Is Innovation A Reason for Consumer Resistance Towards Smartphone? An Indian Perspective

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Abstract: Despite successful innovations in market pertaining to smart phones, the consumer behavior is constantly leading to failure of these products. Even if the product offers extensive benefits and improved functionality, the response of the customers is less than enthusiastic. Consumer resistance is inversely related to customer adoption. If resistance is not overcome, adoption rate surely decreases and ultimately causes failure of the product. Consumer resistance can be perceived in two parts. First, the consumer psychological factors that influence their buying decisions and second, the product factors i.e. how the innovation is strong enough to overcome the resistance barrier. Against this back drop the paper aims to uncover the factors of consumer resistance characteristics that mainly determine consumers' resistance towards Smartphones and the inter-relationship between innovation and factors affecting consumer's characteristics. The study employs smart PLS to analyze the above mentioned relationship and finds that Perceived Risk, Complexity, Relative Advantage and Compatibility are found to be the most important factors which determine the consumers' resistance towards smart phones.

INTRODUCTION

The trend in mobile phone innovations is going toward smartphones. Smartphones are mobile devices integrating cell phone and all consumer electronic products, including MP3, Camera, Internet (Computer), GPS, and even TV. Indian smart phone market comprises of 220 million users of smart phones which is much higher as compared to the US market making India the second largest smart phone market. (Counterpoint Research, 2016).

Indian population comprises 1.3 billion people out of which two thirds are below the age of 35 making it the world's largest youth population which implies that India has potential of becoming world's largest market for smartphones. This fact coupled with the country's economic growth has led to an

unprecedented growth in the usage of smartphones (NASSCOM, 2015). The market is expected to see a compounded annual growth rate of 23 per cent through 2018 and account for 30 per cent of global growth during that period.

Gartner defines smartphone as "A large-screen, voice- centric handheld device designed to offer complete phone functions while simultaneously functioning as a personal digital assistant (PDA)" (Jo B., 2006) Palm, the handheld manufacturer defines smartphone as "A portable device that combines a wireless phone, e-mail and Web access and an organizer into a single, integrated piece of hardware", which represents radical innovation in the mobile phone industry (Mike, 2007).

Smartphones are excellent communication tools, providing users with "smart" multi fold functionalities of both PDA (Personal Digital Assistants) & cell phones (Nanda *et al.*, 2008). Smartphones represent the new wave of innovation in the mobile phone industry which will have a far-reaching effect (Park & Chen, 2007). Since the introduction of personal mobile phones in the 1970s the mobile handset has undergone a great leap in evolution. (Goyal and Bagga, 2016). The modern mobile handsets are capable of much more than just connecting people over a wireless line, they can connect with the world instantly, process data like a computer and do more while getting slimmer, fancier, and more robust. All this has been possible due to the innovation in the Mobile operating systems (Bagga et al 2016). These smartphones have become an integral part of users' life, as they are not merely communication tools but also expressions of the lifestyle of its users (Castells, 2006). They provide impressive usable interface, are more powerful, with increasing processor capability and storage space, and better communication & multimedia functions (Monk *et al.*, 2002 and Nguyen *et al.*, 2008).

LITERATURE REVISITED

Innovation is different from invention. Innovation is the embodiment, combination, and/or synthesis of knowledge in original, relevant, valued new products, processes, or service. (Harvard Business Press, 2009). It leads to advancement in technology or enhancement or introduction of new features or all of them. It has become an indispensible measure for the companies to survive in the competitive environment. The term can be classified into 2 major subheadings, i.e. Sustaining Innovation and Disruptive innovation. The former can be, further subdivided into Radical and incremental innovation. They focus on improving the performance of existing product various dimensions and ensure further technological advancement.

