FACTORS AFFECTING CONSUMER RESISTANCE TO INNOVATION IN MOBILE PHONE INDUSTRY

CrossMark
← click for updates

Mirza Hassan Hosseini[1] --- Mohsen Delaviz[2] --- Hamed Derakhshide[3][†] --- Mojtaba Delaviz[4]

[1]*Professor, Department of Management ,Payame Noor University, Tehran, Iran*
[2]*PhD student in Crisis Management, Institute of Research Index, Isfahan, Iran*
[3]*PhD Student of Business Administration, Department of Management ,Payame Noor University, Tehran, Iran*
[4]*Student of M.Sc in Public Administration, Islamic Azad University, Tehran, Iran*

ABSTRACT

Innovation has been called as a key factor for companies to survive and grow in the long run, especially in the dynamic & complex markets and uncertain economic circumstances. The purpose of this research is to analyze the relationship between consumers' resistance and different factors from innovation and consumers' characteristics. Confirmatory factor analysis has been done on pre-test questionnaires to test, improve, and verify the constructs (variables/questions) for measuring the hypothesized factors. A theoretical model has been proposed from the hypotheses; and Structural Equation Modeling has been applied, where results are estimated through Partial Least Square and AMOS approaches, using a sample of 330 respondents from Iran. Five out of eight hypotheses have been supported by our empirical data, where H1 i.e. relative advantage, H3 i.e. complexity, and H4 i.e. perceived risk, are from innovation characteristics, while H6 i.e. motivation, and H7 i.e. „favorable attitude towards existing products" are from consumers' characteristics. Motivation, Complexity, Relative Advantage, and Perceived Risk are found as important factors that affect/determine consumers' resistance to mobile phone.

© 2016 AESS Publications. All Rights Reserved.

Keywords: Consumers resistance, Innovation, Motivation, Perceived risk, Compatibility, Relative advantage, Mobile phone.

Contribution/ Originality

This study is one of very few studies which have investigated Factors Affecting Consumer Resistance to Innovation in Mobile Phone Industry in a conceptual model based on the comprehensive literature review in the area of Phone Industry.

1. INTRODUCTION

Innovation is a key factor for companies to survive and grow in the long run, and has been called as the lifeblood of most organization (Balachandra and John, 1997). One of the main reasons for inhibiting or delaying the innovation diffusion is consumers" resistance, which appears to have been neglected in the academic literature (Laukkanen *et al.*, 2008). Even though the innovative product may provide extensive benefits and improved functionalities, researchers have found that consumers often convey less than enthusiastic response to a number of new products (Gold, 1981). Consumers' resistance has been defined as "Innovation resistance is the resistance offered by consumers to an innovation, either because it poses potential changes from a satisfactory status quo or because it conflicts with their belief structure" (Ram and Sheth, 1989). Consumers' resistance plays an important role in the success of innovation,

as it can certainly inhibit or delay the consumer adoption. It has been termed as one of the major causes for market failure of innovations and also a valuable source of information vital to the successful implementation and marketing of innovation (O'Connor *et al.*, 1990). Consumer adoption of innovation depends upon several factors: the most important of which are specified as consumers' characteristics (psychological characteristics of consumers; how they view the innovativeness with respect to that particular product), and the innovation characteristics (outcome and effects of innovation) (Dunphy and Herbig, 1995). Innovation characteristics research represents the relationship between the attributes or characteristics of an innovation and the adoption, use, or implementation of that innovation (Tornatzky and Klein, 1982).

The study of consumer's resistance in the case of mobile phone, based on innovation and consumers' characteristics can contribute to the innovation, research field, a new breed of information/knowledge regarding consumers' behavior towards newer mobile technology. Ultimately, manufacturers/marketers would be in a better position to predict consumers' reaction/interaction with the new products to minimize/overcome the resulting consumers'' resistance. The purpose of this study is to identify and analyze the relationship between consumers' resistance and different factors from innovation and consumers' characteristics. Thereafter, important factors are identified which mainly affect/determine consumers' resistance to mobile phones.

2. LITERATURE REVIEW

An innovation is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption. An innovation may composed of advancement in existing features, or establishment of new features to an existing product/service, or it might be a totally new/innovative product/service introduced in the (same or new) market (Bagozzi and Kyu-Hyun, 1999). Technological innovation is an iterative process started by the perception of a new market and/or new opportunity for an invention (technological) which directs to development/improvement, manufacturing, and then marketing tasks essential for the commercial accomplishment of the invention. This reveals two important perspectives, first, the innovation process comprises the technological development of an invention with addition to the commercial introduction of that invention to consumers, secondly, the innovation process is iterative and hence, instinctively includes the first opening of a new product and the re-opening of an enhanced and developed innovation (Garcia and Calantone, 2002). The commercialization of new product has been termed as the most critical and also crucial activity that renders its accomplishment. Generally there are two types of innovation; incremental and radical innovation. In this study we deal with radical innovation. A radical innovation is "a product, process or service with either unprecedented performance features or familiar features that offer significant improvements in performance or cost that transform existing markets or create new ones" (Assink, 2006). It can also be defined as an "innovation that breaks with traditions in the field". They can also be labeled as radical, discontinuous, generational or breakthrough (Dahlin and Behrens, 2005) and also disruptive innovation. Radical innovations are essential and eminent for manufacturers/marketers because of their capabilities to bring new means of competitive advantage, on the other hand they are necessary for consumers as they are the main source of social and economic change in everyday lives (Garcia and Calantone, 2002). The adoption of radical innovations require much more commitment and entail higher expenditure and risks (including learning costs and psychological effort) than the adoption of incremental innovations (Heiskanen *et al.*, 2007).

Innovation resistance is consumers' reaction towards an innovation, either because it create potential changes from a satisfactory status quo or because it is in conflict with their belief structure. One aspect of innovation resistance is; resistance due to changes imposed by innovation (e.g. changes in consumption or product) and is called resistance to change (Gatignon and Robertson, 1989). Zaltman and Duncan (1977) defined this as "any conduct that serves to maintain the status quo in the face of pressure to alter the status quo". Resistance to change is a natural response of a human being to any changes that disturb the balance of living environment or firms' actions (Zaltman and Duncan, 1977). Innovation resistance has been called as one of the important critical success factors for the

adoption of technological innovation, and adoption has been portrayed as the result of overcoming resistance (Szmigin and Foxall, 1998).

