

The Embracing Digital Banking: An Innovation Acceptance Model Perspective in Indonesian Islamic Banks

M. Fauzan¹, Andri Soemitra², Marliyah³

¹²³Universitas Islam Negeri Sumater Utara, Indonesia

¹mfauzanstb2020@gmail.com *✉

²andrisoemitra@uinsu.ac.id

³marliyah@uinsu.ac.id

ARTICLE INFO

ABSTRACT

Keywords:

Digital Banking;
Islamic Banks;
Innovation
Acceptance Model
(IAM);

Background: This study investigates the determinants of users' behavioral intention to adopt Islamic digital banking in Indonesia through the lens of the Innovation Acceptance Model (IAM). The purpose of this research is to identify which factors business support, perceived trust, perceived ease of use, perceived usefulness, attitude, perceived behavioral control, and perceived economic considerations significantly influence adoption intention

Method: A mixed-methods design was employed, combining Structural Equation Modeling Partial Least Squares (SEM-PLS) to assess demand-side perceptions with Analytic Network Process (ANP) to prioritize supply-side strategies for Islamic banks

Results: The findings reveal that business support, trust, ease of use, usefulness, attitude, and behavioral control positively and significantly shape behavioral intention, while the economic factor does not exert a significant effect. This suggests that in the context of Islamic finance, trust, Sharia compliance, security, and convenience outweigh financial considerations in driving adoption. The results also highlight the pivotal role of institutional support and digital literacy in shaping favorable perceptions, especially among student and young adult users who formed the majority of the sample.

Conclusion: The novelty of this research lies in applying IAM to Islamic digital banking, demonstrating that not all theoretical constructs universally apply, thereby offering opportunities for contextual refinement of the model. Practically, the study emphasizes the need for Islamic banks to enhance support services, ensure visible Sharia compliance, simplify user experiences, and strengthen trust mechanisms. Overall, this research contributes to both theory and practice by broadening the understanding of digital banking adoption within a faith-based financial system. findings, implications, and the novelty of the study

Received: 10/20/2025

Revised: 12/24/2025

Accepted: 12/27/2025

How to cite this article:

Fauzan, M., Soemitra, A., Marliyah. (2026). The Embracing Digital Banking: An Innovation Acceptance Model Perspective in Indonesian Islamic Banks. *Sharia Economic and Management Business Journal (SEMBJ)*, 7(1), 151-167. <https://doi.org/10.62159/sembj.v7i1.2006>

INTRODUCTION

The rapid advancement of digital technology has transformed the global banking sector, reshaping how financial institutions deliver services and how customers interact with them. Digital banking has emerged as a core innovation, promising efficiency, accessibility, and enhanced user experience. Islamic banks in Indonesia, as an integral part of the national financial system, have also embarked on digital transformation by integrating technologies such as Artificial Intelligence (AI), big data analytics, and process automation to modernize their services. The primary aim of this transformation is to provide convenient, secure, and accessible financial services anytime and anywhere. However, despite these advancements, the adoption rate of digital banking in Indonesian Islamic banks remains relatively low compared to their conventional counterparts. (Khanturaev, 2021)

Studies indicate that only around 40–50% of Islamic bank customers in Indonesia actively adopt digital banking services, while the adoption rate among conventional bank customers exceeds 80%. Several factors have been identified as influencing adoption, including perceived return on investment, user habits, price-value perceptions, social influence, and hedonic motivation. In addition, variables such as relative advantage, compatibility, and observability tend to support adoption, while perceived complexity and risk hinder it. Trust also plays a crucial mediating role, as positive regulatory perceptions strengthen consumer confidence in digital services. This situation underlines that beyond technological readiness, customer perceptions and socio-psychological aspects remain key determinants in shaping adoption behavior. (Kumar et al., 2022)

Despite operating for nearly three decades, the market share of Islamic banking in Indonesia remains modest, standing at only 7.72% in December 2024 according to the Financial Services Authority (OJK). While the introduction of digital banking services—such as internet banking, mobile banking, and QRIS—has shown promise in expanding market share, several challenges persist. These include limited technological infrastructure in rural areas, insufficient financial literacy among customers, cybersecurity threats, and a shortage of competent human resources in information technology. Furthermore, the capital regulation framework limits the ability of many Islamic banks—mostly categorized as BUKU 1 and 2 banks to invest in large-scale digital innovations, placing them at a disadvantage compared to conventional banks, which are often classified as BUKU 3 or 4. (Grassi et al., 2022)

The merger that formed Bank Syariah Indonesia (BSI) was intended to strengthen competitiveness nationally and globally. However, events such as the ransomware attack in May 2023, which disrupted customer transactions for several days, highlighted the vulnerabilities of digital infrastructure and eroded customer trust. This incident reinforced the importance of robust cybersecurity systems as a prerequisite for successful digital adoption. Moreover, compared to conventional banks like BCA, Islamic banks often lag in offering comprehensive digital services, user-friendly applications, and broad payment networks, which further exacerbates perceptions of being less competitive in digital innovation. (Khanturaev, 2021)

From a technological perspective, Islamic banks in Indonesia face constraints in designing digital applications that are both comprehensive and user-friendly. Customers often perceive Islamic bank applications as less intuitive and limited in features, which discourages active usage. In addition, the lack of IT specialists within Islamic banks slows innovation, while strict regulatory approvals and significant capital investments required for digital infrastructure create additional barriers. Consequently, many Islamic bank customers particularly older generations and those in rural areas continue to rely on physical branches rather than transitioning to digital platforms. (Kumar et al., 2022)

To address these challenges, Islamic banks must balance technological innovation with regulatory compliance, customer trust, and socio-cultural needs. Collaborative efforts with technology providers, as well as the development of unique Sharia-based features such as digital zakat or Hajj savings platforms, could become distinctive competitive advantages. Nevertheless, to ensure that such innovations are widely adopted, it is crucial to understand customer acceptance behavior. (Zhang et al., 2023)

The Innovation Acceptance Model (IAM) offers a relevant analytical framework in this regard. Building upon the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), IAM incorporates both internal and external factors to explain user adoption of innovations. Key constructs such as Perceived Usefulness (PU), Perceived Ease of Use

(PEOU), and Perceived Trust (PT) are central in determining whether customers perceive digital banking services as beneficial, easy to use, and secure. Other important factors include Awareness and Knowledge (AK), Perceived Economic Factors (PEF), and Behavioral Intention (BI), all of which directly influence actual usage. (Pereira et al., 2021)

In the context of Indonesian Islamic banks, challenges such as low technological background among customers and limited familiarity with digital banking services remain critical barriers. Many customers lack basic knowledge of financial technology and ICT, making them hesitant or stressed when using digital platforms. Psychological factors, such as anxiety about making mistakes or preference for face-to-face interactions, also reduce adoption rates. These behavioral tendencies highlight the mediating role of Behavioral Intention, which bridges perceptions of usefulness, trust, and economic value with actual usage. (Morin & Franck, 2017)

