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Ahmed Maher Ali, Awnalrafek Mohamed Sodad & Hussein Abdulhakim Abdulkarim. The Impact of Financial Technology on Banking Efficiency. ***University of Kirkuk Journal For Administrative and Economic Science*** **(2026) 16(2):182-192.**

The Impact of Financial Technology on Banking Efficiency

Maher Ali Ahmed[1], Mohamed Sodad Awnalrafek[2], Abdulhakim Abdulkarim Hussein[3]

[1,2,3]*Kirkuk University-College of Administration & Economics, Kirkuk, Iraq*

maherali@uokirkuk.edu.iq[1], sodadmohamed97@uokirkuk.edu.iq[2], abd.hussein@uokirkuk.edu.iq[3]

Abstract: This study investigates the impact of financial technology (FinTech) on the operational efficiency of banks and customer satisfaction. The research was conducted using a quantitative approach, with data collected from a sample of 225 bank customers through a structured questionnaire assessing banks' adoption of financial technology, digital services, cybersecurity, and innovation strategies. Data analysis was performed using SPSS software, employing descriptive statistics and simple regression analysis.

The results indicate a strong positive relationship between FinTech adoption and banking efficiency, showing that digital technologies and cybersecurity measures accelerate transactions, reduce operational costs, and enhance customer satisfaction. Furthermore, the study highlights the importance of continuous investment in digital platforms, mobile banking applications, artificial intelligence, and cybersecurity to maintain competitive advantage and improve service quality. The findings confirm that banks leveraging financial technology can achieve higher operational efficiency and improved customer experiences, supporting the hypothesis that FinTech is a critical driver of modern banking performance.

Keywords: Financial Technology, Banking Efficiency, Customer Satisfaction, Cybersecurity, Digital Innovation.

أثر التكنولوجيا المالية على كفاءة العمل المصرفي

أ.م.د. ماهر علي أحمد [1]، م.م. محمد سداد عون الرفيق [2]، م.م. عبد الحكيم عبد الكريم حسين [3]

جامعة كركوك-كلية الإدارة والاقتصاد، كركوك، العراق[1,2,3]

maherali@uokirkuk.edu.iq[1], sodadmohamed97@uokirkuk.edu.iq[2], abd.hussein@uokirkuk.edu.iq[3]

المستخلص:تبحث هذه الدراسة أثر التكنولوجيا المالية (FinTech) على الكفاءة التشغيلية للبنوك ورضا العملاء. أُجري البحث باستخدام منهج كمي، حيث جُمعت البيانات من عينة مكونة من ٢٢٥ عميلًا مصرفيًا من خلال استبيان مُهيكل يقيس مدى تبني البنوك للتكنولوجيا المالية والخدمات الرقمية والأمن السيبراني واستراتيجيات الابتكار. أُجري تحليل البيانات باستخدام برنامج SPSS ، مع توظيف الإحصاء الوصفي وتحليل الانحدار البسيط

تشير النتائج إلى وجود علاقة إيجابية قوية بين تبني التكنولوجيا المالية وكفاءة العمل المصرفي، مما يُظهر أن التقنيات الرقمية وإجراءات الأمن السيبراني تُسرّع المعاملات، وتُقلل التكاليف التشغيلية، وتُعزز رضا العملاء. علاوة على ذلك، تُبرز الدراسة أهمية الاستثمار المستمر في المنصات الرقمية، وتطبيقات الخدمات المصرفية عبر الهاتف المحمول، والذكاء الاصطناعي، والأمن السيبراني للحفاظ على الميزة التنافسية وتحسين جودة الخدمة. وتؤكد النتائج أن البنوك التي تستفيد من التكنولوجيا المالية يُمكنها تحقيق كفاءة تشغيلية أعلى وتجارب عملاء مُحسّنة، مما يدعم فرضية أن التكنولوجيا المالية تُعدّ محركًا أساسيًا لأداء العمل المصرفي الحديث.

الكلمات المفتاحية: التكنولوجيا المالية، كفاءة العمل المصرفي، رضا العملاء، الأمن السيبراني، الابتكار الرقمي.

Corresponding Author: E-mail: maherali@uokirkuk.edu.iq

Introduction

Financial technology (FinTech) has emerged as a transformative force in the global banking sector, driving innovation, enhancing operational efficiency, and improving customer experience. With the rapid advancement of digital solutions, traditional banking models are undergoing significant changes, particularly in areas such as payment systems, data management, financial services delivery, and customer interactions (Angel, 2025; Agarwal, 2024).

