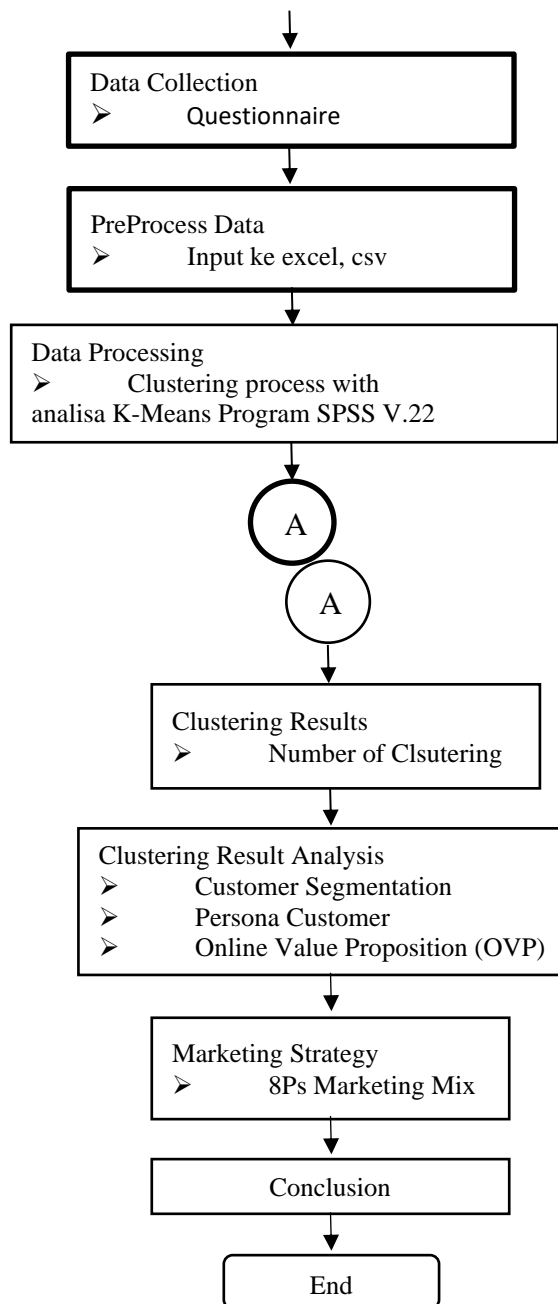
This study aims to discuss in depth the segmentasi using the clustering model, developthe persona that emerged as a result of this clustering analysis, so that we canidentify their needs, keinginan, and preferences, develop an onli ne value propositionfor existing target segments, and develop marketing strategy tactics "8Ps" based on clustering results.

Metode Penelitian

In this study, the authors carried out several stages. The following is an overview of the flow of the research process based on the methodology that the author did:

Chart 1
Research Processes Flow

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```
                    ┌──────────────────────────┐
                    │ Data Collection          │
                    │  ➢      Questionnaire     │
                    └──────────────────────────┘
                                 │
                    ┌──────────────────────────┐
                    │ PreProcess Data          │
                    │  ➢      Input ke excel, csv│
                    └──────────────────────────┘
                                 │
                 ┌─────────────────────────────────┐
                 │ Data Processing                 │
                 │  ➢      Clustering process with  │
                 │ analisa K-Means Program SPSS V.22│
                 └─────────────────────────────────┘
                                 │
                               ( A )
                               ( A )
                                 │
                   ┌──────────────────────────┐
                   │ Clustering Results       │
                   │  ➢      Number of Clsutering│
                   └──────────────────────────┘
                                 │
                ┌────────────────────────────────┐
                │ Clustering Result Analysis     │
                │  ➢      Customer Segmentation   │
                │  ➢      Persona Customer        │
                │  ➢      Online Value Proposition (OVP)│
                └────────────────────────────────┘
                                 │
                   ┌──────────────────────────┐
                   │ Marketing Strategy       │
                   │  ➢      8Ps Marketing Mix │
                   └──────────────────────────┘
                                 │
                   ┌──────────────────────────┐
                   │      Conclusion          │
                   └──────────────────────────┘
                                 │
                          (   End   )
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In preparing the data, the author makes a questionnaire that will be filled out by respondents as data material that will be studied by the author. The questionnaire contains background, questions containing variables that display personas, characteristics of respondents and questions on the scale of satisfaction with the quality of service, facilities and overall satisfaction of respondents with the object of study. The author determines that thes ampel or object of research used in this study is the customer of The Park Mall Sawangan.