Resistance leads consumers response towards three forms, it may take the form of direct rejection, postponement or opposition (Mirella *et al.*, 2009). Postponement occurs when consumers delay the adoption of an innovation. It simply "refers to pushing the adoption decision to future. Opposition refers to "protesting the innovation or searching for further information after the trial" (Kuisma *et al.*, 2007). It is a kind of rejection, but the consumer is willing to test/check the innovation before finally rejecting it. The causes of opposition vary and can be many, e.g. habit resistance, situational factors, and consumers' cognitive style might direct them to reject innovations (Mirella *et al.*, 2009). Consumers may directly reject an innovation, which is the most extreme form of resistance (Mirella *et al.*, 2009). When a mass of consumers reject an innovation, manufacturers usually change or iterate/modify it appropriately and then re-introduce it in the market. Rejection may occur if the innovation does not offer any valuable advantage, is complex or risky, etc (Szmigin and Foxall, 1998).

2.1. Factors Affecting Consumers' Resistance

There are two kinds of factors that affect consumers'' resistance, and are based on consumers'' characteristics and innovation characteristics (Kim, 2005). Innovation characteristics are related to the outcome and the affect of new products on consumers, which determine the amount of resistance generated. And has the power to predict consumer adoption and expected resistance. It has been found by some researchers that innovation characteristics provide greater explanation to consumers' behavior towards innovation. Consumers' characteristics are the psychological characteristics of consumers e.g. how they view the innovativeness with respect to that particular product. Innovation resistance is dependent on the psychological characteristics of the consumer. The important factors that have been identified as relevant to consumer behavior in innovations context are: Personality, Attitudes, Value Orientation, Previous Innovative Experience, Perception, and Motivation (Ram, 1987). According to Ram (1987) innovation characteristics can be divided into two contexts, first is consumer-independent context and the second is consumers-dependent. The factors of consumer-independent context can be expected to create the same type of resistance across all consumers (Ram, 1987) and is thus out of the scope of this study. On the other hand, the affects of Consumer-dependent factors vary across different consumers. Innovation characteristics (consumer-dependent) factors effect consumer's decision making to adopt a new product, these factors are; relative advantage, compatibility, risk, complexity, and expectations for better products (inhibitory effect on adoption of other innovations). Understanding these factors and their affect on consumers' resistance is crucial for increasing the chances of innovation success (Ram, 1987). Following is the detailed discussion about each factor.

1: The relative advantage of an innovation is the "degree to which an innovation is perceived as being better/superior than the idea it supersedes" (Rogers and Shoemaker, 1971). Relative advantage can be presented in economic profitability, social benefits, time saved, hazards removed (Tornatzky and Klein, 1982) and also perceived usefulness (PU) (Roberts and Pick, 2004) .2: Compatibility is the degree to which prospective consumers believe that the new product fits with their socio-cultural norms or is consistent with existing values, past experiences, style, behavior patterns, and needs (Dunphy and Herbig, 1995). It has been regarded as an important component included in attitude development (Saaksjarvi, 2003) and is of special importance in technological markets. A general cause expressed by different consumers for resisting or not adopting new product is "no need. There are two aspects of innovation compatibility (Tornatzky and Klein, 1982): (1) it may refer to compatibility with the values or norms of the potential adopters or (2) may represent congruence with the existing practices of the adopters. 3: Complexity can be defined as "the degree to which the innovation is perceived as relatively difficult to understand, use or comprehend" (Rogers and Shoemaker, 1971). This definition has been followed by some other researchers (Dunphy and Herbig, 1995). Different researchers have found complexity as negatively related to the innovation diffusion and positively related to innovation resistance (Dunphy and Herbig, 1995). 4: Ostlund (1974) introduced risk as an

499

additional dimension in the diffusion and adoption of innovation, which is then added by Ram (1987) as another factor affecting consumer's resistance. Here we are talking about the degree of perceived risk associated with adopting & using innovation. It is believed as positively related to consumer's resistance and negatively related to adoption (Ram, 1987). Researchers have identified six key dimensions of perceived risk, which are; financial, performance, physical, time, social, and psychological risks (Cherry and Fraedrich, 2002). 5: Kim (2005) used a term of „expectation for better products" rather than „inhibitory effect on the adoption of other innovations" as it is easy to understand and give a clear meaning. In this study, we will also use the term „expectation for better products".

For this study we have chosen „Motivation" and „attitude towards existing products", as motivation is believed as the central key factor driving consumer behavior (Barczak *et al.*, 1997) and "attitude towards existing product" is to examine the role of existing products in driving consumers resistance. Moreover, self-efficacy has been added, as it believed to play a major role in technological innovative products (Compeau and Higgins, 1995). One of purposes behind choosing these factors is because of their easy measurement procedure and intensive use by different researchers (Lee *et al.*, 2007).

1; Motivation is defined as "goal-directed arousal" that drives consumers need. It entails internal processes that provide behavior with power and direction. Power describe the strength, determination, and concentration of the concerned behavior, while direction provides a specific purpose to the behavior (Lee *et al.*, 2007). Compeau and Higgins (1995) define self-efficacy as "an individual's perception of his or her ability to use a technological innovative product". 2: Self-efficacy is a determinant of perceived ease-of-use and the usability of an item. It is also defined as, "an individual's self-confidence in his or her ability to perform a behavior" (Bandura, 1977). Self-efficacy refers to the confidence in one's ability and competence to manage and perform the courses of action required to accomplish a desired outcome. 3: The tradition value is associated with individual's favorable attitude towards the past and present, and shows individual's respect for culture, social norms, and traditions. The tradition value implies consumer's favorable attitude toward the products that they are currently using. In such case, consumers will be unwilling to replace their old and still functional products with innovative products. In this era, products life cycle is becoming shorter and shorter and competition getting tougher, new products are coming in the market with much faster pace, and existing products/technologies often become outdated very quickly and prematurely.

