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An Empirical Study on The Social Media Users in Indonesia's Food Industry to Provide Social Media Marketing Strategies

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Abstract. The use of social media has witnessed significant growth in recent years. Individuals utilize social media platforms to establish indirect social connections, while companies have also embraced social media as a marketing tool. However, many companies struggle to effectively leverage social media for marketing purposes, resulting in unmet expectations and potential losses. One key factor contributing to this challenge is a lack of knowledge about the target audience. Consequently, social media marketing campaigns often fail to reach the intended audience, leading to unsatisfactory outcomes. This research aims to investigate the target audience of the food industry in Indonesia based on four variables: usage habits, interaction habits, food purchase behavior on social media, and social media promotion preferences. Data were collected through questionnaires distributed to targeted respondents. The collected data were analyzed using data mining methods, which are the K-Means clustering and Apriori association rules. The study identifies three segments of social media users and reveals patterns of association rules based on the four variables. The findings provide actionable recommendations for companies to develop marketing strategies with a deeper understanding of their target audience.

Keywords: Social media, Data mining, Clustering analysis, Association rules, Food Industry.

1. Introduction

Technology has developed rapidly, therefore industry development is fast and sophisticated. One of the essential technologies is the internet. Based on census data collected by (Simon Kemp, 2022) as of February 2022, out of a total world population of 7.91 billion, 4.95 billion or 62.5% are active internet users, and 4.62 billion or 58.4% are active social media users. One of the countries with the most internet users in the world is Indonesia. With a total population of 277.7 million, 204.7 million or 73.7% are internet users, and 68.9% or 191.4 million are active social media users. This data proves that the internet has become a necessity for society in various ways, such as education, entertainment, and businesses.

One of the roles of technology in business is for marketing, and social media is the most popular way to reach target audiences. Indonesia is one of the country that continues to experience rapid market development with the use of social media, which makes Indonesia has excellent opportunities for social media marketers (Zamrudi & Il-Hyun, 2018). About 93.5% of Indonesian internet users are active social media users, so this is what makes social media marketing the most popular and effective method in Indonesia. Based on data from (Simon Kemp, 2022), 50% of social media users in Indonesia use social media to find activities to do or products to buy, so this strengthens the reason for a business to use social media as a marketing tool.

With all the promising benefits and broad reach, various industrial sectors, from large to small scale, see this as an opportunity and start competing to use social media to expand their business. The food industry is one of Indonesia's largest and most significant investments. Data from (Sarpono, 2022) states that in 2018-2020 the food industry ranked first as the most small-scale business sector and ranks first as the most large-scale business sector in 2017-2019. Moreover, the food industry sector is one of the business sectors that provided significant investments for Indonesia in 2020 (Bahlil, 2020). Based on these data, it can be concluded that the food industry sector has enormous growth potential.

Social media and social networks has proven have a great positive impacts in many of industries, especially food industry (Radavičiūtė & Kavaliauskienė, 2023). In addition, social media can generate relevant real-time information to help businesses learn more about their customers and competitors (Tourani, 2022). However, according to (Ekarina, 2020), the food industry have faced several obstacles in social media marketing. Firstly, social media users have a shorter attention span. The food industry is challenged to prepare content that is genuinely suitable for audiences and social media platforms to attract attention. Secondly, food companies find it challenging to determine the posting time to reach the active target audiences. Thirdly, many options of social media platforms make it difficult for the food industry to find content that matches the audience on a platform. This problems leading to the food industry's failure to spread the message across to the right audience (Ekarina, 2020).

To create a successful promotional campaign, marketers must define the objectives, understand the target audience, and choose the right social media platform. However, many companies find it challenging in understanding the target audience's characteristics and choosing the right social media platform. A social media marketing campaign can be successful and achieve business goals if relevant content is displayed on the appropriate social media channels (Zamrudi & Il-Hyun, 2018). Therefore, an in-depth understanding of the target audience to be achieved and the characteristics of the social media platform to be used is very much needed in marketing. Morover, the characteristics of users on each social media are different from one another. Nevertheless, only a few marketers research their targets and identify platforms where their audience is active. This is caused by the notion that the more social media is used for marketing, the better and more effective the results will be (Beese, 2016).

As a result, the company suffered losses in terms of financial and corporate image, as experienced by a self-service company in the UK, Aldi's. The marketing campaign on Instagram by Aldi called the "Poorest day challenge" aims to inspire customers to save by spending 25 pounds for one week. However, due to a lack of customer understanding, the campaign was found to be offensive and

offensive to most customers (Darcy Schild, 2021). Another case occurred in one of the largest fast-food companies, McDonald's, which carried out a marketing campaign with the hashtag #McDStories on Twitter that aims to tell the organic farmers who work for McDonald's to provide quality food ingredients. The company pays for the Twitter platform to become the number one hashtag on the trending list. However, this campaign damaged the company's image due to not understanding the target audience and social media platforms. McDonald's had not learned that Twitter was a social media platform that allowed users to share and retweet, so the campaign's failure spread globally. They also do not identify the characteristics of their customers before carrying out marketing campaigns. As a result, the hashtag is used, even today, to narrate lousy customer service, food poisoning, and other hate posts against McDonald's (Elisabeth Burke, 2019).

Many studies have been conducted to explore the strategy and use of social media for business. However, not much has been discussed about social media users' segmentation for marketing platform recommendations. The aim of this research is to study social media marketing, focusing on the target audience of food businesses in Indonesia and analyze social media users. The analysis results will be clustered, looking for patterns of user association rules, and then matched with the characteristics of the most suitable social media platforms to provide recommendations. The selected social media platforms are Facebook, YouTube, Instagram, Twitter, TikTok, Pinterest, and WhatsApp. Survey by (Harris et al., 2021) said that Instagram, YouTube, Facebook, Twitter and TikTok are the most popular social media platforms for promoting food. The expected results of this study are in the form of association rules from social media user groups that are used to provide platform recommendations that are most suitable for the company's target audience. Based on previous research, it is said that the data mining method is the most effective method for recommendations (Kolahkaj et al., 2020; S. H. Liao & Yang, 2020; S. hsien Liao & Chang, 2016). In addition, there are many recent applications of data mining applied in social media, such as trend analysis, market research, corporate decision-making, and research (Aušrinė, 2021; Siyam et al., 2020; Yin et al., 2020). According to (S. H. Liao & Yang, 2020) in his research, data mining methods, such as associations, clustering, and classification, are used in online marketing studies.

