Modeling Brand Switching of Blackberry Smartphone using Logistic Regression

Sussy Susanti

Abstract— Indonesia is a market that is growing very rapidly in the smartphone industry in Southeast Asia and become the main target market for smartphone manufacturers and this will lead to a very tight competition . Blackberry smartphones get a very good position at the beginning of its appearance in Indonesia but experiencing declining in 2013 that could be thought to be triggered by the presence of consumer dissatisfaction and lack of brand loyalty , which have an impact on brand switching . This study aim to examine the influence of consumer dissatisfaction and brand loyalty and generation simultaneously on brand switching . Using 100 respondents of Blackberry users from 3 generations , we used logistic regression model. The result reveals consumer dissatisfaction and generation significantly affect the brand switching behavior and as a moderating variable ,the generation Y has strengthened the influence of dissatisfaction to the decision of brand switching.

Keywords— Blackberry smartphone, Brand Switching, Logistic Regression

I. Introduction

Currently, there is competition among producers in various industrial sectors. One of the industrial sector showed a fairly high level of competition is the sector of information and communication technology. And the most attractive sectors in this industry is the emergence of smart phones (smartphones). Indonesia is a market that is growing very rapidly in the smartphone industry, it is seen from the greatest percentage growth among other countries in Southeast Asia.

This condition shows that Indonesia has become the main target market for smartphone manufacturers and this will lead to a very tight competition. As a result are from year to year, more varied smartphone mobile products and consumers are faced more and more choices.

Blackberry smartphones as one of the products get a very good position at the beginning of its appearance in Indonesia, so that in 2011, the Blackberry emerged as a global market leader in the category of mobile devices and mobile devices, and is in the first position (TOP) but in 2011, and despite still being in that position, but the share declined until 2013. The following shows the results of a survey of Top Brand Award 2011-2013 for the product category of smartphones.

Sussy Susanti, STIE Ekuitas, Bandung, West Java, Indonesia (mobile number: +628122141193; e-mail: sussy.rebab19@gmail.com)

TABLE I
TOP BRAND SMARTPHONE IN 2011-2013

Merek	2011	2012	2013
Blackberry	41,5%	40,7%	39%
Nokia	39,8%	37,9%	37%
Samsung	5,3%	6,6%	11,1%
iPhone	6,2%	3,8%	2%
Sony Ericson	3,3%	3,6%	-

Source: http://www.topbrand-award.com/

The data in Table I shows the condition of the Blackberry which are experiencing significant problems in Indonesia in general, both in terms of brand index and in terms of consumer satisfaction levels, which indicates the number of Blackberry (BB) users who switch to other brands caused by several factors, including the features and applications that are very standard, from the limited memory until the imperfect browser system . In Bandung, based on the observation in mobile phone shops, brand switching behavior is highly visible with many Blackberry users who visit and offer to sell their handphone, and others. It appears the saturation and decrease in the level of satisfaction with the Blacberry product in the market and emerging of more attractive new products on the market. This condition is possible because the product delivered excellence in brand advertising does not comply with the conditions of actual product, so for consumers who often experienced anything like this would cast doubt on the truth of the contents of the messages conveyed in the ad. The data illustrates how consumption patterns when a new technology that is different from the others can affect a person or consumers to switch products.

Manufacturers should really pay attention to a few things to maintain its brand that consumers who have owned could remain loyal to our products and do not switch to another brand because it was not satisfied with the products they consume. Dissatisfaction of consumers to the brand or product used previously are factors that lead to brand switching. The consumer dissatisfaction occurs as a result of a product or brand that used previously in line with expectations or desires of consumers [1].

