Effect of Technology Trust, Self Efficacy and Technology Anxiety on Intention to Use Self Service Technology: A Study of e-ticketing Service of Indian Railways

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Abstract

With the development of technology, there has been an increase in the business being conducted over the internet. The internet has become indispensable as a transaction medium. This can be observed in retail settings where it is an integral part of self service technologies which are being used to give additional services to the customers. The Indian Railways have a self service technology in the form of e-ticketing or online ticket reservation. Although the advantages of this self-service technology is fairly evident, its adoption by Indian travellers is far from universal. This study aims at understanding the impact of trust in technology, technology anxiety and self efficacy on the adoption of e-ticketing services of the Indian Railways. Primary data for the study has been collected from Indian consumers above 16 years of age. The study finds that trust in technology, technology anxiety and self efficacy do impact the intention of a consumer to use e-ticketing. Managerial implications of the findings are discussed. The findings of this study and its implications are relevant for academicians, researchers and self service providers.

Keywords: *Technology Trust, Technology Anxiety, Self Efficacy, E-ticketing*

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INTRODUCTION

Due to rapid developments in technology, a plethora of improved products and services has been introduced to consumers globally. The growth of information and communication technologies can aid firms in increasing their competitiveness and providing better service experiences to their customers. Technology can be used by both service providers and customers during the service process. Dabholkar (1994) proposed that there are three ways in which a company can use technology when providing service: (a) Employees who are not "contact" personnel use technology behind the scenes to increase the overall efficiency of operations (b) "Contact" employees (whether face to face or by telephone) use technology to provide faster, fuller service to customers and (c) Customers use technology to perform services for themselves. Technology can be employed by customers to provide service for themselves, such as ATMs. By using such types of innovations, customers can access services at any time and at any place they want without the complications of interpersonal exchanges (Bitner et al. 2002). Such services are referred to as Self Service Technologies i.e SSTs. Self-service technologies are defined as technological interfaces that allow customers to act as a producer and a consumer of services without direct communication with an organization's employees (Meuter, Ostrom,Bitner& Roundtree, 2003). The increase in the use of various self-service technology platforms has led to an increase in the involvement of customers in the service delivery process. This kind of a direct relationship with customers requires service providers to pay more attention to understand what a customer desires from service delivery so that they can achieve high levels of customer satisfaction. In most cases of service delivery, satisfaction is seen as being the major determinant of subsequent loyalty. (Anderson and Sullivan,1993; Szymanski and Henard, 2001; Fassnacht and Köse, 2007; Blattberg et al., 2009). The knowledge about what attracts customers towards new technologies and how to retain the customers and increase the satisfaction levels of the customers is still in its developmental stage. For marketers to have greater acceptance for their new technologies and increase their usage among target customers, it is important for them to understand the factors influencing adoption of these technologies and also have insights in to what factors contribute to customer satisfaction.

SST includes a wide range of technologies such as vending machines, automatic teller machines (ATMs), online automated phone systems, information kiosks, grocery store self-checkout systems, Internet banking, paying bills by mobile phone, airline check-in via internet, check in booths at airports, interactive phone/voice systems, internet shopping, self ticket purchasing on the internet etc. (Eriksson and Nilsson, 2007; Liljander et al.,2006;Lin and Hsieh, 2007). Most of the SSTs are provided using kiosks (eg. ATM, self checkout systems at the hotels etc.), vending machines (eg. ticket vending machines at metro stations) and using the internet platform (eg. Online banking, online booking etc.)

India is a developing economy where, in recent years, consumers are gaining increasing access to modern technology at a rapid pace. One of the developments has been the penetration of internet facilities. According to a report published jointly by the Internet and Mobile Association of India (IAMAI) & Kantar IMRB, the number of internet users has reached 500 million by June 2018 and the overall internet penetration is 35% of total population as on December 2017 (IAMAI, 2018). Online retail sales in India are expected to touch $32.70 billion, however, India's growth rate in e-commerce is yet to catch up with countries such as China and Indonesia in the Asia Pacific market. (eMarketer,2018)

Online reservation of tickets or e-ticketing is a form of selfservice technology whereby customers can reserve a seat in a database system and payment is made through the Internet. Online passenger reservation system is an important service of Indian Railways. It allows railways to easily access and transact with their customers directly and have a closer relationship with them. According to Ministry of State for Railways, the national transporter earned Rs. 19,209.28 crore in online booking and Rs. 28,468.81 crore in offline booking in 2016-2017. (Indian Railways, 2016).

