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# Understanding the Adoption of Mobile Banking Services: An Empirical Assessment

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## ABSTRACT

Services offered through the mobile channel are increasing rapidly. However, limited understanding exists on the variation in adoption of these services. This study provides insights on this area by examining factors that influence the adoption of mobile banking services. Based on UTAUT, innovation diffusion, and ubiquitous computing framework, we identify accessibility, alertness, personalization, ease of navigation, service compatibility, device compatibility, and facilitating conditions as key drivers of mobile banking services adoption. Empirical assessment based on discriminant analysis shows that individual perceptions regarding accessibility, alertness, and ease of navigation have a significant influence on the adoption decision. Interestingly, we found that accessibility and ease of navigation had a positive association with the adoption of mobile banking services, while non-adopters perceived alertness to be a more compelling value proposition. Overall, the results offer guidance on how to increase adoption rates and open new avenues for research in the area of mobile services.

**Keywords:** Mobile Banking, Mobile Services, Technology Adoption, IS Acceptance, Survey

## INTRODUCTION

Mobility has emerged as an important concept. Development in mobile devices and the ever increasing services render through this interface has increased the importance of the mobile channel. Individuals are pulling the plug on physical inertia, while demanding that their needs be fulfilled regardless of their location. Organizations have quickly embraced the wireless channel in order to support the nomadic behavior of their customers (Lyytinen and Yoo, 2002). Recent anecdotal evidence shows a dramatic shift in the behavior of individuals wherein mobile phones are becoming the primary device for accessing many services such as news, videos, and more. The large scale penetration of smart phones among the general populace has triggered the development of applications for youtube, home depot, yahoo, and CNBC for the iphone and android platforms.

Although, many services are being provided through the mobile channel, one area where the response has not been emphatic is mobile banking. Anecdotal evidence shows that financial institutions are getting penetration rates of around 2% on the low side to 7% on the high side. Bank of America currently has the largest base of mobile banking users with user base of 2.4 million that on average conducts 12-14 activities per month (Yankee Group, 2009). Given the low adoption rate, only limited research exists on evaluating the adoption and usage of mobile banking services limiting our understanding of why some customers engage in mobile banking while many stay away.

The emerging importance of mobility and the experience of financial institutions pose an interesting quandary. The emerging trends including diffusion of smart phones, explosion of demand for data services, and increasing mobility of the individuals provides a compelling case for entering the mobile space. On the contrary, limited adoption rates and lack of visibility into the value that mobile banking services offers to the customers has put a damper on mobile banking initiatives at many financial institutions. We believe that understanding the adoption behavior of mobile banking services can provide insights on this issue.

## LITERATURE REVIEW

Numerous studies have been conducted on understanding individual behavior regarding services delivered through the mobile phone (Patricia and Standing, 2008; Lee, et al., 2007) (Table 1). The core thesis in understanding individual behavior has centered on comprehending either the factors tied to value of services delivered through the mobile phone or factors that inhibit the value (Tang et al., 2008; Lee, et al., 2007). Innovation diffusion theory

(IDT), UTAUT, and more recently models on ubiquitous / nomadic computing offer strong theoretical perspectives that can help in formulating a research model that is relevant to the mobile banking context. IDT and UTAUT have been used extensively in IS literature to evaluate information system acceptance and behavior (Venkatesh et al., 2003). Thus these theories offer rich knowledge base that can inform us on evaluating individual behavior in the mobile environment. UTAUT through the synthesis of extensive literature offers performance expectancy, effort expectancy, social influence, and facilitating conditions as four core drivers of information systems acceptance. However, it is important to examine these aspects in the context of the mobile environment in which individuals expect ubiquitous access to services. Further, many of the services offered through the mobile channel are focused on personal tasks as opposed work related tasks. Thus, although the core themes may still be ground in UTAUT and IDT but their implementation may be unique. For example, performance expectancy may still be a relevant aspect when examining the adoption decision but its implementation is not strictly tied to productivity at the work place and can encompass other sources of value such as ubiquitous access to services. An important adaptation is to explore the aspects based on which the individuals develop their judgment about the value of mobile banking. This enables us to take a more granular approach along with the potential of exploring aspects that are unique to the mobile environment.

