The Relationship between Financial Technology as one of the Tools of the Industrial Revolution and the Development of Financial and Banking Services

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ABSTRACT

The research aims to study the role of financial technology as one of the tools of the industrial revolution in the development of financial and banking services in the Egyptian and Arab business environment, and to achieve this goal, the researcher formulated a set of assumptions, perhaps the most important of which is " there is no statistically significant impact of financial technology on the development of financial and banking services "and also" there is no statistically significant impact of financial technology positively on the process of financial inclusion", and to test these assumptions, a set of statistical methods were used to serve the preparation of a field study in order to achieve research purposes, and that study resulted in a set of results, the most important of which were there is a significant effect Statistics of financial technology in the improvement and development of financial and banking services and the economic work environment through the provision of innovative tools of digital financial services, which leads to an increase in the funds available for lending and through lending platforms, which contributes to the financing of small and medium enterprises. Considering these results, a set of recommendations was presented that the researcher hopes to contribute to maximizing the benefits of financial technology for companies, banks, and organizations and directing financial information flows toward further development in this field with the need to establish regulations and laws to hedge the risks associated with digital transformation and applications of financial technology

Keywords: Digital transformation, FinTech, Financial services, Industrial revolution, financial inclusion

INTRODUCTION

Financial technology is one of the outcomes of the Fourth Industrial Revolution, which has its repercussions, and the rapid technological developments that the world is witnessing. Therefore, contemporary technology has created several new fields that combine financial knowledge and technological skills in providing financial services and improving the financial and administrative performance of companies, financial institutions, and commercial banks. This has led to the tremendous development that the world is witnessing today in the field of information and communications technology has led to the emergence of many innovative financial and banking applications and solutions, which greatly help in increasing the efficiency of financial services and expanding their spread, with the resulting positive impact on the national economy. (CBE), Interest in and investment in financial technology has witnessed a massive demand, leading to the spread of emerging companies that have adopted financial technology and benefited from its financial services. The clear impact of this technology has

been in the banking sector. The transformation of commercial banks into digital electronic banks, meaning that it is described as a new era of financial technology, Digital finance around the world that extends from the application of artificial intelligence and machine learning to the use of big data, (Arner et al, 2017).

According to Mroczkowska (2020), there was more than one FinTech application. First, trading online apps have enabled everyone with internet access to invest in the market, analyze risk immediately, and spread expertise inside the online platform itself. Banking for Individual customers might now govern their finances through the Internet. Banks and start-ups in this field are evolving online wallets and profiles to follow services, resulting in an improved and faster user experience that enhances the digitalization of the world. Second, digital solutions are being used by InsurTech insurance businesses to improve client experience, access to financial services is also an important step towards achieving financial and banking justice and reducing poverty and inequality (Agyemang-Badu et 2018). That is, there is an urgent need to expand the application of financial inclusion and digital transformation to develop financial products. Accordingly, financial institutions in general and banks in particular needed to adopt a digital transformation strategy and the associated digital financial services that are more innovative and widespread and consider the requirements and expectations of customers to Sustainable financial service.

Based on the above, the research aims to study financial technology as one of the tools of the industrial revolution in the development of financial and banking services within the Egyptian business environment.

Accordingly of the economic and financial crises the world is witnessing and the expected losses in the financial system Globally, against the backdrop of the Corona crisis during the past two years, there has been a trend toward seeking inclusion Financial and digital transformation to meet the requirements of banking services, with the presence of companies Financial technology that has developed some financial products to take advantage of the digital transformation feature, And employing these financial innovations to provide advanced banking services to its customers, and from here it appeared Fintech term. Therefore, the study is seeking answers to the following main question:

Q1: What is the relationship between financial technology as one of the tools of the industrial revolution and the development of financial and banking services?

Q2: What are the challenges facing the financial technology industry?

Q3: What are the risks that can accompany the use of financial technology for banks and companies?

Q4: What are the desired results of using financial technology for banks and companies?