According to above statistics although a gradual growth of online purchasing is apparent, but there is still huge scope for improvement. If more customers will opt for e-ticketing it would be cost effective for the Railways as well. This opens up interesting areas of academic research from the perspectives of sellers as well as buyers. For any transaction which is conducted online, there are at least two parties involved. The selling side wants to attract maximum consumers to purchase online and be satisfied and become loyal customers. The buyers consider the benefits of online transactions such as usefulness and ease of browsing, convenience of placing orders and payments. The adoption of e-ticketing depends on the assessment of the technology by the consumers.

Many people in India still prefer shopping from physical stores or malls as online purchasing to be complex and somewhat risky process. The availability of high-speed internet connectivity and the costs thereof are still an in many parts of the country. These are amongst the reasons that are likely to be impacting the Indian consumer's adoption ofself-service technologies such as the railway's e-ticketing services. However, there are also likely to be certain consumer-related factors that play a role in consumer willingness to try out new and unfamiliar options. Besides consumer demographics certain personality related or psychographic factors may be impacting consumer's attitude and willingness to adopt these alternatives. Understanding the factors will give better understanding about consumer buying behaviour. This will aid online retailers to gain acceptability for online modes and to better promote their products. .

In this context it is important to understand the drivers as well as the inhibitors that impact Indian consumers in adopting e-ticketing. This paper is an attempt to understand the impact of three variables i.e. Trust in Technology, Technology Anxiety and Self Efficacy in the usage of self service technology on the adoption of online ticket reservation in Indian Railways.

LITERATURE REVIEW

In order to understand the adoption behaviour of technology related services, researchers have tried to identify, analyse and

understand its various antecedents. However, the knowledge about the critical success factors for a self service technology is still evolving and needs to be explored more. This section provides an overview of the extant literature on the subject.

Technology Trust

Technology trust is defined as the willingness of a customer to be vulnerable to a technology based on how predictable and reliable is the technology and what is the expectation about the utility of the technology to the customer. (McKnight, Choudhury, &Kacmar, 2002). Trust has also been defined by Chong,(2012) as "whether users are willing to become vulnerable to the service providers after considering their characteristics (e.g. security, brand name)."

In the absence of technology trust, customers will avoid or hesitate to use the option of self service technology especially when the alternate methods of transaction involving human contact are available. (Oh et al., 2013). Technology trust has been found to be a key construct in consumers' overall evaluation of any Self Service Technology. (Johnson, Bardhi and Dunn,2008)

If the level of predictability, reliability, and utility of new technology is high and the consumer trusts the technology, the likeliness of its use by him increases. (McKnight, & Chervany, 2002). Trust has been identified as one of the important barriers in research studies related to self service technology (Dimitriadis & Kyrezis, 2010; Benamati et al., 2010). In their study of Malaysian consumers Wei et al. (2009) found that trust with regard to security and privacy is an important determinant of consumer decisions to adopt m-commerce. Lack of clear regulations, preference of face-to face interactions, and potential information that can be accessed by the vendors were some issues resulting in users not trusting m-commerce. (Chong et al., 2010; Wei et al., 2009).

When a new innovative service is introduced, customers may be fearful about using it for banking transactions. Trust is an important element which affects consumers' decisions to adopt technologies such as online purchases. [Holsapple&Sasidharan,2005; Lin,2011; Luo et al. 2010; Gefen, Karahanna& Straub,2003].

The main concern regarding doing any online transaction is the wireless transaction security and customer fear of distributing personal data. If customers have trust in the technology then their fears of risks and uncertainity of monetary transactions using internet are reduced (Corritore; Chong et al. 2010; Luarn and Lin ,2005).

Trust of the customers need to be formed and retained in the long term, and understanding the risks perceived by the customers helps service providers in identifying the barriers of adoption and addressing them. (Hanafizadeh et. Al., 2014)

In this research, Trust focuses on the trust placed on e-ticketing option of Indian Railways. The aim is to examine whether users are willing to take the risks of trusting online ticket booking with its uncertainties such as security and privacy risks, and lack of face-to face interactions with service providers.

Technology Anxiety

Technology anxiety focuses on the state of mind of the user pertaining to their ability and willingness to use technology-related tools. As defined by Meuter et al (2003), technology anxiety is a negative response reflecting apprehension or fear of technology. Research indicates that technology anxiety arises from the inability in effectively managing or controlling the technology and the anxiety experienced by an individual when confronted with the decision to use the new technology. (Igbaria& Parasuraman, 1989; Oyedele& Simpson, 2007; Beckers,Wicherts, & Schmidt, 2007).

