

How Does Interactivity Impact User Engagement Over Mobile Bookkeeping Applications?

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ABSTRACT

The purpose of this study is to examine the effect of interactivity on users' engagement towards mobile bookkeeping application using stimulus-organism-response (S-O-R) theory and technology acceptance model (TAM). Further, moderation effect of users' innovativeness was also examined. A total of 308 responses were analyzed for examining the proposed hypotheses. The results exhibited that application interactivity enhances perceived usefulness (PU) and perceived ease of use (PEOU) and in turn users' engagement. Moreover, users' innovativeness positively moderates the association between PU, PEOU, and user engagement. The study suggests marketers enhance application interactivity to enhance user engagement.

KEYWORDS

Bookkeeping Application, Interactivity, Technology Acceptance Model, User Innovativeness, Users' Engagement

1. INTRODUCTION

With the advancement in information and communication technology and increasing penetration of mobile phones worldwide, all businesses, including bookkeeping service providers, are using mobile platforms to deliver their services (Gupta and Arora, 2017; Shankar and Datta, 2019; Shankar, 2021; Shankar et al., 2021a). Service providers are early adopters of advanced information technology in delivering services (Mullan et al., 2017; Shankar and Jain, 2021). Compared to other channels, the mobile application provides more convenient, flexible, and affordable services without geographical and time constraints (Tam and Oliveira, 2017; Shankar et al., 2021). The mobile application allows customers to perform different activities over mobile phones (Shaikh and Karjaluoto, 2015; Shankar et al., 2020). Similarly, accounting services providers are now providing services using mobile phone applications, and several applications have been introduced to provide accounting services, especially bookkeeping services, to enterprises. Quickbooks, Wave, Bench, Bill.com, and Khatabook are major bookkeeping applications for small business owners. Accounting management is a real challenge for Small and Medium Enterprises (SMEs), and they need a handy and straightforward digital solution to manage their accounts. Although users adopt mobile bookkeeping applications for availing bookkeeping services, the usage of mobile bookkeeping applications is a critical issue

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for them (Jebarajakirthy and Shankar, 2020). Hence, marketers put several efforts in enhancing user engagement over mobile bookkeeping platforms. As user engagement enhances the usage of mobile bookkeeping platforms, service providers are keen to know how they can enhance users' engagement.

Further, user engagement also helps in acquiring and retaining users. As in the mobile commerce context, marketers have limited resources to influence user engagement (Shankar et al., 2020). Along with the traditional service marketing mix, the interactivity of the mobile application plays a crucial role in enhancing user engagement (Bedi et al., 2017; Islam et al., 2012). Mobile application interactivity helps in improving user engagement, enhancing usability, and personalization (Lee et al., 2015). Mobile bookkeeping application interactivity includes interface navigation, content, user, control, and responsiveness which enhances user experience (Lee et al., 2015).

Additionally, the interactivity of the application offers several functional and hedonic values to the users in availing of bookkeeping services over mobile bookkeeping platforms (Cano et al., 2017; Shankar and Datta, 2019). Moreover, interactivity also reduces user-perceived transaction risks and enhances user engagement. Hence, in previous literature, several attempts were made to examine the role of website interactivity on user responses (Coursaris and Sung, 2012; Hood et al., 2015; Bedi et al., 2017). Nevertheless, scant efforts were made to examine the effect of mobile application interactivity in a different context (Alnawas and Aburub, 2016; Cano et al., 2017; Islam et al., 2021, and there is a dearth of literature examining the effect of interactivity on user engagement in mobile bookkeeping context. However, due to the small screen size, navigation complexity, less compatibility, and complex interface, several users are skeptical towards using mobile bookkeeping applications for availing of bookkeeping services and show less engagement (Shankar, 2021). Hence, Marketers are keen to know how to enhance users' interactivity over mobile bookkeeping applications to enhance user engagement. Hence, this study attempts to examine the effect of interactivity on user engagement over mobile bookkeeping application platforms using the TAM and S-O-R framework. Hence, we explore how different mobile bookkeeping application interactivity elements affect user engagement. The study also examines the moderating impact of user innovativeness between interactivity and user engagement. This research carries practical and theoretical contributions. Theoretically, the study's findings will enrich service marketing and information system adoption literature. The study also extends the TAM and S-O-R in mobile bookkeeping context. Further, this research enriches the users' innovativeness literature by examining the moderating effect of it in a new context (mobile bookkeeping). This study offers implications to the mobile bookkeeping application service providers to enhance mobile bookkeeping application interactivity to enhance user engagement.

