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Research Paper

From Freemium to Premium App Services: The Expectation Confirmation Model and Two-Factor Theory

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ABSTRACT

The freemium strategy is a widely adopted model in the mobile app industry, offering users free access to basic features while enticing them to pay for premium content. Successfully navigating the boundary between these two app types is crucial for developers. This study aimed to examine the impact of perceived values on satisfaction, dissatisfaction, and the intention to pay in utilitarian apps, drawing on the two-factor theory and the expectation confirmation model. Additionally, the study proposed that hygiene factors should be integrated into freemium apps, reserving motivating factors for premium apps. This study used an online survey to collect 552 participants and analyzed by structural equation modeling. The empirical model provided insights into the fundamental determinants of motivating factors transitioning from freemium to premium apps. Results indicated that social and emotional values positively influence satisfaction, with satisfaction potentially mediating purchase intention. Furthermore, functional value reduces dissatisfaction and increases purchase intention. This study distinguished social and emotional values as motivational factors and functional values as hygiene factors. The findings offered valuable guidance to software companies for developing useful and profitable apps.

Keywords: Freemium, Expectation Confirmation Model, Two-Factor Theory, Perceived values, Intention to Pay

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1. INTRODUCTION

The ubiquity of mobile networks has profoundly impacted daily routines, prompting a surge in the use of diverse mobile applications for both work and leisure (J. Wang, Xu, & Liu, 2022; L. Wang, Gao, Yan, & Qin, 2020). Consequently, applications have become pivotal components of business models, particularly freemium apps, which have garnered favor among businesses (J. Kim, Lee, & Zo, 2018). Freemium apps, featuring both free and upgraded paid versions, enjoy widespread popularity, serving diverse purposes in professional and recreational domains (Hamari, Hanner, & Koivisto, 2020). Beyond merely expanding user bases, freemium apps empower service providers to increase their market share (Sciglimpaglia & Raafat, 2020). Notably, providers of freemium apps derive benefits from both in-app advertisements and users opting for premium upgrades (L. Wang et al., 2020). Consequently, success in this business model hinges on app service providers' ability to attract downloads, sustain consistent app usage, and subsequently motivate users to invest in premium versions (Almeida, Proença, & Ferreira, 2021; Mäntymäki, Islam, & Benbasat, 2020; Sciglimpaglia & Raafat, 2020).

Nevertheless, enticing users to invest in premium versions remains challenging for most app companies. Despite numerous studies investigating the factors influencing users' willingness to pay for premium apps (Hamari et al., 2020; J. Kim et al., 2018), limited attention has been given to delineating the demarcation between freemium and premium apps, particularly concerning utilitarian applications. It is crucial to discern strategies compelling users to initially engage with utilitarian apps for free and subsequently motivate them to opt for premium content. This aspect served as a central motivation for this study.

The Expectation Confirmation Model (ECM) serves as a cornerstone in studies on the adoption of information systems (IS) and deals with the disparities between performance and expectation (Bhattacherjee, 2001; Li, Liu, Ma, & Zhang, 2019). While several theoretical frameworks, such as the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology, and Flow Theory, have incorporated ECM (Ong, Chang, & Lee, 2013; I.-L. Wu,

Chiu, & Chen, 2020), they have often overlooked the aspect of user dissatisfaction. Notably, dissatisfaction significantly influences users' negative behaviors. Users exhibit reluctance to pay for apps they are satisfied with, yet promptly delete those they find dissatisfying, especially within the realm of freemium apps (J. Kim et al., 2018).

Numerous freemium studies have highlighted the substantial impact of perceived values on users' satisfaction and willingness to pay (Hamari et al., 2020; Hsu & Lin, 2015; L. Wang et al., 2020). Therefore, this study aims to scrutinize satisfaction and dissatisfaction as distinct constructs rather than treating them as opposing points on the same continuum. Additionally, the two-factor theory, renowned for its relevance to user satisfaction and dissatisfaction with a service or product (B. Lee, Lee, Choi, & Kim, 2022; P. Zhang & von Dran, 2000), is integrated with ECM to explore users' intentions to upgrade a freemium app.

