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Adoption of artificial intelligence-supported digital banking applications and their impact on customer loyalty

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Abstract. The rationale of this paper is that AI-enabled digital banking applications enhance consumer experiences and customer relationships; however, holistic findings on the impact of these applications on customer satisfaction and loyalty, beyond their benefits and adoption, are limited. The study aims to reveal the impact of AI-powered digital banking applications on customer loyalty by examining consumer adoption, experience, and satisfaction levels. The theoretical basis is grounded in an integrated research model that correlates variables from the technology acceptance model and the expectation confirmation model. The data and research methods comprise 510 participants using AI-enabled banking applications in Türkiye, employing a quantitative research design and an online survey technique. The data obtained were analysed using structural equation modelling (PLS-SEM). The findings indicate significant effects of perceived ease of use on perceived usefulness, as well as the relationship between perceived usefulness and confirmation on satisfaction. Furthermore, significant effects of satisfaction on continuance intention and continuance intention on customer loyalty were found. However, the direct effect of satisfaction on customer loyalty is not significant. This result suggests that satisfaction plays an indirect role in the formation of customer loyalty through continuance intention. Therefore, satisfaction and continuance intention are critical variables in strengthening customer loyalty in AI-enabled digital banking. Increasing customer satisfaction may not be sufficient for enhancing customer loyalty: banks must devise strategies to support customers' intentions to use applications regularly.

Keywords: digital banking; artificial intelligence; mobile apps; banking services; customer satisfaction; customer loyalty; consumer behaviour; perceived ease of use; perceived usefulness; Türkiye.

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Мобильный банкинг с поддержкой искусственного интеллекта: особенности внедрения и влияние на лояльность клиентов

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Аннотация. Мобильные банковские приложения с поддержкой искусственного интеллекта (ИИ) улучшают потребительский опыт и отношения с клиентами. Тем не менее в фокусе интереса ученых находятся, главным образом, преимущества и специфика внедрения таких приложений, а не комплексное изучение их влияния на удовлетворенность и лояльность потребителей. С помощью анализа уровня внедрения, пользовательского опыта и удовлетворенности потребителей в статье исследуется воздействие мобильного банкинга на основе ИИ на удержание клиентов. Теоретическая база основана на интегрированной исследовательской модели, сопоставляющей переменные моделей принятия технологии и подтверждения ожиданий. В работе использованы такие научные методы, как моделирование структурными уравнениями (PLS-SEM) и количественный подход. Эмпирические данные получены в ходе онлайн-опроса 510 респондентов – пользователей мобильных приложений с поддержкой ИИ турецких банков. Результаты исследования свидетельствуют о значительном влиянии воспринимаемой простоты использования мобильных ИИ-сервисов на их воспринимаемую полезность, а также о взаимосвязи между последней и удовлетворенностью потребителей банковских услуг. Выявлено, что удовлетворенность банковским ИИ-приложением в значительной степени определяет намерение клиентов продолжить его использование, что, в свою очередь, сказывается на их лояльности. В то же время влияние прямого эффекта удовлетворенности на удержание клиентов оказалось несущественным, что подтверждает ее опосредованное воздействие через намерение дальнейшего пользования приложением. Сделан вывод, что для поддержания лояльности клиентов может быть недостаточно только высокого уровня удовлетворенности: банкам необходимо разрабатывать стратегии, стимулирующие пользователей регулярно обращаться к мобильным ИИ-приложениям.

Ключевые слова: мобильный банкинг; искусственный интеллект; мобильные приложения; банковские услуги; удовлетворенность клиентов; лояльность клиентов; поведение потребителей; воспринимаемая простота использования; воспринимаемая полезность; Турция.

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INTRODUCTION

The digital banking market is a dynamic field, expected to grow by 10.3% between 2024 and 2028, reaching a volume of 1.2 trillion US dollars¹ [Bhatnagr, Rajesh, 2025]. The integration of artificial intelligence (AI) technologies into the banking and finance sector is transforming service processes and accelerating the sector's growth [Bafour Gyau et al., 2024]. Many banks globally are turning to AI-based innovations to strengthen their financial performance and increase operational efficiency [Shiyyab et al., 2023]. AI applications have become an integral part of banking operations in various areas, such as credit scoring, risk assessment, customer service, chatbots, and fraud detection [Singh et al., 2025]. These developments demonstrate that the role of AI in the financial sector is not only a technological innovation but also a strategic transformational element in customer relationships and experience.

Studies in recent years on the subject have analysed the effects of AI-enabled banking applications on consumer behaviour. However, most studies were restricted to user adoption, satisfaction, and continuance intention [Jain, Wadhwani, Eastman, 2024; Ho, Chow, 2024; Rahman et al., 2022]. Most previous studies have been grounded in a particular theory, such as the technology acceptance model (TAM) or the expectation confirmation model (ECM), and have not clearly focused on the customer loyalty dimension in a holistic model. Indeed, the review of the literature shows a scant number of studies that investigate the user satisfaction and loyalty link with AI-enabled applications.

