

A Study of User Behavioral Intention to Use LINE's Ugly E-Stickers Based on Technology Acceptance Mode

Yan-Ru Chen, Yuan Ze University, Taiwan
Li-Chiou Chen, Yuan Ze University, Taiwan

The Asian Conference on Asian Studies 2017
Official Conference Proceedings

Abstract

As development of technology and popularity of mobile device in recent years the way of communication between people has been a great change, in which the demand for mobile communication applications have gradually increased. Among the many social communication applications in Taiwan, LINE is the most frequently used communication application. In addition to convenience and easy to use, LINE has varied and interesting e-stickers which allow users to pass messages with more fun. Recently, the trend for “ugly e-stickers” emerged in the Line network. These ugly e-stickers feature simple lines and graffiti-like art styles and thereby exhibit an unrefined, childlike appearance. Thus, these e-stickers achieve ugliness from the conventional visual perspective and subvert the general impression that e-stickers should be designed and applied through artistic foundations. Moreover, with jokes and fun slang embedded within them, these ugly e-stickers have attracted people’s interests, comments, and attention. Today, ugly e-stickers are prominently featured in the official list of hot e-stickers in Line. However, the phenomenon of popularity of ugly e-stickers has not been studied, the study therefore applying Technology Acceptance Model (TAM) to explore the behavioral intention to use ugly e-stickers.

Keywords: LINE, ugly e-sticker, technology acceptance model (TAM)

iafor

The International Academic Forum
www.iafor.org

Introduction

Over recent years, the percentage of people using communication software via a mobile device has been increasing. According to the statistics in a survey, Taiwan was ranked first worldwide in terms of the average daily hours of going online via a smart phone. On top of it, the use of communication software featuring socializing was most prevalent when people were online (United Daily News Focus, 2016). In the first half of 2014 in Taiwan, five out of the top 10 popular mobile apps were designed for socializing and they were LINE, Facebook, Facebook Message, WhatsApp and WeChat. Among them, LINE was the app most frequently used for socializing, ranking No. 1 at a usage rate of 66% (Institute for Information Industry, 2014). Even today, the number of LINE users remains high. Its stickers are ubiquitously accepted by users. This shows that E-stickers have become an indispensable element for people while using communication software.

However, the recent use of “ugly” stickers has triggered another fad both on LINE and the Internet. This fad resulted from a bet between a sticker creator and his friend who didn’t think that such ugly stickers could be approved by LINE (see Figure 1). To their surprise, LINE agreed to release those stickers to the market so the creator’s friend had to buy the stickers and gave them away via an online announcement. This event also caused strong feedback from Internet users. From then on, users started paying attention to ugly stickers with a similar style (Hanrock, 2016). The creators of “ugly stickers” use simple lines close to children’s graffiti to present a childlike style without complicated arrangements. Though these stickers are not good-looking works and even considered ugly, their “bad-looking” style has drawn users’ attention and infused social communications with a bit more fun. Until now, ugly stickers have accidentally become popular among users. In LINE’s official rankings of popular stickers, this type of ugly stickers is apparently gaining higher visibility.

The massive exposure of these ugly stickers within a short period of time can be attributed to the text’s being entertaining and useful in addition to the interesting drawing style. The use of stickers is often affected by the factors such as background, functionality, entertainment and perceived values. However, ugly stickers, being different from other types of stickers, are preferred by the public mainly because of their usefulness and functionality rather than aesthetic standards. This study aims at exploring the popular phenomenon of ugly stickers and user intentions to use these ugly stickers. In this study, the Technology Acceptance Model proposed by Davis (Davis, Bagozzi, & Warshaw, 1989) serves as the basis to conduct a survey via an online questionnaire. Then, SPSS is applied for making a quantitative analysis. This study aims at analyzing why there is such a phenomenon and what are the motivations behind the use of ugly stickers. The results obtained from this study will be able to bring up some suggestions for creators or designers in designing e-stickers or other items in the future. The findings can also serve as a reference for future industrial marketing and research.