Although numerous studies have explored digital banking adoption using models such as TAM and UTAUT, significant gaps remain. First, theoretical gaps arise because TAM and UTAUT primarily focus on internal perceptions (usefulness, ease of use, performance expectancy, etc.) while neglecting external factors such as technological background and familiarity with digital services, which are particularly relevant in developing economies like Indonesia. The IAM framework seeks to address this limitation by integrating these external variables to better capture the dynamics of adoption in Islamic banking. (Windasari et al., 2022)

Then, as previous research often treats digital banking adoption as a homogeneous process without considering the unique regulatory, ethical, and socio-cultural aspects of Islamic finance. Studies rarely account for Sharia-specific features that could influence customer trust and behavioural intention. empirical gaps persist because prior findings on factors such as perceived trust or ease of use have been inconsistent across contexts. Few empirical studies in Indonesia have examined how technological background and service familiarity directly influence actual usage through behavioural intention within Islamic banking customers. most prior studies rely solely on quantitative approaches using SEM. Limited attention has been given to mixed-method designs that combine SEM with multi-criteria decision-making tools such as Analytic Network Process (ANP), which could yield richer insights into practical solutions and strategies for increasing adoption. Finally, there are practical gaps, since Islamic banks often adopt digital technologies without systematically analysing customer readiness and acceptance. As a result, many innovations fail to achieve widespread usage, and banks continue to face customer resistance despite technological investments. (Kasri et al., 2022)

In summary, addressing these gaps requires a comprehensive framework that integrates both internal and external adoption factors while accounting for the specific context of Islamic banking in Indonesia. This study seeks to fill these gaps by employing the Innovation Acceptance Model (IAM) to analyse determinants of digital banking adoption, thereby providing theoretical contributions, empirical evidence, and practical recommendations for Islamic banks in the digital era.

METHOD

This study adopts a mixed-methods design to comprehensively investigate the determinants of behavioral intention to adopt Islamic digital banking in Indonesia. The quantitative component employs Structural Equation Modeling–Partial Least Squares (SEM-PLS) to examine causal relationships among the Innovation Acceptance Model (IAM) constructs, (Kitsios et al., 2021) while the qualitative and decision-making component uses the Analytic Network Process (ANP) to prioritize managerial strategies for Islamic banks. This design ensures a balance between measuring demand-side perceptions of users and identifying supply-side strategic responses from practitioners (Miles, M. B., Huberman, A. M., & Saldaña, 2014).

Data

This study uses primary data collected through a structured questionnaire distributed to customers of Islamic banks in Indonesia. The questionnaire was designed based on validated constructs from TAM, UTAUT, and IAM literature, with modifications to suit the context of Islamic banking. Data were collected through both online platforms (Google Forms, email distribution, and social media) and offline distribution at selected bank branches. To ensure data quality, a pilot test was conducted with a small group of respondents prior to the main survey. This process helped refine the questionnaire, ensuring

clarity of wording and content validity. Only responses that were complete and met the inclusion criteria were included in the final dataset. (Mertens, 2015)

Sample and Procedure

The population of this study consisted of Islamic bank customers in Indonesia who have access to digital banking services, such as mobile banking, internet banking, and electronic payment systems. Considering that not all customers actively use these services, a purposive sampling technique was applied to respondents. According to Hair, the minimum sample size required for SEM Partial Least Squares (PLS) is determined by determining the minimum R² value (0.10; 0.25; 0.50; and 0.75), for significance levels (1%, 5%, and 10%), assuming a statistical power level of 80% and a maximum number of indicators for the independent variables. The following sample size recommendations for 80% statistical power are shown in the figure below (Hair et al., 2022):

Table 1. PLS-SEM Sample Size Recommendations

Exhibit 1.7 Sample Size Recommendation a in PLS-SEM for a Statistical Power of 80%												
Maximum Number of Arrows Pointing at a Construct	Significance Level											
	1%				5%				10%			
	Minimum R ²				Minimum R ²				Minimum R ²			
	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
2	158	75	47	38	110	52	33	26	88	41	26	21
3	176	84	53	42	124	59	38	30	100	48	30	25
4	191	91	58	46	137	65	42	33	111	53	34	27
5	205	98	62	50	147	70	45	36	120	58	37	30
6	217	103	66	53	157	75	48	39	128	62	40	32
7	228	109	69	56	166	80	51	41	136	66	42	35
8	238	114	73	59	174	84	54	44	143	69	45	37
9	247	119	76	62	181	88	57	46	150	73	47	39
10	256	123	79	64	189	91	59	48	156	76	49	41

Source: Cohen, J. A power primer. *Psychological Bulletin*, 112, 155–159.

Based on the table above, the maximum number of indicators for this study's independent variables is 10. This study expects a minimum R² value of 0.10 using a 5% significance level and 80% statistical power. Therefore, the minimum sample size for this study is 189 respondents. This study used a purposive sampling technique, which is a sampling technique based on specific considerations or objectives. In purposive sampling, researchers deliberately select respondents who are deemed to have relevant or in-depth information related to the research topic. With this technique, it is hoped that the selected respondents will truly provide useful data to answer the research questions specifically and in accordance with the desired objectives.

Active Users of Sharia Digital Banking in Indonesia: Respondents were selected based on their status as active users of Sharia digital banking services. Active users are those who have used digital banking services in at least the past six months for various banking transactions, such as fund transfers, bill payments, or Sharia investments.

Adequate Technological Background: Respondents must have a basic understanding of digital technology, enabling them to use digital banking applications smoothly. This can be seen from their level of familiarity with digital devices or similar applications, as well as the frequency of use of other digital-based applications.

Level of Familiarity with Digital Banking Services: Respondents need to have sufficient experience using digital banking services, especially Sharia-compliant ones. This familiarity includes an understanding of the features of digital Sharia banking applications and experience conducting digital transactions in accordance with Sharia principles.

Measurement

The measurement instruments were adapted from established constructs in TAM, UTAUT, and IAM literature, with modifications to suit the context of Islamic banking in Indonesia. All items were measured using a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The main constructs and their indicators are as follows:

1. Perceived Usefulness (PU): The extent to which customers believe digital banking enhances the effectiveness and efficiency of their financial activities.
2. Perceived Ease of Use (PEOU): The degree to which customers find digital banking simple and user-friendly.
3. Perceived Trust (PT): Customer confidence in the security, reliability, and Sharia compliance of digital banking services.
4. Awareness and Knowledge (AK): The extent of customer awareness of digital banking services and their understanding of how to use them.
5. Perceived Economic Factor (PEF): The perception of cost-effectiveness and financial benefits derived from using digital banking.
6. Attitude (ATT): Customers’ overall positive or negative evaluation of using digital banking.
7. Perceived Behavioral Control (PBC): Customers’ perception of their capability and control in using digital banking applications.
8. Behavioral Intention (BI): The intention to continue or increase the use of digital banking services in the future.
9. Actual Use (AU): The frequency and extent to which customers actively use digital banking platforms for financial transactions.

