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Smart Banking Solutions to Increase the Transparency and Health of The Banking System

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ABSTRACT

As a critical component of the banking industry, smart banking is integral to the equitable distribution of banking services to the public. As a critical component of the banking industry, smart banking is integral to the equitable distribution of banking services to the public. However, policymakers in the banking system shoulder a weighty responsibility beyond physical implementation. As a critical component of the banking industry, smart banking is integral to the equitable distribution of banking services to the public. Smart banking encompasses the creation of novel banking services utilizing advanced information and communication technology tools. The purpose of this study is to offer smart banking solutions for enhancing transparency and health of the banking system. The method utilized in this survey-based research is descriptive-survey, with a focus on applied purposes. The statistical population of the study comprises of economic experts, and based on Cochran's unlimited population formula, the sample size was determined to be 286 individuals. Data was collected through a researcher-conducted survey questionnaire. The research findings demonstrate that enhancing the security and safety of banking operations within the smart banking system is necessary to advance the health and transparency of the banking industry. Secondly, the implementation of personalized banking operations will contribute to the overall health of the banking system. Finally, as ease of access and transparency of service rates increase, significant improvement in the system's health can be expected.

1. INTRODUCTION

The banking sector plays a pivotal role in global economies, serving as the backbone of financial systems by facilitating transactions, credit provision, and economic stability [1]. However, challenges such as fraud, inefficiencies, and lack of transparency have historically undermined the health and trustworthiness of banking systems [2]. In recent years, smart banking solutions, leveraging technologies like blockchain, artificial intelligence (AI), big data analytics, and fintech innovations, have emerged as transformative tools to enhance transparency and strengthen the financial ecosystem [3]. These technologies address critical issues such as regulatory compliance, risk management, and customer trust, which are essential for a robust banking system [4]. This study explores the purpose

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of implementing smart banking solutions to increase transparency and promote the overall health of the banking system. Transparency in banking refers to the clear, accessible, and accurate disclosure of financial processes, transactions, and institutional operations to stakeholders, including customers, regulators, and investors [5]. Lack of transparency has been a significant factor in financial crises, such as the 2008 global financial meltdown, where opaque practices in mortgage-backed securities led to systemic failures [6]. Smart banking solutions, particularly blockchain technology, offer decentralized and immutable ledgers that ensure transparent and tamper-proof transaction records [7]. For instance, blockchain-based systems enable real-time auditing and reduce the risk of fraudulent activities, thereby fostering trust among stakeholders [8]. Studies have shown that blockchain can reduce operational costs by up to 30% while improving transparency in banking processes [9].

Artificial intelligence and machine learning also play a crucial role in enhancing banking transparency and health. AI-driven tools can detect anomalies in transactions, identify potential fraud, and ensure compliance with anti-money laundering (AML) regulations [10]. A 2019 study found that AI-based fraud detection systems improved accuracy by 85% compared to traditional methods [11]. Additionally, AI enhances customer experience through personalized services and predictive analytics, which contribute to financial inclusion and customer satisfaction [12]. Big data analytics further supports transparency by enabling banks to analyze vast datasets, identify risk patterns, and ensure regulatory compliance [13]. These technologies collectively strengthen the banking system by reducing operational risks and improving decision-making processes [14].

Fintech innovations, such as mobile banking apps and open banking platforms, have also transformed the banking landscape by promoting transparency and accessibility [15]. Open banking, mandated in regions like the European Union under the PSD2 directive, allows customers to share their financial data securely with third-party providers, fostering competition and transparency [16]. Research indicates that open banking has increased customer trust by 20% in regions where it is implemented [17]. Moreover, digital wallets and peer-to-peer payment systems reduce reliance on cash, minimizing the risk of untracked transactions and enhancing financial oversight [18].

The health of the banking system is closely tied to its ability to maintain stability, manage risks, and adapt to technological advancements [19]. Smart banking solutions address these needs by automating processes, reducing human error, and ensuring compliance with global standards such as Basel III [20]. For example, stress-testing models powered by AI and big data have improved banks' ability to withstand economic shocks, as demonstrated during the 2020 COVID-19 pandemic [21]. These technologies also promote financial inclusion by providing underserved populations with access to banking services, thereby strengthening the overall financial ecosystem [22].

This study aims to examine how smart banking solutions can enhance transparency and contribute to the health of the banking system. By leveraging technologies such as blockchain, AI, and big data, banks can address systemic inefficiencies, build trust, and ensure long-term stability. The findings are expected to provide insights for policymakers and financial institutions to adopt innovative solutions that align with regulatory frameworks and customer expectations, ultimately fostering a more resilient and transparent banking system.