LITERATURE REVIEW AND RESEARCH HYPOTHESES

The previous studies will cover studies for the last three years, For example, **yacoub**, **Abdullah**, and **Matar** (2021), which aimed to employ recovery strategies from the Covid-19 pandemic crisis that struck the world's economies and its various sectors, including the banking sector, through financial technology that is based on digital transformation to achieve financial sustainability, and the researcher arrived at a sentence One of the most notable results is that it is possible to shift towards financial technology in the Iraqi environment, due to the availability of infrastructure and human and material capabilities for financial technology In addition, The study by **Qashi**, **Barkan** (2021) aimed to explore the current landscape of financial technology companies and their impact on the financial and banking industry. The results of the study concluded that financial technology has greatly improved consumer banking services and has also provided alternatives to financial technology for basic banking services, including payments and lending, the future of the banking financial industry lies in moving from competition to developing other forms of cooperation with banks. As for studies that dealt with Arab countries, we find, for example, a study by **Fouad** (2021), which revealed the role of technology in improving the economy of Arab countries and recognition On financial technology, its stages and sectors, the reality of technology in Arab countries, and how It contributes to improving the business and economic environment in those countries, the researcher found a group of Recommendations, the most important of which is the need for

banks, central banks, and regulatory authorities to move toward creation Balancing the phenomenon of risk aversion and the global trend towards financial technology innovations and digitalization.

Also, **Ntwiga**, (2020) study is about whether the merger of the Fintech and the bank has an impact on efficiency and a positive on the banking sector. In his study, he takes 5 data from the financial statements of banks from 2009-2018 and divides it into two periods before the use of Fintech from 2009-2014 and the period of using Fintech from 2015-2018, and studies the effects of the impact of Fintech on financial transactions in these two periods. The result is that a positive and effective effect was found in the cooperation between Fintech and banks and that the efficiency of banks increased during the period in which Fintech was used, **Panjwani** and **Shili** (2020), tested the influence of financial technology on the growth of the Islamic banking sector in the modern world. The sample taken for this study is the Islamic banking sector in the contemporary world for the period 2014 to 2018. The results showed that financial technology appears to play a key role in the empowerment of people who do not have access to financial services, resulting in immediate and sustained interest for people, the planet, and wealth. The financial sector's fast change has affected people all across the world. The rapid digitalization prompted a significant increase in the use of technology in the banking business, particularly in the Islamic banking sector. This study investigates how financial technology advances motivate financing efforts to improve the quality of Islamic banking sector services in today's world, as well as the new concept of digital Islamic banking. On the other hand **Tinawi's** (2018) study emphasized the relationship between the use of information technology, He demonstrated the improvement in the quality of services provided by telecommunications companies, as an attempt to achieve an investigation Optimal use of information technology; To improve the quality of services provided in companies Communications, and the study reached many results, the most important of which is the existence of a significant relationship between the use of Information technology and the dimensions of service quality are represented by the dimension of tangible physical aspects, Relying on credibility, speed of response, customer assistance, trust, security, and empathy the client either partially with each dimension separately, or with all dimensions combined, There was also another vision in the study of **Julapa** & **Catharine** (2018).aimed to test whether fintech sites designed for lending purposes are capable It was designed to open new markets for banking services instead of the presence of financial intermediaries a platform in the United States of America called the peer-to-peer lending platform, which contains data Regarding the type of loan, its interest, duration, and method of repayment, the researcher concluded that financial technology opened new markets for banks, and thus electronic services were delivered to areas Many bank branches were not opened there Qadri, Madfouni (2021) also shed light on the reality of financial technology companies in the Kingdom of Saudi Arabia during the period from 2018 to 2021. It concluded with several results, the most important of which are: that the government contributed to many initiatives supporting financial technology companies under the supervision of the Central Bank. The Capital Market Authority and Fintech Saudi Arabia, which reflects positively on the growth of these companies in the period studied and the emergence of new areas in light of these payments and the disbursement of commissions, According to **Zaykh**, **Younesi** (2022) their study examines and clarifies the role of the financial technology industry in promoting financial inclusion in the Arab world, ensuring the achievement of financial, economic and social stability, by presenting the experience of the Kingdom of Saudi Arabia in activating financial technology to enhance financial inclusion. The study concluded that the Kingdom It has made progress and become a leader in this field, and is expected to become the financial technology pole in the region, enhancing levels of financial inclusion, The **Xavier** (2019) study also showed the positive impact of financial technology innovations And the services that exist as a result of digital technological transformation, which affects the services provided by financial institutions such as banks, it is characterized by features, the most important of which are: cost reduction and speed Providing advanced financial services that suit customer requirements, as the study recommended as necessary Issuing standards and guidelines clarifying the responsibilities of financial technology. The study by **Turker** and **Bicer** (2020) conducted a study focused on clarifying the role of financial technology innovations and the tools used in their application, which can affect the services of all functions, especially about the shift from traditional methods to financial technology applications In addition to the development of other services, in addition to the emergence of new professional services that are appropriate With the financial technology environment. The study recommended the need to strengthen business strategies Digital technology is one of the innovative solutions to support the development process of financial services, Besides **Wei et al**. (2022) conducted a study to identify the impact of the risks facing financial technology companies. The researcher identified several risk factors in the financial technology sector and the various sub-

