

The mediating role of effort expectation on digital banking behavior intention in the Indonesian bank industry: An integration of UGT-UTAUT2

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ABSTRACT

Using the frameworks of the Theory of Use and Gratification (UGT) and the Unified Theory of Acceptance and Use of Technology (UTAUT2), this study explores the factors that influence individual behavior and behavioral goals in the adoption of digital banking. Partial Least Square-Structural Equation Modeling (PLS-SEM) is used in the analysis of research data using the program SmartPLS 3.2.9 professional. There are 432 people in the research sample that filled out questionnaires. The results show that behavioral intentions are strongly influenced by the integration of UGT-UTAUT2 by 60.3%. Performance and effort expectations are influenced by cognitive needs, effort expectations are influenced by affective needs, and social influence is impacted by social needs. Behavioral intentions for the use of digital banking are shaped by a combination of factors such as price value, hedonic motivation, habits, facilitating conditions, and effort expectations. The relationship between behavioral intentions, affective and cognitive needs is mediated by effort expectations. In the context of using digital banking, habits and behavioral intentions are important factors that influence behavior; in contrast, cognitive needs, affective needs, performance expectations, and social influence have no direct effect on behavioral intentions.

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1. Introduction

An important factor in a country's economic development is banking. Both the general Indonesian economy and the financial lives of individuals are positively impacted by the banking industry. The concept of banking given by Banking Law Number 10 of 1998, which amends Banking Law Number 7 of 1992, includes all facets of banks, including establishments, operations, and procedures. Since banks' primary purpose is to collect and disburse public monies, they must constantly innovate and improve their services for the benefit of their clients. Five reputable Indonesian banks, Bank Central Asia (BCA), Bank Rakyat Indonesia (BRI), Bank Mandiri (BMRI), Bank Negara Indonesia (BNI), and Bank Tabungan Negara, have reinforced the transaction values linked to digital banking in response to the rapid growth of this industry since 2021. Rp 5,460 trillion in mobile banking transactions, up 34% year on year (yoy), and Rp 17,471 trillion in internet banking transactions, up 15.6% yoy, were recorded by BCA, while Livin by Mandiri reported Rp 2,435 trillion in transactions in 2022, up 48.4% annually. As per BNI's report, mobile banking transactions reached Rp 802 trillion in 2022, showing a significant 30.4% annual increase. BRI observed a substantial year-over-year rise of 68.46% in users, totaling 26.85 million, and a remarkable 98.48% increase in transaction value, amounting to Rp 2,669 trillion (www.bisnis.com). Additionally, BTN documented notable expansion in digital banking activities, with a 32% year-on-year surge in mobile banking transactions and a 31% year-on-year growth in internet banking transactions in 2022 (www.antaranews.com). Several challenges faced by national banks in enhancing digital banking services include issues with customer service, application errors, and occasional transaction notifications. Another obstacle for banks in transitioning to digital banking technology is the lack of customer knowledge and information in digital transactions, unfamiliarity with information technology developments, and customer comfort in traditional banking transactions (<http://digiads.id/insight>). Internet banking, one of the digital banking services used by the public, is preferred for its

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transaction processing speed and ease compared to traditional banking services, despite security concerns (Mols 1998; Sathye 1999; Jun and Cai 2001; Hutchinson and Warren 2003; Bradley and Stewart 2003). Aldás-Manzano et al. (2009) state that innovation can influence risk perception, making individuals willing to use Internet banking. According to Kesharwani et al. (2012), behavioral intentions to utilize banking are influenced by both risk perception and trust, and trust may have an impact on an individual's perception of risk. In addition to internet banking, the general public now uses mobile banking. While Cruz et al. (2010) point out transaction costs and risk perception as barriers to utilizing mobile banking, Laukkanen et al. (2007) claim that perceived value is a hindrance.

The increasing use of digital banking services predicted to reach 74.7 million users by 2026, depends significantly on the behavioral intentions of digital banking users. In their hypothesis, the Uses and Gratification theory (UGT), Katz et al. (1973b) suggest that behavioral intents to select and use a medium are influenced by cognitive, affective, integrative personal, social integrative and tension release needs. The Unified Theory of Acceptance and Use of Technology (UTAUT) model was created by Venkatesh et al. (2003) to examine the variables affecting people's behavioral intentions to utilize IT systems. An individual's behavioral intentions to utilize technology are influenced by a variety of factors, including social influence, performance and effort expectations, and facilitating conditions. Three factors, there are hedonic motivation, price value, and habits that affect a person's behavioral intentions to utilize information technology systems were added to Venkatesh et al. (2012) expansion of UTAUT into UTAUT2. Thongsri et al. (2018) examined the factors influencing students' intentions to adopt m-learning by combining the UGT model with UTAUT. The combination of UGT-UTAUT impacted students' behavioral intents to adopt mobile learning. Similar to this, Wut et al. (2021) combined the UGT and UTAUT models to investigate the variables affecting young people's behavioral intentions in Asia with relation to using mobile applications.

In order to investigate the variables impacting the behavioral intentions of users of digital banking, this study will combine the UGT and UTAUT2 models. It is anticipated that the merger of the UGT and UTAUT models would address upcoming issues in digital banking concerning the necessary data, readily available support resources, social needs, usability, and pleasurable experiences when utilizing digital banking. The research presents three originality findings: (1) it examines the impact of cognitive needs on effort expectations; (2) it uses effort expectations to mediate the relationship between cognitive and affective needs and behavioral intentions to use digital banking. The following are the research questions that surface:

RQ1. *Does the integration of the UGT-UTAUT model influence digital banking users' behavioral intentions?*

RQ2. *Can effort expectations and behavioral intentions become mediator variables?*

2. Literature Review and Hypothesis Development

2.1. Digital Banking

According to Financial Services Authority Regulation Number 12 of 2018 regarding the Use of Digital Banking Services by Commercial Banks, digital banking services are electronic banking services that are intended to improve customer service by making effective use of customer data, guaranteeing prompt and simple access, and being in line with the individual needs of the customer. Customers can independently perform these services, with due consideration given to security aspects. The categories of digital banking services and transactions are: (1) Internet banking, (2) Mobile banking, (3) Phone banking, and (4) SMS banking. Table 1. lists the variations in digital banking services for each category.