2. LITERATURE REVIEW

The evolution of the banking sector has been significantly influenced by advancements in technology, particularly through smart banking solutions. These innovations aim to enhance transparency, security, and efficiency within the banking system, ultimately promoting the overall health of financial institutions. The integration of technologies such as blockchain, artificial intelligence (AI), and fintech applications has opened new avenues for improving banking practices. This literature review synthesizes recent research findings related to smart banking solutions, highlighting their potential benefits, challenges, and implications for the banking system while identifying knowledge gaps and suggesting future research directions.

Blockchain technology has emerged as a pivotal innovation in enhancing transparency in banking transactions. Baiod et al. (2021) conducted a comprehensive survey on blockchain applications across various domains, emphasizing its potential to foster trust and security in financial transactions [23]. By providing a decentralized ledger, blockchain reduces the risk of fraud and enhances the traceability of transactions, which is crucial for regulatory compliance in the banking sector.

Moreover, LaPointe and Fishbane (2019) proposed an ethical design framework for blockchain applications, underscoring the importance of integrating ethical considerations into the design and implementation of blockchain solutions in banking. This framework aims to guide banks in adopting blockchain in a manner that promotes transparency and accountability [24].

The rise of financial technology (fintech) has introduced innovative banking solutions that enhance customer experiences and streamline operations. Hasan et al. (2021) explored the drivers of fintech adoption in the Netherlands, highlighting factors such as convenience, accessibility, and security [25]. These findings indicate that fintech solutions can significantly improve customer satisfaction and engagement, contributing to the overall health of the banking system.

In addition, Alvarez et al. (2022) examined the implications of cryptocurrencies as legal tender, particularly in the context of El Salvador [26]. This research indicates that the integration of cryptocurrencies into mainstream banking can enhance financial inclusivity and transparency, albeit with certain risks related to volatility and regulation.

Artificial intelligence is transforming banking operations by automating processes and improving decision-making. The use of AI in fraud detection and risk assessment has been widely acknowledged as an effective strategy for enhancing the security of banking transactions. For instance, the implementation of AI-driven analytics can help banks identify unusual patterns in transactions, thereby mitigating risks associated with fraudulent activities.

The integration of smart banking solutions has demonstrated a positive impact on the transparency and health of the banking system. For example, Gelb and Decker (2012) highlighted the role of biometric technology in facilitating secure transfers in developing countries, showcasing how technology can enhance access to banking services while ensuring the integrity of transactions [27].

Moreover, Sazu and Jahan (2022) discussed the impact of blockchain-enabled analytics as a revolutionary tool for the banking industry [28]. By utilizing blockchain for data analytics, banks can enhance operational efficiency and transparency, leading to better decision-making and risk management.

Despite the potential benefits, the adoption of smart banking solutions is not without challenges. Concerns regarding data privacy, cybersecurity, and the need for regulatory frameworks are significant barriers to the widespread implementation of these technologies. Furthermore, the digital divide remains a critical issue, as not all segments of the population have equal access to technology, potentially exacerbating existing inequalities in the banking sector.

While substantial progress has been made in understanding the implications of smart banking solutions, several knowledge gaps remain. First, there is a need for more empirical research to evaluate the long-term effects of these technologies on the financial health of banks and their customers. Future studies could focus on longitudinal analyses that assess the sustainability of fintech solutions in different economic contexts.

Additionally, research exploring the ethical implications of adopting advanced technologies in banking is limited. Examining how banks can balance innovation with ethical considerations will be crucial for fostering trust among consumers. Finally, the intersection of smart banking solutions and regulatory frameworks presents an area ripe for exploration. Future research should investigate how regulatory bodies can adapt to the rapid technological advancements in banking to ensure a secure and transparent financial environment.

Smart banking solutions, including blockchain, fintech innovations, and artificial intelligence, hold the potential to significantly enhance the transparency and health of the banking system. While these technologies offer numerous advantages, challenges related to data privacy, regulation, and ethical considerations must be addressed. By identifying knowledge gaps and suggesting avenues for future research, the banking industry can better navigate the complexities of technological integration, ultimately fostering a more transparent and resilient banking environment.

3. RESEARCH METHODOLOGY

The present study utilizes a descriptive-survey method to achieve its objectives. The statistical population consists of economic experts, with a sample size of 286 determined using Cochran's unlimited population formula. Data collection was conducted via a researcher-created questionnaire, evaluated for face validity through the opinions of

management professors to ensure its accuracy. To assess the questionnaire's reliability, we utilized the Cronbach's alpha method, resulting in a calculated alpha of 97% for the entire questionnaire. This high value indicates the questionnaire's suitability for use in our research. The subsequent section presents the calculated Cronbach's alpha coefficients for various dimensions of the questionnaire. To analyze the research data, descriptive statistics were utilized to assess the demographic questions, and SPSS20 and AMOS 20 software were applied. Based on research conducted and investigations carried out on library documents, a research model has been developed to present the influencing variables on increasing transparency and improving the health of the banking system.

