

INDUCING BEHAVIORAL INTENTIONS THROUGH USER ENGAGEMENT: THE MEDIATING ROLE OF PERCEIVED VALUE CO-CREATION IN M-BANKING APPS

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Abstract

Availing banking services through technology is gaining ubiquity, shifting the customer from conventional banking to mobile app-based banking services. The study proposed its theoretical concept, drawing on service-dominant logic (S-D logic) and social cognitive theory (SCT), analyzing the relationship between user engagement and value co-creation, resulting in favorable behavioral intentions. This study investigated user engagement with m-banking apps, co-creating perceived value, resulting in users' behavioral intention to use mobile banking apps subsequently. The study context is based on tertiary students who use m-banking apps, and they were surveyed through the purposive sampling technique. It included 141 responses who met the study requirements. The paper followed an empirical approach and structured equation modeling (SEM) analysis of 141 responses supported a more detailed understanding of users' engagement leading to their behavioral intentions, that are directly mediated by perceived value co-creation. The findings further confirmed the theoretical framework posed in the study, that if users can engage in m-banking apps (thereby connecting on a cognitive and emotional level), they can co-create value through the apps' assistance, which in turn will lead their behavioral intention toward using those apps at a regular time interval. The theoretical and managerial implications demonstrated the importance of user engagement in m-banking apps for co-creating value, thus suggesting the m-banking service providers strategize their phygital (physical + digital) customer contact points to proceed with future services.

Keywords : *M-Banking Apps, Mobile Banking, Service-Dominant Logic (S-D), Social Cognitive Theory (SCT), User Engagement, Perceived Value Co-creation, Behavioral Intentions*

JEL Classification : *G21, G29, M31, O32*

1. INTRODUCTION

For the banking industry, mobile banking is a quantum leap, with regard to distance banking service delivery. Internet or web-based applications gained popularity over traditional banking due to their convenience, comfort, and ease in handling customer

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transactions, customer support, fixing customer queries, and around-the-clock automated services (Munoz-Leiva et al., 2017). As mobile devices are pervasive in all aspects of people's lives, it becomes a strategic decision for all the corporations, including banks, to invest in the mobility issues of their clients (Fenu & Pau, 2015). Banks are also focusing more on clients' mobility to provide them with real-time value. Thus, banks are introducing on-the-go mobile apps to provide several services (Garzaro et al., 2021). From account opening to account updates, from balance transfer to balance inquiry, from utility bill payments to mobile recharge, most banking services are now at the fingertip of clients due to the availability of smart mobile devices and mobile-based banking app services.

Bangladesh is a small country with an immense population of around 165.16 million and a literacy rate of 74.66%, as of 2022 (Bangladesh Bureau of Statistics [BBS], 2022). BBS (2022) also reported that presently, 55.89% of the population has mobile phones and 30.68% has an internet connection. The banking industry of Bangladesh is currently comprised of 61 scheduled banks and 5 non-scheduled banks (Bangladesh Bank, 2022). Out of the 61 scheduled banks, 6 are state-owned commercial banks, 3 are specialized banks, 43 are private commercial banks (10 are Islami Shariah-based PCBs), and 9 are foreign commercial banks (Bangladesh Bank, 2022). Over the last decade, the people of Bangladesh have seen both the inception and growth phases of mobile banking services. Back in 2011, Dutch Bangla Bank Limited (DBBL), for the very first time, introduced mobile banking services in Bangladesh (The Daily Star, 2011). But the City Bank Limited initiated an internet banking app named 'Citytouch' in 2013, which became the first mobile banking app in Bangladesh (Khan et al., 2022). After that, until now, about forty banks have introduced mobile banking apps to offer several services to their clients through off-branch banking (Business Inspection BD, 2023). Citytouch, EBL Skybanking, MTB Smart Banking, BRAC Bank Astha, My Prime, AD Direct, NexusPay, SC Mobile App, Sonali Wallet, and IBBL iBanking are a few of the widely used m-banking apps in Bangladesh.

The mobile innovation adoption, acceptance, and behavioral intention have an extant theoretical background, beginning with the theory of reasoned action (TRA) by Fishbein and Ajzen (1975), the theory of planned behavior (TPB) by Ajzen (1985), social cognitive theory by Bandura (1986), the technology acceptance model by Davis (1989), the innovation diffusion theory (IDT) by Rogers (1995), and the unified theory of acceptance and use of technology (UTAUT) by Venkatesh et al. (2003). This study is predominantly drawn from the work of social cognitive theory (SCT) by Bandura (1986) and service-dominant (S-D) logic by Vargo and Lusch (2008) and, to some extent, from the theory of planned behavior (TPB) by Ajzen (1985). Additionally, it took direction from Kahn (1990)'s philosophy of user engagement and Brodie et al. (2011)'s systematic literature review on engagement and value creation. Since various investigations were undertaken to align the adoption and acceptance theory in mobile-based banking services (Wessels & Drennan, 2010; Lin, 2011; Ramdhony & Munien, 2013; Chitungo & Munongo, 2013; Altin Gumussoy et al., 2018; Zhang et al., 2018; Hong et al., 2019; Aldammagh et al., 2021), this

theoretical concept principally focused on user engagement and their behavioral intention toward m-banking apps, where value co-creation plays a mediating role.

A bundle of studies has been conducted to address the satisfaction of m-banking users (Sampaio et al., 2017; Garzaro et al., 2021; Kamboj et al., 2022), the acceptance and adoption of mobile banking services (Zhang et al., 2018; Thusi & Maduku, 2020; Ali et al., 2022; Kamdjoug et al., 2021, Lee & Chen, 2022), and the security issues of m-banking apps (Devadevan, 2013; Hayikader et al., 2016; Chen et al., 2018). Several studies investigated how to generate trust when using m-banking apps (Kim et al., 2009; Zhou, 2012; Malaquias & Hwang, 2016). Significant literature is also found related to establishing a relationship between users' engagement and their satisfaction and loyalty in m-banking apps (Hepola et al., 2016; Garzaro et al., 2021), demonstrating a connection between m-banking servicescape between users' attitude and engagement (Sahoo & Pillai, 2017), and illustrating the association between m-banking app interactivity and user engagement (Shankar, 2021). Garzaro et al. (2021) came up with a relationship between the customer engagement level with m-banking apps and customer satisfaction. As many of the users have already adopted the m-banking apps, the issue of inducing users' engagement with m-banking apps is currently the big question that should be addressed. In light of earlier research on m-banking apps, this study proposes that perceived value co-creation may mediate the relationship between user engagement and potential behavioral intentions. It explored this relationship at cognitive, emotional, and behavioral levels as well as the way it subsequently influenced app users' intentions. A large number of authors also advocated the relationship between engagement and behavioral intention (Flavián et al., 2019; Hepola et al., 2016; Rather et al., 2022) which further strengthens the basis for this research.

The aim of the study is to investigate user engagement and their behavioral intentions toward the m-banking apps. There is extant literature on customer engagement and behavioral intention as mentioned; however, there remains no study where the interactive engagement (here engagement was measured with cognition, emotion, and participation) between mobile apps and app users ushered in the co-creation of perceived value. This value co-creation is then reflected in the behavioral intentions of the users to use the service, thus answering the research questions posed in this paper: Do m-banking apps improve how users interact with banks? What are the levels of engagement users have with m-banking apps? How does perceived value co-creation mediate the relationship between customer engagement and behavioral intentions? Do m-banking apps ultimately influence users' intentions to use the service in the future? The study examines the process by which users' interaction with m-banking apps contributes to the co-creation of value, which in turn affects their future behavioral intentions to use mobile banking apps.