Innovation Resistance (IR)

Adoption of innovation and its resistance are two extreme points of the same continuum (Lapointe *et al.*, 2002). Consumer reacts to any innovation in a negative way because of two reasons. Either the innovation disturbs the status quo of satisfaction achieved from the existing product or comes into conflict with the existing belief system (Ram & Sheth 1989). Changes due to innovation lead to consumer resistance (Gatignon & Robertson, 1989). People are not against innovation but resist the outcome that follows leading to a complete upheaval of existing belief structure (Ellen *et al.*, 1991; Schein, 1985). It is considered as the most important factor for success of any adoption of technical Innovation (Leonard, 2004), which has reduced the importance of innovation in technical fields. It has transformed itself as the major cause of product failure (Ram 1987). According to Mirella *et al.* (2009). and Smiin & Foxall (1998) resistance can be defined in terms of three things: Rejection , Postponement and Opposition.

Postponement leads to delay in adoption (Kuisma *et al.*, 2007) while rejection leads to complete product failure. Postponement may lead to adoption or rejection of the product after a specified time period. Opposition leads to rejection in the long run but the consumers are willing to test the innovation, which increases its chances for adoption. Keeping in minds that innovation resistance in an important factor in consumer decision making process, various researchers have proposed models for explaining consumer resistance towards adoption of new innovations. Some notable models have been discussed hereafter.
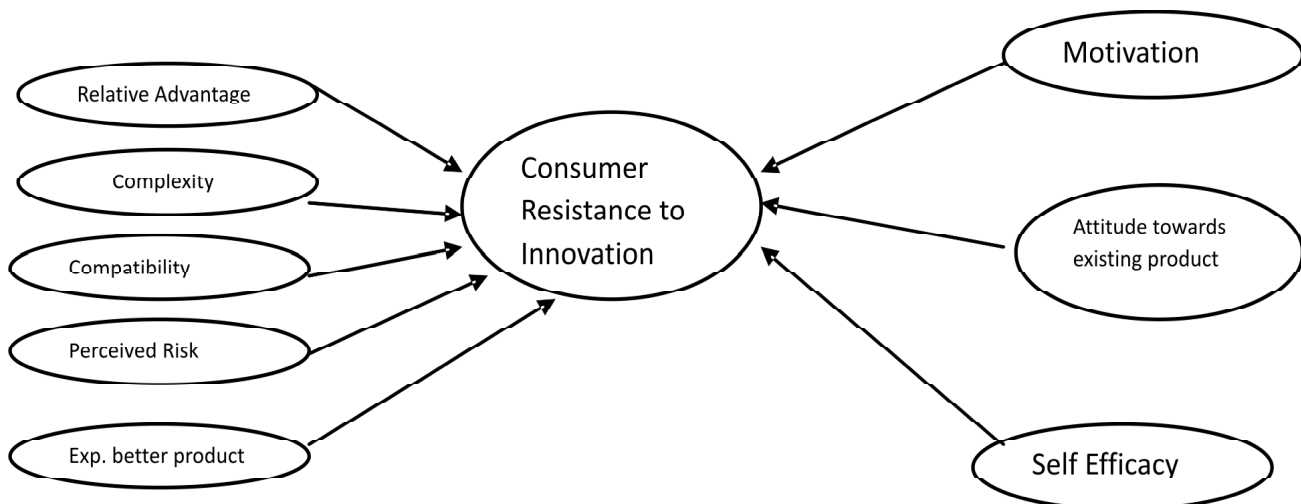
Ram's Model

The model comprises of three factors: "Perceived Innovation Characteristics", "Consumers Characteristics", and "Characteristics of Propagation Mechanisms", which can be further sub-divided into a set of detailed factors (Gatignon & Robertson 1991; Rogers 1995). This model has been later modified by Yu and Lee in 1994 who removed the third factor and claimed that the factor acts as an obstacle in the path of diffusion of innovation and does not lead to innovation resistance. This new model helped the researchers to establish distinction between the term innovation barriers and innovation resistance.

Technology Adoption Model (TAM)

The third model dealing with consumer adoption of new technology was proposed by Davis in 1989. The model had two variables, i.e. PU (perceived usefulness) and PEOU (perceived ease of use) for the specific technology. This model was applied to measure consumer resistance. (Davis,1989). Researchers perceive it as a subset of the original Ram's model where PEOU is derived from complexity and perceived usefulness from relative advantage (Roberts & Pick, 2004). Later PEOU was replaced by "self efficacy" for measuring consumer attitude towards innovation of technological products.