2. Literature Review

2.1. Social Media Marketing

Social media marketing is a type of internet marketing model to achieve marketing campaign objectives by participating in or using social media networks (Wijaya et al., 2021). Currently, social media is considered the most effective method in achieving marketing goals and strategies, especially in customer engagement, customer relationship management, and communication (Alalwan et al., 2017). According to (Li et al., 2020), the presence of social media has resulted in three fundamental changes in the market, and the first is connecting companies and customers to build shared interests and values. Second, changes in interaction and social media generate actions through communication or observation that can influence the choices and behavior of the users and other people. Moreover, social media data is a supporting component for companies in managing customer relationships and making business decisions. Social media enables marketers to achieve various marketing objectives, such as enhancing customer experience, brand perception, brand awareness, purchase intention, and direct purchase (Alalwan et al., 2017). There are many advantages to social media marketing, namely lower costs, wider reach, maximizing social interaction, providing adequate customer service, and involving customers in marketing activities (Nadaraja & Yazdanifard, 2018).

However, marketing with social media also has weaknesses. It requires much time investment to monitor social media activity and remain interactive with customers; trademarks and copyrights are at risk of being misused by certain parties. It is challenging to build trust, especially if the business gets negative reviews (Nadaraja & Yazdanifard, 2018). Therefore, companies must develop a good marketing strategy and consider all possible risks. To prepare a good strategy, companies must also

consider the goals achieved from marketing campaigns, identify the right social media platforms, understand the target audience they want to prospect, create appropriate promotional content, and prepare content posting schedules on social media. In addition to preparing a mature strategy, companies must consistently carry out marketing, build communities with their audiences, and participate in social communities that have been actively built (Gholston et al., 2016).

With social media marketing, food businesses can be more exposed on the internet, making it easier for people to find businesses and add professional value and business validity. Food promotion content through peers, social media influencers, games, contests or giveaways, and short videos is gaining popularity and engaging users in an entertaining experience (van der Bend et al., 2022). In maximizing social media marketing in the food industry, companies must be able to engage target consumers before buying and then influence their decisions. Users in Indonesia show a pattern of social media growth, and relationships can be built with continuous dialogue on social media to create an online community or environment. Social media marketing that involves loyalty programs has also been shown to make customers repeatedly interact with a brand (Zamrudi & Il-Hyun, 2018).

2.2. Social Media Users Segmentation

User segmentation is a way to divide all users into several small, distinctive groups, and each group consists of users with the exact needs and characteristics (Peker et al., 2017). Currently, user segmentation is the basis of marketing activity, so more and more companies are using it to deepen their understanding of the characteristics of their customers. Behavioral segmentation is the best choice to help companies understand their target audience. Behavioral segmentation, namely division based on product behavior, such as brand loyalty, user status, purchase readiness, and purchase intention (Kansal et al., 2018). In its division, there are several user segments in behavioral segmentation. First, seen from the frequency of use, namely heavy users, which means users who are most often involved and spend the most time using social media, also make the most transactions; medium users, which means users who do not use a product too often, usually based on a particular time or event; and light users, namely users who rarely use products compared to other segments, usually only once (Gary, 2022; Stephanie, 2022).

Second, the user segment is based on shopping habits, namely smart, which means users who are thorough and careful and want to understand every complicated factor before deciding to make a purchase; risk-averse, i.e., users who shop very carefully economically; and persuasive, namely users who shop impulsively and are very vulnerable to various kinds of offers (Gary, 2022). In shopping habits, there are also complex users, namely users who are highly involved in the buying and decision-making process, and there are significant differences between the brands being considered; variety seeking users, namely users who are not too involved in the buying process, but will still look for products offered by different brands; and habitual users who do not require much involvement in purchases, the products offered do not differ much between brands, and what matters is a personal preference (Stephanie, 2022).

Third, there is also segmentation based on the characteristics of its users, namely sociable adventurers, which means users who are interested in almost all existing activities; average daily person, i.e. value doing their routine and spending time with their family or close friends; and uninterested inactive, namely users who have no genuine interest and do not like to leave their comfort zone, these users mainly observe and are not involved (Weber et al., 2020). In addition, research from (Kımıloğlu et al., 2020) divides users based on characteristics, namely pragmatic, which means that these users only care about the basic functionality of the product they buy, without paying attention to other factors; value conscious, which means that this user is very critical in making decisions when they want to make a transaction, especially in terms of price; and charismatic, which means that these users attach importance to all aspects of making decisions when they want to make transactions, not only in terms of functionality and price, but also the values offered by the company.

To perform segmentation, variables are needed to help the categorization process. In several studies, the variables used for behavioral segmentation of social media users are preferences and interests, user habits and behavior, usage motivation, user interaction behavior, and user buying behavior (S. H. Liao, Widowati, & Hsieh, 2021). Another study (Doğan et al., 2018) used RFM or recency, frequency, and monetary models for segmentation. Meanwhile, research (Silva et al., 2019) links the RFM model with the level of customer loyalty for segmentation.

2.3. Data Mining Approach

Data mining is a computational process for finding patterns in a data set or commonly referred to as a dataset, which is applied to transform the information extracted from the dataset into a structure that can be understood as preparation for the next step (W. Wang, 2020). The basic concept of data mining is a collection of data that is not meaningful, processed using algorithms or data mining methods, and becomes knowledge that can be used to make decisions. There are several data mining methods, namely classification, estimation, clustering (segmentation), association (affinity grouping), and forecasting (S. H. Liao & Yang, 2020). In this study, data mining clustering and association methods will be used. The algorithm to be used is K-Means clustering to study social media user groups, and Apriori association rules to produce association rules from social media user groups, so these rules can be used to provide recommendations for social media platforms that are appropriate for food industry marketing.

2.3.1 Clustering Analysis

Clustering is a data mining method used to divide data into several clusters based on similarity calculations between data or other evaluation criteria so that data contained in a cluster has a high degree of similarity, and data in different clusters will have different characteristics (S. H. Liao, Widowati, & Hsieh, 2021). Clustering, usually called cluster analysis, is very important in data mining and is considered one of the most important unsupervised learning methods (Jardim & Mora, 2021). The goal is to organize data that does not have a label to determine the number of appropriate clusters, where several raw data are analyzed to find similarities and patterns. This method can be used when the analysis starts with unlabeled and unstructured datasets, when the desired number of clusters is unknown, and when we want to look for anomalies in a dataset. Clustering algorithms must be appropriately selected and adapted to the needs to achieve the expected results. There are several types of clustering, one of which is centroid-based clustering using the K-Means algorithm, which is the most popular algorithmic technique and is widely used in studying user segmentation (S. H. Liao, Widowati, & Hsieh, 2021), (Jardim & Mora, 2021; S. H. Liao et al., 2022; S. H. Liao, Widowati, & Yang, 2021). The way the K-Means algorithm works is to determine the value of the desired cluster, determine the centroid randomly, and look for data closest to the specified centroid. For example, three centroids are determined, then data 1 is closest to centroid 1, then the data is included in cluster 1 and so on. Calculating the distance between the data and the centroid is carried out in several iterations until the cluster grouping results no longer change.

