

Big data analytics for investigating Taiwan Line sticker social media marketing

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Abstract

Purpose – Line sticker, a social media, it allows users to exchange multimedia files and engage in one-to-one and one-to-many communication with text, pictures, animation and sound. The purpose of this paper is to examine various Taiwan user experiences in the Line sticker use behaviors. Further, this research looks at how the situations of Line sticker proprietors and their affiliates are disseminated for formulating social media marketing (SMM) in its business model concerns.

Design/methodology/approach – This study examines the experience of various Taiwanese Line stickers users utilizing a market survey, a total of 1,164 valid questionnaire data, and the questionnaire is divided into five sections with 30 items in terms of the database design. All questions use nominal and order scales. This study develops a big data analytics approach, including cluster analysis and association rules, based on a big data structure and a relational database.

Findings – The authors divide Taiwan Line sticker users into three clusters by their profiles and then find each group's social media utilization and online purchase behaviors for investigating the Line sticker SMM and business models.

Originality/value – This is the first study to offer a big data analytics to investigate and analyze the varieties in the use of Line sticker by exploring users' behaviors for further SMM and business model development.

Keywords Social marketing, E-marketing, Database marketing, Media (new media)

Paper type Research paper

Introduction

The sticker is a digital image used in electronic communication to express a particular idea or feeling. A sticker is a kind of emoticons or characters, but these emoticons or characters of a sticker are different in the way of illustration and variety (Griffith, 2015). Emoticons, a combination of emotions and icons, developed as pictorial representations of facial expressions to share an individual's feelings in emails and messages. It is an example of meta communication using punctuation marks, numbers and letters akin to a wink and (expressing sadness) in computer-mediated communication. However, since people can easily misinterpret the intended meaning of emoticons, users prefer to use graphic emoticons, available on messaging apps and social media, to express their feelings or mood more clearly (Lee, 2017). Character merchandizing is a term referring to the licensing, production, marketing and consumption of goods and media based around the image of a character (World Intellectual Property Organization, 1994). In an expanded sense, this is a practice depending at once on the thingification of the character image (the becoming-everyday-thing of the image – in the form of people, things, events, human relationships and even feelings, all of which become bearers of the character image) and the environmental diffusion of this thingified image (Steinberg, 2017). Therefore, stickers are typically pictures or animations of a cartoon character, or even a celebrity, allowing users to express their emotions, moods and actions. Their elaborate and character-driven nature clearly portraying body language and facial expressions offers users a greater variety of ways to express their feelings. App users like to use e-stickers to communicate with friends because e-sticker allows them to express opinions and feelings (Griffith, 2015). The stickers thus offer themselves as a site for thinking about the ubiquity of a media or social media.









Line sticker, a social media, was developed by NHN Japan Corp. and first released in 2011. It is now available in 10 languages and is used by 1bn people worldwide (Su, 2018). It allows users to exchange multimedia files and engage in one-to-one and one-to-many communication with text, pictures, animation and sound. Users can make voice and video calls for free, and they can play games, such as puzzles, match-three and battle. Line has a sticker shop from which users can download free or paid e-stickers. Social media research defines this kind of media ecosystem as a combination of the processes, systems, operations and devices that produce, mix and disseminate media content including text, image, sound, films and multimedia (Kallinikos and Mariategui, 2011) to fulfill audiences' needs (Adner and Kapoor, 2010). In the Line business model, e-stickers are operated on messaging app software on a computer, smartphone or tablet platform. App developers consider users' daily needs to design various kinds of apps that suit their demands, including games, maps, weather, dining and travel (Khalaf, 2015). Users can download and install apps on their computers, smartphone or tablet with a simple click. Following authentication, messaging apps allow users to add other users to their circle of app friends (Khalaf, 2015) to whom they can send pictures, sound, e-stickers and text messages. These apps have not only changed how people interact with one another, but they have also become a new social media business model based on not only brand marketing but also merchandise sales. In terms of Line user penetration rate, Japan has a total population of about 126m, in which LINE has about 70–80m users; Taiwan has a total of 23m, but LINE has more than 21m users. Comparing with other social media such as Facebook, WhatsApp or WeChat, Line has most social media user penetration rate in Taiwan (Tang, 2018). Thus, this study considers Taiwan Line sticker as a social media tool in terms of investigating users' behaviors and its business model development.

The two classifications of LINE stickers are emotion stickers and situation stickers. Emotion stickers mainly express individual facial expressions and emotions to convey specific emotional conditions. Emotions are any conscious experience characterized by intense mental activity and a high degree of pleasure or displeasure including like, anger, sad, happy. For example, for descriptions of our feelings that we are in a dangerous situation, a sticker is integral to the experience of our feeling of fear. These kinds of emotion stickers belong to a tacit classification. On the other hand, situation stickers describe a real event, location, people or object that is occurring and the conditions existing at a particular time and place belong to an explicit classification sticker (Lim, 2015) (Table I).

This study examines various Taiwan user experiences in the Line sticker business model development. Further, this research looks at how the situations of Line sticker proprietors and their affiliates are disseminated through online marketing for formulating social media marketing (SMM) in its business model concerns. Based on these considerations, the purposes of this research can be simplified as follows: first, segment Line stickers users by their social network community information utilization behaviors. Second, explore the interrelationships existing between participation motives and the utilization of stickers employed by social

Table I.
Classifications of
emotions and situation
stickers

Emotion sticker			Situation sticker		
Facial expression for surprise	Emotion for happy	Emotion for love	Busy situation	Objects for sale	I am sick
					

media site users. Third, explore the information on how online purchase distribution channels shared on the social media affect Line sticker users' intended purchases. Fourth, segment Line sticker users by their behaviors, so corporations can develop a pertinent marketing proposal that mixes and matches appropriate interactive tools in SMM. Fifth, devise an effective service mechanism for developing an integrated SMM model for Line and other SMM firms.