Literature Review

Phenomenon of Line's Ugly E-Stickers

According to the annual sticker rankings released by LINE in 2015, 15% of its users expressed a particular preference for “interesting/funny” stickers. These “unique/ugly” stickers helped enhance the intimacy between friends while chatting or interacting with each other (Chung, 2016). Among these ugly stickers, many were designed by using simple lines which are similar to children’s graffiti. They don’t have complicated designs but simple images with a childlike style. These ugly stickers have flipped over the public’s stereotype that “one should have basic drawing skills to file an application for releasing his/her stickers online”. At first, many users expressed their doubts on how come such stickers qualified to be released to the market. What were the aesthetic standards of sticker buyers? Afterwards, some people said that they liked these childish and graffiti-like stickers because they featured useful online catchphrases and simplicity and were entertainingly ugly.









In April 2015, a set of stickers named “Invisible Person” were posted and widely discussed on PTT, a big Bulletin Board System (BBS) in Taiwan. The main issue being discussed was that “why would it be possible to release such lousy stickers to the market?” or “they’re drawn by a kid” or “even I can draw something better”, etc. As the discussions were carried on, different voice like “maybe they’re really drawn by a kid, why mocking?” or “I think they’re cute”, etc. These discussions later drew the public’s attention and the stickers were once ranked among the top 16 LINE stickers. During the same year in July, the creator URA accepted an interview by LINE and expressed that almost no one bought the stickers during the first three weeks and he never expected that his works would become an overnight sensation in Taiwan (Tt. Mei Gen, 2016). Another story was about the stickers named “Foggy Ghost”. They became popular because of two friends betting on a set of ugly stickers being believed no chance to pass LINE’s official reviews. The creator’s friend said that she would buy 20 sets of the stickers and give them away if the stickers got LINE’s approval. As a result, the stickers passed the reviews and became quite popular. The interesting betting process also triggered a hot debate among Internet users (see Figure 1 below). The discussions over the stickers in terms of aesthetics aroused Internet users’ strong feedback and thus caused users’ interests. Consequently, similar ugly stickers then became a part of the discussions (hanrock, 2016).



Figure 1: LINE screenshots showing the betting process between the creator of “Foggy Ghost” and the friend

Why are ugly stickers attractive enough to stimulate Taiwanese users’ intentions to buy? This may be related to the national conditions in Taiwan. The surveys made by LINE found that sticker purchases illustrated various preferences due to different national conditions. For example, Taiwanese like funny and humorous figures while Japanese prefer white and round figures. Thai people favor 2D female characters. Indonesians prefer stickers in European and American styles. Funny and humorous stickers have been the first choice by Taiwanese (LINE, 2016). Therefore, the surveys by LINE revealed that Taiwanese liked KUSO stickers with underlying meanings. The above may be the explanation for Taiwanese’ overnight sensation to the “Invisible Person” designed by the Japanese creator URA. Since ugly stickers drew the public’s attention, more and more stickers of this type have been released to the market. Among the rankings of LINE stickers, there were “White Stuff” series, “I have nothing to say to you” series and the “Foggy Ghost” which finally made it onto LINE’s official fans page (See Table 1 below). However, the above sticker series contain Chinese characters, most of them are catchphrases, which is the biggest difference from “Invisible Person”. This explains that ugly stickers not only feature childish drawings but also useful catchphrases to present a sense of humor. Today, “ugly” works enjoy excellent sales. Meanwhile, everyone has a chance to become a LINE sticker creator regardless of being a professional illustrators or an ordinary person.

Table 1: Ugly Stickers on LINE Rankings

Sticker Title	Creator	Representative Sticker Drawing	Sticker Drawings
Invisible Person	URA		
White G3	Stuff Kimi Bro		
I have nothing to say to you!	sboypeor th		
Foggy Ghost	Lance Yang		

Source: compiled by the author

Technology Acceptance Model

In 1986, Technology Acceptance Model (TAM) was extended by Davis based on the Theory of Reasoned Action (TRA). TAM has been modified and proved to be a research model which is applicable to explaining user acceptance process of information technology systems (Davis, 1986). In this model, “perceived usefulness” and “perceived ease of use” are considered to be two essential factors affecting user intentions. Later, Davis et al. proposed a modification on this model in 1989 (see Figure 2). External variables were introduced into the new model. It was thought that external variables could affect internal variables (perceived usefulness and perceived ease of use) reflected from users (Davis et al., 1989). TAM has been considered a complete model for years and adopted to study user acceptance of new technologies. Since then, it has been widely applied to many fields such as social media, E-commerce, software applications, system quality and so on (Lorenzo-Romero et al., 2014; Pavlou, 2003; Zhang et al., 2008).