2.3.2 Association Rules Analysis

The association is a function or data mining method that aims to find the probability of the occurrence of the same item in a collection. The relationship between items that occur together is called an association rule. The association rule algorithm extracts data into rules that can predict the appearance of an item based on the presence of other items (Isinkaye, 2015). To enable knowledge discovery through data mining, an association is a rule that results from database processing and can infer a set of attributes from other attributes (S. hsien Liao & Chang, 2016). This association rule method is a procedure in market analysis to find rules that meet the minimum support and confidence requirements. In simple terms, there are two steps in the association rule method. The first step is to detect large item sets with a support value greater than the minimum support, and the second is to generate association rules using large item sets (H. Bin Wang & Gao, 2021). After the algorithm is run and produces rules in the form of association patterns, the rules that are formed will be evaluated for their accuracy by calculating the lift value. This is done to ensure that all association rules are valid and that there are no

misleading or misleading rules. To create an association rule, many researchers use the Apriori algorithm (S. H. Liao et al., 2022; S. H. Liao, Widowati, & Yang, 2021; S. hsien Liao & Chang, 2016).

3. Methodology

3.1. Research Framework

This study had three stages, as shown in Fig. 1. In the first stage, we design questionnaires based on four variables and distributed to target respondents. Next, we use clustering data mining method with K-Means algorithms to create customer segmentation. The final stage is to find association rules patterns using data mining association method with Apriori algorithms.

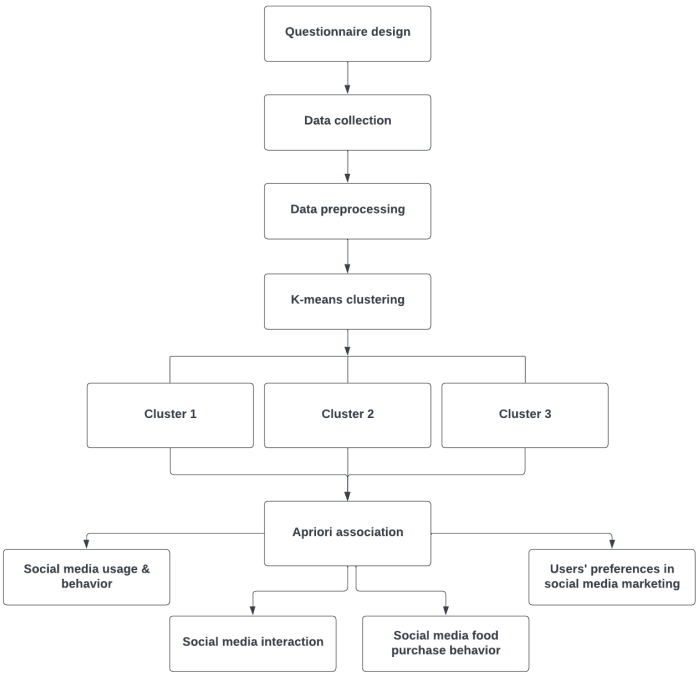

Fig. 1: Research Framework

3.2. Questionnaire Design

Based on a previous studies there are four variables in this study, namely social media usage behavior, social media interaction, social media food purchase behavior, and user preferences for social media marketing (S. H. Liao, Widowati, & Hsieh, 2021), (S. H. Liao et al., 2022; S. H. Liao, Widowati, & Yang, 2021). The social media usage behavior variable is used to study habits, usage motivation, and frequently used functions or features of the social media. With this variable, it is expected to obtain profiles of social media users related to their habits in using social media. Social media interaction variable is used to study how a user interacts within social media. Marketers can enhance social media marketing strategies with this information, such as through community groups and others. Social media food purchase behavior variable is to determine the user's habits in buying food products from social media promotions. Finally, user preferences for social media marketing variable, is to learn things that users like, or user preferences for an advertisement, campaign, or promotion. These four variables will be developed into a questionnaire using a multiple choice. Before we distributed the questionnaire, we informed all respondents that we only collect data for this research. All personal information remains confidential and there is no violation of their privacy.

3.3. Data Collection

The population of this research is social media users in Indonesia with age ranges from 18 to 54. According to the previous study, this range of age is the most active social media users and a regular customer of the food industry. This research uses a simple random sampling technique, and using the Slovin's formula with 5% margin error, the minimum sample of this research is 400 respondents. Data was collected from 27 May 2022 to 5 October 2022 and distributed to all 37 provinces in Indonesia. There were 1,486 respondents who filled out the survey, and there were no missing values or invalid data, so that all data could be used in the data mining process. The following is a summary of the profiles of the respondents obtained: 72% female and 28% male; 72.1% aged 18-23 years and 27.9% over 23 years; 61.5% unemployed, and 38.5% employed; 49.5% earn under IDR 500,000, and 50.5% earn IDR 500,000-IDR 20,000,000 per month; 64.5% are high school graduates, and 27.6% are undergraduate; 87.6% are not married, and 12.4% are married; 31.2% are interested in food and drink, 27.2% are interested in entertainment, 17.6% are interested in shopping and fashion, 8.6% are interested in hobbies and activities, 8.4% are interested in technology, 4.9% are interested in sports and outdoor recreation, and 2.1% are interested in fitness and wellness.

3.4. Data Mining Process

All the data collected is integrated and usable, there is no noise and missing value, and there is no inconsistent data. However, to be able to run the K-Means and Apriori algorithms, an appropriate data format is required, so the data preprocessing stage that will be used in this study is data transformation. The stage of changing the form of data is a process of changing data in such a way as to produce a dataset that follows the data mining algorithm to be executed, without eliminating the meaning of the data. The authors use the data mining clustering method with the K-Means and Apriori algorithms to obtain profiles of social media users in the food industry. We used RapidMiner Studio and IBM SPSS Modeler as tools for data analyzing.

4. Results and Discussion

4.1. K-Means Clustering Analysis Results

In the first cluster or group or smart users there are 470 respondents, in the second cluster or group or risk-averse users there are 533 respondents, and in the third cluster or persuadable users there are 483 respondents. The following presents the characteristics of each cluster in the form of Table 1.