2.2. Hypotheses Formulation

To identify the causal relationship among consumers' resistance to mobile phones and the above discussed eight factors, we set up hypotheses based on the models of innovation resistance and previous research findings. Following the above discussed literature on eight factors, a positivistic research paradigm was adopted and eight hypotheses have been constructed.

2.3. Relative Advantage

In this thesis, we defined relative advantage of mobile phones as advantage over non-mobile phones. Based on past research and empirical results (Dunphy and Herbig, 1995) relative advantage is hypothesized to have negative effect on consumers' resistance to mobile phones.
Hypothesis1. The lower the Relative Advantage, the higher the consumers' resistance to Mobile phones

2.4. Compatibility

Based on the definition of compatibility in innovation perspective, mobile phones compatibility is checked with consumers' needs and life/work style. Following the past research on compatibility (Saaksjarvi, 2003) we hypothesize compatibility to have negative effect on consumers' resistance to mobile phones.
Hypothesis 2. The lower the Compatibility, the higher the consumers' resistance to Mobile phones

500

2.5. Complexity

Most of the researchers have found complexity to have negative effect on consumers' adoption and positive effect on resistance (Tan and Teo, 2000) so we hypothesize complexity to have positive effect on consumers' resistance to mobile phone.

Hypothesis 3. The higher the Complexity, the higher the consumers' resistance to Mobile phones

2.6. Perceived Risk

Three kinds of risk (financial, performance, and security risk) have been found as important in case of mobile phone. Following the past research on perceived risk and consumers' behavior towards innovation (Yiu *et al.*, 2007) we hypothesize perceived risk to have positive effects on consumers' resistance to mobile phones.

Hypothesis 4. The higher the Perceived Risk, the higher the consumers' resistance to Mobile phones

2.7. Expectation for Better Products

Severe inhibitory effects of mobile phones (effect of mobile phones on the expected adoption of more advanced and better mobile phones in future) make consumers resist its adoption and expect much better mobile phones. It is measured by consumers' expectation for "more convenient & useful phones" and with "lower prices". Based on some studies (Kim, 2005) we hypothesize „expectations" to have positive effect on consumers' resistance to mobile phone.

Hypothesis 5. The higher the Expectation for Better Mobile phones, the higher the consumers' resistance

2.8. Motivation

Motivation drives consumers' needs and intentions to adopt innovation. Following researcher arguments and empirical results (Lee *et al.*, 2007) we hypothesize motivation to have negative effects on consumers' resistance to mobile phones.

Hypothesis 6 The lower the Motivation, the higher the consumers' resistance to Mobile phones

2.9. Attitude towards Existing Products

This factor is used to find consumers satisfaction from existing products and it plays an important role in driving consumers' behavior toward innovations. This factor has been found to have positive effect on consumers' resistance towards innovation (Wang *et al.*, 2008) and therefore we hypothesize consumers' favorable attitude towards normal mobile phones to have positive effect on consumers' resistance to mobile phones.

Hypothesis 7 The more favorable/positive consumers' Attitude towards normal mobile phones, the higher the consumers' resistance to Mobile phones

2.10. Self-Efficacy

Confidence in one's ability to use/understand mobile phones without any difficulty, may increase the chances of adoption, and will have negative effect on consumers' resistance. Different researchers have found self-efficacy to have negative effect on consumer resistance and positive effect on consumers' adoption of innovative products (Park and Chen, 2007) based on which we hypothesize consumers self-efficacy to have negative effect on resistance to mobile phones.

Hypothesis 8. The lower the Self-efficacy, the higher the consumers' resistance to Mobile phones

2.11. Theoretical Model of Consumers Resistance to Mobile Phones

Following our research problem, purpose, and the formulated hypotheses, we can construct a theoretical model to express the hypothesized relationship between consumers' resistance and factors of innovation & consumers characteristics. This model will be applied in our analysis of empirical data, collected through questionnaires.
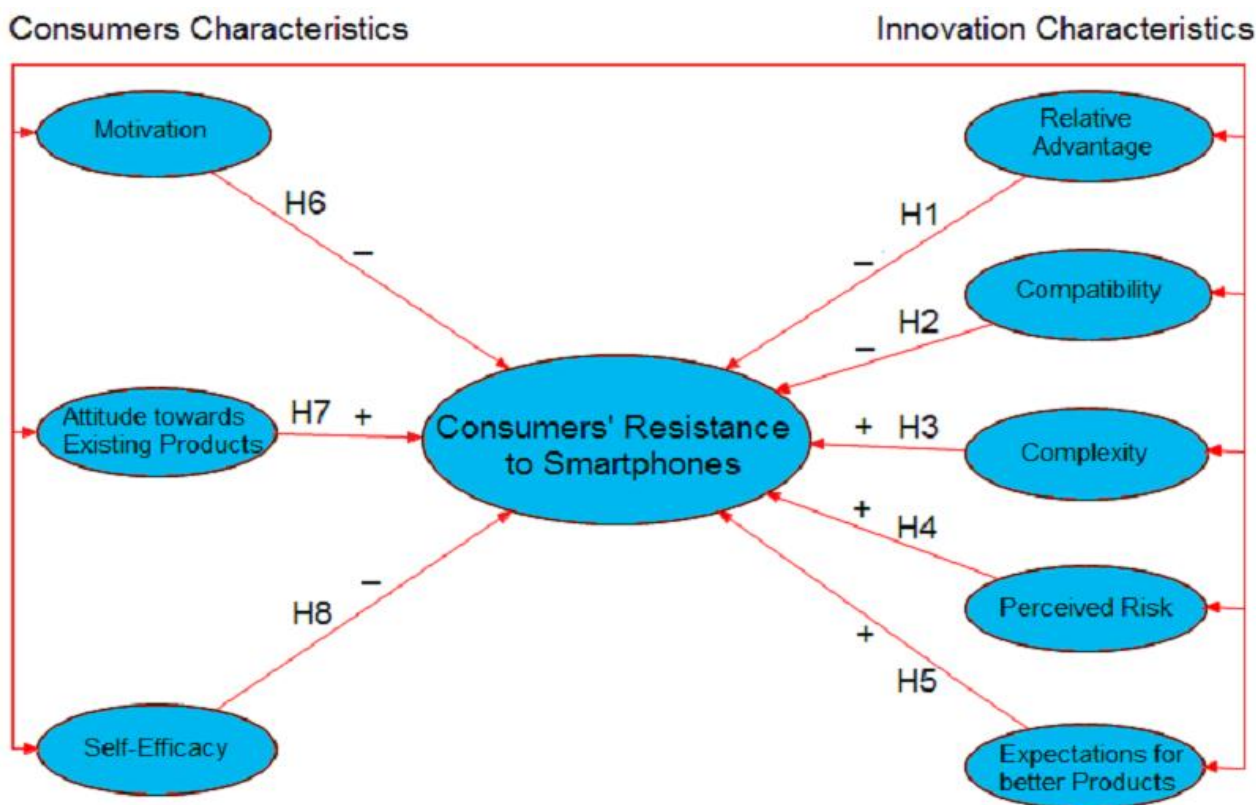
Figure-1. Theoretical Model of Consumers Resistance to Mobile phones