Data is obtained by distributing questionnaires to customers of The Park Mall Sawangan. From the questionnaire that the author made in the form of a "*google* form", the author got a total of 102 respondent data. In the pre-processing stage of the data, the results of the questionnaire that the author has filled in enter the data into the "*microsoft*

ecxcel" program. The author uses the csv format as the basis for input in the SPSS program.

In this study, to process the data , the author usedto use the SPSS Version 22 program. In the program, the authors used the K Means analysis method to obtain the final result of the number of clusters formed with each number of members in it. After the clustering results are obtained, the next stage is the analysis ofthe clustering hasil. The author conducted an analysis based on the output data of the clustering results from the SPSS Version 22 Program, so that the type of cluster formed, starting from personas, characteristics, segmentation and Online Value Propositon (OVP).

The next stage is to carry out an 8Ps Marketing Mix strategy on one of the clusters that the author chose based on the results of the previous analysis. In this 8Ps Marketing mix strategy, the author details in detail each of the elements in it which include *Product, Price, Place, Promotion, People, Physical Evidence, Processes,* and *Partnership*, which activities in the 8Ps marketing strategy need to be maintained (*maintained)* , stopped (*stopped*) and will start (*start)*. In the end, the author gives conclusions and recommendations from this study.

Result and Discussion

interviews, surveys and others to increase the researcher's understanding of the case under study and present it as a finding to others. In this chapter, we will discuss the process of data preparation, data collection, data pre-processing, clustering results, analysis of clustering results (customer segmentation, customer persona and online value proposition) and marketing strategies (8Ps Marketing Mix).

Data Preparation

In the process of data preparation, it includes making questionnaires and determining research samples. The making of questionnaires by researchers aims to get initial customer data. The questionnaire contains the background of the respondents, questions that contain variables that display the persona, characteristics of the respondent such as gender, information media regarding the object of study, distance of the respondent's residence, type of transportation mode used, the purpose of the respondent, the time of visit, the duration or length of time of the visit, the amount of expenditure in one visit and the payment method used.

The author also asked respondents about the level of satisfaction with the quality of mall services which include parking, cleanliness, security, customer service. Questions about the satisfaction level of mall facilities which include car parks, motorbike parking lots, prayer rooms, toilets, "*diffable*" toilets, automated teller machines (ATMs), internet network connections, Covid protection facilities, breastfeeding mothers' places, and seats in the mall were also asked by respondents. In closing the questionnaire submitted to the respondents, the author asked questions about the overall level of satisfaction with services, facilities, outbuilding appearances and *interior* appearance and design of buildings in the mall. Thes ampel or object of research used by the author in this study is a customer of The Park Mall Sawangan.

Data Collection

To obtain data from a predetermined sample, the author distributed the survey questionnaire through a "*google form*" to respondents at random which was carried out during weekdays and holidays. From the survey carried out in the results of 102 customer respondents of The Park Mall Sawangan. The next stage is for the author to enter the data

from the questionnaire into the "*microsoft ecxcel*" program. As an input in the SPSS program, the author enters the data into the "*microsoft excel*" program in csv format.