Consumer satisfaction is something that must be considered by the company as customer satisfaction has a great contribution to the important aspects of the company. Customers have a choice, if they are not satisfied or do not like what is offered by the company, they can go or switch to another product. Companies should be aware of the level of satisfaction enough, because with decreasing customer

satisfaction, the desire of consumers to switch brands will be higher.[2]

Brand became a direct link between consumers and companies, as well as the likelihood that consumers will build loyalty to the brand. Brand loyalty (brand loyalty), brand awareness (brand awareness), perceived quality (perceived quality), as well as brand associations (associations of the brand) is an attribute that is instrumental in increasing brand equity. [3]

Today, in smartphone products, brand loyalty is still relatively low. According to marketing analysts and CEO BuzznCo, Sumardy, customer loyalty of Blackberry Smartphone is low because many consumers feel negative experience when utilizing this smartphones. Previously, the BlackBerry service suffered damage due to a hardware malfunction in the network infrastructure. As a result, most of the smartphone users around the world complain data transmission failure. It includes a big problem considering the 70 million BlackBerry subscribers spread across North America, Europe and Asia complained delivery service interruptions email, instant messaging and web browsing.

Blackberry users are widespread in some age groups and come from several generations. A generation describe the circumstances or situations, where every individual has the life experience to go through, can describe who we and how we see the world through the eyes of its own. Where in every generation have beliefs, values, cultures, perspectives, interests, what is not popular, and skills / abilities of the different life and work. The difference is what can bring a positive impact if it can be managed properly, even otherwise raise issues that will impact on the performance of the employees because no cooperation between generations. [4]

Each generation is followed by the letter X, Y, Z and so on that show at intervals of how they were born and grew that gave birth to the characteristics of different generations. For example, generation X is people who were born in the interval 1960 to 1980. In the generation X, they used to use the letter as a medium of communication, and mass media such as newspaper. The generation Y, they may hardly know what it is communication using letters, because they are already using SMS and telephone, but they still know what it is newspapers. the generation Z, they may not know what it is and what it is newspaper letters because the world media is already on the Internet that every day they access. The environmental differences that cause differences in their views on the benefits and uses of telecommunications equipment, as well as the optimization of the tool, causing differences in applying it in life.

II. LITERATURE REVIEW

a. Literature Review

Brand is a name of a term, sign, symbol, design or a combination of all of these are intended to identify products or services of a person or group of sellers and to differentiate it from the competition or can also be related to appointments, acceptance, trust and expectations of sellers to consistently provide the features and benefits of certain services to the buyer [5]. There are five levels of understanding that a brand, namely: attributes, benefits, values, culture, personality and users.

Each consumer purchases have certain expectations of the products that he uses and satisfaction is the expected result. Customer satisfaction depends on the assumption product performance in delivering value relative to the expectations of the buyer. When performance or achievements fit even exceed expectations, the buyer is satisfied. So that the consumer dissatisfaction arises when the results do not meet consumer expectations [6].

Consumer dissatisfaction is one factor contributing to the brand switching because of dissatisfied customers will look for another product, and will probably stop buying products or influence others to not buy [7]. Indicator of that can be used is the value, benefits and desires.

Brand Loyalty is a measure of customer loyalty to a brand. Brand loyalty is the willingness of consumers to stick with a brand when competitors come up with offers that are equally interesting not because of the history of the consumer and the brand. Most writers and researchers focused more on the behavioral aspects of brand loyalty and less focused on aspects of brand loyalty. Dick and Basu [8] described the loyalty behavior, depending on the purchase of a proportional and purchase order. Loyalty behavior does not provide a comprehensive overview of loyalty by failing to account for customers to move away from competitive brands (Allan & Joel, 1996). Attributes of behavior or attitude loyalty has been further reinforced by Kabiraj & Shanmugan [9] which shows that "brand loyalty is the consumer's decision, consciously or unconsciously, which is expressed through intention or behavior, to buy back the brand continuously.