Source: Authors

3. METHODOLOGY

There are two methods of conducting research, which are; qualitative and quantitative methods, where no method is considered to be better than another. Research questions should be taken in consideration before deciding for the most suitable method of conducting study (Ghauri and Gronhaug, 2005). Where *why* and *how* questions are generally followed by qualitative research and, *what where* and *when* questions are generally followed quantitative research (Maylor and Blackmon, 2005). Maylor and Blackmon (2005) state that, when a study involved statistical conclusion, quantitative research is conducted while the qualitative approach of research deals with processes, such as analyzing non-numeral information, which is out of the scope of this study. Moreover, quantitative approach is strongly linked with hypothesis testing (Saunders *et al.*, 2003) keeping in view the purpose of this study, quantitative measurements (statistical analysis) have been done in order to be able to objectively interpret and analyze the data of a larger sample. The aim of this study is to find consumers' behavior based on a set of selected factors, for which it is important to collect primary data with addition to secondary data. Secondary data is collected from multiple sources, which mostly include journal articles, books, and web/online information. Primary data can be collected through interviews, observations, and questionnaire surveys (Sekaran, 2003). Considering the purpose of this study questionnaire survey is the most appropriate method of primary data collection, as there are large numbers of respondents targeted in a wide geographical area. Questionnaire survey is a very cost efficient, free from interviewer effect, and useful; easily accessing a wide range of sample in less time. For getting fast and many responses with low cost, web-based surveys are conducted. The population of this study has been chosen as the potential young buyers of mobile phones in Iran, and keeping in view such a large population, "convenience sampling" has been selected as most appropriate method to get responses from a large size of population. Web-based/online questionnaires are designed, to get responses, as much as possible.

Likert scale from 1 to 5 has been used to measure the constructed variables (where 5=strongly agree, 4=agree, 3=neutral, 2=disagree, 1=strongly disagree). The first pre-test has been done by filling & checking the questionnaire

by twenty different students in Jonkoping International Business School, to improve the questions and replace any confusing & difficult terms. SPSS, AMOS, and Smart-PLS, statistical software have been used to perform statistical analysis, and achieve the desired objectives of the study. After the first pre-test, a full version questionnaire has been finalized for collecting data to perform confirmatory factor analysis. A total of 160 responses have been collected for performing the CFA. Confirmatory factors analysis is done with the help of Amos 16.0 software, as a second pre-test to verify the conceptualization of the selected constructs/indicators for each factor. After performing CFA, unimportant and irrelevant questions have been excluded from the full version questionnaire to get a final version of questionnaire. The final version questionnaire was just a subset of full version questionnaire; that is why the first 160 responses have also been used in further analysis of the study. To examine the reliability of the empirical data, consistency analysis has been done on the basis of Cronbach's Alpha method.

To evaluate the construct validity of the factors, factor analysis has been performed, following a theory driven approach. The basic purpose of CFA is to find out those variables/questions that measure different aspects of a same underlying factor and that have less correlation with other variables of the same factors. It is very helpful in choosing the right variable/questions for measuring an underlying factor. A large sample size has been recommended by different researchers. To perform CFA, where the minimum sample size required is 150 (Hair *et al.*, 2006). The following table shows the factor loadings derived from Amos 16.0 (Structural Equation Modeling software) for CFA.

Table-1. Full version questionnaire & Factor Analysis

Factors/ Latent variables	Q#	Variable (Observed)	Corresponding question	Factors Loading
Factor Analysis of Pilot Questionnaire				
Relative Advantage	Q1	More useful, reliable and convenient	Mobile phones are more convenient, reliable, and useful than normal mobile phones.	**0.84**
	Q2	More integrated	Mobile phone has good integration of wide range of functions and services.	0.59
	Q3	Fashionable & trendy	Mobile phone are more fashionable, stylish, and trendy.	0.62
	Q4	Good Price/Quality relationship	The price/quality relationship is acceptable in mobile phone, as I can enjoy other free services (e.g. e-mail, voice-mail, MSN & Skype, word processor) anywhere I want.	**0.86**
	Q5	Bigger screen and full keyboard	Mobile phones bigger screen and full keyboard, make different functions easier to use.	0.65
Compatibility	Q6	Compatible with needs	Mobile phones fit with my needs.	0.52
	Q7	Compatible with lifestyle/work-style	Mobile phones fit with my lifestyle/ work-style.	**0.89**
	Q8	Compatible with habits	Mobile phones fits with my habits of using cell phones.	**0.83**
	Q9	Complement	Mobile phone is a good complement to the traditional mobile phones.	0.63
Self-Efficacy	Q10	Usage know how	I know how to use mobile phones.	0.66
	Q11	Confidence	I am confident of understanding and using mobile phone.	**0.89**
	Q12	Comfort	I am comfortable with using technical and advanced consumers' products (e.g. mp3 player, computer, digital camera, PDA,etc).	**0.85**
	Q13	Independence	I would be able to operate mobile phone, even if I have never used it before.	0.66
Motivation	Q14	Intrinsic motivation	It is very exciting and entertaining to use mobile phone.	**0.81**
	Q15	Extrinsic Motivation	Using mobile phone would be beneficial to my work	0.44
	Q16	Extrinsic Motivation	I need mobile phone for its new features/functions.	**0.82**
	Q17	Intentions	I have intentions to use mobile phone in the near future.	0.86
				Continue

