FACTORS INFLUENCING CONSUMERS' ATTITUDE TOWARDS HIGH TECHNOLOGY TELECOMMUNICATION SERVICES

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Abstract

Technological innovation, aware and demanding consumers ensure that the business environment is dynamic and is prone to rapid changes. The global organizations, especially in technology driven industries like telecommunications industry operate in a complex and competitive environment characterized by these changing conditions. Information and communication systems are at the locus of efficient functioning of the contemporary organizations. Further, the businesses, to remain competitive are proactively engaged in adopting new forms of communication technologies to reduce expenses. The telecommunication service providers have the opportunity to leverage contemporary technology and provide innovative cost-effective telecommunication solutions to their customers in B2B and B2C segments. However, the success of these high technology services depends on willingness of consumers to adopt these new technologies. The present research work endeavours to understand and identify the factors that would influence the adoption of high technology telecommunication services.

Keywords: *high technology telecommunications services, technology adoption, information technology, online mobile telephony (OMT), cloud telephony*

1. INTRODUCTION

In the last century, technology has not only catalyzed globalization but also impacted day to day functioning of individuals. Imagine a day without e-mails, mobile phones, computers, digital cameras, digital TV, etc. The list is unending. In the 'e-age', it is extremely difficult to estimate the impact of technology on society and individuals. Technology affects everyone – societies, families, adults and children alike because all individuals face decisions regarding development or use of technology.

The Internet is a revolutionary technology which was commercialized in 1990's and today serves one-third of world's population. It has reshaped and redefined many industries and businesses. The Internet has accelerated new forms of human interactions through instant messaging, internet forums, and social networking. Online shopping has boomed both for major retail outlets and small artisans and traders. Business-to-business and financial services on the Internet affect supply chains across entire industries. Most traditional communications media have also been affected, giving birth to new services such as Voice over Internet Protocol (VoIP) and Internet Protocol Television (IPTV). Newspaper, book and other print publishing are adapting to Web site technology, or are reshaped into blogging and web feeds. While Internet has transformed many traditional businesses – banks, travel and retail – it hasn't really changed the telecom sector. Though the operators struggle to provide cheaper, faster and more reliable access to the Internet, not many have used it to provide better service. The emergence of new telecommunication technology is best described by Ishwar Sridharan (Co-founder, Exotel) who suggests, "The technology people use now is from the seventies, but the world has moved on".

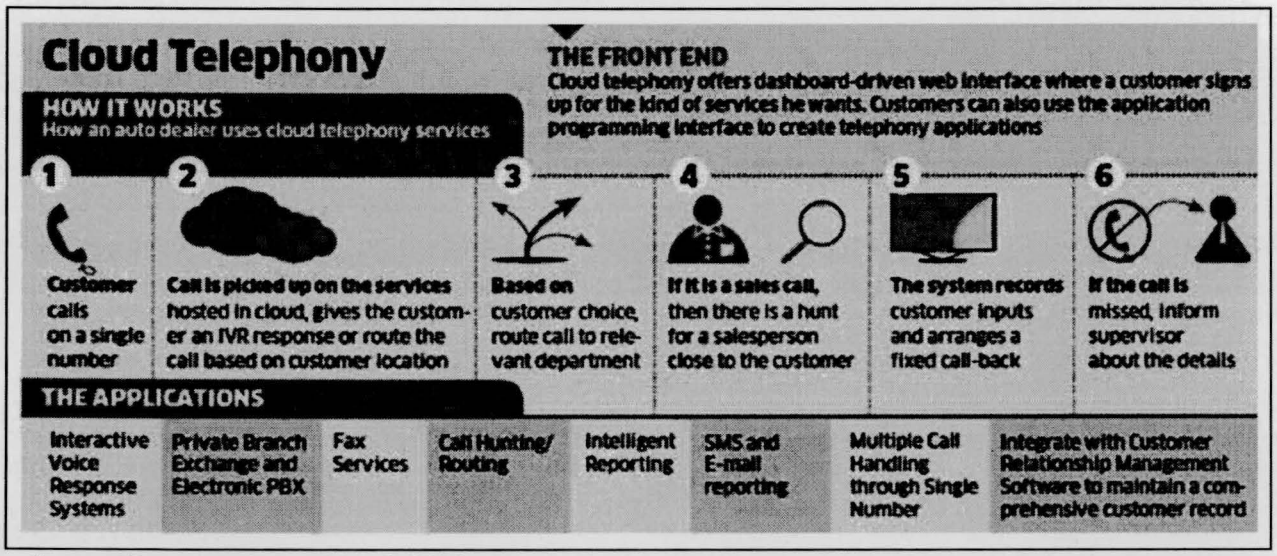
Online Mobile Telephony (OMT), also referred to as Cloud Telephony, is an innovative and reliable solution available in the market. It enables operators to create new, improved and cost effective services for end users based on the principles of cloud computing and Web 2.0. It allows users to configure their mobile telephony services online and gives them access to their call records, SMS and voicemails as if they were emails. Also these services constitute basic building blocks which can be used quickly to construct new products tailored to the needs of specific customer segments.

