Dependency on Smartphone 4G and the Impact on Purchase Behavior in Indonesia

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Abstract: The main purpose of this paper is to investigate the factors that influence the dependency on smartphones and purchase behavior in Indonesia. Data collection was conducted using questionnaires distributed to 4G smartphone users in Indonesia. Non-probability purposive sampling was used to collect data from 441 respondents. Analysis software using Structural Equation Model (SEM)-Amos 20 to review revealed the factors affecting the use of 4G smartphone purchase behavior. Results showed that social need, social influence, and convenience had significant positive effect on dependency. Social influence had high score that means customers have high good perception for variables. A significant relationship also existed between dependency and purchase behavior of 4G smartphone. This research suggested to increase social influence through increasing family factor that conducts promotion strategy. Based on descriptive result, in order to give a good promotion strategy, the smartphone manufacturers should give priority to word of mouth strategy.

Keywords: Social need, Social influence, Convenience, Dependency, purchase behavior, 4G smartphone.

INTRODUCTION

Telecommunication has very significant evolution, ranging from the first generation (1G), Second Generation (2G), Third Generation (3G), and Fourth Generation (4G). The last few years have been a phenomenal growth in the wireless industry, where previously the wireless access technologies have also evolved to achieve the common goals: performance and efficiency. Implementation of 4G services in Indonesia started in early 2015. 4G provides better value and service than the previous generation, including advanced mobile services and stability. (Samaria, 2014). Even 4G smartphone offers various features activities that can be easier for users. However, the deciding factor of buying behavior of 4G smartphone is still evolving. Smartphones today have turned into a trend among the community (Farnsworth & Austrin, 2010). In fact, people are addicted to the gadgets where most consumers feel uneasy when they're away from their gadgets (Nielsen, 2016).

Nowadays, smartphone users have a common phenomenon called Nomophobia (no mobile-phone phobia) or fear and anxiety when there is no mobile phone. 66% respondents suffered from this phenomenon and for majority, this problem affected women more than men (SecurEnvoy, 2016). Tavolacci, Meyrignac, Richard, Dechelotte and Ladner (2015), found that almost one in three college students suffered from nomophobia. 31.3% were anxious caused by non-availability of a smartphone for 24 hours and 30.4% spent too much time on their smartphone.

Meanwhile, Pavithra and Madhukumar (2015) found that 23% of students in India felt losing the concentration and became stressed when there was no mobile around or their mobile had run out of balance or battery. 39.5% of students were Nomopobic (suffered from Nomophobia) and 27% of students were at risk of developing Nomophobia.

Meanwhile, based on International Data Corporation's, Quarterly Mobile Phone Tracker (Q2 in 2016) total smartphone shipments had increased about 3% Year-On-Year (YoY) and 22% Quarter-on-Quarter (QoQ). But smartphone penetration rate is still low in Indonesia, as many as 21% of the total use of mobile devices. Though smartphone offers a variety of features that can facilitate the activities of

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its users (Pew Research Center, 2016). Dream Incubator Marketing (2016), an online market research company in Asia, is doing research on the viewing habits of smartphone users in Indonesia. Through this research can be seen any activity that allows users to become dependent on the smartphone. Activities use of smartphones and smartphone penetration rate in Indonesia emphasized the importance of understanding the determinants that create dependency on smartphones to expand the market segment.

According to Ting, Lim, Patanmacia, Low and Ker (2011), students with a high level of dependency on smartphones tend to make evaluations based on the past experience in determining purchasing behavior in the future. In other words, high dependency on smartphones is associated with the future potential in terms of purchasing smartphones. Suki (2013) found that there were two factors that significantly affect students dependency on smart phones; social needs and social influences. Social need was found to have the strongest effect. In this research, convenience was found to be insignificant to students dependency on smart phones. But there was very strong relationship existing between dependency on smart phones and students purchase behaviour in Malaysia.

In theoretical aspects, the determinants of purchase behavior are still growing. Therefore, the research on consumer purchasing behavior towards 4G smartphone is required because the previous studies have not covered Indonesian context.

This study begins by determining the topic, title, and formulation of the problem. Then specify the variables that are used, and a study by reading the literature to strengthen and get references. Then discuss the formulation of hypotheses and collect research data. All data and facts obtained in this study were processed, analyzed, and concluded so as to describe the determinants of purchasing behavior of 4G smartphone.

Objectives
- To identify how much the social need affects dependency on smartphone.
- To identify how much the social influence affects dependency on smartphone.
- To identify how much the convenience affects dependency on smartphone.
- To identify the relationship between dependency on smartphones and purchase behavior of 4G smartphones.