The key contribution of this study is that it proposes a new model for explaining AI-enabled digital banking's satisfaction-continuance intention-customer loyalty chain, including variables based on the technology acceptance model and the expectation confirmation model. Therefore, the study contributes to the literature by jointly examining the indirect effects of satisfaction and continuance intention on loyalty. Furthermore, the research contributes to both theoretical and practical applications by testing the validity of this model using data obtained from digital banking users in Türkiye. The article presents

a literature review and theoretical framework, followed by sections on method, findings, discussion, and conclusion.

THEORETICAL FRAMEWORK

This study investigates consumers' acceptance of a new technology, expectations, experiences, satisfaction levels, and intentions to continue using it. Companies also employ new technology as a strategic resource. Each of these cases is considered separately, each based on a different theory.

The technology acceptance model is based on the explanation of consumers' acceptance of new technology. Meanwhile, in this present study, the perceived ease of use variable and the perceived usefulness variable have some relevance with the idea of reaping significant benefits from the new artificial intelligence technologies without having to try too hard [Davis, 1989]. According to this model, attitudes towards technologies are influenced by perceived ease of use and perceived usefulness. If an individual thinks that they can use technology easily, this is referred to as perceived ease of use. It is also explained as the degree at which one believes the use of technology will enhance performance [Davis, 1989; Byambaa et al., 2025, p. 4].

Expectation confirmation theory refers to a theory in which the confirmation of users' expectations before a behaviour, performance evaluations of usage, and expressions of satisfaction occur [Oliver, 1980]. From this theory, Bhattacharjee [2001] has studied the expectation confirmation model. That model researched the effects that users' perceptions and expectations of information technologies have on their usage intentions. Based on this theory and model, this study has investigated user expectations, performance, and satisfaction evaluations regarding the use of artificial intelligence-supported banking applications.

The explanation can be grounded in the resource-based view (RBV), which suggests that banks may leverage the capabilities offered by AI as a strategic resource and understand the impact of this innovation on their financial performance. This view provides a theoretical perspective in which firms regard AI capabilities as unique and valuable resources to be leveraged for gaining a com-

¹ Statista. (2023). Digital banks – worldwide | Statista market forecast. <https://www.statista.com/outlook/fmo/banking/digital-banks/worldwide>.

petitive advantage, according to Barney [1991]. In particular, the innovative, customized, and trust-enhancing features of AI-enabled banking services are regarded as unique capabilities in enhancing users' perceived usefulness and service quality in the context of this study. Thus, the RBV approach provides the theoretical basis necessary to explain the value creation dimension of AI-enabled digital banking applications.

Another theory which our research rests on is the diffusion of innovation theory, proposed by Rogers, Singhal and Quinlan [2009] to describe users' perceptions and decisions during the adoption process of new technologies. According to this theory, characteristics of innovation, such as complexity, compatibility, and observability, influence the nature of adoption. In this context, when the AI-enabled banking applications are considered as innovations in the financial sector, the level of technology adoption by users is influenced by perceptions of the characteristics mentioned above. It is assumed that the perceived ease of use and satisfaction variables play important roles in relation to these features of innovation.

Literature overview. Artificial intelligence technology has been one of the most intensively researched topics in the finance and banking sector in recent years. The adoption of AI-supported banking applications has been frequently researched within the TAM framework, while the ECT has also been used to examine consumers' confirmation, satisfaction, and continuance intention of these applications. Alnaser et al. [2023] examine the adoption of AI-supported digital banking within the framework of the expectation confirmation model. According to the study results, expectation validation affects satisfaction and perceived performance. Perceived performance affects satisfaction with artificial intelligence banking. Similarly, Bhatnagr and Rajesh [2025] examined artificial intelligence applications in digital banking applications based on the expectation confirmation theory from the perspective of Generation Y and Generation Z. It has been concluded that perceived liveliness and perceived intelligence of artificial intelligence have an effect on perceived anthropomorphic perceptions, which, in turn, increase perceived usefulness, satisfaction, and intention to continue. Byambaa et al. [2025] and Goyal, Garg and Malik [2025] also conducted their studies using TAM variables. Byambaa et al. [2025] found that perceived usefulness, perceived trust, and attitudes towards artificial intelligence in banking significantly increase the adoption of artificial intelligence-supported banking services. Koyluoglu and Acar [2023] also support these findings. Cintamür [2024] examined customers' acceptance of artificial intelligence devices. Goyal, Garg and Malik [2025] found that perceived ease of use positively affects attitudes towards technology use. However, it was determined that artificial intelligence does not directly impact continuance intention. Ramos, Casaca and Patri-

cio [2025] examined the intention to adopt intelligent assistants in the Portuguese banking sector within the TAM framework, while Ikhsan et al. [2025] and Papathomas, Konteos and Avlogiaris [2025] also examined the TAM model in their studies. The strong relationship between the structures, such as "performance expectancy," "effort expectancy," and "hedonic motivation" in AI adoption is emphasized in [Papathomas, Konteos, Avlogiaris, 2025], while finding that "social influence" is insignificant.