The questionnaire items were adapted from prior validated studies with slight modifications to fit the Islamic banking context. A pilot test was conducted to ensure reliability and content validity before the main survey.

Validity and Reliability Analysis Techniques

The Validity and Reliability Analysis section of this study was conducted to ensure that the instrument used can measure the intended construct accurately and consistently. The validity of the instrument was tested through two types of validity, namely convergent validity and discriminant validity. For convergent validity, two main measures were used: the loading factor and the Average Variance Extracted (AVE). The loading factor measures the extent to which indicators in a construct relate to the latent construct being measured, with a recommended value of more than 0.7 to indicate a significant relationship. Indicators with a loading factor less than 0.7 but greater than 0.4 are still accepted, although indicators with a loading factor less than 0.4 should be considered for removal. Meanwhile, an AVE value greater than 0.5 indicates that the latent construct has good convergent validity, meaning that more than 50% of the variance in the indicators can be explained by the construct. Discriminant validity measures the extent to which different constructs in a model can be distinguished from each other. Discriminant validity testing is performed using the Fornell-Larcker Criterion, where the square root of the AVE for each construct must be greater than the correlation between the different constructs in the model.

Reliability is tested using two measures: Cronbach's Alpha and Composite Reliability (CR). Cronbach's Alpha measures the internal consistency of a construct, with a recommended minimum value of 0.7 indicating good reliability. If the Cronbach's Alpha value is in the range of 0.6 to 0.7, the construct is still considered acceptable, although a value below 0.6 indicates the need for improvement or removal of certain indicators. Composite Reliability (CR) is used as an alternative measure that is more stable and unaffected by the number of indicators in the construct. A CR value greater than 0.7 indicates good reliability, indicating that the latent construct can explain the indicators consistently and accurately. Additionally, bootstrapping techniques were used in the SEM-PLS analysis to test the statistical significance of the relationships between variables, as well as to calculate t-values and confidence intervals, which helped verify the overall validity and reliability of the model. In this way, this

study ensured that the instruments used were not only valid in measuring the intended constructs, but also reliable in producing consistent results.

Data Analysis

The collected data were analyzed using a two-stage approach. First, Structural Equation Modeling with Partial Least Squares (SEM-PLS) was employed to test the measurement and structural models. This method was chosen because of its suitability for exploratory research, its ability to handle complex models with multiple constructs, and its robustness with relatively small sample sizes. The analysis was conducted using SmartPLS software (Miles, M. B., Huberman, A. M., & Saldaña, 2014). The data analysis procedure consisted of:

1. **Measurement Model Assessment:** This step evaluated the validity and reliability of the constructs using indicators such as factor loadings, composite reliability (CR), Cronbach's alpha, and average variance extracted (AVE). Discriminant validity was also assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT).
2. **Structural Model Assessment:** After establishing the validity of the measurement model, the hypothesized relationships between constructs were tested. Path coefficients, t-values, and p-values were generated through bootstrapping to assess the significance of relationships. The coefficient of determination (R^2) and effect size (f^2) were also examined to evaluate the predictive relevance of the model.
3. **Analytical Network Process (ANP):** This study uses the Analytic Network Process (ANP) method with the help of the Super Decisions 2.10 application. ANP is a development of the Analytical Hierarchy Process (AHP) method that is able to overcome the weaknesses of AHP in terms of accommodating the relationship between criteria or alternatives. The ANP method is used to generate composite priorities through relative ratio measurements that take into account the influence of interacting elements based on certain control criteria. ANP is a general theory of relative measurement used to derive composite priority ratios from individual ratio scales that reflect the relative measurement of the influence of interacting elements regarding control criteria. ANP is a mathematical theory that allows one to systematically perform dependence and feedback that can capture and combine tangible and intangible factors. The following are the stages of ANP data processing:

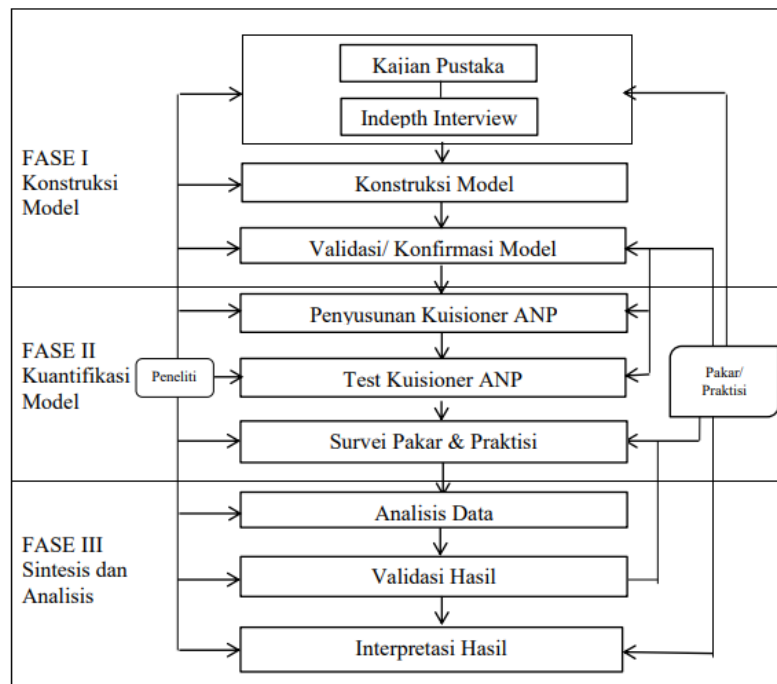


Figure 1. Data Processing Stages

The combination of SEM-PLS and ANP ensures both theoretical rigor and practical relevance. While SEM-PLS captures customer perspectives on adoption behavior, ANP provides strategic priorities from the institutional viewpoint, thus bridging the gap between academic research and managerial decision-making in Islamic banks.

RESULTS AND DISCUSSION

Outer Model Test Results

1. Convergent Validity Test

The results of the convergent validity test using loading factors in this study can be seen in the table in the appendix. Overall, the results of this test indicate that most indicators meet the established validity criteria, namely loading factor values above 0.7. However, several indicators had loading factors lower than 0.7 and were therefore deemed invalid. These indicators were then removed, and recalculations were performed. The recalculation results showed that all indicators had loading factor values greater than 0.7, meaning all indicators can be considered valid for use in further analysis.