Significance of the study
Theoretical aspects
Contributions within the scope of Marketing Management. The results from this research are expected to be used to broaden the horizon and as reference material in the field of Marketing Management, especially on the topic of consumer purchasing behavior. In addition, the availability of 4G mobile networks and the growth of smartphones show that mobile technology is in great demand. This study provides a glimpse of the dependency of students on smartphones and influence of buying behavior in Indonesia.

Practical aspects
For local smartphone manufacturers Indonesia. The results from this research can be adapted and be useful in terms of analyzing consumer behavior and can be used to give a description of the factors influencing the purchase decisions of smartphones. In addition, the results of this study can be used as one of the recommendations for the company in evaluating marketing strategies seen from the result of consumer feedback in this study. Where companies cant only focus on a specific target market, but also in conveying the message to the social networks of target market (friends and family). So it can attract more consumers.

Scope of the study
This research used quantitative methodology using questionnaire to collect data from 4G smartphone users in Indonesia. This is because the implementation of 4G in Indonesia started in 2015 and the sample can represent the experience of using a 4G smartphone. Non-probability purposive sampling was used to collect data from 441 respondents. Data were collected using primary and secondary data analysis.
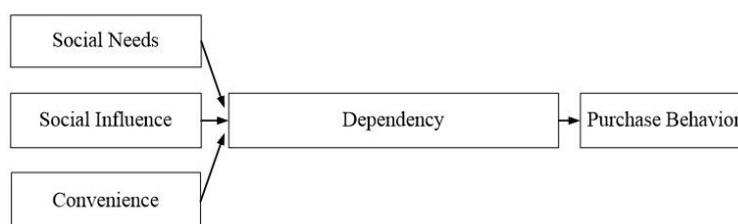
Figure 1. Conceptual framework of a study
Source: Adapted from Ting et al. 2011; Suki, 2013; Arif et al. 2016

LITERATURE REVIEW
Marketing management
Marketing is the activity, processes, art and sciences in selecting target marketing, getting, keeping, and growing customers by creating, delivering, communicating, and exchanging value for customers, clients, partners, and many others. (Kotler & Keller, 2016).

Consumer behavior
Consumer behavior involves the thinking, feelings, people's experiences, the actions that are performed in consumption processes, and all the things in the environment that influence, such as other consumer's review, advertisements, price information, packaging, physical appearance, and many others. Consumer behavior is dynamic, involves interactions and exchanges (Peter & Olson, 2010).

Social need
Social need is the need for social interaction with others which is fulfilled by communication with friends, family, or affiliates (Tikkanen, 2009; Wijetunge, 2016).

Social influence
Social relationships related to consumers' decisions to adopt a technology. Social influences come from people around the consumer such as neighbors, relatives, family members and friends. It also comes from the inspirational figures in the media, such as celebrities or movie stars (Chun, Lee & Kim, 2012).

Convenience
Smartphones that provide features and convenience to others increased dependency on smartphones. Convenience is related to students' dependency on smartphone (Ting et al., 2011).

Dependency
According to Ting et al. (2011), university students with high dependency on smartphones enhanced the future purchase behavior based on their past experiences.

Previous studies
The first research was the topic covering the effect of convenience, social needs and social inuences on students' dependency towards smartphones and the impact on future purchase behavior in Malaysia, undertaken by Ting et al., (2011). This research studied main areas: Factors influencing smartphone dependency and the impact on purchase. The population of the study was university students, the sample size was 358 students who used smartphones. The researcher tested the hypotheses with random and judgemental sampling method. The results from the research found that university students' dependency on smartphones is inuenced by social needs, social inuences and convenience. Dependency also positively affects student's purchase behavior.

Pan, Chen and Rau (2013), studied the topics of the factors affecting adoption and acceptance of smartphone among university students in China. This research studied two main areas: 1) Framework acceptance; and 2) adoption of smartphone. The results of this study found that social influence, en-

tertainment utility and compatibility of smartphone are the factors that influence university students' perceived usefulness and attitude to use in China. That is very important for manufacturers to improve smartphone's interactive interface to win bigger market share.

Arif, Aslam and Ali (2016), studied the factors that affect dependency on smartphones and purchasing behavior among university students in Pakistan. The scope of the study are factors influencing smartphone dependency and the impact on purchase. The results of the study found the factors (social need, social influence and convenience) that significantly affect students' dependency on smartphones. Students' dependency on smartphones is also significantly related to purchasing behavior.