The study context is set among tertiary level students who were surveyed for their opinions on using mobile banking apps to conduct financial transactions. It incorporated the purposive sampling technique due to having no definitive sampling

framework and data were collected on m-banking apps, namely Citytouch, Sky Banking, MTB Smart Banking, BRAC Bank Astha, My Prime, AD Direct, NexusPay, SC Mobile App, Sonali Wallet, IBBL iBanking, etc. The surveyed students of public universities in Dhaka division represent a heterogeneous background in terms of demographic profile. The final-year students are chosen as they are well-informed regarding technological breakthroughs and transitions (Smith et al., 2009; Margaryan et al., 2011). Likewise, they have the propensity to initiate and adopt new aspects of technological innovation (Saleem et al., 2022). Thus, this study does not generalize the conceptual model for all the age groups who are using the m-banking apps; rather, it highlights the behavioral intentions of the university students, who will be the largest user base of m-banking apps in the future.

The findings support the conceptual framework posed by the researchers, as the users were found to be engaging with the m-banking apps when they believed they were co-creating value. So here, the perceived value co-creation mediated the relationship between engagement and behavioral intentions.

The paper is designed as follows: the second section describes the existing literature on the engagement behavior and value co-creation of users, which assisted the authors in proposing the conceptual model posed in the study. The third section includes the research methodology, the fourth section contains the data analysis and findings, followed by an overall discussion section. The paper is finally concluded after presenting the theoretical and managerial implications of the study.

2. LITERATURE REVIEW

This section delves into the theoretical underpinnings of the study of user engagement and their value co-creation perspective and behavioral intentions, drawing on the major conceptual work: from Social cognitive theory (Bandura, 1986), Vargo and Lusch (2008)'s Service-Dominant Logic, Kahn (1990)'s philosophy for user engagement constructs (cognitive, emotional, and behavioral) and their relationship with value co-creation construct, and from the theory of planned behavior (TPB) by Ajzen (1985) for behavioral intentions construct.

2.1 Underpinnings of User Engagement Construct

There is an extant literature on user engagement from technology adoption and intention perspective. The social cognitive theory by Bandura (1986) premised on how behavior is influenced by cognitive, behavioral, and environmental factors. An individual observes others and relies on own capability to perform a task or challenge. Kahn (1990)'s philosophy on engagement pertains to varying degrees of how people engage and disengage their personal self cognitively, emotionally, and physically in their performance. This theory is built on personal engagement (association of own self with work) and personal disengagement (withdrawing own self from work) where Kahn suggested both self-engagement and self-expression are necessary for work performance. User engagement construct is multidimensional as it is widely used as antecedents/ outcomes to related concepts and can be measured cognitively,

emotionally, and behaviorally, that can be both stakeholder (subject) or context (object) oriented, such as, students, visitors, employees, firms, services, mobile application, and so on (Brodie et al., 2011). The previous literature suggest that user engagement has been generated from the service-dominant logic through the value co-creation and resource integration (Vargo & Lusch, 2008). Brodie et al. (2011) studied the user engagement from co-creation viewpoint. Lehmann et al. (2012) suggested user engagement can be explained by variety of models (flow theory, play theory, information interaction, etc.) by studying the effect of students' engagement in learning and video games. The cognitive behavioral therapy (CBT) model was applied in mobile apps engagement where those apps helped in mental well-being, connecting cognitive, behavioral, and physical senses (Bakker & Rickard, 2019). This paper therefore took direction from social cognitive theory (SCT) by Bandura (1986), Kahn (1990)'s philosophy of engagement, Vargo and Lusch's Service-Dominant Logic (2008), and the connection between user engagement and S-D logic (Brodie et al, 2011).

2.2 Cognitive Engagement

Cognitive engagement is defined as conscious commitment (Bandura, 1986; Kahn, 1990), where the engagement is powered by one's self empowered task behavior. Cognitive engagement covers thinking and understanding (Tang & Hew, 2022), attending and absorbing (Dovaliene et al. 2016) of information, and active learning (Tang & Hew, 2022). Therefore, cognitive engagement is the perceived degree of psychological involvement (Silva et al., 2023). This conscious behavior triggers personal presence resulting in active engagement through interactive experience (Kosiba et al., 2018). This study followed both SCT by Bandura (1986) and Kahn (1990)'s philosophy where user engagement is defined through self-efficacy, self-employment, and self-expression. It additionally followed Brodie et al. (2011)'s suggestion of multidimensionality where engagement is measured through cognitive, emotional, and behavioral level. Belanche (2021) studied the effect of user engagement in digital medium where competence and warmth in service interaction were held important. Garzaro et al. (2021) examined the interactive elements' presence in determining the internet banking users' satisfaction. Portela and Garnel-Canut (2017) investigated user engagement where professional background and education of users (cognitive understanding) dominated the acceptance of digital apps. Flavián et al. (2019) studied conscious attention to tech (engagement), furthering interaction with mobile devices and other innovative channels. Thusi and Maduku (2020) studied the millennial cohort's acceptance of mobile banking and suggested how performance expectancy (the capacity of a technology to improve user performance) of m-banking apps influences the users' engagement and usage intention. Based on the above literature, the following hypothesis is proposed:

H₁ : Cognitive engagement has a positive direct effect on users' behavioral intentions to use m-banking apps.

2.3 Emotional Engagement

Emotional engagement is the degree of connectedness and affection (Belanche, 2021; Silva et al., 2023), enthusiasm and enjoyment (Dovaliene, 2016), and affective reaction toward learning and interaction (Tang and Hew, 2022). Przegalinska et al. (2019) studied the human interaction with digital apps, where the comfort in engagement enhanced user acceptance. So is suggested by Zhang et al. (2018), where users preferred emotionally satisfying engagement with digital apps that made way for subsequent interaction. The emotional engagement of customers with digital mediums produce co-created value (Vargo & Lusch, 2008; Portela & Garnel-Canut, 2017; Tang & Hew, 2022). Garzaro et al. (2021) stated better user interaction in internet banking apps facilitates emotional engagement, resulting in better social connectivity and satisfaction. Zhang et al. (2018) studied the technology acceptance model factors and involved the fun-factors presented in internet banking adoption, and found that privacy and trust shaped digital service users' experience. Belanche (2021) identified users' engagement with mobile apps to be carrying both functional (cognition) and emotional meaning, whereas, Tang and Hew (2022) found students' learning enthusiasm and enjoyment helped in learning collaboration and reflection. Thusi and Maduku (2020) pinpointed the m-banking apps to be playing a role in making this an innovative channel for financial services, inspiring the millennial bank users with trust and assurance thereby switching from physical (tedious) banking to online (enthusiastic) banking. Following this information, the below hypothesis is developed:

H₂ : Emotional engagement has a positive direct effect on users' behavioral intentions to use m-banking apps.

2.4 Behavioral Engagement

This level of engagement deals with the degree of positive participation and involvement, resulting in interpersonal interaction (Bandura, 1986; Kahn, 1990; Brodie et al., 2011; Lalicic & Weismayer, 2021; Silva et al., 2023). Dovaliene (2016) stated behavioral engagement to be sharing, endorsing, and learning. Tang and Hew (2022) further confirmed that behavioral engagement in students' learning happens when they actively participate in academic and social activities. Van Droom et al. (2010) defined behaviorally engaged customers as those who put proactive efforts with the brand. These customers avail their knowledge, experience, time, networking resources, and social influence in their attached services (Brodie et al., 2011; Tafesse & Wien, 2018). As the study approached user engagement from Kahn perspective and S-D logic viewpoint, the engagement is perceived to be a psychological process where users get engrossed in the service experience which produces value (Brodie et al., 2011; Dovaliene et al., 2016; Belanche, 2021). The mobile apps' assistance will be meaningful to the users if value can be co-created through users' active participation (Vargo & Lusch, 2008; Brodie et al., 2011; Przegalinska et al., 2019; Tang & Hew, 2022). Garzaro et al. (2021) suggested m-banking apps can facilitate innovative and interactive experience for the app users to generate feelings and

sensations, which will result in positive engagement and favorable response. Zhang et al. (2018) studied the users' sociability need (need for social interaction) through sharing digital platform, Flavián et al. (2019) explored the mindfulness attribute where users pay attention to mobile apps' features and the alternatives available to those, thus deciding prudently on app usage and engaging to their own benefit, thereby attaining their sociability need. Dovaliene et al. (2016) discussed about the users' need for sharing their feedback with others (felt seen and heard) where Zhang et al. (2018) opined that intimacy, friendship, and social support are the key features of sociability that users expect when engaging in mobile apps. The following hypothesis is designed supporting the above discussion:

H₃ : Behavioral engagement has a positive direct effect on users' behavioral intentions to use m-banking apps.