Theoretical Model of the Study

The model (presented above) used for the purpose of this study has been adopted from three earlier models- Ram's model (1989), its extension model of Yu and Lee (1994) and the Technology Adoption Model (TAM) proposed by Davis in 1989.

Table 1
Variables of the study

Definition of variables	Authors
Relative Advantage	Roger and Shoemaker, 1971
"Degree to which an innovation is perceived as	Holak and Lehmann, 1990
being better/ Superior than the idea it supersedes."	
Complexity	Holak and Lehmann, 1990
"Degree to which innovation is perceive as a relatively	Cooper and Zmud, 1990
difficult to understand use or comprehend"	
Compatibility	Roger and Shoemaker, 1971
"Degree to which prospective consumers believe that	Holak and Lehmann, 1990
the new product fits with their socio cultural norms"	
Perceived Risk	Ram, 1989
"Consumers subjective expectation of suffering a loss	Dunphy and Herbig, 1995
in pursuit of a desired outcome."	
Expectations for better products	Ram, 1987
"Inhibitory effect on the adoption of other innovations"	Ram and Seth 1989
Motivation	MacInnis and Moorman, 1991
"Goal Directed arousal driving consumer needs"	Herzberg *et al.*, 1959
Self efficacy	Compeau and Higgins, 1995
An individual's perception of his or her ability to	Davis 1996
use a technologically innovative product."	
Attitude towards existing product	Schwartz, 1992
"influence of tradition and the abilities of existing	Wan 2008
product in serving consumer needs"	

RESEARCH METHOD

This study employs conclusive research design. The study tries to fulfill the gap of the existing literature by addressing the issue of customer resistance among smart phone users. A quantitative research is undertaken as it always involves hypothesis testing (Saunders *et al* , 2003). For meeting its objective a Survey has been conducted which allows researcher to gather large quantity of data from a given sample in an efficient and economical way. People, having a smart phone and falling into age group 28 to 40, working in Delhi NCR were targeted.

The variables of the questionnaire were taken from literature. The following variables were finalized for the study.

Table 2
Endogenous and Exogenous variables

Consumer Characteristics (Exogenous Variables)	(Endogenous Variable)	Innovation Characteristics (Exogenous Variables)
Attitude Towards existing Product (ATP)	Resistance towards Innovation (RI)	Complexity (CMXY)
Self Efficacy (SE)		Compatibility (CMPY)
Motivation (MVN)		Relative advantage (RA)
		Perceived Risk (PR)
		Expectation of better product (EBP)

The above mentioned variables were taken from 3 consumer resistance models given by Ram, Yu and Lee model (1994) and TAM model. 5 point Likert Scale was used to measure the latent variables of the study. The questionnaire was pilot tested on a sample of 48 people who volunteered to participate in the survey. The questionnaire was modified according to the response given by the respondents.

The survey was done with the help of internet which has become a very popular method of collecting data as it reduces the time and money involved in collecting data (Wright, 2005; Nie *et al.*, 2002). The data was collected in a span of 45 days. Convenience sampling was used to select the sample from the population and a total of 389 respondents were identified to whom the request to fill the questionnaire was sent through internet. After excluding the incomplete responses finally 204 completely filled questionnaire were considered for analysis.

The reliability of the questionnaire was tested with the help of *Cronbach Alpha.* The closer the value of Alpha to 1, higher is the internal consistency or reliability of the questionnaire (George and Mallery, 2003).

Table 3
Reliability scores

Variables	Value of Cronbach Alpha
RI	0.886
SE	0.984
MNV	0.897
ATP	0.866
CMXY	0.901
CMPY	0.900
RA	0.891
PR	0.882
EBP	0.923

Table 3 indicates that the questionnaire is reliable with the value of alpha ranging from 0.8 to 0.9.

Following hypothesis were tested with the help of Smart PLS.