sectors. The study showed a difference in the important risk factors depending on the sub-sectors that use financial technology. An experimental study was presented on several risk factors in the financial technology sector and pointed out that the types of risk factors are similar for financial technology companies, but the content of the risk factors remains different from one company to another.

Another study has been conducted by **Saura et al** (2021) confirmed that the most important challenge that may face the application of Financial technology is the concern of investors and lenders about its future results and estimates, as the main goal of enterprises is to increase their profitability by presenting these estimates in the market finances and these practices raise concerns to other parties; Because these facilities are given priority To achieve their economic goals, at the expense of controlling data related to technology Finance. For example, we find that some lenders to these establishments offer them these Estimates, but they do not realize how the facilities themselves manipulate the data they process Which may be linked to the data of the lenders themselves to predict their future behavior, which provides Data that directs them towards investing in these establishments. Hence, the emphasis is on having a system a regulatory framework that is disclosed to investors by those establishments has a significant impact on decision-making and rationalization of Investment decisions Sending feedback,

Iman's study (2021) also aimed to highlight the importance of financial technology and its stages. And its sectors, the role of the reality of financial technology in Arab countries, and the impact of financial technology on Improving the business and economic environment in Arab countries. The study found a group of recommendations include the need for banks, central banks, and regulatory authorities to create a balance between the phenomenon of risk avoidance and the global trend toward financial technology innovations and digitization. **Echchabi**, **et al**., (2022) the IFIs (Islamic Financial Institutions) are positively related to the prospects of outcome and success of Fintech. Also, **Ntwiga**, (2020) there is a positive relationship between Fintech and banks, and that the efficiency of banks increased during the period in which Fintech was used. Moreover, Sheng (2021) (Fintech) financial technology facilitates obtaining credit from banks to institutions, and Fintech helps in developing small banks. In addition, Alwi (2021) there are positive effects on banks' profit, and the stock price continues to change for the better.

The Relationship between Fintech and the development of financial and banking services

Echchabi, et al., (2022) the IFIs (Islamic Financial Institutions) are positively related to the prospects of outcome and success of Fintech. Also, Ntwiga, (2020) there is a positive relationship between Fintech and banks, and that the effectiveness of banks increased during the period in which Fintech was used. Moreover, Sheng (2021) (Fintech) financial technology facilitates obtaining credit from banks to institutions, and Fintech helps in evolving small banks. In addition, Alwi (2021) there are positive effects on banks' profit, and the stock price continues to change for the better. Wang, et al., (2021) the risks in banks increase in the period of using Fintech, as the relationship between them is in a U-shape, which means that the use of Fintech is intensive and then weakens the ability of banks to take risks, and also banks become more sensitive. Ebrahim, et al., (2021) that Fintech is much better than doing traditional transactions because it provides easier services to users and has more information preservation and more effectiveness. Furthermore, Pollari (2021) Fintech offers electronic payment, which helps to keep the distance and safety among people during the pandemic. Moreover, consumers and business owners prefer electronic payment because of low costs and fees. On other hand, Li, Spigt, and Swinkels (2017) they found a positive relationship between financial technology and the returns and profits of banks when using it. Likewise, Alkhazaleh, and Haddad (2021) there is a positive relationship between them, as customer satisfaction increases in the bank after using financial technology. In addition, Hornuf, Klus, Lohwasser and Schwienbacher (2021) the financial technology affects the banks well, as the banks sign agreements with financial technology companies to develop their programs

The researcher believes that financial technology has significantly expanded across various institutions and companies, such as banks, insurance firms, and telecommunications companies. This expansion has facilitated numerous financial operations, including payments, fund transfers, and online borrowing. The researcher also asserts that financial technology is a novel financial innovation that merges technological advancements with financial services to replace traditional methods. In the context of contemporary business and digital transformation, the application of financial technology is inevitable.