The difference between Cloud Telephony Services and traditional telephony services is comparable to the difference between going to your local bank office and using online banking. The two types of content that are most important to mobile phone users are their personal call records (calls, texts, voicemails) as well as the telephone numbers of the people they communicate with (address book). Cloud Telephony can create enormous value for end users as it removes many limitations of current mobile telephony services giving them total control over their mobile phone. Some examples of value proposition include being able to recall the exact date on which an important call was received months ago, keeping important voice messages safely archived or sending unwanted calls directly into voicemail etc.

The cloud telephony firms provide an interface between the telecom infrastructure provider and the consumer. They provide easy-to-use, web-based telephony solutions. The data is hosted on the cloud and served on pay-per-use basis. The customers do not have to buy and manage expensive telephone infrastructure. All the

hardware associated with traditional telephony can be done away with using soft-phones, hosted interactive voice response systems and other web-based solutions. With the use of this technology, total cost of ownership is expected to reduce by 80 percent .These cost effective, 'hardware-less' offerings are being provided by at least six to seven startups in India including-Ozonetel, Exotel, Knowlarity, etc. The functioning of cloud telephony firms is described in Exhibit1.

Exhibit 1: The Functioning of Cloud Telephony Firm



Source: Economic Times, May 3, 2012

2. REVIEW OF LITERATURE

In today's world real time changes in technology are becoming a norm. New technology ventures produce not just innovative products and services but are essential for survival of any economy. However the chances of survival of new technology are challenged by fast moving, risky market scenario and majorly acceptance of the customers. Consumers' attitudes towards technology affect the way they purchase, what they buy, when they purchase and even how they pay for purchases (Mohr, 2001). It requires a good understanding of how customers adopt innovative technologies and their derived products. Several theories have been developed to explain the process of market acceptance of new technologies. The most widely used being the Diffusion of Innovation Theory by Rogers (2003). In Roger's model a potential customer's adoption decision is based on the evaluation of a set of perceived innovation characteristics. It includes the relative advantage of the new technology/product over existing alternatives, its level of compatibility with precious solutions, its complexity, trialability and observability, and also the level of uncertainty surrounding the technology, among others. The theory predicts that innovative customers will adopt a new technology and its derived products when the overall evaluation is positive. It will cause a slow or more speedily diffusion among other customers in the marketplace.

Though technology affects everybody, but all individuals do not perceive it positively. Some individuals are uncomfortable with technological change, do not enjoy the uncertainty and are reluctant to embrace these tools and ideas. Others welcome technological change and the resultant uncertainty and enjoy the challenge (Edison and Geissler, 2003). The attitude of consumers towards technology and the distribution of their response to technology can be understood by learning more about subjects like information technology, psychology, education and marketing. This will allow marketers to understand factors affecting consumer behavior related to adoption of technology or resistance towards the same.

2.1. THEORY OF TECHNOLOGY ACCEPTANCE

In the area of adoption of innovation, there have largely been two categories of research:

a) The first set of research, studies the diffusion or spread of adoption over time, and is typically applied to issues such as sales forecasting.

b) The second set tries to study factors affecting an individual's response to an innovation.

The second category includes Theory of Reasoned Action as well as Theory of Planned Behaviour, suggesting that beliefs influence attitudes, which in turn lead to intentions that further determine behaviors. The widely used model in the understanding the adoption of information technology is Technology Acceptance Model (TAM). This model was created by Davis in 1989 and is built on the theoretical foundation of the theory of reasoned action. It proposes that user adoption is determined by two key beliefs:

a) 'Perceived Usefulness' is defined as the extent to which a person believes that using a particular technology will enhance his job performance, and

b) 'Perceived Ease of Adoption' is defined as the degree to which a person believes that using a technology will be less cumbersome

Although perceived usefulness has a direct effect on adoption intention, perceived ease of adoption has both a direct and an indirect effect on intention through perceived usefulness. Furthermore, both types of beliefs are subject to the influence of external variables. By manipulating these external variables, managers can have greater control over adopters' beliefs about the system and, subsequently, their behavioral intentions toward usage of the system.

2.2. ATTITUDE TOWARDS TECHNOLOGY

An attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour. Ajzen (2001) noted that there is agreement that attitudes are summary evaluations of a psychological object in dimensions such as good–bad, harmful–beneficial, pleasant–unpleasant and likeable–dislikeable.