Research hypotheses

H1:   Social need positively affects dependency on smartphones.
H2:   Social influence positively affects dependency on smartphones.
H3:   Convenience positively affects dependency on smartphones.
H4:   Dependency on smartphones positively affects purchasing behavior.

RESEARCH METHODOLOGY

Population and sample size

The population in this research are 4G smartphone users in Indonesia who were using 4G smartphone with minimum two months of smartphone usage.

Determine the sample size

This research project focused on smartphone users in Indonesia, therefore the non-probability purposive sampling was the most suitable to use. Purposive sampling is a non-probability sample that is selected based on the objective of the study rather than characteristics of a population (Bungin, 2013). This research used Bernoulli's formula:

$$n = \frac{(Z\propto/2)^2 p.q}{e^2} \qquad (1)$$

Where,

n = minimum sample size

e = rate of errors allowed

α = level of precision

Z = the value of the standard normal distribution

p = large proportion of rejected

q = large proportion of accepted (1-p)

In this equation, the letter is the level of precision (in this research it was 5%) with 95% confidence level, so the value of Z is 1.96. Margin of error was set at 5%, and p = q = 0.5. This equation was used to make the minimum sampling calculation and the results were as follows:

$$\frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 384.16 \approx 384$$

The result from Bernoulli's equation was 384.16 which means, the minimum sampling size in this research was at least 384 smartphone users.

Data collection

The questionnaire in this research was divided into three parts:

Part 1:   Screening questions, to select valid respondents who meet the criteria for 4G users with minimum two months of smartphone usage.

Part 2:   Respondents' characteristics. It was divided into five questions about age, city, occupation, gender, and income from the respondents.

Part 3:   The perception of smartphone users of the social need, social influence, and convenience and its dependency on smartphone influencing the purchase behavior.

Validity test

Validity was tested using the convergent validity and discriminant validity. Convergent validity test was used to determine the construct (indicator) whether it has a high proportion of variance. Discriminant validity test was used to determine how much of an indicator is completely different from the other indicator (construct). In this research convergent validity was assessed by loading factor and Average Variance Extracted (AVE). An acceptable loading factor value is more than 0.5 (Hair, Black, Babin & Anderson, 2010). Validity test results showed that the outer loading of all indicators in the questionnaire is more than 0.5, it can be said to be valid. While based on the Average Variance Extracted (AVE) can be seen all over the latent variable has a value of > 0.5 to be valid.

Reliability test

Reliability was tested using internal consistency reliability (construct reliability/ CR and Cronbach's alpha). The acceptable value of CR is 0.7 and above (Hair et al., 2010). The instrument is good if each of the indicators has a CR value greater than or equal to 0.7. It is calculated by equation 2.

$$CR = \frac{(\sum tandarizedloading)^2}{(\sum tandarizedloading)^2 + \sum \epsilon} \qquad (2)$$

Based on the results obtained, data measurement model's reliability values were greater than 0.70 and qualified reliability. Thus, it can be said that item variables in the model are reliable.

Table 1: Validity and reliability

Constructs		Items	Discriminant Validity					AVE	CR
			SN	SI	C	D	PB		
Social Need	I use smartphone to stay connected with family through social media (Facebook, Line, Whatsapp, etc.) (Ting, et al. 2011)	SN_1	0,807	0,543	0,667	0,692	0,588	0,520	0,843
	I use smartphone to stay connected with friends through social media (Facebook, Line, Whatsapp, etc.) (Ting, et al. 2011)	SN_2	0,739	0,497	0,612	0,634	0,539		
	It is easy for me to observe others' happenings by using the smartphone (Ting, et al. 2011)	SN_3	0,610	0,410	0,505	0,523	0,445		
	I use smartphone to catch up with friends and relatives (Ting, et al. 2011)	SN_4	0,743	0,500	0,615	0,638	0,542		
	Smartphone allows me to stay connected with the people that I love (Ting, et al. 2011)	SN_5	0,692	0,465	0,573	0,594	0,505		
Social Influence	It is important that my smartphone had the same brand as my friend (Ting, et al. 2011)	SI_1	0,471	0,700	0,500	0,613	0,521	0,500	0,800
	Family factors affecting my smartphone usage rate (Ting, et al. 2011)	SI_2	0,472	0,702	0,510	0,615	0,523		
	I would buy a smartphone if it helped me t in with my social group better (Ting, et al. 2011)	SI_3	0,454	0,675	0,482	0,591	0,502		
	I would be susceptible to be persuaded into using a smartphone if I had a low self-esteem (Ting, et al. 2011)	SI_4	0,504	0,750	0,535	0,657	0,558		
Convenience	Using a smartphone would allow me to accomplish tasks more quickly (Ting, et al. 2011)	C_1	0,592	0,511	0,716	0,636	0,541	0,501	0,833
	In my work, smartphone saves my time (Ting, et al. 2011)	C_2	0,576	0,497	0,696	0,618	0,525		
	I would prefer carrying my smartphone rather than my laptop (Ting, et al. 2011)	C_3	0,592	0,511	0,716	0,636	0,540		
	Having a smartphone is like having both a mobile phone and a computer together (Ting, et al. 2011)	C_4	0,626	0,540	0,757	0,672	0,571		
	Smartphone allows me to access material information anywhere I go (Ting, et al. 2011)	C_5	0,537	0,463	0,649	0,577	0,490		