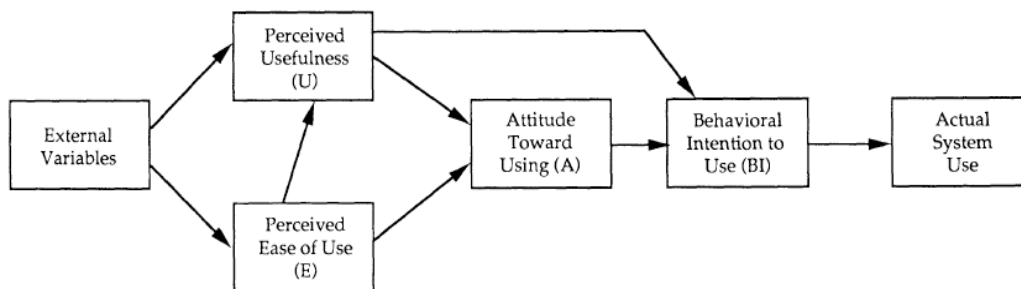


Figure 2: Technology Acceptance Model Davies (1989)

As time progresses, the external variables affecting user behavioral intention may become diverse. Accordingly, Venkatesh and Davis developed a new technology acceptance model (TAM2) in 2000. This model explained that two variables including “social influence processes” and “cognitive instrumental processes” would create effects on perceived usefulness. Social Influence Processes contained several constructs such as subjective norm, voluntariness, image and experience (Venkatesh & Davis, 2000). “Social influence” was an important factor dominating human behavior and decision-making. Meanwhile, TAM2 proved that “subjective norm” under social influence caused effect on “user intention” at a significant level. In general, people often respond to social norm by establishing or maintaining a good image in a group. Venkatesh and Davis (2000) found that subjective norm could create a more significant effect when there were restrictive conditions. Being limited by subjective norm, to a certain degree, effects on user behavioral intention would be seen when new things or systems were introduced. In recent years, TAM has been applied in a great number of studies to explore the phenomena concerning communication software – LINE (Battarbee & Koskinen, 2005; Narkwilai, Funilkul, & Supasitthimethee, 2015; Lin, 2016; Chung, 2016). Based on the above facts, this model has been widely recognized for verifying user acceptance of new technologies.

Research Methodology

Research Framework and Hypotheses

This study applies Technology Acceptance Model (TAM) proposed by Davis (1989) as the fundamental theoretical framework. This model consists of six major constructs including external variables, perceived usefulness, perceived ease of use, attitude toward using, behavioral intention to use and actual system use (see Figure 3 below). Based on TAM, researchers are able to introduce external variables into the model by considering research background and needs in order to achieve better predictions and analyses. By referring to the above mentioned constructs and combining them with the “subjective norm” under social influence as one of the external variables (Venkatesh & Davis, 2000), it is expected that the extension of TAM with external variables can establish better ground to explore the mindset and motivation of using ugly stickers. Furthermore, the study aims at finding out the effects of LINE ugly stickers on users. Next, the following hypotheses are proposed to present the correlations between the variables based on the above mentioned research framework:

- H1: “Subjective norm” in relating to LINE ugly stickers creates positive effect on users’ “perceived usefulness” at a significant level.
- H2: “Subjective norm” on LINE ugly stickers creates positive effect on users’ “perceived ease of use” at a significant level.
- H3: “Perceived usefulness” of LINE ugly stickers creates positive effect on users’ “attitude toward using” at a significant level.
- H4: “Perceived ease of use” of LINE ugly stickers creates positive effect on users’ “attitude toward using” at a significant level.
- H5: “Attitude toward using” LINE ugly stickers creates positive effect on users’ “behavioral intention” at a significant level.
- H6: “Behavioral Intention to use” LINE ugly stickers creates positive effect on “actual usage” at a significant level.