This study investigated the impact of social, emotional, and functional values on satisfaction, dissatisfaction, and the intention to pay within utilitarian apps. An online survey was employed, and measurements were based on scales developed in previous studies to ensure precise and comprehensive data acquisition. The results could provide recommendations for app service providers on strategically placing certain functions behind a premium paywall.

2. LITERATURE REVIEW

The Expectation Confirmation Theory (ECT) serves as a fundamental model for analyzing consumer behavior across three phases of satisfaction (Li et al., 2019; Oliver, 1980). Initially, during the pre-purchase stage, consumers establish expectations through word-of-mouth and advertisements. Subsequently, they assess products and services based on experiential performance, leading to the evaluation of the disparity between expectations and actual performance. Typically, positive or negative confirmation emerges when the product or service surpasses or falls short of expectations (Chiu, Cho, & Chi, 2021; Tam, Santos, & Oliveira, 2020). To align with the IS context, Bhattacherjee (2001) and Tam et al. (2020) have integrated ECT into the ECM.

2.1 Expectation confirmation model (ECM)

Li et al. (2019) and Chiu et al. (2021) delved into the usage intentions of fitness app users, employing the social comparison theory and the ECM. Their findings underscored the significance of social desirability and personal expectations as pivotal drivers of users' sustained usage.

Additionally, Tam et al. (2020) amalgamated ECM and TAM, where satisfaction, habit, and expectations for performance and effort were identified as predictors of continued usage intentions. In another study, I.-L. Wu et al. (2020) explored the causal relationships between satisfaction and flow behaviors in online impulse buying, integrating ECM and flow theory. While previous research has investigated how IS functions impact user satisfaction and usage intentions based on ECM (Chiu et al., 2021; Hsu & Lin, 2020; Trivedi & Trivedi, 2018), few have examined the influence of disconfirmation on users' negative attitudes, such as dissatisfaction. Addressing this research gap, the current study adopted the two-factor theory to scrutinize the impact of dissatisfaction arising from the disconfirmation effect.

2.2 Two-factor theory

The Two-Factor Theory, developed by Herzberg (1974), was conceived to provide deeper insights into employee behavior, highlighting the nonlinear relationship between satisfaction and dissatisfaction. This theory posits that both motivating and hygiene factors play crucial roles in predicting job satisfaction (B. Lee et al., 2022; J. Zhang, Luo, & Cao, 2019). Motivating factors, linked to job performance, directly enhance job capabilities and satisfaction. These factors encompass responsibilities, career development, job achievements, and promotional opportunities (P. Zhang & von Dran, 2000). On the other hand, hygiene factors are associated with the work environment and job context, encompassing elements like security, salary, employee benefits, interpersonal relationships, supervisory supervision, company policies, and management practices (B. Lee et al., 2022). A deficiency in hygiene factors contributes to negative emotions and job dissatisfaction among employees (Credé, Chernyshenko, Bagraim, & Sully, 2009).

The Two-Factor Theory is applicable in explaining adaptive behaviors in the context of IS. For instance, Huang, Yang, and Chen (2018) investigated social networking apps through the lens of the Two-Factor Theory, revealing that interface designs emphasizing motivating factors are more likely to attract users. Jang and Park (2021) applied the theory to augmented reality apps, concluding that emotional factors significantly contribute to motivation. They noted that many dissatisfied users tend to raise concerns about operational issues. Evaluations of website development by PP. Zhang and von Dran (2000) and J. Zhang et al. (2019) highlighted hygiene factors such as security, navigation, and technical problems, along with motivating factors like enjoyment, trustability, and visual appeal. Consequently, it is imperative to analyze satisfaction and dissatisfaction separately due to their distinct antecedents and consequences (Credé et al.,

2009; M. Kim & Lee, 2023). According to this theory, satisfaction can vary from none to high, while dissatisfaction can range from none to high (J. Zhang et al., 2019). Therefore, this study adopts the perspectives of the ECM and Two-Factor Theory to explore how perceived value may influence the freemium business model.