Literature review

Social media

Social media platforms provide the key affordance of “communicative fluidity,” where communication can be more seamless because the multiple channels users can tap to express themselves (Kusumasondjaja, 2018). Besides just text, users can communicate via photographs, videos, emoji, TV and stickers, on top of voice and video calls (Daellenbach *et al.*, 2015). The visual richness of social media enables users to make explicit feelings that cannot be articulated in words, while graphical representations such as stickers can lend messages an air of interpretability. Users also can strategically and dynamically choose the best means by which to express their emotions, opinions and intentions to attain communicative fluidity (Treem *et al.*, 2015). However, the rigid scripting underpinnings the vocabulary of social media can also compel users to communicate in ways they find forced and inauthentic (Lim, 2015; Zhao *et al.*, 2019). In terms of online SMM, e-sticker marketing exhibits substantial potential for mobile-commerce channels. It leverages the expansive power of SMM to spread brand influence to the circle of friends of the user. Among various e-stickers formats, messaging apps involving e-stickers dominate the market (Knight, 2013). Competing apps, such as Line, enable companies to promote branded emoticons and text. The use of stickers has become an innovative method of expanding market reach and SMM (Lomas, 2013).

Social media marketing

In the case of Line, the emerging channel of SMM, has attracted the attention of marketing practitioners and researchers (Zhang and Luo, 2016). These media not only permit users to express comments and opinions on products, people, organizations and many other entities, but also enable users to build various social relationships (Ananda *et al.*, 2019). With these social relationships, opinions will have greater impact on users than those expressed on other channels because people believe or more easily accept the opinions of those with whom they have social relationships. In addition, the influence of opinions on SMM can be disseminated more widely and quickly than that of other channels (Gökerik *et al.*, 2018). Thus, some user opinions captured on SMM can greatly influence other users' buying decisions or their views on certain companies (Oberoi *et al.*, 2017). In this regard, many business entities have recently come to recognize this phenomenon, and some companies have begun to identify certain users of SMM to conduct online marketing and reputation management (Wang and Kim, 2017) in e-commerce and e-business. For companies to better utilize SMM for cost-effective, targeted marketing and reputation management, they must address an important question, given the huge number of social network users and companies' limited budgets. This brings up the question of which users' opinions will most influence others' actions. If the most influential group of target users could be identified, companies could consume minimal resources to improve product sales and enhance their reputations (Salo, 2017).

Big data analytics

Big data solves the problem of traditional data processing applications; however, these applications are insufficient to handle large or complex datasets (Lim *et al.*, 2019). Big data characteristics include capturing data, data storage, data analysis, searching, sharing, transferring, visualization, querying, updating, mining and information privacy in a database

(Calder *et al.*, 2016). There are three dimensions to big data: volume, variety and velocity (Laney, 2001). Big data typically contains more data than traditional software can handle in an acceptable amount of time (Rathore *et al.*, 2018). Databases and data warehouses are used in big data technology as a basis to organize and model large and complicated data for further big data analytics (Jukić *et al.*, 2015; Wang and Wang, 2016). Due to recent technological advances in data processing, the release of new data and the high transparency requirements of most governments and businesses around the world, large data analysis is becoming more and more prominent. This is termed big data analytics (Al-Jarrah *et al.*, 2015). Big data analytics now refers to the use of predictive analytics, user behavior analytics, or certain other advanced data analytics methods that extract value from data, not to a particularly large data set (Trieu, 2017). In terms of data analysis and computation, big data analytics discovers significant knowledge, such as patterns, associations, changes, anomalies and significant structures, from large amounts of data that are stored in databases, data warehouses or other information repositories (Fonseca and Cabral, 2017). There are also many applications of big data analytics, such as data/text mining, including association rules, sequential patterns, queries, grouping analysis, classification analysis and probabilistic heuristic analysis (Choi, 2018; Liao *et al.*, 2012). Knowledge of Line sticker users and their online purchasing behaviors extracted by big data analytics can be integrated into marketing and business knowledge from research and then provided to social media business in terms of business model development.

Research design

Research framework

The research framework is shown in Figure 1. It outlines the questionnaire to examine the Line sticker users' behavior on sharing their information and the social interactive tools of the label. This survey facilitated the data set and compiled into a big data structure and a relational database for analyzing the user behaviors of line stickers. In this study, the behavior of Line communities was studied in the field, and preliminary data and secondary data were collected.

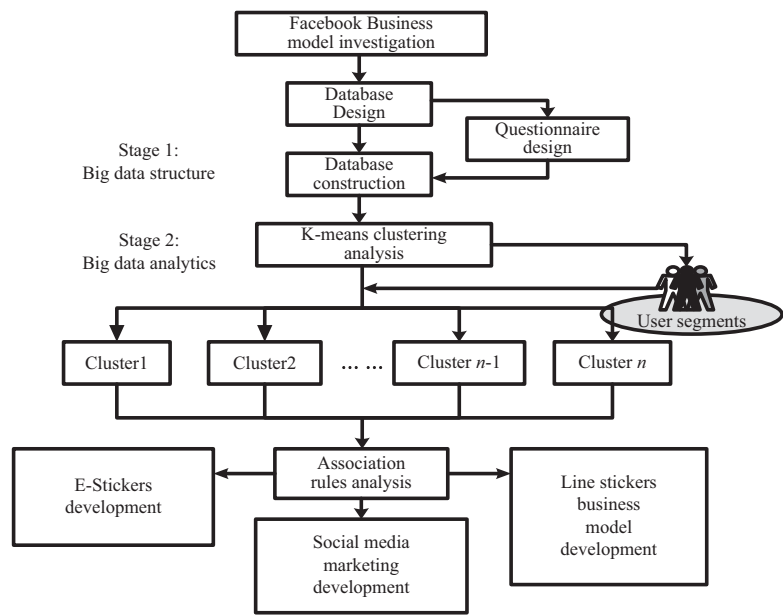


Figure 1.
The research
framework

The questionnaires that are answered collect data that contains the database architecture and use the built database to divide the users by the behaviors shown in the analysis results. The big data analytics, K-means clustering analysis and association rules, was make use of for depth analyses that the similarity and difference summarized by the inherent behaviors of Line sticker users were examined through the contexts of “Online Information and Purchased Items” and “Line stickers Community Utility Operative Attitude.” In this regard, this study proposes a suggested e-stickers and business model development for the Line sticker SMM context.

