ORIGINAL CONTRIBUTION

Investigating Users' Continuance Usage Intention Towards Mobile Apps with the Mediating effect of Customer-Brand Engagement

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Abstract— Mobile commerce is seen as a modern marketing communication tool in e-retail. This study explores how the utility of mobile apps impacts customer behavior and their intention to continue using the app. In addition, the researchers investigated customer brand engagement as a mediating factor and privacy risk as a moderating factor that could influence how customer brand engagement affects continuance usage intention. Data was gathered from the Grocer App's grocery service providers via their mobile app. The researchers surveyed 445 current users using Google Forms. Using SEM analysis, the study found that mobile app utility positively influences customers' intentions to keep using the app through customer brand engagement. However, privacy risk did not appear to significantly affect this relationship. The data was sourced from online grocery apps representing e-retail branded mobile apps. The study recommends offering more utility and enjoyable benefits to remain competitive in the market. Notably, this research is the first to investigate continuance usage intention by highlighting a negative factor (privacy risk) in mobile commerce, while also considering customer brand engagement. This is framed through the lens of the theory of reasoned action.

Index Terms— M-commerce, E-commerce, Mobile application, App utility, Customer brand engagement, Continuance usage intention, Privacy risk, Theory of reasoned action
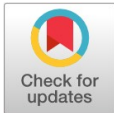
Introduction

The term "mobile applications" refers to software that can be downloaded onto a mobile device or smartphone and that, during the user experience, prominently displays a brand identity. The process is often done through the app's name and the appearance of a logo or symbol. Apps have been viewed as a viable marketing technique to provide customers with extra benefits and build long-lasting consumer-brand ties (Shanahan, Tran, & Taylor, 2019). Numerous well-known corporations have released branded applications, including banking institutions, helping guides, and many food brands.

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Due to the rapid growth of app development, these branded apps are gaining the desired number of users and receiving much praise. On the other hand, branded apps have a hard time gaining users over time. In the first quarter of 2019, mobile users installed up to 3.5 new apps but removed an average of 3.3 apps per month (Aurora, 2020). This finding suggests consumers don't keep most apps around for long. The secret to creating effective branded apps, though, is persistence intention. First, given users' growing smartphone dependency, businesses must focus on client targeting by mobile apps (Hsu & Tang, 2020). Second, when businesses increase the effectiveness of their resource consumption, apps are used over an extended period. Third, continued use might result in the co-creation of consumer brand value. The more interactions there are, the more value branded apps may offer consumers. Thus, the secret to developing successful branded apps is continual intention, which enables businesses to give value continuously (Bhattacherjee, 2001).

According to the logic of the service domain, marketing entails "customising offerings, acknowledging that the consumer is always a co-producer, and striving to increase consumer engagement and involvement in the customisation to meet thier wants better." Users engage in numerous interactions and by implementing this logic in branded app marketing practices. This perception emphasises the crucial function of customer-Brand Engagement (CBE), which is defined as a consumer's positive valence emotional, affectional, behavioural, and cognitional activities related to the brand occurring during or connected to particular consumer-brand encounters (Hollebeek, Glynn, & Brodie, 2014). In line with the service domain's logic, CBE strongly emphasises interaction throughout long-term adoption. Through interaction, businesses and consumers construct values that satiate users' demands over time (Shanahan et al., 2019). Cognitive processing, affection, and activation are the three levels of achievement of CBE that are all connected to consumer-brand interactions (van Berlo, van Reijmersdal, & van Noort, 2023). These dimensions may be incoherent or contradictory (Viswanathan et al., 2017).

Another issue is how to engage customers with some crucial concrete features of a branded app. Mclean, Al-Nabhani, and Wilson (2018) mentioned numerous significant benefits that can be provided by a branded app, such as usability, enjoyment, and others, which have been highlighted in previous research (Li & Fang, 2019; Mclean et al., 2018). However, only a small number of research has examined how these values affect users' intentions to use the mobile app continually.

By utilising the Theory of Reasoned Actions (TRA), we argue that customers' attitudes and behaviours towards the provided utility will decide whether they intend to continue their usage of that brand mobile app. With the mediating effect of CBE, customers know the brand is so interactive and involved in them. Thus, these efforts may change customers' inclination toward a particular mobile app. Accordingly, the main objectives of this study are to study how CBE contributes to customers' usage intention towards mobile apps and how privacy risk conditions its impact in the presence of CBE.