4.1.1 Cluster-1

This group is dominated by single women aged 18-23 who have graduated from high school (high school) and unemployed, with a monthly income of under IDR 500,000. They are very interested in food and drink contents. This group uses social media to obtain information and is accessed more than 3 hours daily from 11.00 to 15.59. The most used social media platforms are Instagram and WhatsApp. The purpose of using social media is to find product information, entertainment content, and the latest news. When they want to buy food products, this group usually looks for information on Instagram and YouTube. Product descriptions, attractive offers and reviews from previous buyers determine purchases. Meanwhile, what makes them not want to buy is incomplete payment methods, bad reviews, and incomplete information. Beverages, fast food and processed food products are the most frequently purchased types of food on social media. Promotions that are preferred are product price discounts and special offers, and they usually find promotional content on the account homepage or the explore feature. This group's most interesting promotional content is user-generated, educational, and storytelling.

4.1.2 Cluster-2

This group mostly consists of single women who have graduated with bachelor's degrees aged 24-29 years, and are already working, with an income range of Rp. 2,000,000-Rp. 4,999,999 per month. The thing that interests them is the field of entertainment or entertainment such as movies, games, TV shows,

music, and others. In using social media, the benefits expected by this group are as a medium for learning and obtaining information, and it is accessed for more than 3 hours per day from 16.00 to 20.59. The main social media platforms are WhatsApp and Instagram. The purpose of using social media is to socialize, seek entertainment, and get the latest news. Instagram and YouTube are social media used when looking for information on food products. Customer reviews and complete product information descriptions determine purchases. In addition, poor customer reviews and unclear product information discourage this group of users from making purchases. Main meals, desserts and drinks are the types of food most frequently purchased by this group. Interesting promotions are product price discounts, gifts or gift-giving, and special offers. Users in this group are usually reached via the homepage or explore. Promotional content that catches their attention is usually in the form of user-generated content, education and entertainment.

4.1.3 Cluster-3

In the third cluster, the user profiles are single women aged 18-23 years who have graduated from high school (high school) and are not yet working, with a monthly income below IDR 500,000. They are interested in food and drink, such as cooking recipes, restaurants, and others. The expected benefits of using social media are to get the latest information and news, and they access social media for more than 3 hours per day at 16.00-20.59. Their main platforms are TikTok, Instagram and WhatsApp. This group aims to get information and entertainment content and fill their free time by accessing social media. When looking for information on a food business, Instagram and YouTube are the platforms of choice, and customer reviews and clear product information determine purchases. What hinders purchasing decisions are poor reviews, as well as minimal information about the product. The types of food most frequently purchased by this group were those included in the fast food, dessert and beverage categories. They are most interested in promotions that offer product discounts and special offers and usually find promotions through the live streaming feature. Promotional content that most attracts the attention of this group is user-generated, education and entertainment.

Table 1. K-Means cluster results and profiles

Indicator	**Cluster-1**	**Cluster-2**	**Cluster-3**
Cluster name & description	**Smart user** These users consider many factors before purchasing products on social media.	**Risk-averse user** These users are high-risk averse to making purchases on social media, so they are cautious.	**Persuadable user** These users tend to be impulsive when shopping and are highly susceptible to promotions and offers on social media.
Number of samples	470 (31.6%)	533 (35.8%)	483 (32.5%)
Age	18 - 23 years old	24 - 29 years old	18 - 23 years old
Gender	Female	Female	Female
Occupation	Unemployed	Employed	Unemployed
Monthly disposable income	< Rp500.000	Rp2.000.000 - Rp4.999.999	< Rp500.000
Education	High school graduate	Bachelor's degree	High school graduate
Marital status	Unmarried	Unmarried	Unmarried
Interest	Food and drink	Entertainment	Food and drink
Social media access device	Smartphone	Smartphone	Smartphone
Duration of social media access per day	More than 3 hours	More than 3 hours	More than 3 hours
Social media access time in a day	From 11.00 to 15.59	From 16.00 to20.59	From 16.00 to 20.59

Expected benefits of social media	As a medium for learning and a source of information	As a medium for learning and a source of information	As a medium for learning and a source of information
Main platform	Instagram, WhatsApp	WhatsApp, Instagram	TikTok, Instagram, WhatsApp
Purpose of use	Looking for something to buy, looking for information about the product you want to buy, looking for entertainment content, Getting the latest information or news	Socialize (connect with friends, or meet new people), Seek entertainment content, Get the latest information or news	Getting the latest information or news, looking for entertainment content, Filling free time
Main activities	Interact (exchange messages, share posts with friends, like, comment). Browse the homepage or explore (browsing), Share (stories, post photos & videos, statuses)	Interact (exchange messages, share posts with friends, like, comment), Browse homepages or explore (browsing), Search for information, and accounts (searching)	Browsing the homepage or explore (browsing), Searching for information, and accounts (searching), Interacting (exchanging messages, sharing posts with friends, liking, commenting)
Feedback after interaction	Forge good relationships, or make new acquaintances	Forge good relationships, or make new acquaintances	Forge good relationships, or make new acquaintances
Increase interaction with others	Needs of information or help	Needs of information or help	Needs of information or help
Reduce interaction with others	Fake information, hoax	Data security and privacy	Harmful content (gossip, hate speech & comments)
Purpose of social media interaction	Improving social life (social life), exchanging information, emotional satisfaction (something that makes you happy or the feeling of having achieved something)	Exchanging information, As entertainment, Improving social life (social life)	As entertainment, Improving social life (social life)
Interact with others	Friends, family (someone you know), Communities with the same interests, hobbies or visions, Accounts that share information and entertaining content	Friends, family (someone you know), Accounts that share information and entertaining content	Friends, family (someone you know), Accounts that share information and entertaining content
How to interact on social media	Post interaction (giving likes, comments, shares, reactions, replies); Exchange messages in the form of text, images, videos, posts, calls, voice notes, video calls	Exchange messages in the form of text, images, videos, posts, calls, voice notes, and video calls; Post interaction (give likes, comments, shares, reactions, replies)	Post interaction (giving likes, comments, shares, reactions, replies); Exchange messages in the form of text, images, videos, posts, calls, voice notes, video calls
Number of food purchases in 1 week	1 - 3 times per week	1 - 3 times per week	1 - 3 times per week
Online shopping motivation	Save time and energy	Save time and energy	Lots of exciting offers and promotional content
The primary platform for food purchase	Instagram, YouTube	Instagram, YouTube	Instagram, YouTube
Affect intention to buy	Clear and complete description or information, There are attractive offers, Has lots of reviews (reviews)	Have lots of reviews (reviews) from other customers, clear and complete descriptions or information	Have lots of reviews (reviews) from other customers, clear and complete descriptions or information