Subject background

The online questionnaire was sent to individuals through messages on Line users in Taiwan. This was most effective way to distribute the questionnaire and thus receive primary data for this research. This research began with questionnaire distribution from April 13, 2016 to September 1, 2016. A total of 1,200 questionnaires were answered and returned. After discarding incompletely, inappropriately or excessively answered questionnaires, the remaining 1,078 questionnaires were incorporated into the database. The effectively return rate for the questionnaires was 89.83 percent. By analyzing the surveyed users' data, it was found this database had a higher proportion of female participants of 58.8 percent, compared to male participants of 41.2 percent. For age, 59 percent of the adults were between 20 and 40 years of age, 20.7 percent were below 20 years of age, and 20.3 percent were above 40 years of age. Most were university graduates, comprising 66.8 percent of the surveyed users, and those who had completed postgraduate studies comprised 14.9 percent. With regard to their social media behaviors, 77 percent of these surveyed users had used social media for more than seven years, followed by those who had used it for more than five years. Users with less exposure comprised 13 percent of the total surveyed users. There were 81 percent of the users who spent three to 5 h each day using Line. The most popular device for participation was a smartphone, equaling 65 percent. The popular locations chosen for surfing were on campus (48.36 percent) and the office and at home (45.07 percent) (multiple answers permitted). A total of 68.54 percent of the users specifically enrolled in social media information as their main purpose for using Line. This was followed by users obtaining information on dynamic messaging (33.68 percent). Interpersonal relationships were also noted among these users (27.16 percent). In addition, 96 percent of subjects were experienced in online purchase and electronic commerce.

Questionnaire design

The questionnaire design of this study is divided questions into five parts with 30 items. The first part (subject background): reading basic information, to determine demographic statistics, such as gender, age and education level, a total of six items. The second part (Line sticker use behaviors): including main purpose, sticker information source, free/pay mode, situation sticker use behaviors (free to pay), emotional sticker use behaviors (free to pay), situation sticker use behaviors (pay), emotional sticker use behaviors (pay), Line sticker categories, companions and satisfactions, a total of ten items. The third part (social media interaction): including interactive subjects and behaviors, a total of two items. The forth part (online purchase behaviors): including business information, group purchasing, online purchasing behaviors, purchase categories, product deliver ways and pay ways, a total of eight items. The fifth part (online services): including Line functions, Line social network, Line business model and Line community, for a total of four items. All questions are designed as the nominal and order scales (not the Likert scale). All items are designed as a multiple choice question. For example:

What kind of emotion do you express using your LINE sticker? (Multiple choice)

①Happy ②Angry ③Sorrow ④Scared ⑤Fear ⑥Love ⑦Abashed ⑧Other

(Please list the top three rankings of your preferences / /)

A big data structure – relational database development

The concept of relational databases was first developed in the 1970s by Codd to represent interrelated data in the form of a table (Codd, 1970). It applied the concept of the entity in business environments, where the data attributes between entities and their relationships were explored to interpret events that occurred and messages that ensued. The term entity is used to describe an important object, event or concept existing within a corporation for its ontological objectivity. Data attributes are used to describe entities' characteristics. The interrelationships between these attributes were explored by the formulated questionnaire that gave rise to seven entities, three existing relationships, and 67 attributes. In this study, the relational database contains six entities, five relationships and 59 attributes (Figure 2).