Research has also been conducted on the use of chatbots/virtual assistants (chatbots) in AI-supported banking applications [Hwang, Kim, 2021; Mogaji et al., 2021; Bhat-tacharya, Sinha, 2022; Deneçli, Yıldız Balaban, Deneçli Ari-bakan, 2022]. Alt and Ibolya [2021] identified the relevant segments of chatbot users; Eren [2021] and Balaji, Karim and Rao [2024] also conducted research on chatbots and customer satisfaction. Similarly, in addition to chatbot satisfaction, Le and Nguyen [2024], Park et al. [2024], and Nguyen and Le [2025] have focused on customer experience. Unlike these studies, Roozen et al. [2025] investigated how chatbots affect users regarding gender in the banking sector. Chatbots perceived as male were perceived as more competent and were more likely to be desired for use. On the other hand, chatbots have also been examined from a brand perspective. Armutcu et al. [2025] examined how artificial intelligence affects consumers' brand experience and brand preference in the banking sector. Meanwhile, Lee, Tang and Jiang [2022] based their study on the SOR technique, focusing on perceived intelligence and anthropomorphism variables. Trivedi [2019] and Upadhyay and Kamble [2024] have examined chatbots from the perspective of brand love. Hari, Iyer and Sampat [2022] show that banking chatbots affect brand experience satisfaction and customer brand usage intention. Graham et al. [2025] highlight the limitations of chatbots in terms of response accuracy and reliability, as well as the need for significant improvement, while also presenting a critical approach to the advantages of chatbots in other studies. Chatbots can provide significant benefits to both consumers and banks in the industry. However, it is argued that they cannot be expected to answer all customer queries without human assistance. Shaikh et al. [2024] also demonstrate that, despite the benefits of artificial intelligence, there remains a demand for human employees. Boustani [2022] also points out that although artificial intelligence-supported banking transactions can be more efficient than those of bank employees, they often lack emotional intelligence in addressing customer expectations.

Applications of artificial intelligence in the banking sector have been analysed using the methods of bibliometric analysis, by [Doumpos et al., 2023; Manta et al., 2024], and by systematic literature reviews, including works by [Indriasari, Gaol, Matsuo, 2019; Kumar, Srivastava, Gupta, 2022; Hentzen et al., 2022; Singh et al., 2025]. Fares, Butt and Lee [2022] present how research on arti-

ficial intelligence and banking has focused on three significant areas: strategy, process, and customer. According to Ghandour [2021], the key benefits of AI in banking include a focus on personalized services, customer satisfaction and loyalty, transaction security, and cybersecurity. Lăzăroiu et al. [2023] discuss AI together with cloud and blockchain technologies in light of the restructuring of financial service delivery.

AI-supported banking applications also support banks' innovation strategies. Artificial intelligence can improve both banks' sustainable innovation performance [Al-soukini, Adedokun, Berberoğlu, 2025] and financial performance [Baffour Gyau et al., 2024]. In addition to contributing to relationship banking [Jakšič, Marinč, 2019], it can influence consumer perceptions and create customer value [Manser Payne, Peltier, Barger, 2021]. In the banking sector, it can be effective in fraud detection [Rahman et al., 2023], risk management with machine learning [Milojević, Redzepagic, 2021], cybersecurity [Rodrigues et al., 2022], and increasing market share with innovative financial processes [Rabbani et al., 2022].

Hypothesis development. In this study, perceived usefulness is associated with users' beliefs that using AI-supported banking applications will contribute to their performance. Numerous studies have shown that perceived usefulness is influenced by perceived ease of use [Belanche, Casaló, Flavián, 2019; Damerji, Salimi, 2021; Liu, Huang, 2023; Abdullah, Almqatari, 2024; Zaman et al., 2024]. Users' intention to use a new technology appears to be related to their belief that the technology is easy to use, effortless, and beneficial to them. Users will likely be satisfied when they perceive they benefit from a technology [Ramos, Casaca, Patrício, 2025, p. 2]. In this regard, the study proposes hypotheses H1 and H2. These hypotheses are theoretically based on the technology acceptance model.

H1: Perceived ease of use has a statistically significant and positive effect on perceived usefulness.

H2: Perceived usefulness has a statistically significant and positive effect on satisfaction.