	from other customers		
Affect intention not to buy	Limited payment methods, bad customer reviews, unclear and incomplete information	Bad customer reviews, information that is not clear and complete	Bad customer reviews, information that is not clear and complete
Type of foo	Beverages/, fast food, food products (processed, preserved, packaged)	The main course, dessert, beverages	Fast food, dessert, beverages
The factor of trusting a brand	Positive feedback (comments, ratings, reviews, testimonials from customers or influencers)	Positive feedback (comments, ratings, reviews, testimonials from customers or influencers)	Positive feedback (comments, ratings, reviews, testimonials from customers or influencers)
Increase purchase intention	Positive reviews and good rating	Positive reviews and good rating	Positive reviews and good rating
The place to find promotions on social media	Homepage, explore	Homepage, explore	Live streaming
Promotional preference	Price discount, special offer	Price discount, gift giving	Price discount, special offer
Content preference	User-generated content, education, storytelling	User-generated content, education, entertainment	User-generated content, education, entertainment

4.2. Apriori Association Rules Analysis Results

To create an association rule, we must determine the minimum support and minimum confidence. The support value is the frequency of occurrence of the itemset combination, while the confidence value is the level of accuracy of the itemset combination. The higher the support value means that these combinations often appear together, and the higher the confidence value means that the prediction of the appearance of the itemset is more accurate. To be able to see the magnitude of the influence of the antecedents and consequences on the rules that have been formed, it can be evaluated using a lift value. If the lift value is higher or more than 1, then the rules that are formed are better and influence each other. Researchers determine the figure of 30% as a minimum support, and 50% as a minimum confidence.

4.2.1. User Profile and Social Media Behavior

There are five association rules, each that are formed with a minimum support of 30% and a minimum confidence of 50%, and all the rules that are formed have a lift value of more than 1. In the first cluster, users who use Facebook as the primary social media usually access between 11.00 to 15.59 to share moments through stories, photos, videos and more. The main activity on Facebook is shopping using the shop feature and direct messages to sellers. They are interested in the entertainment sector, and the expected benefits are as a medium for learning and a source of information. Users who use Instagram as the primary social media access between 16.00 to 20.59 to find products to buy and study product information. Its main activity is to find the latest information. They are interested in hobbies and activities, and the expected benefit is building personal branding from a professional perspective. Users whose primary social media is TikTok usually access it between 21.00 to 00.59 to socialize with others. Their main activity is interacting by exchanging messages and sharing posts. These users tend to be interested in shopping and fashion, and the expected benefits are as a place to share experiences and express themselves. Furthermore, users who use YouTube as their primary platform usually access it between 16.00 and 20.59, intending to look for entertainment content. The main activity on this social

media is browsing the homepage and browsing. These users are interested in food and drink and expect benefits from obtaining information and learning media. Then, users using WhatsApp as the main platform usually access it between 11.00 and 15.59 to socialize and connect with others. Their main activity is sharing stories, photos, statuses and videos. These users are interested in the entertainment sector, and the expected benefit of using social media is building personal branding.

In the second cluster, users who use Instagram as their primary platform usually access it between 16.00 and 20.59, intending to get the latest information and news. Their main activity is sharing through stories, photos, statuses and videos. These users are interested in shopping and fashion and expect benefits from information and learning media. Users whose primary social media is TikTok usually access it between 11.00 and 15.59 to look for entertainment content. Their main activity is interacting by exchanging messages and sharing posts. These users tend to be interested in food and drink, and the expected benefits are as a place to share experiences and express themselves. Furthermore, users who use YouTube as the main platform usually access it between 21.00 to 00.59 to find products to buy and study product information. The main activity on social media is seeking information. These users are interested in entertainment and expect benefits from obtaining information and learning media. Then, users using WhatsApp as the main platform usually access it between 16.00 to 20.59 to socialise and connect with others. Their main activity is exploring and browsing. These users are interested in shopping and fashion, and the expected benefits include obtaining information and learning media. Meanwhile, users who use Twitter as the main platform usually access it between 16.00 and 20.59 to fill their free time. Their main activity is to find the latest information and news. This user is interested in food and drink, and the expected benefits include obtaining information and learning media.

In the third cluster, users who use Instagram as their primary platform usually access it between 21.00 and 00.59 to socialize and connect with others. Their main activity is seeking information. These users are interested in food and drink and expect benefits from information and learning media. Users whose main social media is TikTok usually access it between 05.00 and 10.59 to look for entertainment content. Their main activity is shopping using the shop feature, direct messages to sellers, and others. These users tend to be interested in shopping and fashion, and the expected benefits are as a medium for learning and getting information. Then, users who use Twitter as the main platform usually access it between 05.00 and 10.59 to get the latest information and news. Their main activity is exploring and browsing. These users are interested in the entertainment sector, and the expected benefits are a place to share experiences and express themselves. Furthermore, users who use YouTube as their primary platform usually access it between 16.00 and 20.59 to fill their free time. The main activity on social media is interacting with users through comments or posts. These users are interested in food and drink and expect benefits from obtaining information and learning media. Whereas users who use WhatsApp as the main platform usually access it between 21.00 to 00.59 to fill their free time. Their main activity is exploring and browsing. This user is interested in the entertainment sector, and the expected benefits are obtaining information and learning media.

Table 2. Association rules between user and usage habits

Lift value	Support	Confidence	Consequent	Antecedent				
			Main platform	Main purpose	Main activities	Expected benefits	Access time	Interest
3.551	39.574	50	Facebook	Sharing moments	Shopping	Learning and gaining information	11.00-15.59	Entertainment
2.679	60.638	48.387	Instagram	Product research	Get latest information	Build personal branding	16.00-20.59	Hobbies and activity

Lift value	Support	Confidence	Consequent	Antecedent				
			Main platform	Main purpose	Main activities	Expected benefits	Access time	Interest
2.524	34.894	58.929	TikTok	Socialize	Interact with other users	Share experiences and express themselves	21.00-00.59	Shopping and fashion
2.276	67.447	53.061	YouTube	Entertainment	Browsing	Gain information	16.00-20.59	Food and drink
2.186	33.404	43.243	WhatsApp	Socialize	Sharing	Build personal branding	11.00-15.59	Entertainment