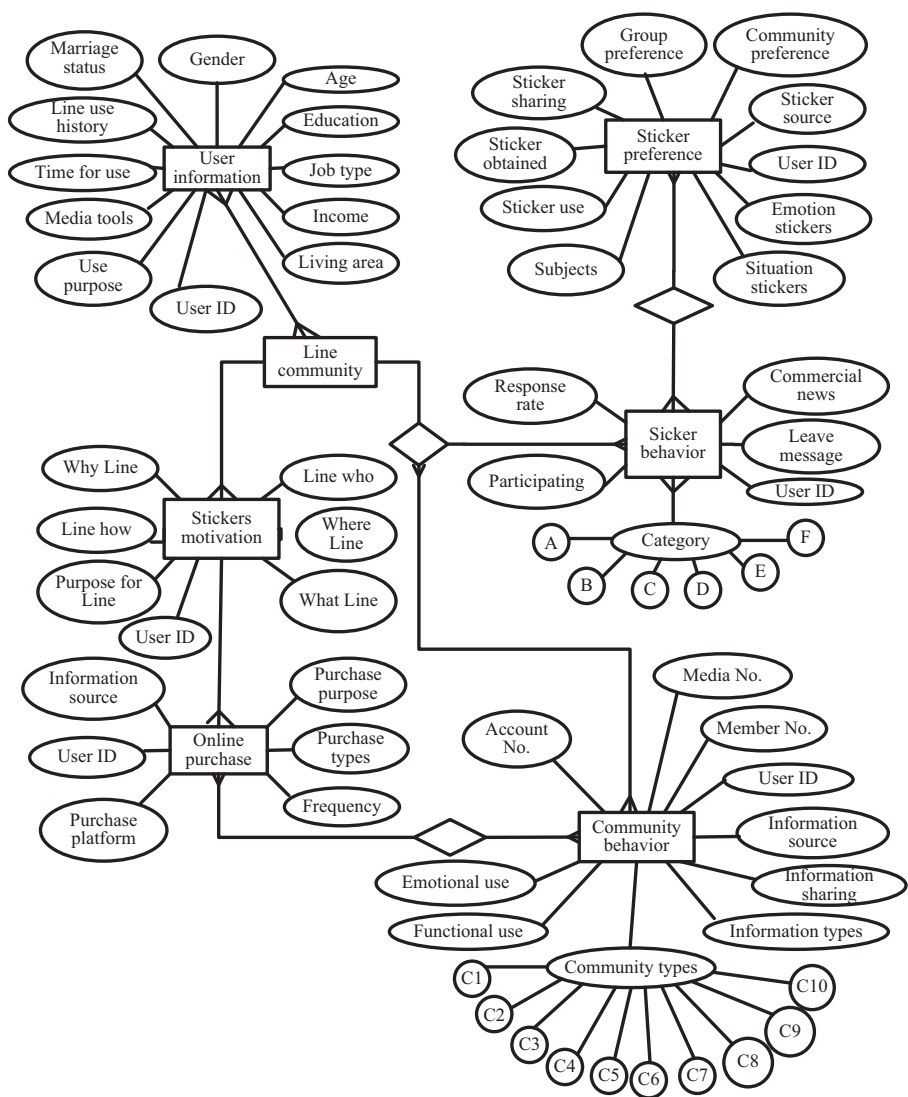


Figure 2.
A big data structure –
relational database
development

Big data analytics

The databases for this research were constructed through a surveyed questionnaire under randomized sampling. The questionnaires used online distributions that reached social network communities, to explore various online behaviors of Line users. There were six structural components in the questionnaire, encompassing the basic information of Line users, sticker motive for the Line community, participating preference in the Line community, Line promotion, online shopping preference and Line community types. In addition, other investigated issues included sites for online shopping platforms, purchased items, information gathering behavior and the degrees of acceptance of online channels. This research employed the SPSS Modeler to analyze data using K-means clustering, followed by application of the *a priori* algorithm, association rules, on each cluster to analyze the association rules.

Big data analytics results

Cluster analysis

Cluster analysis for data mining was applied to partition Line sticker users in their social media community participation behavior and interaction patterns. The data were analyzed by the K-means clustering algorithm under eleven cluster variables that included “demographic data”, “pay/free stickers source,” “emotion/situation stickers,” “online purchase behaviors,” “emotional expression,” “social media interaction,” etc. The *a priori* algorithm was applied to determine the associations between each cluster. With the six structural components construed in the questionnaire, 58 subcomponents were created: “user basic information,” “social network community participation motive,” “social network participation behavior,” “facebook promotion,” “online purchase and consuming preference,” and “brand tracking.” These subcomponents became the foundation for the clustering process. The data samplers were incorporated into the SPSS modeler, where a K-means clustering algorithm partitioned the database constituents into two clusters: cluster 1 (297 data entries) and cluster 2 (303 data entries). This study employs K-means clustering algorithm for analyses, and 11 structural components from the formulated questionnaire were used as the clustering variables. This was followed by the association analyses conducted by the *a priori* algorithm, as shown in Table II:

- (1) Save money petty bourgeoisie cluster: this cluster group is single and female, aged from 20 to 40 years old, with disposable income of NT10,000–NT15,000 per month, preferring to use free and paid stickers. Their main expressions of the situation and emotion are the use of stickers, such as your own mood; thank you. In the LINE chat group, they interact with individuals or groups engaged in the main behavior to share the information/text/video/pictures with others. The main purpose for terming this group as a save money petty bourgeoisie cluster is the economic capacity of this cluster is limited, but it is good at expressing itself and sharing the information known about them and also it is highly sensitive to price and popularity. Their online purchase product/service include music, games, clothes and 3C products.
- (2) Self-centered income cluster: this cluster group is single female, aged from 20 to 40 years old, disposable income of more than NT15,000–NT25,000 per month, prefer to use free stickers, LINE cartoon stars (such as big bear, rabbit); the use of free stickers and mainly use the emotional stickers. In the LINE chat group, they interact with the individual or group engaged in the main behavior of sharing the product/information with others to express their opinions or preference rankings. The main purpose of terming the group a self-centered income cluster is they are more conservative in their spending power, and they will share product information or express their opinions with others. Their online purchase product/service include cosmetic, expertise knowledge, clothes and fashion products.

Table II.
K-means clustering
results

Data mining approach Cluster	Cluster 1	K-means clustering Cluster 2	Cluster 3
Participant profile	Save money petty bourgeoisie cluster This cluster is comprised of single-females, limited purchase capability and positive on replacing Line stickers	Self-centered income cluster This cluster is comprised of single-females, consumption independent, personal opinion of brand and product selection	Home high-income cluster This cluster is comprised of married males, consumption independent and positive in sharing their information
Sample size	462	349	267
Gender	Female (69.5%)	Female (51.6%)	Male (50.2%)
Age	20–40 years old (57.1%)	20–40 years old (59.0%)	20–40 years old (62.2%)
Disposable income	10,000–15,000 NT dollars	15,000–25,000 NT dollars	Exceed 25,001 NT dollars
Marital status	Single	Single	Married
Pay/free stickers source	Both	Free	Free
Emotion/situation stickers	Emotion stickers	Both	Emotion stickers
Sticker type preference	Line original stickers Cartoon figure stickers	Virtual role stickers Cartoon figure stickers	Cartoon figure stickers
Emotional expression	Personal mood Appreciation	Concern Appreciation	Encourage Appreciation
Social media interaction	Share personal video/ pictures information with others	Share product/opinion/ purchase information with others	Share different issues and personal opinions with others
Online purchase product/ service	Music, game, clothes and 3C products	Cosmetic, expertise knowledge, clothes and fashion products	Expertise knowledge, database, food, sporting goods and magazines

- (3) Home high-income cluster: this cluster group is married men, aged from 20 to 40 years old, disposable income of more than NT25,001 per month, prefer to use a free map, the main emotional map. When they use a free sticker, it is mainly an emotional sticker; the preferred sticker type is a LINE cartoon star (such as a bear or rabbit); thanks for the main expression by using a sticker. In a LINE chat group, the main interaction in the group is to discuss various issues or their own opinions. The main purpose of terming this group a home high-income cluster is this cluster is mostly married men but their disposable income is higher than other clusters. Their online purchase product/service include expertise knowledge, database, food, sporting goods and magazines.

Association rules analysis

The needs of the SPSS modeler user will map people anthropomorphically; the LINE sticker of the characters in the role, with a career, personality, full interpretation of the user's life, in the same subject with different expression levels (Figure 3).

