

# Consumer Preferences to Specific Features in Mobile Phones: A Comparative Study

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## Abstract—

**T**he growth of the mobile market over the years have resulted into a fierce competition between the players of the smartphone industry. Original Equipment Manufacturers (OEM) have set up benchmarks and are always competing for a larger market share. The objective of this study is to analyse the switching preference of a consumer to a specific device (Nokia 6) and their preferences to different product features. The study is done on a set of 105 consumers with varied profession and age groups. The preferences between 8 different product features are analysed and then summarised. A logistic regression model is used to estimate the willingness of people to buy the specific device Nokia 6.

**Keywords—** Battery Backup, Primary and Secondary Camera, Display Resolution, Storage, Nokia 6, Budget Range, Processor Speed

## I. INTRODUCTION

The growth of mobile phones have been phenomenon in the 21<sup>st</sup> Century. Almost everyone possess a mobile phone. The mobile phones have come of an age. The mobile phone is an electronic handheld device which was initially introduced for the sole purpose of calling other people in a wireless environment. Many mobile phones support not only the features of calling and texting but several other features including camera, music player and web browsers to mention a few. The mobile phones have become a daily part and parcel of life and one simple cannot live without it.

In the competitive market of mobile phones, the Original Equipment Manufacturer (OEM) always try to build an advantage and distinguish its products features in subtle ways in order to convince the consumer to choose their brand instead of other. In order to address this situation, there are lots of researches performed in order to find out the factors which help consumers in choosing a particular brand and help the OEMs remain competitive in the market. All mobile phones have a generic set of features but they get differentiated by extent of service and quality provided by the OEM through usage of different materials for production, usage of different services and even different operating system software. This leads to great innovation in mobile phones industry.

The consumer purchase decision is influence by different factors throughout the world. This factor can be personality of customers and features associated with mobile phone handset. The customer preference of mobile phone attributes such as design, price, internet connection, battery life, gaming, e-mail, photo shooting, SMS, video quality, apps downloading, operating system and social networking etc. is very much popular. Its importance is increasing further when customer participates in large number. The product attributes help to select the product when customer confused between different products. This study has done with intention to find out the attributes which help to choose the mobile phone. It is focus on customer preference of product attribute of mobile phone handset.

## II. REVIEW OF LITERATURE

Bhatt (2008) in his study the mobile phone usage among the post graduate student researcher analysed, the vital factor for mobile phone which affected the behaviour at the time of mobile phone purchased. The factors are mobile phone carrier, services provider, equipment development. And young people like most key characteristics of mobile phone as well as risk understand which associated with. Ling Hwang and Salvendy (2007) in this study they surveyed on college students to find out students preference on mobile phones. The result of survey show that size, physical appearance and main menu of mobile phone are the most important factors which influence the choices of mobile phone.

Consumers are individuals and households that buy the firms product for personal consumption (Kotler, 2004). It often used to describe two different kinds of consuming entities: the personal consumers and the organizational consumers (Krishna, 2010). The activities these consumers undertake when obtaining, consuming, and disposing of products and a service is known as consumer behaviour. Consumer behaviour involves studying how people buy, what they buy, when they buy and why they buy. When a consumer wanted to make the purchase decision, they will pass through the process through recognition, search information, evaluation, purchase, feedback (Blackwell, Miniard, and Engel, 2006). At last, the consumer will choose a product or brand to consume from various choices in the market. However, these factors affecting the buying behaviour of consumers vary due to diverse environmental and individual determinants. Consumer buying behaviour is influenced by two major factors. These factors are individual and environmental. The major categories of individual factors affecting consumer behaviour are demographics, consumer

Knowledge, perception, learning, motivation, personality, beliefs, attitudes and life styles. The second category of factors is environmental factors. Environmental factors represent those items outside of the individual that affect individual consumer's decision making process. These factors include culture, social class, reference group, family and household. The above mentioned factors are the major determinants behind the decision of consumers to opt a given good or service (Blackwell, Miniard, and Engel, 2006).