4.2.2 User Profile and Social Media Interaction Behavior

In the first cluster, users interact through post interaction through comments, likes, shares, reactions, and replies. The purpose of interacting with users is to fulfil emotional satisfaction and usually interact with friends or family. The thing that increases the desire of users to interact is if they want to share content that is considered relevant with others. They expect positive affirmations from others after interacting. Then in the second pattern, users interact through the live-streaming feature to be recognized by others. These users usually interact with accounts that share information and entertaining content, and interactions are made when they want to respond in the form of replies or comments. The expected feedback after interacting is to establish a good relationship or get new acquaintances. In the following pattern, users interact through group buying with communities with the same interests. The goal is to be known by many people, and they expect good relationships and new acquaintances. Usually, these users interact if there are features with action buttons such as polls, quizzes, and others to make them more interactive. In the following pattern, users interact by exchanging messages to exchange information. Usually, interactions are carried out with brand accounts and expect good relationships and new acquaintances after interacting. The main trigger for users to interact is if they want to respond in the form of replies or comments. In the following pattern, users usually interact via calls, voice notes, and video calls with friends or family. The goal is to improve the quality of social life and expect feedback in the form of a sense of belonging. The main trigger for users to interact is if they want to respond in the form of replies or comments.

In the second cluster, users interact through post interaction through comments, likes, shares, reactions, and replies. Interacting with users is to improve their social life, and it is common to interact with accounts that share information and entertaining content. The thing that increases the desire of users to interact is when they need information or help from other people. They expect to establish a good relationship or make new acquaintances after interacting. Furthermore, in the second pattern, users who interact through the live streaming feature aim to get entertainment. These users usually interact with influencer accounts or idol artists, and interactions are made when they want to respond in the form of replies or comments. The expected feedback after interacting is to get positive affirmations from others. Users interact through group buying with a brand account in the following pattern. The goal is to get satisfaction, such as pleasure and achievement. Usually, these users interact if they want to find some information or need help. The expected feedback is to gain confidence from the interaction. In the following pattern, users interact by exchanging messages to exchange information. Usually, interactions are with friends or family and expect good relationships and new acquaintances after interacting. The main trigger for users to interact is if they want to get information or need help. In the following pattern, users usually interact via calls, voice notes, and video calls with friends or family. The goal is to get entertainment and expect feedback by establishing a good relationship. The main trigger for users to interact is if they want to get new information or need help.

In the third cluster, users interact through post interaction through comments, likes, shares, reactions, and replies. The purpose of interacting with users is to get entertainment, and they usually interact with

accounts that share information and entertaining content. The thing that increases the desire of users to interact is when they need information or help from other people. They expect positive affirmations from others after interacting. Furthermore, in the second pattern, users who interact through the live-streaming feature aim to get emotional satisfaction. These users usually interact with friends and family, and interactions are made when they want to seek information or help. The expected feedback after interacting is gaining confidence. In the following pattern, users interact through group buying with communities with the same interests. The goal is to improve social life. Usually, these users interact if they want to find some information or need help. The expected feedback is to establish good relationships and make new acquaintances. In the following pattern, users interact by exchanging messages to exchange information. Usually, interactions are with friends or family and expect good relationships and new acquaintances after interacting. The main trigger for users to interact is if they want to provide feedback in the form of replies. In the following pattern, users usually interact via calls, voice notes, and video calls with friends or family. The goal is to get entertained and expect feedback from positive affirmations from others. The main trigger for users to interact is if they want to respond to the form of a reply.

Table 3. Association rules between user and interaction behavior

Lift value	Support	Confidence	Consequent	Antecedent			
			User interaction	Expected feedback	Increase interaction	Interaction purpose	Interact with
2.71	46.596	58.333	Post interaction	Gain positive affirmation	Share relevant content	Emotional satisfaction	Friends, family, acquaintances
2.762	55.745	57.812	Live streaming	Forge good relationships, or make new acquaintances	Give reaction	To be recognized by others	Accounts that share information, and entertaining content
2.688	45.532	66.667	Group buying	Forge good relationships, or make new acquaintances	Interaction (polling, Q&A, quiz, sliding scale, reaction)	To be recognized by others	Communities that share the same interests, hobbies or visions
2.856	49.787	67.073	Texting	Forge good relationships, or make new acquaintances	Give reaction	Exchanging information	Brands account
2.778	81.489	58.824	Call, voice notes, video call	Sense of belonging	Share relevant content	Improve social life	Friends, family, acquaintances

4.2.3 User Profile and Social Media Food Purchasing

In the first cluster, users who use Facebook when looking for information to purchase food usually prefer payment methods that vary from the transaction. Factors that increase purchase intention is if the brand provides an attractive product image, which is different from the previous study. The result from the previous study said that word-of-mouth is the variables that can increase purchase intention of the users. The possibility of not buying increases if the available payment methods are limited. The type of food that is often purchased is drinks. Then, users whose main platform is Instagram for buying food choose to shop online to save time and effort. The thing that determines a purchase is good reviews from other customers, and you do not want to buy if you see lots of bad reviews from previous purchases. The types of food that are often purchased are snacks or desserts. Furthermore, users who use TikTok as the primary platform for buying the food also like the various payment methods. They tend to buy a product with an attractive offer and do not want to purchase if the product information is unclear. The

type of food that is often purchased is fast food. Then, users who use YouTube as the main platform in determining food purchases also like the convenience of online shopping to save time and effort. They tend to buy a product if there are many good reviews from other customers and do not want to purchase if the product information is unclear. The type of food that is often purchased is fast food. Lastly, WhatsApp users also choose to shop online because of the convenience that saves time and effort. What increases purchase intention is a clear description of product information, and what decreases purchase intention is limited payment methods. The types of food that are often purchased are processed, preserved, or packaged food products.

In the second cluster, users who use Instagram when looking for information to purchase food usually like the ease and convenience of transactions. The thing that can increase the desire to buy is a good business image. The likelihood of not buying also increases if the business has bad reviews from other customers. The type of food that is often purchased is fast food. Then, users whose main platform is TikTok for buying food choose to shop online because there are many exciting offers and promotional content. The thing that determines a purchase is that there are attractive offers, and they do not want to buy if the payment methods provided are limited. The type of food that is often purchased is drinks. Furthermore, users who use YouTube as the primary platform for purchasing food also like the convenience and comfort when making purchase transactions. They tend to buy products if a business creates content in the form of promotional videos for its food products, and they do not want to make purchases if there are bad reviews from previous customers. The types of food that are often purchased are desserts and snacks. Then, users who use WhatsApp as the primary platform for determining food purchases also like the ease and convenience of making transactions. They tend to buy a product if there are many good reviews from other customers and do not want to purchase if there are bad reviews from previous purchases. The type of food that is often purchased is fast food. Finally, Twitter users choose to shop online because of its convenience, which saves time and effort. What increases purchase intention is clear product information descriptions, and what decreases purchase intention is incomplete product information. The type of food that is often purchased is the main food product.