2.3 Freemium Business Model

Freemium, a portmanteau of "free" and "premium," denotes the provision of a service for free, with or without ads, relying on referral networks and organic search marketing (Sciglimpaglia & Raafat, 2020; L. Wang et al., 2020). The freemium business model operates in two stages to attract paying customers. Initially, free users are drawn in through word of mouth and social network diffusion effects, many of whom provide profile and usage data that can be leveraged for marketing purposes (Hamari et al., 2020; Sciglimpaglia & Raafat, 2020). Subsequently, service providers can present premium features or upgraded versions of freemium apps to motivate users to make payments (Bapna, Ramaprasad, & Umyarov, 2018; Mäntymäki et al., 2020). In essence, the freemium business model comprises free essential services alongside additional paid services.

While industry insiders have successfully employed the freemium model for revenue generation, pricing, delivery, and product promotion (J. Kim et al., 2018; Sciglimpaglia & Raafat, 2020), the fundamental aspect of users paying for premium features remains constant. App service providers aim to boost revenue, meticulously analyze user engagement, and actively promote premium version upgrades; however, motivating users to pay for additional app services remains a formidable challenge (Hamari et al., 2020). For this challenge, this study delved into the distinct impacts of foundational values and supplementary values on app users' intention to pay. Furthermore, unlike hedonic types, utilitarian types are primarily motivated by the user's need to complete tasks efficiently. While prior research has explored the purchase of utilitarian products or services based on their functional value (Strahilevitz & Myers, 1998; J. Wu & Lu, 2013), there has been limited discussion regarding utilitarian apps, such as cloud services. Consequently, this study investigated the influence of perceived value on the purchase intention of utilitarian apps.

2.4 Perceived Value

Perceived value is the assessment customers make regarding the alignment between a product or service and their needs (Zeithaml, 1988; L. Zheng, 2023). It stands as a crucial concept for comprehending customer behaviors post-experience with products or services (Hamari et al., 2020; Maqableh, Abuhashesh, Dahabiyeh, Nawayseh, & Masadeh, 2021). In this context, the study

explored the impact of perceived value on satisfaction, dissatisfaction, and intention to pay among app users. The subsequent sections delineate social, emotional, and functional values based on the consumer perceived value theory (Hsu & Lin, 2015; Sweeney & Soutar, 2001). Furthermore, the study posited dimensions of social value (encompassing self-image expression, social connectivity, and social support), emotional value (encompassing enjoyment, aesthetics, and playfulness), and functional value (encompassing perceptions of ubiquity and quality) that may influence user behavior based on insights from prior studies.

2.4.1 Social Value

(1) Self-image expression

Within the realm of social value, self-image expression denotes the capacity to augment one's impression in the eyes of others through a digital device (H.-W. Kim, Gupta, & Koh, 2011). As indicated by prior research, the digital landscape, as an alternative to physical spaces, provides individuals with opportunities to cultivate their desired self-image (H.-W. Kim et al., 2011; Osei-Frimpong, McLean, Islam, & Otoo, 2022). Purchasing virtual commodities is common among individuals aiming to portray a specific image in virtual spheres, acquiring digital goods to fortify social interactions in online relationships, and obtaining multimedia services to enrich the depth of their communication (H. Chen & Chen, 2020).

(2) Social connectivity

The social connectivity function is a feature that enables users to communicate, share information, play games, and maintain social relationships regardless of geographical distance (J. Kim et al., 2018; Luarn, Huang, Chiu, & Chen, 2016). Research indicated that users who perceive a sense of belonging to a specific group are inclined to sustain high levels of continued usage, particularly when socially connected with others who share similar interests (Mäntymäki et al., 2020). Previous studies have demonstrated that apps incorporating social connectivity increase user engagement and fortify communal cohesion (Gamberini et al., 2023; Hagen & Lüders, 2017), potentially raising switching costs and thereby retaining users.

(3) Social support

Users can cultivate social support by forming, maintaining, and enhancing interpersonal relationships in virtual communities (Baumel, 2023; Gamberini et al., 2023). Online communities serve as platforms for individuals seeking emotional support, companionship, and encouragement (Liang, Ho, Li, & Turban, 2011; Luarn et al., 2016). Furthermore, Bapna et al. (2018) posited that

users might be willing to pay for virtual goods or services to enhance their social engagement. Indeed, the social support capability of apps is strongly linked to users' perception of social value (Baumel, 2023; J. Kim et al., 2018). Thus, apps with robust social support not only reinforce the social cohesion of paying users but also harness the social diffusion effect to attract new users (C.-C. Chen & Chiu, 2021; Maqableh et al., 2021). In line with this, this study proposed that self-image expression, social connectivity, and social support are factors contributing to social value, positively influencing satisfaction.