Pattern 1: analysis of line sticker users' preference and types

Under the criterion for minimum antecedent support of 6.71 percent and minimum rule confidence of 63.89 percent, four significant association rules were derived, as shown in Table III. According to the association rule, we can see the main type of sticker is the situation and emotion stickers and the information source is mainly obtained through the

Line app store and recommendations by friends/colleagues/classmates. In addition, the stickers could be free or require payment. The main motivation is for communication needs and to express emotion. The purposes of downloading or purchase them are practical and style preferences.

Under the criterion for minimum antecedent support of 5.16 percent and minimum rule confidence of 83.33 percent, four significant association rules were derived (Table IV). According to these association rules, we can see the information source is mainly obtained through the Line app store and recommendations by friends/colleagues/classmates. In addition, the stickers could be free or require payment. In addition, the main motivation is to enhance friendships and pursue fashion. The purposes of downloading or to purchase them are practical and cartoon figure preferences.

Under the criterion for minimum antecedent support of 5.16 percent and minimum rule confidence of 83.33 percent, four significant association rules were derived (Table V). According to these association rules, we can see the information source is mainly through the Line app store and friends/colleagues/classmates recommendations. In addition, the

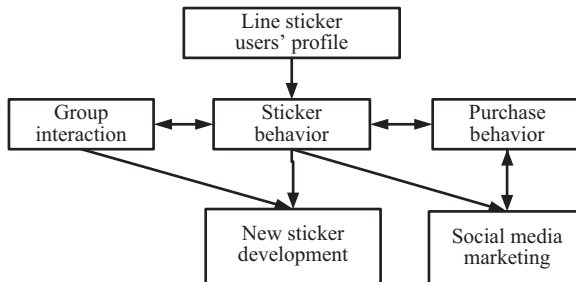


Figure 3.
Association rule
analysis model

Rule	Lift	Sup.	Conf.	Consequent Sticker types	Motivation	Antecedent Source	Pay/free	Purpose
R1	2.03	6.71	54.84	Situation stickers	Communication	Line app store	Both	Practical
R2	1.85	6.06	50.0	Situation stickers	Communication	Friends, colleagues, classmates	Both	Style preferences
R3	1.51	7.79	63.89	Emotion stickers	Express emotion	Friends, colleagues, classmates	Free	Practical
R4	1.41	9.09	59.52	Emotion stickers	Express emotion	Line app store	Both	Practical

Table III.
Association rules of
user profile and
sticker behavior
preference (Cluster 1)

Rule	Lift	Sup.	Conf.	Consequent Sticker types	Motivation	Source	Antecedent Pay/free	Purpose
R1	2.06	4.01	64.29	Situation stickers	Enhance friendships	Line app store	Pay	Cartoon figure preferences
R2	1.37	3.44	83.33	Emotion stickers	Fashion	Friends, colleagues, classmates	Free	Practical
R3	1.37	4.01	42.86	Situation stickers	Enhance friendships	Friends, colleagues, classmates	Free	Practical
R4	1.01	5.16	61.11	Situation figures	Work needs	Friends, colleagues, classmates	Free	Practical

Table IV.
Association rules of
user profile and
sticker behavior
preference (Cluster 2)

stickers could be free or require payment. In addition, the main motivation is to enhance friendships and pursuing fashion. The purposes for downloading or to purchase them are practical and cartoon figure preferences.

In Figure 4, in regard to sticker preferences and pattern types, cluster 2 and 3 members prefer to use situation stickers to enhance friendships with friends, colleagues, classmates and communication with others for personal use and usually provide a gift for someone by both free download and paying model. Less emotion stickers are used by cluster 2 and 3. Higher income sticker users are reluctant to share their emotions with others rather than managing their relationships with friends, colleagues, classmates in practical ways. Do these groups of sticker user hide their emotions because of work or their relationships in their living and working environment? Do Line sticker users show different group behaviors in the social networking environment? The following pattern investigates the group interaction behaviors of Line sticker users.

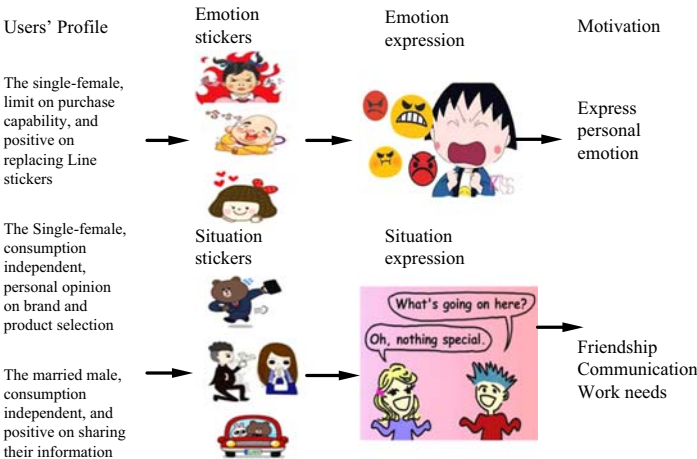
Pattern 2: analysis of line sticker users' group interaction behavior

In this section, through investigating the Line sticker users' group interaction, we explore the kinds of emotions and situations in the LINE group interactive behavior. In doing so, we can better understand the different sticker users and their social media behavior. Under the criterion of a minimum antecedent support of 4.55 percent and minimum rule confidence of 63.16 percent, six significant association rules were derived, as shown in Table V. From the

Table V.
Association rules of
user profile and
sticker behavior
preference (Cluster 3)

Rule	Lift	Sup.	Conf.	Consequent Sticker types	Motivation	Antecedent Source	Pay/free	Purpose
R1	3.87	1.12	66.67	Situation stickers	Enhance friendships	Friends, colleagues, classmates	Both	Style preferences
R2	3.73	1.12	66.67	Emotion stickers	Express emotion	Line app store	Both	Specific needs
R3	1.98	1.12	100.0	Situation stickers	Communication	Line sticker creators	Both	Gift for someone
R4	1.32	1.12	66.67	Situation stickers	Enhance friendships	Friends, colleagues, classmates	Free	Practical

Figure 4.
Line sticker users'
preference and types



association rule, we can see people in cluster 1 like to interact with individuals and groups to collect others' shared things. The chat objective is mainly for friends, family and relatives and expression of emotions is mainly happiness. In the LINE group, the main interactive theme is for new knowledge learning/article sharing, social greetings and image video sharing.