Table 1
Types of Digital Banking Service Transactions

No.	Internet Banking	Mobile banking	SMS banking	Phone banking
1.	Fund transfer	Fund transfer	Fund transfer	Fund transfer
2.	Balance information	Balance information	Balance information	Balance information
3.	Account statement	Account statement	Account statement	Account statement
4.	Exchange rate information	Exchange rate information	No service	No service
5.	Payment of credit card bills, telephone, mobile, electricity	Payment of credit card bills, telephone, mobile, electricity	Payment of credit card bills	Payment of credit card bills, telephone, mobile, electricity
6.	Purchase	Purchase	Purchase	Purchase

2.2. Uses and Gratification Theory (UGT)

According to Katz et al. (1973a), active viewers or audiences look for communication/media sources with the intention of meeting their requirements by gaining the information they need and reaping the benefits of the media. The fundamental assumptions of UGT are as follows: (1) the audience is viewed as active; (2) the audience is the one who takes the initiative to link their needs fulfillment and media choices in the mass communication process; (3) media will compete with other needs satisfiers for the audience; and (4) the audience itself can provide data on the purpose of mass media usage; (5) It is necessary to suspend important cultural value considerations in mass communication while the audience investigates their own expectations and attitudes. According to Katz et al. (1973b), there are five primary types of needs for the psychological and social

roles that mass media play. The five types of needs are: (1) cognitive, (2) affective, (3) personal integrative, (4) social integrative, and (5) stress release.

Doshi et al. (2023) discovered through empirical research that the intention to subscribe is influenced by monetary value and perceived usefulness, while functional and emotional values do not play a significant role. Chakraborty and Biswal (2023) explained that the intention of digital entrepreneurial women in India is influenced by information participation, follow-up participation, and participation attitude. Osei-Frimpong et al. (2022) resented empirical evidence indicating that sustainable attachment to a brand on social media is influenced by compatibility with lifestyle, perception of information quality, and escapism. Cheung et al. (2022) provided empirical evidence that social interaction influences the behavioral intention of social media users. Nuzuli (2022) presented empirical findings indicating that the primary factors influencing individual interest in using the TikTok application are social integration and entertainment motives. Gazit (2021) conducted research that demonstrated individuals' motivation to create a Facebook community is grounded in information needs, social needs, and personal interests. The motivation for individuals to assume leadership roles in the Facebook community is influenced by social, personal, and influencing motivations, along with community ultimate goals and time allocation. According to Hsu and Lin (2021), behavioral intention is influenced by socializing ability and flow, while entertainment and information accuracy do not impact someone's intention to use live-streaming services.

2.3. Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) employed a variety of theories and models to create UTAUT, a test that measures a person's behavioral intention to accept technology. UTAUT is comprised of the following theories and models: (1) Theory of Reason Action (TRA) developed by Fishbein and Ajzen (1975), (2) Theory of Planned Behavior (TPB) by Ajzen (1991), (3) Technology Acceptance Model (TAM) by Davis (1989), (4) Model of PC Utilization (MPCU) created by Thompson et al. (1991) (5) Innovation Diffusion Theory (IDT) proposed by Rogers (1983), and furthermore developed by Moore and Benbasat (1991), (6) Motivation Model (MM) designed by (Vallerand 1997), (7) Social Cognitive Theory (SCT) initially developed by Bandura (1991) and expanded upon by Compeau and Higgins (1995), (8) combination of TAM and TPB presented by Taylor and Todd (1995).

Bhatnagr and Rajesh (2023) discovered through empirical research that UTAUT3 significantly impacts the behavioral intention to use and adopt neo banking. Hassaan et al. (2023), Negm (2023) Nandru et al. (2023), Wu and Liu (2022), Bailey et al. (2022), Chan et al. (2022), Ahmad and Yahaya (2022), Yaseen et al. (2022), Iqbal et al. (2022), Farzin et al. (2021), Mohd Thas Thaker et al. (2021), Kaur and Arora (2020) found empirical evidence that UTAUT2 significantly affects behavioral intention. Furthermore, a number of studies (Rahi and Abd. Ghani 2019; Rahi et al. 2019; Rahi and Abd. Ghani 2019; Rahi and Abd. Ghani 2018; Tarhini et al. 2016; AbuShanab and Pearson 2007) have shown the effectiveness of the UTAUT model in influencing individual behavioral intentions to utilize online banking. The behavioral intention of individuals to use digital payment systems can be influenced by integrating UTAUT and TAM, according to Srivastava et al. (2023). However, UTAUT2 has an impact on this intention, according to Manrai et al. (2021) and Sivathanu (2019). Individual behavioral intentions to utilize mobile banking can be influenced by the UTAUT model (Wu and Ho 2021; Sobti 2019; Giovanis et al. 2019; Tan and Leby Lau 2016). According to Le (2021), the behavioral intention to utilize QR codes can be influenced by combining the UTAUT model with Protection Motivation Theory (PMT).

2.3. Hypothesis Development

2.4.1. Cognitive Needs (CN) and Performance Expectations (PE)

The demand for knowledge, information, and comprehension is known as a cognitive need (Katz et al. 1973b; Hashim et al. 2015). A person's behavioral intention to use digital banking will be impacted by the need to obtain enough and comprehensive information about the digital banking system to be used. This outcome is consistent with research by Chakraborty and Biswal (2023), Osei-Frimpong et al. (2022), Gazit (2021), and Thongsri et al. (2018), which discovered that cognitive needs affect behavioral intention.

H₁: *Cognitive needs have a positive influence on the behavioral intention to use digital banking.*

Performance expectations are the degree to which a person believes that information technology may help them accomplish tasks (Venkatesh et al. 2003). Users that utilize digital banking expect the system to process their financial transactions quickly and effectively, which motivates them to use digital banking. The aforementioned findings are consistent with a number of empirical investigations carried out by Srivastava et al. (2023), Bhatnagr and Rajesh (2023), Hassaan et al. (2023), Nandru et al. (2023), Negm (2023), Wu and Liu (2022), and Raza et al. (2019).

