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A Study on Consumer Perceptions towards Adoption of 4G Technology

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Abstract: ***The 4G technology is new in the market; it is the major high lights of the telecommunication industry in the world. The 3G technology was launched in the India in 2010 and it was a new era in the world of internet. It was the fastest way to communicate and connect with the world, the launching of the 4G was the evolution in the era in the very short period of time. The current study aims at studying perception of consumers towards adoption of 4G technology. The study includes 300 respondents and majority of them possess positive perceptions regarding 4G. It is concluded that the major factors contributing to adoption of 4G are attitude, easiness, behavioural intention and usefulness. The perceptions do not differ between various age groups and occupational groups.***

Keywords: consumer perception, 4G technology, Technology acceptance model

I. INTRODUCTION

Success or failure of any service industry depends on the consumer adoption of the services. Due to tremendous development in technology especially internet and social media and development of smart phones, the mobile dependency has been increased. Mobile and internet has become integral parts of human life nowadays. For this, it is required to understand consumer perception about a particular service organization.

Perception is the cognitive process which involves the organism selecting, organizing and interpreting the stimulus. Thus perception is the process of selecting, organizing and interpreting or attaching meaning to the events happening in the environment. According to Robbins, "Perception may be defined as a process by which individuals organize and interpret their sensory impressions in order to give meaning to the environment." Customer perception is the process to assess how customers perceive services, how they assess, whether they have experienced quality service and whether they are satisfied or not. Customer perception is directly related to customer expectation. Due to the dynamic nature of expectation perception of any person may also shift over time, person, place or culture. Customers perceive services in terms of the quality of the service and how satisfied they are overall with their experiences.

Mobile communication technology

Mobile communication permits transmission of voice and multimedia data via mobile device or a computer without any physical link. Mobile communication technology benefits the businesses to improve performance and it helps in raising the standard of living of people. Increased population calls for the need for better communication. For that, advancement in technology is required and invention of telephone is the best example of this. Also, continuous improvement and innovation took place such as introduction of mobile phone. Basically, mobile communication systems are identified by its generation designations. 1G, the first generation was introduced in early 1980's and second generation, 2G system was introduced in late 1980's. Both of these were used for voice transmission and reception. 3G networks succeed 2G ones, by offering faster data transfer rates and are the first to enable video calls, which makes them suitable for use in modern smart phones that require constant high-speed internet connection for many applications. Thus, journey of mobile communication technology has started with the first generation mobile technology and reached till 4th generation which has changed the image of whole communication mode. Due to this kind of unbelievable development in technology, the earth has turned into a global village.

In last few years, there has been a incredible rise in Indian mobile market. It is estimated that over a billion phones will be sold by 2020. The major reason behind this is 4G connectivity, which has been rolling out in phases since 2012. In addition to this, an estimated nine crore subscribers will use 4G services in India by 2018, and thus there is a huge potential for the cell phone providers to upgrade their infrastructure to support 4G.

II. LITERATURE REVIEW

The indication of the users' acceptance of advanced wireless 4G technology is, significantly increased number of users. The Technology Acceptance Model (TAM) was proposed by Davis, Bagozzi, and Warshaw (1985) based on construct and relationships in view of the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975). TAM suggests that individuals'

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willingness, decision- making, attitude and subjective norm positively affect their behavioral intention (Davis, Bagozzi, and Warshaw, 1992). The subjective norm deals with individuals' certainty that they should express particular behavior which is expected by those they consider important (Davis et al., 1989; Rawashdeh, 2011). TRA shows that attitude and subjective norms independently affect intentions (Davis et al., 1989; Rawashdeh, 2013), whereas in the TAM, perceived usefulness and perceived ease of use have been found to directly affect attitude (Davis et al., 1989; Rawashdeh, 2013). According to Davis et al. (1992), the subjective norm had no significant effect on the intentions more than perceived usefulness and perceived ease of use, and therefore, it was omitted from the original TAM.