The integration of FinTech allows banks to process transactions more rapidly, reduce operational costs, and provide personalized services while mitigating risks associated with fraud and inefficiency (Allen II, 2023; Zhang & Zhang, 2024). In particular, digital banking platforms, mobile applications, artificial intelligence, and blockchain technology have been shown to streamline operations, enhance security, and support innovation in financial services (George, 2024; Jaywalk & Jaywalk, 2025).

Despite these advantages, banks face challenges in implementing FinTech solutions, including cybersecurity threats, regulatory compliance, and the need for continuous technological investment (Abikoye et al., 2024; Dhiaf et al., 2024). Addressing these challenges is essential to maximize the benefits of FinTech adoption and sustain customer satisfaction.

This study investigates the impact of FinTech on banking operational efficiency and customer satisfaction in the context of Iraqi banks. Using a sample of 225 customers, data were collected through a structured questionnaire assessing digital technologies, cybersecurity measures, innovation strategies, cost efficiency, and service speed. Analyses were conducted using SPSS, employing descriptive statistics and simple regression models to evaluate the relationship between FinTech adoption and banking performance.

The study contributes to the literature by providing empirical evidence on the benefits of financial technology adoption in emerging banking markets, demonstrating that digital transformation enhances operational efficiency, reduces costs, and increases customer satisfaction. The findings also offer practical recommendations for banks to optimize their technology investments and maintain competitiveness in an increasingly digital financial landscape.

1st: Default layout:

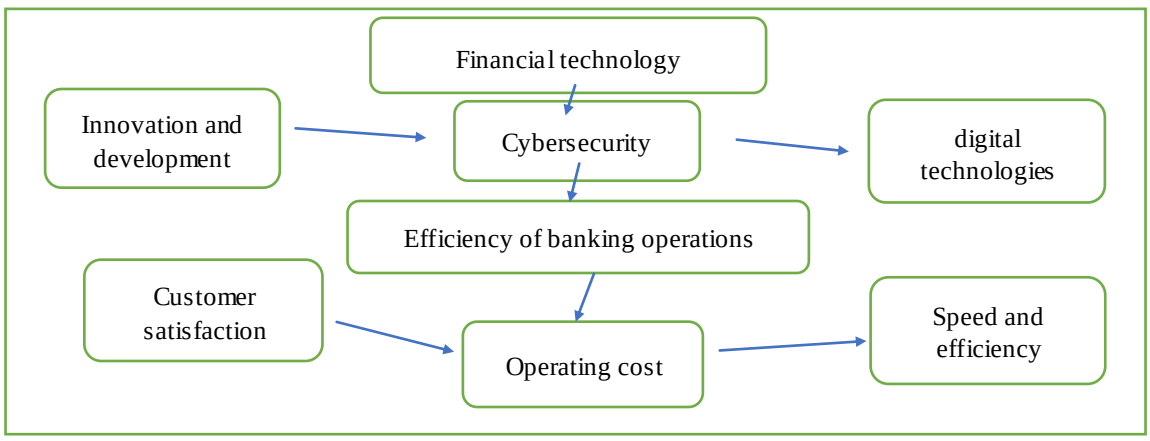

Fig (1)

2nd: Understanding Financial Technology

According to A.K. Khan Testing A.K. Khan, these disruptive technologies have created the banking industry more efficient and cost-effective. Dennis, A.R.; Kim, A.; and A. Moreover, 2024 Stephen long agree that they may increase currency use and make processes faster . Andrade Lontara, M., & A. 2024. They change how this conventional field operates in a situation, when it is executed through outsourcing, corporate governance, and other less expensive choices. This has an impact on a specific day-to-day performance steps and operations. M., & A. Andrade Lontara 2024.. Fitch, or disruptive technologies, have made the banking industry more effective and less expensive. A.K. Khan. Testing A.K. Khan 2024 agreed that they may improve currency use and hasten processes. Dennis, A. R.; Kim, A.; and A. 2024. "It alters how the traditional banking sector work which, in this instance, is carried out through outsourcing, corporate governance, and other less costly replacements. This impacts a certain day-to-day performance stages." M., & A. Andrade Lontara 2024. Mangotingthesize: Most notably, FinTech made the banking business more efficient and cost-effective. A.K. Khan. Testing A.K. Khan 2024 confirmed that FinTech made currency use better and process faster. Dennis, A. R.; Kim, A.; et al. 2024 steam says: "Thus, in this scenario, Fintech changes the way the traditional banking sector business is done, which is accomplished through the outsourcing, corporate governance, and other less costly replacements. This impacts certain day-to-day performance stages-. M., & A. Andrade Lontara 2024.