The results of the Average Variance Extracted (AVE) test, which can be seen in the table in the appendix, indicate that all latent variables have AVE values higher than the established critical value of 0.5. These high AVE values indicate that the latent variables have good reliability in explaining the variance of the connected indicators. Thus, it can be concluded that all variables in this study are reliable and suitable for use in further analysis.

2. Discriminant Validity Test

The results of the cross-loading test in this study, as shown in the table in the appendix, indicate that all latent variables have cross-loading values greater than the critical value of 0.7. This test also indicates that each indicator has a high cross-loading coefficient on the relevant construct. The indicators of the other latent variables also show significant cross-loading coefficients, indicating that the discriminant validity between the latent variables has been met.

Based on the results of the Fornell-Larcker correlation test, as shown in the table in the appendix, it can be concluded that the AVE value for each latent variable exceeds the correlation value between them. Specifically, the AVE value on the main diagonal of the table is greater than the correlation between that variable and other variables outside the main diagonal. This indicates that each latent variable has adequate discriminant validity.

Reliability Test

The reliability test results shown in the reliability test table in the appendix indicate that all variables had Cronbach's alpha and composite reliability values that exceeded the established critical points. The Cronbach's alpha and composite reliability values for each variable were above 0.6 and 0.7, respectively, indicating a good level of reliability. Therefore, it can be concluded that all variables in this study reliably measure the intended constructs.

Results Test Hypothesis

1. Test Hypothesis

Following results test hypothesis in study this, which can observed in table following:

Table 2. Results Test Hypothesis

No	Hypothesis	Path Coefficient	P - Values
1.	Business Support (X1) → Behavioral Intention (Z)	0.168	0.009
2.	Perceived Economic Factor (X2) → Behavioral Intention (Z)	-0.023	0.375
3.	Perceived Trust (X3) → Behavioral Intention (Z)	0.092	0.019
4.	Perceived Ease of Use (X4) → Behavioral Intention (Z)	0.093	0.016
5.	Perceived Usefulness (X5) → Behavioral Intention (Z)	0.099	0.044
6.	Attitude (X6) → Behavioral Intention (Z)	0.246	0.001
7.	Perceived Behavioral Control (X7) → Behavioral Intention (Z)	0.147	0.019

8.	PC Knowledge (X8) → Actual Use of Digital Banking (Y)	0.204	0.002
9.	Fintech Knowledge (X9) → Actual Use of Digital Banking (Y)	0.083	0.023
10.	ICT Knowledge (X10) → Actual Use of Digital Banking (Y)	0.061	0.047
11.	Card Banking (X11) → Actual Use of Digital Banking (Y)	0.034	0.021
12.	Feeling Stressed During The Use (X12) → Actual Use of Digital Banking (Y)	-0.006	0.467
13.	Need for Interaction (X13) → Actual Use of Digital Banking (Y)	-0.037	0.304
14.	Information Mobile and PC Banking (X14) → Actual Use of Digital Banking (Y)	0.092	0.039
15.	Noinfo Mobile and PC Banking (X15) → Actual Use of Digital Banking (Y)	0.031	0.036
16.	Noinfo for All Electronic Banking (X16) → Actual Use of Digital Banking (Y)	0.049	0.047
17.	Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	0.423	0.001
18.	Business Support (X1) → Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	0.071	0.082
19.	Perceived Economic Factor (X2) → Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	-0.010	0.425
20.	Perceived Trust (X3) → Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	0.039	0.023
21.	Perceived Ease of Use (X4) → Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	0.040	0.020
22.	Perceived Usefulness (X5) → Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	0.042	0.007
23.	Attitude (X6) → Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	0.104	0.020
24.	Perceived Behavioral Control (X7) → Behavioral Intention (Z) → Actual Use of Digital Banking (Y)	0.062	0.011

Structural Model Study

Following is structural model overview from study This:

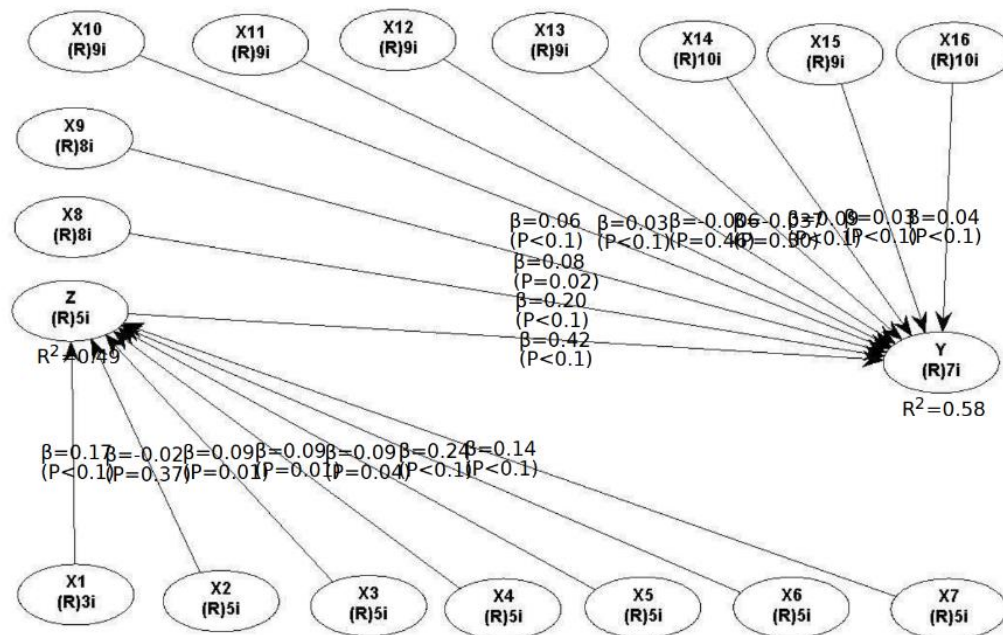


Figure 2. Structural Model Study

Following structural model equation in study This is:

$$Z=0.168X1-0.023X2+0.092X3+0.093X4+0.099X5+0.246X6+0.147X7+e.. (i)$$

$$Y=0.204X8+0.083X9+0.061X10+0.034X11-0.006X12-0.037X13+0.092X14+0.031X15+0.049X16+0.423Z+0.071Z1-0.010Z2+0.039Z3+0.040Z4+0.042Z5+0.104Z6+0.062Z7+e..(ii)$$