2.5 Perceived Co-Creation Value

Co-creation of value is the process of joint collaboration to produce new symbolic and material value (Vargo & Lusch, 2008). The extant literature on value co-creation shows the difference between co-creation and co-production of value, where the former encompasses the general view of users' interaction with the services (Galvano & Dalli, 2014). The collaboration between digital mediums (innovative online and mobile channels) and users creates value perceptions (Lalicic & Weismayer, 2021). The study draws its co-creation perspective from the Service-Dominant logic by Vargo and Lusch (2008) and the result of user engagement is found to be users' perceived value co-creation, satisfaction, and loyalty (Brodie et al., 2011; Galvano & Dalli, 2014; Dovaliene et al., 2016). Galvano and Dalli (2014), in their systematic literature on value co-creation, suggested users' active engagement in the value creation process adds to their own satisfaction. This is additionally confirmed by the service science perspective of S-D logic (Vargo & Lusch, 2008), where the primary goal of user engagement is perceived through users' collaborative consumption experience, resulting in symbolic, cultural, and material value (Vargo & Lusch, 2008; Galvano & Dalli, 2014). From cognitive engagement literature, Dovaliene et al. (2016), Flavian et al. (2019), and Thusi and Maduku (2020) suggested conscious attention, absorption, and mindful behavior (cognitive engagement) result in users' better interaction with the m-banking apps, so this cognitive level of engagement shapes the users value co-creation perception. Zhang et al. (2018) and Belanche (2021) stated that affective feeling and enjoyment of using mobile banking apps tend to be significant to the user's value perception and this emotional engagement facilitates users' collaborative experience. From behavioral engagement literature, sociability feature (social connectivity, intimacy, friendship) is at the core of users' engagement with their m-banking apps, creating value through social collaboration (Zhang et al., 2018; Lalicic & Weismayer, 2021). From the existing literature on user engagement and resulting value co-creation, it can be said that m-banking app users' active engagement (cognitive, emotional, and behavioral level) produce value co-creation perception (Belanche, 2021; Lalicic & Weismayer, 2021; Portela & Garnel-

Canut, 2017; Garzaro et al., 2021; Flavián et al., 2019). This perception satisfies the overall collaborative experience and persuade their behavioral intention (Vargo & Lusch, 2008; Brodie et al., 2011; Galvano & Dalli, 2014; Dovaliene et al., 2016; Tang & Hew, 2022). Based on literature of user engagement and value co-creation, the following hypotheses are sculpted and proposed:

H₄ : Perceived value co-creation has a positive direct effect on users' behavioral intentions to use m-banking apps.

H₅ : Perceived value co-creation has a significant mediating effect on the direct effect of cognitive engagement on users' behavioral intentions to use m-banking apps.

H₆ : Perceived value co-creation has a significant mediating effect on the direct effect of emotional engagement on users' behavioral intentions to use m-banking apps.

H₇ : Perceived value co-creation has a significant mediating effect on the direct effect of users' behavioral engagement to use m-banking apps.

2.6 Behavioral Intentions

The desire and positive feeling toward any offering or services pertain to one's behavioral intentions (Zhang et al., 2018; Thusi & Maduku, 2020; Lalicic & Weismayer, 2021). Vargo and Lusch (2008)'s perspective on user engagement and their value co-creation perception have led to user satisfaction, loyalty, and finally an influence on user behavioral intention (Brodie et al., 2011; Dovaliene et al., 2016; Flavián et al., 2019; Rather et al., 2022). The current literature on users' behavioral intention was drawn from numerous theories, following the work of theory of reasoned action (TPA) by Fishbein and Ajzen (1975), theory of planned behavior (TPB) by Ajzen (1985), technology adoption model (TAM) by Davis (1989), innovation diffusion theory (IDT) by Rogers (1995), and social cognitive theory (SCT) by Bandura (1986) (Gu et al., 2009, Zhang et al., 2018; Ho et al., 2020). Ho et al. (2020) studied the m-banking adoption intention among Vietnamese and Taiwanese population, drawing on TAM factors. While all the previous literature worked on perceived ease and usefulness and trust from technology adoption perspective (Gu et al., 2009; Ho et al., 2020; Flavian et al., 2019; Belanche, 2021; Tang & Hew, 2022) this study focused on m-banking apps users' engagement and their behavioral intentions. The user engagement, when uniquely linked with the mobile banking apps and perceived to be co-creating value, triggers cognitive engagement by the users (Belanche, 2021). In terms of emotional engagement, the mobile apps must be easy to operate to the user's perception (Zhang et al., 2018; Przegalinska et al., 2019, Ho et al., 2020). In regard to favorable behavioral engagement, the sociability feature of mobile banking apps (connecting mobile apps users with the banks and the other users) stimulates positive behavioral engagement between users and apps (Zhang et al., 2018; Thusi & Maduku, 2020; Garzaro et al., 2021, Belanche 2021). Lalicic and Weismayer (2021) studied the social interaction between users and mobile apps as a requisite to user engagement and Garzaro et al. (2021) suggested innovative user engagement between users and mobile apps produce favorable behavioral response, confirming the service science

perspective of S-D logic (Vargo & Lusch, 2008; Brodie et al., 2011; Galvano & Dalli, 2014; Dovaliene et al., 2016). Therefore, the study proposes to find out the two major intentions namely, (i) user engagement's impact on users' behavioral intention and (ii) user engagement's impact on value co-creation and behavioral intention toward m-banking apps usage in near future.

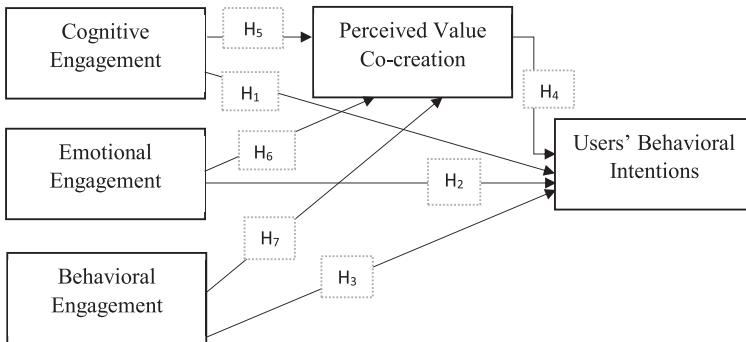


Figure 1 : Conceptual Framework of the Study (Authors' Constructed)

3. METHODOLOGY

A survey was conducted to test the hypotheses of this study. A structured questionnaire was circulated to collect data from the respondents. The questionnaire had two modules: the target population's demographic profiles (e.g., gender, income, age, education level) and five constructs containing 19 questions.

A set of 25 samples was selected to conduct a pilot study. As per the recommendations of the samples, a few words were modified and some grammatical mistakes were corrected. Cronbach alpha was observed to be satisfactory (Christmann & Aelst, 2006; Brown, 2002; Bland, 1997), i.e., above 0.80 for all five constructs.