	Constructs	Items	Discriminant Validity					AVE	CR
			SN	SI	C	D	PB		
Dependency	In my daily life, usage rate of my smartphone is high (Ting, et al. 2011)	D_1	0,598	0,610	0,619	0,697	0,592	0,502	0,834
	I will feel insecure when my smartphone is not with me (Ting, et al. 2011)	D_2	0,626	0,639	0,648	0,730	0,620		
	I always use smartphone to deal with my job (Ting, et al. 2011)	D_3	0,630	0,644	0,653	0,735	0,624		
	I cannot do anything with my job without the smartphone (Ting, et al. 2011)	D_4	0,587	0,600	0,608	0,685	0,582		
	I'm totally dependent on my smartphone (Ting, et al. 2011)	D_5	0,595	0,607	0,616	0,693	0,589		
Purchase Behavior	On the whole, I'm satised with the smartphone experience (Ting, et al. 2011)	PB_1	0,517	0,527	0,535	0,602	0,708	0,537	0,822
	Overall, my positive experience outweighs my negative experience with smartphone (Ting, et al. 2011)	PB_2	0,513	0,524	0,532	0,598	0,704		
	I intend to keep continuing use of smartphone in the future (Ting, et al. 2011)	PB_3	0,542	0,553	0,561	0,632	0,743		
	I intend to purchase a smartphone in the future (Ting, et al. 2011)	PB_4	0,563	0,575	0,583	0,657	0,773		

RESULTS

Descriptive analyses were used to obtain the distribution of respondents based on demographic variables of age, city, occupation, gender, and income. Based on the research results, it was found that from the 441 respondents, the highest percentage in the age range was in the range of 19-30 years old (389 respondents or 88.21%), 33 respondents over 30 years old (7.48%), and 19 respondents less than 19 years old (4.31%). Wherein based on a survey by the Pew Research Center, a total of smartphone users in Indonesia were as many as 7% (35 years old) and 39% (between 18 and 34 years old). The respondents were female-dominated as many as 343 respondents (77.8%), and male 98 respondents (22.2%). Based on research by security firm SecurEnvoy (2012), women are more anxious when theres no mobile phone around them than men. In addition, women also spend more time using their mobile phones. Based on monthly income, most of the respondents had an average income of less than Rp. 1,500,000 as many as 210 respondents (47.6%).

Table 2: Frequency of response

Variable	Indicator	Frequency				Total	Index	Mean Variable	Category
		SD	D	A	SA				
Social Need	SN1	7	72	597	796	1472	83.45%	82.88%	Very Good
	SN2	4	78	639	740	1461	82.82%		
	SN3	7	86	627	728	1448	82.09%		
	SN4	7	76	681	676	1440	81.63%		
	SN5	6	84	519	880	1489	84.41%		
Social Influence	SI1	13	172	531	660	1376	78.00%	79.16%	Good
	SI2	5	94	633	712	1444	81.86%		
	SI3	8	100	612	716	1436	81.41%		
	SI4	13	184	633	500	1330	75.40%		
Convenience	C1	4	70	687	692	1453	82.37%	82.17%	Very Good
	C2	2	92	711	624	1429	81.01%		
	C3	5	86	678	668	1437	81.46%		
	C4	6	104	672	636	1418	80.39%		
	C5	3	80	492	936	1511	85.66%		
Dependency	D1	5	94	636	708	1443	81.80%	79.66%	Good
	D2	6	110	666	632	1414	80.16%		
	D3	7	116	636	656	1415	80.22%		
	D4	11	164	669	500	1344	76.19%		
	D5	4	116	678	612	1410	79.93%		
Purchase Behavior	PB1	4	84	663	696	1447	82.03%	80.90%	Very Good
	PB2	6	104	723	568	1401	79.42%		
	PB3	4	62	630	784	1480	83.90%		
	PB4	9	108	747	516	1380	78.23%		