Brand switching is purchasing patterns characterized by alteration or replacement of one brand to another brand Switching brands may arise because of the need to find variations. Consumers decision to switch brands are not only influenced by the need to find variations, but also influenced by several factors such as strategic decisions , situational and normative factors, dissatisfaction with the previous brand, and problem-solving strategies [1]. Consumers who only activate hypothesized cognitive stage as consumers are most vulnerable to switch due to the stimulation of brand marketing [10]. The indicators include the presence / absence of money, switching cost, and habit[1]. Dissatisfaction of consumers to the brand of products used previously are the factors that lead to brand switching. The consumer dissatisfaction occurs as a result of a product / brand that used previously not liking / consumer expectations.

b. Framework

In a study conducted by Uturestantix,, Ari Warokka, and Cristina Gallato [11] state that in Southeast Asia the mobile phone market is experiencing tremendous growth with the results indicate that consumer dissatisfaction and promotional sales significantly positive effect on brand switching. Variety seeking variable moderating consumer dissatisfaction on brand switching, and as a moderating variable, variety seeking have weakened the influence of consumer dissatisfaction on brand switching.

When consumers cannot get satisfaction from the product, they switch to another brand. This makes the product loses market share and ultimately reduce the rate of loss of profits from the products of the market. In order for a minimum switching, consumer product manufacturers should be oriented and maintain the quality of their products [12]

Similar results were supported by research from Teguh Suharseno, *et.al* [13] who studied the effect of dissatisfaction and the characteristics of the product to the consumer brand switching in mobile phone in Rembang, Indonesia, where the results stated that the consumer dissatisfaction has a significant positive effect against the decision of brand switching on the mobile phone users

Afzal [14] examined the factors that cause Brand Switching on mobile phone networks in Larkana city of India. They stated that the customer is satisfied, when the desire, and their needs can be met by any brand, which is used by them. A case brand in India (Ufone), factors such as: price, quality of service, trust and brand loyalty plays a major role in customer satisfaction and switching brands. The result stated that brand loyalty has a negative influence on brand switching. If their loyalty to the brand is high then possibility to switch would getting small.

Shehzad and Moosavi [15] examined the factors that influence brand loyalty of mobile phone on the Y generation in Sweden. The results suggest that the majority of Y generation show loyalty to their mobile where the quality of the brand, brand image, brand experience and customer satisfaction as factors influencing loyalty. Based on the above theory, framework presented in the following diagram:
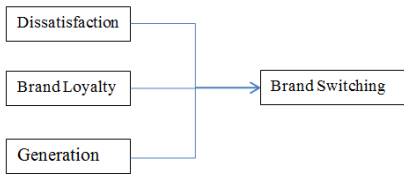

Fig. 1 Research Framework

III. METHODOLOGY

a. Research Methods

The study was conducted with descriptive and inferential approach . Given the type of research consists of descriptive and verification , the study conducted by collecting data in the field using survey research methods that include : descriptive survey and explanatory.

b. Population and samples

The target population of this study is the whole Blackberry smartphone users in Bandung either they never used or ever used but switched to other smartphone. The population will be separated according to age group is called Generation. Generation regarded as strata so that in each stratum characteristics tend to be homogen but across strata tend to be heterogen. The sample in this study is a Blackberry Smartphone customers are taken from three generational groups randomly selected by stratified sampling method. While the time horizon of this study is cross-sectional, the method of research by studying the object in a certain period of time that is the beginning of 2014.

c. Data Collection Methods

Collection of data relating to the study conducted by the survey. The data required is the primary data through the deployment of a set list of written questions (questionnaire). Because the scope of the study area is very large, the sampling technique used in this study were stratified random sampling which divides the research objectives into 3 groups of strata, so that all strata are represented. The reason for using this technique because the unavailability of complete sampling frame, in this case a list of all residents of the city of Bandung which uses the Blackberry so as to facilitate the process of randomization, we divided the population into strata.

d. Data Analysis Methods

i. Logistic Regression Models

In principle, logistic regression has the objective to estimate the probability of certain events in a population as a function of explanatory. This regression using a variable response / bound in the form of a dummy.