Goldman and Kaplan (1973) studied attitude of college students towards general technology. They included five set of scale items viz. 'global mechanism' (positive or negative global attitudes towards technology); 'mechanical curiosity' (machine competence and curiosity in machines); 'preference for handmade goods'; 'alienation' (reflects societal unconcern with the individual); and 'spiritual benefits of technology'. They concluded that 'the differences between groups (science majors vs non-science majors) are largely defined by mechanical curiosity and by a preference for handmade goods. Lee (1970) suggested that the main factor leading to technology use was 'beneficial tool attitude'. Mick and Fournier (1998) describe "technology paradox," the conflicting emotional reactions consumers experience as they respond to innovations. They argued that the more marketers take emotions into account, the more successful they will be in designing and marketing high tech products. Parasuraman (2000) developed a scale to measure the 'technological readiness' of individuals and firms. The items included are: 'optimism' (a positive view of technology); 'innovativeness' (tendency to be a technology pioneer); 'discomfort' (perceived lack of control over technology); and 'insecurity' (distrust of technology).

Modahl (1999) studied technology adoption and focused on three factors - attitude, income and motivation. Results suggested that attitude towards technology is a key factor influencing the adoption of a wide range of digital technologies. The demographic factors (age, race and gender) do not matter as much as the consumers' attitude toward technology. Modahl also categorised individuals with an affinity for technology as 'technology optimists', and those that have an aversion to technology as 'technology pessimists'.

The focus of the present research is to identify the factors that influence individual attitude towards technology and in turn assess whether it influences the adoption of high technology telecommunication services like cloud telephony. For this purpose, the factors suggested by Edison and Geissler (2003) have been included in the study. Table 1 provides the details regarding the factors chosen, their definition and also their impact on attitude towards technology.

Table 1: Determinants of Attitude towards Technology

Determinant	Definition	Affect on Attitude towards technology
Tolerance for ambiguity	It is 'the tendency to perceive ambiguous situations as desirable', and intolerance for ambiguity 'may be defined as the tendency to perceive (ie interpret) ambiguous situations as sources of threat'.	Individuals with a higher tolerance for ambiguity will have a greater affinity for technology.
Dispositional optimism	Optimists are people who tend to hold positive expectations for their futures and who have ways of coping with outside threats and pressures that differ from those of pessimists.	Individuals with high scores on the optimism scale will have higher scores on the affinity for technology scale.
Locus of control	It refers to an individual's belief that he or she is in control of their own actions. Locus of control is anchored at one end by strong external control (the idea that someone or something outside of oneself is in control), and at the other by strong internal control (where an individual feels that outcomes depend on what the individual does).	Individuals with higher scores on the locus of control scale (externals) will have lower affinity for technology.
Need for cognition	It represents the degree to which a person tends to engage in and enjoy effortful information processing (thinking). The individuals with high need for cognition find simple tasks more unpleasant than complex ones.	Lower levels of need for cognition will lead to lower scores on the affinity for technology scale.
Self-efficacy	It refers to an individual's belief about his or her capability to produce effects and determines how people feel, think, motivate themselves, and behave, along with which goals they set, the effort they expend and their resilience to failures.	Individuals scoring high in self-efficacy will have a greater affinity for technology.

Source: Adapted from Edison and Geissler (2003)

3. OBJECTIVES OF THE STUDY

This paper examines the factors affecting attitude of consumers towards new high technology telecommunication services. The services that we have chosen to study include Online Mobile Telephony Services (OMT) or Cloud Telephony. These have been introduced in the Indian market very recently. There are

only six to seven firms engaged in providing these services through customized offerings. Cloud telephony does not just promise superior service but also significantly low cost. For SMEs (Small and Medium Enterprises), small businesses and individuals it promises to cut costs by 80 percent and also offer greater control than mobile telephony. In developed markets like United States, the share of cloud telephony is slated to increase from 2 percent to 30 percent by 2014. However the Indian consumers are not aware about cloud telephony. As the technology is being introduced and many new technology venture firms are getting involved, their success will largely depend on acceptance of these services by the consumers – both businesses and individuals. To understand the attitude of consumers towards technology and cloud telephony services in particular will hence provide insights to the marketers of these services. This research study was conducted with the following objectives:

1) To explore the affinity of users towards technology
2) To find out the factors influencing attitude of consumers towards technology, and
3) To find out the influence of attitude towards technology on likelihood of buying high technology services.

4. METHODOLOGY

4.1. INSTRUMENT DESIGN

A structured non-disguised questionnaire was used. The questionnaire consisted of three parts. The first part of the questionnaire contained attitudinal statements regarding factors that are likely to influence attitude towards technology. These statements were adapted from scale suggested by Edison and Geissler (2003) for measuring attitude towards general technology (Refer Table 1). The second part had questions related to attitude towards technology and likelihood of adopting high technology telecommunication services like cloud telephony. The third part of the questionnaire contained questions related to demographic characteristics.