Considerable innovations in service delivery processes have been introduced in the form of Self ServiceTechnologies. In order to have less resistance towards the technology related services, customers need to have knowledge, skills and above all liking for the new technologies. According to Meuter et al, (2003), when a choice is available, customers will not use a SST option unless they perceive an advantage for using it and feel comfortable with the technology. The study also concluded that technological anxiety had a negative relationship with overall satisfaction, word of mouth, and repeat usage intentions. Many other studies have also demonstrated that technology anxiety decreases perceived ease of use and intention to use self service technologies. (Venkatesh, 2000; Venkatesh and Bala, 2008).

Also, technology anxiety may contribute to role ambiguity, decreased motivation levels, and a reduced self-perception of ability to use SSTs (Meuter et al., 2005). Therefore high levels of technology anxiety also causes avoidance of the technology (Parasuraman, 2000; Parasuraman & Colby, 2001).

Self Efficacy

Self-efficacy is the judgment of one's ability to organize and execute given types of performances" (Bandura, 1997, p. 21). In the context of the acceptance of self service technologies, self-efficacy refers to the degree to which a person believes that she/he is able to use a technology to accomplish a particular task. (Katija& Britta 2014).

In the area of Information Systems it is important to understand self efficacy so as to better analyse the individual consumer responses and behavioural intentions towards information technology and related services.(Luo et al, 2010). Earlier studies have proven that self efficacy is an important determinant of the attitude of consumers towards the technology. (Davis 1986; Meuter et. al. 2005; Kim et al., 2012). When consumers have more confidence in their ability to use Self Service Technologies, he/she will more likely adopt that technology. (Xiaoren et al 2013).

This research is an attempt to understand whether the consumers believe that they have the ability to use online ticket reservation for Railways. We can thus expect that the higher the users' self-efficacy, the better is their acceptance and use of e-ticketing.
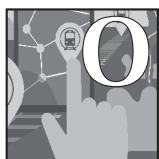
OBJECTIVES OF THE STUDY

The following are the specific objectives of the study:

1. To study the intention to use e-ticketing for railways ticket reservation amongst Indian adults.

2. To examine the relationship between technology trust, technology anxiety and self efficacy and intention to use e-ticketing for railways ticket reservation amongst Indian adults.

HYPOTHESES

Based on the literature review the following hypotheses were taken up for examination in the study:

H_1 : Technology trust has a direct and positive effect on intention to use of e-ticketing service.

H_2 : Self Efficacy has a direct and positive effect on intention to use e-ticketing service.

H_3 : Self Efficacy has a direct and negative effect on intention to use e-ticketing service.

CONCEPTUAL MODEL FOR THE STUDY

Figure 1 presents the conceptual model representing the relationship between intention to use e-ticketing and the hypothesized antecedents.
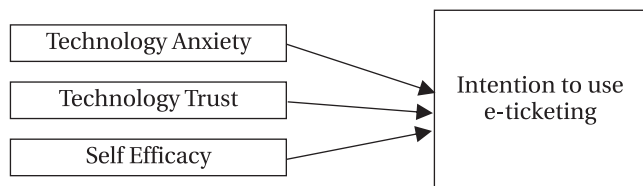

Figure No.01

RESEARCH METHODOLOGY

To test the conceptual model, a survey was created to capture the customer evaluations of the SST. A survey consisting of 15 items was developed to measure the impact of technology trust, technology anxiety and self efficacy towards intention to use the SST. Measures for trust were adapted from Chong, et al (2012). Measures for Self Efficacy and Technology Anxiety were adapted from Meuter et al. (2005) and Intention to use from Oliver and Swan(1989) . The variables were measured on a five-point Likert type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). In addition, the questionnaire sought to collect information on the following respondent demographics: age, annual household income, education and gender.

The specific SST used for this study was online ticket reservation or e-ticketing of Indian Railways. Primary data for the study was collected, using the structured questionnaire, from 125 adults above the age of 16 years. The data was collected through personally administering the survey instrument. Convenience sampling was used to draw the sample.

The sample comprised respondents above the age of 16 years. As presented in Table 1, there is an almost equal representation of males (48%) and females (52%). in the sample. Of the total respondents 33.6 percent were graduates and 18.4 percent had completed Class 12 and 46.4 percent were post graduates. A fairly large segment of the sample (40.8%) is employed in Private Service.