Under the criterion of a minimum antecedent support of 1.12 percent and minimum rule confidence of 100 percent, four significant association rules were derived. From the association rule, we can see people in cluster 2 like to interact with groups to publish their own work and share product/information to comment as their group interaction behavior. Sticker objects are mainly for friends, family and relatives and the expression of emotions is mainly happiness. In the LINE group, the interactive theme includes social greetings, traveling, gossip message and shopping.

Under the criterion of a minimum antecedent support of 1.12 percent and minimum rule confidence of 100 percent, four significant association rules were derived. From the association rule, we can see people in cluster 2 like to interact with groups to publish their own work and share product/information and comments as their group interaction behavior. Sticker objects are mainly for friends, family and relatives and the expression of emotions is mainly happiness. In the LINE group, the interactive themes include social greetings, traveling, gossip message and shopping.

In Figure 5, in terms of Line sticker users' group interaction behavior pattern, overall, happy emotion stickers are the most popular sticker used in all of three clusters. Friends, group and family/relatives are the main sticker object. In cluster 1, collect others' shared things and respond to others' sharing are the main group interaction behaviors. The emotions are classified as a positive emotion without sadness, though they have limited purchasing capability. In cluster 2, the single-female consumption independent group, all sticker objects

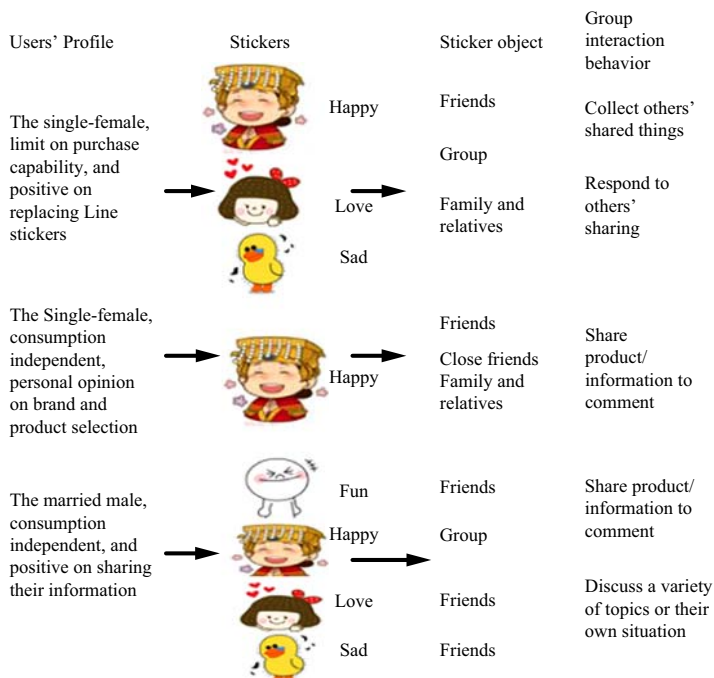


Figure 5.
Line sticker users'
group interaction
behavior

deliver a message with a happy emotion. Thus, this cluster is a potential group to target as market segmentation for sharing product/information to comment on their chat group. In cluster 3, the stickers include fun, happy, sad and angry sent to their friends, since this group comprises married males and is consumption independent. They would like to share and discuss market information and social issues with their friends in an open-minded manner. We consider more niche markets could focus on different emotional statuses and sticker objects to explore possible business opportunities. Thus, we investigate the possible pattern of sticker behavior and SMM and sales in terms of Line business model development.

Pattern 3: analysis of line sticker behavior and business activities

Under the criterion of a minimum antecedent support of 6.02 percent and minimum rule confidence of 47.62 percent, four significant association rules are derived. From the association rules, we can see people in cluster 1 who care about others and accept recommendation from friends and relatives message in the Line group. They also purchase food, clothing/fashion items and 3C product online; participate in offline activities. They prefer to obtain consultation parity service during the purchase process.

Under the criterion of a minimum antecedent support of 1.08 percent and minimum rule confidence of 20.0 percent, four significant association rules were derived. From the association rules, we can see people in cluster 1 like to express themselves, gratitude, enjoy gift to others and have a strong personal style. They also enjoy purchasing food and cosmetics online. In addition, they prefer to obtain financial commodity consultation; legal advice and make friends service during the purchase process.

Under the criterion of a minimum antecedent support of 1.12 percent and minimum rule confidence of 100 percent, four significant association rules were derived. From the association rules, we can see people in cluster 1 like to maintain emotions/friendships, care about interpersonal relationships, express gratitude to others and to seek truth from facts. They also enjoy purchasing houseware and food online; participate in offline activities by obtaining entity merchandise experience at a discount price, bonus/gift feedback and rapidly acquire goods on promotions. They prefer obtaining travel information service and group purchase services during the purchase process.

In Figure 6, in regard to Line sticker behavior and business activities patterns, all three cluster have different sticker behavior in representing their situation stickers. Cluster 1 group demonstrates the character of caring about others and accepting advice on sticker behavior. Online purchase preference items are food, 3C products and clothing/fashion items so discount price, consultation service and parity are possible ways to implement SMM by accompanying sticker behavior in the cluster 1 single-female group. In terms of cluster 2 and 3, personal style and interpersonal relationships are the situational characters of sticker behavior. Food, cosmetics and houseware are popular online purchase items. Thus, some customized services such as legal advice and travel information can be implemented in these two clusters for possible SMM.