H1: For utilitarian apps, social values are positively related to satisfaction.

2.4.2 Emotional Value

(1) Enjoyment

Perceived enjoyment is the sensation of excitement and pleasure derived from the intrinsic use of a product (Ray, Bala, & Dwivedi, 2020). The inherent nature of enjoyment is linked to the desire to maintain an optimal, preferred state of comfort in response to external stimuli (Akdim, Casaló, & Flavián, 2022; C.-C. Chen & Chiu, 2021). Furthermore, mobile app providers are increasingly incorporating programs that integrate enjoyable and entertaining features into their designs, content, and functions, creating a context for hedonistic enjoyment and satisfaction (Lu, Liu, & Wei, 2017).

(2) Aesthetics

An aesthetic response is an individual's reaction to beauty (Mathwick, Malhotra, & Rigdon, 2001). The aesthetic appeal of apps stems from factors such as symmetry, proportion, and visual and auditory elements (Q. Zheng & Liu, 2019). An app's interface design is often influenced by aesthetics, playing a crucial role in shaping a user's initial impressions (H.-W. Kim et al., 2011). Indeed, apps with aesthetically pleasing interfaces stand out in a competitive market, offering cues about an app's hedonic or utilitarian value that significantly influences decisions related to in-app purchases (H.-W. Kim et al., 2011).

(3) Playfulness

Playfulness is a significant influencer of users' intention to use the Internet, rooted in their subjective experiences with human-computer interaction (Ayundyayasti & Ciptaningtias, 2022; Moon & Kim, 2001). Flow theory perceives playfulness as an intrinsic motivation that shapes user attitudes and behaviors (H.-W. Kim et al., 2011). Additionally, many apps strategically integrate elements of playfulness into their design to enhance user acceptance of the service, making the

apps more engaging and appealing (Lu et al., 2017; X. Wang, Yu, Zhu, & Zheng, 2022). Therefore, this study posited that enjoyment, aesthetics, and playfulness contribute to emotional value and are positively associated with satisfaction.

H2: For utilitarian apps, emotional values are positively related to satisfaction.

Satisfaction serves as a comprehensive assessment of user perceptions (J. Kim et al., 2018; M. Kim & Lee, 2023). Aligned with the ECM, maintaining a high level of app performance is essential for fostering user satisfaction, subsequently enhancing users' intent to use the app (Ashfaq, Yun, Yu, & Loureiro, 2020; Lin, Au, & Baum, 2023) and their willingness to pay (Hsu & Lin, 2015; J. Kim et al., 2018). Consequently, this study posited that satisfaction would act as a mediating factor in the relationship between social and emotional values and the intention to pay.

H3: Satisfaction mediates the effects of social values on users' intention to pay.

H4: Satisfaction mediates the effects of emotional values on users' intention to pay.

2.4.3 Functional Value

(1) Ubiquity

Drawing from the two-factor theory (Jang & Park, 2021; Ong et al., 2013), functional value is regarded as a hygiene factor that is foundational and indispensable, irrespective of the presence of hedonic or utilitarian value (Ashfaq et al., 2020), such as ubiquity and quality. Concerning ubiquity, it denotes the capacity for users to access information or transmit data without limitations imposed by location, time, or device (Clarke, 2008). With advancements in mobile technology and Internet speeds (J. M. Lee & Kim, 2023; Morris & Powers, 2015), users have become progressively interconnected. For instance, cloud services and real-time collaboration platforms have gained increased ubiquity, as highlighted by Mäntymäki et al. (2020), who emphasized its significance in users' continued intention to use music streaming platforms.