As young customers are the major users of m-banking apps (Lee & Lee, 2020), the study collected data from the tertiary-level students of Dhaka division, who are the active users of m-banking apps. As there was no sampling framework available for this study, the researchers used the purposive sampling method (Marshall, 1996), a non-probability sampling technique, to collect data from the respondents. Participants in a purposive sampling strategy are those who have particular characteristics that allow for a comprehensive understanding of the main subjects that the researchers desire to explore (Lewis et al., 2003). In order to investigate the conceptual model of the study, it was considered vital that participants fulfill the requirements listed below: (1) to be a final-year student of a public university in Dhaka division; (2) to have an m-banking app; and (3) to be an active user of m-banking apps (Nguyen & Tong, 2022). Questionnaires were circulated to two-hundred final-year university students in Dhaka, at the convenience of the researchers, between October 2022 and December 2022. On the onset of January 2023, of the two hundred returned questionnaires, fifty-nine were rejected, in total, using the pre-determined requirements: 48 participants were non-users of m-banking apps and 11 of them were non-frequent users (five used

it occasionally and six used it once a month). Hair et al. (2010) also recommended a 150 sample size for a research model with five or fewer constructs.

In order to control the effect caused by variations among the diverse backgrounds of the users of m-banking apps, the study chose a single age group: the final year students of different public universities in Dhaka division. As they comprise the largest user group of m-banking apps for the next one or two decades, the study intended to measure the engagement level and its impact on the behavioral intentions of those users. The selection of final year public university students in Dhaka division was based on three major reasons. First, public universities in Dhaka divisions (DU, JU, JNU, and BUP) have diverse students who represent the demographic diversity of Bangladesh. Second, compared to students in other academic levels, the final year students have the willingness, motivation, and ability to use m-banking apps for their novelty. Finally, m-banking usage is popular among the 21-30 years age group (Sulaiman et al., 2007).

Table 1 : Profile of Respondents

Profile Category	Frequency	Percentage (%)
Gender		
Male	109	54.5
Female	91	45.5
Personal Income		
Below BDT 5,000	24	12.0
BDT 5,001-10,000	58	29.0
BDT 10,001-15,000	62	31.0
BDT 15,001-20,000	41	20.5
Above BDT 20,001	15	7.5
Smart phone owner		
Yes	174	87.0
No	26	13.0
M-banking apps User		
Yes	152	76.0
No	48	24.0
Frequency of using m-banking apps		
Never	48	24.0
Daily-once	03	01.5
Daily-several times	00	00.0
Weekly-once	55	27.5
Weekly-several times	23	11.5

Monthly-once	06	03.0
Monthly-several times	60	30.0
Occasionally	05	02.5

Two major statistical analyses were conducted during this study. Firstly, the reliability and validity of the constructs were analyzed using confirmatory factor analysis (Hair et al., 2010). And secondly, the seven proposed hypotheses and structural model were examined by the structural equation modeling (SEM). Statistical software SPSS (version 20.0) and AMOS (version 22.0) were used to conduct the statistical analyses.

The theories and previous literature supported the questionnaire for this study. The constructs were measured using 5-point Likert scale. Cognitive engagement construct was adapted from Bandura (1986), Kahn (1990), Brodie et al. (2011), and Kumar et al. (2021). Behavioral and emotional engagement constructs were adjusted with the constructs developed by Bandura (1986), Kahn (1990), and Kosiba et al. (2018). Customer value co-creation construct was measured by adapting four items from the literature by Vargo and Lusch (2008), Galvano and Dalli (2014), Lalicic and Weismayer (2021), and Gupta and Kim (2010). Finally, the users' behavioral intentions construct was measured by adapting five items from the study of Gao and Bai (2014), Hong et al. (2019), and Tang & Hew, (2022).

4. DATA ANALYSIS AND FINDINGS

Confirmatory factor analysis (CFA): The study employed the structural equation modeling technique for testing the proposed conceptual framework. AMOS software was utilized to conduct CFA in this study. The fit statistics of the overall model for the CFA were satisfactory ($\chi^2 = 1.587$, $df = 140$, $p < .05$, goodness-of-fit statistics index (GFI) = 0.873, adjusted goodness-of-fit index (AGFI) = 0.828, parsimony goodness of fit index (PGFI) = 0.644, comparative fit index (CFI) = 0.950, RMR = 0.050, standardized RMR = 0.0671, root mean square error of approximation (RMSEA) = .065), specifying the satisfactory strength of the individual indicators (Cheng, 2011; Kline, 2016).

Table 2 : Reliability and Validity

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE
Cognitive Engagement	CE1	0.729	0.912	0.878	0.643
	CE2	0.849			
	CE3	0.863			
	CE4	0.759			
Emotional Engagement	EE1	0.869	0.900	0.913	0.778
	EE2	0.879			
	EE3	0.898			

Behavioral Engagement	BE1	0.846	0.827	0.901	0.753
	BE2	0.925			
	BE3	0.829			
Perceived Value Co-creation	PVC1	0.782	0.875	0.828	0.547
	PVC2	0.694			
	PVC3	0.771			
	PVC4	0.706			
User Behavioral Intentions	UBI1	0.697	0.866	0.902	0.648
	UBI2	0.840			
	UBI3	0.800			
	UBI4	0.861			
	UBI5	0.817			

Table 1 and 2 confirmed the appreciable reliability and validity of the measurement scales. Hair et al. (2021) stated that the Cronbach's alpha (CA) and composite reliability (CR) should be greater than 0.70. All the constructs' CA and CR values were found to be higher than 0.70, which indicates that the scales used in the study are reliable. The factor loading should be above 0.70 but Hair et al. (2019) pointed it out that if AVE meets the cut-off value of >0.50, the factor loading of >0.40 should be kept in the model. As all the constructs' AVE is greater than 0.50, it can be affirmed that the scales have convergent validity. Lastly, discriminant validity of the model is confirmed as all the constructs AVE are greater than MSV of those constructs.

Table 3 : Reliability and Convergent and Discriminant Validity

	Cronbach's Alpha	CV	AVE	MSV	MaxR (H)	PVC	CE	EE	BE	UBI
PVC	0.875	0.828	0.547	0.539	0.832	0.739				
CE	0.912	0.878	0.643	0.055	0.889	0.234	0.802			
EE	0.900	0.913	0.778	0.221	0.914	0.470	0.003	0.882		
BE	0.827	0.901	0.753	0.039	0.914	0.140	-0.041	-0.049	0.868	
UBI	0.866	0.902	0.648	0.539	0.909	0.734	0.183	0.434	0.197	0.805

Structural model: Based on the outcomes of the confirmatory factor analysis, the fit indices for the measurement model without mediating variables were estimated ($\chi^2 = 1.378$, $df = 82$, $p < 0.05$, $CFI = .976$, $GFI = .909$, $AGFI = .867$, $RMR = .052$, $Standardized\ RMR = 0.0679$, $RMSEA = .052$). All the relationships between the exogenous and endogenous variables were found significant, which is a prerequisite for involving a mediating construct in a proposed model (Gunzler et al., 2013). All the exogenous variables, namely, cognitive, emotional, and behavioral engagement, pose significant effect on mobile banking app users' behavioral intentions. The model explains 21% variation in the endogenous variable using three exogenous constructs.

Out of the three exogenous constructs, emotional engagement mostly explains the users’ behavioral intentions to use m-banking apps further ($\beta = 0.385$; t value = 4.571; sig. < 0.05).

