

Combination of TAM and TPB in Internet Banking Adoption

Rahmath Safeena, Hema Date, Nisar Hundewale, and Abdullah Kammani

Abstract—IT Services is considered as the key driver for the changes taking place around the world. Internet banking (IB) is the latest and most innovative service and is the new trend among the consumers. The transformation from the traditional banking to e-banking has been a 'leap' change. This study determines the factors for the consumer acceptance of internet banking and hence investigates the influence of perceived usefulness, perceived ease of use, subjective norm, attitude and perceived behavioral control on use of IB among consumers. It is an essential part of a bank's strategy to formulate a model for popularizing the technology adopted to provide customer services. Therefore in this study an integration of TAM and TPB is done. Survey based questionnaire design with empirical test was carried out. The results have supported the hypothesis.

Index Terms—Internet banking, TAM, TPB, ease of use, usefulness, subjective norm, attitude.

I. INTRODUCTION

The proliferation of, and rapid advances in, technology-based systems, especially those related to the internet, are leading to fundamental changes in how companies interact with customers [1]-[3]. The challenging business process in the financial services pressurized banks to introduce alternate delivery channel to attract customers and to improve customers' perception. Many banks have implemented Internet banking to offer their customers a variety of online services with more convenience for accessing information and making transactions. Customer satisfaction and customer retention are increasingly developing into key success factors in e-banking [1]. [4] stated that the diffusion of Internet Banking is more determined by customer acceptance than by seller offerings. Though customer acceptance is a key driver determining the rate of change in the financial sector, empirical studies on what is holding customers from acceptance of Internet banking have been few [5]. Not enough is known regarding how customers perceive and evaluate electronically delivered services. [6] have also recently highlighted the need for further research to measure the influence of e-service on customer-perceived service quality and satisfaction [2]. While Internet banking has grown rapidly, there is not enough evidence of its acceptance amongst consumers. [7] reported that half of the people that have tried online banking services will not become active users. Another author claims that Internet banking is not living up to the hype [8]. Highly publicized cases involving major

security failures might have contributed to the public's concern and lack of acceptance of Internet banking [9].

Technology Acceptance Model (TAM) is the widely used model in describing the user acceptance of new technology. One of the most utilized model in studying information system acceptance is the technology acceptance model (TAM) [10]-[13] in which system use (actual behavior) is determined by perceived usefulness (PU) and perceived ease of use (PEU) relating to the attitude toward use that relates to intention and finally to behavior. For studying the acceptance of Internet banking, we understand that the original TAM is inadequate because the technology used and the transaction environment in Internet banking are different from that of conventional IT and the normal business environment. Before accepting Internet banking services, users should be aware about benefits, security issues and the risk associated with it, which are important. In this regard, we use theory of planned behavior (TPB) with the addition of two extra variables to the model to provide a more comprehensive theoretical perspective of user technology acceptance in the context of Internet banking. So this study considers the 5 factors perceived usefulness, perceived ease of use, subjective norm, attitude and perceived behavioral control associated with internet banking.

II. INTERNET BANKING

Internet banking is the latest in the series of technological wonders of the recent past. ATMs, Tele-Banking, Internet Banking, Credit Cards and Debit Cards have emerged as effective delivery channels for traditional banking products. Internet or Electronic or online banking is the newest delivery channel to be offered by retail banks in many developed countries, and there is a wide agreement that this channel will have a significant impact on the market. Banks know that the Internet opens up new horizons for them and moves them from local to global frontiers [14]. Internet banking refers to systems that enable bank customers to get access to their accounts and general information on bank products and services through the use of bank's website, without the intervention or inconvenience of sending letters, faxes, original signatures and telephone confirmations ([15]. In its simplest form, electronic banking may mean the provision of information about the bank and its products via a page on the internet [2]. It is the types of services through which bank customers can request information and carry out most retail banking services such as balance reporting, inter-account transfers, bill-payment, etc., via a telecommunication network without leaving their homes or organizations [16],[17],[4],[5]. In essence, it is an electronic consumer interface and an alternative channel of distributions. Online banking has been regarded as the most

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important way to reduce cost and maintain or enhance services for consumers. It provides universal connection from any location worldwide and is universally accessible from any internet linked computer. It is a process of innovation whereby customers handle their own banking transactions without visiting bank tellers.