4.2. SAMPLING METHOD AND DATA COLLECTION

The questionnaire was administered to the respondents at a shopping mall and requested to provide their unbiased valuable feedback. Random sampling was done and every fifth respondent exiting the chosen departmental store was requested for feedback. A total of 102 complete questionnaires (complete in all respects) were obtained. The reason for obtaining feedback at the shopping mall was easy accessibility, budget constraints and quality responses. The demographic data was obtained to generate a profile of the respondents.

5. DATA ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS

The demographic profile of the respondents is presented in Table 2. About 75 percent of the respondents were males, 57 percent of males were in the up-to 35 years old; 50 percent were general graduates and 40 percent of them had an annual income of more than Rs 5 lakhs. 52 percent females were in the age group of 20 to 40 years and 52 percent female respondents were general graduates and 40 percent had an annual income between Rs. 2.5 - 5 lakhs.

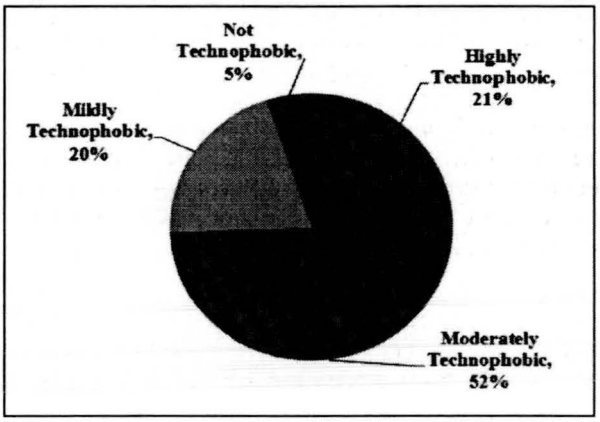
Table 2: Profile of the Respondents

	Gender	Male	Female
	Total Respondents	**77**	**25**
	Average Size of Household	**4**	**4**
Age profile	Less than 15 Years	3%	12%
	15 to 20 Years	9%	16%
	20 to 25 Years	14%	12%
	25 to 30 Years	22%	4%
	30 to 35 Years	9%	16%
	35 to 40 Years	17%	20%
	40 to 45 Years	10%	8%
	45 Years and above	16%	12%
Education	Class 10 (Matriculate)	10%	20%
	Class 12+ but not Graduate	16%	4%
	Graduate/ Post graduate - General	50%	52%
	Graduate/ Post graduate –Professional	24%	24%
Income	Less than 2.5 Lakhs	36%	24%
	2.5 to 5 Lakhs	24%	40%
	5 Lakhs and above	40%	36%

5.1. INFLUENCE OF PERSONAL FACTORS ON ATTITUDE TOWARDS NEW TECHNOLOGY

'Technophobia' was defined as feeling of discomfort towards products based on any new technology. The respondents were asked to rate themselves as Highly Technophobic; Moderately Technophobic; Mildly Technophobic and Not Technophobic. The results are presented in Figure 1.

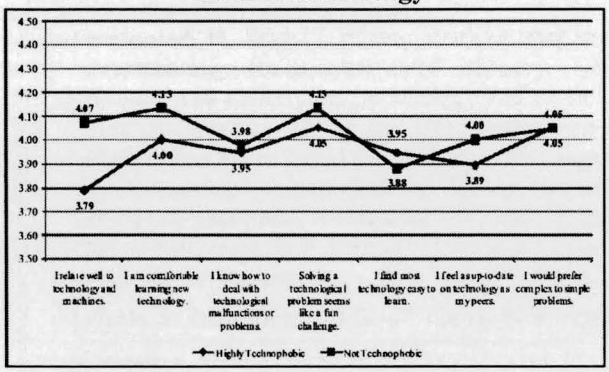
Figure 1: Respondents Comfort with New Technology



The respondents were asked to rate several statements associated with their attitude towards technology. The respondents who categorized themselves as moderately, mildly and not technophobic were grouped together as 'Not Technophobic'. The respondents who felt that they are 'Highly Technophobic formed the

second group. A comparison of the two groups i.e. Highly Technophobic and Not Technophobic is presented in Figure 2.

Figure 2: Comparison of Attitude of Respondents towards Technology



The respondents who suggest that they are 'highly technophobic' have lower ratings than 'not technophopic' on the following – 'I relate well to technology', 'I am comfortable learning new technology', 'I know how to deal with technological malfunctions or problems', 'Solving a technological problem seems like a fun challenge', 'I feel up-to-date on technology as my peers' and 'I would prefer complex to simple problems'. It is however surprising that people who feel that they are not technophobic have slightly lower rating on 'I find most technology easy to learn'. It may probably be so that the 'not technophobic' people feel that though most technology is not so easy to learn but exploring new technology is fun as well as challenging because the nature of the problem is complex.