Till now, many of the researchers have used TAM to identify and/or confirm factors affecting intention to use a particular technology. Performance expectancy positively influences behavioral intention and user behavior (Carlsson et al., 2006; Martins et al., 2014). Pagani, M, (2004) identified perceived usefulness, ease of use, price, and speed of use as the most important determinants of adoption of 3G multimedia mobile services. The importance of determinants differs by age groups or segments to some extent. Ortega, Martinez, and De Hoyos (2006), have tested the basic constructs of TAM, without external variables, on the acceptance of online business management and industry effect. Elwood et al. (2006) studied perceptions of students and their acceptance of implementing a laptop program by adopting TAM as the theoretical framework. Karjaluoto (2007) investigated examined the success factors and user acceptance of the 3G mobile network and its services. Y. L. Wu et. al, (2010) the factors which positively contribute towards behavioral intention user behavior are performance expectancy, facilitating conditions, social influence, attitude towards technology change and adoption of 3G mobile telecommunication services. According to authors, Technology Acceptance Model (TAM) has been considered very useful for predicting the usage of technology. Fadare et al.,(2011) identified the factors affecting students' intention to use mobile learning based on TAM. Soon et al. (2012) identified four variables, namely perceived ease of use, perceived usefulness, subjective norm and perceived enjoyment which influence the intentions of Malaysian college and university students to adopt 4G Mobile for academic purpose and for pleasure purposes. Abubakar and Ahmed (2013) studied the factors affecting 3G technology perception and adoption by using theoretical framework of TAM and unified theory of acceptance and use of technology. Authors have used perceived usefulness, perceived ease of use, price, variety of 3G services, service quality and social influence as external variables to analyze users' perception and behavioral intention. The study concluded that perceived usefulness, variety of 3G services, service quality and social influence the factors that affect behavioral intention of 3G usage (Abubakar & Ahmed, 2013).

Technology Acceptance Model (TAM)

The following figure provides conceptual model of the TAM.

Perceived Usefulness (PU)

According to Davis et al. (1989) perceived usefulness can be defined as "the prospective user's subjective probability that using a specific application system will increase his/her job performance within an organizational context". Based on this, Adams et al. (1992) found PU a major determinant of usage behavior and intention. Also, usefulness was ascertained as the key determinant in the usage behavior and intention (Pynoo et al., 2012).

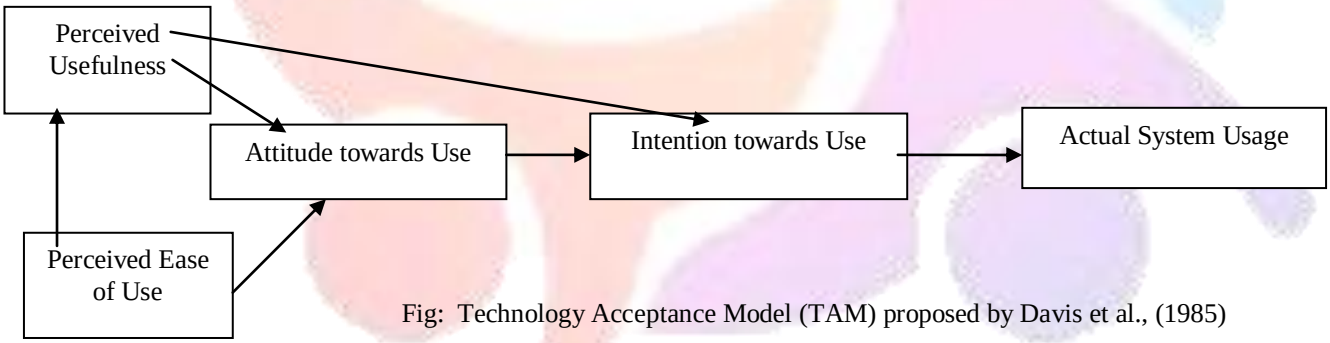

Fig: Technology Acceptance Model (TAM) proposed by Davis et al., (1985)