Expectation for better products	Q18	Convenient	I expect more convenient and advance mobile phones	0.53
	Q19	Low price	I expect more affordable mobile phones	0.51
	Q20	Secure	I expect more secure mobile phones.	**0.85**
	Q21	Durability	I expect more durable mobile phones.	**0.88**
Attitude towards existing products	Q22	Preference	I prefer compact and handy mobile phones.	0.36
	Q23	Concept / tradition	I do not like the idea of putting so many functions together in a cell phone.	**0.77**
	Q24	Attitude towards & satisfaction from existing products	I am quite satisfied and have favorable attitude towards normal mobile phones.	**0.93**
Complexity	Q25	Usage complexity	Mobile phones may be complex to use.	**0.76**
	Q26	Require more skills & mental effort	Understanding and using mobile phones may require more skills and or mental effort.	0.35
	Q27	Complex to understand functions	It may be difficult to understand internet, gaming, mp3, and PDA functions in mobile phone.	**0.86**
	Q28	Maintenance	It may be difficult to make updates & put new software in mobile phones.	0.34
Perceived Risk	Q29	Performance risk	Mobile phone performance may not meet my expectations.	0.27
	Q30	Performance risk	I afraid of getting out of battery, while I need to use mobile phone for a long time.	**0.83**
	Q31	Financial risk	I fear of losing much money if I lost my mobile phone.	**0.86**
	Q32	Security risk	I fear of losing my personal information and all the data, if I lost my mobile phone.	**0.83**
	Q33	Value/safety risk	It is risky to spend relatively more money for buying a mobile phone.	**0.85**
	Q34	Durability risk	Mobile phone can easily break if dropped etc., and may stop functioning.	0.48
Consumers' Resistance (Dependent variable/factor)	Q35	Postponement	I will wait to buy mobile phone till it proves beneficial for me.	0.22
	Q36	Postponement	I need to clarify some queries and justify the reasons to buy mobile phone.	**0.76**
	Q37	Postponement	I am waiting for the right time and required capability to buy mobile phone.	0.48
	Q38	Opposition/Wastage of resources	Buying mobile phone maybe a wastage of money.	**0.76**
	Q39	Opposition	I fear of wasting my time using mobile phones.	**0.77**
	Q40	Opposition	I need to get a solution for some of my complaints and objections before I buy mobile phone.	0.33
	Q41	Opposition	Mobile phone may decrease my autonomy.	**0.76**
	Q42	Resistance to change	I fear of certain changes mobile phone may impose on me.	0.29
	Q43	Rejection	It is unlikely that I buy mobile phone in the near future.	0.55
	Q44	Rejection	Mobile phone is not for me.	**0.79**
	Q45	Rejection	I don't need mobile phones.	**0.83**

Source: Authors

Results from factor analysis have provided factor loadings for each variable (question) where factor loading above 0.70 is termed as acceptable so that each factor is explained more by its constructed variable (question) than by error (Hair *et al.*, 2006). Several variables (factor analysis table) have factor loading above than 0.70 and prove as best measure of the corresponding factor. To find the reliability of the empirical data, consistency analysis has been done using SPSS. Consistency analysis is used to find the internal consistency of the observed data, and ranges from 0 to 1. Cronbach's Alpha (α) has been calculated to find the internal consistency of the data. Below is a table, presenting consistency of each factor, and also overall consistency of the data, where most of the factors are found with good consistency.

Table-2. Consistency Analysis

Consistency Analysis using Cronbach's Alpha									
Factors	Relative Advantage	Compatibility	Self-Efficacy	Motivation	Expectations for better products	Attitude towards ex. products	Complexity	Risk	Resistance (Dependent factor)
Cronbach Aplha (α)	0.821	0.846	0.768	0.793	0.835	0.744	0.705	0.883	0.925
Overall Consistency (α)		0.885							

Source: Authors

4. ANALYSIS

Two different approaches (SmartPLS and AMOS) have been used to estimate results for hypothesis testing and answer other research questions. Results with very slight differences have been got from both approaches. The purpose of utilizing both approaches is to confirm the accuracy of the result, and thus provide it more credibility. The following diagram shows the output results from SmartPLS. The values/scores with the paths (arrows) from independent variables (consumers' and innovation characteristics factors) to dependent variable (consumers' resistance) show the regression coefficients. The regression coefficient is interpreted as the rate of change in dependent variable (consumer resistance) as a function of change in independent variables (factors).
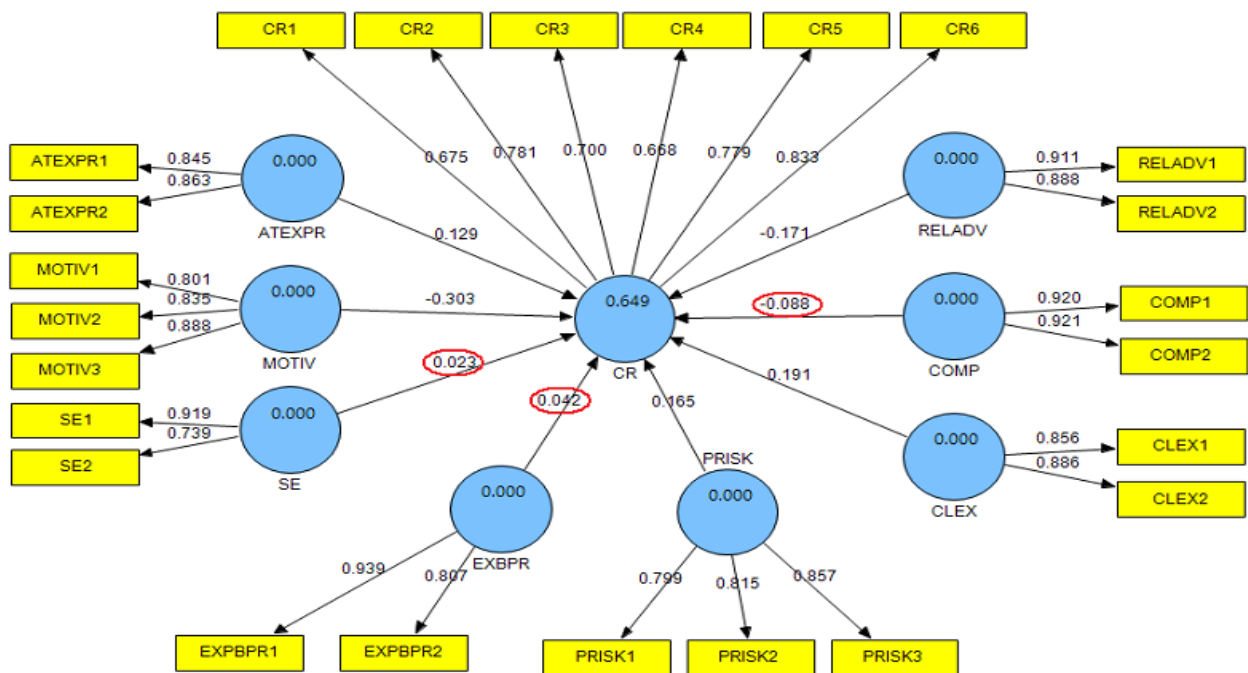