1. Meaning and Extent FinTech

refers to the use of technology to make financial services accessible cheaper and better Marashdeh, H., & El Khiry, R. M. 2024. As such, it includes traditional sectors such as banking and capital markets; however, it is also changing banking through mobile and online service delivery. A.S. George 2024.

2. Historical Development

On the other hand, the 1980s brought a revolution in digital communications, changing the way money moved, the way bank institutions conversed with one another, and the way financial products worked." Paiardini, P.,& Leo, S. (2025). Moreover, diverse banking services are at the people's disposal as virtual systems are becoming more and more prevalent. That has provoked the emergence of virtual systems among the rural and underprivileged population. Alongside numerous other initiatives in the field of technologies, including, above all, Internet banking and, for example, Mobile telephone, customers are able to consult their bank account without visiting the bank, and in some instances, they are allowed to manage the status of their accounts without attending the bank. Alharthi, S; Mina, SM (2024)

3rd: Current Trends in Financial Technology

This software also provides the ability for them to verify their account information, wire funds and make payments without having to visit a branch or ATM. Monica, L., & Asha, A.. And, they boost the productivity of banking – especially on exchanges – via 24-7 advising and robot-advising; that profile individualized risk preferences more effectively inasmuch as one can delete robot advisor in his role as advisor. George, A.S..

1. Mobile Banking Solutions

Financial technology makes banking far more efficient by cutting expenses, speeding up operations, and lowering risks. Yodeled, O., and Ogunsuji, Y. M. (2024). Time and money are two operational limits that make it hard for clients to adapt. Hidayatullah, S., and Suprayitno, D. (2024). Even while users think digital banking works, is safe, and is easy to use, it needs rules to keep it in check. Gupta, V., and Shukla, S. (2024). The integration of telecommunications and banking has also helped low-income populations by speeding up the processes of saving, lending, and borrowing. Phil-Ugochukwu, A.I. (2024).

2. Blockchain Technology

Blockchain technology might change the banking and financial sectors by making them safer, less likely to be hacked, and cheaper to do business across borders. M.O. and C. Azubuike (2024) still. Confusing legislation, high energy use, privacy worries, and hazards from quantum computing are all things that make it hard for broad deployment to happen.

3. Artificial Intelligence in Banking

AI has enhanced the efficiency and cost-effectiveness of banking procedures by incorporating cognitive capabilities such as automated communication, investment advice, fraud detection, and compliance regulations. Jaywalk, S., and Jaywalk, K.S. (2025). Chabot's facilitate the identification of fraud, manage money, and provide customer service. Wahl, J. N. K. (2025).

4th: Examples of the Implementation of Financial Technology

Businesses are being disrupted by finch and now gain competitive advantage through its deployment. Aqedah, M. Z., & Masada, R. E. (2025). And yet, although technology and apps, mobile banking and internet platforms make things possible now that were out of reach only two decades ago (when hardly any percent rein even in the most modern economy), the "elegant theory of economics" often bogs down.

1. Case Study 1: Mobile Payments Systems

Fintech refers to technology in financial services that can act as its competitor, which is known for providing more user-friendly, transparent and personalized services of mobile payment, online banking and smart card. E Singh, V., & Yadav, N. (2025).

2. Case Study 2: Robot-Advisors

Robotic advisors are automatically managing portfolios and making investment recommendations, reducing in costs. Hu, K., and Wang, Y. (2025). Despite many pressures, according to research, since 2008 banks have been good for private wealth. As a result, banking is now more efficient and consumers are happier. R., Wang Q., and Li H. (2025):.

3. Case 3 –Digital Banking Platforms

International research capacity can help financial institutions comply with stringent regulations (millions of criteria) by enabling better understanding thanks to global best practice.

Fintech, including mobile banking apps, robot-advising tools (which provide generic investment advice) and digital platforms streamline the bank service and can do so at reduced rates than conventional means of banking. For instance, Pix handled 5.8 billion transactions worth R$5.9 trillion. George, A.S. (2024).