(2) Quality

It's a fundamental truth that users hold a more favorable perception of higher-quality apps (Albayrak, Rosario González-Rodríguez, Caber, & Karasakal, 2023; Zeithaml, 1988). High-quality apps are distinguished by their prompt response time, user-friendliness, compatibility with older versions, and the absence of bugs (Hamari et al., 2020; Sweeney & Soutar, 2001). Previous studies have underscored the significance of quality as it shapes user attitudes and the functional value of apps. For instance, Phuong, Ngoc, Trang, and Thi (2018) investigated online ride-hailing services and found that user attitudes are significantly influenced by service quality, provided

information, and the operating system. Consequently, this study posited ubiquity and quality as the constituents of functional value that negatively correlate with dissatisfaction. Furthermore, dissatisfaction may subsequently impact the intention to pay.

H5: For utilitarian apps, functional values are negatively related to dissatisfaction.

H6: Dissatisfaction mediates the effects of functional values on intention to pay.

3. METHOD

3.1 Research model and procedures

This study examined the interrelations among social value, emotional value, functional value, satisfaction, dissatisfaction, and intention to pay within utilitarian apps (refer to Figure 1). Given the emphasis on customers' personal sentiments, opinions, attitudes, and behaviors, coupled with the constraints imposed by the epidemic, necessitating avoidance of direct face-to-face contact (Luarn et al., 2016), data were acquired through an online questionnaire designed using Google Forms for this study. The Structural Equation Model (SEM) function within the JASP analysis software was employed for data analysis.

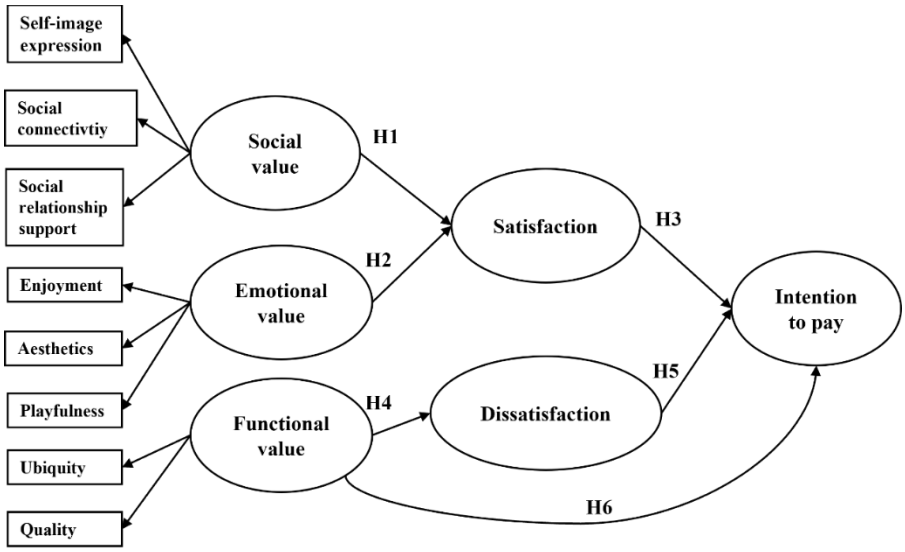


Figure 1. Research model and hypotheses

This study selected cloud storage services as representatives of utilitarian apps. Cloud storage services enable users to access data on a platform through the Internet, leveraging the advantages of accessibility, synchronization, and security without the need for a physical device (Aldiabat,

Rashid, Talafha, & Karajeh, 2018). Additionally, users in cloud storage services can pay for extra storage space or additional functionalities.

Upon entering the Google Forms platform, participants were prompted to recall the cloud storage services they had previously used as a reference standard before proceeding to complete the questionnaire. This recall step aimed to facilitate participants in recollecting the actual feelings and experiences associated with their use of cloud storage services. The questionnaire consisted of six sections, covering social value, emotional value, function value, satisfaction, dissatisfaction, and intention to pay within utilitarian apps. After completing these questions, participants were asked to provide demographic information and concluded the process with a debriefing message.