The expectation confirmation model posits that confirmations resulting from the use of a new technology have a significant impact on satisfaction. Consumers may have certain expectations when using a new technology. It is argued that confirming post-use expectations will positively impact satisfaction and subsequent intentions to continue using [Bhattacharjee, 2001]. Studies have concluded that confirming user expectations has an impact on satisfaction and continuance intention, and that satisfaction, in turn, has an impact on the intention to continue using [Alnaser et al., 2023; Nguyen, Ha, 2022; Nguyen, Dao, 2024]. In this regard, the study proposes hypotheses H3, H4, and H7 that are based on expectation confirmation theory.

H3: Confirmation has a statistically significant and positive effect on satisfaction.

H4: Satisfaction has a statistically significant and positive effect on continuance intention.

H7: Confirmation has a statistically significant and positive effect on continuance intention.

Customer loyalty is defined as consumers' commitment to reuse/purchase a product or service in the future [Oliver, 1999]. It has been observed that using artificial intelligence in a customer-focused manner can significantly impact customer loyalty [Khana et al., 2023]. Loyalty levels can be increased by providing personalized experiences and offers to customers [Peyravi, Nekrošienė, Lobanova, 2020]. According to Shaikh et al. [2024], there is evidence that AI increases customer satisfaction. Satisfaction, in turn, seems to affect reuse/buying a product or service, increasing continued use and loyalty. According to Bloemer et al. [1998], satisfaction directly affects loyalty. Therefore, this study proposes hypotheses H5 and H6, assuming that satisfaction with AI-supported banking applications may lead to increased loyalty of customers who are users. Al Amin et al. [2024] also reach empirical conclusions that e-satisfaction has positive effects on continuance intention and e-loyalty. Moreover, findings from the studies mentioned above theoretically support the validity of the hypotheses H5 and H6.

H5: Satisfaction has a statistically significant and positive effect on customer loyalty.

H6: Continuance intention has a statistically significant and positive effect on customer loyalty.

RESEARCH METHODOLOGY

This paper explores the adoption of AI-enabled applications by users in the banking sector and their impact on customer loyalty by proposing a research model based on theoretical models. In this study, quantitative analysis was used, and the method of data collection was an online survey. Data were collected between March and May 2025 from 510 users aged 18 and over who actively use AI-enabled digital banking applications in Türkiye through a convenience sampling method and an online survey. Ethics committee approval was obtained for the study, and participation was voluntary. Data obtained from participants were analysed using the PLS-SEM approach using SmartPLS software. The research model of this study is presented in Fig. 1.

The survey scales used in the study were adapted from previously developed and tested scales by copying and translating them into Turkish. A total of 18 items were measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), with each scale containing three items. The perceived ease of use and perceived usefulness scales were adapted from Davis [1989]. The Confirmation, Satisfaction, and Continuance intention scales were adapted from Bhattacharjee [2001], and the customer loyalty scale was adapted from Oliver [1999]. Cronbach's alpha coefficients for each scale exceeded 0.88, indicating strong internal consistency. The data source of the study

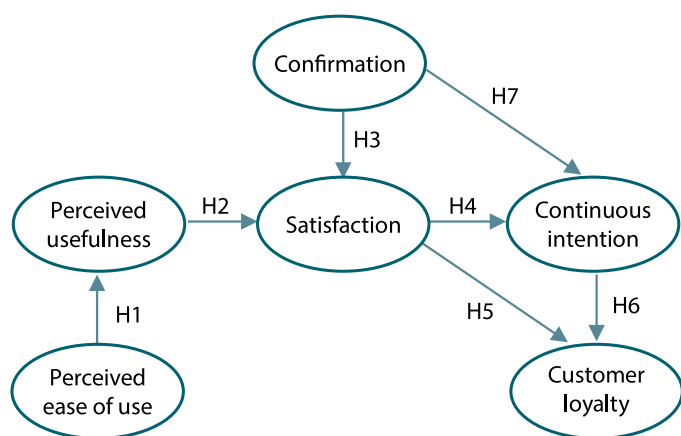


Fig. 1. The research model
Рис. 1. Модель исследования

consists of data obtained from a total of 510 participants who used artificial intelligence-supported digital banking applications in Türkiye, as reached through this survey.

The results of the normality test performed on the study's dataset showed that the skewness and kurtosis values should be between -3 and $+3$ [Kline, 2023] and that all values were within this range. In this regard, it was found that the data were suitable for structural equation modelling analyses.

Table 1 – Demographic characteristics of respondents
Таблица 1 – Демографические характеристики респондентов

Characteristics		n	%
Gender	Female	272	53.3
	Male	238	46,7
Age	18–25	204	40.0
	26–35	139	27.3
	36–45	127	24.9
	46 and above	40	7.8
Educational status	High school and below	65	12.7
	Associate degree	149	29,2
	Bachelor's degree	218	42.7
	Master's degree	53	10.4
Occupation	Doctorate	25	4.9
	Student	137	26.9
	Public sector employee	140	27.5
	Private sector	132	25.9
Income	Other	101	19.8
	Minimum wage and below	103	32.0
	23,000–50,000 TL	70	21.7
	51,000–70,000 TL	53	16.5
	70,000 TL and above	96	29.8

When examining the frequency table for participants, 53.3% of participants are female and 46.7% are male. Most participants are university graduates (42.7%), followed

by those holding associate degrees. Among the study participants, 26.9% are students, 27.5% are public sector employees, and 25.9% are private sector employees. Finally, when participants are analysed by income level, 32% have an income level of minimum wage or below, while 29.8% have an income level of 70,000 Turkish lira (TL) or above.