5th: Operational efficiency of bank Operational efficiency of bank

- Speed and efficiency:
- Operational cost:
- Customer Satisfaction: Gwen, A. N., & Ibex, A. I. (2025).

6th: Descriptive statistics for the Study Variables:

Table (1): To illustrate the development of digital technologies

Statements	Mean	Std. Deviation	Coefficient of Variation%	Relative Weight %	Level of Agreement	Rank
The availability of electronic payment applications at the bank enhances the ease of conducting financial transactions	4.11	1.066	25.9	82.2	Agree	1
The use of internet banking services significantly reduces the time required to complete financial transactions	3.95	1.174	29.7	79.1	Agree	2
The bank's digital systems provide a wide range of financial services that effectively meet customers' needs.	3.55	1.515	42.7	70.9	Agree	3
The interfaces of mobile banking applications contribute positively to improving the overall user experience.	3.47	1.516	43.7	69.4	Agree	5
The digital technologies offered by the bank ensure a high level of security in performing financial transactions.	3.52	1.453	41.3	70.3	Agree	4
Overall Mean of Digital Technologies	3.63	1.261	34.8	72.5	Agree	-

As indicated in the table above, the overall average of the digital technologies is (3.63) and has a relative weight of (72.5%), the averages of the statements were in the range of (3.47-4.11) and the relative weight was (69.4%-82.2). These percentages demonstrate the concurrence of the sample of the study on digital technologies and the entire dimension as depicted in the table above.

1. Descriptive Cybersecurity state sticks

The following table illustrates descriptive cybersecurity state sticks:

Table (2): To illustrate descriptive cybersecurity state sticks.

Statements	Mean	Std. Deviation	Coefficient of Variation%	Relative Weight %	Level of Agreement	Rank
Customers feel reassured about cybersecurity when using the bank's online services.	3.74	1.460	39.1	74.8	Agree	3
The bank implements effective security procedures to protect customers' personal data.	3.58	1.483	41.4	71.7	Agree	5
Digital financial transactions at the bank are characterized by a high level of security.	4.24	0.888	20.9	84.8	Strongly agree	1
Customers receive regular notifications regarding updates to the bank's security policies.	4.04	1.248	30.9	80.8	Agree	2
The bank responds promptly to any security threats that may affect customers' data or funds.	3.62	1.459	40.4	72.3	Agree	4
Overall Mean of Cybersecurity	3.79	1.237	32.7	75.7	Agree	-

(Source): The results of the SPSS program.

The table above indicates that the total mean of the cybersecurity is (3.79) having a relative weight (75.7%), and the means of the statements fall within the range of (3.58 -4.24) having a relative weight (71.7%-84.8%). These percentages show how the study sample agrees on the issue of cybersecurity and the general dimension as reflected in Descriptive state sticks: Innovation and

Development Strategies. The following table illustrates descriptive statistics for innovation and development:

Table (3): To illustrate descriptive statistics for innovation and development strategies

Statements	Mean	Std. Deviation	Coefficient of Variation%	Relative Weight %	Level of Agreement	Rank
The bank employs innovative technologies to improve its banking services.	3.70	1.379	37.3	74.0	Agree	3
The use of artificial intelligence in analyzing banking data contributes to enhancing customer experience.	3.63	1.541	42.4	72.6	Agree	4
The bank provides innovative financial solutions that align with customers' needs	4.07	0.900	22.1	81.4	Agree	2
Modern banking technologies offer more effective tools for managing personal finances.	4.10	0.987	24.1	82.0	Agree	1
The bank continuously seeks to develop its services in line with recent technological advancements.	3.29	1.572	47.8	65.8	Agree	5
Overall Mean of Innovation and Development	3.71	1.247	33.7	74.1	Agree	-

(Source): The SPSS program gives the following outputs.

As it is demonstrated in the table above, the overall average of the statements of Innovation and Development is (3.71) with the relative weight of (74.1%), and the statements averages varied between (3.29-4.07) with the relative weight of (65.8%-81.4%). These percentages signify the concurrence of the sample of the study with the Innovation and Development and the general dimension as illustrated in the table above.

Descriptive state sticks: Efficiency and speed.

The table below shows the descriptive statistics of the speed and efficiency:

Table (4): To illustrate descriptive statistics regarding speed and efficiency.