Perceived Ease of Use (PEOU)

Rawashdeh, A. (2015) defines perceived ease of use as the degree to which the use of the 4G mobile services by the user is perceived as easy or effortless. Davis (1989) and Davis et al. (1992) concluded that perceived ease of use influences perceived usefulness, and perceived usefulness and perceived ease of use both influence behavioral intention and actual usage. Also, perceived ease of use is a significant determinant of perceived usefulness meaning, the easier use of technology makes it more useful (Davis et al., 1989; Venkatesh et al., 2001). In the studies it was identified that PEOU is totally independent of external variable effects (Compeau et al., 1999; Venkaetesh et al., 2001).

There are significant evidence of the linkages between PEOU, PU and attitude in TAM theory. Chau (1996) concluded that behavioral intention to use a particular technology is dependent on the two variables, which are perceived usefulness and perceived ease of use. Perceived ease of use influences behavioral intention to use indirectly through perceived usefulness (Norazah et al., 2008).

Attitude (ATD)

Most of the customers are exposed to 4G mobile phones and they must have formed an attitude towards the use which may be favorable or unfavorable. Rawashdeh A., (2015), has hypothesized attitude as a result of the influences of the intention toward using 4G mobile services. It is the degree to which attitude of an individual is disposed, favorably or unfavorably, towards usage of the 4G mobile services (Rawashdeh A., 2015). Previous empirical studies confirmed existence of attitude and its influences on the evaluation of new technology (Lederer et al., 2000; Moon and Kim, 2001; O'Cass and Fenech, 2003; Vijayasarathy, 2004).

Behavioral Intention (BI)

Behavioral Intention is a measure of the likelihood that a person will adopt the application. Suki N. M (2011) has adopted individual intention as behavioral intention to used 3G services.

III. RESEARCH METHODOLOGY

The present research has been conducted on 300 respondents of Surat city during January to March 2017. The non probability convenience sampling technique was used for selection of respondents. A structured questionnaire has been used for collection of data. Data has been analyzed by SPSS using descriptive statistics, ANOVA and factor analysis.

Objectives of the study:

1. To study the perception of customer towards 4G Technology
2. To study factors contributing to adoption of 4G services

IV. DATA ANALYSIS

Table 1: Demographic profile of respondents

Particulars	No. of respondents
Age (in years)	
Less than 20	7
20 – 40	265
40 – 60	28
Gender	
Male	153
Female	147
Occupation	
Student	124
Service	156
Business	20

Reliability of Data

A reliability test using SPSS has been performed and the cronbach's alpha value is 0.744 (which is under the acceptable range). Hence, the data collected was reliable.

A descriptive statistics was used to analyze consumer perception towards adoption of 4G technology.

Table 2: Descriptive Statistics

Variables	Mean	Standard deviation
Convenient to use	4.24	.630
Effectiveness of use	4.32	.540
Connectivity provided	4.48	.569

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Easy to understand	3.75	.943
Easy to learn	3.65	1.018
Easy to use	3.55	1.009
Willingness of use	3.16	1.190
Interested to use	3.41	1.114
Recommendation to others	3.73	1.065
Status Showoff	3.14	1.163
To test the services	3.64	1.200

Parameter with a mean higher than 3 is considered to be agreed whereas mean equals to 3 implies unbiased response of respondent and mean lesser than 3 is considered to be disagree. From table 1, for the parameter connectivity, mean is highest (4.48), meaning most of the respondents perceive that the 4G technology provides higher connectivity. Also, for the parameters of convenience and effectiveness, the means are higher, which indicate the users perceive that the 4G technology is convenient and effective to use.