The literature has suggested that CBE associates brands' attributes with conditional consequences (Hollebeek et al., 2014). Studies show that CBE mostly moderates with positive characteristics on the individual or brand level. However, we have identified this gap and introduced a negative attributed moderator privacy risk between CBE and CUI. Privacy risk is the potential adverse outcomes or loss associated with online purchases of goods or services (Johnson, Kiser, Washington, & Torres, 2018). TRA theory also suggests that people might perceive risks and doubts directly affecting their attitudes, behaviours, and intentions toward any specific object (Afzal, Khan, Baig, & Ashraf, 2023). Thus, privacy risks lead customers to influence their engagement with the brand, impacting their intention to continue using it.

Hoehle and Venkatesh (2015) provided a more thorough definition of app usability from the few research studies on mobile app continuation intention in the literature. They presented a comprehensive formulation of mobile app usability that defines usability in multiple elements, including app utility. Hoehle and Venkatesh (2015) conducted an extensive study utilising the usability-continuance intention model across four countries. They provided more evidence supporting the impact of usability variables on continuance intention, which is influenced by cultural values. In this research, we contribute to the existing literature in several distinct ways. Firstly, they add value by highlighting a negative factor—privacy risk in mobile commerce—in the context of continued usage intention. This study is the first to explore the relationship between app utility and the continuous intention to use the app. Secondly, we address a gap in research by examining the mediating role of Customer Brand Engagement (CBE) between app utility and app continuance usage intention, an area that has not been studied before. Previous studies have primarily focused on the influence of hedonistic and technological factors on continued usage intention. This study shifts the focus toward a more marketing-oriented perspective, placing brand considerations in the spotlight within a technical framework. Lastly, the inclusion of a negatively impacted construct adds novelty and practical relevance to this study. Specifically, we apply the Theory of Reasoned Action (TRA) to investigate how privacy risk moderates the relationship between CBE and continued usage intention (CUI), and how CBE mediates the connection between app utility and CUI.

Theorization and Hypothesis Development

Theory of reasoned action

This study is grounded in the Theory of Reasoned Action (TRA), initially developed by Ajzen (1980), which posits that an individual's attitude toward a particular object, along with subjective norms, plays a key role in predicting their behavior. A person's perception of an

object—whether positive or negative—and their core beliefs shape their attitude toward it. McClure and Seock (2020) argue that social media interactions and engagement significantly influence users' intentions to continue using platforms. Additionally, previous research has shown that customers' attitudes toward a brand's online activities strongly affect their level of interaction with that brand in the digital space.

Similarly, Alalwan (2018) found that consumers' intentions to engage with a brand's offerings are positively influenced by the brand's communications through mobile apps. These interactions foster a sense of loyalty, making consumers more likely to remain active users of the app. Tajvidi, Wang, Hajli, and Love (2021) further explored how social interactions and brand involvement shape the quality of relationships, identifying key factors that motivate customer participation. According to their findings, mobile app utility and sybaritic aspects are critical drivers of customer engagement with a brand, which ultimately influences their intention to continue using the brand's products or services.

App utility and continuance intention

App utility refers to how effectively users perceive an app to achieve its intended purpose (Oakley-Girvan, Yunis, Longmire, & Ouillon, 2022). Most mobile apps are designed to deliver essential information when needed (Blonigen et al., 2021). The literature widely acknowledges that an app's usability, design, and interface positively influence users' intention to continue using it. Users typically evaluate a branded app based on how well it enhances their productivity and efficiency. Bhattacherjee (2001) found that when an app provides greater value compared to alternatives, users are more likely to continue using and even paying for it. Multiple scenarios, such as m-commerce and location-based services (Chopdar & Balakrishnan, 2020; Kao & L'Huillier, 2022), along with mobile payments, offer strong evidence of the link between app utility and users' ongoing intention to use these apps.

Users demonstrate a higher intention to keep using an app if they believe it enhances their efficiency and performance. Our quantitative analysis also highlights that utility is a key concern for many sybaritic app users. In the mobile application context, individuals use apps for efficient utility, such as music recognition, file synchronization, and information retrieval. Prior research suggests that app utility significantly influences users' desire to engage with mobile and online games. Conversely, users may uninstall an app if it fails to meet its intended purpose or if the content is unreliable, misleading, or irrelevant.

Despite the practical importance of app utility, there is limited literature on its role in marketing communications. Much of the existing research on mobile app acceptance and usage draws from models like TAM and UTAUT, focusing on technology and innovation diffusion. However, our study introduces a fresh perspective on mobile app usage intention. In line with the Theory of Reasoned Action (TRA), we propose that app utility is a critical factor influencing users' continued intention to use an app. While previous studies have applied theories such as usefulness, task-service fit, and expectation confirmation to investigate continued usage in branded apps, we emphasize the importance of utility in sustaining user engagement. According to Qing and Haiying (2021), an app's ability to drive engagement is crucial for its success.