In the third cluster, users who use Facebook when looking for information to purchase food usually shop online to save time and effort. The thing that can increase the desire to buy is if a business has an attractive offer. The likelihood of not buying also increases if the business has bad reviews from other customers. The type of food that is often purchased as dessert or snacks. Then, users whose main platform is Instagram for buying food choose to shop online because of the perceived convenience and comfort. The thing that determines the purchase is if there is an attractive image of a food product, and they do not want to buy if the business image is not good. The type of food that is often purchased is the main food. Furthermore, users who use TikTok as the primary platform for buying food like the many attractive offers and promotional content in shopping online. They tend to buy products if a business creates content in the form of exciting videos to promote its food products, and they do not want to make purchases if the product promotion offers are less attractive. The types of food that are often purchased are processed, preserved, or packaged food products. Then, users who use Twitter as the primary platform for determining food purchases also like shopping online because it saves time and effort. They tend to buy a product with many attractive offers and do not want to purchase if there are bad reviews from previous purchases. The type of food that is often purchased is fast food. Finally, YouTube users choose to shop online because of its convenience, which saves time and effort. What increases purchase intention is promotional video content for food products, and what decreases purchase intention is a bad image of a business. The type of food that is often purchased is fast food.

Table 4. Association rules between user and food purchase behavior

Lift value	Support	Confidence	Consequent	Antecedent			
			Main platform for food purchase	Online purchase preferences	Increasing purchase intention	Decreasing purchase intention	Type of food
2.038	34.043	51.923	Facebook	Various payment methods	Attractive food product images	Limited payment method	Beverages
2.005	34.468	53.846	Instagram	Save time and energy	Positive reviews from other customers	Negative reviews from other customers	Dessert
2.091	33.404	51.471	TikTok	Various payment methods	Interesting offers	Insufficient and incomplete product information	Fast food
2.227	39.362	58.824	YouTube	Save time and energy	Positive reviews from other customers	Insufficient and incomplete product information	Fast food
2.372	36.809	49.275	WhatsApp	Save time and energy	Clear and complete product information	Limited payment method	Processed food products

4.2.4 User Profile and Social Media Marketing Preferences

In the first cluster, users who like promotions from interesting events usually decide to make purchases from recommendations by acquaintances. They find promotional content via the homepage or explore features and like educational content. These users trust a brand based on the quality of the content shared. In the following pattern, users who like promotions with accumulated points usually buy based on personal experience. They find promotional content from paid ads, and the content they like is interactive so that they can participate. These users can trust a brand if they have credible social media accounts. Furthermore, users who like promotions in product price discounts usually make their purchasing decisions based on the rating of a good product or brand. They find promotional content from the homepage or explore and like entertainment content. The determining factor in trusting a brand is if it has positive feedback from its customers. Then, users who like promotions from their payment methods usually buy from acquaintances' recommendations. They also find promotions from the homepage or explore features and like content in user-generated content. The main factor in trusting a brand is its convincing social media accounts. The last pattern is that users who like promotions with gift giving also choose to make purchases based on a good product or brand rating. They find promotions on the homepage or explore and like story-telling content. The determining factor in trusting a brand is the quality of the content shared.

In the second cluster, users who like promotions from interesting events usually decide to make purchases from personal experience. They find promotional content through the homepage or explore features and like entertainment content. These users trust a brand based on positive feedback from customers. In the following pattern, users who like promotions with product price discounts usually buy based on the product or brand rating. They find promotional content from content shared by friends, and the content they like is user-generated. These users can trust a brand if they share quality content. Furthermore, users who like promotions in the form of offers with payment methods usually make their purchasing decisions based on recommendations from acquaintances. They find promotional content from the homepage or explore and like story-telling content. The determining factor for trusting a brand has a credible social media account. Then, users who like promotions with gift giving usually make purchases based on product or brand ratings. They also find promotions from the homepage or explore features like educational content. The main factor in trusting a brand has positive feedback from its customers. The last pattern is that users who like promotions with special offers also choose to make

purchases based on the ratings of a good product or brand. They find promotions from content shared by friends and like this type of user-generated content. The determining factor for trusting a brand is based on the positive feedback given by its customers.

In the third cluster, users who like promotions from interesting events usually decide to make purchases from acquaintances' recommendations. They find promotional content through the homepage or explore features and like story-telling content. These users trust a brand based on positive feedback from customers. In the following pattern, users who like promotions with product price discounts usually buy based on the product or brand rating. They find promotional content from the homepage or explore, and the content they like is user-generated. These users can trust a brand if they have positive feedback from previous purchases. Furthermore, users who like promotions in the form of offers with payment methods usually purchase decisions based on the rating of a product or brand. They find promotional content from content shared by friends and like this type of educational content. The determining factor in trusting a brand is sharing quality promotional content. Then, users who like promotions with gift giving usually make purchases based on brand awareness. They also find promotions from the homepage or explore features and entertainment content types. The main factor in trusting a brand is sharing quality promotional content. The last pattern is that users who like promotions with special offers also choose to make purchases based on the ratings of a good product or brand. They find promotions from the homepage or explore and like story-telling content. The determining factor for trusting a brand has a credible social media account.

Table 5. Association rules between user and social media marketing preferences

Lift value	Support	Confidence	Consequent	Antecedent			
			Type of promotion	Factors of trusting brand	Influence of purchase	Find promotion	Type of content
2.568	45.319	59.649	Interesting events	Based on the social media content	Word-of-mouth	Explore, home feeds	Education
3.852	43.617	56.364	Rewards promotion	Trusted and verified account	Personal experiences	Paid advertisement	Interactive content
2.794	54.894	63.462	Discount	Positive feedbacks	Products rating	Explore, home feeds	Entertainment
3.774	46.596	64.583	Credit cards offer	Trusted and verified account	Word-of-mouth	Explore, home feeds	User-generated content
2.497	33.617	61.702	Gift giving	Based on the social media content	Products rating	Explore, home feeds	Story telling

5. Implications

Most users use Instagram, Facebook, TikTok, YouTube, TikTok, and Twitter. Marketers can use social media, but if they want to be more specific, they can target the platform where their audience is. Then, marketers can also target audiences based on their characteristics and habit patterns, as well as their characteristics. For example, in the fourth rule in the first cluster or smart user, users who use YouTube aim to find entertainment content; their main activity is browsing on the homepage; the expected benefit is information accessed from 16.00 to 20.59 and interested in the food and drink sector.