Response Variable used in this regression being categorized. Binary logistic regression using dichotomous response variable, namely 1 as the incidence and 0 for no incident. Response variable can be of 2 types, as in the case of the incidence of forest fires are divided into three classes, low vulnerability ($Y = 0$), moderate ($Y = 1$) and height ($Y = 2$). For some cases, it can be used multinomial logistic regression. Binary logistic regression model was used to see if the dependent variables are dichotomous scale ($Y = 0$ and $Y = 1$) is influenced by both the independent variables are categorical or numerical. The general form odds logistic regression models with variable k is formulated as follows:

$$\pi(x) = \frac{\exp(\beta_o + \beta_1 x_1 + \cdots + \beta_k x_k)}{1 + \exp(\beta_o + \beta_1 x_1 + \cdots + \beta_k x_k)} \quad (1)$$

If there are j independent variables and variables-jth is a categorical variable, there is k-1 dummy variable , with a dummy variable coefficients k_j called D_{ju} with B_{ju}, $u = 1,2, ..., kj-1$. So the logit transformation model can be written as the following equation:

$$g(x) = \beta_0 + \beta_1 + \ldots + \sum_{u=1}^{kj-1} \beta_{ju} D_{ju} + \beta_k x_k \quad (2)$$

If from several independent variables there are nominal or ordinal scale, then the variable will not be appropriate if included in the logit model because the numbers are used to express the level just as identification and did not have a numeric value in this situation required a dummy variable. For the independent variables with ordinal and nominal scale with k categories, will take as many as k-1 dummy variables.

ii. Parameter Estimation

Method to estimate the unknown parameters in the logistic regression model is Maximum Likelihood Method because this methods more practical. Maximum Likelihoood Method would

estimate parameters with values that maximize the likelihood function.

iii. Model significance test

H_0 : β1 = β2 =....= βp = 0, (no influence of the independent variables on the dependent variable)

H_1 : at least one βj ≠ 0, (there is at least one effect of the independent variables on the dependent variable)

Test statistic used is:

$$G^2 = -2\ln\frac{L_o}{L_p} \tag{3}$$

Lo = Maximum Likelihood reduction model (Reduced Model) or a model consisting of only constants

Lp = Maximum Likelihood from the full model (full model) or with all independent variables.

Statistics G^2 follows the Chi-square distribution with p-degrees of freedom so the hypothesis is rejected if the p-value <α, which means the variable X jointly affect the dependent variable Y.

iv. Partial Test and Model Formation

In general, the purpose of the analysis is to find a statistical model fit and strong linkage between models with existing data. Testing the significance of parameters (coefficient β) can partially be done through the Wald test the following hypothesis:

Ho : βj = 0 (The jth independent variable does not have a significant effect on the dependent variable)

H1 : βj ≠ 0 (The jth independent variable have a significant effect on the dependent variable) for j = 1,2,....,p

Test Statistic used is

$$W = \left[\frac{\beta_j}{Se(\beta_j)}\right]^2 \tag{4}$$

The hypothesis will be rejected if the p-value <α which means independent variables Xj partially affect the dependent variable Y.

e. Odds Ratio

The odds ratio is a measure of the risk or predisposition to experience the events 'success' of the category with the other categories, defined as the ratio of the odds for xj = 1 to xj = 0.

Odds ratio is denoted by θ, is defined as the ratio of two odds value xj = 1 and xj = 0, so that

$$\theta = \frac{[\pi(1)/[1-\pi(1)]]}{[\pi(0)/[1-\pi(0)]]} \tag{5}$$

IV. RESULT AND DISCUSSION

a. Significance Test Model

TABLE II
LIKELIHOOD RATIO TEST
OMNIBUS TESTS OF MODEL COEFFICIENTS

		Chi-square	df	Sig.
	Step	18.179	4	.001
Step 1	Block	18.179	4	.001
	Model	18.179	4	.001

Based on Chi Square calculation as shown at Table II, the significance value lower than 0.05 which means that Ho is rejected so the conclusion reveals that dissatisfaction, loyalty and generations influence significantly to Switching behavior of Blackberry so that testing can be continued to test the logistic regression coefficient partially.