Table 4 : Relationships between exogenous and endogenous constructs without mediation

	Estimates	Standardized Estimates	C.R.	P	Comments
CE → UBI	0.118	0.184	2.479	0.013	Sig.
EE → UBI	0.210	0.385	4.571	0.000	Sig.
BE → UBI	0.123	0.197	2.653	0.008	Sig

The structural model with mediating variable was also assessed. All the fit indices of the structural model ($\chi^2 = 1.557$, $df = 143$, $p < 0.05$, $CFI = .951$, $GFI = .873$, $AGFI = .831$, $RMR = .051$, $Standardized\ RMR = 0.0678$, $RMSEA = .063$) indicate the model is suitable in describing the hypothesized constructs. Out of the seven paths proposed in the structural model, four direct paths were statistically significant and established the anticipated positive direction (Table 5). Out of the three indirect paths, two paths were significant and indicated a mediating relationship among the variables (Table 6).

Hypothesis 1, the more users cognitively engaged with the m-banking apps, the more likely the co-produced value will be realized by the users, was accepted ($\beta = 0.239$; t-value = 2.707; sig. < 0.05). Hypothesis 2, the more the users became emotionally engaged with the m-banking apps, the more likely the co-produced value will be realized by the users, was accepted ($\beta = 0.475$; t-value = 5.149; sig. < 0.05). Hypothesis 3, the more the users behaviorally engaged with the m-banking apps, the more likely the co-produced value will be realized by the users, was accepted ($\beta = 0.169$, t-value = 1.969; sig. < 0.05). Hypothesis 4, perceived value co-creation will have a positive direct effect on users’ behavioral intentions, was accepted ($\beta = .645$; t-value = 5.825; sig. < 0.05).

Table 5 : Path Coefficients and Probability Value of the Proposed Hypotheses

	Estimates	Standardized Estimates	C.R.	P	Comments
Total effect					
CE → PVC	0.181	0.239	2.707	0.007	Sig.
EE → PVC	0.308	0.475	5.149	0.000	Sig.
BE → PVC	0.126	0.169	1.969	0.049	Sig.
PVC → UBI	0.566	0.645	5.825	0.000	Sig.
Direct effect					
CE → UBI	0.024	0.035	0.555	0.579	Not Sig.
EE → UBI	0.077	0.135	1.838	0.066	Not Sig.
BE → UBI	0.074	0.114	1.820	0.069	Not Sig.

Table 6 : Indirect Effects Analysis

	Estimates	Standardized Estimates	P.	Comments
CE → PVC → UBI	0.103	0.154	0.003	Sig.
EE → PVC → UBI	0.174	0.306	0.001	Sig.
BE → PVC → UBI	0.071	0.109	0.091	Not Sig.

The significance of indirect paths indicated the mediating effect of perceived value co-creation between the exogenous and endogenous variables. Hypothesis 5, perceived value co-creation has a significant positive mediating effect on the relationship between cognitive engagement and users' behavioral intentions is found significant ($\beta = .154$; sig. < 0.05). Hypothesis 6, perceived value co-creation has a significant positive mediating effect on the relationship between emotional engagement and users' behavioral intentions is also found significant ($\beta = .306$; sig. < 0.05). But, the seventh hypothesis was rejected implying that perceived value co-creation has no positive mediating effect on the relationship between behavioral engagement and users' behavioral intentions ($\beta = .109$; sig. > 0.05).

The significant values of indirect paths and the insignificant values of the direct paths also suggest that perceived value co-creation has a full mediating effect between the relationships among cognitive and emotional engagement and users' behavioral intentions. But, the insignificance of perceived value co-creation in the relationship between behavioral engagement and users' behavioral intentions indicates that behavioral engagement of the users with the m-banking apps has direct relationship with the behavioral intentions of the users, instead of a mediating relation.

From the loading values, it is noted that cognitive engagement of customers positively affected perceived value co-creation, with a regression weight of 0.239, which supported hypothesis 1. Highest factor loading value, 0.645, is found in the relationship between perceived value co-creation and users' behavioral intentions, which supported the fifth proposed hypothesis. Second hypothesis, that emotional engagement of customers has a positive direct effect on perceived value co-creation, is also supported through the loading value of 0.475. Fourth hypothesis, that behavioral engagement has a positive direct effect on perceived value co-creation, is marginally supported through the loading value of 0.169.

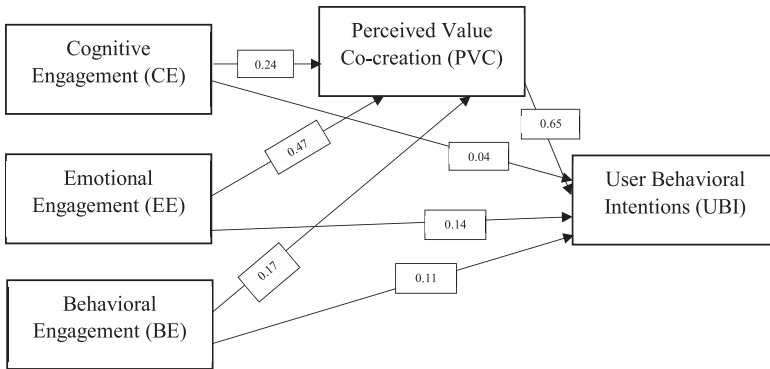


Figure 2 : Outcomes from the SEM Analysis

From SEM path based on loading values, it is seen that perceived value co-creation significantly mediated the relationship between emotional engagement and users’ behavioral intentions with the loading value of 0.306. The loading value of 0.154 also supported the hypothesis that perceived value co-creation act as a mediating factor for the relationship between cognitive engagement and users’ behavioral intentions.

Table 7 : R² and Predictive Quality of the Variables

Dependent Variable	Variable Type	R-square
Perceived value co-creation	Endogenous	0.31
Users’ behavioral intentions	Endogenous	0.57

Hair et al. (2011) proposed to test the quality of a structural model by the R-square values. The R² value of perceived value co-creation is 0.31, which represents 31% variance in the endogenous latent variable can be explained by the three exogenous latent variables, which are, cognitive, emotional, and behavioral engagement. 57% variance in the latent variable of users’ behavioral intentions (R²= 0.57) can be explained by the four exogenous variable, cognitive, emotional and behavioral value, and perceived value co-creation. Falk and Miller (1992) proposed 0.10 for R² as a minimum acceptable cut-off value, whereas Cohen (1988) suggested at least 0.02 minimum value of R² for having weak relationship among the constructs. Following the cut-off values, it can be inferred that perceived value co-creation and users’ behavioral intention have the predictive relevance (Table 7).

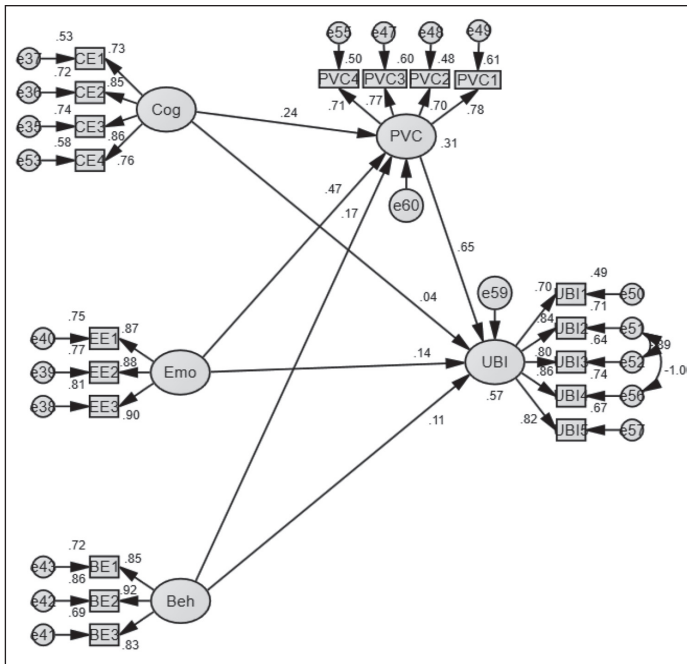


Figure 3 : Structural Model Outcomes

5. DISCUSSION

The study empirically investigated how different types of user engagement develop behavioral intentions toward using m-banking apps. It found out how the types of user engagement has no direct impact on m-banking apps users’ behavioral intentions, but only has impact when mediated by users’ perceived value co-creation. The empirical analysis of the study was conducted on tertiary level students who have been regularly using m-banking apps for their financial transactions. There were three principal types of user engagement, namely, cognitive, emotional, and behavioral, which were drawn from the major theories of social cognitive theory by Bandura (1986), service-dominant (S-D) logic by Vargo and Lusch (2008), and Kahn (1990)’s philosophy. The study found how students who could engage at a cognitive and emotional level with the m-banking apps form their value perception, which in turn motivate their behavioral intentions.