Information technology developments in the banking sector have sped up communication and transactions for clients. Online banking is also one of the technologies which are fastest growing banking practices nowadays. It is vital to extend this new banking feature to clients for maximizing the advantages for both clients and service providers [18]. The Internet has an ever-growing importance in the banking sector because of the advantages it brings to both the entities and their customers. Although information system (IS) expenditure is regarded costly and risky financial institutions are one of the largest investors in IS [19]. Internet is the cheapest delivery channel for banking products as it allows the entity to reduce their branch networks and downsize the number of service staff. The navigability of the website is a very important part of Internet banking because it can become one of the biggest competitive advantages of a financial entity [20]. Bankers consider minimizes inconvenience, minimizes cost of transactions and time saving to be important benefits and chances of government access, chances of fraud and lack of information security to be vital risks associated with electronic banking [21]. Due to increase in technology usage the banking sector's performance increases day by day. Online banking is becoming the indispensable part of modern day banking services. Banking industry is also one of the influenced industries adopting technologies which are helpful in providing better services to customers. Quality of service is improved by using technological innovations. Online banking is time saving [18].

III. THEORY OF PLANNED BEHAVIOR (TPB)

The Theory of Planned Behavior (TPB) is proposed by Ajzen in 1985 [22] as an extension of the Theory of Reasoned Action (which was related to voluntary behavior), because of the limitations of TRA in dealing with behaviors over which people have incomplete volitional control. The TPB introduced a third independent determinant of intention, perceived behavior control (PBC). TPB is a theory that predicts deliberate behavior, because behavior can be deliberative and planned. Attitude toward a behavior is the degree to which performance of the behavior is positively or negatively valued. It is determined by the total set of accessible behavioral beliefs linking the behavior to various outcomes and other attributes. Subjective norm is the perceived social pressure to engage or not to engage in a behavior. Subjective norm is determined by the total set of accessible normative beliefs concerning the expectations of important referents. Perceived behavioral control refers to people's perceptions of their ability to perform a given behavior. Perceived behavioral control is determined by the total set of accessible control beliefs, i.e., beliefs about the presence of factors that may facilitate or impede performance of the behavior. To the extent that it is an accurate reflection of actual behavioral control, perceived

behavioral control can, together with intention, is used to predict behavior. Intention is an indication of a person's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior. The intention is based on attitude toward the behavior, subjective norm, and perceived behavioral control, with each predictor weighted for its importance in relation to the behavior and population of interest.

As a general rule, the more favorable the attitude and subjective norm, and the greater the perceived behavior control, the stronger should be the individual intend to perform the behavior in question. This theory has been widely used in variety of settings including IT acceptance research, explain and predict small business executives' decisions to adopt IT, in online shopping research etc.

IV. TECHNOLOGY ACCEPTANCE MODEL (TAM)

The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology, developed by [10]. TAM is one of the most influential extensions of Theory of Reasoned Action (TRA) [23] and the theory of planned behavior (TPB) [22], which have long provided useful conceptual frameworks for dealing with the complexities of human social behavior. The main idea of the model is to describe the external factors affecting the internal attitudes and use intentions of the users and, through these, to predict the acceptance and use of the system. The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified [24]. It is a theoretical model that evaluates —the effect of system characteristics on user acceptance of computer-based information systems [25]. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably: perceived usefulness and perceived ease of use. It is one of the most utilized models for studying IS acceptance [26],[27],[10]). TAM involves two primary predictors for the potential adopter — perceived usefulness (PU) and perceived ease of use (PEOU) of technology as the main determinants of the attitudes toward a new technology. According to [10] perceived usefulness is the extent to which a person believes that using a particular system will enhance his or her performance and perceived ease of use is the extent to which a person believes that using a particular system will be free of effort ".