Fig-2. Empirical Model of Consumer' Resistance to Mobile phones showing regression coefficients and factor loadings derived from SmartPLS.
Source: Authors

The below figure shows the T-values derived from bootstrapping (with 700 value of sample for observations). Following the rule of thumb (George and Mallery, 2003) t-values below than two (t-value<2) are considered as non-significant and are red-underlined.
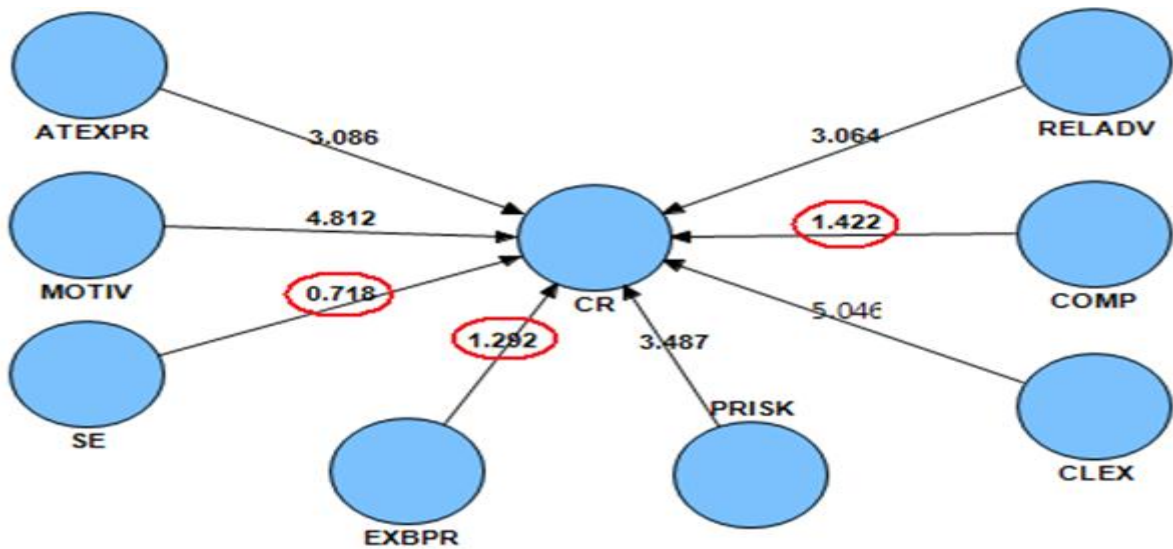
Fig-3. Factors Relationship with Consumers Resistance represented by t-values using SmartPLS

Source: Authors

The theoretical model (from Fig. 3) has been designed in AMOS, by making innovation and consumers' characteristics factors as latent variables and the questions as observed variables. After drawing the expected relationships and providing input values, the following figure has been obtained as result. The values with each arrow show the regression coefficients, where weak relationships are red-underlined. As discussed in the methodology chapter, Amos is a hard approach and may sometimes prevent solution for a problem which is not really a problem in other approaches like PLS.
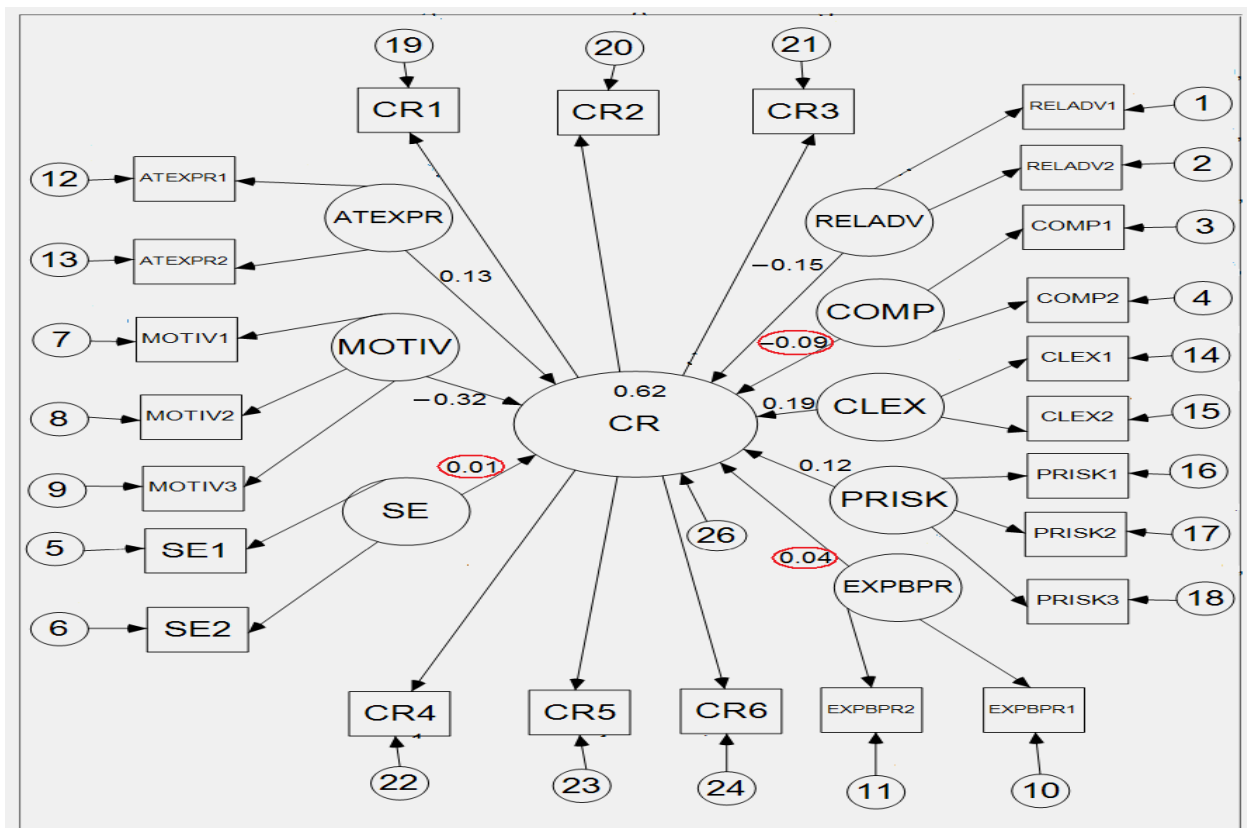