Implications

Users' profile and Line sticker development model

Sticker designers or LINE social networking can clearly see the preferences of the users of the community and target their target users, such as the need for money-saving operations. In terms of cluster 2 users, sticker designers can use the sticker preference type – dynamic stickers – to design the main theme of the unique style with popular language and indicators. Cartoon characters are designed to increase the download or purchase rate. Another method is through the Line app sticker creator to create publicity for promotion of the stickers. In terms of cluster 3, sticker designers can design stickers in accordance with

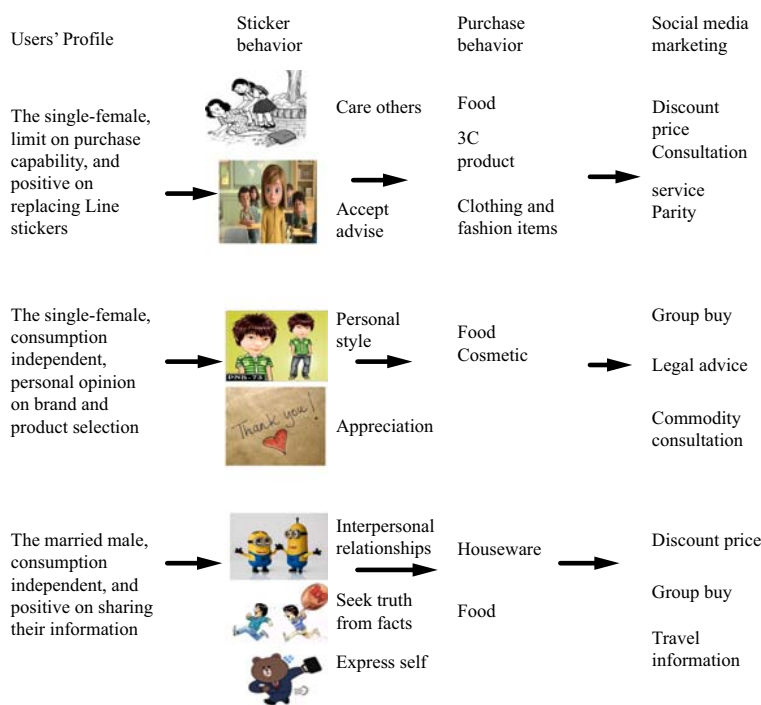


Figure 6.
Line sticker behavior
and business activities

the needs of users' emotions and the situation projected on the role of the body and the users' specific needs in the living and working environment.

Sticker designers want to broaden the sticker market, with the Line user's preferences, for those who can focus on all three clusters, considering the common sticker type preference such as cartoon figure stickers, to design common cartoon stickers promoting them on the Line app store with a free download model for users' practical use. For example, in cluster 2, sticker type preference is for dynamic stickers and motivated by fashion with the sticker source from individual sticker designers. Then sticker designers can think about whether some sort of emotion and situational factors can put into a context to design the dynamic stickers. In this way, the sticker expressions can be more common and better able to meet the needs of different sticker users.

Line sticker users' group interaction behavior model

In Figure 7, in terms of cluster 1, group interaction behavior can enjoy and share with others through interacting with friends. The theme of the interaction is new knowledge learning (inspirational)/article sharing. Line can target the needs of these sticker users to interact with the design theme, and in accordance with the main interactive chat and interactive themes, make the sticker echo to create a chat topic. In terms of cluster 2, group interaction behavior shares users' product/information between close friends. The interactive theme is for shopping, therefore the sticker expresses the emotion of the music and the situation is a grateful mood. In regard to cluster 3, group interaction discusses the various topics or their current situation through the interaction between sticker users.

In terms of expanding the interaction subject to users, satisfying common preferences on the three cluster, the Line can share and distribute specific commercial or chat message

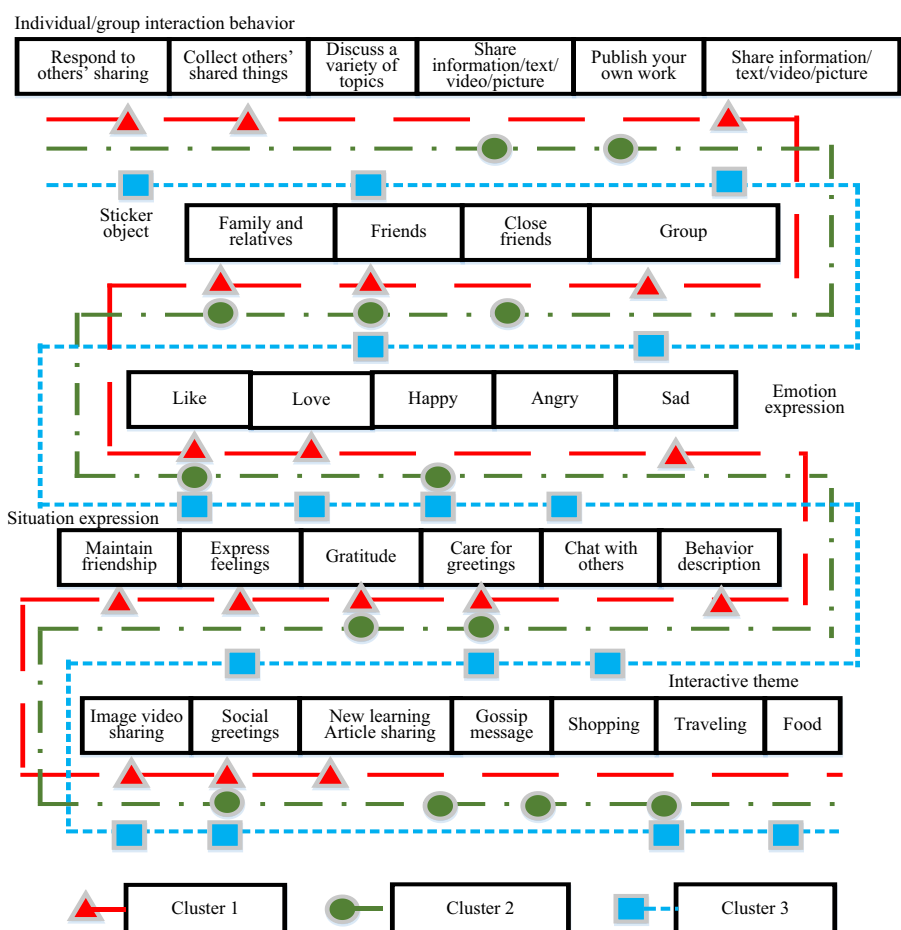


Figure 7.
Line sticker users'
group interaction
behavior map

through the information/text/video/pictures in the interaction between friends to share information with other users. The theme of the interaction is social greetings, through the texture of the expression of the emotion for the like, the expression of the situation for the care of greetings, according to the needs of these users to carry out the theme of the interactive behavior design.