In general, these theories (TPB and TAM) imply that behavior is determined by the intention to perform the behavior. Intention itself is determined by the attitude towards the behavior. TAMs fundamental construct do not fully reflect the specific influences of technological and usage-context factor that may alter user's acceptance; also factors affecting the acceptance of a new IT vary with technology, target users and context. As [10] noted that

future technology acceptance research needs to address how other variables affect usefulness, ease of use and acceptance. Hence various technology acceptance models with TAM as base have been evolved. Hence it necessitates a search for additional factors that better predict the acceptance of IB.

V. RESEARCH MODEL AND HYPOTHESES

Perceived usefulness and perceived ease of use is significant factors affecting acceptance of an information system or new technologies and previous research has empirically found positive relationship between perceived ease of use and perceived usefulness as critical factors on the use of e-banking [28]-[31]. Hence an application perceived to be useful perceived to be easier to use than another is more likely to be accepted by users. By applying these into online banking context we hypothesize:

H1: Perceived usefulness has a positive effect on intention to adopt and use IB.

H2: Perceived ease of use has a positive effect on intention to adopt and use IB

H3: Attitude has a positive effect on intention to adopt and use IB

H4: Subjective norm has a positive effect on intention to adopt and use IB

H5: Perceived behavior control has a positive effect on intention to adopt and use IB

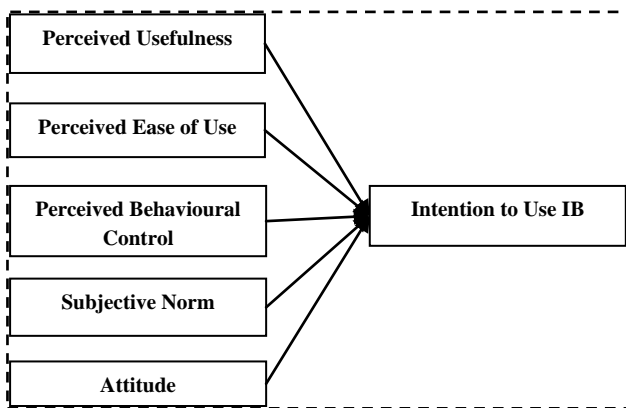


Fig. 1. Research model

VI. RESEARCH METHOD

In order to collect online banking users' information, we first required the permission of bank of India to express our need for the information research purposes. Research questionnaire has been distributed to customers of that bank. A total of 600 questionnaire papers are given randomly. However those questionnaires that not fill in properly and completely have been taken out. Hence, the actual sample used for the study is 549 respondents. The questionnaire consisted of two sections. The first section had questions intended to collect respondent's demographic profile. The second section solicited responses about the variables of interest in this study: perceived usefulness, perceived ease of use, attitude, subjective norm, perceived behavioral control and intention to use. The respondents rate the questionnaire items by the extent to which they agreed with

each statement. Each questionnaire item was scored on a five-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree).

VII. ANALYSIS

Out of the variables considered only PU ($\beta=0.36$, $t = 3.087$, $p < 0:01$), PEU ($\beta=0.34$, $t=2.041$, $p< 0.05$), ATT($\beta=0.21$, $t=1.098$, $p<0.01$), SN($\beta=0.24$, $t=1.43$, $p<0.01$) and PBC($\beta=0.35$, $t=3.04$, $p<0.01$) are statistically significant, the overall model was also statistically significant ($R^2 = .713$, $p < 0.001$).

TABLE I: PROFILE OF RESPONDENTS

Demographic	Items	No. of respondents	Percent
Gender	Male	403	73.4
	Female	146	26.6
Age group	21-24	166	30.2
	24-27	277	41.3
	27-30	121	22.0
	>30	035	06.3
Qualification	Bachelors	327	59.6
	Masters	145	26.4
	PhD	013	02.3
	Other	064	11.6
Occupation	Public sector	198	36.1
	Private sector	238	43.4
	Self-employed	098	17.8
	Other	015	02.7

TABLE II: RELIABILITY ANALYSIS

Determinants	No. of items	Reliability for this sample
PU	3	.642
PEU	3	.797
ATT	5	.692
SN	3	.765
PBC	2	.678

VIII. DISCUSSION AND FINDINGS

This study examines the influence of perceived ease of use, perceived usefulness, attitude, subjective norm and perceived behavioral control of Internet banking. As expected, the results have supported the hypothesis that PU, PEU, ATT, SN, PBC have positive effect on the use of Internet banking.