**Table 1: Review of Studies on Acceptance of Mobile Services**

Citation	Independent Variable	Dependent Variable	Theory Basis	Key Findings
Patricia & Standing, 2008	<ul style="list-style-type: none"> <li>• Functional value</li> <li>• Social value</li> <li>• Epistemic value</li> <li>• Conditional value</li> <li>• Emotional value</li> </ul>		Theory of Consumption Values	The authors propose that the concept of value needs to be expanded to include 5 sub dimensions and evaluate relevance of these aspects within the mobile banking context.
Tang, Lin, Wang, & Wang, 2008	<ul style="list-style-type: none"> <li>• Perceived credibility</li> <li>• Usefulness</li> <li>• Ease of use</li> </ul>	Behavioral intention to use mobile banking	TAM	The authors found that all three variables influence behavioral intentions to use mobile banking. However, the impact of ease of use is the highest among the variables.
Kim, Shin, & Lee, 2007	<ul style="list-style-type: none"> <li>• Relative benefits of mobile banking</li> <li>• Personal propensity to trust</li> <li>• Structural assurances in mobile banking</li> <li>• Firm reputation</li> </ul>	Initial trust in mobile banking & Intention to use mobile banking	Trust	The authors found that relative benefits, personal propensity to trust, and structural assurances positively influence initial trust in mobile banking. Relative benefits of mobile banking also had a direct impact on intentions to use mobile banking.
Lee, Matilla, and Shim, 2007	<ul style="list-style-type: none"> <li>• Usage barriers</li> <li>• Value barriers</li> <li>• Risk barriers</li> </ul>	Adoption of mobile banking	Inhibitors of Adoption	The authors identify various inhibitor of adoption of mobile banking services. Lack of knowledge and perceived risks were also found to impact non-adoption.
Hong and Tam, 2006	<ul style="list-style-type: none"> <li>• Perceived service availability</li> <li>• Perceived monetary value</li> <li>• Perceived usefulness</li> <li>• Perceived ease of use</li> <li>• Social influence</li> <li>• Perceived enjoyment</li> <li>• Need of uniqueness</li> <li>• Gender</li> <li>• Age</li> </ul>	Adoption of multi-purpose information appliances	TAM	All factors were found to impact the dependent variable except for gender. Perceived service availability influenced adoption through ease of use and usefulness. Surprisingly, ease of use had a stronger impact on intention than usefulness.

Lyytinen and Yoo (2003) define nomadicity as a state in which “the system can support a rich set of computing and communication capabilities and services for nomads as they move in a transparent, integrated, convenient, and adaptive manner”. Nomadicity transcends the constraints posed by the physical space in providing access to services. For example, an individual can download the boarding pass on their mobile phone which can be presented and scanned for boarding on the airplane at the airport. Exposure to such an environment has a profound impact on the individual’s belief structure in way that value may not be limited to doing things better but doing them in a way

that was not possible in the traditional environment. Further, devices through which such services are delivered have a strong affinity to the user. Mobile devices are perceived to be an extension of self and thus viewed as means to capability enhancement (Hong and Tam, 2006). For example, mobile banking services accessible through the mobile device may be tied to a person’s ability in managing their day-to-day finances. The personal usage context and unique aspects of the mobile channel require adaptation of the traditional IS acceptance models.

Ubiquitous computing framework (UCF) proposed by Jungals and Watson (2006) takes an important step in this direction. An important contribution of UCF is to bring out the aspects that are considered to be important in the ubiquitous environment. Through extensive review of literature and interviews with practitioners Jungals and Watson (2006) highlight ubiquity, uniqueness, universality, and unison as four core value drivers in the ubiquitous environment. Ubiquity captures the notion of overcoming the constraints of physical space by making services accessible from wherever the user deems fit. Uniqueness reflects the ability to configure the service to a person’s preferences and location. Universality subsumes the notion of getting access to a consistent set of services through multiple mobile devices and platforms. Finally, unison covers the idea of providing access to unified data and services through diverse platforms. We utilize UTAUT, IDT, and UCF to identify important variables that can influence an individual’s adoption of mobile banking services. Table 2 provides the list of the variables and the reference to pertinent theories and variables. We elaborate on these variables next and propose the research hypotheses.