So, to prepare a strategy by creating entertainment content such as a trending challenge about a food product. This is done so that the content created is relevant to exist trends and can enter the homepage of audiences interested in similar content. Then, in the second or risk-averse cluster, where users are

dominated by people who are already working, they can become the target audience for brands that have products at higher prices. These users also have less free time, so marketers need to be able to utilize the most effective social media platforms and engaging content with shorter attention spans. In addition, if a brand wants to expand more broadly in marketing, it can use Instagram, TikTok, and YouTube, which are of interest to all clusters in terms of usage.

This research shows that most users interact on social media with posts such as liking, commenting, sharing, reacting, and replying. In addition, users in the three clusters also primarily interact by exchanging messages and through live streaming. For this reason, marketers can strategize how to build good relationships with their audience. This is because, currently, just reaching the audience is not enough for marketing success, but brands must also be able to continue to be engaged with their audience. Based on the association rules obtained, a brand can use the information to develop a marketing strategy with a high engagement rate. For example, in the first rule of association in the third cluster or persuadable user, users interact with informative accounts by post interactions, aim to seek entertainment, interact if they want to seek information, and expect positive affirmations after interactions. So, brands can promote their products with informative content at times that are usually accessed by the third cluster and carry out paid promotions with accounts relevant to the target audience. With the association rules obtained, a brand or marketer can prepare a marketing strategy to increase the engagement rate in its promotions. In the three clusters formed, there are similarities where all users interact to improve their social life. Marketers can utilize this by creating promotional campaigns involving activities to improve social life, for example, by holding challenges, creating photo competitions under one hashtag, and so on.

The three user clusters usually use Facebook, Instagram, TikTok, YouTube, WhatsApp, and Twitter to seek information about a food product. The analysis results also show the types of food often purchased by users from each cluster and in addition, users also like online shopping because of its convenience and comfort, various payment methods, and interesting offers. By considering these three factors, a brand can include the benefits offered in every shared promotional content. For example, by providing information on accepted payment methods, e-commerce applications that can be used to place orders, and offers that customers will get in transactions. Marketers and brands can use this research's pattern of association rules to develop marketing strategies regarding what to offer their prospective customers. For example, in the second association rule pattern in the second cluster or risk-averse user, most users use TikTok in searching for information on food products; their preferences are attractive offers, usually buy beverage products, want to make purchases if there are attractive offers, and do not want to make purchases if payment methods are limited. Therefore, marketers can promote their business with TikTok by providing attractive offers and providing complete information about how to order and payment methods.

In addition to studying user habits, how to interact, and what they want in making purchases, this research also studies what users like in terms of promotional content on social media. The types of promotions most in demand by all user clusters are product price discounts, exciting events, and special offers. This shows that currently, in order to attract potential customers, it is not enough just to cut prices. Marketers must also be able to devise promotional strategies by holding events such as contests or giveaways, special offers on certain days, and offers with product bundling. That way, potential customers will be more engaged with the brand and get more value from their shopping experience. In developing a marketing strategy, marketers must be able to prepare the best content because this content will generate traffic, and the traffic will generate profitable transactions for the company. In compiling content, there are several things to consider, namely the type of content, the type of promotion, factors that make the target audience believe in the brand, factors that increase the target audience's intention to make purchases, and how this content can reach the target audience. This research produces association rules between user profiles and promotional content preferences on social media. A brand or marketer can use these rules to arrange promotions and the best content that suits their target audience.

For example, in the fifth association rule pattern in the second cluster or risk-averse user, users choose the type of promotion in the form of a special offer, trust the brand based on previous purchase feedback, the rating is a factor that increases purchases, gets content from friends or acquaintances, and likes this type of content. In the form of user-generated content. This information allows marketers to compile informative content and insert customer reviews or influencers who have tried their products. Besides that, brands can also offer offers in the form of bundling or discounts if you make purchases on certain days. Then, for the content to reach the target audience, it must be of high quality and engaging so that people who see it can share it with people they know.

6. Conclusion, Limitation, and Future Works

According to the result of this study, there are 3 segments of social media users which are smart users, risk-averse users, and persuadable users. Smart users' characteristics are considering many factors before deciding to purchase. This segment's majority is students, so their main purpose of using social media is for gaining information and making social connections. Therefore, based on the association rules created, using influencers in the same niche is the best way to reach this users segment. Moreover, since most of this cluster are gen Z, they are more likely to share their experiences in their own page and this will also be increasing word-of-mouth marketing.

The second cluster is risk-averse users. This cluster dominated by career women, so they are more experienced in online shopping. They are more aware and cautious about their safety, and the factor that affects purchase intention is the brand itself. Based on the association rules, to target this segment of users, brands must build trusted and reliable social media profiles. In every marketing campaign, brands also must include detailed information about the products, offers, payment methods, and how to buy their products. It is a plus point if the brand also has their own website. To engage in daily basis, educational contents are the best way to connect with this segment, since they like to gain information from their social media activities.

The last cluster is persuadable users. Most of this cluster is female students and looking for entertainment in social media. They are more likely easy to persuade in purchasing brand's product, using social media marketing. Based on the association rules, the best marketing strategies to reach this target is attractive visual content. Therefore, the brands have to invest more in better videography to reach this segment. In addition, this segment also likes to participate in many marketing campaigns or events. With this information, brands can hold a fun and trending challenge, giveaway, live streaming, and contest to attract this user's segment.

This research has discovered three user segments, and several association patterns that can help marketers or a brand to be able to understand their target audience in developing social media marketing strategies. Business owners can use social media that suits their target audience, prepare appropriate marketing content, and provide relevant information to attract their targeted customer. In social media marketing, a brand must always follow existing trends, establish good relationships with potential customers, follow user habits, and provide offers that best suit the target audience to be successful in marketing. In existing studies about social media marketing, they are more focused on best practices on using social media for marketing. Therefore, this research contributes by providing more information focused on social media users. Understanding social media users will add more value and benefits for marketers to a better decision on developing social media marketing strategies.

From the research, there are several limitations and suggestions from researchers for the future works. First, future work can be done by using a large-scale customer database with sufficient data to obtain more accurate results. Second, future research should consider using different data mining methods or algorithms. Third, future research can focus on different industries, and or different countries. This is because every industry has different audience characteristics, and each country has its own social media culture. Lastly, future research can use other social media that is more common in the country or industry targeted by the researchers.

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