H₂: *Performance expectations have a positive influence on the behavioral intention to use digital banking.*

Users of digital banking anticipate tasks to be finished fast and effectively, together with sufficient and thorough knowledge about the digital banking system. This idea is consistent with the findings of Alkhwaldi (2023), who said that information

quality influences performance expectations. Thongsri et al. (2018) present empirical evidence supporting the idea that cognitive needs impact performance expectations.

H₃: *Cognitive needs positively influence performance expectancy.*

2.4.2. Cognitive Needs (CN) and Effort Expectancy (EE)

The degree to which an individual feels at ease or comfortable using information technology systems is known as effort expectancy (Venkatesh et al. 2003; Thongsri et al. 2018). The degree to which a user finds digital banking easy to use will influence their behavioral intention to utilize these systems. There is empirical evidence in Srivastava et al. (2023), Negm (2023), Bhatnagr and Rajesh (2023), Hassaan et al. (2023), and Chan et al. (2022) that effort expectations affect behavior.

H₄: *Effort expectancy positively influences the behavioral intention to use digital banking.*

The original idea proposed in the integration of UGT-UTAUT is that effort expectancy is influenced by cognitive needs. Users of digital banking experience a sense of ease in utilizing the system when they gain comprehensive knowledge and understanding of it.

H₅: *Cognitive needs have a positive influence on effort expectancy.*

The relationship between behavioral intention and cognitive needs can be mediated by effort expectancy when cognitive needs influence effort expectancy.

H₆: *The relationship between cognitive needs and the behavioral intention to use digital banking is mediated by effort expectations.*

2.4.3. Affective Needs (AN) and Effort Expectancy (EE)

Affective needs refer to an individual's need for acquiring enjoyable, happy, aesthetic, and emotional experiences (Katz et al. 1973b; Hashim et al. 2015). When users of digital banking have positive and enjoyable experiences while using the system, it impacts their behavioral intention to continue using digital banking. This observation aligns with the findings of Chakraborty and Biswal (2023), Nuzuli (2022), Gazit (2021), and Thongsri et al. (2018).

H₇: *Affective needs positively influence the behavioral intention to use digital banking.*

Effort expectancy is influenced by affective needs. Users of digital banking will see the system as being easier to use if they have a positive experience using it. This is in line with Alkhwaldi (2023) and Wut et al. (2021), who found empirical evidence that affective needs influence effort expectancy.

H₈: *Affective needs have a positive influence on effort expectancy.*

The original aspect of integrating UGT-UTAUT is that affective needs and the behavioral intention to use digital banking are mediated by effort expectancy.

H₉: *Effort expectations mediate the relationship between affective needs and the behavioral intention to use digital banking.*

2.4.4. Social Need (SN) and Social Influence (SI)

Social needs refer an individual's desire to foster connections with family, friends, and the broader community (Katz et al. 1973b). On the other side, social influence refers to how much a person thinks other people will affect their adoption of new information systems (Venkatesh et al. 2003). Friends, family, and coworkers have an impact on digital banking users because they feel that using the system enables them to interact with their surroundings. This is consistent with the findings of Dalziel and De Klerk (2021), Wut et al. (2021), and Ha et al. (2015).

H₁₀: *Social needs positively influence social influence.*

Digital banking users' intentions to use the service are influenced by friends and their environment, who encourage them to use the system. Social influence impact behavior intention, according to Bhatnagr and Rajesh (2023), Wu and Liu (2022), Chan et al. (2022), Santoso and Rachmawati (2021), and Sekarini and Meiranto (2014).

H₁₁: *Social influence has a positive influence on the behavioral intention to use digital banking.*

2.4.5. Facilitating Conditions (FC)

Facilitating conditions, according to Venkatesh et al. (2003), are the extent to which an organization provides appropriate facilities that enable the use of information systems, or the degree to which an individual believes that the facilities that are currently available facilitate the use of information systems. Because digital banking provides tools to facilitate routine financial transactions through both the organization's and the system's resources, users plan to use it. Facilitating conditions

influence behavioral intentions, according to Hassaan et al. (2023), Nandru et al. (2023), Bhatnagr and Rajesh (2023), and Meiranto (2012).

H₁₂: *Facilitating conditions have a positive influence on the behavioral intention to use digital banking.*

Facilitating conditions have an effect on usage behavior; people will integrate digital banking into their regular banking activities if they think that the facilities now in place encourage its use. This is consistent with studies by Hassaan et al. (2023), Ahmad and Yahaya (2022), Iqbal et al. (2022), Mohd Thas Thaker et al. (2021), and Baptista and Oliveira (2017).

H₁₃: *Facilitating conditions have a positive impact on the behavior of using digital banking.*

2.4.6. Habits (H)

According to Venkatesh et al. (2012), habit refers to a person's conviction that they can perform an action automatically as a result of learned behavior. Habit is a reflection of a person's prior behavioral preferences that motivates them to either engage in or abstain from something (Limayem and Hirt 2003). The likelihood of someone planning to use digital banking is higher for those who are accustomed to using digital services. Habits affect behavioral intention, according to research by Hassaan et al. (2023), and Pertiwi and Ariyanto (2017).

H₁₄: *Habits positively influence the behavioral intention to use digital banking.*

People who are used to digital systems will employ digital banking in their transactions as a result of behavioral influence. Studies by Hassaan et al. (2023), Iqbal et al. (2022), and Owusu Kwateng et al. (2019) show that habits influence usage behavior.

H₁₅: *Habits positively influence the behavior of using digital banking.*

2.4.7. Hedonic Motivation (HM)

Hedonic motivation refers to the joy and happiness experienced by an individual when using information technology (Venkatesh et al. 2012). When utilizing digital banking, someone will be able to satisfy their needs for amusement, joy, and happiness, which will make them intend to utilize it. Hedonic motivation affects behavioral intention, according to studies by Nandru et al. (2023), Hassaan et al. (2023), Bhatnagr and Rajesh (2023), Iqbal et al. (2022), and Yaseen et al. (2022).