To the researchers’ knowledge, the previous literature dealt with mobile technology adoption and acceptance, drawn from the theory of TRA, TPB, TAM, and IDT. But no study was undertaken to explore users’ engagement and their behavioral intentions from the work of social cognitive theory (SCT) and S-D logic. Here, the primary objective was to examine the relationship of the users’ engagement with m-banking apps, generating positive value co-creation perception in mobile banking app services. To prompt users’ active engagement in mobile banking channels, the

interactive experience leads user engagement with the mobile apps, culminating in co-creation of values and positive behavioral response.

With the advancement of mobile phone technology and mobile banking, the users expect the banks to be conveniently accessible. To have a competitive edge in banking services, the banking industry must engage their users in multiple ways (Garzaro et al., 2021). This user engagement can happen at a cognitive, emotional, and behavioral level (Kosiba et al., 2018; Przegalinska et al., 2019; Belanche, 2021; Portela & Garnel-Canut, 2021). The study examined the direct effect of user engagement (exogenous construct) with the behavioral intentions (the endogenous construct) of the study. Their relationship was mediated through the value co-creation perception (Vargo & Lusch, 2008; Galvano & Dalli, 2014; Lalicic & Weismayer, 2021) construct, resulting in full mediation, except behavioral engagement, which was found out to be directly impacting behavioral intentions, following the paths (CE \rightarrow PVC \rightarrow UBI), (EE \rightarrow PVC \rightarrow UBI), and (BE \rightarrow UBI) respectively.

This study was conducted with the aim of finding out the user-side interaction with the m-banking apps and the impact of the different types of engagement on the users' behavioral intention. Furthermore, the authors studied the mediating effect of value co-creation perception of such personal interaction among users and apps (Vargo & Lusch, 2008; Lalicic & Weismayer, 2021). The study used the tertiary students as backdrop and surveyed for their opinion in m-banking apps usage. The profile of the respondents can be found in Table 1 where both male and female students who regularly used m-banking apps for their financial transaction were chosen as subjects. Among the user engagement construct, the emotional engagement was found to be the most significant, followed by cognitive and behavioral engagement.

The empirical findings supported the proposed conceptual model where the model was found to be reliable and valid. The conceptual model was analyzed through structural equation model with the help of AMOS software. All the constructs were found to be reliable and all the constructs' AVE supported convergent validity of the model. The divergent validity was supported by the greater values of AVE than those of MSV. Based on high reliability and validity, the model can be generalized in the m-banking apps' usage context. Future research can be conducted in other aspects, accounting for this study's model.

This research is carried out since various investigations were undertaken to align the adoption and acceptance theory in mobile based banking services (Wessels & Drennan, 2010; Lin, 2011; Ramdhony & Munien, 2013; Chitungo & Munongo, 2013; Altin Gumussoy et al., 2018; Aldammagh et al., 2021). As many of the users have already adopted the m-banking apps, the issue of inducing users' response regarding m-banking apps is currently the big question which should be addressed. In the light of earlier researches on m-banking apps, this study suggests that perceived value co-creation may mediate the relationship between user engagement and potential behavioral intentions, following this path: user engagement \rightarrow perceived value co-creation \rightarrow behavioral intentions. Drawing on the theoretical work of Ajzen (1985),

Bandura (1986), Kahn (1990), Vargo and Lusch (2008), and Brodie et al. (2011), the primal focus of the study was on user engagement and their behavioral intentions, mediated by the users' perceived value co-creation in the m-banking apps' usage context. From the empirical foundation of the study, the researchers pinpointed a specific path of engagement related to value creation and positive behavioral intentions in the m-banking industry, that sheds light on how the apps users' engagement can be strategized to result in positive behavioral response.

6. IMPLICATIONS OF THE STUDY

6.1 Theoretical Implication

From a theoretical perspective, this study contributes to users' engagement, perceived value co-creation value, and behavioral intentions in mobile banking literature. It proposed and confirmed its theoretical perspective highlighting user engagement effect on behavioral intentions in m-banking context, that is founded on the theory of planned behavior, social cognitive theory, and service-dominant logic. The study demonstrated several academic contributions. Firstly, the study highlights the impact of user engagement (cognitive, emotional, and behavioral) in users' behavioral intention in m-banking context. The previous literature showed relationships between perceived usefulness, perceived ease-of-use, and behavioral intention (Hepolla et al., 2016; Falvián et al., 2019; Rather & Hollebeek, 2021; Tang & Hew 2022), where perceived interactivity (Lee et al., 2022), age (Rather & Hollebeek, 2021), and commitment (Tapar et al., 2017) were incorporated as moderating variables effecting this relationship. This study contributed in the m-banking engagement and behavioral intentions literature in a similar manner. Secondly, it asserted the mediating effect of perceived value co-creation in the relationship between users' engagement and behavioral intentions of using m-banking apps. The relationship between engagement and intention is not straightforward. But if induced by the value co-creation construct, it results in this path (user engagement → perceived value co-creation → behavioral intentions), further contributing to the value co-creation literature in m-banking context. Finally, in m-banking literature aspect, the youth users' engagement, particularly emotional engagement, followed by cognitive and behavioral engagement heavily influence their value perception and in turn, their behavioral intentions toward m-banking apps' usage.

6.2 Managerial Implication

The study extends notable insights into the impact of user engagement on users' behavioral intention to use m-banking service henceforward. The study has practical implication for practitioners and banking service providers. As suggested in this paper, perceived value co-creation is a factor which will make user engagement in m-banking apps meaningful (at cognitive level) and enjoyable (at emotional level). This is because value creation happens when apps are adapted cognitively, emotionally, and behaviorally by the user (Belanche, 2021; Lalicic & Weismayer, 2021; Portela & Garnel-Canut, 2017). This study postulates that in order to motivate

users' behavioral intention, banks must develop a suitable system where users can engage cognitively and emotionally, to get the most from the m-banking apps' usage experience. It found emotional engagement to be the most significant, followed by cognitive and behavioral engagement to be the motivators for the youth users. The study identified the millennial cohorts and the futuristic generation to more likely engage themselves with the value co-creation experience. These different generational users are influenced to use the m-banking apps' new features irrespective of the value they receive from it. The results help shape the practitioners and bank service providers' view of digital modes of banking. The banks are therefore suggested to look forward to new generation users' need who favor phygital (physical + digital) services thus, the spontaneous participation and engagement can be ensured if the m-banking apps are fun (emotionally engaging), easily understandable (cognitively engaging), and user-friendly (behaviorally engaging), all together offering a holistic value to the app users.

7. CONCLUSION

In sum, this study imparts both theoretical and practical implications. From a theoretical perspective, the study posits a new mediating factor in the relationship between users' engagements and users' behavioral intentions toward mobile banking apps in the future. Whereas from a managerial perspective, the study proposes that value co-creation happens if users can engage on a cognitive and emotional level with the m-banking apps. Value co-creation strengthens the relationship among cognitive and behavioral engagement and users' intention to use the service subsequently.