Data Processing

In data processing in this study, the author used the *microsoft excel* program to enterthe initial data and the SPSS Version 22 program for K Means Clustering analysis so as to get the final result of the number of clusters formed with each number of members in it.
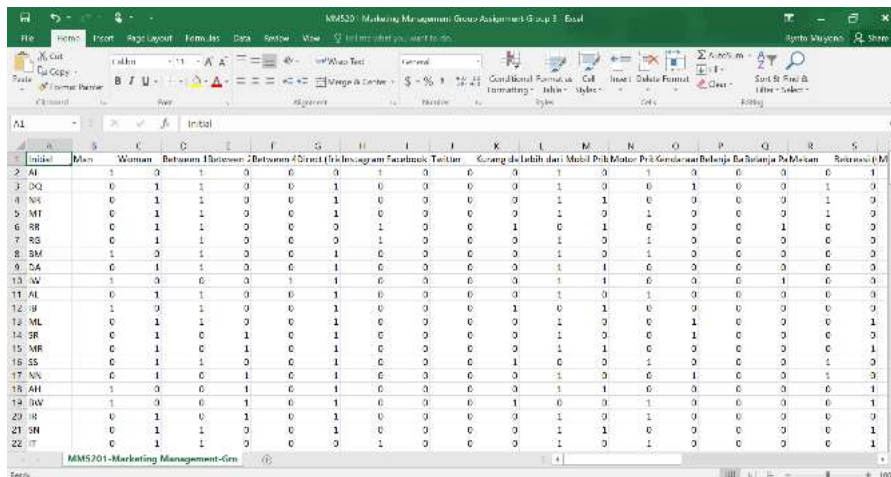
The stages are as follows:

1. Entering the initial data into *the microsoft excel* program, the algorithm (0;1) in the column below the attribute describes the background, persona and characteristics of the respondent. and the linkert scale (1 to 5) for the attribute of the respondent's satisfaction with the quality of service, facilities and overall level of satisfaction. The following results were obtained:

Picture 1
Preliminary data on customer survey results
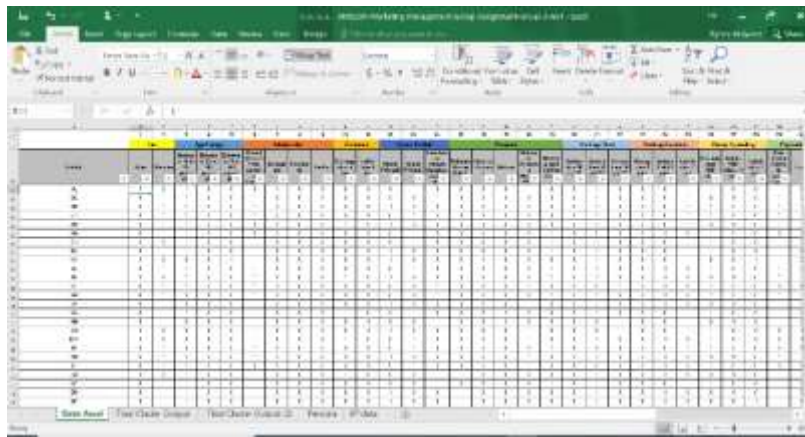
2. The next step is to save the data in the format "microsoft excel comma separated values file". This "csv" format is as input data in the SPSS Version 22 program. The following results were obtained:

Picture 2
Initial data of customer survey results in *csv* form

3. The next step is to open the SPSS Version 2 2 program, in the program two views will appear, namely "data view" and the following view variables:

Picture 3
Result of customer survey in SPSS Version 22 "*data view*"

Picture 4
Results of a customer survey in SPSS Version 22 "*variable view*"