Our research therefore focuses on the pivotal role of app utility in driving continued interaction, highlighting several user benefits that shape customers' attitudes and their intention to keep using the product. This leads to our first hypothesis:

Hypothesis 1: App utility positively influences continuance intention to use the app.

Mediating role of customer brand engagement

Customer Brand Engagement (CBE) is defined as "a consumer's positive cognitive, emotional, and behavioral brand-related activity during, or related to, specific consumer/brand interactions" (Hollebeek et al., 2014). Bozkurt, Gligor, and Babin (2021) expands on this by describing CBE as the ability to build strong relationships with commercial clients, influencing their purchasing decisions, enhancing interactions, and increasing their involvement in the long-term growth of a brand's image. Brand engagement can lead consumers to develop an affinity for a brand, encouraging them to participate in brand communities on social media platforms (Bianchi & Andrews, 2018). As a key organizational goal, CBE signifies that consumers are learning and growing in a positive direction.

Sivaram, Munawar, and Ali (2019) similarly describe CBE as the capacity to form meaningful connections with commercial clients, shaping their purchasing behavior, enhancing their interactions, and boosting their engagement in the brand's long-term growth. This, in turn, reflects an essential organizational goal as it demonstrates consumer development and learning (Bianchi & Andrews, 2018). Hollebeek et al. (2014) identified three core components of CBE: affection, cognition, and activation. In the context of customer-brand interactions, affection refers to the positive emotions a brand evokes in consumers. Cognitive processing assesses how much a consumer thinks and reflects on a brand during the interaction, while activation measures the time, effort, and energy a consumer invests in a brand (Supotthamjaree & Srinaruewan, 2021).

Branded apps aim to strengthen brand-customer relationships through cognitive processing. These apps are designed to cultivate strong connections between customers and brands, enhancing user engagement through thought-provoking interactions (Gutiérrez-

Rodríguez, Cuesta-Valiño, Ravina-Ripoll, & García-Henche, 2023). As consumers discover a brand via its app, they are encouraged to use it more frequently. Regarding affection, customers are more likely to form long-term relationships with the brand and continue using the app when they experience positive emotions such as joy, pride, or satisfaction. Finally, in terms of activation, the more time, effort, and resources users invest in the app, the higher the likelihood of long-term adoption (Guerreiro & Pacheco, 2021). Prior research has shown that satisfied customers are more likely to maintain positive associations with the brand over time.

Moreover, the increasing competition in the mobile app market compels businesses to develop innovative strategies for influencing user behavior and purchasing decisions (Bilal, Jianqu, & Ming, 2021). As a result, many companies now allocate significant resources and time to interacting with consumers and shaping their perceptions of the brand (Gutiérrez-Rodríguez et al., 2023). However, this study focuses on the relationship between CBE and continued usage intention (CUI) within the specific context of branded mobile applications. Previous research has highlighted the importance of brand engagement in shaping consumer purchase intentions. Given the high usability of mobile apps, engaged customers tend to spend more time exploring a company's products and services and are more likely to continue using them. Based on this, the following hypothesis is proposed:

Hypothesis 2: Consumer brand engagement positively mediates between app utility and continuance intention to use the app.

Moderating the role of privacy risk between customer brand engagement and continuance intention

Privacy risk refers to the potential negative outcomes or losses associated with online purchases of goods or services (Gong et al., 2023). As defined by Martin, Mortimer, and Andrews (2015), it encompasses users' concerns about the risks involved in online transactions, particularly regarding the protection of personal information, credit card security, and uncertainties related to mobile verification processes (Tran, 2020). Higher uncertainty and a lack of awareness or knowledge about app utility and usage can lead to lower engagement with a brand's mobile application, ultimately affecting users' intention to continue using it (Ou, Zhang, Angelopoulos, Davison, & Janse, 2022). Research indicates that privacy risk concerns are common among consumers, even in the absence of previous negative experiences (Bianchi & Andrews, 2018). However, the impact of privacy risk on continuance usage intention is typically more pronounced for less engaged customers and diminished for those who are highly engaged with both the brand and the app.