Fig-4. Consumers' resistance model from AMOS

Source: Authors

Most fortunately, we have obtained almost the same results from PLS (SmartPLS) and AMOS approaches.

Here, we have specifically followed PLS approach, as it is a robust method and insensitive to the sample size. Below table presents findings from Smart-PLS, where Beta values are the coefficients of regression and t-value are used to decide on the significance. Expectedly, t-value with greater value of regression coefficients is found higher. Following the rule of thumb, t-value greater than two (T>2) is considered as significant, and are used for making decisions on the constructed hypotheses.

Table-3. Results from SmartPLS

Factors	Hypothesis	Beta	T-Values	*Significance*
Relative Advantage	H1	-0.171	3.064	Significant
Compatibility	H2	-0.088	1.422	Non-significant
Complexity	H3	+0.191	5.046	Significant
Perceived Risk	H4	+0.165	3.487	Significant
Expectation for Better Products	H5	+0.042	1.292	Non-significant
Motivation	H6	+0.303	4.812	Significant
Attitude towards existing products	H7	+0.129	3.086	Significant
Self-Efficacy	H8	+0.023	0.718	Non-significant

Source: Authors

5. CONCLUSION

The above table and figures (fig. 2, 3 &4) from Smart PLS and AMOS show that all of the hypotheses, except H2 i.e. Compatibility, H5 i.e. Expectations for better products, and H8 i.e. Self-Efficacy are supported. The support for H1 i.e. Relative advantage is expected since past literature has consistently shown that relative advantage has a significant and negative effects on consumers resistance (Ram, 1987; Ram and Sheth, 1989); (Dunphy and Herbig, 1995). In other words respondents, who feel that Mobile phones are relatively more advantageous than normal mobile phone, have expressed less resistance. This negative correlation between consumers' resistance and relative advantage has also been confirmed by technology acceptance model with factor of perceived usefulness (PU) (Park and Chen, 2007) where PU is termed synonymously as relative advantage (Roberts and Pick, 2004).

Similarly, the support for H3 i.e. Complexity, and H4 i.e. Perceived Risk are in line with previous findings (Ram, 1987; Dunphy and Herbig, 1995; Yiu *et al.*, 2007) that have shown that complexity and perceived risk has positive effects i.e. increase consumers resistance. So, respondents who feel that mobile phones are more complex and risky have shown more resistance. Support for H6 i.e. Motivation with high beta value has shown motivation factor as the most critical one in affecting consumers resistance negatively. As stated by Macinnis and Moorman (1991) motivation is a "goal directed arousal" which drives consumers needs. Respondents who have shown strong motivation to adopt mobile phones have expressed no or less resistance to it. In this regard, extrinsic motivation (MOTIV2) has been found as important variable in measuring motivation towards adopting mobile phones. Expectedly, consumers' favorable attitude towards normal mobile phones has been found as positively correlated with their expression of resistance to mobile phones. Which show that respondents, who favor tradition, are unwilling to replace their old but still functional mobile phones. Same relationship between consumers' favorable attitude and their resistance to innovation's, has been found in previous studies (Wang *et al.*, 2008).

The empirical data collected for this study, do not confirm H2 i.e. Compatibility, H5 i.e. Expectation for better products, and H8 i.e. Self-efficacy. The relationship between compatibility and resistance has been found as negative which is in line with previous findings (Dunphy and Herbig, 1995; Tan and Teo, 2000; Saaksjarvi, 2003) but is not significant to support our hypothesis. This shows that respondents who express resistance do not really think that mobile phones is not compatible. On the other hand, respondents who expressed no or less resistance do not really think that mobile phones are much compatible. The hypothesized factors in the model of consumers' resistance

represented almost 65% (0.649, see fig. 2) variation in consumers' resistance that is caused by these factors. In other words, 65% variation in consumers' resistance is explained (caused) by innovation and consumers' characteristics factors, which indicates an acceptable goodness of fit of the model.

Throughout this study, we found that innovation resistance has been called as very important in the innovation literature, but relatively less research has been done in this area. So, it would be valuable to do further research on innovation resistance from individual and or organizational perspective. Also, it would be interesting to investigate, how innovative companies are dealing with innovation and consumers' characteristics factors, to overcome/decrease consumers' resistance. Further research can be done, to analyze the model of consumers' resistance for other innovative products and also services. Also, the model of consumers' resistance to Mobile phones can be extended and applied on empirical data, collected from other geographical areas. As discussed in the sampling, we have used convenience sampling method in this study where results cannot be generalized confidently. If accessible, probability sampling method can be used in further study, so that results can be confidently generalized to the study population.

REFERENCES

Assink, M., 2006. Inhibitors of disruptive innovation capability: A conceptual model. European Journal of Innovation Management, 9(3): 215-233.