H₁₆: *Hedonic motivation has a positive influence on the behavioral intention to use digital banking.*

2.4.8. Price Value (PV)

Price value refers to how people assess, cognitively, the advantages of using information systems in comparison to their costs (Venkatesh et al. 2012; Dodds et al. 1991). Consumers' behavioral intention to use digital banking is influenced by their perception that the expenses they incur are less than the benefits they obtain. Price value influences behavioral intention, according to research by Nandru et al. (2023), Bhatnagr and Rajesh (2023), Wu and Liu (2022), Al-Sabaawi et al. (2021), and Mohd Thas Thaker et al. (2021) are all in line with this conclusion, price value influence behavioral intention.

H₁₇: *Price value has a positive influence on the behavioral intention to use digital banking.*

2.4.9. Behavioral Intention (BI)

Behavioral intention serves as a direct antecedent to the real conduct and reflects an individual's preparedness to participate in a particular behavior, as stated by Ajzen (1991). Users of digital banking will utilize their usage behavior in banking transaction activities based on their behavioral aim. Thus, it is consistent with the research results of Nandru et al. (2023), Hassaan et al. (2023), Wu and Liu (2022), Iqbal et al. (2022), and Yaseen et al. (2022).

H₁₈: *Behavioral intention to use digital banking positively impacts the behavior of using digital banking.*

Fig. 1 illustrates the relationship between independent and dependent variables according to the development of hypotheses.

3. Research Methodology

3.1. Population and Sample

Population refers to all subjects of interest in a study (Agresti 2018; Donnelly 2015; Sugiyono 2013). In this study, the population comprises digital banking users, which numbered 59,969,877 individuals in 2022 (www.databoks.katadata.co.id). Purposive sampling combined with non-probability sampling is the methodology used for the sample. The number of question indicator constructions multiplied by ten determines the minimal size of the research sample (Hair et al. 2019; Hair et al. 2022). The survey requires a minimum sample size of 350 users of digital banking, with 35 question indicators.

The research sample was collected using a Likert scale questionnaire with a range from 1 to 5 in Google Form format. The survey was disseminated via social media channels like WhatsApp groups and Instagram, with a particular focus on specific contacts. Respondents used a scoring system that ranged from 1, indicating “strongly disagree”, to 5, representing “strongly agree”. The questionnaire was accessible to participants from September to October 2023, and a total of 432 individuals successfully filled out and submitted the survey.

3.2. Data Analysis Method

Professional software SmartPLS 3.2.9 will be used to process the research data and analyze it utilizing the Partial Least Square-Structural Equation Modeling (PLS-SEM) approach. There are three steps in the data analysis process: (1) descriptive statistics, (2) outer model assessment, and (3) inner model assessment. An essential phase in descriptive statistics is analyzing the research data's minimum, maximum, mean, and standard deviation. (Agestri 2018; Donnelly 2015). The two stages of PLS-SEM data analysis are measurement model assessment (outer models) and structural model assessment (inner model) (Hair et al. 2019b; Hair et al. 2022).

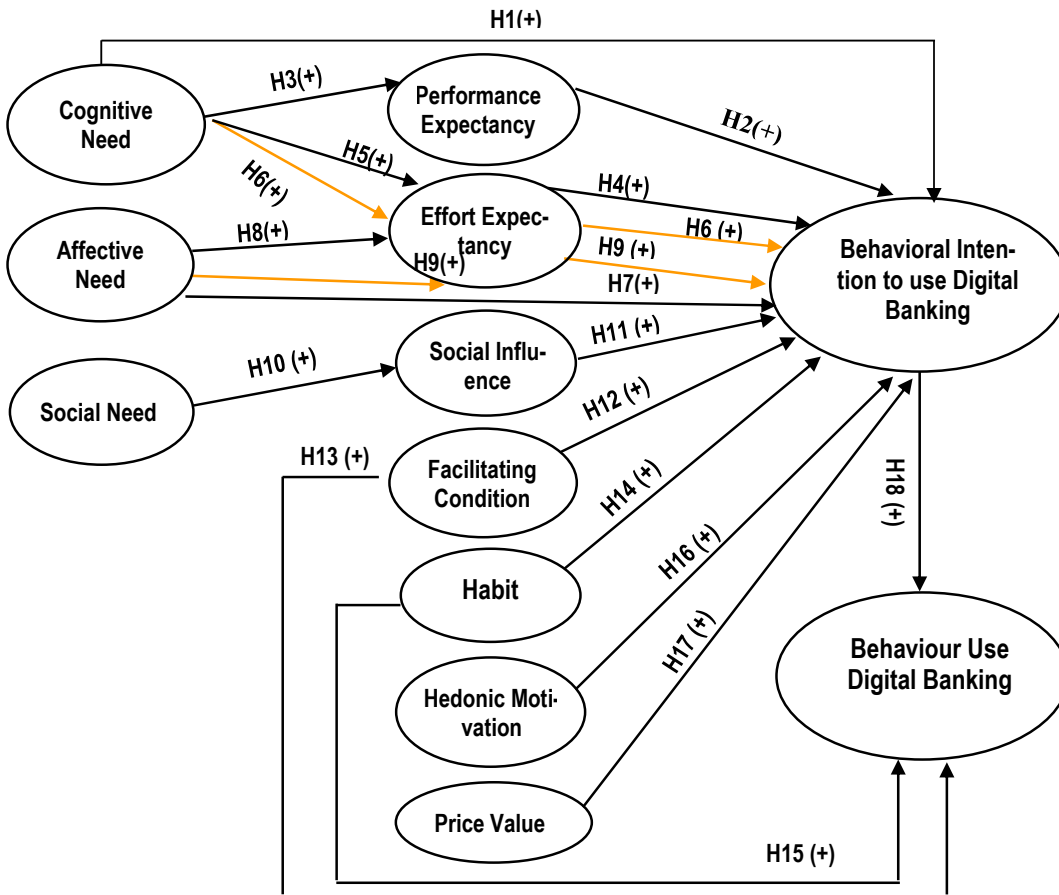


Fig. 1. Research Model

4. Data Analysis and Hypothesis Testing

4.1. Pilot Study

A preliminary investigation was carried out to assess the respondents' comprehension of the questionnaire, ensuring the clarity and simplicity of the questions or statements. Validity and reliability tests are performed on statements or questions that are used as indicators for study variables. It is deemed valid and reliable to use indicators with Cronbach alpha values above 0.7, significance below 0.05, and t-table values greater than 0.325 for 30 respondents.