2. LITERATURE REVIEW

2.1 Underpinning Theory

TAM was applied in different mobile services contexts such as mobile bookkeeping (Koksal, 2016), mobile health (Hung and Jen, 2012), mobile learning (Joo et al., 2014), mobile shopping (Agrebi and Jallais, 2014), mobile governance (Liu et al., 2014), and mobile games (Park et al., 2014) to explore users' engagement. Several studies used extended TAM, including different variables, for a better explanation of adoption behavior in different contexts (Park et al., 2014; Islam et al., 2021; Jain and Shankar, 2021). In this study, TAM has been used due to multiple reasons. TAM was extensively used in exploring technology and information system adoption behavior in different contexts (Tam and Oliveira, 2017), and this model is most reliable for exploring users' engagement of voluntary services (Marangunić and Granić, 2015). Further, TAM is the best suitable model that could be extended using different variables as contexts suitability (Venkatesh and Davis, 2000).

2.2 Effect of Mobile Bookkeeping Application Interactivity

Interactivity refers to the capability of the system for better communication between sender and receiver, and the communicator has better control over layout and content over the website (Rice, 1984). Interactivity has been found to be a crucial factor for the success of information systems in communication, marketing, advertising, and information system literature (Chou et al., 2010; Larsson, 2011; Cano et al., 2017; Gan and Balakrishnan, 2017; Islam et al., 2021; Shankar et al., 2021). Features and perception are two major elements of interactivity (Lee et al., 2015). In this study, both functional-oriented and perception-oriented approaches have been used to conceptualize mobile bookkeeping application interactivity.

Interactivity has been operationalized using several constructs such as user control, perceived responsiveness, content richness, two-way communication, and perceived personalization. User control refers to “users’ control over activities taking place over mobile applications such as choice of information and sequence and schedule of communication (Coursaris and Sung, 2012; Shankar, 2021). Additionally, higher user control reduces time and effort to complete the transaction over application (Cyr et al., 2009; Shankar et al., 2020). Furthermore, if user-perceived more control over environmental factors, they tend to interact actively (Proshansky et al., 1974; Behl et al., 2022), indicating the key role in interactivity (Lee et al., 2015). Moreover, user control helps in developing users’ confidence which plays a crucial role in enhancing interactivity (Lee et al., 2015; Shankar and Behl, 2021). The next construct is perceived responsiveness which refers to “the accuracy and relevance of responses provided over the application to resolve issues faced by user” (Johnson et al., 2006, p. 41). If users receive prompt and relevant responses, they tend to interact with the application (Coursaris and Sung, 2012; Shankar et al., 2019) actively. Hence, the relevancy, accuracy, and promptness of the responses provided by the application are the key aspects of interactivity. The content richness of the application is the next determinant of interactivity which refers to “the availability of updated verbal and nonverbal information over-application” (Wu, 2006). Updated and relevant information helps users to use services inconvenient and easy manner (Johnson et al., 2006; Coursaris and Sung, 2012; Shankar and Kumari, 2019). Moreover, the use of symbols, images, video, and other multimedia objects enhances the content richness and, subsequently, interactivity of the application (Lee et al., 2015; Shankar and Nigam, 2021). The next construct is two-way communication, conceptualized as “bi-directional flow of the information” (Teo et al., 2003; Gao et al., 2010). Two-way communication is always effective compared to monologue communication (Coursaris and Sung, 2012; Shankar et al., 2020). If the application allows users to provide the feedback and see the feedback provided by other users, users perceive greater interactivity (Kiousis, 2002; Coursaris and Sung, 2012; Shankar et al., 2020; Jebarajakirthy et al., 2021). Personalization is the next construct of the application interactivity, which refers to the “degree of appropriateness and relevance of the application to fulfill specific needs of users” (Lee et al., 2015). The interactivity of the application is likely to be enhanced if it provides personal attention to the users and customized services according to their needs and wants (Shankar, 2021). Thus, the following hypotheses have been proposed:

H1: *User control enhances (a) PU and (b) PEOU.*

H2: *Perceived responsiveness enhances (a) PU and (b) PEOU.*

H3: *Content richness enhances (a) PU and (b) PEOU.*

H4: *Two-way communication enhances (a) PU and (b) PEOU.*

H5: *Perceived personalization enhances (a) PU and (b) PEOU.*

2.3 S-O-R Theory and Effects of PU and PEOU on Users’ Engagement

The current study applied the S–O–R framework to propose a relationship between interactivity, PU, PEOU, and users’ engagement. According to the S–O–R model, external stimulus generates organisms through internal psychological processes leading to a response. In the literature, the S-O-R model

has extensively been used to investigate user responses in various contexts (Zhang et al., 2018; Han & Kim, 2020; Jebarajakirthy and Shankar, 2021). In marketing parlance, these stimuli could be cues, such as product/brand, logo, advertisements, packaging, word-of-mouth, value, attractiveness, etc. (Hsu et al., 2012; Chang, 2015). In the current study, we argue interactivity as stimuli. S-O-R theory describes organism as cognitive and affective states resulting from the stimuli and mediates the relationship between the stimulus and response (Chang and Chen, 2008, p. 820). Those internal states could be the feeling of pleasure, arousal, and dominance (Chang, 2015; Jebarajakirthy and Shankar, 2021) or even inspiration (a state). In this study, we argue that PU and PEOU act as the intermediate state and interactivity act as stimuli and generate PU and PEOU, a motivation state (organism), resulting in a response. Response in S-O-R theory means the behavioral manifestation of the organism. In marketing parlance, they can be purchase intention, actual purchase, and loyalty (Goi et al., 2014). The current study considers mobile bookkeeping users' engagement as the desired response. Accordingly, based on the S-O-R model, we posit that interactivity features (stimuli) create PU and PEOU (organism), resulting in users' engagement (response).

2.3.1 Perceived Usefulness (PU)

PU refers to the users' belief that using specific technology or information systems will help them perform better (Davis, 1989: p.320). Several previous studies determined that PU has a significant positive impact on users' engagement (Liu et al., 2014; Park et al., 2014; Koksai, 2016; Shankar and Datta, 2018). Users analyze costs and benefits trade-off before adopting a new information system (Jebarajakirthy and Shankar, 2021). Users tend to adopt it if they find it more useful than traditional accounting (Amin et al., 2012; Shankar and Kumari, 2016). Prompt and convenient bookkeeping services with greater accessibility without the time and location restrictions provide a sense of a PU in users' minds which helps in accelerating mobile bookkeeping adoption (Koksai, 2016). Thus, it is hypothesized that:

H6: PU is positively associated with mobile bookkeeping users' engagement.

2.3.2 Perceived Ease of Use (PEOU)

PEOU is the level of complexity associated with using a technology (Davis, 1989: p.320). It is a crucial determinant of TAM as it influences PU and users' engagement (Gan, and Balakrishnan, 2017; Jain and Shankar, 2021). Users prefer to adopt the technology, which is easy to use and requires less technical knowledge to operate (Deci and Ryan, 1985; Islam et al., 2019). If users perceive that using a mobile bookkeeping channel is easier to use than a traditional bookkeeping system, they represent positive behavior towards it (Jebarajakirthy and Shankar, 2021). Additionally, mobile bookkeeping applications with complex navigation are less pleasing, less attractive, and difficult to operate; hence users are reluctant to use them (Amin et al., 2012). Attractive application design updated, accurate information, valid hyperlinks, and user-friendly interfaces significantly impact PEOU, in turn to users' engagement (Amin et al., 2012; Gan and Balakrishnan, 2017). Thus, it is hypothesized that.

H7: PEOU is positively associated with mobile bookkeeping users' engagement.

2.4 Moderating Effect of User Innovativeness

User innovativeness refers to users' tendency to try novel products and services (Roehrich, 2004; Adapa et al., 2020). The user innovativeness was conceptualized in the diffusion of innovation (DOI) theory proposed by Rogers (1983), which explained innovativeness as an individual tendency to adopt new technology. Previous literature determined user innovativeness as a crucial