4. Next is to perform the analysis using the SPSS Version 22 program for K Means clustering. Goto the "Analyze" item continue to "Classify" and select the "K-Means Cluster" program. Here's what it looks like:
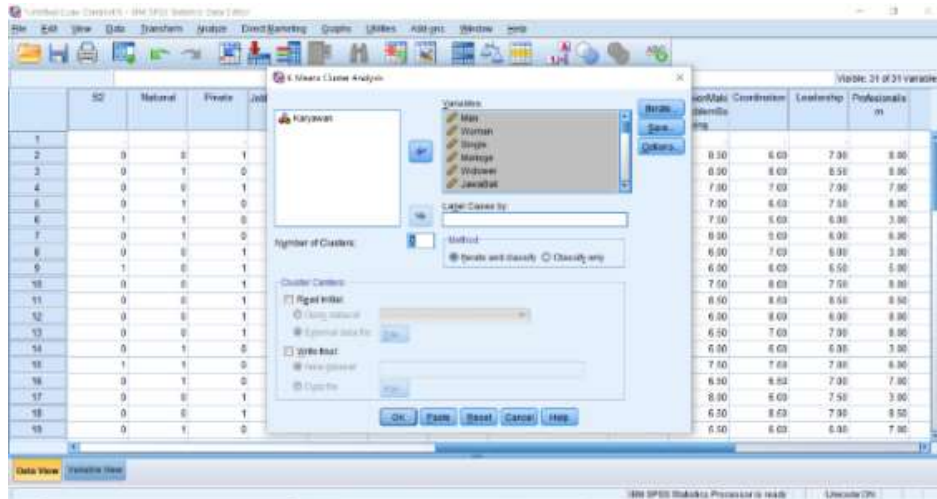
Picture 5
Overview of the K Means Clustering analysis process
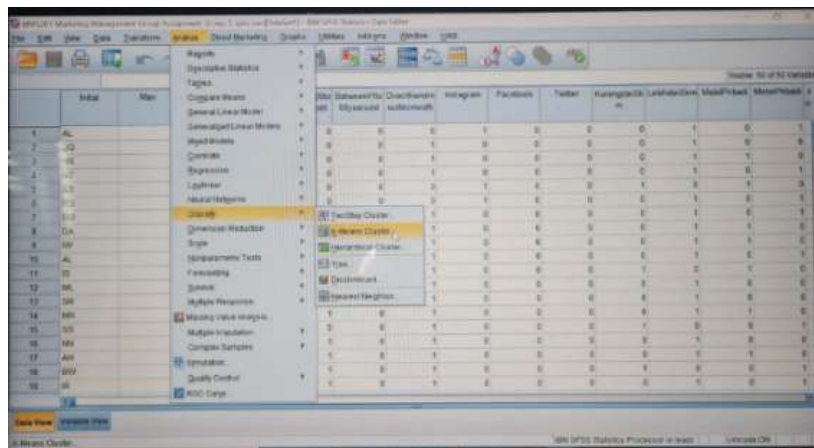
5. Next enter all numeric attributes into the "variable" column and specify the "number of clusters" to be created, enter the number "3" for the desired number of clusters and will be analyzed. Here's what it looks like

Figure 6
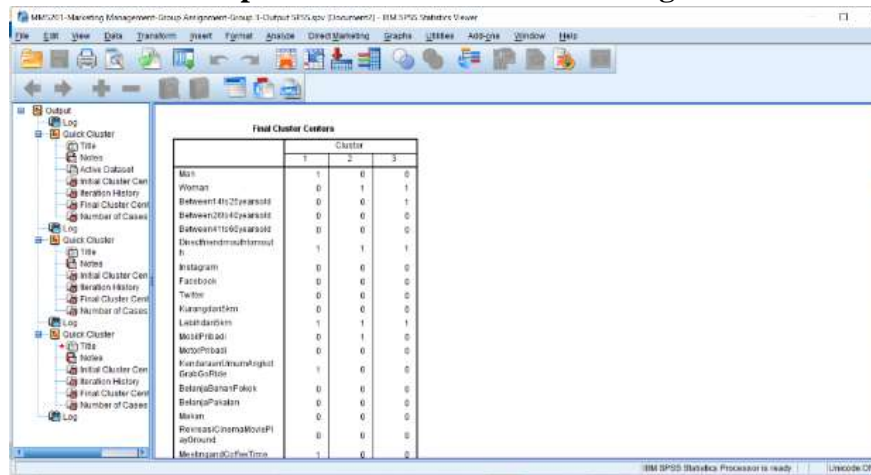**Process view entering the variable K Means Clustering**