The results of the regression analysis conducted on the factors indicate that PU, PBC, PEU, SN and ATT on online banking were found to be the most influential factors explaining the use of online banking services. Results show that the intention to use online banking is primarily and positively affected by perceived usefulness ($\beta = 0.36$) and less so by Perceived behavioral control ($\beta = 0.35$), perceived ease of use ($\beta=0.34$) subjective norms ($\beta = 0.24$) and attitude ($\beta = 0.21$).

This implies that the perceived usefulness is the most important predictor of the intention to use online banking. Perceived behavioral control also has a significant impact ($\beta = 0.35$) and appears to be the second determinant of a consumer's intention to adopt online banking. Similar findings were obtained by [33], who investigated the acceptance of Internet banking in Finland and Hong Kong, respectively. Both studies reached the same conclusion that perceived usefulness is more influential than perceived ease

of use in explaining the acceptance of online banking. As we knew from previous research, perceived usefulness was always an important determinant of attitude in TAM, and it may mediate the influence of perceived ease of use on attitude. Indeed, perceived ease of use has long been recognized as a basic requirement for system design [34],[24]. Another interpretation is that difficulty in using online systems is becoming less of a concern as they are increasingly user-friendly. In addition, since online systems are more common and standardized nowadays, the public has become increasingly competent in using them. Accordingly, in the planning and development of online banking, software developers should pay attention to practical functions and extend key features that are frequently required. Subjective norms also has a significant impact ($\beta = 0.23$) intention to use online banking. Attitude also has a significant impact ($\beta = 0.20$) intention to use online banking.

Also it shows that perceived usefulness and perceived ease of use has positive relation with internet banking use supporting the hypotheses. This finding refers to the fact that consumers use online banking for the benefits and also due to its easiness in use which provides in comparison to other banking delivery channels. This finding is in line with other studies [10],[35]-[38],[15],[39].

When online banking is perceived as useful, customer's intention to adopt it would be greater. Likewise bank customers are likely to adopt internet banking when it is easy to use. This shows that bank customers anchor their online banking adoption intention to the beneficial outcomes and ease of use process of the system.

Practical implication of these results is that banks need to highlight the benefits of Internet banking, make Internet banking easy to use, and enhance Internet banking security to improve consumers' trust. They also need to make the consumers aware about the system by providing them about the details of the benefits associated with it and also ensuring security of the system. Banks can highlight benefits such as Internet banking conveniences in their promotional and advertising activities. The Internet banking interface could be made simple. Banks also need to engage in security enhancement activities such as encryption, firewall, and user protection and authenticity. This finding is particularly important for managers as they decide how to allocate resources to retain and expand their current customer base. In addition, this study suggests that online banking companies could develop trust-building mechanisms to attract customers, such as statements of guarantee, increased familiarity through advertising, and long-term customer service. The proposed model makes an important contribution to the emerging literature on e-commerce, especially with regard to online banking.

IX. CONCLUSION

The result of this study shows that perceived ease of use, perceived usefulness, attitude, subjective norm and perceived behavioral control are the important determinants of online banking adoption. This study meets the desired objective; but it suffers from one setback. The relatively small size of the sample limits generalization of the

outcome of the study. This study was conducted to explore the factors influencing intentions to adopt Internet banking services. As such, there is still room for further investigation into the adoption of Internet banking services. The replication of this study on a wider scale with more IB customers and with different national cultures is essential for the further generalization of the findings. By using a longitudinal study in the future, we could investigate our research model in different time periods and make comparisons, thus providing more insight into the phenomenon of online banking adoption.

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