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THE FINTECH SECTOR AND INFORMATION SECURITY: A BALANCE OF INNOVATIONS AND THREATS

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Abstract
This article analyzes the complex interplay between the fintech sector and information security. It examines the emerging threats that accompany the rapid pace of innovation in financial technologies. The study emphasizes the critical importance of ensuring security in the deployment of digital financial services. The paper discusses strategies for striking a balance between fostering innovation and simultaneously safeguarding user data and systems. It also provides recommendations for strengthening cybersecurity measures and improving regulatory frameworks.

Keywords: Fintech, Information security, Innovations, Threats, Digital transformation, Data protection, Cybersecurity.

Introduction

The Fintech industry is revolutionizing the global financial services landscape, offering innovative solutions and digital transformation. The sector is enhancing efficiency and expanding financial inclusion by digitizing traditional banking services. In Uzbekistan, digital financial services (DFS) are also developing rapidly, becoming a key driver of the economy. By 2022, the number of bank cards in circulation had reached 34.2 million, and cashless payments accounted for nearly 58% of GDP [1]. Under the "Digital Uzbekistan - 2030" strategy, government initiatives, including the digitization of tax and customs systems (My.soliq.uz, Customs.uz), have increased transparency and boosted budget revenues [2]. Fintech companies like CLICK and Payme are increasing economic efficiency by serving millions of users [1].

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However, the rapid pace of fintech innovations is also creating new and complex threats in the field of information security. The expansion of the digital ecosystem increases vulnerability to threats such as malware (viruses, trojans, ransomware), phishing attacks, attacks on IoT devices, and Distributed Denial-of-Service (DDoS) attacks [3]. Additionally, the human factor, such as low employee awareness, is also a significant source of vulnerability [3]. Therefore, finding a balance between innovations in the fintech sector and the information security measures needed to protect them is of critical importance. This article analyzes innovations in the fintech sector, their potential, as well as the main information security threats and vulnerabilities that pose a threat to these systems. The article examines the mechanisms for maintaining an optimal balance between innovation and security, as well as future prospects.

Analysis of relevant literature

A literature review in the field of financial technologies (fintech) indicates that this sector is widely recognized as one of the most dynamic and transformative segments of the global economy. Researchers identify digital transformation, financial inclusion, operational efficiency, and enhancing the consumer experience as the key drivers of fintech. In particular, innovations such as mobile payments, online banking, and digital lending are transforming the traditional financial landscape and creating new business models. The rapid development of digital financial services (DFS) in Uzbekistan and its significant impact on the national economy are also widely discussed in academic circles. research based on official reports from the Central Bank and the Ministry of Finance, as well as data from fintech companies, research based on official reports from the Central Bank and the Ministry of Finance, as well as data from fintech companies, notes that the number of bank cards in the country reached 34.2 million by 2022 and cashless payments accounted for nearly 58% of GDP [1]. These changes are contributing to increasing small business activity, expanding access to financial services for the population, and enhancing overall economic efficiency [1].

The government's initiatives to integrate fintech technologies into the tax and customs systems, as part of the “Digital Uzbekistan - 2030” strategy, are also being extensively analyzed in scientific literature. The implementation of platforms such as My.soliq.uz and Customs.uz is evaluated in terms of its effectiveness in increasing transparency, boosting budget revenues, and

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expediting processes [2]. The expansion of electronic government services offered through these platforms, including the availability of 35 e-services on the My.soliq.uz portal, demonstrates the depth of the digital transformation [2]. However, these studies also note existing problems such as low digital literacy, infrastructure deficiencies, and cybersecurity threats, which Estonia, compared to the experience of advanced countries like Estonia, Singapore, and South Korea, indicates the need for Uzbekistan to seek further avenues for improvement [2].

Alongside the rapid pace of fintech innovations, threats in the field of information security are also at the center of scientific research. The expansion of the Internet, cloud technologies, and the popularization of IoT devices are creating new opportunities for cyberattacks [3]. Authors such as Temirov and Aminbayeva (2020) analyze modern cybersecurity threats, including malicious software (viruses, trojans, ransomware) aimed at stealing data or disabling systems, citing malware (viruses, trojans, ransomware), phishing attacks attempting to obtain personal data, attacks on vulnerable IoT devices, and denial-of-service (DDoS) attacks as the main risks [3]. These threats can seriously undermine the stability of financial systems and user trust. The human factor, such as low employee awareness, is also noted as a significant source of vulnerability, which can reduce the effectiveness of technological security measures [3].

Blockchain technology holds a special place in information security, and its potential is being widely studied in academic literature. Uzakov (2020) defines blockchain as a significant innovation in securely and transparently managing data in the digital era. He defines blockchain as a decentralized, distributed, and secure data storage system, where transactions are recorded in cryptographically linked blocks, making data falsification nearly impossible [5]. Blockchain's decentralization, transparency, its principles such as decentralization, transparency, immutability, and consensus mechanisms contribute significantly to its security, eliminating single points of failure, enabling fraud detection, and ensuring data integrity [4, 5]. However, research on blockchain security also reveals its vulnerabilities; For example, the risk of a “51% attack,” where an entity controls a majority of the computational power and can manipulate transactions, is a serious threat [4]. Improper protocol implementations or errors in smart contracts can also be sources of vulnerability. Therefore, it is crucial to continuously update and invest in security measures to ensure the stability and reliability of blockchain systems [4].