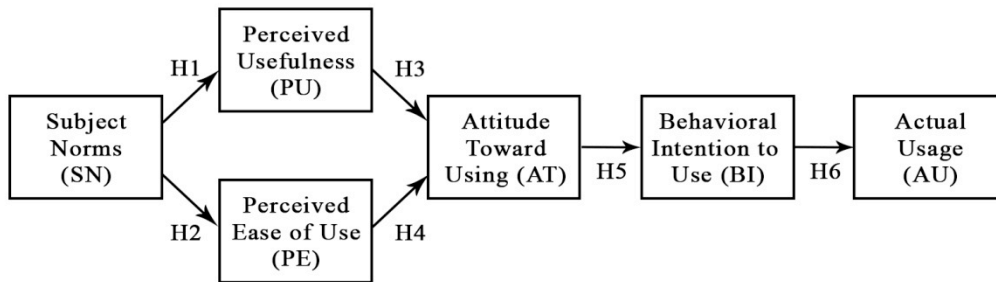


Figure 3: Research Model Hypotheses

Questionnaire Design

The users who have had user experience in LINE communication software and its ugly stickers were covered in this study. Data is collected by way of convenience sampling via an online questionnaire. Regarding the design of the questionnaire, Likert 5-point scale was adopted as a measurement for each item. The content of the questionnaire contains two major sections. The first section is designed to collect the information on demographics and user behavior. The items aim at surveying respondents' age, gender, personality traits, past experience in using LINE, number of LINE friends, frequency of use, and use of LINE ugly stickers. The collected data is used to classify the characteristics of LINE sticker user groups. The second section is designed to explore the motivations and intentions of LINE sticker users. The six dimensions constructing the research framework are applied by the author to operationalize and define the variables. Modifications are further made to fulfill the needs of this study in order to clarify user acceptance of LINE ugly stickers. The reliability of the questionnaire is estimated based on the coefficient Cronbach's α . In the test, Cronbach's α varying between 0.7 and 0.9 stands for satisfied reliability (Nunnally, 1978). In this study, the reliability denoted by Cronbach's α of each of the six constructs is greater than 0.7, which proves satisfactory internal consistency of the items corresponding to related constructs.

Data Analysis

Basic Descriptive Data Analysis

The questionnaire was sent to LINE ugly sticker users. As many as 120 copies of the questionnaire were collected with a total of 111 valid ones. With respect to demographic variables, females accounted for 66.7% while male 33.3%. Respondents aged between 20 and 30 accounted for 55.9%, followed by 20 for 36%. The above figures explain that LINE ugly stickers users were mainly young people. As to personality traits, introverts accounted for 50.5%, almost equal to 49.5% identifying themselves as extroverts. Regarding user experience, 21.6% pointed out that they had used LINE for 1~2 years followed by 18% 3~4 years, 17.1% less than 0.5 year, 15.3% 0.5~1 year, 15.3% 2~3 years and few more than 5 years. Most LINE users (57.7%) had more than 91 LINE friends. 42.3% of LINE users spent more than 1~3 hours on LINE. As high as 27% of LINE users bought stickers every half a year and 25.2% every three months.

On the other hand, 22.5% of LINE users rarely bought stickers. As to the remaining respondents, 12.6% bought stickers every year and 12.6% every month (See Table 2).