Results structural model analysis show influence various factor to intention and use actual digital banking at Islamic Banks in Indonesia. Business support (X1) has influence positive on behavioral intention (Z) with the path coefficient value is 0.168, which means every improvement One unit on business support will increase intention for using digital banking is 0.168. The perceived economic factor (X2) has an influence negative to intention with path coefficient value -0.023, which indicates that decline One unit on factor economy will lower intention use of -0.023. On the other hand, the factors perceived trust (X3), perceived ease of use (X4), perceived usefulness (X5), attitude (X6), and perceived behavioral control (X7) are all own influence positive to intention use of digital banking, each with path coefficients of 0.092, 0.093, 0.099, 0.246, and 0.147. In addition that, factor knowledge related technology information, such as PC knowledge (X8), fintech knowledge (X9), ICT knowledge (X10), as well as other factors such as card banking (X11), information mobile and PC banking (X14), and noinfo for all electronic banking (X16) too contribute positive to use actual digital banking, with varying path coefficients between 0.031 to 0.204. However, some factors, such as feeling stressed during the use (X12) and need for interaction (X13), indicate influence negative to use actual, each with path coefficients of -0.006 and -0.037. In addition that, the relationship between behavioral intention (Z) and actual use (Y) has influence significant positive, with the path coefficient value is 0.423, which shows that the more tall intention somebody for using digital banking, increasingly the possibility is also high use actual. In overall, findings this give clear picture about factors that influence intention and behavior the use of digital banking in Islamic Banks in Indonesia, which includes individual internal factors, support external, and knowledge technology.

Processing and Analytic Network Process (ANP) Data Analysis

1. Results Model Construction

The Analytic Network Process (ANP) approach was used to evaluate digital banking adoption at Islamic banks in Indonesia using a structured methodology. The process began with the identification of key variables, such as system technical disruptions, limited human resources, low customer digital literacy, distrust of personal data security, and low digital banking adoption compared to conventional banks. These variables were based on previous studies and then grouped into criteria, clusters, and nodes.

After identifying variables through a literature review, the ANP established hierarchical relationships between them to enable analysis of the impact and priorities of digital banking adoption. In-depth interviews with experts from various disciplines, including academics, regulators, and practitioners, were used to gain consensus on the most significant variables in increasing digital banking adoption. The identified variables were grouped into two main clusters: internal and external.

Internal challenges include issues such as limited investment in digital technology, slow technology adoption, system disruptions, and a lack of trained human resources. External challenges include competition with conventional banks, low customer digital literacy, lack of collaboration with fintech companies, distrust of personal data security, and regulatory barriers.

To address these issues, internal solutions are being implemented, including allocating funds for technology, establishing a technology adoption acceleration team, improving IT infrastructure, and training the workforce. External solutions include creating added value through digital banking features, customer education programs, partnering with fintech companies, strengthening data security systems, and implementing regulatory transparency. Strategies to achieve these goals include developing training modules, implementing encryption technology, launching new features, collaborating with technology education institutions, and developing a long-term technology roadmap.

The determination of these criteria, clusters, and nodes formed a complex network research model that was further analyzed using Super Decision 2.10 software. This network provides an in-depth overview of the interrelationships between variables that influence digital banking adoption. Thus, this

detailed ANP model provides a strong foundation for formulating effective policies and strategic decision-making to increase digital banking adoption at Islamic banks in Indonesia.

2. Results Model Quantification

After validation or confirm the model, then done application of the model to ANP software, namely Super Decision 2.10 For compile questionnaire comparison pairwise comparison. Questionnaire made for know name among second more elements big its influence and How many big the difference. In ANP, the size scale usually made with give mark from numbers 1 (one) to 9 (nine). On table following can seen scale relatively comparison pairs used in ANP.

Table 3. Paired Comparison Rating Scale

Level Interest	Def inisi	Information
1	Both elements are equally important/preferred	Elements A1 and A2 are equally preferred/important
3	One element is slightly more important/preferred than the other elements	Element A1 is quite preferred/important compared to element A2
5	One element is more important/preferred than another element	Element A1 is more preferred/important than element A2
7	One element is significantly more important/preferred than another element	Element A1 is highly preferred/important compared to element A2
9	One element is absolutely important/preferred over other elements	Element A1 is absolutely preferred/important compared to element A2
2, 4, 6, 8	The middle value between two adjacent assessments	This value is given if compromise/doubt is required in choosing the scale. For example: choose very liked and absolutely liked
The opposite	If the i th element in factor i gets the value x then the vile element in factor j gets the value $1/x$	The j th factor in the j th factor gets a value of $1/x$. For example: If A1 compared to A2 has a scale of 7, then A2 compared to A1 has a scale of $1/7$

The next step in this research was to develop a pairwise comparison matrix, which was used to evaluate the level of influence between the identified subcriteria. This matrix involved five expert respondents, consisting of Islamic finance experts, academics, regulators, and practitioners who have a deep understanding of the issues surrounding digital banking adoption in Islamic banks in Indonesia. Assessments were conducted using a scale of 1 to 9 through the distribution of a paired comparison questionnaire. Before distributing the questionnaire to the experts, validation was conducted using a pilot study approach. The pilot study results indicated that there were excess questions in the paired comparison questionnaire, but reducing the number of questions was not possible due to the dependence on Super Decision 2.10 software and the complexity of the relationships between variables that must be maintained.

After that, obtained variation evaluation from fifth expert for determination weight. After get evaluation weight from each expert, steps furthermore is count mark geometric means (GM). The following Wrong One calculation mark geometric means (GM) on Internal Problem 1 (MI 1):

Table 4. Questionnaire Comparison Paired (Pairwise Comparison) and Results Geometric Means Questionnaire 1

If we look at the objective of this research, which is to increase the use of *digital banking (actual use of digital banking)* of Islamic Banks in Indonesia, then in your opinion, rank the important aspects below according to their importance and influence:

No	Expert 1 Dervish Harahap	Expert 2 Mhd. Furqan	Expert 3 Rifki Ismal	Expert 4 Hamsari Nazli	Expert 5 Mr. Hakim Sitompul	Geometric Means	Round Up
Internal Problems							
1.	7	9	7	8	9	7.94	8
2.	7	9	3	7	7	6.21	6
3.	8	9	5	8	5	6.78	7
4.	7	9	4	8	9	7.10	7
Problem External							
1.	7	7	2	4	8	5.00	5
2.	8	8	5	4	7	6.17	6
3.	7	8	2	7	7	5.59	6
4.	9	9	2	7	9	6.33	6
5.	7	9	1	4	7	4.45	4
Internal Solutions							
1.	8	8	7	7	9	7.76	8
2.	8	8	8	8	8	8	8
3.	9	9	9	8	9	8.79	9
4.	9	9	9	9	8	8.79	9
Solution External							
1.	8	8	9	8	8	8.19	8
2.	8	8	9	4	6	6.73	7
3.	8	9	9	5	8	7.63	8
4.	9	9	9	7	9	8.55	9
5.	8	8	9	8	6	7.73	8
Strategy							
1.	7	7	9	5	7	6.88	7
2.	8	9	9	7	8	8.16	8
3.	8	8	9	7	9	8.16	8
4.	8	7	9	9	6	7.70	8
5.	8	9	9	9	9	8.79	9

Note: Darwis Harahap (Academician of UIN Syekh Ali Hasan Ahmad Addary Padangsidimpuan), Mhd. Furqan (Academician of UIN North Sumatra Medan), Rifki Ismal (Bank Indonesia and DSN MUI), Hamsari Nazli (PT Bank Muamalat Indonesia), Muhammad Hakim Sitompul (PT Bank Sumut Sharia Business Unit).