RESULTS

Confirmatory factor analysis was conducted for the factors in the study, and the data for each factor are presented in Table 2.

Table 2 – Assessment results of the measurement model
Таблица 2 – Результаты оценки модели измерения

Construct	Loadings	t-value	AVE	CR	Cronbach's Alpha
Perceived usefulness					
PU1	0.829	37.89	0.712	0.881	0.807
PU2	0.886	47.91			
PU3	0.814	33.58			
Perceived ease of use					
PEU1	0.864	23.89	0.742	0.895	0.827
PEU2	0.749	16.90			
PEU3	0.958	24.70			
Confirmation					
CO1	0.870	49.80	0.765	0.907	0.843
CO2	0.839	38.95			
CO3	0.913	55.52			
Satisfaction					
SA1	0.860	46.96	0.745	0.898	0.830
SA2	0.883	63.24			
SA3	0.846	55.25			
Continuance intention					
CI1	0.877	50.07	0.782	0.915	0.855
CI2	0.881	48.70			
CI3	0.895	52.51			
Customer loyalty					
CL1	0.879	49.15	0.731	0.891	0.820
CL2	0.813	37.64			
CL3	0.870	46.16			

Table 2 shows that the Construct Reliability (CR) values are above 0.70, indicating that the scales demonstrate high internal consistency, and that the Average Variance Explained (AVE) values are also above 0.50. These findings suggest that the measurement model is satisfactory in terms of convergent validity and reliability [Hair et al., 2014].

When HTMT scores were examined in the discriminant validity analysis of the study, it was observed that the Satisfaction variable showed a correlation of over 0.90 with some structures (especially Continuance Intention and Customer Loyalty). However, as emphasized in the litera-

Table 3 – HTMT ratio results

Таблица 3 – Расчет соотношения «гетеротрейт – монотрейт»

Variables	CO	CI	CL	PEU	PU	SA
Confirmation	–	–	–	–	–	–
Continuance intention	0.876	–	–	–	–	–
Customer loyalty	0.885	0.977	–	–	–	–
Perceived ease of use	0.347	0.430	0.355	–	–	–
Perceived usefulness	0.758	0.804	0.793	0.624	–	–
Satisfaction	0.954	0.934	0.939	0.326	0.778	–

ture, this is an expected result in variables that are conceptually very close to each other and have sequential interactions [Henseler, Ringle, Sarstedt, 2015]. Furthermore, according to the bootstrap analysis conducted in this regard, when the 95% confidence intervals were examined, it was observed that none of the HTMT values were within the confidence interval of 1.00, and therefore, discriminant validity was accepted. The Fornell-Larcker criterion [Fornell, Larcker, 1981] and subsequent methodological studies also argue that correlation values may be high in variables that are conceptually close [Franke, Sarstedt, 2019].

However, the high correlation between the Continuance intention (CI) and Customer loyalty (CL) variables was carefully examined to assess the possibility of overfitting the model. However, the potential implications of this situation were discussed at a conceptual level, rather than a statistical one. Because the CI and CL variables are considered distinct yet complementary constructs in the behavioural intention-loyalty literature, these variables were retained as separate yet related constructs, in line with the prevailing approach in the literature, rather than being combined. This interpretation supports the conceptual distinction between continuance intention and loyalty

towards the bank in the context of digital banking [Oliver, 1999; Bhattacharjee, 2001].

The ECM argues that satisfaction plays a determining role in the intention to continue using [Bhattacharjee, 2001]. Furthermore, Oliver [1999] demonstrates that satisfaction is a critical mediating variable in the formation of loyalty, while Davis [1989] shows that perceived usefulness and ease of use in the TAM model have a direct effect on behavioural intention. Therefore, the high level of relationships between these structures in the study is based on the theoretical foundation of the research model rather than measurement error. In this context, the structures were not removed from the model, thus preserving its integrity, and analyses were continued while considering common practices in the literature.

Within the scope of the structural equation model, the Variance Inflation Factor (VIF) values were examined to determine whether a linearity problem existed in the study. The results showed that the values were below 5 (2.18–3.62) [Hair et al., 2019], confirming the absence of a multiple linearity problem.

The structural model and hypothesis testing. The structural model and path analysis created within the scope of the research model are shown in Fig. 2.