4.2. Respondent Demographics

There were 177 male and 255 female respondents. The ages of the respondents are dispersed as follows: 205 persons fell into the 18–26 age group, 151 into the 27–42 age group, 73 into the 43–58 age group, and 3 into the 59–68 age group. 363 participants said that they had been involved in digital banking for 1–8 years, 59 for 9–16 years, and 10 for 17–23 years. In

terms of the m-banking platforms they utilize, 97 respondents use BNI mobile, 28 use BTN mobile, 98 use BCA mobile, 81 use Brimo, and 128 use Livin (Table 2).

Table 2
Respondent Demographic

Demographic	Category	Total	Percentage
Gender	Male	177	40.9%
	Female	255	59.1%
Age	18-26 year	205	47.5%
	27-42 year	151	34.9%
	43-58 year	73	16.9%
	59-68 year	3	0.7%
Experience	1-8 year	363	84%
	9-16 year	59	14%
	17-23 year	10	0.2%
M-banking	BNI mobile	97	22.5%
	BTN mobile	28	6.5%
	BCA mobile	98	22.7%
	Brimo	81	18.7%
	Livin	128	29.6%

4.3. Non-Response Bias Testing

An independent sample t-test was used to assess for non-response bias by comparing the average response values of respondents who responded on time vs those who did not. Levene's test and t-test values above 5% indicated that there is no difference between respondents who answered on time and those who answered after the allotted period, according to the results of the non-response bias tests (Table 3).

Table 3
Result of Non-Response Bias Test

Respondent Answer	N	Means	Levene's Test		t-test	
			F	Sig	t	Sig (2-tailed)
On-time	412	146.56	0.23	0.879	0.179	0.858
Late	20	145.95			0.186	0.854

4.4. Data Analysis

4.4.1. Descriptive Statistics

Descriptive statistics offer a comprehensive summary of the research data, encompassing metrics such as minimum, maximum, median, mean, and standard deviation. The research data's average value suggests a number that is within a high range and somewhat near to the maximum value of 15. A standard deviation lower than the mean value indicates that respondents' responses cluster around the mean value (Table 4).

Table 4
Descriptive Statistic

	N	Min	Max	Means	Std. Deviation
Cognitive Need (CN)	432	6	15	13.08	1.656
Affective Need (AN)	432	7	15	11.06	1.861
Social Need (SN)	432	6	15	12.07	1.833
Performance Expectancy (PE)	432	9	15	14.19	1.194
Effort Expectancy (EE)	432	6	15	13.23	1.490
Social Influence (SI)	432	6	15	11.54	2.224
Facilitating Condition (FC)	432	9	15	13.23	1.520
Habit (H)	432	8	15	13.22	1.659
Hedonic Motivation (HM)	432	6	15	12.28	1.883
Price Value (PV)	432	6	15	11.99	1.926
Behavioral Intention (BI)	432	6	15	13.17	1.755
Behavior (B)	432	4	10	8.62	1.563

4.4.2. Measurement Model

The results from the indicator loading test reveal several indicators with values below 0.7, namely the AN₂ indicator for the affective need variable with a value of 0.692, the SN₁ indicator for the social need variable with a value of 0.601, the FC₃ indicator for the facilitating conditions variable with a value of 0.671, and the HM₃ indicator for the hedonic motivation variable with a value of 0.595. Despite being below 0.7, these indicators are retained considering the CR and AVE values for the affective need, social need, facilitating conditions, and hedonic motivation variables, all of which meet the required

criteria. The CR values for all variables are below 0.95, and the AVE values are ≥ 0.50 , indicating the validity and reliability of the research variables (Table 5 and Fig. 2).

Table 5
Result of Outer Loading, CR and AVE

Variable	Outer Loading	CR	AVE	
Cognitive Need	CN ₁	0.767	0.836	0.630
	CN ₂	0.747		
	CN ₃	0.826		
Affective Need	AN ₁	0.756	0.885	0.720
	AN ₂	0.692		
	AN ₃	0.756		
Social Need	SN ₁	0.601	0.779	0.541
	SN ₂	0.794		
	SN ₃	0.741		
Performance Expectancy	PE ₁	0.811	0.824	0.609
	PE ₂	0.762		
	PE ₃	0.807		
Effort Expectancy	EE ₁	0.823	0.758	0.514
	EE ₂	0.876		
	EE ₃	0.845		
Social Influence	SI ₁	0.790	0.872	0.695
	SI ₂	0.801		
	SI ₃	0.789		
Facilitating Condition	FC ₁	0.874	0.854	0.664
	FC ₂	0.883		
	FC ₃	0.671		
Habit	H ₁	0.810	0.851	0.664
	H ₂	0.881		
	H ₃	0.807		
Hedonic Motivation	HM ₁	0.899	0.913	0.778
	HM ₂	0.910		
	HM ₃	0.595		
Price Value	PV ₁	0.820	0.861	0.674
	PV ₂	0.851		
	PV ₃	0.791		
Behavioral Intention	BI ₁	0.905	0.836	0.630
	BI ₂	0.905		
	BI ₃	0.834		
Behavior	B ₁	0.923	0.935	0.878
	B ₂	0.950		