3.2 Measurements

As a crucial study component, structured questionnaires were employed to gather data and assess the formulated hypotheses. Existing scales from prior studies were applied in this research. Initially, social value was evaluated using self-image expression, social connectivity, and social support measures. Self-image expression, representing the social image projected when using an app, was gauged using a scale adapted from H.-W. Kim et al. (2011). Social connectivity, indicating an app's capacity to facilitate user interactions, utilized a scale adapted from Mäntymäki et al. (2020). The measurement of social support, reflecting the extent of interpersonal relationships formed through app usage, drew from the scale developed by J. Kim et al. (2018).

Second, emotional value was measured through enjoyment, aesthetics, and playfulness. Perceived enjoyment indicates the extent to which positive feelings are generated while using an app, and the scale was adopted from Hamari et al. (2020). Perceived aesthetics means users' perception of the aesthetic design of an app, and perceived playfulness means the degree of enjoyment experienced while using an app, and these two scale were adopted from H.-W. Kim et al. (2011).

Third, functional value was measured through ubiquity and quality. Perceived ubiquity indicates the flexible evaluation of using apps without temporal, geographic, or device-based limitations, and the scale was adopted from Mäntymäki et al. (2020). The perceived quality scale was adopted from Hamari et al. (2020). In addition, the satisfaction scale and dissatisfaction scale were adopted from J. Kim et al. (2018), and the intention to pay scale was adopted from Mäntymäki et al. (2020). All constructs were measured on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree".

3.3 Participants

The data were collected through an online survey conducted from September 15 to 22, 2021, and included those who used or bought cloud storage services through their computer or mobile device. A total of 552 responses remained after eliminating respondents with duplicate submissions, unreasonable completion times, or no usage experience. The sample comprised 216 men (39.1%) and 336 women (60.9%). The average age ranged from 18 to 36, with the majority having a university/college education (68%). The most common occupation is in the service industry (24%), and a majority have a monthly disposable income of over 20,000 New Taiwan Dollars (32%). Furthermore, most people spend over 8 hours using electronic devices daily (29%).

4. RESULTS

4.1 Reliability

Cronbach's alpha was employed to assess the reliability of each item. The results indicated high reliability for the items measuring social value, emotional value, functional value, satisfaction, dissatisfaction, and intention to pay, with coefficients of 0.963, 0.966, 0.931, 0.929, 0.927, and 0.974, respectively. Additionally, this study utilized confirmatory factor analysis (CFA) to evaluate convergent and discriminant validity. CFA is primarily used to verify the validity of questionnaire items, focusing on testing the factor loading and correlation between factors. The composite reliability (CR), average variance extracted (AVE), and correlation coefficients between dimensions were calculated based on formulas. These results are used to test the convergent and discriminant validity. The convergent validity results, detailed in Table 1, surpassed the established thresholds of 0.7 for CR and 0.5 for AVE, as proposed by Fornell and Larcker (1981).

Table 1. Results of reliability test and convergent validity

	CR	AVE	Cronbach's α
Social value	0.819	0.931	0.963
Emotional value	0.806	0.926	0.966
Functional value	0.793	0.885	0.931
Satisfaction	0.762	0.927	0.929
Dissatisfaction	0.766	0.929	0.927
Intention to pay	0.925	0.974	0.974