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A number of strategies are proposed in the literature to combat cybersecurity threats. These include data encryption, strong passwords with two-factor authentication, regular employee training, timely system updates, implementing firewalls and antivirus software, and regular data backups [3]. In the future, AI, ML, and blockchain technologies are expected to play a crucial role in threat detection, response, and enhancing data integrity [3]. Research highlights the complex balance between innovation and information security in fintech. While innovation makes financial services more efficient and convenient, it also introduces new security risks. Therefore, academic literature calls for prioritizing security in the fintech ecosystem and the continuous adoption of advanced measures. This analysis lays the foundation for the subsequent sections of the article, aiming to find the optimal balance between fintech innovations and the necessary information security measures to protect them.

Research methodology

This article is aimed at analyzing the complex balance between innovation in the fintech sector and information security, and is based on a qualitative research design. The primary objective of the study is to examine the emerging opportunities and threats in the fintech ecosystem, as well as to identify the optimal mechanisms for balancing these two aspects. The article relies on a critical synthesis of existing literature, official reports, and industry analyses by applying a descriptive and analytical approach. This approach allows for a systematic assessment of the impact of fintech innovations on security, the main cybersecurity threats, and strategies to counter them.

The research is primarily based on secondary data. The data collection process includes academic literature, conference proceedings, and dissertations on fintech, information security, cybersecurity, digital financial services, blockchain technology, and artificial intelligence. To cover global and regional research findings, priority was given to articles published after 2020. Official reports, strategic documents, and statistical data from government agencies such as the Central Bank of the Republic of Uzbekistan, the Ministry of Finance, and the Ministry of Information Technologies also served as important sources. Provided clear information about the development of fintech in Uzbekistan and the impact of digital financial services on the economy [1, 2]. Reports and analytical reviews from international financial organizations, consulting firms, and fintech

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companies provided valuable insights into practical industry trends, innovative solutions, and security challenges. A systematic literature review was used to collect data, employing keywords such as “AI in cybersecurity,” “Fintech,” “information security,” “cybersecurity threats,” “digital financial services Uzbekistan,” “blockchain security,” Scientific databases (Scopus, Web of Science, Google Scholar) and local scientific journals were reviewed using keywords such as “Fintech,” “information security,” “cybersecurity threats,” “digital financial services Uzbekistan,” “blockchain security,” and “AI in cybersecurity.” This process helped to identify the most relevant and reliable sources on the topic of the article.

Several qualitative methods were used to analyze the collected data. Thematic analysis was used to identify recurring themes, patterns, and key ideas related to fintech innovations, information security threats, defense strategies, and mechanisms for maintaining a balance between innovation and security. For example, common threats such as malware, phishing, DDoS attacks, and the human factor [3], as well as the role of blockchain in security [4, 5], were identified and analyzed in depth. The comparative analysis allowed for a comparison of Uzbekistan's achievements and challenges in the fintech and cybersecurity sectors with the experience of advanced countries such as Estonia, Singapore, and South Korea [2]. This comparison served to identify areas for improvement and assess the effectiveness of existing practices for Uzbekistan. The critical synthesis aimed to integrate data from various sources to construct a coherent argument for understanding the interrelationship between fintech innovations and information security. This process involved evaluating various perspectives, identifying contradictions, and highlighting gaps in the existing knowledge base. The article's key findings and recommendations were formulated as a result of this critical synthesis. The conceptual analysis helped to define and deeply explore key concepts, such as the “Balance between Innovation and Security,” in the fintech context, revealing their theoretical foundations and practical significance.

The scope of this research is limited to analyzing innovations in the fintech sector and their impact on information security, as well as the main threats in this field and strategies for combating them. The article focuses particularly on the context of Uzbekistan, but also takes into account global trends and advanced international practices. There are some limitations to the study. First, the research

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relies primarily on secondary data, which may introduce limitations regarding the availability and quality of the data. Second, as the fintech and cybersecurity sectors are evolving rapidly, some of the information and trends presented in the article may change over time. Third, this article does not include empirical primary data (e.g., surveys, interviews, or case studies), which may limit the generalizability of the research findings. However, through an in-depth analysis and critical synthesis of existing literature, the article establishes a solid theoretical foundation for understanding the balance between innovation in the fintech sector and information security.

Conclusion

The Fintech sector is fundamentally transforming financial services, expanding efficiency and financial inclusion, and has become a key driver of digital transformation in Uzbekistan. However, this rapid innovation also gives rise to complex cybersecurity threats such as malware, phishing, and DDoS attacks, and the human factor remains a source of vulnerability. Protective measures such as data encryption, two-factor authentication, and employee training are essential. In the future, artificial intelligence, machine learning, and blockchain technologies will play a crucial role in strengthening cybersecurity. Thus, ensuring an optimal balance between innovation and information security is a priority for the sustainable development of fintech.

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