Clustering Results

At this stage of clustering results include the following:

1. After all the input data has been entered in the SPSS V.22 Program, the output that will come out is as follows:

Picture 7
Output view of K Means Clustering

Iteration History

Iteration	Change in Cluster Centers		
	1	2	3
1	4.467	4.560	8.002
2	.000	.559	.303
3	.000	.270	.212
4	.000	.175	.123
5	.000	.187	.004
6	.000	.000	.000

a. Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is .000. The current iteration is 6. The minimum distance between initial centers is 7.937.

Number of Cases in each Cluster

Cluster	1	6.000
	2	39.000
	3	56.000
Valid		101.000
Missing		85.000

2. In this study, from theoutput results of the SPSS Version 22 program, we tried to detail the numbers on each cluster with the Microsoft excel program to be as follows:

Picture 8
Details of the output of K Means Clustering in Microsoft Excel

Clustering Result Analysis

The analysis of clustering results is formed cluster type, the number of members of each cluster. From these data, the author analyzes and finds starting from personas, characteristics, segmentation andn Online Value Propositon (OVP) from the clusters formed.

Here'sa look at the views for each cluster:

Cluster 1; Consumptive Customer
- The cluster consists of 6 people.
- The custer consists mostly of males (0.667) and the most males compared to other clusters.
- This cluster is spread across all age groups (0.333), the most visitors aged 41-60 in this cluster compared to other clusters.
- This cluster gets information about The Park Mall Sawangan mostly by direct / word of mouth (0.833), only a few who use Instagram media (0.167)
- Visitors from a radius of less than 5km (0.167) in this cluster are the most numerous compared to other clsuters.
- This cluster 50% uses public transportation (angkot, grab, go-ride) to go to the mall (0.500), and the most compared to other clusters.
- Visitors with the purpose of shopping for clothes (0.333) and the purpose of meeting and coffee time (0.500) are the most among the other clusters.
- In this cluster, visitors who come at 10-14 hours (0.333) and at 18-22 (0.667) are the most compared to other clusters.

- In this cluster, visitors who come in more than 2 hours (0.667) are the most compared to other clusters.
- In this cluster, visitors who spend more than 1 million rupiah (0.500) for one visit to the mall are the most among other clusters.
- In this cluster, visitors who use the payment method in cash (0.500) and applications (0.333) are the most among other clusters.
- According to this Cluster, the best thing in terms of service at The Park Mall Sawangan is in the Customer Service section (3,333) and what needs to be improved in parking services (2,333).
- According to this Cluster, the best thing in terms of facilities at The Park Mall Sawangan is in the Covid Protection facilities section (3,833) and those that need to be repaired in toilet facilities (2,500).
- Inorder of this Cluster, overallthe best thing the best thing about The Park Mall Sawangan is in the appearance of the exsterior façade (4,167) and what needs to be improved in the service section (3,167).

Cluster 2; Potential Customer
- The cluster consists of 39 people.
- Clsuter is a near-balanced comparison between males (0.513) and females (0.487).
- This cluster compares the number of ages 14 to 25 years (0.487) greater than others.
- Visitors who use instagram media (0.231) in this cluster are the most compared to other clsuters.
- Visitors from a radius of more than 5km (0.872) in this cluster are the most numerous compared to other clsuters.
- More than 50% of these clusters use private cars to get to the mall (0.513) and the most among other clusters.
- Visitors with the purpose of shopping for staples (0.103) and recreational destinations (moviet and play ground) (0.385) were the most among the other clusters.
- In this cluster, visitors who come at 14-18 o'clock (0.615) are the most compared to other clusters.
- In this cluster, visitors who come in less than 1 hour (0.051) and the duration of time between 1 to 2 hours (0.615) are the most compared to other clusters.
- In this cluster, visitors who spend less than 500 thousand rupiah (0.615) and between 500 thousand to 1 million for one visit to the mall are the most among other clusters.
- In this cluster, visitors who use non-cash payment methods (debit and credit cards) (0.744) are the most among other clusters.
- According to this Cluster, the best thing in terms of service at The Park Mall Sawangan is in the House Keeping section (3,641) and what needs to be improved in customer service (3,333).
- According to this Cluster, the best thing in terms of facilities at The Park Mall Sawangan is in the toilet facilities section (3,564) and those that need to be improved on internet/WIFI connection facilities (2,872).