TABLE III
MODEL SUMMARY

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	119.007[a]	.166	.223

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Value Nagelkerke R Square of 0.223 means switching brand variation can be explained by dissatisfaction and loyalty as well as the generation is 22.3%.

TABLE IV
CLASSIFICATION TABLE

			Predicted		
			Switching Behaviour		
			Ever used and still using	Ever used but no more	Percentage Correct
Observed					
Step 1	Switching Behaviour	Ever used and still using	39	17	69.6
		Ever used but no more	17	27	61.4
	Overall Percentage				66.0

a. The cut value is .500

Percentage of the model correctly classify the observations is 66 percent . This means that of the 100 observations , there are 66 observations correct classification by logistic regression models . Proper classification number of observations can be seen on the main diagonal.

i. Partial Test and Model Building

TABLE V
VARIABLES IN THE EQUATION

		B	S.E.	Wald	df	Sig.	Exp(B)
	TP	.364	.135	7.325	1	.007	1.439
	LOY	-.093	.116	.635	1	.426	.912
Step 1[a]	GEN			4.944	2	.044	
	GEN(1)	-1.089	.628	3.011	1	.043	.336
	GEN(2)	.254	.510	.248	1	.619	1.289
	Constant	-2.897	1.965	2.173	1	.140	.055

a. Variable(s) entered on step 1: TP, LOY, GEN.

Dissatisfaction and generation are significant predictors when all three variables are considered together which confirms the results in Table V. Each of these variables has a significant value smaller than α = 5 % The Exp (B) column in Table V presents the extent to which raising the corresponding measure by one unit influences the odds ratio. If the value exceeds 1 then the odds of an outcome occurring increase; but if the figure is less than 1, any increase in the predictor leads to a drop in the odds of the outcome occurring.

Based on the results in the Table V it is known that there are two independent variables that significantly affect brand switching decision . Each of these variables has a significant value smaller than α = 10 % . These variables are

Dissatisfaction (Sig . = 0.007) and Generation Y (Sig . = 0.043) . Building model is

$$\hat{\pi} = \frac{\exp(-2.897 + 0.364X_{1i} - 1.089X_{2i})}{1 + \exp(-2.897 + 0.364X_{1i} - 1.089X_{2i})}$$

ii. Odds Ratio Interpretation

Odds ratio value is also provided by the table in the column Exp (B). Increasing in dissatisfaction experienced by BlackBerry users , the tendency to switch 1.439 times than not not to switch.The higher customer loyalty , brand switching propensity to commit 0.912 times rather than not to switch. For instance, when dissatisfaction is increased by one unit (one Blackberry user)the odds ratio is 1.439 times as large and therefore Blackberry users are 3.247 more times likely to switch to one brand. Also, Loyalty is increased by one unit the odds ratio is 0.912 times as large and therefore Blackberry users are 0.912 more times likely to switch from one brand to the other.

V. CONCLUSION AND RECOMMENDATION

a. Conclusion

Based on the results and the discussion in the previous section regarding dissatisfaction, brand loyalty, and the type of generation in influencing the BLACKBERRY brand switching can be concluded that most respondents who switch brands on average expressed dissatisfaction over the features available, the price offered, and specifications advertised on the BLACKBERRY. Opinions of respondents for the generation of X, Y and Z are likely say the same thing although this higher dissatisfaction shown by generation Y and Z which is understandable because this group is a young group who are masters of technology and easily adapt to any changes that occur in telecommunications products as compared to generation X which tends to be difficult to adapt in the face of technological advances in the field of telecommunications.