<b>Variable</b>	<b>UTAUT</b>	<b>IDT</b>	<b>UCF</b>
Accessibility	Performance Expectancy	Relative Advantage	Ubiquity
Personalization			Uniqueness
Alertness	Performance Expectancy	Relative Advantage	
Service Compatibility	Performance Expectancy	Relative Advantage	Unison
Ease of Navigation	Effort Expectancy	Ease of Use	
Device Compatibility*	Facilitating Conditions	Compatibility	Universality
Facilitating Conditions	Facilitating Conditions		

\*The main reason for categorizing this variable as facilitating conditions is because Venkatesh et al. (2003) propose compatibility as the root construct for facilitating conditions. However, in the case of service compatibility, we believe that it overlaps more with work-fit which was the root construct for performance expectancy.

**ACCESSIBILITY**

Ubiquity forms the core value proposition offered by mobile services. Accessibility is defined as the ability to use banking services regardless of location. The proliferation of hand held devices and availability of network services has led to the reconfiguration of cognition about service accessibility. Individuals are no longer satisfied with provision of services, but demand that accessibility should no longer be constraints by their physical location (Lyytinen and Yo, 2003). The evolution in personal habits have been influenced by the ubiquitous computing environment (Jungals and Watson, 2003). Thus, an important element of the overall value proposition of a service delivered through the mobile platform is tied to its accessibility (Hong and Tam, 2006). Individuals are able to structure their tasks around the time that may have been underutilized due to location constraints. Further, the value of service is enhanced because its accessibility at a particular location aligns well with the need of the individual. For example, the ability to ascertain sufficiency of funds at a shopping mall before making a major purchase is an example of the alignment. Thus, we argue that an important aspect that drives the adoption of mobile banking services is accessibility. Accessibility is strongly grounded in performance expectancy, relative advantage, and ubiquity constructs presented in UTAUT, IDT, and UCF.

H1: Accessibility of mobile banking services is positively associated with mobile banking service adoption

**PERSONLIZATION**

Uniqueness is the ability to identify an individual and configure services to his or her preferences (Jungals and Watson, 2003). Individual’s ability to personalize the service according to his or her preferences and the ability of the system to uniquely identify the individual constitute two important perspectives related to uniqueness. For this study, we define personalization as the ability to customize mobile banking services to fit the user’s preferences. The

mobile banking service is delivered through a website that is configured for mobile/smart phones. Often, the individual is provided with various options such as choosing the landing page and setting parameters for account history. These options enable the individual to personalize the service to his or her liking. Personalization enhances value by aligning system configuration parameters with user's preferences (Perkowitz and Etzioni, 2000). If an individual perceives that the system is configurable to his or her preferences he or she will be deemed it more valuable, which will enhance the likelihood of its adoption.

H 2: Personalization of mobile banking services is positively associated with mobile banking service adoption

### **ALERTNESS**

In recent years, there has been a fundamental shift in the structure of service delivery. Traditional services were based on the pull concept wherein users proactively accessed services or information. However, current systems offer the ability to utilize the push structure (Brusilovsky and Maybury, 2002). Setting up alerts so that the system can inform the users about changes to their bank account is an example. We call this concept alertness and define it as the ability of the mobile banking service to alert the users about changes in their bank account. Individuals may find value in being alerted to changes in account balances, payments that may be due shortly, and/or clearing of bank deposits. The concept of alertness taps into the ability of the system to act like a personal assistant that informs the users about key things or events that they deemed important. Thus, the features supporting alertness offer value by assisting the user in tracking events related to their bank account(s).