Statements	Mean	Std. Deviation	Coefficient of Variation%	Relative Weight %	Level of Agreement	Rank
Banking transactions are conducted quickly and efficiently at the bank.	3.60	1.455	40.4	72.0	Agree	4
The use of financial technology contributes to accelerating the completion of transactions	3.88	1.321	34.0	77.7	Agree	2
The time required to complete banking transactions is reduced through the use of modern technologies.	3.79	1.310	34.5	75.8	Agree	3
Financial transactions are completed more rapidly compared to other banks.	4.10	0.939	22.9	82.0	Agree	1
Electronic services contribute to faster access to the results of banking transactions.	3.30	1.588	48.1	66.0	Agree	5
Overall Mean of Financial Performance	4.11	1.066	25.9	82.2	Agree	-

(Source): The results of SPSS program.

As indicated in the table above, the overall average of the speed and efficiency is (4.11) with a weight of (82.2) and that of statements was between (3.30-4.11) with a weight (66.0-82.0). These percentages reveal that the sample study had an agreement on speed, efficiency and the overall dimension as reflected in The table above.

Descriptive state sticks: Operation Cost Effectiveness.

Figures of descriptive statistics of operating costs are shown in the table below.

Table (5): To illustrate descriptive statistics for operating costs

Statements	Mean	Std. Deviation	Coefficient of Variation%	Relative Weight %	Level of Agreement	Rank
Digital banking services help reduce transaction-related fees	3.80	1.171	30.8	76.0	Agree	3
Financial technology contributes to reducing the bank's operational costs.	3.85	1.376	35.7	77.1	Agree	2
The bank provides banking services at a lower cost due to the use of technology.	3.58	1.483	41.5	71.5	Agree	4
Financial technology enables the bank to offer banking services at lower costs compared to traditional methods.	4.47	0.637	14.3	89.4	Strongly agree	1
Customers perceive banking service costs to be lower due to the use of financial technology applications.	3.32	1.254	37.8	66.4	Agree	5
Overall Mean of Operational Cost Efficiency	3.95	1.174	29.7	79.1	Agree	-

(Source): The results of the SPSS program.

The table above indicates that the total average of the operational cost is (3.95) with the relative weight of (79.1%), and the averages of the statements were between (3.32-4.47) with the relative weight (66.4%-89.4%). These percentages reflect that the sample used in the study had accepted the operational cost, as well as the general dimension depicted in the table above.

The table below corresponds to the descriptive statistics of customer satisfaction:

Table (6): To illustrate the descriptive statistics for customer satisfaction.

Statements	Mean	Std. Deviation	Coefficient of Variation%	Relative Weight %	Level of Agreement	Rank
Digital banking services help reduce transaction-related fees	3.73	1.306	35.0	74.6	Agree	4
Financial technology contributes to reducing the bank's operational costs.	3.82	1.261	33.0	76.5	Agree	1
The bank provides banking services at a lower cost due to the use of technology.	3.82	1.221	31.9	76.5	Agree	1
Financial technology enables the bank to offer banking services at lower costs compared to traditional methods.	3.73	1.287	34.5	74.7	Agree	3
Customers perceive banking service costs to be lower due to the use of financial technology applications.	3.80	1.217	32.0	76.0	Agree	2
Overall Mean of Operational Cost Efficiency	3.55	1.515	42.7	70.9	Agree	-

The table above shows that the overall average customer satisfaction was (3.55) and the relative weight of the statements was (70.9%), and the averages of the statements were between (3.73-3.82) with relative weight between (74.6%-76.5%). The percentages above demonstrate that customer satisfaction and the overall dimension were concurred with by the study sample as indicated in the table above.

Table (7): Descriptive statistics for Simple Regression Results Between the Use of Financial Technology and the Efficiency of Banking Operations in Banks

Dependent variable: M: Efficiency of banking operations in banks Independent variable: X: Use of financial technology						
morale level	**Calculated T value**	**coefficient value**	**R**	**R square**	**morale level**	**F Calculated**
0.000	4.960	0.05	.993[a]	.986	0.000	9164.989
0.000	95.734	=β1.0113				

Result from SPSS data revealed a strong and positive relationship between financial technology adoption and the improvement of bank efficiency. Results The f- and t-tests both revealed that the model was significant at the 1% level. The model accounted for 98.6% of the variance in banking performance which shows that increased use of financial technology leads to higher efficiency. The B-value reflected this fact. The results support the theory that financial technology improves banking efficiency and speeds up transactions.

Table(8): To demonstrate the outcomes of the simple regression about the impact of financial technology on mitigating prospective financial crises.