factor in forming users' engagement behavior in different contexts (Wood, 2010; Koschate-Fischer et al., 2018; Cha, 2020; Shankar et al., 2021). User innovativeness significantly affects user attitude towards service-based technology (Frimpong et al., 2017; Hwang et al., 2020). Innovative users tend to use new technology and hence represent a positive response towards mobile bookkeeping (Shankar et al., 2021). Users with less innovativeness are skeptical about using new technology and, hence, do not prefer mobile bookkeeping platforms (Jebarajakirthy and Shankar, 2021). Due to the involvement of finance, low-innovative users perceived several risks in using mobile bookkeeping platforms (Shankar, 2021). In contrast, innovative users receive several utilitarian and hedonic benefits over mobile bookkeeping platforms (Jebarajakirthy and Shankar, 2021). Further, innovative users found mobile bookkeeping services effortless and useful due to interactive features (efficient navigation, easy search option, content richness, user-friendly interface, and user control) compared to less innovative users (Lee et al., 2015). Hence following hypotheses are formulated:

H8: The effect of PU on users' engagement is higher for users having a high level of innovativeness compared to a low level of innovativeness.

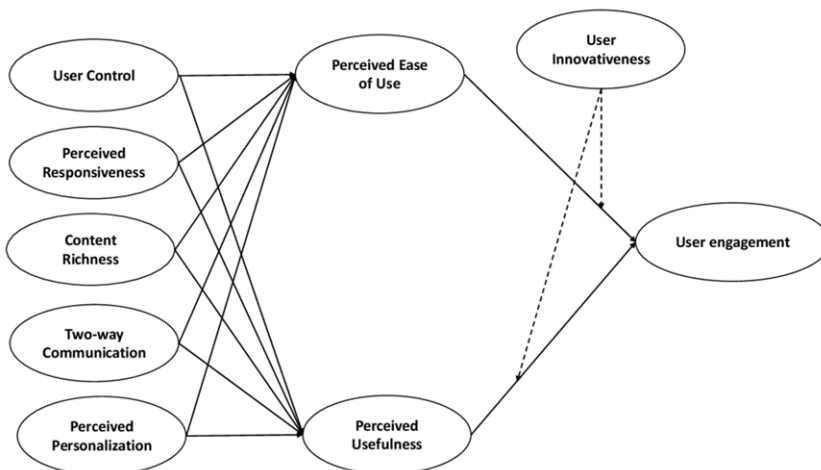
H9: The effect of PEOU on users' engagement is higher for users having a high level of innovativeness compared to a low level of innovativeness.

3. METHOD

3.1 Sample and Survey Administration

A total of 500 respondents were approached using purposive sampling with an online questionnaire. Respondents were approached over different social media platforms. Out of 500 who approached, a total of 346 responses were received, and 308 responses were used for data analysis. The sample comprised 56.2% male. The majority of the respondents belonged to below 20 years (39%) and 21-40 years (43%). 12.5% sample were from the age group 40 -60 years, and the rest were above 60 years. The data were collected between December 2020 and February 2021. The sample consists of existing users of bookkeeping applications.

Figure 1. Conceptual framework



3.2 Measures

The survey instrument was devolved by taking items from a previously validated scale. PU and PEOU were measured scales borrowed from Islam et al. (2021). Three items operationalizing user innovativeness were adopted from Roehrich (2004). The user engagement scale was borrowed from Laroche et al. (2012) and Kharou et al. (2020). The user control scale was obtained from (Wu, 2006), perceived responsiveness was operationalized using four items from Wu (2006) and Lee et al. (2015). Content richness scale was obtained from Mann and Sahni (2011). Two-way communication was measured using three items adapted from Liu (2003) and Shih and Huang (2014). Perceived personalization was conceptualized using four items taken from Wu (2006) and Lee et al. (2015). Responses were collected in a 5-point Likert scale format. Finally, we collected demographic information (age, education, and employment status) of the respondents, which were considered as control variables. Prior to the actual survey administration, a pre-test of the questionnaire was conducted with 30 mobile bookkeeping users. Feedback from the pre-test resulted in slight modifications to the survey instrument.

4. RESULTS

4.1 Common Method Bias (CMB)

In the study, several measures have been taken to check CMB. In the questionnaire, Items measuring a variable are theoretically unrelated to other variables (Malhotra et al., 2006). Moreover, a common latent factor method has been performed to check CMB. Results suggest that for all constructs difference between standard factor loadings with latent factor and without latent factor is less than .2, indicating the absence of CMB (Podsakoff et al., 2003).