H 3: Alertness of mobile banking services is positively associated with mobile banking service adoption

### **SERVICE COMPATIBILITY**

Another important issue in the context of mobile environment is the gap between services offered through different channels. Lyytinen and Yo (2003) highlight that digital convergence from a service perspective requires that the gap between services offered through other channels compare well with what are offered through the mobile channel. We refer to this concept as service compatibility and define it as the comprehensiveness of the services offered through mobile banking platform. Our conceptualization of service compatibility is modeled after the unison concept proposed by Junglas and Watson (2006). They propose that unison captures a unified data model accessible through multiple channels and platforms. When a firm opens up multiple channels for customer interaction, the customers will not only evaluate the unique value offered through the new channel but also how well it compares to other channels in terms of service provision. In addition to mobile banking, the banks offer services through physical branches, ATMs, telephone, and online banking. An important component in determining the value of a particular channel relates to the scope of services offered. Thus, in assessing the relative value of the different available channels, an individual will take into consideration the comprehensiveness of services delivered through the mobile platform as an important value driver.

H 4: Service compatibility of mobile banking services is positively associated with mobile banking service adoption

### **EASE OF NAVIGATION**

The effort expectancy perspective argues that an individual will tend to use a system that is easy to use. So, individual's perception regarding the level of effort required to interact with the system will influence his or her acceptance (Tarafdar and Zhang, 2005). Innovation diffusion theory highlights ease of use / complexity as an important factor that impacts IS adoption. Expanding on these two concepts, we selected ease of navigation as an important aspect. Ease of navigation is defined as the extent to which an individual perceives that navigating the mobile banking service will be free of effort. Among other challenges, interacting with a service through a mobile device is constrained by a small screen and capabilities of the mobile device in terms of interactivity options. Small screen impacts the provision of information and the how it is spread over different screens. The effective inter-linkage across screens can make it easy or difficult for the user to quickly access what they need (Palmer, 2002). Although, services are configured for accessibility through a mobile device, locating the desired information or features may require the user to explore several screens to locate what they need. If an individual perceives that navigating the mobile banking service requires less effort they are more likely to adopt it.

H 5: Ease of navigation of mobile banking services is positively associated with mobile banking service adoption

**FACILITATING CONDITIONS**

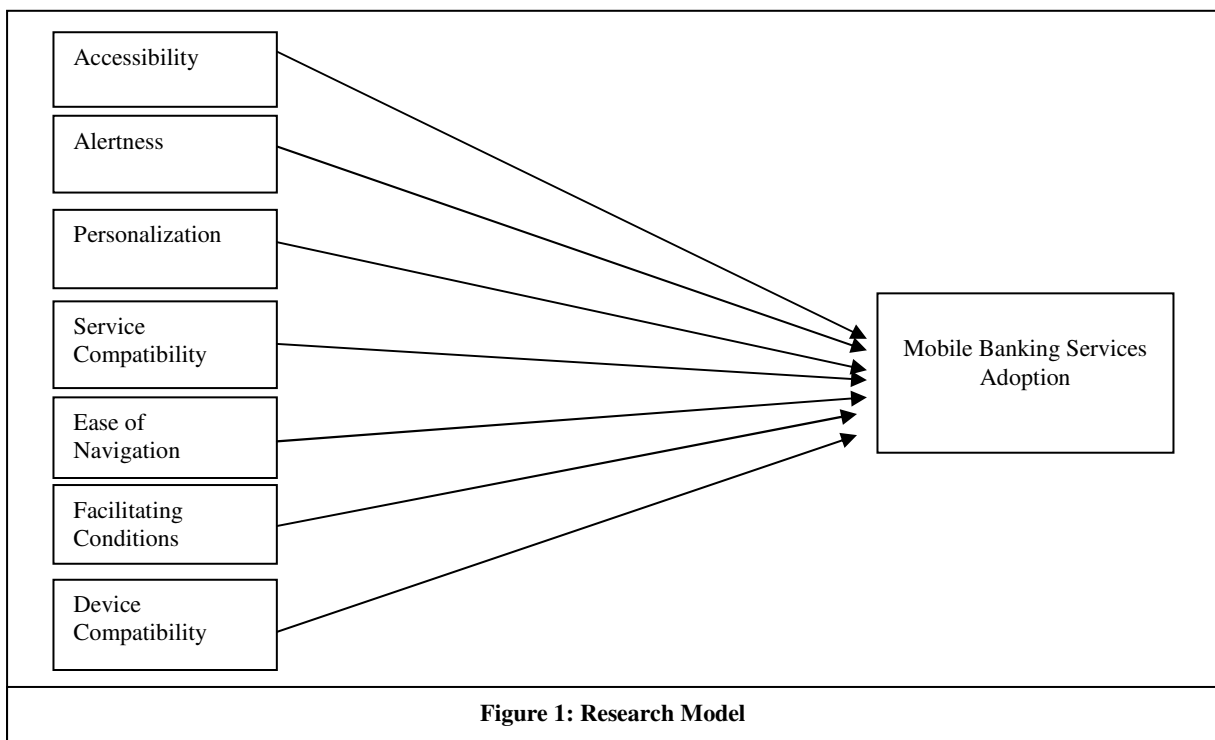
Facilitating conditions is defined as the extent to which an individual perceives that adequate support is available from the organization for using mobile banking services. Although other conceptualizations of facilitating conditions exist, we use the approach employed by Thompson et al, (1995). The key aspect in facilitating conditions incorporates support and guidance offered by the organization in helping the customer in utilization of mobile banking services. Interacting with a new system can be challenging and may require that an individual seek assistance in tackling issues. The support services can range from providing tutorials to expert assistance. If the individual perceive that adequate support is available, he or she would feel more confident in adopting the service. Facilitating conditions can also contribute toward removing utilization barriers making an individual feel more comfortable because he or she knows that help is available. Thus, if an individual perceives that the organization has set up appropriate infrastructure to assist the customers, it likely that he or she will adopt mobile banking services.