Dependent Variable: M (Acceleration of Banking Transactions and Improvement in Operational Efficiency of Banks) Independent Variable: X (Financial Technology)						
morale level	**Calculated T value**	**coefficient value**	**R**	**R square**	**morale level**	**F Calculated**
0.000	4.694	.273 =α	.987[a]	.975	0.000	4945.623
0.000	70.325	1.020 =β				

The SPSS results show that there is a strongly positive relationship between financial technology and banking efficiency. The correlation is R=0.975, and it is statistically significant at the level of.000. Moreover, the model has shown the significance of 1% and validated by the t-test and the B-value of the independent variable. The percentage of the model's explanatory power 97.5% also demonstrates that it is financial technology that deprived of measuring the increase in the banking efficiency, as the results confirm the second sub-hypothesis, which suggests that financial technology reduces operational costs and improves financial sustainability.

Table (9): To illustrate the results of the simple regression between financial technology and reducing banks' operating costs

Dependent variable: M Reducing banks' operating costs Independent variable: X FinTech						
morale level	**Calculated T value**	**coefficient value**	**R**	**R square**	**morale level**	**F Calculated**
.862	0.174	=α.009	.988a	.977	0.000	5215.529
0.000	72.219	=β.968				

The SPSS results showed a strong positive relationship between financial technology (X) and operational cost reduction (M), with a correlation coefficient of R = 0.988 and a morale level of 0.000. The model was significant at the 1% level, and the t-test (t = 72.219) showed that the independent variable was important. The B-value (97.7%) shows that using financial technology more often leads to a big drop in operating costs. The model explains 97.7% of the difference in the dependent variable. The results corroborate the sub-hypothesis that the utilization of financial technology enhances client satisfaction with banking services.

Table(10): To display the results of the simple regression analysis regarding the utilization of financial technology and its influence on the mitigation of adverse effects on financial stability.

Dependent variable: M Customer satisfaction with banking services provided Independent variable: X Use of financial technology							
morale level	Calculated T value	coefficient value		R	R square	morale level	F Calculated
0.000	6.472	.286	=α	.993[a]	.985	0.000	8643.83
0.000	92.972	1.029	=β				

The results from the SPSS analysis indicated a strong positive significant relationship between customer satisfaction and financial technology utilization (R = 0.993, Sig = 0.000), where by the model explained 98.5% of the variance. Results showed there was general agreement on cybersecurity (75.7%), cost-effectiveness (79.1%), and quickness (82.2%). This further confirms that increasing financial technology increases bank efficiencies, speed and customer satisfaction.

Study results:

- We find a strong positive association between financial technology use and banking efficiency suggesting that using technology can help develop the overall business of banks.
- The results of the F-test showed that estimation was statistically significant at the 0.01 level for acceptance and quality allowing us to conclude that model is valid and reliable.
- The t-test result revealed that the independent variable (financial technology) significantly influences improvement in operational efficiency in banks.
- The B-value means an increased use of financial technology has a positive direct impact on efficiency, and is equivalent and stable.
- Coefficient of determination (R^2 = 98.6%) indicated that 98.6% changes in banking operational efficiency is explained by ariation in the use of financial technology and making the mode as useful due to its high explanatory power.
- The empirical results validate the research hypothesis that using financial technology has a positive effect on speeding up bank transactions and increasing operational efficiency, hence its importance in shaping modern banking performance.

Recommendations: Digital transformation model in banking and financial sectors

- Additional resources should be invested in e-payment systems and online banking service by banks and other financial intermediaries to improve the efficiency of their operations.
- Cyber Security Improvement: As to avoid any unauthorised /fraudulent usage of transaction banking, and/or products/services, a Financial Institution is to focus on enhancing their security posture.
- continued re-invention and new tech: Financial institutions, such as banks, need to keep investing in next level technologies — whether AI or other — to ensure they are still able to provide the best customer services and money management.
- Enhance performance and speed: Refining transaction processing systems in the attempt to bring down transaction time, this will improve customer experience.
- Reduced cost of Doing Business: Increase use of finance technology by banks would enable to deliver banking services much cheaper.
- enhancing customer satisfaction: It is important that technology be utilized to enhance productivity in banking and maximize service in banks with a view to making a positive effort towards improving the consumers experience for more business opportunities.
- Promoting the adoption of technology to make institutions run better.
- Speeding the adoption of financial technology: If banks harnessed FinTech's more quickly, they could process transactions more rapidly and affordably.

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