The scale to study general technology adoption was created by Edison and Geissler (2003). This scale was modified and used for the present study. It includes personal characteristics influencing general technology adoption viz. Tolerance for ambiguity; Dispositional optimism; Locus of control; Need for cognition and Self-efficacy. The scale items were shortlisted based on their inclusion by Edison and Geissler in Structural Equation Modeling (SEM) of the study conducted by them. The validity of the scale in Indian context was tested using Factor Analysis. The results of Factor Analysis are discussed below.

The reliability and equivalence of the different items of the scale was checked by analyzing Cronbach's alpha coefficient and Hotelling's T-squared test. Table 3 shows that the dimensions viz. Self Efficacy, Locus of Control and Affinity for Technology achieved a high Cronbach's alpha coefficient, suggesting a high reliability (greater than 0.6 recommended by Nunally and Bernstein) and internal consistency. However, the overall Cronbach's alpha coefficient for the all the items was 86.6 percent and Hotelling's T-squared test is also significant confirming difference between the items. Finally, the results of Hotelling's T-squared test confirmed that the mean of different items under the dimensions Need for Cognition, Self Efficacy, Locus of Control and Affinity for Technology was significantly different from each other at 0.5 percent level. This indicates that there is no equivalence between the items and that they are different. Based on the results presented in Table 3 it was decided that the items representing dimensions Self Efficacy, Locus of Control and Affinity for Technology will be included to conduct factor analysis as these dimensions have a higher than the required level of reliability as predicted by Cronbach's Alpha. Hence, the results of factor analysis, presented subsequently include items under the dimensions Self Efficacy, Locus of Control and Affinity for Technology.

Table 3: Reliability and Equivalence of Various Items

Dimensions	No.of Items	Cronbach's Alpha	Hotelling's T-squared	F-value	Df	P-value
Need for Cognition	7	0.322	232.499	36.832	6, 96	0.000
Tolerance for Ambiguity	8	0.466	15.549	2.089	7, 95	0.052
Self Efficacy	10	0.643	31.925	3.266	9, 93	0.002
Dispositional Optimism	3	0.573	2.562	1.268	2, 100	0.286
Locus of Control	17	0.793	78.559	4.181	16, 86	0.000
Affinity for Technology	7	0.786	15.619	2.474	6, 96	0.029
All	52	0.866	1139.710	11.284	51, 51	0.000

Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett test for sphericity were conducted and the results are presented in Table 4.

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.614
Bartlett's Test of Sphericity	Approx. Chi-Square	1435.511
	Df	561
	Sig.	.000

The KMO measure of sampling adequacy is 0.614. It is greater than 0.5, which is the recommended value for acceptance of results of factor analysis, by Kaiser (1974). The result of Bartlett's Test of Sphericity and chi-square ($\chi 2$) transformation is also significant at 0.05 level of significance.

Table 5 displays the results of factor analysis conducted for the items under dimensions Self Efficacy, Locus of Control and Affinity for technology. The results suggest that the eigen value, for the extracted 11 dimensions, was greater than recommended level of 1. This reveals that from the 34 items included in factor analysis, only 11 dimensions were extracted and emerged with a cumulative variance of 69.458 percent. These 11 dimensions explained 69.458 percent variance of the consumers' attitude towards new technology.

Table 5: Total Variance Explained

Initial Eigenvalues				Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Compo-nent	Total	% of Variance	Cumula-tive %	Total	% of Variance	Cumula-tive %	Total	% of Variance	Cumula-tive %
1	6.745	19.838	19.838	6.745	19.838	19.838	3.398	9.995	9.995
2	2.270	6.678	26.516	2.270	6.678	26.516	2.494	7.334	17.329
3	2.227	6.550	33.066	2.227	6.550	33.066	2.480	7.294	24.623
4	2.087	6.139	39.204	2.087	6.139	39.204	2.307	6.786	31.409
5	1.947	5.728	44.932	1.947	5.728	44.932	2.136	6.283	37.692
6	1.787	5.256	50.189	1.787	5.256	50.189	2.098	6.170	43.862
7	1.659	4.880	55.069	1.659	4.880	55.069	2.057	6.049	49.911
8	1.339	3.938	59.007	1.339	3.938	59.007	1.850	5.440	55.351
9	1.222	3.593	62.600	1.222	3.593	62.600	1.793	5.272	60.624
10	1.184	3.483	66.083	1.184	3.483	66.083	1.573	4.625	65.249
11	1.147	3.375	69.458	1.147	3.375	69.458	1.431	4.209	69.458
12	.950	2.793	72.251						
13	.919	2.703	74.954						
14	.819	2.410	77.364						
15	.777	2.284	79.648						
16	.729	2.145	81.793						
17	.685	2.014	83.807						
18	.658	1.937	85.744						
19	.561	1.649	87.393						
20	.523	1.539	88.932						
21	.481	1.413	90.345						
22	.439	1.292	91.637						
23	.385	1.133	92.771						
24	.359	1.057	93.827						
25	.347	1.021	94.848						
26	.280	.824	95.672						
27	.277	.816	96.488						
28	.258	.758	97.247						
29	.231	.680	97.926						
30	.196	.576	98.503						
31	.185	.544	99.047						
32	.143	.420	99.467						
33	.103	.302	99.770						
34	.078	.230`	100.000						

Note: Extraction Method: Principal Component Analysis; 11 Components extracted.