Table1: Respondent Profile

Age	%	Household Income	%
16-25 Years	30.4	Below 1 Lac	3.2
26-35 Years	20.8	01-05 Lac	16.8
36-45 Years	24.0	05-15 Lac	22.4
46-55 Years	8.0	15-25 Lac	21.6
56-65 Years	12.8	25-05 Lac	20.8
Over 65 Years	4.0	Above 35 Lac	15.2
Education		**Occupation**	
Class 12	18.4	Business	8.0
Graduate	33.6	Private Service	40.8
Post Graduate	46.4	Government Service	5.6
Completed Ph.D	1.6	Professional	8.8

n=125

FINDINGS AND ANALYSIS

Data analysis was conducted with Structural Equation Modelling using IBM-Amos Version-18. A two stage approach (Anderson & Gerbing, 1988) was used i.e. first estimating the measurement model to get the standardized regression weights and then estimating the structural model. In the first stage Confirmatory Factor Analysis (CFA)was done on the data. The data was checked for construct validity, reliability as well as for the model fit. All the 15 items were used in the CFA to obtain a model fit. The results of the confirmatory factor analysis indicate that each item loaded on its respective underlying concept and all loadings were significant. 14 items loaded very well with scores lying between 0.79 and 0.97. Item 3 of Technology Trust construct had low factor loading and was deleted from the model. The path loadings for the proposed measurement model are shown in Table 2. Cronbach's alfa score for each construct is above 0.7 showing high construct reliability. (Fornell and Larcker ,1981)

The CFA results on convergent and discriminant validity are provided in the Table 3. There is strong convergent validity as all the items loaded on their corresponding latent factors with standardised scores or loadings for each factor above 0.5 and significant at p values < 0.001 as shown in Table 2. Also the average variance extracted for each construct is > 0.5. (Fornell and Larcker (1981); Bagozzi and Yi (1988); Hair et al (2010). The discriminant validity was also met as the square root of the average variance extracted is more than the inter-construct correlation. (Chin (1998); Farrell (2010); Hair et al (2010).

Table 2: Construct Reliabilities and Item Loadings.

Construct/Items	Reliability /Item Loadings
Technology Anxiety	.939
I feel apprehensive about booking Railway tickets online.	.921
Technological terms sound like confusing jargon to me.	..946
I have avoided technology because it is unfamiliar to me.	.837
I hesitate to use most forms of technology for fear of making mistakes I cannot correct.	.873
Label: Self Efficacy	.945
I am fully capable of booking railway tickets online.	.940
I am confident in my ability to book railway tickets online.	.930
Using online railway ticket reservation service is well within the scope of my abilities	.950
My past experiences increase my confidence that I will be able to use online railway ticket reservation service.	.799
Technology Trust	.932
Payments made through online ticket reservation service will be processed securely	.862
Transactions via online reservation are secured.	.948
Privacy (personal information will be kept confidential) on e-ticketing is well protected.	.829
Intention to use Online ticket reservation	.975
Its very likely I will use Online ticket reservation option.	.978
Its possible that I will reserve the tickets online when travelling by Railways.	.956
Its very probable that I will use Online Ticket reservation service when travelling by Railways.	.960

Table 3 Construct Validity

	CR	AVE	MSV	Max R(H)	Self Efficacy	Technology Anxiety	Technology Trust	Intention to use
Self Efficacy	0.950	0.826	0.619	0.963	0.909			
Technology Anxiety	0.941	0.800	0.453	0.954	-0.673	0.894		
Technology Trust	0.912	0.776	0.619	0.933	0.787	-0.628	0.881	
Intention to use	0.976	0.931	0.444	0.978	0.666	-0.581	0.648	0.965

The results of fit assessment of the proposed measurement model show acceptable fit with Goodness of fit (GFI)= 0.798 ; Incremental fit index(IFI)= .903 ;Tucker Lewis index(TLI)=0.88 ;Comparative fit index (CFI)=0.903 ;Normed $\chi2$ (CMIN/DF)= 4.08 ;Root mean square error of approximation(RMSEA)= 0.158 ;Root mean square residual (RMR)= 0.041 .

GFI is almost equal to the minimum value of 0.8 which represents a good fit (Williams & Hazer, 1986), and RMSEA is slightly above the maximum limit of 0.08 (Browne &Cudeck, 1989). TLI and CFI should be >0.9 which show the incremental fit. CMIN/Df statistic recommended acceptable ratios range from 5 (Wheaton, Muthen, Alwin and Summers, 1977) to 2 (Byrne, 1989) which shows a good parsimonious fit of the model.