- According to this Cluster, in general, the best thing about The Park Mall Sawangan is in the interior appearance of the mall (3,590) and what needs to be improved in the service section (3,513).

Cluster 3; Standard Young Customer

- The cluster consists of 56 people.
- This cluster compares the number of women (0.572) greater than that of men (0.428), and the number of women is the most numerous compared to other clusters.
- This cluster consists of more than 50% of the ages of 14 to 25 years (0.536), and visitors aged 14-25 and 25-40 years are the most in this cluster compared to other clusters.
- Visitors who used direct/word-of-mouth media (0.875) on this cluster were the most numerous compared to other clusters.
- Many of these clusters come from areas with a radius of more than 5 km from the mall (0.839).
- Visitors who use private motorbikes (0.321) in this cluster are the most numerous compared to other cluster.
- Visitors with the goal of eating (0.268) were the most among the other clusters.
- The majority of these clusters visit the mall during the day and evening between 14 to 18 o'clock (0.536) compared to other hours.
- The majority of these clusters visit the mall between 1 to 2 hours (0.571).
- The majority of this cluster spends less than 500 thousand dollars once visiting the mall (0.589).
- The majority of this cluster uses non-cash payment methods (using debit and credit cards) (0.696).
- According to this Cluster, the best thing in terms of service at The Park Mall Sawangan is in the House Keeping section (4,256) and what needs to be improved in parking services (4,161).
- According to this Cluster, the best thing in terms of facilities at The Park Mall Sawangan is in the mushola facilities section (4,303) and those that need to be repaired in toilet facilities (3,232).
- According to this Cluster, in general, the best thing about The Park Mall Sawangan is in the appearance of the exsterior façade (4,375) and what needs to be improved in the service section (4,268).

Marketing Strategy 8Ps Marketing Mix

In this 8Ps Marketing mix strategy, the author details in detail each element in it which includes *Product, Price, Place, Promotion, People, Physical Evidence, Processes,* and *Partnership*, which activities in the 8Ps marketing strategy need to be maintained (*maintained*) , stopped (stopped) and will start on one of the clusters that the author chooses based on the results of the previous analysis. In this case, the author chooses a potential customer cluster. Here's a look at the strategies for each of the elements as follows:

1. Product
   The strategy to be started:
   - Start using materials for making malls that are environmentally friendly.
   - Start adding a new variety of F&B tenants.
   - Improving internet connection/free wifi facilities for visitors.

- Improving the cleanliness of toilet facilities.
- Increase the variety of tenants / tenants with well-known brands2 and are searched for visitors.
- Increase covid protection facilities for mall visitors.
- Create an application for visitor satisfaction surveys.

Maintained strategy (*keep*):

- Maintaining the quality of a good mall building with quality materials, with a good safety factor.
- Maintain and maintain facilities that are already considered good by visitors (such as prayer rooms, parking spaces, etc.).
- Maintaining the interior of the mall is instagramable.
- Maintaining the concept of green building in accordance with the name The Park itself.

2. *Price*

The strategy to be started:

- Providing rental discounts / grass periods for tenants who are of interest to customers so as to increase customer traffic to the mall for transactions that increase mall income.
- Providing rental discounts/grass periods for local MSMEs to attract nearby/local visitors.
- Provide an annual promotional fee package for product brand advertisements and events2 that want to enter and appear in the mall.