3. Results Synthesis and Analysis

Step furthermore is synthesis and analysis results study. The questionnaire that has been filled respondents done input on Super Decision 2.10 software. Before the data is processed analyzed, done

data validation with do test consistency. Data that is considered consistent if consistency ratio (CR) is higher small of 10 % or 0.1. If mark ratio consistency is above 10 % or $CR > 0.1$; then considered happen inconsistency. The following results test consistency ratio (CR) on study This:

Table 5. Results Test Consistency Ratio (CR) Questionnaire 1

Objective: To increase the use of <i>digital banking (actual use of digital banking)</i> of Islamic banks in Indonesia.			
No	Node	CR	Conclusion
1	Internal Problems	0.00772	Consistent
2	Problem External	0.03365	Consistent
3	Internal Solutions	0.00000	Consistent
4	Solution External	0.02607	Consistent
5	Strategy	0.00000	Consistent

Source: *Output Super Decisions 2.10 (2025)*

Results test Consistency Ratio (CR) Questionnaire 1 aims to increase increasing the use of digital banking (actual use of digital banking) of Islamic Banks in Indonesia, resulting in consistent CR value for every statement questionnaire. Mark inconsistency node comparison for internal problems, problems external, internal aspects, aspects external, solutions, and strategy is each one obtained not enough from 0.10. So, it can be called that comparison in pairs the Already consistent. With thus, the weight priority given elements can used as base For data analysis and interpretation results study more carry on.

The results that have been There is counted mark Kendall's Coefficient of Concordance for count mark agreement between respondents (rater agreement). Kendall's Coefficient of Concordance is Wrong One tools used for measure opportunity between a number of giver values (judges) who check or evaluate a group the given object. As for Kendall's Coefficient of Concordance formula are: W ; $0 < W < 1$. If $W = 1$, then matter the show suitability perfect, whereas when W value of 0 or the more approaching 0, then matter the show agreement between respondents the more weak or existence mismatch answer between respondents or answer respondents the varies. The following calculation rater agreement (W) on study This:

$$U = \frac{(1+2+4+3)}{4} = 2,5$$

$$S = (4 - 2,5)^2 + (3 - 2,5)^2 + (2 - 2,5)^2 + (1 - 2,5)^2 = 5$$

$$M = (1 - 2,5)^2 + (2 - 2,5)^2 + (3 - 2,5)^2 + (4 - 2,5)^2 + (5 - 2,5)^2 = 11,25$$

$$W = \frac{5}{11,25} = 0,444$$

Based on results calculation Kendall's Coefficient of Concordance (W) shows that its value of 0.444 or is at at $0 < 0.444 < 1$. This is show that agreement between respondents has a moderate and important contribution to the goal, and has balanced relevance or existence suitability answer between respondents, although varies.

Table 6. Values Kendall's Coefficient of Concordance (W)

No	Node	Ranking	U	S	MaxS	W
Internal Problems						
1	MI 1	1	2.5	5	11.25	0.444
2	MI 2	2				
3	MI 3	4				
4	MI 4	3				
Problem External						
1	ME 1	4	3	10	10	1
2	ME 2	1				
3	ME 3	3				
4	ME 4	2				
5	ME 5	5				

Internal Solutions						
1	SI 1	1				
2	SI 2	3				
3	SI 3	4	2.5	5	11.25	0.444
4	SI 4	2				
Solution External						
1	SE 1	1				
2	SE 2	4				
3	SE 3	3	3	10	10	1
4	SE 4	2				
5	SE 5	5				
Strategy						
1	ST 1	2				
2	ST 2	1				
3	ST 3	4	3	10	10	1
4	ST 4	5				
5	ST 5	3				

Source : Ms. Output Excel (2025)

Based on results mark Kendall's Coefficient of Concordance (W) known that mark from each node has mark approach value 0 and value 1. That is, the answer every respondents expert the varies And show agreement between respondents expert and perfect. After done analysis results agreement between respondents expert, then step furthermore is make synthesis results study. Following data synthesis results average value of all respondents expert:

Table 7. Results Synthesis Overall Average Value Respondents Expert

No	Node	NR	Priority
Internal Problems			
1	Limited investment in digital technology	0.053501	1
2	Slow technology adoption process	0.041884	2
3	The system frequently experiences technical problems	0.034446	4
4	Lack of human resources who are experts in the latest technology	0.036835	3
Problem External			
1	Tight competition with conventional banks	0.035064	4
2	Low digital literacy of customers	0.038060	1
3	Lack of collaboration between Islamic banks and fintech	0.037721	3
4	Customer distrust of personal data security	0.037979	2
5	Regulatory Barriers	0.017843	5
Internal Solutions			
1	Allocation of priority technology funds	0.042018	2
2	Form a team to accelerate the adoption of digital technology	0.041322	3
3	IT infrastructure with more stable servers and cloud technology	0.040947	4
4	Recruiting and training a workforce with <i>digital banking expertise</i>	0.042379	1
Solution External			
1	Creating added value to features	0.038979	1
2	Education and training programs for customers	0.033456	4
3	Establish partnerships with fintech companies	0.033991	3
4	Strengthening customer data security systems	0.038267	2
5	Policy transparency and flexible regulations	0.021974	5
Strategy			
1	Developing training modules	0.035043	2
2	Implementing data encryption technology	0.038515	1
3	Launching banking service features	0.031526	4

4	Collaborate with technology education institutions	0.029665	5
5	Creating a long-term technology roadmap	0.031917	3
Objective			
1	Increasing the use of <i>digital banking (actual use of digital banking)</i> of Islamic Banks in Indonesia	0.166667	1
Total		1	

Source: *Super Decisions Output 2.10 and Ms. Excel (2025)*

Table results synthesis average value of all respondents expert presenting synthetic data the average value of all over respondents expert for each node that becomes focus study. In category internal problems, there are four main nodes, where problem Limited investment in digital technology gets the highest priority with an average value (NR) of 0.053501 and system problems often experience technical problems gets the lowest priority with an average value (NR) of 0.034446. On problem externally, there are five main nodes, where problem low digital literacy of customers gets the highest priority with an average value (NR) of 0.038060 and regulatory barriers issues received the lowest priority with an average value (NR) of 0.017843.

solutions, there are four main nodes, for problem recruiting and training workers with digital banking skills gets the highest priority with an average value (NR) of 0.017843 and IT infrastructure issues with more stable servers and cloud technology received the lowest priority with an average value (NR) of 0.040947. Then, the external solution, there are five main nodes, for the problem of creating added value on the feature getting the highest average priority (NR) of 0.038979 and the issue of policy transparency and flexible regulations received the lowest priority with an average value (NR) of 0.021974.