4.2 Measurement Model Validation

Table 1 shows the summary of the measurement model. All the factor loadings and the Average Variance Extracted (AVE) values were close to or above 0.7 and 0.5, respectively, indicating the convergent validity of the measures (Hair et al., 2010). Cronbach's alpha coefficients were above 0.7 for all constructs, indicating the items' reliability in measuring their respective construct (Hair et al., 2010). In Table 2, the diagonal elements in parentheses are the square root of AVE, whereas off-diagonal elements represent the correlation coefficient among constructs. Results indicate that the value of AVE is larger than the corresponding correlation coefficient, indicating discriminant validity among constructs (Fornell and Larcker, 1981).

4.3 Hypotheses Testing

A structural equation model (SEM) was run to investigate direct effect hypotheses (H_1 - H_7). Table 3 represents the result of hypothesis testing and model fit indices. Model fit indices indicate an acceptable level of model fit for the proposed framework.

Results indicate that, user control ($\beta = .15, p < 0.05$), two-way communication ($\beta = .55, p < 0.001$), and perceived personalization ($\beta = .37, p < 0.001$) are positively associated with PU. Hence, hypotheses H_{1a} , H_{4a} , and H_{5a} were supported. Whereas perceived responsiveness ($\beta = .07, p > 0.05$) and content richness ($\beta = .09, p > 0.05$) have no significant effects on PU. Hence, hypotheses H_{2a} and H_{3a} were not supported. Additionally, Results indicated that user control ($\beta = .59, p < 0.001$), perceived content richness ($\beta = .41, p < 0.001$), two-way communication ($\beta = .47, p < 0.001$), and perceived personalization ($\beta = .36, p < 0.001$) are positively associated with PEOU. Hence, hypotheses H_{2a} , H_{3b} , H_{4b} , and H_{5b} were supported. At the same time, perceived responsiveness ($\beta = -.05, p > 0.05$) does not significantly affect PEOU. Hence, H_{2b} was not supported. Both the generic variables of TAM, PU ($\beta = .34, p < 0.001$) and PEOU ($\beta = .16, p < 0.05$) are significantly associated with mobile bookkeeping users' engagement. Thus, H_6 and H_7 were also supported.

Table 1. Reliability and Validity of measurement scale

Variables and items	FL
User Control (AVE= 0.61, CR= 0.82, α= 0.82)	
I can freely move through the bookkeeping application menu	0.75
I know how to control bookkeeping applications efficiently	0.77
I can manage information in bookkeeping application as I wish	0.82
Perceived Responsiveness (AVE= 0.53, CR= 0.82, α= 0.82)	
The bookkeeping application has the ability to respond to my specific questions efficiently	0.72
The bookkeeping application quickly responds to my input	0.75
The bookkeeping application gives relevant information with respect to my input	0.73
The bookkeeping application has no delay in operations	0.72
Content Richness (AVE= 0.67, CR= 0.89, α= 0.88)	
Reliable and accurate information is provided by over bookkeeping application	0.71
I find that content over bookkeeping application is up to date	0.90
The bookkeeping application provides an interactive interface by using icons and images	0.91
The bookkeeping application provides intuitive icons and images on its interface	0.74
Two-way Communication (AVE= 0.77, CR= 0.91, α= 0.90)	
The bookkeeping application facilitates two-way communication	0.84
The bookkeeping application gives me the opportunity to talk back	0.88
The bookkeeping application enables conversation among members	0.91
Perceived Personalization (AVE= 0.70, CR= 0.90, α= 0.90)	
The bookkeeping application menu can be personalized to my preference.	0.77
The bookkeeping application was like talking back to me while I clicked through	0.86
I perceived the bookkeeping application to be sensitive to my needs	0.85
The bookkeeping application menu can be personalized to my preference	0.88
Perceived Ease of Use (AVE= 0.70, CR= 0.92, α= 0.92)	
Learning to operate bookkeeping application would be easy for me	0.84
I would find it easy to get a bookkeeping application to do what I want it to do	0.85
My interaction with the bookkeeping application would be clear and understandable	0.84
I would find bookkeeping application to be flexible to interact with	0.83
It would be easy for me to become skillful at using bookkeeping application	0.82
Perceived Usefulness (AVE= 0.70, CR= 0.87, α= 0.87)	
Using bookkeeping applications would be valuable	0.89
Using bookkeeping application would be involving	0.91
Using bookkeeping application would be needed	0.70
User Innovativeness (AVE= 0.72, CR= 0.94, α= 0.94)	
I am always seeking new ideas and experiences	0.80
I do not prefer a routine way of life to an unpredictable one full of change	0.87
I like meeting people who have a new idea	0.91
User engagement (AVE= 0.61, CR= 0.87, α= 0.86)	
I am actively participating actively over bookkeeping application	0.68
I enjoyed interacting with the online content over the bookkeeping application	0.88
I spent time exploring bookkeeping application	0.79