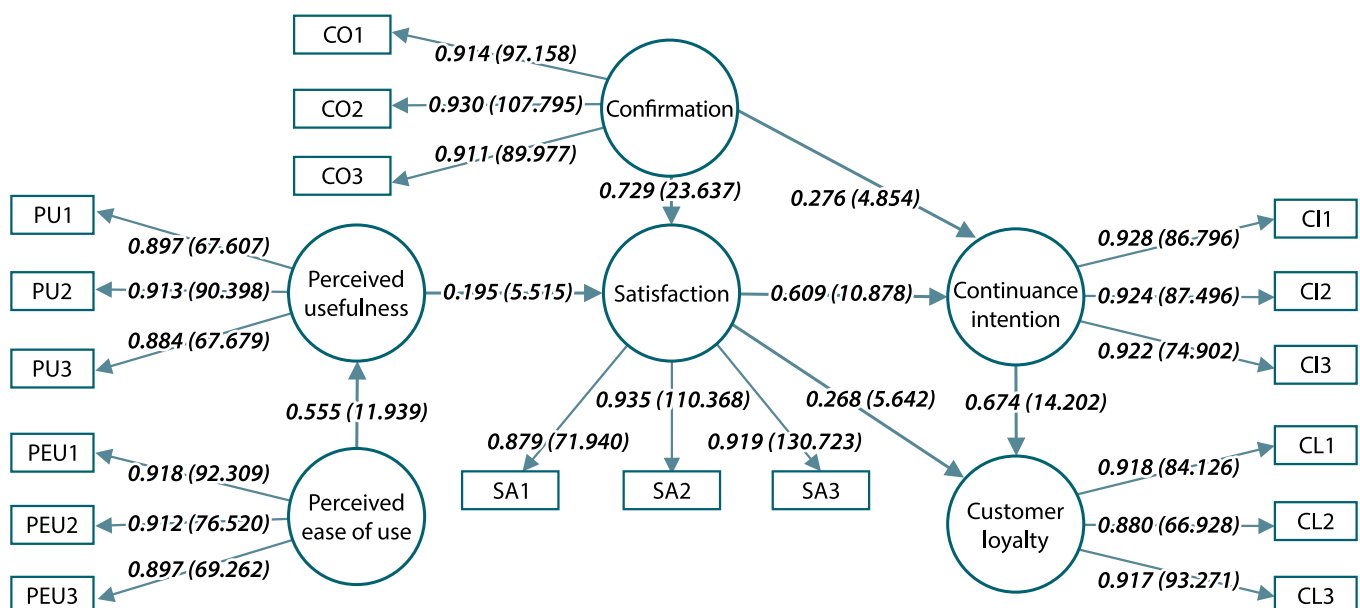


Fig. 2. Structural model assessment results (PLS-SEM)

Рис. 2. Результаты оценки структурной модели (PLS-SEM)

Table 4 – Results of hypothesized relationships
Таблица 4 – Результаты проверки гипотез

Hs	Hypothesized path	Beta	t-value	p-value	Decision
H7	Confirmation → Continuance intention	−0.151	0.360	0.718	Not supported
H3	Confirmation → Satisfaction	0.859	17.707	0.000	Supported
H6	Continuance intention → Customer loyalty	0.949	4.998	0.000	Supported
H1	Perceived ease of use → Perceived usefulness	0.620	13.061	0.000	Supported
H2	Perceived usefulness → Satisfaction	0.126	2.358	0.018	Supported
H4	Satisfaction → Continuance intention	1.078	2.589	0.010	Supported
H5	Satisfaction → Customer loyalty	0.052	0.269	0.788	Not supported

When the hypothesis test results are examined, it is seen that hypotheses H7 and H5 are not supported, while the other hypotheses (H1, H2, H3, H4, H6) are supported. It is seen that confirmation does not affect continuance intention but has a strong effect on satisfaction. Continuance intention was found to have a significant effect on customer loyalty ($\beta = 0.949, p = 0.000$).

The overall fitness of the structural model is then checked using the model fit indices of the SmartPLS analysis. The SRMR value of the Saturated Model is 0.056, which is below the limit of 0.08 as suggested by Hair et al. [2021]. It therefore means that this model fits the data well. Moreover, a low d_ULS value of 0.532 and d_G of 0.382 portray an overall good fit of the estimated model. From a different perspective, NFI has reached a value of 0.87, which is approximately close to 0.88, indicating a value within an acceptable limit. According to Henseler, Ringle and Sarstedt [2015] and Hair et al. [2021], it is recommended to report only the Saturated Model SRMR value. In this context, the findings indicate that the model generally fits the data and has a theoretically balanced structure.

In addition to these findings, indirect effects between some of the model's variables were also examined. The results of the specific indirect effects study examining these indirect effects are shown in Table 5.

The indirect effects results revealed that only two indirect effects were statistically significant, while the other indirect effects were not significant. Satisfaction mediated the relationship between Confirmation and Continuance intention ($\beta = 0.926, p < 0.05$). Furthermore, the Perceived ease of use variable was found to have an indirect effect on Satisfaction through Perceived usefulness ($\beta = 0.078, p < 0.05$).