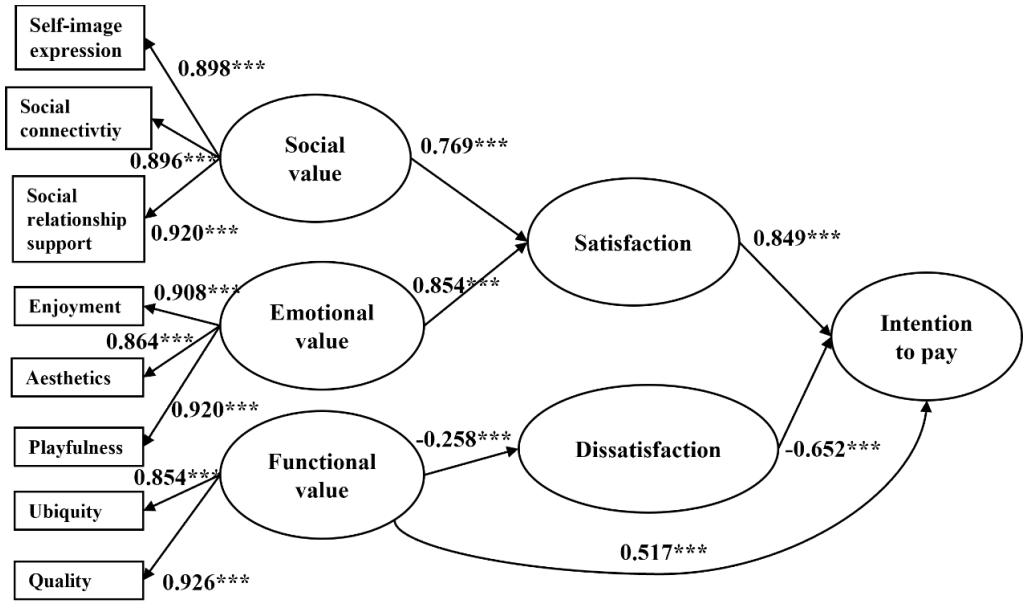
4.2 Validity

This study also *tested* discriminant validity *by comparing the square root of the AVE of a given construct with that construct's correlation with any other construct in the model (Fornell & Larcker, 1981)*. The square root of the AVE value of different factors should be greater than the correlation coefficient between that factor and other factors to confirm discriminant validity between variables. Therefore, this study presents the correlation coefficient matrix of all variables, with the square root of the AVE value of each variable represented diagonally. All constructs had discriminant validity (Table 2).

Table 2. Results of discriminate validity

	Social value	Emotional value	Functional value	Satisfaction	Intention to pay	Dissatisfaction
Social value	**0.965**					
Emotional value	0.839	**0.898**				
Functional value	0.591	0.707	**0.891**			
Satisfaction	0.624	0.696	0.626	**0.873**		
Intention to pay	0.683	0.763	0.734	0.799	**0.962**	
Dissatisfaction	-0.471	-0.538	-0.535	-0.617	-0.651	**0.875**

This study evaluated the proposed model and hypothesized relationships between items by using the SEM function in the JASP analysis software. All of the proposed hypotheses were supported. The SEM indicated good model fit at GFI = 0.981, SRMR = 0.08, NFI = 0.910, NNFI = 0.907, TLI = 0.907, and CFI = 0.92 (Hu & Bentler, 1999). According to the SEM analysis, social value ($\beta = 0.769$, $p < 0.001$) and emotional value ($\beta = 0.854$, $p < 0.001$) had significant and positive influence on satisfaction, so H1 and H2 were supported. Moreover, satisfaction ($\beta = 0.849$, $p < 0.001$) mediates the effects of social and emotional values on users' intention to pay, so H3 and H4 were supported. Functional value had a significant and negative ($\beta = -0.258$, $p < 0.001$) influence on dissatisfaction, and H5 was supported. In addition, dissatisfaction had a significant and negative ($\beta = -0.652$, $p < 0.001$) influence on intention to pay. According to the findings, H6 was supported that dissatisfaction partially mediates the effects of functional values on intention to pay ($\beta = 0.517$, $p < 0.001$). (see Figure 2)



Note: *p<0.05, **p<0.01, ***p<0.001

Figure 2. Results of Hypothesis Testing

5. DISCUSSION

The results validate the applicability of the two-factor theory, enriching our comprehension of user satisfaction, dissatisfaction, and the intention to pay. This investigation confirmed that social and emotional values act as motivating factors, contributing value and reinforcing satisfaction, ultimately elevating the intention to pay among app users, in line with earlier research (Bapna et al., 2018; Bhattacherjee, 2001). Notably, while the findings indicated that social and emotional values did not directly influence the intention to pay, this underscores the significance of user satisfaction as a mediator. In essence, these results align with the ECM, emphasizing that without user satisfaction, social and emotional values may be inconsequential.

Functional values offer substantial extrinsic motivations, heightening the perceived value of functionality. This aligns with previous perspectives (Hamari et al., 2020; Sweeney & Soutar, 2001), revealing that functional value is foundational for utilitarian apps, acting as hygiene factors crucial for averting user dissatisfaction and motivating continued use. Furthermore, the study illuminated that users are willing to pay for perceived functional value, particularly to accomplish goal-oriented tasks. They may find sufficient satisfaction to pay for process-oriented apps, directly influencing their behavior without mediation from their attitudes. This highlights the nuanced role of functional value in influencing user behavior within the utilitarian app landscape.