The extraction method used was Principal Component Analysis (PCA) The communalities in the column labeled 'extraction' reflected the common variance in data structure. After extraction, some factors, whose eigen value was less than 1, were dropped. The component matrix which shows factor loadings before rotation was used to extract 11 components which are shown in Table 6. Further to decide the number of factors to be interpreted, we also referred to the results of Figure 3 i.e. the Scree Plot. It clearly depicts the point/s of inflexion on the curve. There is a distinct drop after the seventh and the eleventh dimensions. Hence, based on the results Table 5 and Figure 3, we considered retaining 11 dimensions.

Figure 3: Scree Plot

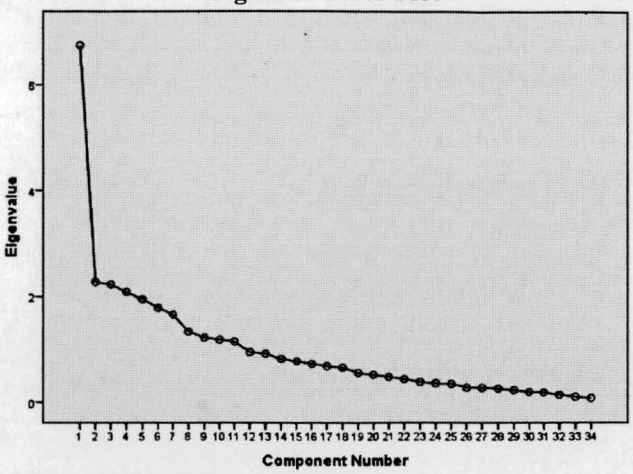


Table 6 is the Rotated Component Matrix and is used to interpret the dimensions. The factor loadings above 0.500 have been highlighted and used to interpret the dimensions. The results of Table 6 have been obtained using PCA as the extraction method and Varimax rotation with Kaiser-normalization as the rotation method.

Table 6: Rotated Component Matrix

	1	2	3	4	5	6	7	8	9	10	11
I can always manage to solve difficult problems if I try hard enough.	0.011	-0.023	-0.009	0.078	0.092	0.768	0.089	0.048	0.144	-0.019	0.073
If someone opposes me, I can find the means and ways to get what I want.	-0.051	0.301	0.271	-0.037	0.69	0.144	-0.176	-0.158	0.03	0.06	0.068
It is easy for me to stick to my aims and accomplish my goals.	0.135	0.681	0.02	0.084	0.266	-0.19	-0.027	0.218	-0.152	0.033	-0.071
I am confident that I could deal efficiently with unexpected events.	0.137	0.695	-0.001	0.034	0.029	0.096	0.117	0.03	0.207	0.207	-0.048
Thanks to my resourcefulness, I know how to handle unforeseen situations.	-0.048	0.282	-0.095	0.094	0.621	0.097	0.373	0.025	-0.03	-0.138	-0.169
I can solve most problems if I invest the necessary effort.	-0.047	-0.006	-0.022	-0.094	0.147	0.065	-0.018	0.215	0.765	-0.162	0.049
I can remain calm when facing difficulties because I can rely on my coping abilities.	0.002	-0.16	0.066	0.099	0.829	-0.002	-0.004	0.046	0.13	0.162	0.097
When I am confronted with a problem, I can usually find several solutions.	0.186	0.088	0.242	-0.049	0.085	0.328	0.414	-0.287	0.446	-0.143	-0.128
If I am in trouble, I can usually think of a solution.	0.242	0.324	0.31	-0.181	0.066	0.081	0.317	0.174	0.215	0.081	0.006
I can usually handle whatever comes my way.	0.184	0.473	0.192	0.289	-0.169	0.218	-0.102	0.025	0.228	-0.304	-0.057
Children get into trouble because their parents punish them too much.	-0.187	0.386	0.438	0.084	-0.128	-0.362	0.251	-0.104	0.194	0.317	0.179
Many of the unhappy things in people's lives are partly due to bad luck.	0.012	0.153	0.433	0.111	-0.256	-0.006	0.342	0.46	-0.249	0.144	-0.06
People's misfortunes result from the mistakes they make.	0.017	-0.196	0.044	0.082	0.044	0.051	0.096	-0.065	0.108	0.004	0.826
In the long run people get the respect they deserve in this world.	0.035	0.147	-0.036	0.002	0.104	0.094	0.124	0.157	-0.094	0.865	-0.003
Unfortunately, an individual's worth often passes un-recognised no matter how hard he or she tries.	0.226	0.292	0.411	0.057	0.004	0.092	0.179	0.214	-0.16	-0.243	0.356