In particular, the lack of a direct effect of the Confirmation variable on Continuance intention ($\beta = -0.151, p > 0.05$), but the significant indirect effect through Satisfaction, indicates that this relationship is fully mediated. This result supports the critical role of satisfaction in shaping user behaviour within the expectation confirmation model framework.

Another notable finding of the study is the lack of support for a direct relationship between satisfaction and customer loyalty. In this case, Continuance intention was the primary determinant of customer loyalty. These findings, consistent with the technology acceptance model, demonstrate that satisfaction and continuance intention form an indirect and sequential chain of influence in the formation of customer loyalty.

Table 6 presents the explanatory and predictive power of the constructs in the structural model. Perceived use-

Table 5 – Specific indirect effects
Таблица 5 – Специфические косвенные эффекты

Path	β	t-value	p-value	Decision
CO → SA → CI	0.926	2.051	0.040	Supported
PU → SA → CI	0.135	1.834	0.067	Not supported
PEOU → PU → SA → CI	0.084	1.886	0.059	Not supported
CO → CI → CL	−0.143	0.277	0.782	Not supported
CO → SA → CI → CL	0.879	1.363	0.173	Not supported
SA → CI → CL	1.023	1.468	0.142	Not supported
PU → SA → CI → CL	0.128	1.424	0.154	Not supported
PEOU → PU → SA → CI → CL	0.080	1.505	0.132	Not supported
CO → SA → CL	0.045	0.155	0.877	Not supported
PU → SA → CL	0.007	0.170	0.865	Not supported
PEOU → PU → SA → CL	0.004	0.184	0.854	Not supported
PEOU → PU → SA	0.078	2.353	0.019	Supported

Table 6 – The predictive power of the structural model
Таблица 6 – Прогностическая способность структурной модели

Constructs	R ² value	Level of explanation	Q ² value	Predictive relevance level
Perceived usefulness	0.308	Low to Moderate	0.243	Small to Moderate
Satisfaction	0.764	Substantial / High	0.629	High
Continuance intention	0.736	Substantial / High	0.624	High
Customer loyalty	0.832	Substantial / Very High	0.676	High

fulness had lower explanatory and predictive power than the other constructs. On the other hand, the other constructs were found to have higher values. Customer loyalty ($R^2 = 0.832$; $Q^2 = 0.676$) scores indicated that the structural model had the highest explanatory and predictive power on loyalty outcomes. Overall, the research model provided a high level of explanation and a strong predictor of satisfaction, continuance intention, and customer loyalty.

DISCUSSION

This study analysed user perceptions of AI-enabled banking applications using a research model developed by integrating the TAM and ECM models. The results of the hypothesis testing revealed that perceived ease of use had a statistically significant effect on perceived usefulness, perceived usefulness on satisfaction, confirmation on satisfaction, satisfaction on continuance intention, and finally, continuance intention on customer loyalty. The study found that confirmation had no effect on continuance intention, nor did satisfaction have an effect on customer loyalty.

The lack of a significant direct effect of satisfaction on customer loyalty in this study may be explained by the fact that customers interact with multiple banks in the digital banking environment. Even when users are satisfied with the service, this satisfaction is often directed not at a specific brand but at the overall quality of the digital service experience. This finding is consistent with the literature, which suggests that the effect of satisfaction on loyalty weakens in digital environments [Gounaris, Koritos, 2012; Foroudi et al., 2018; Yellanki, 2024]. Therefore, the concept of loyalty was evaluated in this study as attitudinal loyalty rather than behavioural loyalty.

Perceived ease of use, one of the TAM model variables, appears to have an impact on individuals' perceived usefulness of the technology they use. Users' ease of use and the perceived ease and usefulness of using technology can also influence their development of positive attitudes towards that technology. Similar to studies by Koyluoglu and Acar [2023], Pathak and Bansal [2024], Cheng et al. [2024], Ikhsan et al. [2025], and Byambaa et al. [2025], this study found that perceived ease of use has a positive and significant impact on perceived usefulness.

Confirming users' expectations for a technology can lead them to develop positive attitudes and feel satisfied with its use. The study found that the effect of perceived

usefulness on satisfaction and the effect of satisfaction on continuance intention were significant and positive. Cheng et al. [2024] also reached these conclusions in their study. Shaikh et al. [2024] present findings that, in banking, AI applications increase customer satisfaction. Tiwari [2023] notes that it also impacts customer loyalty. According to Tulcanaza-Prieto, Cortez-Ordoñez and Lee [2023], customer satisfaction influences customer experience and continuance intention. However, in contrast to the results of this study, it is stated that customer loyalty may positively affect customer experiences and continuance intention. Customer loyalty refers to an attitudinal variable that outlines users' tendency to be loyal to both the application and the brand in the setting of digital banking. Since it is possible for customers to reach various banks in digitalized financial services, the concept of loyalty reflects attitudinal loyalty, not behavioural singularity. In further research, it is recommended that loyalty be supported with behavioural indicators, such as the customer retention rate, stakeholder wallet, and intention to recommend.