We conclude the paper by inquiring into the limitations and suggesting some possible scopes for future research. Firstly, we established a mediating relationship between user engagement and behavioral intentions for future usage. But the antecedents of engagement could be incorporated into the model. Due to the complexity and strong evidence from previous literature (Pansari and Kumar, 2017; Chan et al., 2014), that part was omitted from the model. Due to limitations of resources and time, the relationship between user engagement and behavioral intention was examined from a developing country's perspective. But the cross-country or longitudinal design of the study may put forward different findings.

REFERENCES

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior (pp. 11-39). *Springer*, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-69746-3_2
- Aldammagh, Z., Abdeljawad, R., & Obaid, T. (2021). Predicting mobile banking adoption: An integration of TAM and TPB with trust and perceived risk. *Financial Internet Quarterly*, 17(3), 35-46.
- Ali, A., Hameed, A., Moin, M. F., & Khan, N. A. (2022). Exploring factors affecting mobile-banking app adoption: a perspective from adaptive structuration theory. *Aslib Journal of Information Management*, 2050.
- Altin Gumussoy, C., Kaya, A., & Ozlu, E. (2018). Determinants of mobile banking use: an extended TAM with perceived risk, mobility access, compatibility, perceived self-efficacy and subjective norms. In *Industrial Engineering in the Industry 4.0 Era: Selected papers from the Global Joint Conference on Industrial Engineering and Its Application Areas, GJCIE 2017*, July 20–21, Vienna, Austria (pp. 225-238). Springer International Publishing.
- Bakker, D., & Rickard, N. (2019). Engagement with a cognitive behavioral therapy mobile phone app predicts changes in mental health and wellbeing: MoodMission. *Australian Psychologist*, 54(4), 245-260.
- Bandura, A. (1986). *Social Foundations of Thoughts and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bangladesh Bank (2022). Financial System Overview - Banks an FIs. *Bangladesh Bank*. Available at: <https://www.bb.org.bd/en/index.php/financialactivity/bankfi#:~:text=There%20are%2061%20scheduled%20banks,and%20Bank%20Company%20Act%2C%201991.> (Accessed: February 11, 2023).
- Bangladesh Bureau of Statistics [BBS]. (2022). *Population & Housing Census 2022 (Preliminary Report)*. Bangladesh Bureau of Statistics, Ministry of Planning, Government of the People's Republic of Bangladesh.
- Belanche, D., Casaló, L. V., Schepers, J., & Flavián, C. (2021). Examining the effects of robots' physical appearance, warmth, and competence in frontline services: The Humanness-Value-Loyalty model. *Psychology & Marketing*, 38(12), 2357-2376.
- Bland, J. M., & Altman, D. G. (1997). Statistics notes: Cronbach's alpha. *Bmj*, 314(7080), 572.
- Brodie, R. J., Hollebeek, L. D., Jurić, B., & Ilić, A. (2011). Customer engagement: Conceptual domain, fundamental propositions, and implications for research. *Journal of Service Research*, 14(3), 252-271.
- Brown, J. D. (2002). The Cronbach alpha reliability estimate. *JALT Testing & Evaluation SIG Newsletter*, 6(1).
- Business Inspection BD (2023). Top internet banking apps in Bangladesh. *Business Inspection BD*. Available at: <https://businessinspection.com.bd/top-internet-banking-apps-in-bd/> (Accessed: March 12, 2023).

- Chan, T. K., Zheng, X., Cheung, C. M., Lee, M. K., & Lee, Z. W. (2014). Antecedents and consequences of customer engagement in online brand communities. *Journal of Marketing Analytics*, 2, 81-97.
- Chen, S., Su, T., Fan, L., Meng, G., Xue, M., Liu, Y., & Xu, L. (2018), October. Are mobile banking apps secure? what can be improved? In Proceedings of the 2018 26th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering, *ACM Digital Library*. <https://doi.org/10.1145/3236024.3275523>
- Cheng, S. I. (2011). Comparisons of competing models between attitudinal loyalty and behavioral loyalty. *International Journal of Business and Social Science*, 2(10), 149-166.
- Chitungo, S. K., & Munongo, S. (2013). Extending the technology acceptance model to mobile banking adoption in rural Zimbabwe. *Journal of Business Administration and Education*, 3(1).
- Christmann, A., & Van Aelst, S. (2006). Robust estimation of Cronbach's alpha. *Journal of Multivariate Analysis*, 97(7), 1660-1674.
- Cohen, J. (1988). Set correlation and contingency tables. *Applied Psychological Measurement*, 12(4), 425-434.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340.
- Devadevan, V. (2013). Mobile Banking in India—Issues & Challenges. *International Journal of Emerging Technology and Advanced Engineering*, 3(6), 516-520.
- Dovaliene, A., Piligrimiene, Z., & Masiulyte, A. (2016). Factors influencing customer engagement in mobile applications. *Engineering Economics*, 27(2), 205-212.
- Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling*. University of Akron Press.
- Fenu, G., & Pau, P. L. (2015). An analysis of features and tendencies in mobile banking apps. *Procedia Computer Science*, 56, 26-33.
- Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior: an introduction to theory and research. Reading, Massachusetts: *Addison-Wesley*.
- Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). Integrating virtual reality devices into the body: effects of technological embodiment on customer engagement and behavioral intentions toward the destination. *Journal of Travel & Tourism Marketing*, 36(7), 847-863.
- Gao, L., & Bai, X. (2014). A unified perspective on the factors influencing consumer acceptance of internet of things technology. *Asia Pacific Journal of Marketing and Logistics*, 26(2), 211-231.
- Garzaro, D. M., Varotto, L. F., & Pedro, S. D. C. (2021). Internet and mobile banking: the role of engagement and experience on satisfaction and loyalty. *International Journal of Bank Marketing*, 39(1), 1-23.

- Gu, J. C., Lee, S. C., & Suh, Y. H. (2009). Determinants of behavioral intention to mobile banking. *Expert Systems with Applications*, 36(9), 11605-11616.
- Gunzler, D., Chen, T., Wu, P., & Zhang, H. (2013). Introduction to mediation analysis with structural equation modeling. *Shanghai Archives of Psychiatry*, 25(6), 390.
- Gupta, S., & Kim, H. W. (2010). Value-driven Internet shopping: The mental accounting theory perspective. *Psychology & Marketing*, 27(1), 13-35.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). Partial least squares structural equation modeling (PLS-SEM) using R: A workbook. *Springer Nature*, 197.
- Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate Data Analysis: A Global Perspective*, vol. 7 Pearson Education. Upper Saddle River, NJ.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-152.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24.
- Hayikader, S., Hadi, F. N., & Ibrahim, J. (2016). Issues and security measures of mobile banking Apps. *International Journal of Scientific and Research Publications*, 6(1), pp.36-41.
- Hepola, J., Karjaluo, H., & Shaikh, A. A. (2016). Consumer engagement and behavioral intention toward continuous use of innovative mobile banking applications: a case study of Finland. In International Conference on Information Systems. *Association for Information Systems (AIS)*.
- Ho, J. C., Wu, C. G., Lee, C. S., & Pham, T. T. T. (2020). Factors affecting the behavioral intention to adopt mobile banking: An international comparison. *Technology in Society*, 63, 101360.
- Hong, I. B. (2019). Understanding and predicting behavioral intention to adopt mobile banking: The Korean experience. *Journal of Global Information Management (JGIM)*, 27(3), 182-202.
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4), 692-724.
- Kamboj, S., Sharma, M., & Sarmah, B. (2022). Impact of mobile banking failure on bank customers' usage behaviour: the mediating role of user satisfaction. *International Journal of Bank Marketing*, 40(1), 128-153.
- Kamdjoug, J. R. K., Wamba-Taguimdje, S. L., Wamba, S. F., & Kake, I. B. E. (2021). Determining factors and impacts of the intention to adopt mobile banking app in Cameroon: Case of SARA by afriland First Bank. *Journal of Retailing and Consumer Services*, 61, 102509.