The adequacy of data for factor analysis was measured by Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity. Kaiser-Meyer-Olkinvalue should be greater then 0.6and also the p-value of Bartlett's Test of Sphericity should be less then 0.05. From table 3, Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is 0.797 which is greater then 0.6 which satisfies the condition of factor analysis were as value of Bartlett's Test of Sphericity is 0.000 which is less then 0.05 and thus factor analysis can be performed.

Table 3 : KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.797
Bartlett's Test of Sphericity	Approx. Chi-Square	1115.775
	Df	55
	Sig.	.000

The following table represents the components extracted for the study.

Table 4: Factor analysis on the variables

Factors under study	1	2	3	4
Convenient to use				.657
Effectiveness of use				.791
Connectivity provided				.629
Easy to understand		.692		
Easy to learn		.828		
Easy to use		.622		
Willingness of use	.794			
Interested to use	.755			
Recommendation to others			.753	
Status Showoff	.765			
To test the services			.761	

There are four factors contributing to the adoption of 4G services. First factor consists of willingness of use, interest in using the technology and status showoff and it is named as attitude towards adoption. Second factor consists of variables such as easy to understand, learn and use the technology, named as easiness. Third component consists of variables like recommendation to others and testing the services, named as behavioral intention. Fourth factor consists of variables like convenience, effectiveness and connectivity ease of use, named as usefulness. The study revealed four factors which are more or less similar to the study by Ramnandani N. et al. (2015).

ANOVA

One way ANOVA was used to check whether there are significant differences among various age groups regarding perceptions of 4G services.

Hypotheses:

1.

H0: There is no significant difference in consumer perception of convenience of 4G mobile technologies among various age groups.

H1: There is a significant difference in consumer perception of convenience of 4G mobile technologies among various age groups.

Similarly other hypotheses of all variables can be formulated. Following table 5 represents ANOVA table with F values and p values.

Table 5:

Variables	F	Sig.
Convenient to use	1.004	.368
Effectiveness of use	.384	.681
Connectivity provided	2.210	.111
Easy to understand	2.440	.089
Easy to learn	1.748	.176
Easy to use	1.192	.305
Willingness of use	2.852	.059
Interested to use	2.678	.070
Recommendation to others	1.843	.160
Status Showoff	.550	.578
To test the services	1.605	.203

From the above table it can be said that all variables p values are greater than 0.05. Thus, H0 will be accepted meaning there is no significant difference in consumer perception of 4G mobile technologies among various age groups.

2.

H0: There is no significant difference in consumer perception of convenience of 4G mobile technologies among people from different occupation.

H1: There is a significant difference in consumer perception of convenience of 4G mobile technologies among people from different occupation.

Similarly other hypotheses of all variables can be formulated. Following table 6 represents ANOVA table with F values and p values

Table 6: ANOVA Results

Variables	F	Sig.
Convenient to use	.466	.628
Effectiveness of use	.019	.981
Connectivity provided	.549	.578
Easy to understand	.391	.677
Easy to learn	.831	.436
Easy to use	.342	.710
Willingness of use	1.726	.180
Interested to use	1.507	.223
Recommendation to others	.302	.739

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Status Showoff	1.721	.181
To test the services	.026	.975

From the above table it can be said that all variables p values are greater than 0.05. Thus, H0 will be accepted meaning there is no significant difference in consumer perception of 4G mobile technologies among people from different occupation.

V. CONCLUSION

According to descriptive statistics, the respondents have positive perceptions regarding adoption of 4G technology. The main factors which contribute to user perception about adoption of 4G are attitude, easiness, behavioral intention and usefulness. One way ANOVA results concluded that there are no significant differences regarding consumer perception towards 4G technology between various age groups and occupational groups.

VI. SCOPE FOR FURTHER STUDY

The current study aimed at consumer perceptions towards adoption of 4G technology. A small sample could be the limitation for the study and it might be difficult to generalize the study results. A further study could be considered by explaining effects of other demographic variables like educational qualifications, area of residence (urban or rural) on the perception of users.

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