Table 2: Analysis of Demographics of Respondents

Item	Choices	No. of people	%
Gender	Male	74	66.7
	Female	37	33.3
Age	Below 20	40	36.0
	21~30	62	55.9
	31~40	8	7.2
	41~50	1	0.9
Personality trait	Extravert	55	49.5
	Introvert	56	50.5
Length of use (seniority)	< 0.5	19	17.1
	0.5~1 year	17	15.3
	1~2 years	24	21.6
	2~3 years	17	15.3
	3~4 years	20	18.0
	5 years and more	14	12.6
No. of LINE friends	1~10	4	3.6
	11~30	16	14.4
	31~50	4	3.6
	51~70	12	10.8
	71~90	11	9.9
Average daily time of using LINE	91 & more	64	57.7
	< 1 hr	18	16.2
	1~3 hrs	47	42.3
	3~5 hrs	25	22.5
Frequency of Buying LINE stickers	> 5 hrs	21	18.9
	0	25	22.5
	Every year	14	12.6
	Every half a year	30	27.0
	Every 3 months	28	25.2
	Every month	14	12.6

The averages deriving from the six TAM constructs are compared versus respondents' demographic characteristics and ANOVA was carried out accordingly (see Table 3). By observing the averages of the six TAM constructs, perceived ease of use (PE) gained the highest average while social norm (SM) the lowest. In terms of age and frequency of buying, users aged below 20 showed a higher average in each of the six TAM constructs. This explains that ugly stickers were more popular or used among young people. Meanwhile, LINE users who showed a higher frequency of buying ugly stickers consistently gained a higher score in each of the six TAM constructs. It can be speculated that these users held a more positive attitude and inclined towards using ugly stickers. The findings obtained via ANOVA revealed significant differences between actual usage and frequency of buying.

This pointed out that the users who bought ugly stickers more frequently were more likely to use ugly stickers (gender and frequency of buying affected TAM more).

Table 3: ANOVA by Demographics and TAM Variables

Characteristics	Category	SN	PU	PE	AT	BI	AU
	All respondents	3.59	4.01	4.25	4.11	4.02	3.70
Gender	Male	3.62	3.98	4.18	4.09	4.12	3.74
	Female	3.60	4.03	4.29	4.14	4.08	3.72
Age	< 20	3.74	4.18	4.40	4.25	4.15	3.86
	> 20	3.53	3.92	4.18	4.05	4.07	3.65
Personality trait	Extrovert	3.64	3.98	4.23	4.15	4.10	3.81
	Introvert	3.57	4.04	4.29	4.09	4.09	3.64
User age	< 1 year	3.59	3.92	4.27	4.03	4.01	3.68
	> 1 year	3.61	4.06	4.25	4.17	4.14	3.75
No. of friends	< 91	3.67	4.04	4.17	4.11	4.04	3.59
	> 91	3.56	4.00	4.32	4.14	4.14	3.83
Daily time of use	< 1 hr	3.68	4.03	4.19	4.15	3.98	3.52
	> 1 hr	3.59	4.01	4.27	4.12	4.12	3.77
Frequency of buying stickers	Less than 0.5 yr (seldom buy)	3.50	3.93	4.20	3.96	3.91	3.35**
	More than 0.5 yr (often buy)	3.66	4.06	4.29	4.21	4.20	3.93**

**p < 0.01

Correlation and Regression Analysis

For avoiding multi-collinearity, Pearson correlation coefficient analysis was conducted before making a regression analysis for discussing causes and effects. Then, the results will be used to verify the hypotheses. In addition, Pearson Correlation coefficient which is greater than 0.7 stands for high correlation, 0.4~0.7 for medium correlation, and smaller than 0.4 for low correlation. Pearson correlation coefficient analysis was shown below in Table 4, in which medium or high positive correlations were shown between the six TAM constructs. However, attention should be paid to multi-collinearity when there is a high correlation. Variance inflation factor (VIF) was applied as a basis to examine multi-collinearity. According to Chatterjee & Price (1991), VIF greater than 10 denotes multi-collinearity exists between variables (Chatterjee & Price, 1991). The findings obtained from the VIF tests showed that VIF did not exceed the standard so no multi-collinearity existed.