- Khan, M. R., Rana, S., & Hosen, M. I. (2022). Impact of trustworthiness on the usage of m-banking apps: A study on Bangladeshi consumers. *Business Perspectives and Research*, 10(2), 234-250.
- Kim, G., Shin, B., & Lee, H. G. (2009). Understanding dynamics between initial trust and usage intentions of mobile banking. *Information Systems Journal*, 19(3), 283-311.
- Kline, R.B. (2016). Principles and practice of structural equation modeling (Fourth ed.). *The Guilford Press*.
- Kosiba, J. P. B., Boateng, H., Okoe Amartey, A. F., Boakye, R. O., & Hinson, R. (2018). Examining customer engagement and brand loyalty in retail banking: The trustworthiness influence. *International Journal of Retail & Distribution Management*, 46(8), 764-779.
- Kumar, P., Dwivedi, Y. K., & Anand, A. (2021). Responsible artificial intelligence (AI) for value formation and market performance in healthcare: The mediating role of patient's cognitive engagement. *Information Systems Frontiers*, 1-24.
- Lalicic, L., & Weismayer, C. (2021). Consumers' reasons and perceived value co-creation of using artificial intelligence-enabled travel service agents. *Journal of Business Research*, 129, 891-901.
- Lee, J. C., & Chen, X. (2022). Exploring users' adoption intentions in the evolution of artificial intelligence mobile banking applications: the intelligent and anthropomorphic perspectives. *International Journal of Bank Marketing*, 631-658.
- Lee, K. C., Chang, I. H., Wu, T. J., & Chen, R. S. (2022). The moderating role of perceived interactivity in the relationship between online customer experience and behavioral intentions to use parenting apps for Taiwanese preschool parents. *SAGE Open*, 12(1), 21582440221082136.
- Lee, S. M., & Lee, D. (2020). "Untact": a new customer service strategy in the digital age. *Service Business*, 14(1), pp.1-22.
- Lehmann, J., Lalmas, M., Yom-Tov, E., & Dupret, G. (2012). Models of user engagement. In User Modeling, Adaptation, and Personalization: 20th International Conference, UMAP 2012, Montreal, Canada, July 16-20, 2012. Proceedings 20 (pp. 164-175). *Springer*, Berlin, Heidelberg.
- Lin, H. F. (2011). An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. *International Journal of Information Management*, 31(3), 252-260.
- Malaquias, R. F., & Hwang, Y. (2016). An empirical study on trust in mobile banking: A developing country perspective. *Computers in Human Behavior*, 54, 453-461.
- Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, 56(2), 429-440.

Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice*, 13(6), 522-526.

Munoz-Leiva, F., Climent-Climent, S., & Liébana-Cabanillas, F. (2017). Determinants of intention to use the mobile banking apps: An extension of the classic TAM model. *Spanish Journal of Marketing-ESIC*, 21(1), 25-38.

Nguyen, T. T. T., & Tong, S. (2022). The impact of user-generated content on intention to select a travel destination. *Journal of Marketing Analytics*, 1-15.

Pansari, A., & Kumar, V. (2017). Customer engagement: the construct, antecedents, and consequences. *Journal of the Academy of Marketing Science*, 45, 294-311.

Portela, M., & Granell-Canut, C. (2017), September. A new friend in our smartphone? Observing interactions with chatbots in the search of emotional engagement. In *Proceedings of the XVIII International Conference on Human Computer Interaction* (pp. 1-7).

Przegalinska, A., Ciechanowski, L., Stroz, A., Gloor, P., & Mazurek, G. (2019). In bot we trust: A new methodology of chatbot performance measures. *Business Horizons*, 62(6), 785-797.

Ramdhony, D., & Munien, S. (2013). An investigation on mobile banking adoption and usage: A case study of Mauritius. *World*, 3(3), 197-217.

Rather, R. A., & Hollebeek, L. D. (2021). Customers' service-related engagement, experience, and behavioral intent: Moderating role of age. *Journal of Retailing and Consumer Services*, 60, 102453.

Rather, R. A., Parrey, S. H., Gulzar, R., & Rehman, S. U. (2022). COVID-19-based threat vs coping appraisal: effect of psychological risk on customer engagement and behavioral intentions. *Journal of Hospitality and Tourism Insights*.

Rogers, E. M. (1995). *Definition of Innovation* (4th ed.). New York: *The Free Press*.

Sahoo, D., & Pillai, S. S. (2017). Role of mobile banking servicescape on customer attitude and engagement: An empirical investigation in India. *International Journal of Bank Marketing*, 35(7), 1115-1132.

Saleem, M., Kamarudin, S., Shoaib, H. M., & Nasar, A. (2022). Retail consumers' behavioral intention to use augmented reality mobile apps in Pakistan. *Journal of Internet Commerce*, 21(4), 497-525.

Sampaio, C. H., Ladeira, W. J., & Santini, F. D. O. (2017). Apps for mobile banking and customer satisfaction: a cross-cultural study. *International Journal of Bank Marketing*, 35(7), pp.1133-1153.

Shankar, A. (2021). Impact of mobile banking application interactivity on consumer engagement: An Experiment-based investigation. *Journal of Global Information Management (JGIM)*, 30(5), 1-18.

- Silva, S. C., De Cicco, R., Levi, M., & Hammerschmidt, M. (2023, February). Value Creation in Gamified Chatbot Interactions and Its Impact on Brand Engagement. In *Chatbot Research and Design: 6th International Workshop, CONVERSATIONS 2022*, Amsterdam, The Netherlands, November 22–23, 2022, Revised Selected Papers (pp. 50-65). Cham: *Springer International Publishing*.
- Smith, S. D., Salaway, G., Caruso, J. B., & Katz, R. N. (2009). The ECAR study of undergraduate students and information technology. *Educause Center for Applied Research*.
- Sulaiman, A., Jaafar, N. I., & Mohezar, S. (2007). An overview of mobile banking adoption among the urban community. *International Journal of Mobile Communications*, 5(2), 157-168.
- Tafesse, W., & Wien, A. (2018). Using message strategy to drive consumer behavioral engagement on social media. *Journal of Consumer Marketing*, 35(3), 241-253
- Tang, Y., & Hew, K. F. (2022). Effects of using mobile instant messaging on student behavioral, emotional, and cognitive engagement: A quasi-experimental study. *International Journal of Educational Technology in Higher Education*, 19, 1-22.
- Tapar, A. V., Dhaigude, A. S., & Jawed, M. S. (2017). Customer experience-based satisfaction and behavioural intention in adventure tourism: exploring the mediating role of commitment. *Tourism Recreation Research*, 42(3), 344-355.
- The Daily Star. (2011). DBBL first to introduce mobile banking. *The Daily Star*. Available at: <https://www.thedailystar.net/news-detail-180027> (Accessed: February 13, 2023).
- Thusi, P., & Maduku, D. K. (2020). South African millennials' acceptance and use of retail mobile banking apps: An integrated perspective. *Computers in Human Behavior*, 111, 106405.
- Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, 36, 1-10.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425-478.
- Wessels, L., & Drennan, J. (2010). An investigation of consumer acceptance of M-banking. *International Journal of Bank Marketing*, 28(7), 547-568.
- Zhang, T., Lu, C., & Kizildag, M. (2018). Banking “on-the-go”: examining consumers' adoption of mobile banking services. *International Journal of Quality and Service Sciences*, 10(3), 279-295.
- Zhou, T. (2012). Understanding users' initial trust in mobile banking: An elaboration likelihood perspective. *Computers in Human Behavior*, 28(4), 1518-1525.