Notes: AVE= Average variance extracted, CR= Composite reliability, α = Cronbach's alpha coefficient, FL= Factor loading

Table 2. Discriminant validity

	UC	PR	CR	TWC	PP	PU	PEOU	UI	UE
UC	.78 ^a								
PR	.20**	.73 ^a							
CR	.71**	.20**	.81 ^a						
TWC	.39**	.30**	.33**	.87 ^a					
PP	.48**	.32**	.41**	.79**	.83 ^a				
PU	.28**	.36**	.28**	.43**	.43**	.84 ^a			
PEOU	.16**	.34**	.22**	.23**	.29**	.44**	.83 ^a		
UI	.57**	.26**	.52**	.39**	.50**	.29**	.23**	.84 ^a	
UE	.30**	.39**	.27**	.43**	.48**	.77**	.47**	.30**	.79 ^a

Notes: ** Correlation is significant at $p < 0.01$, ^a Diagonal value indicates the square root of AVE of individual latent construct, UC= user control, PR= perceived responsiveness, CR= content richness, TWC= two-way communication, PP= perceived personalization, PU= perceived usefulness, PEOU= perceived ease of use, UI= user innovativeness, UE= user engagement

Table 3 Structural model results

Path	β	SE	Hypotheses
User Control → PU	0.15*	0.07	Supported
Perceived Responsiveness → PU	0.07	0.05	Not Supported
Content Richness → PU	0.09	0.06	Not Supported
Two-way Communication → PU	0.55***	0.14	Supported
Perceived Personalization → PU	0.37***	0.09	Supported
User Control → PEOU	0.59***	0.19	Supported
Perceived Responsiveness → PEOU	-0.05	0.04	Not Supported
Content Richness → PEOU	0.41***	0.12	Supported
Two-way Communication → PEOU	0.47***	0.13	Supported
Perceived Personalization → PEOU	0.36***	0.11	Supported
PU → User engagement	0.34***	0.04	Supported
PEOU → User engagement	0.16**	0.05	Supported

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. Fit indices: CMIN/DF= 2.879 ($p < 0.001$), CFI= .91, GFI= .86, NFI= .87, TLI= .90, RMSEA= .071. CFI= comparative fit index, PU= Perceived Usefulness, PEOU= Perceived Ease of Use, GFI= goodness-of-fit index, NFI= normed fit index, TLI= Tucker-Lewis index, RMSEA= root mean square error of approximation.

4.4 Moderation Effect of User Innovativeness

A moderation analysis conducted using model 1 in PROCESS macro involved bootstrapping the effects 5,000 times, resulting in interaction terms and their 95% confidence intervals to investigate H_8 and H_9 . The results present in Table 4 indicated that the relationship between PU ($\beta = 0.111$; $LLCI = 0.0633$ and $ULCI = 0.1587$), PEOU ($\beta = 0.099$; $LLCI = 0.0285$ and $ULCI = 0.1695$) and users' engagement vary at different levels of users' innovativeness. Hence, H_8 and H_9 were supported. To further investigate the interaction's nature, we conducted a slope analysis, and a graph was plotted. As Figures 2 and 3 represent, at high levels of user innovativeness, PU and PEOU are more positively and significantly associated with mobile bookkeeping users' engagement than at low levels of user innovativeness.