H1 Lower RA leads to higher consumer resistance towards Smartphones.

H2 Higher CMXY leads to higher consumer resistance towards Smartphones.

H3 Lower CMPY leads to higher consumer resistance towards Smartphones.

H4 Higher PR leads to higher consumer resistance towards Smartphones.

H5 Higher EBP leads to higher consumer resistance towards Smartphones.

H6 Lower MVN leads to higher consumer resistance towards Smartphones.

H7 The more favorable consumers' Attitude towards normal mobile phones, the higher the consumers' resistance to Smart phones

H8 The lower the Self-efficacy, the higher the consumers' resistance to Smart phones

TOOL FOR ANALYSIS

Smart PLS, developed by Ringle, Wende &Will in 2005 has become a very popular software for conducting Partial least Square Structural Equation Modeling as it involves no assumptions about the distribution of data (Hwang *et al.*, 2010). It can be applicable when the sample size is less and predictive accuracy is paramount (Bacon, 1999; Hwang *et al.*, 2010; Wong, 2010). Studies suggest that a sample size of 100 to 200 can be considered sufficient for carrying out path modeling (Hoyle, 1995).

DATA ANALYSIS

The study uses Reflective model in order to measure the consumer Resistance towards smart phones. The results generated after applying path analysis through SMART PLS are produced here under.
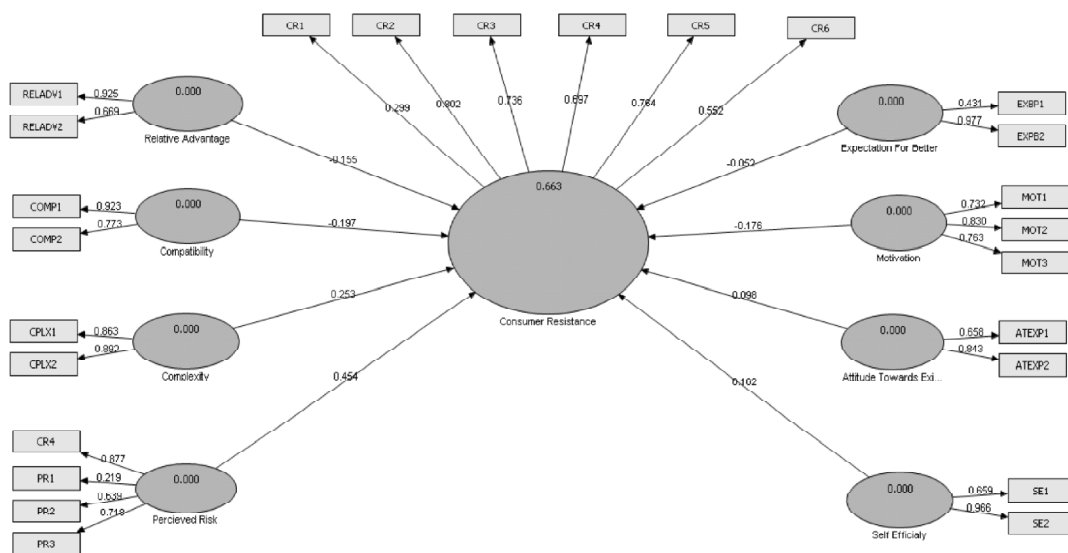

Figure 2 : Final Model of Consumer Resistance

Source: Output of Smart PLS from data gathered by the researcher

The targeted endogenous variable for the study was consumer resistance. It can be inferred from the table that the 8 exogenous variables together explains 66.3% variance in consumer resistance i.e. RI.