This study also explores privacy risks in the context of online grocery apps, specifically related to the potential negative consequences of exposing personal information (Johnson et al., 2018). These concerns may stem from various factors, such as fears of insufficient privacy protection, the absence of human interaction, safety issues, or the possibility of technological failure (Meuter, Ostrom, Roundtree, & Bitner, 2000; Shankar & Malthouse, 2006). For example, research shows that customers are often hesitant to provide personal information when granted customization options in online services (Lin, Wang, & Shih, 2017). Sunder M, Ganesh, and Marathe (2018) suggest that while automated system-initiated personalization can make mobile apps more convenient, it also raises significant privacy concerns for users.

In the realm of online grocery shopping services, earlier studies highlighted the uncertainty users feel about new IS tools, including mobile banking, mobile payments, and smartwatches (Dehghani, 2018; Gao & Waechter, 2017). Similarly, brands offering mobile app services face privacy risk concerns from potential customers who fear that their personal information, such as addresses and phone numbers, may be compromised by third parties (Eeuwen, 2017).

Conversely, a considerable body of literature suggests that engaged customers who trust a brand and its mobile app experience fewer privacy concerns (Farah, Hasni, & Abbas, 2018; Wang, Khan, Sajjad, Sarki, & Yaseen, 2023). When customers trust a brand and feel satisfied, attached, and emotionally connected, they tend to engage more deeply with the brand's mobile app, developing positive cognitive perceptions of it. As Mayer, Davis, and Schoorman (1995) explain, while taking a risk is necessary for establishing trust, trust does not always entail significant risk. Consumers are less likely to engage in risky behavior if the perceived level of risk out weighs their level of trust, and vice versa.

In this study, we examine the effects of privacy risk on user engagement with mobile apps in the context of online grocery shopping in Asian countries. There is limited research on the impact of privacy risks on customer-brand engagement and continuance usage intention, particularly through the lens of the Theory of Reasoned Action (TRA). Therefore, it is reasonable to hypothesize that higher privacy risks associated with online shopping will reduce customer-brand engagement, while lower or nonexistent privacy risks will enhance it. Based on this, the we propose the following hypothesis:

Hypothesis 3: When consumers have a high privacy risk, the positive effect of customer-brand engagement on continuance intention is reduced.
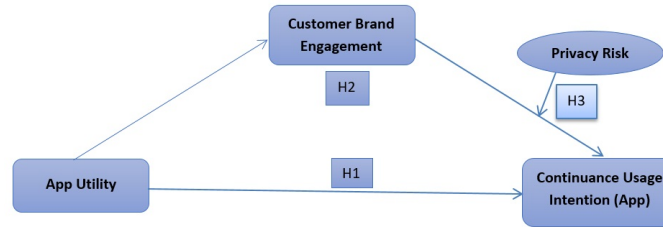
Fig. 1 *Proposed model*

Methodology

Context of the study

Mobile commerce (m-commerce) represents a new era of electronic commerce where mobile apps are increasingly gaining popularity as a compelling medium for marketing communication Kim, Kim, Choi, and Trivedi (2017). This study examines how customer brand engagement mediates the relationship between app utility and the intention to continue using a branded grocery app (i.e., GrocerApp) within the context of Pakistan. Additionally, the study explores privacy risk as a moderating factor between app utility and continuance intention.

The focus of our analysis, GrocerApp, was founded in 2016 and is one of the leading online grocery platforms in Pakistan. It enables users to order groceries via its web and mobile apps, with home delivery services available in major cities, including Lahore, Islamabad, Rawalpindi, Faisalabad, and Karachi. The company is poised for further expansion with a growing team of over 650 members. A key motivation for selecting GrocerApp was to explore how a startup competes at both local and global levels ("glocally") against multinational companies like Carrefour and Airlift Express, particularly in the post-COVID-19 environment. This period has seen a shift in consumer behavior due to social distancing and concerns about crowded places, prompting many to transition from offline to online grocery shopping (Al Amin et al., 2022).

There are three primary reasons why GrocerApp was chosen for this study. First, there is a lack of research on locally developed downloadable mobile apps in Pakistan that prominently display a brand identity. Second, while the literature has extensively addressed mobile app usage through the lens of information systems (IS) adoption, there is limited research that considers customer brand engagement in the context of mobile applications. Third, GrocerApp has emerged as one of the most risk-averse online shopping platforms in Pakistan due to its specialization in groceries, stringent privacy policies, and user-friendly order placement system, setting it apart from other apps in the market (Action, 2022).

Sample and procedure

We gathered information by asking current GrocerApp mobile app users in a survey. We registered and frequent GrocerApp users. The application requires a mobile device with a wireless LAN or Internet connection. GrocerApp can be accessed by users by selecting the app icon on their device through the user interface. GrocerApp has over 9,000 users registered to use it since its inception. The application and associated services were restricted to users who have registered.