Subramanyam and Venkateswarlu (2012) conducted a study on factors influencing buyer behaviour of mobile phone buyers in Kadapa district in India. The researchers studied the various types of marketing strategies adopted by market to acquire the attention and cognition of both existing and potential customers, and to study what role these marketing strategies play in consumer buying process. According to the results, income, advertising and level of education in a family are the determining factors of owning a mobile phone set. Malasi (2012) examined the influence of product attributes on mobile phone preference among undergraduate university students in Kenya. The study indicated that varying the product attributes' has an influence on the undergraduate students' preferences on mobile phones. Various aspects of product and brand attributes were considered such as colour themes, visible name labels, and mobile phone with variety of models, packaging for safety, degree of awareness on safety issues, look and design of the phone.

### III. OBJECTIVE OF STUDY

The major objectives of the research work at hand is listed as follows

- To find out the consumer preferences in smartphone market place.
- To analyse and predict the brand switching tendencies in smartphone market
- To analyse the factors affecting smartphone purchase decision
- To find out the awareness of new product launched by Nokia and probability of its acceptance by Indian consumers
- To analyse the factors that may contribute to the success of the Nokia 6

To analyse the willingness of consumers to buy the Nokia 6, the questionnaire has been so formed to test the awareness of consumers to the existence of Nokia 6 and their preferences to buy the Nokia 6 given their satisfaction levels pertaining to the performance of the specific product features which includes camera performance (both primary and secondary camera), battery backup as well as brand loyalty. The brand loyalty is measured in the form of a consumer's satisfaction level to the current brand of mobile phone they are having. The data for the same is collected through the questionnaire pertaining to the scope of the research.

Assumption of Hypothesis

H0: there is no significant contribution of the satisfaction of consumers from mobile camera, battery backup and brand loyalty towards buying the Nokia 6.

H1: there is significant contribution of the satisfaction of consumers from mobile camera, battery backup and brand loyalty towards buying the Nokia 6.

Finding the correlation between budgets and switching to new mobile phones among the consumers are also taken into consideration.

### IV. METHODOLOGY

The research methodology deals with the methods that have been used in the research for concluding and adhering to the objectives. For the objective of finding out the willingness to buy Nokia 6, a dichotomous variable has been used which represents the willingness factor. A logistic regression model has been used for evaluating. The dependent variable in logistic regression is usually dichotomous, that is, the dependent variable can take the value 1 with a probability of success  $q$ , or the value 0 with probability of failure  $1-q$ . this type of variable is called a Bernoulli (or binary) variable. Although not as common and not discussed in this treatment, applications of logistic regression have also been extended to cases where the dependent variable is of more than two cases, known as multinomial or polytomous [tabachnick and fidell (1996) use the term polychotomous].

Here are two main uses of logistic regression. The first is the prediction of group membership. Since logistic regression calculates the probability of success over the probability of failure, the results of the analysis are in the form of an odds ratio. For example, logistic regression is often used in epidemiological studies where the result of the analysis is the probability of developing cancer after controlling for other associated risks. Logistic regression also provides knowledge of the relationships and strengths among the variables (e.g., smoking 10 packs a day puts you at a higher risk for developing cancer than working in an asbestos mine).

We have two possible outcomes 1 or 0 for  $N$  observations indicating a success or failure of an event. For  $N$  observations, a study of failures in a class is conducted for a particular subject. Following are the outputs:

{ 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, ..... }

In which 1 indicates the pass in subject and 0 indicates the failure in subject.