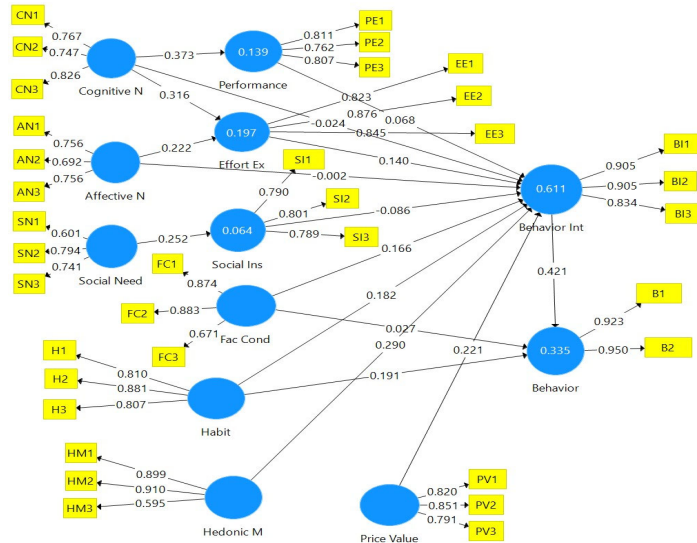


Fig. 2. Result of Measurement Model Assessment

Heterotrait-Monotrait Ratio (HTMT) and Fornell-Lacker criterion are used to assess discriminant validity. The square root of AVE is still greater than the correlation value between a construct and other constructs in the model, as shown by the Fornell-Lacker criterion (Table 6). At a 95% confidence level, all HTMT values are below 0.90 according to the Heterotrait-Monotrait Ratio criterion (Table 7). This result implies that the study's variables show validity.

Table 6
Result of *Fornell-Lacker Criteria*

	PE	EE	AN	CN	SN	H	FC	HM	BI	PV	SI	B
PE	0.794											
EE	0.453	0.848										
AN	0.139	0.330	0.735									
CN	0.373	0.392	0.342	0.781								
SN	0.226	0.327	0.379	0.317	0.717							
H	0.376	0.578	0.288	0.304	0.308	0.833						
FC	0.462	0.522	0.333	0.363	0.285	0.600	0.815					
HM	0.336	0.530	0.318	0.417	0.391	0.589	0.535	0.815				
BI	0.406	0.576	0.302	0.355	0.346	0.624	0.599	0.666	0.882			
PV	0.274	0.452	0.400	0.418	0.348	0.465	0.488	0.564	0.589	0.821		
SI	0.222	0.350	0.369	0.339	0.252	0.346	0.400	0.366	0.287	0.373	0.793	
B	0.274	0.478	0.283	0.265	0.232	0.470	0.394	0.497	0.556	0.453	0.254	0.937

Table 7
Result of Heterotrait-Monotrait Ratio (HTMT) Criteria

	PE	EE	AN	CN	SN	H	FC	HM	BI	PV	SI	B
PE												
EE	0.591											
AN	0.196	0.470										
CN	0.533	0.526	0.534									
SN	0.371	0.497	0.662	0.515								
H	0.512	0.729	0.413	0.418	0.454							
FC	0.638	0.679	0.494	0.516	0.452	0.794						
HM	0.407	0.674	0.521	0.569	0.627	0.753	0.705					
BI	0.518	0.691	0.412	0.461	0.513	0.762	0.755	0.786				
PV	0.352	0.567	0.584	0.575	0.543	0.589	0.646	0.744	0.715			
SI	0.275	0.419	0.586	0.451	0.383	0.430	0.529	0.500	0.330	0.476		
B	0.346	0.571	0.406	0.338	0.300	0.570	0.491	0.623	0.638	0.547	0.296	

4.4.3. *Structural Model*

The assessment of collinearity between structural model variables based on the VIF values shows that the outer VIF and inner VIF values are below 3, indicating no collinearity between variables (Table 8).

Table 8
VIF Value

Variable	Outer VIF	Inner VIF				
		PE	EE	SI	BI	B
Cognitive Need	CN ₁	1.452				
	CN ₂	1.373	1.000	1.133	-	1.464
	CN ₃	1.342				
Affective Need	AN ₁	1.673				
	AN ₂	1.977	-	1.133	-	1.344
	AN ₃	1.692				
Social Need	SN ₁	1.587				
	SN ₂	1.967	-	-	1.000	-
	SN ₃	1.552				
Performance Expectancy	PE ₁	1.272				
	PE ₂	1.276	-	-	-	1.459
	PE ₃	1.107				
Effort Expectancy	EE ₁	1.260				
	EE ₂	1.342	-	-	-	1.889
	EE ₃	1.528				
Social Influence	SI ₁	1.159				
	SI ₂	1.196	-	-	-	1.362
	SI ₃	1.104				
Facilitating Condition	FC ₁	2.402				
	FC ₂	2.457	-	-	-	2.013
	FC ₃	1.157				1.793
Habit	H ₁	2.221				
	H ₂	2.034	-	-	-	2.048
	H ₃	1.235				1.885
Hedonic Motivation	HM ₁	1.620				
	HM ₂	1.471	-	-	-	2.011
	HM ₃	1.570				
Price Value	PV ₁	2.562				
	PV ₂	2.571	-	-	-	1.757
	PV ₃	1.783				
Behavioral Intention	BI ₁	2.345				
	BI ₂	2.345	-	-	-	-
	BI ₃	1.946				1.881
Behavior	B ₁	2.037				
	B ₂	1.171	-	-	-	-

According to Table 9, the structural model's explanatory power was assessed using the R2 values, which showed that the behavioral intention R2 value was 0.603 (moderate) and the behavior R2 value was 0.330 (low). A Q2 value of 0.461 (moderate) for behavioral intention and 0.284 (moderate) for behavior is shown when the predictive capacity of the structural model is evaluated using the Q2 values.