In June 2023, 650 randomly chosen GrocerApp users who had used the service at least once in the previous month were sent an email and SMS with a hyperlink to the online questionnaire as part of the research. Additionally, the email and SMS included instructions on how to access and complete the questionnaire. Multiple entries from the same responder were prevented by design in the online poll. Officially, the online survey was run for two weeks. Moreover, a sample of users who willingly participated in the poll yielded 445 valid answers. Of those surveyed, 41.1% were women, 48.3% were between the ages of 20 and 25, 70.3 per cent held a bachelor's university degree, 257 respondents (57.8 per cent) were employees, and 294 respondents (66 per cent) had 76,000-100,000 family income range. Table 1 presents demographic characteristics.

Measures

This study used a "five-point Likert Scale ranging from 1-Strongly disagree to 5-Strongly Agree" for its questionnaire (see Table 2).

App utility

The study adapted Xu, Peak, and Prybutok (2015) six-item scale to assess App utility and noted its reliability as 0.84 from a pilot study conducted on 20 users not included in the sample. Its sample item was, "GrocerApp enables me to do grocery more quickly."

Customer brand engagement

Customer brand engagement was assessed through Hollebeek et al. (2014) newly developed ten-item scale, which was further categorised into three categories: cognitive processing, affection, and activation. The reliability of this scale was observed as 0.91. A sample item was, "Using GrocerApp gets me to think more about their brand. "

Privacy risk

Researcher used Xu et al. (2015) six-item scale to measure privacy risk. We observed its Cronbach's alpha value to be 0.84. The sample item is, "Grocerapp may disclose my personal information to others."

Continuance intention

Researcher used Bhattacherjee (2001) three-item scale to measure continuance intention. Its Cronbach's alpha value is 0.81. The sample item includes, "I intend to continue using the grocer app rather than discontinue its use."

Control variables

Qing and Haiying (2021) have discovered that age and occupation, two sociodemographic factors, significantly influenced the intention to continue to use app perceptions as older and jobholder consumers have deep concerns about it.

Table I
Demographical characteristics of respondents

Demographics		N	%
Gender	Male	262	58.9
	Female	183	41.1
Age	Below 20	37	8.3
	20-25	215	48.3
	26-30	125	28.1
	31-35	59	13.3
	Above 35	9	2
Qualification	Intermediate	48	10.8
	Bachelors	313	70.3
	MS/MPhil	74	16.6
	PHD	4	0.9
	Others	6	1.3
Occupation	Student	96	21.6
	Business Owner	37	8.3
	Job Holder	257	57.8
	Housewife	53	11.9
	Others	2	0.4
Family Income	25,000-50,000	4	0.9
	51,000-75,000	63	14.2
	76,000-100,000	294	66.1
	Above 100,000	84	18.9

Results

Preliminary analysis

According to Hair, Ringle, and Sarstedt (2011), Researcher first examined our data for SEM using AMOS. We used Google Forms to collect and found no missing value. Further, we checked data normality by following George and Mallery (2019), and the values of skewness and kurtosis were within the limit, that is, (±1) and (±3). Moreover, the values of multi-collinearity and correlation were within the limit of

0.85 (Tabachnick & Fidell, 2007). Researcher collected data from GrocerApp customers via hyperlinks in SMS and email and ensured respondents' confidentiality to avoid CMB. Now, the data was prepared for SEM analysis to test on AMOS.

Measurement model

To verify the consistency of the variables observed, we first perform the Confirmatory factor analysis (Byrne, 2010). Since there were no missing values and the data were normally distributed, we carried out Confirmatory Factor Analyses (CFAs) following Islam et al. (2021) to ensure that our best-fit model was maintained at values of "Chi-Square ($\chi 2$ /df) < 3.0, comparative fit index (CFI) ≥ 0.90, goodness-of-fit index (GFI) ≥ 0.90, Standardised Root Mean Residual (SRMR) ≤ 0.10, Hair, Black, Babin, and Anderson (2010), and Root Mean Square Error of Approximation (RMSEA) ≤ 0.08," with a 0.5 cutoff value for factor loading. The results for the 6-item scale app utility and 6-item scale for privacy risk (Table 2) resulted in inadequate model fit, for example, $\chi 2$ /d.f = 7.667; RMSEA = 0.104. Therefore, based on these analyses, app utility items U1 and U6 and privacy risk item PR2 were filtered while aiming to attain the best-fit model. The results for the reduced utility 4-item scale and privacy risk 5-item scale suggested an excellent model fit as per criteria, i.e., $\chi 2$ /df (235.103/192) = 1.22, CFI = 0.99, RMR = 0.02, RMSEA = 0.02, GFI = 0.95, AGFI = 0.94, and loading values > 0.50.