Previous studies in the field of information system context have explored various theories such as ECM integrating user gratification theory (Mahfuzra, Hidayanto, Hapsari, & Utari, 2019), technology acceptance model (Kumar & Natarajan, 2020), self-determination theory (Rahi & Abd. Ghani, 2019), UTAUT (Singh, 2020), and IS success model (Pang, Bao, Hao, Kim, & Gu, 2020). Yet, the contribution of ECM largely ignores the crucial role of dissatisfaction. As a result, our current study combines ECM with two-factor theory to examine this often overlooked but significant construct in the context of utilitarian apps.

As the app industry evolves rapidly, various motivating and hygiene factors must be carefully monitored and strategically promoted by app service providers to maintain freemium users and encourage users' intention to pay for premium features.

6. CONCLUSIONS

This study investigated the relationships among perceived values (social, emotional, and functional values), satisfaction, dissatisfaction, and intention to pay, aiming to delineate the boundary between freemium and premium apps.

6.1 Theoretical implications

The results offer the following theoretical implications. Firstly, it represents a noteworthy endeavor to refine and validate the expanded ECM and two-factor theory within the mobile application domain (Chiu et al., 2021; Hsu & Lin, 2020; Trivedi & Trivedi, 2018). By applying this extended model to the context of mobile applications, our study contributes to the theoretical understanding of user behavior. The empirical support for the ECM (Li et al., 2019; Oliver, 1980) and identifying the pivotal roles played by hygiene and motivating factors in delineating the boundary between free and premium apps offer valuable insights. These findings shed light on the shifting dynamics in the relative importance of key beliefs during the post-usage stage of the user experience.

Secondly, while studies on extrinsic motivation such as perceived usefulness for IT/IS use have received more attention in the ECM literature, our research model enhances the comprehension of the fundamental drivers of app utilization and the intention to pay by emphasizing the concept of perceived value. This extension responds to the growing demand for the integration of relevant constructs in research contexts, providing a framework that aids in the design of interventions. Furthermore, it contributes to the expanding body of research underscoring the critical role of

social, emotional, and functional values within the IS landscape. By unraveling the nuanced interplay of these values, our model adds depth to the understanding of user motivations and decision-making processes in the context of mobile applications.

6.2 Practical implications

The findings of this study offer practical implications with ramifications for the mobile app industry. Firstly, given the proliferation of app service providers and the resulting heightened competition, users now possess elevated expectations. To retain freemium users and increase revenue, app service providers must strategically define the boundary between freemium and premium functionality, optimizing the balance to align with user preferences. The user experience, encompassing interfaces, features, and app variety, plays a pivotal role in shaping expectations. Consequently, the mobile app industry should allocate substantial resources to craft a genuinely enjoyable and mobile-friendly experience, tailoring products to meet diverse user needs. This necessitates a thorough analysis of the factors contributing to perceived value among different user segments.

Secondly, in the fiercely competitive landscape of freemium apps, the bargaining power of app users emerges as a decisive factor influencing their willingness to pay for premium features. This study suggests that enhancing apps' functional value (considered hygiene factors) can incentivize users to download freemium versions while simultaneously promoting social and emotional values (viewed as motivating factors) that encourage users to upgrade. Continuous engagement is paramount, and addressing user dissatisfaction by aligning with their expectations is crucial. Both aspects are dynamic and wield significant influence over user retention, necessitating vigilant attention from app providers.

6.3 Research limitations and suggestions

This study used a questionnaire to collect data to examine freemium strategy with limited resources. Future studies should consider other possible methods of gathering data to reevaluate the influence of the conditions to obtain a more precise and complete understanding of perceived value in this area. In addition, this study used utilitarian apps as input into a model, and the results indicated that social, emotional, and functional values can be perceived simultaneously through app usage. Because of the diverse range of apps in app stores, more app types can be further tested. Moreover, further studies can examine the influence of price value, premium performance, and user behaviors and attitudes after purchase.

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