Notes: SA = Strongly Agree, SD = Strongly Disagree

Structural model used to test the relationship between the dependent variable and the independent variables.
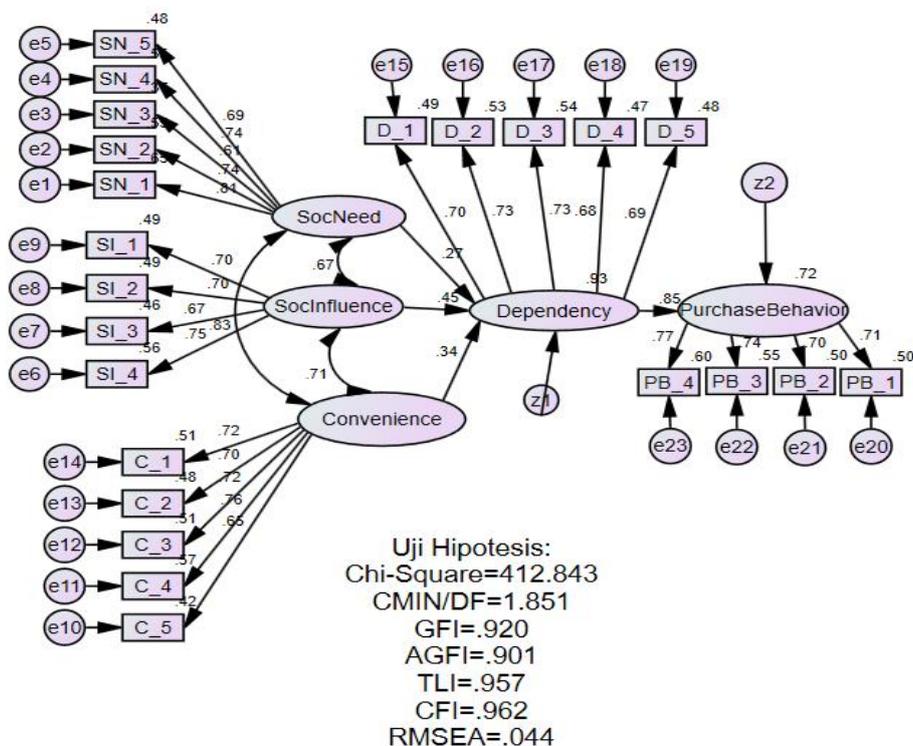

Figure 2. Structural equation model

R-Square was used to evaluate the structural model. The higher the R-square value, the better the predictive power of the model. The value of R-Square in this study was obtained from the processing of data at 0.722. According to Hair et al. (2010), the value of R-Square shows that this model is in the substantial category (strong).

Table 3: Goodness-of-fit model

Fit indices	Model value	Recommended level of fit
Chi-Square	412.843	
CMIN/DF	1.851	≤ 2
GFI	0.920	≥ 0.90
AGFI	0.901	≥ 0.90
TLI	0.957	0-1
CFI	0.962	< 0.95
RMSEA	0.044	0.05-0.08

Based on analysis using software Amos 20, the model was adequate. The model value CMIN/DF = 1.851 ($\leq$), GFI = 0.920($\geq$ 0.90), AGFI = 0.901 ($\geq$ 0.90), RMSEA = 0.044 (0.05-0.08), CFI = 0.962 (>0.95), TLI = 0.957 (0-1).

Table 4: Hypothesis testing

Jalur	Estimate	S.E.	C.R.	P	Label
Dependency $\leftarrow$ SocNeed	.236	.059	3.980	***	
Dependency $\leftarrow$ SocInfluence	.368	.048	7.696	***	
Dependency $\leftarrow$ Convenience	.371	.084	4.400	***	
PurchaseBehavior $\leftarrow$ Dependency	.835	.067	12.397	***	

Based on the hypotheses testing using Amos 20, the results indicated that factors affecting dependency on smartphones were positively related at $p \leq 0.01$ levels. The cr value (critical ratio) for the relationship between social need and dependency amounted to 3.980 indicating that the value of t-statistic 3.980> t-table value and p-value in the form ***. Thus, H1 was supported. The social needs had a positive and significant impact on the dependency on smartphones.