From reviewing previous studies, the significant role that financial technology plays in providing clear financial benefits becomes evident. What distinguishes the current study is that it emerges at a crucial stage following the conclusion of the global COVID-19 pandemic experienced over the past three years. The study proposes a model based on financial technology as a strategy for economic recovery from the effects of the COVID-19 pandemic.

Study hypotheses:

The researcher posits that specific standards and controls in financial technology must be considered to enhance its effectiveness, which requires formulating the following hypotheses to serve the purposes of the research:

H1: There is a statistically significant and strong impact on historical financial and banking services.

H2: There is a statistically significant positive impact of financial technology on financial inclusion.

Limitations of the study:

The applied aspect of the study included an account of financial technology and financial access indicators, focusing on the Egyptian case study, including banks and emerging companies.

Then, indicators of technology and financial access were analyzed and studied, focusing on:

The period from 2021 to 2022.

Research Design and Data

The research population is a group of companies and banks listed on the Egyptian Stock Exchange and the interest it represents in financial technology and its applications, which the researcher wants to generalize the results, will be reached from the sample.

The research sample is a random stratified sample of financial technology experts in banks and financial technology implementation companies

Table (1) the sample of the applied study is distributed among sectors

s	Sector	Sample	Percentage
1	Banks	5	62%
2	Companies	3	38%
total		8	100%

Table (2) Distribution of the population according to the study categories

Research categories	No.
Financial technology experts in banks	90
Experts in financial technology implementation companies	60
Total	150

RESEARCH METHODOLOGY

To address the problem of the study, test the hypotheses, and achieve the objectives, the study adopted the inductive method and the descriptive analytical method the researcher relied on this method

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As following:

a) Descriptive approach: to be a theoretical framework for the study by collecting data and information about financial technology.

b) Analytical approach: to analyze shapes and proportions and interpret them to arrive at results of the role of technology Finance in the development of financial and banking services.

Conceptual framework

The Fourth Industrial Revolution:

The Fourth Industrial Revolution is a technological shift that affects cultures and economies everywhere around the world, encompassing a wide range of modern technologies that drive innovations and inventions across sectors as fundamental aspects of culture and society change. It includes elements of this revolution: technology such as artificial intelligence, machine learning, automatic control, the Internet of Things, Big data, block chain, quantum computing, and 3D printing Dimensions. The uniqueness of this revolution, according to contemporary economists and thought leaders, emerges from its scope Associated with the abundance of technology associated with it, and the speed of its spread throughout the world. A lot of The new technology has only been in use in the last decade or so and has been accelerated by the Covid-19 pandemic With certain technological applications and at large rates, it was a product of this industrial revolution Financial technology, its applications, and uses, **Rizk**, **Ismail** (2021).

Features of the Fourth Industrial Revolution in Egypt:

Egypt is moving towards launching the fifth generation of communications networks, which will contribute to Achieving the prosperity of the Fourth Industrial Revolution by providing technologies such as the Internet of Things and intelligence Artificial, thanks to the efforts of the National Telecommunications Regulatory Authority in providing a broadband optical network Term. The primary goal of the Egyptian state currently is to create a strong infrastructure, which is It reflects the acceleration of the pace of digital transformation in the country and the move towards the "Fourth Industrial Revolution."

It also highlights the features of the Fourth Industrial Revolution in Egypt through its pursuit of digital transformation in all Fields that rely on technology, and the emergence of digital matching platforms such as Hire Wuzzuf, Forasna, and Shaghalni, to match office, manual, and medium-sized jobs with job seekers, as well as in the financial field and financial technology applications in companies and banks, which is what the searcher mechanism offers. During this study

Financial technology:

Financial technology, known as "FinTech," is one of the most important innovations that is changing the shape of the way the financial sector works in the world; This is because it helps improve financial services, simplify them, make them more transparent and secure, and also makes it easier for users to access various financial services quickly and effectively. The term "FinTech" consists of two terms: the first is technology, and the second is finance, and includes innovative startup companies using technology to shape financial and banking services. In the wake of the 2008 financial crisis, many bankers and traders left the world's financial centers and embarked on entrepreneurial adventures. And investing in venture capital to reconsider the financing model through financial innovation Harfouche (2019).