The likelihood principle says that all inference about a parameter should utilize observed data only through how it affects the likelihood function, the probability of observing the observed data given  $p$ . the likelihood is

$$F(Y) = P(Y = (1, 1, 1, 0, 0, 1, \dots, 1, 1, 0) / p)$$

$$= p * p * p * (1 - p) * (1 - p) * p * \dots * p * p * (1 - p)$$

$$F(Y) = \sum P^{y * (1 - P)^{1 - y}}$$

In our case  $P$  takes up the logistic distribution function  $K(x) = e^x / (1 + e^x)$

$$\ln F(Y) = \sum y \ln P + 1 - y \ln(1 - P)$$

$$\ln F(Y) = \sum y \ln P - y \ln(1 - P) + \ln(1 - P)$$

$$\ln F(Y) = \sum y \ln(P / (1 - P)) + \sum \ln(1 - P)$$

$$\sum (P / (1 - P)) = e^z / (1 + e^z) / 1 / (1 + e^z)$$

$$\sum (P / (1 - P)) = e^z \text{ where } z = \beta_1 + \beta_2 * x$$

$$\sum (1 - P) = 1 / (1 + e^z)$$

$$\ln F(y) = \sum y (\beta_1 + \beta_2 * x) - \sum \ln(1 + e^{\beta_1 + \beta_2 * x})$$

Eq 1.2 is called as Log Likelihood function

In maximum likelihood our aim is to maximize the likelihood function and finding the unknown parameters  $\beta_1$  and  $\beta_2$  in such a way that the probability of observing the value of Y's as high as possible. The resulting expansion will be of nonlinear nature hence we should resort to iterative algorithm like Newton – Raphson method.

In our research, there are three independent variables viz. Camera rating, Battery Backup and Brand Loyalty. The independent variables are unweighted and follows the Likert Scale. The variables have values ranging from 1-5 with 5 representing maximum satisfaction and 1 representing least satisfaction. Brand Loyalty is mapped as 5 being the most loyal and 1 being the least loyal.

## V. RESULTS

Table I logistic regression analysis

Iteration Number	Logit Analysis		
	Beta Values	L value	Comments
1	$\beta_0, \beta_1, \beta_2, \beta_3 =$ 0 0 0 0	-72.7805	Initial Log-likelihood function value
2	$\beta_0, \beta_1, \beta_2, \beta_3 =$ 0.8949 0.3204 -0.1477 -0.1957	-57.8185	Subsequent log likelihood function value
3	$\beta_0, \beta_1, \beta_2, \beta_3 =$ 1.0063 0.4184 -0.1803 -0.2694	-57.5116	Subsequent log likelihood function value
4	$\beta_0, \beta_1, \beta_2, \beta_3 =$ 1.0137 0.4274 -0.1820 -0.2774	-57.5096	Subsequent log likelihood function value
5	$\beta_0, \beta_1, \beta_2, \beta_3 =$ 1.0137 0.4275 -0.1820 -0.2775	-57.5096	Subsequent log likelihood function value

Table 2 Satisfaction analysis

Serial Number	Satisfaction Values on different Parameters		
	Rating Value	Camera	Battery
1	5	27	25
2	4	35	27
3	3	35	34
4	2	4	14
5	1	4	5