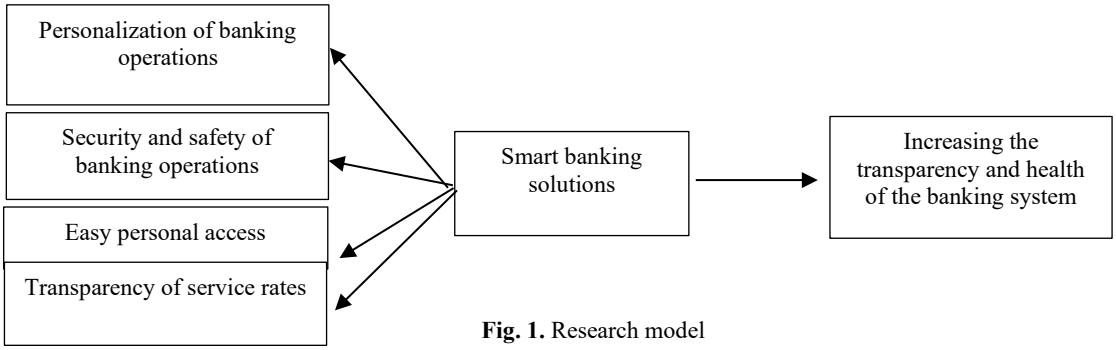

Fig. 1. Research model

Table 1. Cronbach's alpha coefficient of the research questionnaire

Cronbach's alpha	Variable
0/87	Personalization of banking operations
0/84	Security and safety of banking operations
0.80	Easy personal access
0.72	Transparency of service rates
0.79	total reliability

4. DATA ANALYSIS

4.1. Description of Demographic Characteristics

The demographic information of the participants is presented in the above table. As shown, the majority of respondents were male (68%), while female participants constituted 32% of the sample. In terms of age distribution, most participants were between 30 and 40 years old (40%), followed by those in the 40–50 age group (30%). Younger respondents under 30 years accounted for 20%, and only 10% were above 50 years old.

Regarding education level, more than half of the participants (52%) held a bachelor's degree, while 28% had an associate degree, 15% held a diploma, and only 5% had a master's degree. Finally, with respect to their history of using smart services, the majority of participants had between 5 and 10 years of experience (55%). Additionally, 30% had less than 5 years of experience, and 15% had 10–15 years of experience with smart services.

This demographic distribution indicates that the study sample is predominantly composed of educated and relatively experienced individuals, particularly in the context of smart service usage.

Table 2. Demographic Characteristics of Participants

Variable	Category	Percentage
Gender	Female	32%
	Male	68%
Age	Under 30 years	20%
	30–40 years	40%
	40–50 years	30%
	Above 50 years	10%
Education Level	Diploma	15%
	Associate Degree	28%

	Bachelor's Degree	52%
	Master's Degree	5%
History of Using Smart Services	Less than 5 years	30%
	5–10 years	55%
	10–15 years	15%

The study utilized the Pearson correlation test to evaluate the relationship between smart banking and the transparency and health of the banking system. The results revealed a significant positive correlation between smart banking and the transparency and health of the banking system. In other words, greater subscales of smart banking services - including personalization of banking operations, security and safety, easy personal access, and transparent service rates - correspond to enhanced transparency and safety within the banking system. The Pearson correlation coefficient computed between smart banking variables and banking system transparency and health is 0.60, indicating a robust positive correlation between these two variables.

Table 3. Pearson's correlation coefficient between the variables of smart banking and health and the banking system

Variables of smart banking	Variable
1	Variables of smart banking
0.60	Transparency and health of the banking system
0.000	Significance level
286	Number

Furthermore, the Pearson correlation test revealed a direct relationship between the dimensions of smart banking and the transparency and health of the banking system. The calculated correlation coefficient between personalization of banking operations and the health of the banking system is 0.56. The calculated correlation coefficient between the security and safety of banking operations and the health of the banking system is 0.62. The calculated correlation coefficient between easy personal access and the health of the banking system is 0.48. The calculated correlation coefficient between the transparency of service rates and the health of the banking system is 0.54.

4.2. Research hypothesis test based on structural equation method

It is hypothesized in this study that there is a clear, direct correlation between all aspects of smart banking and the transparency and overall well-being of the banking system. Each of the variables contributes to the health of the system, with the varying degree of impact being the only difference. To test these hypotheses, the researchers employed the structural equation method using AMOS software. The resulting structural equation model is depicted in Figure 2.