Table 4
The inner model

Factors	Hypothesis	Beta	T-Values	Significance
RA	Hypothesis 1	-0.155	2.332	SIGNIFICANT
CMPY	Hypothesis 3	-0.197	2.139	SIGNIFICANT
CMXY	Hypothesis 2	+0.253	3.272	SIGNIFICANT
PR	Hypothesis 4	+0.454	5.250	SIGNIFICANT
EBP	Hypothesis 5	+0.054	0.565	NON-SIGNIFICANT
MVN	Hypothesis 6	-0.176	2.094	SIGNIFICANT
ATP	Hypothesis 7	+0.097	1.323	NON-SIGNIFICANT
SE	Hypothesis 8	+0.162	1.805	NON- SIGNIFICANT

As can be inferred from table 4, five out of eight Hypotheses are accepted while 3 are rejected. The data has converged in 4 iterations making the sample size deemed fit for Analysis (Chin,1998).

Table 5
The outer model loadings

RA	0.920
	0.669
CMPY	0.920
	0.773
CMXY	0.863
	0.892
PR	0.877
	0.219
	0.639
	0.719
EBP	0.9
	0.431
MVN	0.732
	0.860
	0.763
ATP	0.658
	0.843
SE	0.659
	0.966

The results were robust as average variance explained was more than 0.5 for all the 8 latent variables. The convergent and discriminate validity was also achieved.

The results from Smart PLS suggests that 5 of the hypotheses, except H5, H7 and H8 i.e.. Expectations for better products, Attitude towards existing product and Self-Efficacy are supported.

The support for RA can be easily established from the literature as advocated by researchers in the past. It has a significantly negative impact on consumer resistance towards Innovation.(Ram 1987,Ram & Sheth 1989, Lee & Yu, 1994; Dunphy & Herbig, 1995). This negative correlation is also confirmed by Technology Adoption Model., where "perceived ease of used" has been taken as a synonym for Relative Advantage (Roberts and Pick , 2004). The variables complexity and compatibility has been also supported by the studies of Ram, 1987, Dunphy & Herbig, 1995.

Respondents displayed higher resistance if they felt that the smart phones are more risky and complex to use. Motivation is a very important factor in affecting resistance negatively. The importance of motivation was highlighted by MacInnis *et al.* in 1991 stating that this variable drives consumer needs. Respondents who have strong motivation for adopting smart phones are less resistant towards innovation.

But the study does not confirm the importance of 3 variables, i.e. expectations for better products, Attitude towards existing products and self efficacy.

CONCLUSION

The model for the study explained 66% variation in Resistance towards Innovation. Consumer Resistance is significantly affected by 5 factors which together constitute innovation and consumers' characteristics. The results conclude that resistance will increase with lowering of relative advantage of the Smart phones in the minds of the consumer. Perceived Risk factor is most important among all the factors as it has the highest T-Value indicating a positive impact on the endogenous variable. Consumers who believe that they may lose their private data or complain of poor battery life are the strongest opponents of Smartphone adoption in India. Few sections of the society feel that it is a sheer waste of money to have expensive smart phones and resist the innovation.

Support for H6, i.e. Motivation is also very high. It has a negative impact on the resistance offered by the consumers. The more a person is motivated to buy a smartphone, lesser will be the resistance offered by him.

It is seen that H7 i.e. Attitude Towards Existing Products has a positive effect on consumers' resistance. This means that more a customer is satisfied with the existing product, more he will resist the new product. This shows that respondents, who are traditional, will be reluctant to replace their old but still functional mobile phones. Similarly, Self Efficacy does not have sufficient significance on customer resistance to smartphones (according to the empirical data). This can be interpreted as the fact that technologically educated consumers these days have adequate knowledge of the features/ functions of the phones they are using.

For the 'Expectation for Better Products', a positive relationship is observed between the Expectancy and Consumers' Resistance. In this study it can be concluded that whether or not the consumers resist smartphones, they have quite high expectations from the new product.

MANAGERIAL IMPLICATION

In the past decade, markets have witnessed several product failures. The products are introduced and fail immediately with a very short shelf life. In this context, the companies need to understand the concept of consumer resistance to become more efficient (Dunphy and Herbig, 1995). The smartphone market is growing in India, hence it becomes pertinent for the companies manufacturing smartphones, to understand the relationship between innovation and resistance, so that the they are able to reap the benefits of the investment made in innovation. Thereby increasing their profitability and avoiding future product failures.

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