Bagozzi, R.P. and L. Kyu-Hyun, 1999. Consumer resistance to, and acceptance of, innovations. Advances in Consumer Research, 26(12): 218-226.

Balachandra, R. and F.H. John, 1997. Factors for success in R&D projects and new product innovation: A contextual framework. IEEE Transactions on Engineering Management, 44(August): 276-287.

Bandura, A., 1977. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 13(84): 191-215.

Barczak, G., P.S. Ellen and B.K. Pilling, 1997. Developing typologies of consumer motives for use of technologically based banking services. Journal of Business Research, 38(7): 131-139.

Cherry, J. and J. Fraedrich, 2002. Perceived risk, moral philosophy and marketing ethics: Mediating influences on sales managers ethical decision-making. Journal of Business Research, 55(2): 951-962.

Compeau, D. and C.A. Higgins, 1995. Computer self-efficacy: Development of a measure and initial test. MIS Quarterly, 17(12): 189-211.

Dahlin, K. and D.M. Behrens, 2005. When is an invention really radical? Defining and measuring technological radicalness. Research Policy, 34(5): 717-737.

Dunphy, S. and P.A. Herbig, 1995. Acceptance of innovations: The customer is the key! Journal of High Technology Management Research, 6(11): 193-209.

Garcia, R. and R. Calantone, 2002. A critical look at technological innovation typology and innovativeness terminology: A literature review. Journal of Product Innovation Management, 169(7): 110-132.

Gatignon, H. and T.S. Robertson, 1989. Technology diffusion: An empirical test of competitive effects. Journal of Marketing, 53(9): 35-49.

George, D. and P. Mallery, 2003. SPSS for windows step by step: A simple guide and reference. 11.0 update. 4th Edn., Boston: Allyn & Bacon.

Ghauri, P.N. and K. Gronhaug, 2005. Research methods for business studies: A practical guide. Harlow, England: Financial Times Prentice Hall.

Gold, B., 1981. Technological diffusion in industry: Research needs and shortcomings. Journal of Industrial Economics, 29(3): 247-269.

Hair, J.F., C.K. Black, B.J. Babin and R.E. Anderson, 2006. Multivariate data analysis: A global perspective. 7th Edn., New York: Pearson Education Inc.

Heiskanen, E., K. Hyvönen, M. Niva, M. Pantzar, P. Timonen and J. Varjonen, 2007. User involvement in radical innovation: Are consumers conservative? European Journal of Innovation Management, 10(2): 489-509.

Kim, K., 2005. A study on barriers in activating mobile commerce: Innovation resistance perspective. Korea: Hannam University.

Kuisma, T., T. Laukkanen and M. Hiltunen, 2007. Mapping the reasons for resistance to internet banking: A means-end approach. International Journal of Information Management, 27(11): 75-75.

Laukkanen, P., S. Sinkkonen and T. Laukkanen, 2008. Consumer resistance to internet banking: Postponers, opponents and rejectors. International Journal of Bank Marketing, 26(8): 440-455.

Lee, M.K.O., C.M.K. Cheung and Z. Chen, 2007. Understanding user acceptance of multimedia messaging services: An empirical study. Journal of the American Society for Information Science and Technology, 58(12): 2066-2066.

Macinnis, D.J. and C. Moorman, 1991. Enhancing and measuring consumers motivation, opportunity, and ability to process brand. Journal of Marketing, 55(7): 32-54.

Maylor, H. and K. Blackmon, 2005. Researching business and management. Basingstoke, UK: Palgrave Macmillan.

Mirella, K., L. Nick and M. Wetzels, 2009. An exploration of consumer resistance to innovation and its antecedents. Journal of Economic Psychology. 11(6): 47-61.

O'Connor, E., P. Charles, L. Robert and H. David, 1990. Implementing new technology: Managemcnt issues and opportunities. Journal of High Technology Management Research, 1(1): 68- 89.

Ostlund, L.E., 1974. Perceived innovation attributes as predictors of innovativeness. Journal of Consumer Research, 3(1): 23-29.

Park, Y. and J.V. Chen, 2007. Acceptance and adoption of the innovative use of mobile phone. Industrial Management & Data Systems, 107(4): 1349-1365.

Ram, S., 1987. A model of innovation resistance. Advances in Consumer Research, 14(4): 208-213.

Ram, S. and N.J. Sheth, 1989. Consumer resistance to innovation: The marketing problem and its solution. Journal of Consumer Marketing, 6(2): 5-14.

Roberts, G.K. and J.B. Pick, 2004. Technology factors in corporate adoption of mobile cell phones: A case study analysis. System Sciences. Proceedings of the 37th Annual Hawaii International Conference on. pp: 287-296.

Rogers, E.M. and F.F. Shoemaker, 1971. Communication of innovation: A cross cultural approach. New York: The Free Press.

Saaksjarvi, M., 2003. Consumer adoption of technological innovations. European Journal of Innovation Management, 8(7): 23-36.

Saunders, M., P. Lewis and A. Thornhill, 2003. Research methods for business students. 3rd Edn., London: Prentice Hall.

Sekaran, U., 2003. Research method for business: A skill building approach. 4th Edn., New York: John Wiley & Sons, Inc.

Szmigin, I. and G. Foxall, 1998. Three forms of innovation resistance: The case of retail payment methods. Technovation, 18(9): 459-468.

Tan, M. and T. Teo, 2000. Factors influencing the adoption of internet banking. Journal of the Association for Information Systems, 17(3): 73-91.

Tornatzky, L. and K. Klein, 1982. Innovation characteristics and innovation adoption implementation: A meta-analysis of findings. IEEE Transactions on Engineering Management, 4(12): 152-170.

Wang, G., W. Dou and N. Zhou, 2008. Consumption attitudes and adoption of new consumer products: A contingency approach. European Journal of Marketing, 42(5): 238-254.

Yiu, C.S., K. Grant and D. Edgar, 2007. Factors affecting the adoption of internet banking in Hong Kong-implications for the banking sector. International Journal of Information Management, 27(2): 336-336.

Zaltman, G. and R. Duncan, 1977. Strategies for planned change. New York: Wiley.