Table 4: Correlation Analysis

	SN	PU	PE	AT	BI	AU
SN						
PU	.732**					
PE	.683**	.837**				
AT	.779**	.793**	.768**			
BI	.738**	.823**	.781**	.894**		
AU	.741**	.709**	.696**	.769**	.846**	

**p.< 0.01 (two-tail)

For exploring the correlations and effect levels among the variables, perceived usefulness (PE), perceived ease of use (PE), attitude toward using (AT), behavioral intention to use (BI) and actual usage (AU) were introduced as dependent variables in order to check if the corresponding independent variables created significant effects on and make contributions to these dependent variables. The analysis for obtaining five regression lines was made accordingly as shown in Table 5. The regression analysis was applied to explain the hypotheses in this study. It is found that Hypotheses 1 to 6 were highly explainable and presented positive correlations. The result obtained when BI was considered as a dependent variable in the model showed that ΔR^2 value increased to 0.83, the highest in comparison with others, when AT was introduced into the regression analysis. This indicates that users' attitude toward using (AT) created significant effects on behavioral intention to use (BI). The above result proved that this model was more explainable and predicable. The regression analysis on the dependent variable AU presented that BI was highly explainable and could create significant effect with β value at 0.74.

By referring to the Table, the effect of subjective norm (SN) can be observed. If we compare the effect of SN on both PU and PE, it is found that SN could explain PU better. Meanwhile, SN also creates effect on both AT and AU at a significant level. Based on the regression analysis with AT as a dependent variable, SN has a higher β value at 0.38 and a higher level of significance. In addition, SN's β value is 0.29 based on the regression analysis with AU as a dependent variable. The findings shown in Table 5 reveal that subjective norm acted as an important factor in the TAM, which not only initially affected perceived usefulness and perceived ease of use but also attitude toward using and ultimately the final actual usage.

Table 5: Model Regression Analysis

Independent variable	Dependent variable				
	PU	PE	AT	BI	AU
SN	0.73 ^{***}	0.68 ^{***}	0.38 ^{***}	0.01	0.29 ^{***}
PU			0.29 ^{**}	0.25 ^{**}	-0.10
PE			0.25 ^{**}	0.08	0.08
AT				0.61 ^{***}	-0.11
BI					0.74 ^{***}
ΔR2	0.53	0.46	0.72	0.83	0.73
F	125.74 ^{***}	95.28 ^{***}	97.93 ^{***}	135.74 ^{***}	62.88 ^{***}

P < 0.01 *P < 0.001. The variable value in the Table is β.

Conclusions and Suggestions

The usage rate of LINE has been remaining high. In particular, LINE stickers are preferred by users. Furthermore, LINE ugly stickers recently emerging have become widely accepted within a very short period of time. Therefore, this study is designed to discuss the above said phenomenon and reasons why LINE users love using ugly stickers. Literature review has discovered that the national conditions in Taiwan laid the ground for Taiwanese users in favor of kuso and humorous stickers. This study adopted the technology acceptance model to explore why LINE ugly stickers have been quite popular and the users' intention to use them. The findings reveal that ugly sticker users featuring "age below 20" and "higher frequency of buying stickers" are more easily acceptable to ugly stickers. This shows that ugly stickers are more popular among young generations and those who are frequent sticker users. The results of the study also demonstrate that actual usage is significantly correlated with the frequency of buying. Users who bought ugly stickers more frequently indeed used them too.

Apart from the above, the study also finds that users' attitude can most affect behavioral intention to use followed by perceived usefulness. This result translates that users pay more attention to perceived value and functionality of stickers when they are using ugly ones. This means that users intend to use stickers when they consider those stickers being valuable and functional regardless of their being ugly or beautiful. The results of this study verify the same. Besides, subjective norm creates effects on perceived usefulness, perceived ease of use and attitude toward using at a significant level. That is, other people's comments on ugly stickers and the popularity of ugly stickers would affect users' intention to use ugly stickers. In other words, subjective norm has become another important factor affecting users' motivation apart from perceived usefulness and perceived ease of use. Others' opinions and level of acceptance have deeply rooted in users and further affect their intention to use.