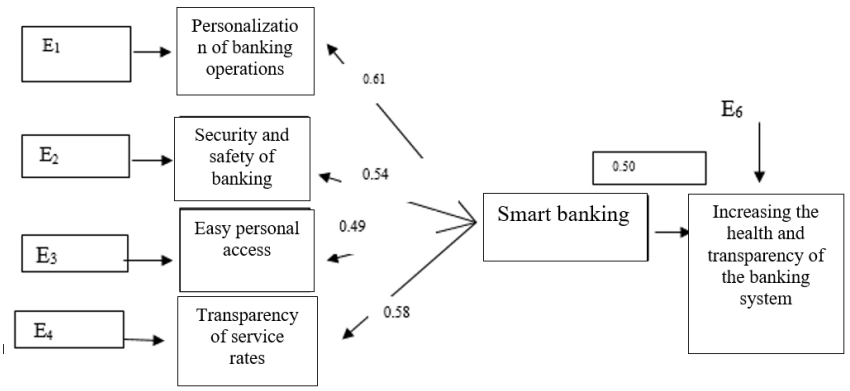

Fig. 2. Structural equations model of the research

In order to assess the significance of hypotheses, we utilized two partial indexes - the critical value and P. The critical value was obtained by dividing the "regression weight estimate" by the "standard error". According to a

significance level of 0.05, the critical value should exceed 1.96. If the parameter in the model is less than this value, it is not considered significant, and P values below 0.05 indicate a significant difference between the value calculated for the regression weights and the zero value at a confidence level of 0.95. Table 3 displays the results of hypothesis confirmation.

Table 4. The results of confirming the research hypotheses

Result	P	Critical value	Path coefficient	Direction
confirmation	0.019	2.355	0.50	The effect of smart banking variables on the health of the banking system
confirmation	-	4.422	0.58	Personalization of banking operations
confirmation	0.005	4.723	0.62	Security and safety of banking operations
confirmation	0.013	3.173	0.55	Easy personal access
confirmation	-	2.235	0.45	Transparency of service rates

In order to evaluate which of the variables has a greater impact on the health of the banking system, the solutions were ranked. Friedman's test has been used to rank smart banking solutions in order to improve the health of the banking system. The results of this test are shown in the table below. Considering that the significance level of the test is less than 0.05, Friedman's test is used to rank smart banking solutions.

Table 5. Friedman's test

Significance level	Degrees of freedom	X^2	number of samples
0.000	3	51.362	286

Table 6. Prioritization of smart banking solutions

Average rating	Components	Rank
2.42	Security and safety of banking operations	1
1.80	Personalization of banking operations	2
1.78	Transparency of service rates	3
1.65	Easy personal access	4

According to the respondents, under equal conditions, the results of the Friedman test reveal that the security and safety of banking operations received the highest average rank of 2.42 among all the proposed solutions to increase the level of health and transparency in the banking system. On the other hand, easy personal access received the lowest average rank of 1.65.

5. SUMMARY AND CONCLUSION

Providing quality services in smart banking is a significant challenge in today's era. Managers of organizations, particularly banks, aim to cultivate a user-centered mindset and culture by focusing on users' needs and responding appropriately to their demands. This approach creates a competitive advantage and fosters excellence in organizational performance. Smart banking is a crucial infrastructure in the banking industry, facilitating equal distribution of banking services. Policy makers in the banking system have a significant responsibility in this regard. Its development and policy implementation are not limited to physical expansion but includes incorporating information and communication technology tools. One of their key duties is to devise policies and accelerate instructions. On the flip side, individuals expect safe, fast, and cost-effective services from online banking. Failure to provide any of these services causes clients to lose confidence. The research that follows aims to obtain suitable solutions for smart banking to improve the health and transparency of the banking system. The study's findings indicate that security and safety measures for banking operations, personalized banking services, transparent service fee rates, and easily accessible customer service are the top strategies for boosting the banking system's transparency and overall well-being.

To enhance the health and transparency of the banking system, it is imperative to bolster the security and safety of banking operations within the smart banking system. By enhancing the safety of banking operations within the smart space, the overall health of the banking system can be improved. Secondly, the implementation of personalized banking operations will enhance the overall health of the banking system. Additionally, easy and transparent access to personal banking services is expected to significantly improve the system's health.

6. PRACTICAL SUGGESTIONS

At the end of this research, the following suggestions can be helpful for bank managers and other organizations:

- Adapting Internet banking services to the needs and demands of customers
- Creating a suitable platform for introducing the economic advantages of using smart banking
- Providing practical training for customers on how to use smart banking services through public media
- Providing the necessary incentives for smart banking
- Creating The fields of identifying the needs of customers in smart banking for services according to it
- Providing primary databases for personalizing banking operations
- Providing the fields of providing service rates in a clear manner in all application platforms

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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