3. *Place*

The strategy to be started:

- Began to develop the concept of The Park Mall to several areas outside Java Island.
- Setting up parking lots/waiting areas for online driver vehicles.
- Expanded basement parking services and added "valet" lobby parking facilities.
- Prepare an instagramable photo2 place for visitors to upload on their social media.
- Providing a spacious place to create entertainment events according to the seasons.
- Cooperate with online motorcycle taxi companies, to create a special pick-up room.

Maintained strategy (*keep*):

- Maintaining a mall location that is easily reached by visitors with various modes of transportation.

4. *Promotion*

The strategy to be started:

- Further increase promotional programs on social media (instagram).
- Create a "customer loyality program" for regular and loyal customers.
- Hold a "midgnight sale" with discounted rates and free parking.
- Invite artists, celebgrams, YouTubers for concerts or create content inside the mall.
- Create cashback programs or discounts for debit and credit card users.

Maintained strategy (*keep*):

- Promotion of member discount strategies for shopping for basic necessities.
- Collaborate with large tenants in joint promotions within a certain period on Instagram.

- Carry out thematic promotion regularly (such as Eid sale, back to school, christmas and new year, Chinese new year).
- Holding "live shopping" using social media platforms.

5. *People*

The strategy to be started:
- Start recruiting employees in a radius of less than 5km from the mall to increase direct promotions from these employees and to keep the environment conducive around the mall.
- Increasing product / tenant konowledge to officers in the mall (customer service, housekeeping, security) to make it easier for them to answer visitors' questions about the location of tenants.

Maintained strategy (*keep*):
- Maintain good SOPs in customer service (customer service officers, house keeping, security, etc.).
- Continue to conduct SOP training regularly for a certain period to refresh / refresh all employees.

6. *Physical Evidence*

The strategy to be started:
- Start developing interior design according to the development of the times and customer preferences.
- Develop interior design according to the development of the times and customer preferences.
- Started to develop exterior façade designs according to the times and customer preferences.
- Began to update the appearance/uniforms of the officers standing guard inside the mall according to the current trend.

Maintained strategy (*keep*):
- Maintaining the exterior façade design of the mall that is liked by customers.
- Maintaining interior design in the mall that customers like.

7. *Processes*

The strategy to be started:
- Clarify signs or signs to and within the mall to make it easier for visitors (such as entrance signs, parking lots, prayer rooms, toilets, atms, names of anchor tenants, etc.)

Maintained strategy (*keep*):
- Placing officers to help smooth traffic in front of the mall to make it easier for visitors to enter and exit the mall.
- Placing a digital map mall site plan, at the entrance, on each floor, to make it easier for visitors to know the location of tenants and what facilities.

8. *Partnership*

The strategy to be started:
- Started working withendorsements, celebgrams, YouTubers" to support mall promotions.
- Began to increase cooperation with banks for the promotion of cashless payments to attract visitors and increase the volume of shopping transactions.

Maintained strategy (*keep*):
- Maintain good relations with tenants by gathering together.
- Play an active role in the management of APPBI (Association of Shopping Centers throughout Indonesia).

- Cooperate with the local government in empowering MSMEs to support.
- Continue to cooperate with the government and health offices as a place for vaccine centers.

Kesimpulan

This study succeeded in modeling the customer segmentation of The Park Mall Sawangan using K Means analysis in the SPSS Version 22 program.   From the results of the analysis, personas, characteristics, segmentation and Online Value Propositon (OVP) were obtained from the clusters formed.   Based on the results of the analysis obtained, 3 clusters were obtained, namely the consumptive customer cluster, potential customers, and standard young customers. In this case, the author chooses a potential customer cluster to explain in detail the 8Ps Marketing mix strategy which includes *Product, Price, Place, Promotion, People, Physical Evidence, Processes,* and *Partnership*. Furthermore, from each element in the 8Ps of the marketing strategy, it is further explained which strategy is maintained (*maintained),* stopped (*stopped*) and will be started (*start)* based on the results of the previous analysis.

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