The second stage was the assessment of the structural model by path analysis. Given that the proposed structural model was confirmed and is valid the tests of the hypotheses can be analysed. In regard to the dependent variable of intention to use , all three antecedent variables had significant relationship to intention to use supporting Hypotheses 1-3. All three hypotheses are accepted, the summary of which is given in table 4.

Table 4: Summary of results

Hypotheses	Standardised parameter estimate	P-value	Result
Technology Anxiety → Intention to use	-.202	1045<0.05	Supported
Technology Trust → Intention to use	.392	.024<0.05	Supported
Self Efficacy → Intention to use	.405	.011<0.05	Supported
Model fit statistics	CMIN/DF=3.5; RMR=.03; GFI=.78; NFI=.894; TLI=.897; CFI=.921; RMSEA=.14		

DISCUSSION AND MANAGERIAL IMPLICATIONS:

The results of the study have important theoretical as well as practical implications. As the service delivery sector is increasingly adopting different types of self service technologies, it has become imperative for both the academic researchers and the marketers to understand and analyse consumer behaviour in this area.

This research provides important insights by identifying the factors that impact the adoption of self service technology, in this case, e- ticketing. The results indicate that technology trust, technology anxiety and self efficacy in usage of technology based options have significant impact on the intention to use e-ticketing. This result can give some useful guidance to the service providers in their strategy to encourage consumer adoption of various self-service technologies.

As the empirical results support the role of technology trust, technology anxiety and self efficacy as significant predictors of intention to use e-ticketing, marketers of SSTs, including the railways should address these areas to formulate strategies aimed at motivating their customers to adopt new channels of service purchase and delivery. Marketing strategies using various personal and mass media tools can help in motivating the consumers to use this channel.

The findings that technology trust is a determinant of adoption of e-ticketing suggest that trust needs to be addressed by the service providers. Consumers usually have concerns regarding security of personal information when conducting transactions online. One possible way is by stressing the security features related to keeping the personal information safe during e-ticketing so that anxiety among potential customers is reduced. The service providers need to assure customers that their processes incorporate all the requisite safeguards for ensuring the privacy and security of their customers.

Self-efficacy in usage of this technology has also been found to be an important determinant of adoption of e-ticketing. One way to increase the confidence and capability of the consumers is by uploading demo videos on their website that give step-by-step guidance and can give them more confidence. Also, educating customers in general about the information technology related to internet transactions would aid in creating trust among current as well as prospective customers and will also increase their sense of self efficacy towards this technology. This has to be coupled with strategies to popularise e-ticketing by the railways by stressing the usefulness of this self service technology over the alternative channel of physical ticket counters.

This research indicates a significant relationship between intention to use e-ticketing and level of technology anxiety. The results show that Technology Anxiety negatively influences usage of this technology. As Table 1 indicates, about 75 percent of the respondents to this study are in the age group of 16 yrs to 45 yrs which can be considered as an active part of the population and of the total sample. Further, 33 percent of the respondents are graduates and 46.4 percent of them are postgraduates. These results have significant implications for researchers and point to the need for further investigation regarding the reasons for technology anxiety since the majority ofrespondents are educated and below the age of 45 yearsss who might be expected to have relatively lower levels of technology anxiety.

This study provides certain pointers to the service providers for specifically technology based self services. The results indicate that some consumers feel apprehensive about using technology, technological terms are confusing to them and they are also apprehensive about making mistakes while using new technology. Firms should device various strategies to reduce the impact of possible technology anxiety on consumer adoption of new technology. Some ways to do this could be through employing friendly service interface and simple and easy to understand language. It can be accompanied with training videos for customers and regular feedback from them. Some viable suggestions by the consumers can be implemented.

The Railways authority needs to look into the expectations of the users from online reservation and strategize to build trust and reduce anxiety among consumers so as to have a quicker diffusion of online reservation amongst all consumer segments. .

LIMITATIONS

The research results are obtained from a limited sample where the majority of the respondents were fairly well educated and belonging to households with medium to high income. Therefore, caution must be exercised in attempting to generalize the findings of this study.

Future studies can investigate more variables related to technology and consumers which can be studied to get a more comprehensive analysis of consumer behaviour with reference to technology adoption and use. This study is about only one self service technology i.e. e-ticketing. The scope of the study of self service technology use can be extended by including various other technologies from other sectors as well. Also, it is a study employing cross-sectional data. To understand the evolution of technology acceptance, a longitudinal study can be done.

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