Table 4 Moderation analysis

Paths	Effects	Bootstrap 95% CIs			Hypotheses
		BootSE	Lower	Upper	
Perceived Usefulness → User engagement	0.111	0.0242	0.0633	0.1587	Supported
Perceived Ease of Use→ User engagement	0.099	0.0358	0.0285	0.1695	Supported

Figure 2. Effect of perceived usefulness on user engagement for low and high user innovativeness

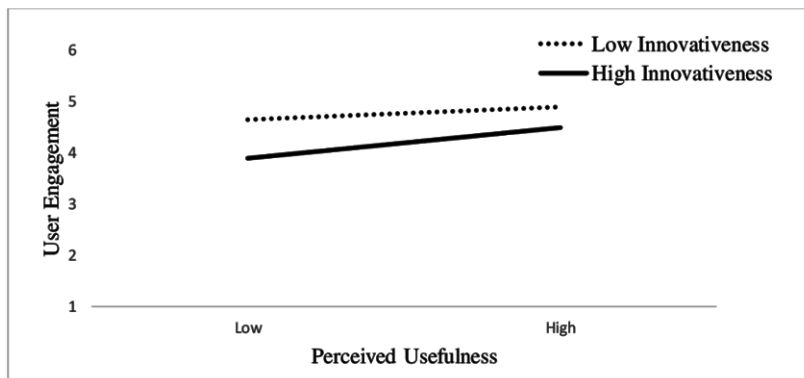
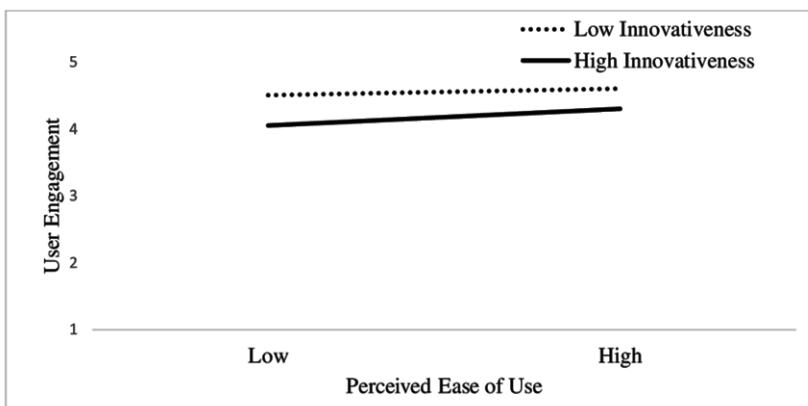


Figure 3. Effect of perceived ease of use on user engagement for low and high user innovativeness



5. DISCUSSION

In line with previous studies' findings, the results indicated that user control, content richness, two-way communication, and perceived personalization have a significant impact on PEOU (Blazevic et al., 2014; Gan and Balakrishnan, 2017; Islam et al., 2021). Interactive features of the application reduce information search efforts and provide adequate solutions to the users effectively. If users perceive better control information, they find it useful. With better control, they can easily use mobile bookkeeping. Further, content richness positively affects PEOU. If content shared over mobile bookkeeping platforms consists of videos, images, symbols, it is easy for the user to process the information and avail of bookkeeping services over mobile bookkeeping platforms. Results also

indicated that two-way communication plays a significant role in enhancing PEOU. Access to online reviews helps users know the experience of the existing user and helps them use the application easily.

Moreover, users can also communicate with service providers over mobile bookkeeping platforms which help them resolve their issues. The results also suggested that perceived personalization is positively associated with PEOU. Hence, if users receive personalized services such as welcome greetings, content-language, account information, and product information as per their preference, they find it easy to use.

The results also indicated that user control, two-way communication, and perceived personalization have significant effects on PU, which is consistent with previous literature (Cheng, 2014; Gan and Balakrishnan, 2017; Islam et al., 2021; Jain and Shankar, 2021). If users perceive better control over mobile bookkeeping platforms, they find it useful in performing the transaction. Further, access to online reviews helps users understand the performance of different products and services over mobile bookkeeping platforms. A two-way communication facility also helps users share their issues with the service providers, and they found it useful in resolving the issues.

The findings suggested that PU and PEOU are significantly associated with mobile bookkeeping users' engagement, consistent with previous literature (Shankar et al., 2021; Islam et al., 2021). If users perceive mobile bookkeeping is useful, they are likely to adopt it. Additionally, if they perceive that mobile bookkeeping reduces efforts and time, they tend to adopt it.

The study also investigated the role of user innovativeness on PU, PEOU, and mobile bookkeeping users' engagement association. Results exhibited that the relationship between PU and users' engagement varies at high and low levels of innovativeness which is consistent with previous related literature (Gamliel et al., 2013; Lee and Bai, 2014; Quach et al., 2016). Innovative users found interactive features more useful compared to less innovative users. Further, user innovativeness also moderates the PEOU and users' engagement association. Innovative users tend to show more positive responses towards mobile bookkeeping services if they find them easy to use compared to less innovative users.