Most of the respondents who are not switch on average expressed in the normal tendency advised to always use the BLACKBERRY, always give positive comments and keep using BLACKBERRY and opinions of respondents for generations X, Y and Z tend to say the same thing though loyalty brand shown by generation Y and Z is lower than the generation X which can be understood because this group is a young group that is easily changed in terms of brand loyalty for telecommunications products as compared to generation X. Based on the results of logistic regression analysis it is known that there are two independent variables that significantly affect brand switching decision is variable dissatisfaction and Generation as variables that mediate the effects of dissatisfaction with the decision of the brand switching.

b. Recommendations

Recommendations that may be filed relating to the conclusion are; firstly, based on the characteristics of the respondents who mostly belong on generation Y and Z are in the range of adolescence and adulthood, the company and marketer of Blackberry should pay more attentionon display

features and use of these features. Blackberry producer should be able to understand and recognize what the cause of dissatisfaction customers so that they can develop strategies to meet the desires and needs of the customer. Identify the needs of each generation to innovate products that suit the characteristics of each generation. For further research should be able to examine f other factors that affect the brand switching in addition to customer dissatisfaction and brand loyalty in terms of customer characteristics other than the generation.

REFERENCES

[1] Setiyaningrum, A. "Effect of Consumer Dissatisfaction and Needs Variety Seeking Decision on Brand Switching," *Thesis Faculty of Economics and Business UGM*, *Yogyakarta (unpublished)*.2006.

[2] Amala Solicha," The influence of consumer dissatisfaction towards brand switching decision of noodles product (study on students of the Faculty of Economics, University of Malang), 2008

[3] Susilo, Dedi.,Generation X versus Generation Y in Perspective and Outlook, published article on www.scrib.com, 2013

[4] Aaker, David A., *Building Strong Brands*, Free Press Business,United Kingdom, 2004.

[5] Kotler, P & Keller, K, "Marketing Management", twelfth edition, Prentice-Hall, 2008

[6] Daryanto, Principles of Marketing , Volume 1 ,. Erlangga Publisher , Jakarta , 2011

[7] Kotler, P. and G. Armstrong, *Principles of marketing*. 13th Edn., New Jersey: Prentice Hall, 2010.

[8] Dick, A.S. and K. Basu, *Customer loyalty towards an integrated framework*. Journal of the Academy of Marketing Science, 22(2): 1994. http://dx.doi.org/10.1177/0092070394222001

[9] Kabiraj & Shanmugan. 2011. *Development of a conceptual framework for brand loyalty: A Euro-Mediterranean perspective.* Journal of Brand Management. Palgrave; MacMillan

[10] Dharmmesta , Basu S. " Customer Loyalty : As a Conceptual Study A Guide for Researchers , " *Journal of Economics and Business Indonesia* , Vol . 14 , No. 3 , pp. 73-88 , 1999

[11] Uturestantix,, Ari Warokka, and Cristina Gallato, *Do Customer Dissatisfaction and Variety Seeking Really Affect the Product Brand Switching? A Lesson from the Biggest Southeast Asia Mobile Telecommunication Market*. Journal of Marketing Research & Case Studies; IBIMA Publishing, 2013

[12] Awogbemi , *et. al*, '*Modeling Brand Switching in Consumers' Products*. Journal of Economics and Sustainable Development. Vol 3 (12). Abuja, 2012

[13] Teguh Suharseno , Riskin Hidayat and Dian Ayu Dewi Liana, ' The influence of consumer dissatisfaction and the characteristics of the product categories brand switching decision by the need to find variations as a moderating variable' , *Journal Bulletin of Economic Studies* , Vol . 18 , No. 2, STIE YPPI, Rembang, 2013

[14] Afzal, 'Factors Behind Brand Switching In Cellular Networks.' *International Journal of Asian Social Science.* Larkana. Pakistan

[15] Shehzad & Moosavi. '*Factor influencing the cell phone Brand Loyalty of Swedish Generation Y.* Thesis Marketing Master of Mälardalen University. The School of Business, Society and Engineering Västerås. Sweden, 2013