Table 9
Result of R² and Q²

Variable	R-Square	Adjusted R-Square	Q Square
Performance Expectancy	0.139	0.137	0.082
Effort Expectancy	0.197	0.193	0.137
Behavioral Intention	0.611	0.603	0.461
Social Influence	0.064	0.061	0.034
Behavior	0.335	0.330	0.284

A t-statistic less than 1,65 at 0,649, a p-value above 0,05 (5%) at 0,516, and an original sample value of -0,024 all indicate that *hypothesis 1 is rejected*. Instead, cognitive demands are thought to favorably influence behavioral intention. The second hypothesis states that behavioral desire to utilize digital banking is positively impacted by performance expectations. The test findings indicate that *hypothesis 2 is rejected* because the original sample value of 0,068 is positive, the t-statistic is 1,531 below the 1,65, and the p-value is 0,126 above the significance level of 0,05 (5%). With an initial sample value of 0,373, a t-statistic of 7,121 exceeding 1,65, and a p-value of 0,000 below the 0,01 (1%) significance level, *Hypothesis 3 is accepted*. It suggests that cognitive needs positively affect performance expectations. Using an original sample value of 0,140, a t-statistic of 2,457 exceeding 1,65, and a p-value of 0,014 below the 0,05 (5%) significance level, *Hypothesis 4 is supported*. On the other hand, Hypothesis 5 contends that effort expectations are positively impacted by cognitive needs. Using an original sample value of 0,316, a t-statistic of 5,473 greater than 1,65, and a p-value of 0,000 below the 0,01 (1%), *H5 is accepted*. The relationship between cognitive needs and the behavioral intention to use digital banking is mediated by effort expectations, according to hypothesis 6, which is supported by the positive original sample value of 0,045, the t-statistic of 2,063 above 1,65, and the p-value of 0,040 below 0,05 (5%). As a result, *H6 is accepted*.

Affective needs are said to positively influence behavioral intentions to utilize digital banking, according to hypothesis 7. Nevertheless, *H7 is rejected* because the initial sample value is -0,002, the t-statistic is 0,052 below 1,65, and the p-value is 0,959 over 0,05 (5%). With an initial sample value of 0,222, a t-statistic of 4,538 exceeding 1,65, and a p-value of 0,000 below 0,01 (1%), *H8 is accepted*. With a positive initial sample value of 0,031, a t-statistic of 2,301 above 1,65, and a p-value of 0,022 below 0,05 (5%), the result *H9 is accepted*. With a positive original sample value of 0,252, a t-statistic of 5,230 more than 1,65, and a p-value of 0,000 below 0,01 (1%), *H10 is accepted*. The test results demonstrate that *H11 is rejected* with a negative original sample value of -0,086; a t-statistic of 2,387 above 1,65; and a p-value of 0,017 below 0,05 (5%). Hypothesis 12 posits that facilitating conditions positively influence the behavioral intention to use digital banking, supported by a positive original sample value of 0.166, a t-statistic of 2.964 above 1.65, and a p-value of 0.003 below 0.01 (1%). Hence, *H12 is supported*. Hypothesis 13 suggests that facilitating conditions have a positive effect on the behavior of using digital banking. However, the original sample value is 0.027, a t-statistic of 0.424 below 1.65, and a p-value of 0.672 above 0.05 (5%), resulting in *the rejection of H13*.

Hypothesis 14 suggests that habit positively impacts the behavioral intention to use digital banking, as indicated by a positive original sample value of 0.182, a t-statistic of 3.060 exceeding 1.65, and a p-value of 0.002 below 0.01 (1%). Thus, *H14 is accepted*. Hypothesis 15 with a positive original sample value of 0.191, a t-statistic of 2.769 above 1.65, and a p-value of 0.002 below 0.01 (1%), leading to *the acceptance of H15*. Hypothesis 16 suggests that hedonic motivation positively affects the behavioral intention to use digital banking, supported by a positive original sample value of 0.290, a t-statistic of 5.171 exceeding 1.65, and a p-value of 0.000 below 0.01 (1%). Thus, *H16 is accepted*. Hypothesis 17 with a positive original sample value of 0.221, a t-statistic of 4.067 above 1.65, and a p-value of 0.000 below 0.01 (1%), leading to *the acceptance of H17*. Hypothesis 18 asserts that the behavioral intention to use digital banking positively affects the behavior of using digital banking, as indicated by a positive original sample value of 0.421, a t-statistic of 6.491 exceeding 1.65, and a p-value of 0.000 below the 0.01 (1%) significance level. Therefore, *H18 is accepted*.

Fig. 3 and Table 10 provide an explanation of the results of hypothesis testing.

Table 10
Result of Hypothesis Testing

	Hypothesis	Original sample	t statistics	p values	Result	Mediation
H1	CN → BI	-0.024	0.649	0.516	Rejected	-
H2	PE → BI	0.068	1.531	0.126	Rejected	-
H3	CN → PE	0.373	7.121	0.000	Accepted	-
H4	CN → EE	0.316	5.473	0.000	Accepted	-
H5	EE → BI	0.140	2.457	0.014	Accepted	-

Table 10
Result of Hypothesis Testing (Continued)

Hypothesis	Original sample	t statistics	p values	Result	Mediation	
H6	CN → EE → BI	0.045	2.063	0.040	Accepted	Full Mediation
H7	AN → BI	-0.002	0.052	0.959	Rejected	-
H8	AN → EE	0.222	4.538	0.000	Accepted	-
H9	AN → EE → BI	0.031	2.301	0.022	Accepted	Full Mediation
H10	SN → SI	0.252	5.230	0.000	Accepted	-
H11	SI → BI	-0.086	2.387	0.017	Rejected	-
H12	FC → BI	0.166	2.964	0.003	Accepted	-
H13	FC → B	0.027	0.424	0.672	Rejected	-
H14	H → BI	0.182	3.060	0.002	Accepted	-
H15	H → B	0.191	2.769	0.006	Accepted	-
H16	HM → BI	0.290	5.171	0.000	Accepted	-
H17	PV → BI	0.221	4.067	0.000	Accepted	-
H18	BI → B	0.421	6.491	0.000	Accepted	-