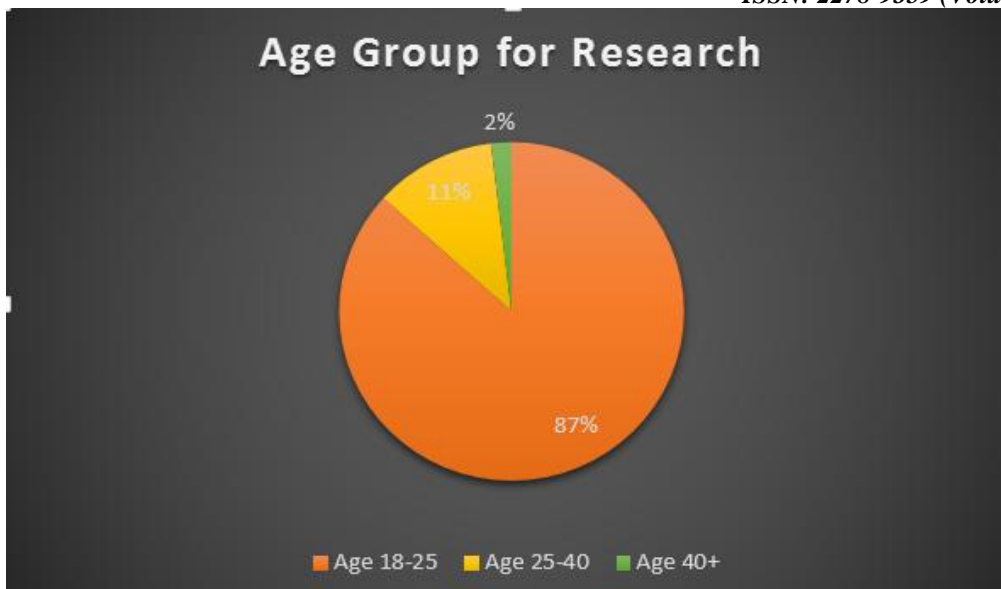


Fig 1. Age group of the Respondents

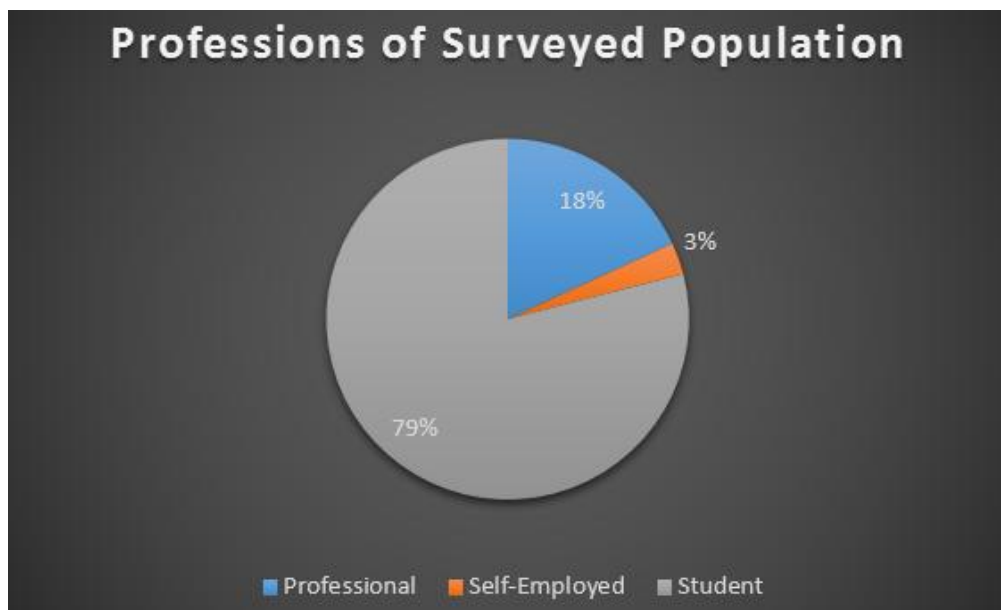


Fig 2. Professions of the Respondents

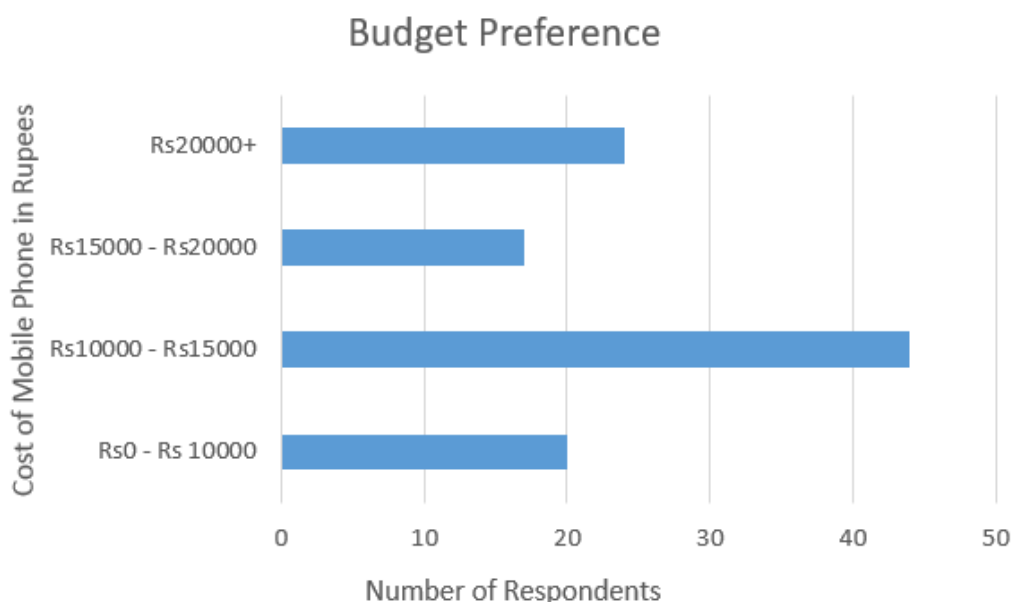


Fig 3. Budget preference of Respondents for buying a new mobile phone

## First Mobile Brand of Respondents

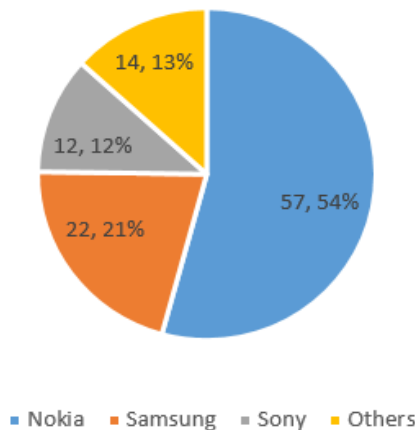


Fig 4. First Mobile Brand of Respondents in the Survey.

## VI. CONCLUSION

It can be concluded that logistic regression reveals a close saturation in very less number of iterations. This signifies the value of the sigmoid curve is already saturated at the beginning of the research. The slope of the curve at each point doesn't change drastically as there is only a minute change in the log-likelihood value. Thus the willingness of people to buy a Nokia 6 and adhering to our following objectives

- To find out the awareness of new product launched by Nokia and probability of its acceptance by Indian consumers
- To analyse the factors that may contribute to the success of the Nokia 6

We can conclude that 69/105 respondents have heard about the Nokia 6 but 78 people want to buy the Nokia 6 even though they have not heard of it. This goes to show, that Nokia is having customer preference and brand value existing. The major factor that came out from the research is Fig 3 which shows that nostalgia of owning a Nokia. 54.3 % of the respondents had the first mobile phone as a Nokia.

At 80% confidence level and application of Z-Test, we can tell that the factors of Camera Performance and Brand Loyalty is significant for choosing of Nokia 6.

At 95% confidence level and application of Z-Test, we can tell that the only factor of Brand Loyalty is significant for choosing of Nokia 6.

At 75% confidence level and application of Z-Test, we can tell that Camera Performance, Battery Backup as well as brand Loyalty plays a significant role in choosing of the Nokia 6.

Adhering to our following objectives:

- To find out the consumer preferences in smartphone market place.
- To analyse and predict the brand switching tendencies in smartphone market
- To analyse the factors affecting smartphone purchase decision

We can have the following conclusion from Fig 4: Respondents prefer to stick a medium range for the budget thereby emphasizing the need for value for money for the product. Table 2 depicts that 92.3% of respondents are satisfied with the performance of their camera and 81.9% of respondents are satisfied with the performance of the battery backup of their current smartphone.

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