In this study, people's motivations of using ugly stickers were discussed. While "subjective norm" has been verified to be effective on "user motivation", it is yet to be explored whether other social norms affect user motivations or not. It is suggested

that researchers focusing on social media could discuss the effects of external social factors on user motivations or the relationships between human beings and the society in future studies. Subjective norm may play an important role affecting social behavior on communication software and social media. Therefore, the author would like to release the results of the study as a reference so that the researchers focusing on other related academic fields are able to make in-depth discussion on the phenomenon in this regard. Some improvements can be made on this type of study. For example, future researchers can refer to more information on related theories in order to compare the definitions and results obtained in this study with those being brought up in other studies. By doing so, the operationalized definitions of the theoretical model constructs shall be more precise and the items covered in a questionnaire can be more explicitly designed. Then the respondents will be able to answer the questions with better intuition. In addition, the sampling of respondents can be expanded by considering age, personality traits, experience of use, etc. in order to enrich and diverse the data collected. It is also suggested that a total of more than 200 copies of valid questionnaires are required in order to obtain analytical results with higher accuracy and achieve a more comprehensive research.

References

Battarbee, K., & Koskinen, I. (2005). Co-experience: user experience as interaction. *CoDesign*, 1(1), 5-18.

Chatterjee, S., & Price, B. (1991). Regression diagnostics. *New York*.

Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results*. (Doctoral dissertation), Massachusetts Institute of Technology, Sloan School of Management. Retrieved from <http://dspace.mit.edu/handle/1721.1/15192>

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science*, 35(8), 982-1003.

hanrock. (2016). [X D] LINE stickers without limits... Retrieved from 02/04, 2016, <https://www.ptt.cc/bbs/joke/M.1454517302.A.84C.html>.

LINE. (2016). Exclusive on LINE Headquarters -- three sticker golden elements: pragmatism, style and position. Retrieved from 15 Nov., 2016, <http://www.brain.com.tw/news/articlecontent?sort=&ID=22127>.

Lorenzo-Romero, C., Alarcón-del-Amo, M.-d.-C., & Constantinides, E. (2014). Determinants of Use of Social Media Tools in Retailing Sector. *Journal of theoretical and applied electronic commerce research*, 9(1), 9-10.
doi:10.4067/s0718-18762014000100005

Narkwilai, M., Funilkul, S., & Supasitthimethee, U. (2015, 29-30 Oct. 2015). *Factors influencing the Thai elderly's intention to use social network for Quality of Life: A case study LINE application*. Paper presented at the 2015 7th International Conference on Information Technology and Electrical Engineering (ICITEE).

Nunnally, J. C. (1978). *Psychometric theory*: McGraw-Hill.

Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International journal of electronic commerce*, 7(3), 101-134.

Tt. M.G. (2016). Dose aesthetics of LINE stickers really matter when it comes to sales?. Retrieved from 15 Nov., 2016, http://www.tpintrts.tpin.idv.tw/index.php?blog_id=214&blogex_id=12.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, 46(2), 186-204.

Zhang, S., Zhao, J., & Tan, W. (2008). Extending TAM for online learning systems: An intrinsic motivation perspective. *Tsinghua Science & Technology*, 13(3), 312-317.
Gan, W. C. (2016). LINE released the annual pop stickers rankings. Retrieved from

22 Nov., 2016, <http://www.nownews.com/n/2016/01/21/1969976>.

Lin, T. Y. (2016). *Study on LINE user behavior based on technology acceptance model*. (unpublished master's thesis), National Taipei University of Technology, Taipei.

Institute for Information Industry. (2014). First time! Cross-channel analysis on user behavior and "Taiwan's top 100 APPs in first half of 2014" by Institute for Information Industry. Retrieved from 26 Nov., 2014, http://www.find.org.tw/market_info.aspx?n_ID=7201.

United Daily News. Focus. (2016). World No. 1: Taiwanese phubbers spend more than 3 hours daily. Retrieved from 26 Nov., 2016, <http://a.udn.com/focus/2016/07/21/23379/index.html>.

Chong Y. T. (2016). *Exploration of use and repurchase on LINE@ based on technology acceptance model*. (unpublished master's thesis), National University of Kaohsiung, Kaohsiung.

Contact email: m6556254@gmail.com