H 6: Facilitating conditions related to mobile banking services is positively associated with mobile banking service adoption

**DEVICE COMPATIBILITY**

Device compatibility is defined as the extent to which the mobile banking services are accessibility in a consistent manner across different mobile devices. The emergence of multiple platforms and the diversity in mobile devices has created challenges for uniform provision of services. Variations in user’s interaction experience through multiple mobile devices increases the complexity of accessing the service. Differences in interfaces, screen sizes, and how the services are rendered increase the effort that the user has to expand on utilizing the service. Device compatibility is rooted in the universality concept proposed by Junglas and Watson (2006). Universality can be an important driver of adoption because it portrays to an individual that the service has reached the level of maturity where lack of compatibility is a not an issue. Thus, device compatibility creates supporting conditions which can trigger the adoption of mobile banking services.

H 7: Device compatibility of mobile banking services is positively associated with mobile banking service adoption



## RESEARCH METHOD

The model was tested by collecting data through a survey. Before initiation of the survey, given that some variables in the model were new, we developed appropriate scales for the study variables. Specifically, new scales were developed for accessibility, alertness, personalization, service compatibility, and device compatibility (the items are available upon request). Scales for ease of navigation and facilitating conditions were adapted from earlier studies (Venkatesh, et al., 2003; Tarafdar and Zhang, 2005). We followed a three step process for scale development. Through the review of earlier studies, we delineated the domain of each variable and developed initial measurement items. After initial items were developed, we conducted a preliminary assessment with 23 subjects. This process was very beneficial in revising the scales. For example, it was found that accessibility had location and time dimensions. After initial revision of the measurement items a second round was conducted with 21 subjects to make further refinement to the scales. The third and fourth rounds of assessment were conducted with 50 and 61 subjects respectively. These subjects were graduate and undergraduate students and included both adopters and non-adopters of mobile banking services. Factor analysis was used in all the rounds for a preliminary assessment of construct validity. At the fourth round, it was deemed that the scales were stable for large scale data collection.

Final data was collected in two phases. In the first phase, data was collected from customers of a financial institution located in the mid-western region. We randomly selected 500 non-adopters and 500 adopters and mailed them the survey. Due to the limitations imposed by the financial institution, we were only allowed to survey the customers once which yielded 58 responses (52 % adopters and 48% non-adopters). The response rate was about 6%. In order to collect adequate data for empirical assessment, we expanded the sample size. The survey was opened up to executive MBA, MBA, and seniors taking MIS and Finance classes at a mid-western university. This effort yielded 172 responses. Due to missing values the sample was reduced to 223 subjects, which included 30% adopters and 70% non-adopters. We conducted t-test across the two samples to evaluate consistency of responses. The results show that there were no significant differences in the two samples across the study variables for non-adopters. However, significant difference across the adopters from the two samples was found in service compatibility, device compatibility, facilitating conditions, and ease of navigation. The adopters from the financial institution had higher mean values across these variables than adopters of mobile banking services from other financial institutions.