Temporary that, on category strategy with problem Implementing data encryption technology received the highest priority with an average value (NR) of 0.038515, and the problem of collaborating with technology education institutions received the lowest priority with an average value (NR) of 0.029665. synthesis mark this, can concluded that priority action in Increasing the use of digital banking (actual use of digital banking) in Islamic Banks in Indonesia includes internal problems, external problems, internal solutions, external solutions, and strategies that have been implemented. identified from perspective for experts involved in study this.

The findings of this study contribute to a deeper understanding of how the Innovation Acceptance Model (IAM) applies in the context of Islamic digital banking in Indonesia. Overall, the results confirm that business support, trust, ease of use, usefulness, attitude, and perceived behavioral control significantly enhance users' behavioral intention to adopt Islamic digital banking. In contrast, the economic factor does not appear to play a decisive role.

The strong influence of business support highlights the critical role of institutional facilitation in shaping user perceptions. In the context of emerging markets such as Indonesia, where digital literacy levels remain uneven, banks' efforts in providing responsive customer service, tutorials, and reliable infrastructure become pivotal. These results reinforce prior innovation adoption research suggesting that organizational support accelerates the transition from knowledge to persuasion and eventually to decision-making.

The non-significant effect of the economic factor represents an intriguing departure from conventional technology acceptance studies. Typically, economic benefits such as efficiency, cost savings, or incentives are assumed to motivate adoption. However, in Islamic banking, customers' priorities appear to shift toward trust, Sharia compliance, and perceived security. This finding suggests that in value-driven financial ecosystems, intangible benefits may outweigh material considerations. The demographic composition of the sample, largely consisting of students and individuals with limited work experience, further explains why long-term economic advantages may not yet resonate strongly.

The significant role of trust aligns with established theories of consumer behavior, emphasizing that perceived security and credibility serve as filters through which users evaluate risk. In financial services especially those mediated digitally trust is non-negotiable. For Islamic banks, this translates into the dual responsibility of ensuring both technological reliability and compliance with Sharia principles. (Chen & Huang, 2023)

Similarly, ease of use and perceived usefulness emerged as central determinants of behavioral intention, consistent with established innovation adoption frameworks. Users are more inclined to adopt services that are intuitive, accessible, and demonstrate clear relative advantages over traditional banking. Together, these factors demonstrate how usability and functionality reinforce each other in shaping digital adoption.

The positive influence of attitude and behavioral control indicates that both internal evaluations and self-efficacy are vital in driving intention. When users perceive digital banking as beneficial and feel confident in their own ability to use it, adoption becomes more likely. This resonates with the Theory of Planned Behavior, where attitudes and control beliefs are recognized as central predictors of intention.

Taken together, these findings suggest that while IAM offers a robust framework for understanding adoption in Islamic digital banking, contextual adaptations are necessary. Specifically, the diminished role of economic considerations underscores the importance of embedding cultural, religious, and trust-related dimensions into models of innovation acceptance in Islamic finance.

CONCLUSION

This study set out to examine the determinants of users' behavioral intention to adopt Islamic digital banking in Indonesia using the Innovation Acceptance Model (IAM). The findings confirm that business support, perceived trust, perceived ease of use, perceived usefulness, attitude, and perceived behavioral control all have positive and significant effects on intention. These results highlight the importance of institutional facilitation, technological reliability, user confidence, and Sharia compliance in driving adoption.

Notably, the study found that the perceived economic factor does not significantly influence intention. Unlike conventional technology adoption research where cost and efficiency are central, this result suggests that users of Islamic digital banking prioritize intangible elements such as trust, religious values, convenience, and security over material or financial benefits. The demographic composition of the sample, largely students and individuals with limited exposure to financial management, further explains the weak impact of economic factors. Overall, the study contributes to both theory and practice by extending the applicability of IAM to the context of Islamic finance while also revealing contextual nuances that warrant model adaptation.

Future studies should explore several directions to further strengthen and expand these findings. First, including diverse demographics in research, such as working professionals, entrepreneurs, or rural users, could offer more nuanced insights into how economic factors and other determinants vary across different segments. Second, comparative studies, particularly cross-country or cross-religious comparisons, would enrich the understanding of how cultural and institutional factors influence digital banking adoption. Additionally, longitudinal analysis that tracks user behavior over time could capture the dynamics of adoption, trust development, and sustained usage. Furthermore, future research could integrate additional constructs such as perceived risk, religiosity, digital literacy, and the regulatory environment into the Information Adoption Model (IAM) to better account for the unique features of Islamic banking. Lastly, employing mixed-method approaches, combining quantitative surveys with qualitative interviews, could deepen insights into users' motivations and barriers, providing a more comprehensive understanding of digital banking adoption.

REFERENCES

- Alkhowaiter, W. A. (2020). Digital payment and banking adoption research in Gulf countries: A systematic literature review. *International Journal of Information Management*, 53. <https://doi.org/10.1016/j.ijinfomgt.2020.102102>
- Alnemer, H. A. (2022). Determinants of digital banking adoption in the Kingdom of Saudi Arabia: A technology acceptance model approach. *Digital Business*, 2(2). <https://doi.org/10.1016/j.digbus.2022.100037>
- António Porfírio, J., Augusto Felício, J., & Carrilho, T. (2024). Factors affecting digital transformation in banking. *Journal of Business Research*, 171. <https://doi.org/10.1016/j.jbusres.2023.114393>