Reliability and validity

The study uses Cronbach Alpha > 0.7, Cronbach (1951) to check the internal consistency of item scales. In contrast, reliability> 0.60, Bagozzi and Yi (1988) suggested, and in this study, Cronbach's alpha lies at 0.80-0.91, whereas reliability ranges between 0.80-0.92. For convergent validity, we used Bagozzi and Yi (1988) as our guide, and the values of (AVE) were discovered to be above 0.50 (0.50 – 0.62). The values of AVE were greater than those of (MSV) for discriminant validity (Fornell & Larcker, 1981), suggesting no validity problem.

Table II
Confirmatory factor analysis

Variables	α	λ	CR	AVE	MSV
Utility	0.84		0.8	0.57	0.49
U1		0.68			
U2		0.71			
U3		0.62			
U4		0.77			
U5		0.77			
U6		0.65			
Customer Brand Engagement	0.91		0.92	0.52	0.49
CBE1		0.71			
CBE2		0.71			
CBE3		0.71			
CBE4		0.71			
CBE5		0.73			
CBE6		0.72			
CBE7		0.72			
CBE8		0.76			
CBE9		0.76			
CBE10		0.74			
Privacy Risk	0.84		0.83	0.505	0.08
PR1		0.54			
PR2		0.60			
PR3		0.65			
PR4		0.75			
PR5		0.65			
PR6		0.71			
Continuous Usage Intention	0.81		0.9	0.61	0.11
CUI1		0.91			
CUI2		0.79			
CUI3		0.61			

Note(s): CR 5 composite reliability, MSV 5 maximum shared variance, AVE 5 average variance extracted, λ 5 factor loading and α 5 Cronbach's Alpha

Correlational analysis

We found the mean values for mobile app utility (M=3.8), customer brand engagement (M=4.3), Privacy risk (M=2.1), and continuance usage intention (M=4.1). Further, we noted that utility positively correlates with customer brand engagement (r=0.81, $p < 0.000$), continuance usage intention (r=0.39, $p < 0.000$), and negatively with privacy risk (r=0.30, $p < 0.000$). Similarly, we noted a positive correlation between customer brand engagement and continuance usage intention (r=0.37, $p < 0.000$).

Table III
Validity and correlation analysis

Variables	U	CBE	PR	CUI
U	1			
CBE	0.81**	1		
PR	-0.30**	-0.257**	1	
CUI	0.39**	0.37**	-0.11*	1
Mean Values	3.8	4.3	1.2	4.1
Standard Deviation	0.4	0.5	0.5	0.6

Note(s): **p < 0.01 and *p < 0.05

Hypothesis testing

We took 2,000 resamples at a 95% confidence level to examine the model (Hair et al., 2010). The results revealed that mobile app utility positively affects customer brand engagement (β=0.809, CR=29.0, p=0.00) and their continuance usage intention (β=0.18, CR=2.40, p=0.01). Similarly, customer brand engagement positively affected their continuance usage intention (β=0.25, CR=3.31, p=0.00). These findings validate study hypothesis H1. We also examined the indirect path to investigate the mediating role of client brand engagement (see Table 5). To determine the indirect pathway, we multiplied the beta coefficient value of app utility - continuation usage intention (β=0.18) by the beta coefficient value of app utility - customer brand engagement (β=0.809) (Hair et al., 2010). Through customer-brand interaction, we saw a substantial effect of app utility on continuance usage intention (indirect path (β=0.25, CR=3.31, p=0.000), with no zero value between its lower and upper limits (LLCI=0.017, ULCI=0.269), confirming mediation and supporting study hypothesis H2.