Factor analysis was performed to evaluate dimensionality and discriminant validity. The results show a seven factor solution with high loading for items on respective constructs (Table 3). Further, convergent validity was evaluated through cronbach's alpha. Table 4 shows that all constructs have reliabilities higher than the recommended guidelines. Adoption of mobile banking services was coded as a binary variable.

Items	1	2	3	4	5	6	7
Accessibility 1	<b>0.77</b>	0.24	0.14	0.06	0.02	0.18	0.22
Accessibility 2	<b>0.81</b>	0.15	0.13	0.11	0.20	0.24	0.20
Accessibility 3	<b>0.81</b>	0.15	0.13	0.21	0.25	0.21	0.17
Accessibility 4	<b>0.74</b>	0.06	0.11	0.22	0.37	0.12	0.12
Personalization 1	0.21	<b>0.77</b>	0.19	0.12	0.03	0.11	0.25
Personalization 2	0.19	<b>0.74</b>	0.27	0.12	0.26	0.12	0.07
Personalization 3	-0.01	<b>0.80</b>	0.19	0.18	0.31	0.14	0.17
Alertness 1	0.06	0.21	<b>0.91</b>	0.05	0.10	0.13	0.08
Alertness 2	0.06	0.22	<b>0.89</b>	0.10	0.10	0.08	0.09
Alertness 3	0.20	0.13	<b>0.86</b>	0.10	0.11	0.17	0.18
Service Compatibility 1	0.06	0.28	0.03	<b>0.74</b>	0.24	0.27	0.12
Service Compatibility 2	0.09	0.11	0.08	<b>0.85</b>	0.08	0.24	0.19
Service Compatibility 3	0.22	0.06	0.18	<b>0.76</b>	0.36	0.14	0.20
Ease of Navigation 1	0.11	0.27	0.11	0.19	<b>0.76</b>	0.26	0.20
Ease of Navigation 2	0.37	0.18	0.01	0.31	<b>0.54</b>	0.29	0.30
Device Compatibility 1	0.15	0.22	0.17	0.20	0.44	<b>0.64</b>	0.24
Device Compatibility 2	0.17	0.09	0.16	0.31	0.15	<b>0.77</b>	0.21
Device Compatibility 3	0.21	0.12	0.16	0.23	0.38	<b>0.71</b>	0.22
Facilitating Conditions 1	0.15	0.25	0.02	0.23	0.06	0.40	<b>0.70</b>
Facilitating Conditions 2	0.22	0.26	0.03	0.20	0.19	0.34	<b>0.68</b>
Facilitating Conditions 3	0.09	0.04	0.31	0.12	0.34	-0.02	<b>0.76</b>

**Table 4: Descriptive Statistics and Correlations**

	Mean (S.D)	Alpha	1	2	3	4	5	6	7
Accessibility (1)	5.24 (1.36)	0.91	1						
Alertness (2)	4.99 (1.56)	0.93	0.36**	1					
Personalization (3)	4.59 (1.26)	0.85	0.44**	0.50**	1				
Service Compatibility (4)	4.38 (1.44)	0.87	0.45**	0.33**	0.53**	1			
Ease of Navigation (5)	4.73 (1.41)	0.78	0.58**	0.40**	0.51**	0.62**	1		
Device Compatibility (6)	4.48 (1.36)	0.89	0.59**	0.36**	0.57**	0.63**	0.68**	1	
Facilitating Conditions (7)	4.45 (1.25)	0.80	0.51**	0.40**	0.61**	0.58**	0.65**	0.64**	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

## RESULTS

The means, standard deviations, and correlation among the variables are shown in Table 4. The results of the t-test show that perceptions of non-adopters and adopters are significantly different across all the variables except personalization (see table 5). Further, the mean value for alertness was higher for non-adopters than adopters. Subsequent to the t-test, we used discriminant analysis to evaluate the efficacy of the variables in distinguishing between adopters and non-adopters of mobile banking services. Similar to regression, discriminant analysis offers stepwise procedure which helps in identifying the variables that best differentiate among the groups. Further, discriminant analysis can be used to classify the observations based on the identified discriminant function and evaluate the efficacy of the classification rate. The result for the test of equality of group means which conducted as part of discriminant analysis confirms the results from t-tests (table 5).