Most students don't realise the extent to which their grades are influenced by accidental happenings.	0.025	0.211	0.665	-0.054	0.104	-0.002	-0.065	0.031	0.057	-0.126	0.163
LOC Many times exam questions tend to be so unrelated to course work that studying is really useless.	0.327	0.403	0.166	-0.032	0.031	0.148	0.06	-0.031	-0.087	0.057	0.516
Getting a good job depends mainly on being in the right place in the right time.	-0.058	0.1	0.051	-0.092	-0.05	0.084	0.04	0.746	0.191	0.176	-0.024
This world is run by the few people in power, and there is not much the little guy can do about it.	0.105	0.141	0.3	0.223	0.118	0.61	0.221	0.176	-0.188	0.254	0.159
It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.	0.333	0.132	0.117	0.382	0.027	0.429	-0.18	0.139	-0.032	0.321	0.283
Many times we might just as well decide what to do by flipping a coin.	0.134	-0.274	0.677	0.169	0.175	0.049	0.191	0.168	0.031	0.051	-0.021
Who gets to be boss often depends on who was lucky enough to be in the right place first.	0.168	-0.063	0.006	0.435	0.271	-0.416	0.404	0.24	0.041	-0.03	0.036
As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.	0.096	0.346	0.096	0.312	-0.062	0.145	0.529	0.245	-0.272	-0.002	-0.032
Most people don't realise the extent to which their lives are controlled by accidental happenings.	0.137	-0.05	0.067	0.044	-0.008	0.068	0.791	0.109	0.042	0.169	0.207
It is usually best to cover up one's mistakes.	0.319	0.029	0.269	0.382	0.41	-0.449	-0.082	-0.027	-0.261	-0.073	0.088
Many times I feel that I have little influence over the things that happen to me.	0.657	0.342	0.201	-0.071	-0.103	0.063	-0.045	0.323	-0.13	-0.066	0.066
There's not much use in trying too hard to please people, if they like you, they like you.	0.307	0.078	0.141	0.267	0.109	0.05	0.251	0.592	0.099	-0.069	-0.049
I relate well to technology and machines.	0.827	0.028	-0.098	-0.005	-0.009	-0.007	0.123	-0.023	0.027	0.012	0.151
I am comfortable learning new technology.	0.303	0.204	-0.158	0.653	0.055	0.17	-0.058	0.205	0.121	-0.112	0.021
I know how to deal with technological malfunctions or problems.	0.661	0.105	-0.056	0.341	0.029	0.019	0.141	0.13	0.159	0.054	0.008
Solving a technological problem seems like a fun challenge.	0.793	0.082	0.347	0.163	0.013	-0.018	0.076	-0.119	0.071	-0.033	-0.021
I find most technology easy to learn.	0.355	0.233	0.064	0.305	-0.106	-0.009	-0.029	0.048	0.588	0.171	0.079
I feel as up-to-date on technology as my peers.	0.485	-0.03	0.518	0.276	0.028	0.299	0.008	-0.018	-0.074	0.295	-0.133
I would prefer complex to simple problems.	0.027	-0.025	0.196	0.793	0.081	0.055	0.179	-0.133	-0.082	0.081	0.058

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization

From Table 6, it can be inferred that dimension 1 comprised of the scale items – Many times I feel that I have little influence over the things that happen to me; I relate well to technology and machines; I know how to deal with technological malfunctions or problems and Solving a technological problem seems like a fun challenge. Similarly, dimension 2 was represented by - It is easy for me to stick to my aims and accomplish my goals and I am confident that I could deal efficiently with unexpected events; dimension 3 comprised of Most students don't realise the extent to which their grades are influenced by accidental happenings; Many times we might just as well decide what to do by flipping a coin and I feel as up-to-date on technology as my peers; dimension 4 comprised of – I am comfortable learning new technology and I would prefer complex to simple problems. Dimension 5 comprised of – If someone opposes me, I can find the means and ways to get what I want; Thanks to my resourcefulness, I know how to handle unforeseen situations and I can remain calm when facing difficulties because I can rely on my coping abilities; dimension 6 included - I can always manage to solve difficult problems if I try hard enough and This world is run by the few people in power, and there is not much the little guy can do about it; dimension 7 comprised of - As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control and Most people don't realise the extent to which their lives are controlled by accidental happenings; dimension 8 comprised of items – Getting a good job depends mainly on being in the right place in the right time and There's not much use in trying too hard to please people, if they like you, they like you. Dimension 9 comprised of - I can solve most problems if I invest the necessary effort and I find most technology easy to learn. Dimension 10 comprised of – In the long run people get the respect they deserve in this world and dimension 11 comprised of - People's misfortunes result from the mistakes they make; Many times exam questions tend to be so unrelated to course work that studying is really useless.