Table IV
Result of direct path

Hypothesis	β	CR	*SE*	*p*	Bootstrap @ 95%	
					LLCI	ULCI
App Utility ---> Customer Brand Engagement	0.809	29.0	0.310	0.000	0.723	0.867
Customer Brand Engagement ---> Continuance Usage Intention	0.180	2.40	0.910	0.010	0.200	0.327
App Utility ---> Continuance Usage Intention	0.250	3.31	0.100	0.000	0.110	0.388

Table V
Result of indirect path

Hypothesis	β	*p*	Bootstrap @ 95%	
			LLCI	ULCI
Direct Path App Utility ---> Continuance Usage Intention	0.250	0.000	0.110	0.388
Indirect Path App Utility ---> Customer Brand Engagement ---> Continuance Usage Intention	0.140	0.000	0.017	0.269

The conditional effect of privacy risk has been examined through two-step hierarchical regression (see Table 6). Initially, we computed an interactional term between CBE and PR (CBE x PR). In the first step, we regressed CBE (β=0.4, CR=8.22, p=0.000) and PR (β= -02, CR= -0.320, p=0.749) with CUI and noted insignificant results for PR. In the second step, we regressed the interactional term (i.e., privacy risk) with customer brand engagement and noted a significant effect (β=0.061, CR=1.292, p=0.196), indicating insignificant moderation. The above does not go with the H3 of the study.

Table VI
Hierarchical regression for moderation

Variables	M1(β)	M2(β)
Step-1		
CBE	0.46**	
PR	-0.02	
R^2	0.142	
Step-2		
CBExPR		0.06
R^2		0.145
ΔR^2		0.003

Discussion

The proposed model builds on a growing body of research highlighting the importance of mobile app utility within the framework of the theory of reasoned action (TRA). In this empirical study, we explored how continuance usage intention for online grocery apps can be achieved through different moderators and mediators in an Asian context. The primary goal was to assess the effects of mobile app utility on users' intention to continue using the app, which was supported by hypothesis H1. The findings show that the utility users gain from the app directly influences their intent to keep using it. The more utility users perceive, the stronger their desire to continue its usage, consistent with prior research (Qing & Haiying, 2021; Straub & Karahanna, 1998; Xu et al., 2015). For example, grocery apps providing timely product updates, friendly responses, and improved productivity are likely to retain users.

Our second goal was to evaluate how customer brand engagement mediates the relationship between app utility and continuance usage intention, integrating the three dimensions of cognition, affection, and activation (H2). We found that cognition and affection lead users to feel positively about the app's utility, while activation further strengthens their continuance intention. Specifically, the more users experience positive brand-related thoughts and emotions, the greater their motivation to actively use the app, spending time, money, and energy on the brand (Hollebeek et al., 2014). Additionally, we observed that mobile app utility has an indirect positive impact on users' intention to continue using the app.

Finally, we examined the conditional role of privacy risk based on the TRA framework, exploring how it moderates the relationship between utility and customer brand engagement (H3). Prior research suggests that online users perceive some degree of risk before and after purchasing (Ou et al., 2022), and have varying levels of risk tolerance (Yang & Utne, 2022). Contrary to expectations, privacy risk had a positive but insignificant moderating effect on the link between customer brand engagement and continuance usage intention. This suggests privacy risk is less critical when examining the factors influencing continued app usage. This could be due to high brand trust among users with strong cognitive and emotional engagement, reducing concerns over privacy. The grocery app management explained that their customers do not worry about privacy leakage because they are initially provided with a comprehensive privacy policy, ensuring that personal data is handled securely. Furthermore, after the COVID-19 pandemic, customers became more focused on social distancing, prioritizing utility, efficiency, and contactless services over privacy concerns. Lastly, the app's strong brand image may overshadow privacy worries, with users paying less attention to potential risks due to a lack of awareness or knowledge.

Theoretical and managerial implications

Theoretical implications

First, this study contributes towards filling a research gap in the mobile app IS discipline, as all the prior research for mobile app usage is in IS, UTAUT, TAM, EDT, ECT, and innovation diffusion theory perspective (Aboulnasr & Tran, 2020; Chen, Meservy, & Gillenson, 2012; Fang, 2017; Wu, Guo, Zhang, et al., 2019). However, this research focused on TRA to study customer and brand engagement and their intentions to contribute to the plethora of marketing management studies, as this is a contemporary factor underlying the successful deployment of branded mobile applications. Second, this study has provided crucial insights into CBE roles within a parameter of online relationships, including mobile app utility and customer continuance usage intention with the intervention of privacy risk, keeping the mediating effect of CBE. This research also brings the interrelationship of CBE levels of engagement into the limelight. It tells us how the first two levels are more satisfied with the provided utility of the branded app, and the third shows its association with the behavioural intention of its' continued usage, where knowledge of mobile app usage and continuance usage intention is limited. Third, our study also offers insights into the conditional effect of privacy risk (a negative perception) under which customer brand engagement is more or less harmful to customers' intention to continue using. The results suggest that in the Asian context, when customers have a high level of CBE with a branded mobile app, the privacy risk minimises the positive association between customer brand engagement and continuance usage

intention. Therefore, it can be claimed that privacy risk concerns do not interrupt the customers' continuance usage intention when they are highly engaged with the brand.