- Attíe, E., & Meyer-Waarden, L. (2022). The acceptance and usage of smart connected objects according to adoption stages: an enhanced technology acceptance model integrating the diffusion of innovation, uses and gratification and privacy calculus theories. *Technological Forecasting and Social Change*, 176. <https://doi.org/10.1016/j.techfore.2022.121485>
- Carter, L., & Bélanger, F. (2005). The utilization of e-government services: Citizen trust, innovation and acceptance factors. *Information Systems Journal*, 15(1). <https://doi.org/10.1111/j.1365-2575.2005.00183.x>
- Chen, M. S., & Huang, W. T. (2023). Applying the Technology Acceptance Model to Understand Financial Practitioners' Intentions to Use the Digital Innovation Learning Platform †. *Engineering Proceedings*, 38(1). <https://doi.org/10.3390/engproc2023038062>
- Grassi, L., Figini, N., & Fedeli, L. (2022). How does a data strategy enable customer value? The case of FinTechs and traditional banks under the open finance framework. *Financial Innovation*, 8(1). <https://doi.org/10.1186/s40854-022-00378-x>
- Hubert, M., Blut, M., Brock, C., Zhang, R. W., Koch, V., & Riedl, R. (2019). The influence of acceptance and adoption drivers on smart home usage. *European Journal of Marketing*, 53(6). <https://doi.org/10.1108/EJM-12-2016-0794>
- Indriasari, E., Prabowo, H., Gaol, F. L., & Purwandari, B. (2022a). Digital Banking. *International Journal of E-Business Research*, 18(1). <https://doi.org/10.4018/ijebr.309398>
- Indriasari, E., Prabowo, H., Gaol, F. L., & Purwandari, B. (2022b). Intelligent Digital Banking Technology and Architecture: A Systematic Literature Review. *International Journal of Interactive Mobile Technologies*, 16(19). <https://doi.org/10.3991/ijim.v16i19.30993>
- Kasri, R. A., Indrastomo, B. S., Hendranastiti, N. D., & Prasetyo, M. B. (2022). Digital payment and banking stability in emerging economy with dual banking system. *Heliyon*, 8(11). <https://doi.org/10.1016/j.heliyon.2022.e11198>
- Khanturaev, B. A. (2021). TRENDS USING OF DIGITAL MARKETING METHODS IN THE FIELD OF BANKING AND FINANCIAL SERVICES IN DEVELOPED COUNTRIES. *Theoretical & Applied Science*, 98(06). <https://doi.org/10.15863/tas.2021.06.98.55>
- Kim, D., & Bae, J. K. (2020). Understanding internet-only bank service adoption: An integration of the unified technology theory of acceptance and innovation resistance model. *Global Business and Finance Review*, 25(3). <https://doi.org/10.17549/gbfr.2020.25.3.49>
- Kitsios, F., Giatsidis, I., & Kamariotou, M. (2021). Digital transformation and strategy in the banking sector: Evaluating the acceptance rate of e-services. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(3). <https://doi.org/10.3390/joitmc7030204>
- Kumar, A. S., Katta Lakshmi Narayan Setty, V., & Ravi, G. (2022). How blockchain enables financial transactions in the banking sector. *International Journal of Business and Globalisation*, 31(1). <https://doi.org/10.1504/IJBG.2022.124545>
- Lai, K., Guo, S., Ijadi-Maghsoodi, R., Puffer, M., & Kataoka, S. H. (2016). Bringing wellness to schools: Opportunities for and challenges to mental health integration in school-based health centers. *Psychiatric Services*, 67(12). <https://doi.org/10.1176/appi.ps.201500401>
- Mendoza-Tello, J. C., Mora, H., Pujol-López, F. A., & Lytras, M. D. (2019). Disruptive innovation of cryptocurrencies in consumer acceptance and trust. *Information Systems and E-Business Management*, 17(2–4). <https://doi.org/10.1007/s10257-019-00415-w>
- Mertens, D. M. (2015). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (4th ed.). Sage Publications.
- Mhlanga, D. (2023). Block chain technology for digital financial inclusion in the industry 4.0, towards sustainable development? In *Frontiers in Blockchain* (Vol. 6). <https://doi.org/10.3389/fbloc.2023.1035405>
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Sage Publications.

- Morin, L., & Franck, N. (2017). Rehabilitation interventions to promote recovery from schizophrenia: A systematic review. In *Frontiers in Psychiatry* (Vol. 8, Issue JUN). <https://doi.org/10.3389/fpsy.2017.00100>
- Oturakci, M. (2019). New Technology Acceptance Model Based on Innovation Characteristics with AHP-TOPSIS Approach. *International Journal of Innovation and Technology Management*, 16(7). <https://doi.org/10.1142/S0219877019500470>
- Pantano, E., & Di Pietro, L. (2012). Understanding consumer's acceptance of technology-based innovations in retailing. *Journal of Technology Management and Innovation*, 7(4). <https://doi.org/10.4067/S0718-27242012000400001>
- Pereira, L., Pinto, M., da Costa, R. L., Dias, Á., & Gonçalves, R. (2021). The new swot for a sustainable world. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1). <https://doi.org/10.3390/joitmc7010018>
- Pratiwi, R., Nasution, L. N. I., & Ardina, W. P. (2020). THE COMPLEX SENTENCE ACQUISITION BY FIVE YEARS OLD KINDERGARTEN STUDENTS. *Journal of English Education and Linguistics*, 1(1). <https://doi.org/10.56874/jeel.v1i1.55>
- Salimon, M. G., Sanuri, S. M. M., & Yusr, M. M. (2020). E-banking as a financial supply chain system: Can e-TAM improve trust and the rate of adoption? *International Journal of Supply Chain Management*, 9(2).
- Sengupta, T., Narayanamurthy, G., Hota, P. K., Sarker, T., & Dey, S. (2021). Conditional acceptance of digitized business model innovation at the BoP: A stakeholder analysis of eKutir in India. *Technological Forecasting and Social Change*, 170. <https://doi.org/10.1016/j.techfore.2021.120857>
- Shaikh, I. M., Amin, H., Noordin, K., & Shaikh, J. M. (2023). ISLAMIC BANK CUSTOMERS' ADOPTION OF DIGITAL BANKING SERVICES: EXTENDING DIFFUSION THEORY OF INNOVATION. *Journal of Islamic Monetary Economics and Finance*, 9(1). <https://doi.org/10.21098/jimf.v9i1.1545>
- Ward, R. (2013). The application of technology acceptance and diffusion of innovation models in healthcare informatics. In *Health Policy and Technology* (Vol. 2, Issue 4). <https://doi.org/10.1016/j.hlpt.2013.07.002>
- Windasari, N. A., Kusumawati, N., Larasati, N., & Amelia, R. P. (2022). Digital-only banking experience: Insights from gen Y and gen Z. *Journal of Innovation and Knowledge*, 7(2). <https://doi.org/10.1016/j.jik.2022.100170>
- Zhang, Z. J., Lo, H. H. M., Ng, S. M., Mak, W. W. S., Wong, S. Y. S., Hung, K. S. Y., Lo, C. S. L., Wong, J. O. Y., Lui, S. S. Y., Lin, E., Siu, C. M. W., Yan, E. W. C., Chan, S. H. W., Yip, A., Poon, M. F., Wong, G. O. C., Mak, J. W. H., Tam, H. S. W., Tse, I. H. H., & Leung, B. F. H. (2023). The Effects of a Mindfulness-Based Family Psychoeducation Intervention for the Caregivers of Young Adults with First-Episode Psychosis: A Randomized Controlled Trial. *International Journal of Environmental Research and Public Health*, 20(2). <https://doi.org/10.3390/ijerph20021018>