The cr value (critical ratio) for the relationship between social influence and dependency is 7.696 indicating that the value of t-statistic 7.696 > t-table value and p-value in the form ***.

Therefore, the H2 was supported. Hence, social influences were positive and significant related to dependency on smartphones.

The cr value (critical ratio) for the relationship between convenience and dependency is 4.400 indicating that the value of t-statistic 4.400 > t-table value and p-value in the form ***. Therefore, H3 was supported.

The cr value (critical ratio) for the relationship between dependency and purchase behavior is 12.397 indicating that the value of t-statistic 12.397 > t-table value and p-value in the form ***. Therefore, H4 was supported.

DISCUSSION AND CONCLUSION
Discussion in terms of social need
Social needs affect dependency on smartphone because smartphone has turned into much more flexible, that is allowing consumers to increase their use for communication with their family or relations (Lippincott, 2010; Kongmanus, 2016). Based on the survey, results of this study indicate that all the indicators of social need variables are in a very good category with an average value of 82.88%. Additionally, in this study, social need has positive and significant effect on the dependency with SLF value of 0.275. This is in line with research of Balakrishnan and Raj (2012), that smartphone use is influenced by social orientation and social motives such as socializing, gossiping and social status. Where today, consumers have a simple way to meet their social needs by using their smartphone via the features found on smartphones.

Discussion in terms of social influence
Social influence is strongly connected with the consumer's decision in terms to adopt the technology. Social influences come from people around the consumer such as neighbors, relatives, family members and friends. It also comes from the inspirational figures in the media, such as sports celebrities or movie stars (Chun et al., 2012). Based on the survey, results from this study indicate that all the indicators of social influence variables are in good category with an average value of 79.16%. In this study, social influence has positive and significant impact on the value of SLF dependency of 0.447. This is in line with the research of Arif et al. (2016) which states that social influence has significant positive effect on dependency.

Discussion in terms of convenience
Convenience in using smartphones is a factor that motivates users to increase the smartphones' usage (Arif et al., 2016). It is similar to the conclusions drawn by Ting et al. (2011), that smartphones provide convenience to others, dependency on smartphones will be on the rise. In other words, the more a smartphone provides convenience for its users, the degree of dependency on the smartphone will also increase. This is consistent with the results of this study showing that convenience has significant positive effect on purchase behavior with SLF value of 0.342. In addition, all indicators of convenience variables are in very good category with an average value of 82.17% with the highest score for the ease of accessing information that can be done anywhere.

In contrast to Suki (2013), which found that convenience does not significantly influence the dependency on the smartphone. Due to the research concluded, there was a unique perspective of respondents in Malaysia that convenience factor in personal technologies such as smartphones and tablet PCs does not significantly influence the dependency on the smartphone.

Discussion in terms of dependency on smartphone

This study shows that dependency has positive and significant impact on purchase behavior with SLF value of 0.850. In addition, all indicators of dependency variables are in good category with an average value of 79.66%. According to research conducted by Ting et al. (2011), students (young people) with a high level of dependency on smartphones tend to make evaluations in determining the future purchasing behavior. It is also consistent with the results in this research that the majority of respondents were relatively young (between 19 and 30 years old). Thus proving the dependency effect on purchase behavior. The most important thing that makes the respondents rely is because the smartphone allows smartphone users to stay connected with the people whom they loved and the ease of accessing information wherever they are.

CONCLUSION

The results were calculated using SEM to measure purchase behavior with dependency variables. The results indicate that social need, social influence, and convenience have significantly positive effect on dependency and a positive and significant impact on purchase behavior with R2 values of 0.722. Where it is demonstrated that for smartphone users in Indonesia, dependency on smartphone influences purchasing behavior. This finding is similar to the findings of earlier studies by Arif et al. (2016) and Ting et al. (2011) who found that dependency on smartphone among students affects the future purchase behavior of smartphone.

LIMITATIONS

The quantitative research described here has no exception to limitations in representation where there are sample generalizations in this research. These findings might not be applicable for different types of smartphone or brands of smartphone, because different smartphones may impact differently on customer experience.

RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the results of this research, the recommendations for further research are as follows:

- This study focused on 4G smartphone. Furthermore, the object of study can be conducted with specific brand or type of smartphone.
- Future researchers should develop other factors that influence purchase behavior.
- A study could collect a much larger sampling size or focus on specific demographic characteristics. Perhaps a cross-cultural study delineating on different demographic characteristics might generate a more meaningful result.

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