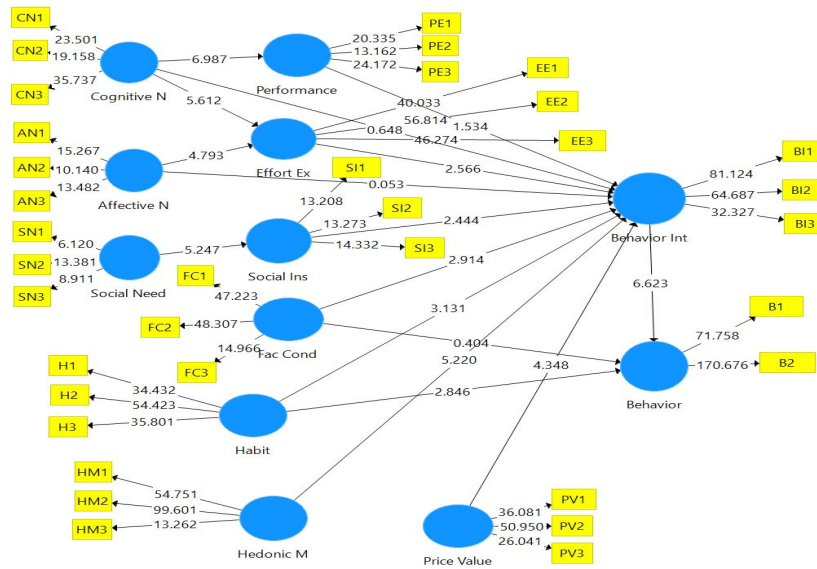


Fig. 3. Result of Structural Model Assessment

5. Discussion

5.1. Results

The integration of UGT-UTAUT2 has a 60.3% influence on behavioral intention, providing empirical evidence that the integration successfully affects behavioral intention with moderate explanatory power in the context of digital banking usage in Indonesia. The predictive power of the UGT and UTAUT2 models on behavioral intention to use digital banking is 46.1%. Cognitive needs influence performance expectations, consistent with Thongsri et al. (2018) findings. Affective needs impact effort expectations, aligning with Wut et al. (2021) research, and social needs influence social impact, as found by Wut et al. (2021). An originality in this study is the positive influence of cognitive needs on effort expectations and the mediating role of effort expectations between cognitive and affective needs and individual behavioral intention to use digital banking. The mediating role of effort expectation is a full mediation, because cognitive and affective needs don't influence directly to behavioral intention.

Effort expectations positively influence the behavioral intention to use digital banking, in line with the research of Srivastava et al. (2023), Negm (2023), Bhatnagr and Rajesh (2023), Hassaan et al. (2023), demonstrating that digital banking users find ease in its usage. Users' motivation for digital banking is to experience joy and comfort, following Nandru et al. (2023), Hassaan et al. (2023), Bhatnagr and Rajesh (2023) and Iqbal et al. (2022), hedonic motivation influences behavioral intention. Transaction costs incurred in digital banking transactions are not a concern, as user benefits outweigh the associated costs. Price value influences behavioral intention (Mohd Thas Thaker et al. 2021; Al-Sabaawi et al. 2021). Digital banking users perceive the available facilities in the digital banking system as adequate and secure, motivating them to use digital banking. Facilitating conditions affect behavioral intention positively, hence in line with the findings of Hassaan et al. (2023), Nandru et al. (2023), and Bhatnagr and Rajesh (2023). Digital banking users are highly familiar with digital systems and information technology, leading them to use digital banking regularly for their daily banking transactions. Habit influences behavioral

intention and the behavior of an individual (Hassaan et al. 2023). Behavioral intention to use digital banking affects the behavior of using digital banking, according to the research of Iqbal et al. (2022), and Yaseen et al. (2022).

Users have a pleasant experience using digital banking, but do not influence their behavioral intention, in line with the research of Doshi et al. (2023), Osei-Frimpong et al. (2022) and Hsu and Lin (2021). Performance expectations do not influence the behavioral intention to use digital banking; users feel that digital banking can efficiently complete transactions but do not influence their behavioral intention. This result aligns with the findings of Iqbal et al. (2022), Wu and Ho (2021), and Owusu Kwateng et al. (2019). Users learn from friends, colleagues, and the environment when using digital banking but do not influence their behavioral intention to use it. Social influence does not affect behavioral intention, consistent with the findings of Hassaan et al. (2023), Nandru et al. (2023), and Shaikh and Amin (2023). Users perceive highly adequate supporting facilities but cannot sustainably influence their behavior. Facilitating conditions do not affect behavior use, in line with the research of Wu and Liu (2022), Çera et al. (2020), and Mansoori et al. (2018).

5.2. Theoretical Implications

The integration of UGT and UTAUT2 can influence an individual's behavioral intention to use information technology in the context of digital banking system usage. Cognitive needs influence performance and effort expectations; affective needs impact effort expectations, and social needs have an effect on social influence. Effort expectations serve as a successful mediator between cognitive and affective needs and behavioral intention, exhibiting full mediation. This marks an originality in the integration of UGT and UTAUT2 concepts. Empirical evidence is provided by effort expectations, facilitating conditions, habit, hedonic motivation, and price value, showcasing the influence of the UTAUT2 framework on behavioral intention in the context of digital banking usage. Both habit and behavioral intention exert influence on behavior.

5.3. Practical Implications

Integrating UGT-UTAUT2 in digital banking usage benefits banking management by ensuring that system development accommodates customer needs. Customers require comprehensive and adequate information to use digital banking more easily and conduct transactions quickly and practically. Security and the facilities in the digital banking application are key factors that encourage customers to use digital banking. Security is crucial as it involves protecting customer data, and the available facilities in the application meet customer needs. Customer motivation to use digital banking includes experiencing joy and comfort during transactions, so attractive promotions can enhance digital banking usage.

6. Conclusion, Limitations, and Future Research Development

Effort expectations mediate the relationship between cognitive and affective needs and behavioral intention to use digital banking with full mediation. The study has limitations, such as delayed responses from participants in returning the distributed questionnaires, although there is no evidence of non-response bias. Future research can utilize two variables from the UGT, namely integrative personal needs and tension release needs, to be integrated with the UTAUT. Future research should maximize questionnaire distribution and involve liaisons to distribute research questionnaires.

Declarations of Interest

1. Data Availability Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. Data only for this research and not shared to the third party.

2. Informed consent

The informed consent was not needed because of the nature of data.

3. Conflicts of interests

The authors declare that there isn't conflict of interests.

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