Nevertheless, the result of this study contrasts with the findings of Khana et al. [2023], who found that artificial intelligence influences customer loyalty. Their findings also presented the role of chatbots as a mediating variable between artificial intelligence and customer loyalty. They maintained that organizations can promote customers' satisfaction and build their loyalty through AI-enabled applications. Kim, Ferrin and Rao [2009] also concluded that the confirmation of customer expectations enhances customers' trust and loyalty. Ho et al. [2025] also found the impact of satisfaction on customer loyalty in their mobile banking study. However, they argue that some moderating effects should not be ignored. While the literature generally emphasizes the positive effects of satisfaction on loyalty, the current study's results differ from these studies, as they fail to capture the impact of satisfaction on loyalty. At this point, it is thought that certain mediating variables or psychological factors (attitudes towards technology, risk perception, demographic differences, etc.) may have an impact.

When examining the impact of continuance intention on customer loyalty, continuance intention is often viewed as both an antecedent and a supporter of loyalty. Lee, Tang and Jiang [2023] found that confirmation and perceived usefulness will influence satisfaction, and satisfaction, in turn, will influence the continuance intention

of AI-supported mobile banking. They emphasize that users will continue to use AI-supported mobile banking by demonstrating loyalty. Al Amin et al. [2023] also emphasized in their study that continuance intention is an antecedent of loyalty. In the banking sector, loyalty is influenced by service quality and experience. It is expected that these factors will lead to continuance intention, which, in turn, will have an impact on loyalty [Shang, Wu, 2017; Zhou et al., 2021; Kumar et al., 2025]. The study's findings align with those in the literature, indicating that continuance intention has a significant impact on customer loyalty.

CONCLUSION

The findings suggest that perceived usefulness and perceived ease of use in AI-enabled banking services contribute to enhanced customer satisfaction. Satisfaction enhances the continuance intention to use a service, which, in turn, becomes one of the key factors that encourage customer loyalty. In this respect, this study expands the literature on customer loyalty in AI-enabled banking by combining the technology acceptance model and the expectation confirmation model.

One of the striking findings of the research is that the direct effect of satisfaction on customer loyalty is not significant. This can be explained because customers in digital banking interact with multiple banks. Even if participants are satisfied with AI-enabled services, their satisfaction is often focused not on a specific brand but on the overall quality of the service experience. That is why loyalty is formed through continuance intention rather than directly from satisfaction.

Indirect effect analyses also give support to the conclusion above. Confirmation strengthens continuance intention through satisfaction, while perceived ease of use influences satisfaction through perceived usefulness. These results demonstrate that user experience and perceptual factors are complementary in building customer loyalty.

These findings suggest that increasing customer satisfaction may not be sufficient. Banks must devise strategies to support customers' intentions to use applications regularly, thereby enhancing customer loyalty.

From a practical viewpoint, AI-powered applications represent a strategic tool of modern banks in customer

relations. Due to the significant impacts of perceived ease of use and usefulness on satisfaction, the design of such applications is recommended to be user-friendly, accessible, and reliable. Moreover, developing personalized AI services, fostering trust-building interactions, and implementing mechanisms for customer feedback will provide an opportunity to ensure ongoing customer satisfaction. Furthermore, the obtained results suggest that AI technologies have the most significant impact on customer interaction, personalization, and service efficiency. Thus, the involvement of AI-driven systems is welcomed not only in operational processes but also in the management of customer relationships and the design of service experiences, so that technological innovation contributes directly to customer loyalty.

In the end, AI-powered banking applications are not only an innovation that enhances the customer experience; they are also a strategic investment in long-term customer loyalty. If a bank manages these technologies effectively, it will be well-positioned to achieve a sustainable competitive advantage in terms of customer retention and acquisition.

Limitations and future research directions. This study has aimed to investigate the loyalty of AI-enabled banking application consumers in Türkiye to banks that provide such applications. The research findings presented in this paper relate to a single country and a very specific population segment. Furthermore, the study only used theoretical models such as the TAM and the ECM. Considering all these factors, these can be regarded as limitations of the research. The study's sample could be expanded to include consumers from different countries or cultures. Comparative analyses could be conducted on consumers with various demographic characteristics. Furthermore, the study could explore the topic from different perspectives by adding new variables. From the findings of this study, the reason why satisfaction has a low effect on customer loyalty, while affecting continuance intention, can be investigated through different or mediating variables. Studies could be conducted on users' ethical, trusting, and emotional beliefs. Consumer opinions could even be explored in depth through qualitative research. Future studies could build upon these findings and contribute to the literature with additional results. ■

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