Line sticker behavior and business model

In regard to Line co-operating with other firms, to attract the attention of users and improve the amount of stickers downloads, for a short time, the increase in sticker users' number has an obvious effect. However, for a long time, following the sticker download boom, coupled with the continuous decline of followers and the public. It will be a questionable whether the electronic business firm can maintain cooperation with the launch of LINE and then actively shift to a good conversion rate performance of business orders and online purchases. In Figure 8, for the sticker designers or the LINE community management, Line can clearly see the preferences of the users and target their own sticker users by mining the users' behavior knowledge for business model development. For example, in terms of cluster 1, a sticker

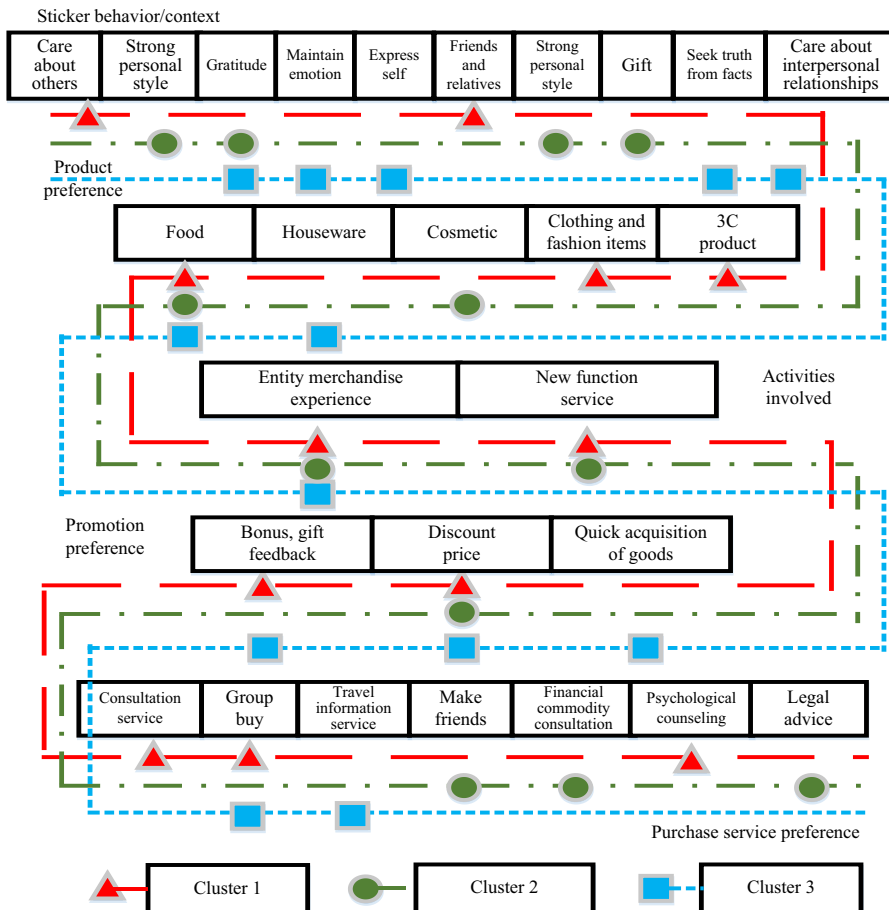


Figure 8.
Line sticker behavior
and business model
map

user might send a “care for greetings” sticker to others or a friend recommends a user download a sticker for “Like.” Businesses can use the LINE platform to recommend psychological counseling services and use new features of the online service to reach this group or recommend physical goods such as clothing and fashion products or electronic 3C products by using dividends, gifts feedback and discount price promotion ways to attract the attention of this group. In terms of cluster 2, a sticker user might send a situation of “behavior description” sticker to others or download a sticker for “style preferences.” This group of sticker users also prefers to dating/networking or financial, legal advice services. Businesses can use the LINE platform and take advantage of new features of the service to attract this group by selling cosmetic products with price discount promotions. In terms of cluster 3, a user might send a situation sticker of “expresses feeling” for those preferring household goods products and tourism information consulting services. Then businesses can use the LINE platform in accordance with the transmission of different emotions to recommend different products or services accordingly.

To use sticker behavior in a business model, Line can explore sticker behavior patterns, for example, when a sticker user sends a “gratitude” sticker to others, businesses can offer services through the LINE platform for financial and travel services to both cluster 2 and 3

groups to attract the attention of the public by price concessions. In addition, Line can recommend the public preference for food products through the entity merchandise experience to attract the attention of the majority of sticker users in different clusters.

Conclusion

In light of the operation and execution of the Line sticker service mechanism, corporations interested in developing related users' behavior and business model should first promote Line sticker visibility to the targeted demographic consumer groups. This visibility can facilitate the social media networking demand chain mechanism through Line stickers, which could induce purchases by users/customers. Through the sticker and group interactive behaviors on Line, vital connections between the sticker behavior and its business activities could be realized and manifest in further business model development. These sticker users are connected by the social network community on Line. Line is more than a social media medium. It joins the missing links between the corporation and its potential clients, so the most loyal clients can be nurtured. In addition, this research sheds light on how corporate decision makers can reach understandings through different clusters on their segmentations. Thus, a market opportunity has vital relationships with its core Line sticker users/consumers. In addition, a good business attracts customers, but the right clientele with close social media and network interactivities could bring the business model to new levels of competitive innovation. On the other hand, comparing with other social media, such as Facebook, WhatsApp or WeChat, the research results might have implications on a very small segment of LINE users in Taiwan only. In this regard, different social media shall be investigate user behaviors using a big data approach for a future research.

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Further reading

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