Finally, the nature of knowledge about mobile apps (m-commerce) is limited (Ahmad, Islam, Sadiq, & Kaleem, 2021; Rose, 2018). Although m-commerce has developed in significant prevalence since the existence of this concept, further R&D and application of mobile apps are needed to attain a maximum understanding of this forum's marketing and retailing capabilities. Consequently, our study contributes to the literature by testing the utility model of an online grocery mobile app (GrocerApp) in an Asian context.

Practical contributions

Given the above discussion and results, our study has several practical implications. First, with the concepts of CBE in the online environment, our study highlights the importance of this emerging concept of engagement, which provides managers novelty in focused strategies, customer-brand relationships (satisfaction or loyalty), and many tactics to compete in the market (Alvarez & Fournier, 2016). This work highlights the potential contribution of CBE to customers' continuance usage intention of mobile app outcomes, which represents practical knowledge for marketing managers in running campaigns. Second, our research identifies utility as the most significant factor influencing CBE and CUI. To achieve customer brand engagement, branded apps should improve their app utility and provide more information about the service or product, such as prices, discounts, delivery time, brand-new products, store locations, categories, display, availability, and entertainment factors as well to engage your customer and make purchases from your brand on the mobile app. Third, this research studied the role of privacy risk as a conditional variable on CBE and CU. It mentions that CBE reduces its impact on the continuance usage intention as customers trust them and are satisfied with their privacy and safety policies (Bianchi & Andrews, 2018). Hence, they have minimal privacy risks to their personal information and credentials with the trusted brand. This finding suggests m-commerce strategies that strategies to reduce risk should be one of their priorities. Safety and privacy policies, return and exchange policies, and transparent third-party credentials should be high-priority assurances.

Limitations and future avenues

Several research limitations must be observed, which leads to opportunities for future research avenues. First, selection biases may have impacted the results as only GrocerApp's current users have been selected as the study sample of the population, which limits the generalizability of the study. Former or noncurrent users may provide different results of the study. Hence, future studies may consider it attractive to seek information from the viewpoint of noncurrent users or those who ceased to use branded mobile apps. Second, the conditional effect of privacy risk is marginal in the Asian context, while it was high in other regions. It might be possible because of the people's cognition and affection for the brand with which they have built CBE. We suggest subsequent researchers seek information on this influential determinant from a diverse set of brands rather than just depending on a single branded app. Third, whether or not the scope of findings of this study is generalisable to other types of apps.

Consequently, to confirm the generalizability, future research can focus on contexts of other industries, such as education orientation, game orientation, and business orientation, to approve the findings. Finally, although a branded mobile app is an important medium to build customer brand engagement and its application produces numerous advantages, this provides limited outcomes to the continuance usage intention of branded apps. In particular, future opportunities to study other essential variables such as brand loyalty, trust, love, and other behaviours are also worth considering.

Conclusion

The study provides compelling evidence that mobile app utility plays a crucial role in enhancing customer brand engagement and continuance usage intention. The positive correlations observed between app utility and both customer brand engagement and continuance usage intention indicate that when users perceive an app as useful and functional, they are more likely to engage deeply with the brand and maintain long-term use. These findings highlight the direct influence of mobile app utility on fostering customer loyalty, which is a key driver for business growth in the digital age.

The research further validates the role of customer brand engagement as a mediator in the relationship between app utility and continuance usage intention. This mediation suggests that improved app utility not only directly impacts continued usage but also indirectly strengthens user retention by deepening brand engagement. These findings support the study's core hypotheses and provide valuable insights into how brands can leverage app design and functionality to cultivate stronger customer relationships.

On the other hand, the examination of privacy risk as a moderating factor revealed that it does not significantly influence the relationship between customer brand engagement and continuance usage intention. This suggests that while privacy concerns are important, they may not have a decisive impact on how users engage with a brand or continue using an app, at least in the context of this study.

Consequently, the third hypothesis (H3) was not supported, indicating that privacy risk does not weaken or enhance the effects of brand engagement on continued app use.

These findings contribute to the broader understanding of how mobile app utility influences customer behavior and brand loyalty. By emphasizing the importance of app utility in driving customer engagement and long-term usage, this research underscores the need for companies to invest in user-friendly, functional apps to build lasting customer relationships. Moreover, the lack of a significant moderating effect from privacy risk points to the potential for brands to focus more on enhancing app features rather than solely addressing privacy concerns in the pursuit of sustained customer engagement and usage.

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