**Table 5: T-tests and Test for Equality of Group Means**

Variables	T-tests		Equality of Group Means		
	Groups	Mean	Significance (p-value)	Wilks' Lambda	Significance (p-value)
Accessibility	Adopters	5.95	0.00	0.89	0.00
	Non-Adopters	4.94			
Alertness	Adopters	4.61	0.02	0.97	0.01
	Non-Adopters	5.15			
Personalization	Adopters	4.66	0.60	0.99	0.45
	Non-Adopters	4.56			
Service Compatibility	Adopters	4.86	0.00	0.95	0.00
	Non-Adopters	4.17			
Ease of Navigation	Adopters	5.43	0.00	0.90	0.00
	Non-Adopters	4.43			
Device Compatibility	Adopters	4.95	0.00	0.96	0.00
	Non-Adopters	4.28			
Facilitating Conditions	Adopters	4.95	0.00	0.94	0.00
	Non-Adopters	4.23			

The results of the stepwise procedure show that accessibility, alertness, and ease of navigation significantly differentiate across adopters and non-adopters of mobile banking services. Accessibility was found to be the most important differentiator, followed by alertness, and ease of navigation (Table 6). The chi-square test for the wilk's lamda was also significant. It is important to recognize that non-adopters actually had a higher mean value for alertness. Further, the importance of ease of navigation is in line with the results of some earlier studies that have found that in the mobile context ease of use was strong predictor of usage intentions. The next step was to evaluate the discriminant function (Table 7). The assessment shows an interesting pattern where it seems that the non-adopters tend to put more weight on alertness, while adopters value accessibility and ease of navigation.



The last step in the analysis was to evaluate the efficacy of the discriminant function in appropriately classifying the subjects. The important issue in evaluating this question is to examine the efficacy of the classification rate. We used the approach proposed by Huberty (1984) which provides test statistics to evaluate the statistical significance of the overall classification rate and classification rate for each group. The test statistics evaluates the value of the classification rate against classification rate due to chance. The assessment shows that the overall classification rate comes out to be 73%, which is significantly greater than due to chance ( $z$ -value = 5.80). Results for each group shows that the classification rate for non-adopters ( $z$ -value = 10.07) and adopters ( $z$ -value = 3.27) are significantly higher than chance as well. Thus, the predictive efficacy of the discriminant function in classifying subjects was found to be significantly better than chance in all cases. Among the groups the discriminant function has the lowest predictive power for correctly classifying adopters. Thus, we believe that the predictive efficacy of the functions has room for improvement and further studies can focus on addressing this issue.

**Table 6: Variables in the Analysis**

Step	Variable	Tolerance	Wilks' Lambda
1	Accessibility	1.00	
2	Accessibility	0.80	0.97
	Alertness	0.80	0.89
3	Accessibility	0.64	0.81
	Alertness	0.76	0.87
	Ease of Navigation	0.66	0.80

**Table 7: Discriminant Function Coefficient**

Variables	Function
Accessibility	0.67
Alertness	-0.85
Ease of Navigation	0.58

**Table 8: Classification Results**

Group Membership	Type	Predicted	
		Adopters	Non-Adopters
Original	Adopters	69 %	31%
	Non-Adopters	25%	75%