Table 6 also shows that the following items - When I am confronted with a problem, I can usually find several solutions; If I am in trouble, I can usually think of a solution; I can usually handle whatever comes my way; Children get into trouble because their parents punish them too much; Many of the unhappy things in people's lives are partly due to bad luck; Unfortunately, an individual's worth often passes un-recognized no matter how hard he or she tries; It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow; Who gets to be boss often depends on who was lucky enough to be in the right place first and It is usually best to cover up one's mistakes - do not have adequate loadings (i.e. greater than 0.500) and are hence not a part of any of the 11 dimensions. Hence we infer that the number of dimensions, affecting attitude of consumers towards new technology are 11 and many items of Edison and Geissler's scale are not applicable in the present research.

The dimensions were interpreted and the results of the same are presented in Table 7. Many items related to Self Efficacy and Locus of Control have not clubbed with the items in the dimension Affinity for Technology.

Table 7: Interpreting the Dimensions

Dimension	Label
Dimension 1	Technophile
Dimension 2	Goal Seeker
Dimension 3	Uncertainty Avoider
Dimension 4	Technology Enthusiast
Dimension 5	Good Manager
Dimension 6	Problem Solver
Dimension 7	Helpless Victim
Dimension 8	Opportunity Seeker
Dimension 9	Active adopter
Dimension 10	Self believer
Dimension 11	Devil's Advocate

Hence, several personal characteristics of consumers that affect their attitude towards new technology include - Technophile; Goal Seeker; Uncertainty Avoider; Technology Enthusiast; Good Manager; Problem Solver; Helpless Victim; Opportunity seeker; Active adopter; Self believer and Devil's Advocate. The impact of these dimensions on attitude of users towards new technology can be interpreted by studying the items that have combined and referring to Table 1 which presents the impact of these dimensions.

Further, the impact of technophobia was studied on the likelihood to adopt cloud telephony (which represents high technology telecommunication service for the purpose of this study). The results are presented in Table 8, Table 9 and Table 10. The hypothesis can be stated as follows:

H_0: Technophobia does not influence the likelihood to use cloud telephony service.

H_1: Technophobia influences the likelihood to use cloud telephony service.

Table 8: Technophobia and Likelihood to Use Cloud Telephony Service

		Likelihood to Use Cloud Telephony Services		Total
		Never	Immediately/ Near Future	
Technophobia	Highly Technophobic	14	5	19
	Not Technophobic	5	78	83
Total		19	83	102

The results in Table 8 suggest that out of total 19 respondents who are not likely to use cloud telephony services, 14 are highly technophobic and also majority of the respondents who are likely to adopt this service immediately or in near future are not technophobic.

Table 9: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	46.694a	1	.000		
Continuity Correctionb	42.337	1	.000		
Likelihood Ratio	38.391	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	46.237	1	.000		
N of Valid Cases	102				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.54.

b. Computed only for a 2x2 table

Table 10: Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.677	.095	9.189	.000[c]
Ordinal by Ordinal	Spearman Correlation	.677	.095	9.189	.000[c]
N of Valid Cases		102			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.

The result of Chi-square test is presented in Table 9 and Table 10. The result suggests that the value is significant at 95% level of confidence. Hence we reject the null hypothesis that technophobia does not influence the likelihood to use cloud telephony service.

From the results of data analysis, it can be concluded that technophobia influences attitude of consumers towards new technology. Technophobia also influences their likelihood to adopt high technology telecommunication services. Further, the Edison and Geissler's scales validity in Indian context is not complete. Only some of the dimensions considered by them were found to be applicable in the Indian context. When factor analysis was done using the valid items of the scale, it was found that the resultant 11 dimensions had items grouping differently than predicted by Edison and Geissler. These dimensions represent the personal characteristics of consumers and the impact of these personal characteristics on likelihood to adopt new technology.

7. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The validity of Edison and Geissler's Scale was checked using factor analysis (PCA). We obtained 11 dimensions that were likely to influence the attitude of consumers towards new technology adoption. As we did not consider all the items of the scale and adapted it to suit Indian context, hence some of the aspects which are not a part of this scale could have been missed. An exploratory study to identify the dimensions influencing attitude of consumers towards new technology adoption (other than those mentioned in the scale), relevant to Indians, can be carried out by future researchers. Further, this research was conducted only in the North of India and therefore future studies can be conducted in other parts of India to improve the reliability of the study.

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