6. ACADEMIC IMPLICATIONS

This study enriches mobile application design, interactivity, TAM, S-O-R model, and mobile bookkeeping users' engagement literature. Although, TAM is the well-established theory of technology adoption. Nevertheless, there have been calls for research to explore antecedents of PU and PEOU in different contexts (Benbasat and Barki, 2007). This study incorporated application interactivity and innovativeness into the TAM and expanded the theory in the mobile bookkeeping. Moreover, this study also investigates the moderating impact of user innovativeness on the generic construct of TAM and mobile bookkeeping users' engagement, contributing to the better conceptualization of TAM in the mobile bookkeeping context. The study also enriches S-O-R literature.

Although attempts were made to examine the impact of different socio-psychological factors on users' engagement in the mobile bookkeeping context, limited efforts were made to examine the role of interactivity. Especially, scant efforts examined how perception interactivity elements play a crucial role in the mobile bookkeeping context. We have examined the effect of perceived interactivity on users' engagement towards mobile bookkeeping, which is the paper's uniqueness.

Moreover, the impact of mobile application interactivity on users' behavioral intention in the mobile bookkeeping context is not straightforward. Hence, to understand this phenomenon, a comprehensive framework is required. Therefore, this study contributes to the mobile bookkeeping users' engagement literature by examining the intervening impact of user innovativeness on the PU, PEOU, and users' engagement.

Finally, previous studies used either the feature orientation approach or perception orientation approach to measure interactivity. However, this study combinedly used both approaches to conceptualizing interactivity, enriching interactivity literature.

7. PRACTICAL IMPLICATIONS

The study suggests to the bookkeeping application service providers. The bookkeeping application service providers should incorporate different features to enhance user control, content richness, two-way communication, and perceived personalization in their mobile bookkeeping application to enhance interactivity. Mobile bookkeeping applications should be more customer-centric and easy to control. The application interface should be easy to explore and provide several crucial information to the users.

The Bookkeeping application service providers should also provide real-time information, including image manipulations, zoom view technology, multimedia videos, images, symbols, GIFs, and valid hyperlinks to enhance the interactivity of the mobile bookkeeping platforms.

The Bookkeeping application service providers should also provide two-way communication facilities over mobile bookkeeping platforms. There must be a section where users can share their experiences. The Bookkeeping application service providers should also provide several options to connect with service providers such as live chat, SMS, email, and toll-free numbers to resolve users' issues. They should also put effort into providing customized features over mobile bookkeeping platforms. The Bookkeeping application service providers should provide information in multi-language, and users can select the language as per their preferences. Further, mobile bookkeeping applications should be available for all the available operating systems so users can download and easily use them.

Additionally, The Bookkeeping application service providers should ensure several means for providing adequate and quick customer support facilities to resolve technical and functional issues. Findings also indicated that user innovativeness significantly moderates the impact of PU and PEOU on users' engagement in mobile bookkeeping applications. Therefore, mobile bookkeeping service providers should incorporate more interactive features to enhance user innovativeness. Interactive applications will keep them engaged, thereby enhancing positive customer perceptions towards mobile bookkeeping applications.

8. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The study was conducted on mobile bookkeeping users in an emerging economy in Asia—India. Hence, generalizing the findings to users in other countries is questionable. Replicating this study in other countries will enable a better generalization of these findings. Moreover, user responses to mobile bookkeeping, such as their values, attitudes, and intention to purchase, are dynamic, indicating cross-sectional data is another limitation of the study. Using longitudinal data to replicate this study may reveal how the results of hypothesis testing alter over time. Further, users' engagement is a culturally driven phenomenon. Accordingly, several cultural factors might impact users' engagement in the mobile bookkeeping context, which can be investigated in the future.

Moreover, the big data revolution transforms behavioral studies into the next level with techniques, such as data extraction (Erevelles et al., 2015). Technology helps capture, in real-time, rich and plentiful data on user phenomena, which reveals interesting insights into user responses and their behavioral patterns. Thus, future research on mobile bookkeeping engagement can examine the relationship between interactivity, PU, PEOU, and users' engagement using real-time data extraction.

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