\*73% of original grouped cases correctly classified

**DISCUSSION**

The results of the study provide interesting insights on the differences between adopters and non-adopters of mobile banking services. The univariate analysis shows that all variables are different across the two groups except for personalization. However, when taken together accessibility, ease of navigation, and alertness were found to be the best discriminators between the adopters and non-adopters. The core value proposition for adopters seems to be the accessibility which is tied to freedom from the restrictions imposed by the physical space. Mobile banking services enable the users to effectively utilize the periods where an individual due to location constraints was not able to undertake banking related tasks. Adopters seem to value this ability more than the non-adopters. Similarly, ease of navigation is another important aspect that contributes significantly towards the adoption decision. Adopters believe that mobile banking services delivered through the mobile channel offer an easy interaction experience. Results related to ease of navigation are consistent with what researchers have found with other information system

types. Thus, it constitutes a key characteristic that impact of which transcends across different information systems. While, accessibility offers a unique value proposition that mobile banking services offer. On the contrary, it seems that adopters are less excited about the capability of mobile banking services to keep them updated with changes in their bank accounts as compared to non-adopters. Push structure that provides different types of alerts seems to be a feature that non-adopters find more compelling among the services offered by mobile banking.

A key contribution of the study is identification of variables that differentiate adopters and non-adopters of mobile banking services. Further, the study digs deeper into contextualizing these variables in the mobile environment and offers a more granular assessment of adoption drivers. Practitioners can use these results to formulate the promotion strategy for mobile banking services which can help in gaining wider acceptance of these services among the customer base. Future research in this area can build on the results by examining the contrasting role of accessibility and alertness. Further, it would be interesting to assess what factors contribute towards usage sustainability. As more financial institutions embrace the mobile banking platform, understanding usage behavior of mobile banking services is likely to gain more traction. Future studies can build on the initial guidance offered in this study to examine the adoption and usage of various types of services which are delivered through the mobile channel.

## REFERENCES

1. Brusilovsky, P. and Maybury, M. T., (2002). From adaptive hypermedia to the adaptive web. *Communications of the ACM*, 45(5), 31-33.
2. Hong, S., and Tam, K., (2006). Understanding the Adoption of Multi-purpose Information Alliances: The Case of Mobile Data Services, *Information Systems Research*, 17(2), pp. 162-179.
3. Junglas, I and Watson, R. T. (2003). U-Commerce: An Experimental Investigation of Ubiquity and Uniqueness, Twenty Fourth International Conference on Information Systems,
4. Junglas, I and Watson, R. T. (2006). The U-Constructs: Four Information Drivers, *Communications of the Association of Information Systems*, 17 (26), pp 569 – 592
5. Kim, G., Shin, B, and Lee, H. G. (2007). Understanding dynamics between initial trust and usage intentions of mobile banking, *Information Systems Journal*, 19, 283-311
6. Lee, C., Mattila, M, and Shim, J. P. (2007). An Exploratory Study of Mobile Banking Systems Resistance in Korea and Finland, *AMCIS*
7. Lyytinen, K, and Yoo, Y., (2002). Issues and Challenges in Ubiquitous Computing, *Communication of the ACM*, 45(12), pp 63-65.
8. Lyytinen, K and Youngjon, Y. (2003). Research Commentary: The Next Wave of Nomadic Computing, *Information Systems Resesearch*, 13(4), pp 377-388
9. McManus, P. and Standing, C. (2008). Understanding the Reasons for Mobile Commerce Adoption and Use, *ACIS*.
10. Paisner, J., Castonguay, A., and Collins, C., (2009). Mobile Banking Creates a Bright Spot within the Struggling Financial Services Industry, *Yankee Group*.
11. Palmer, J. W., (2002). Web site usability, design, and performance metrics. *Information Systems Research*, 13(2), 151-167.
12. Perkwitz, M., and Etzioni, O., (2000). Towards adaptive web sites: Conceptual framework and case study. *Artificial Intelligence*. 118(1-2), 245-275
13. Tang,T, Lin, H, Want, Y, and Wang, Y., (2008). Toward An Understanding of the Behavioral Intention to Use Mobile Banking Services, *PACIS*
14. Tarafdar, M. and Zhang, J. (2005). Analysis of critical website characteristics: A cross category study of successful websites, *Journal of Computer Information Systems*, Winter, 14-24
15. Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D., (2003). User acceptance of information technology: Toward a unified view,” *MIS Quarterly*, 27(3), pp. 425-478.