The emergence of financial technology is due to the development in digital transformation, which is considered the latest Innovation in financial services, while the field of research in fintech is still early because it provides many financial services, such as payment, financing, e-commerce, cryptocurrencies, etc. Ryan et al, (2020). The Financial Stability Board defines financial technology as financial innovations using technology. It is concerned with providing financial services that can result in business models, applications, processes, or products new ones that have a material impact related to markets, financial institutions, and the provision of financial services, and affect FinTech innovations affect many different areas of financial services (FSB, 202).

The **Basel Committee** on Banking Supervision defines it as "any technology or financial innovation that results in a model of a new business, process, or product that has an impact on financial markets and economic units , FinTech is also described as a new era of digital finance around the world, which extends from the application of artificial intelligence and machine learning to the use of big data, and from the use of Biological identification to blockchain technology Arner et al, (2017).

Benefits of applying financial technology:

If we look at some of the benefits of financial technology, they can be considered one of the most important reasons this technology has made it necessary in our current era, and perhaps the most important of these benefits are the following:

a) Improving the speed and effectiveness of financial services users can perform financial transactions quickly and safely without the need to visit bank branches.

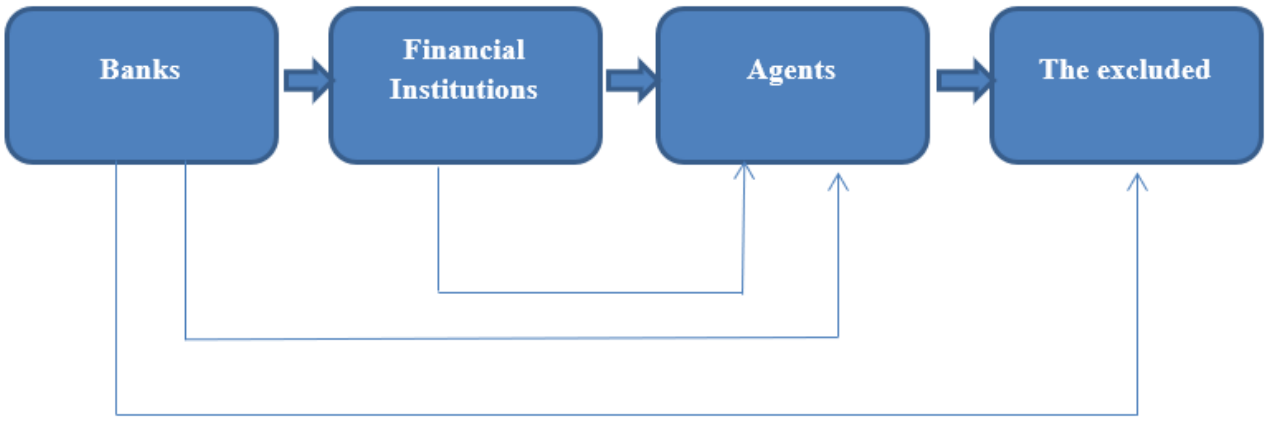
b) Increasing the transparency of financial services: users can monitor their accounts and conduct financial operations transparently and clearly and allows them to access accurate information about Prices and fees related to financial services.

c) Improving the security of financial services: Financial technology uses modern techniques to protect financial data and accounts, such as encryption and two-factor verification procedures.

d) - Providing financial services to non-bankers: individuals and non-banking companies can obtain financial services easily and at reasonable prices, and it also allows them to open bank accounts and perform financial operations easily.

e) - The development of the e-commerce sector: where financial technology is used to facilitate operations Online payment also helps improve the security of online financial transactions.

Figure (1): Expresses the digital system for integrating excluded groups



Source: (Swedish Institute, 2016).

Figure No (1) expresses the digital system for integrating excluded groups into society, as it is linked Poverty and social exclusion are closely linked to unequal access to financial services, so the definition Common to poverty within developed societies is exclusion from community life due to lack of resources Nolan and Ive, (2009).

Accordingly of the above, the researcher believes that financial technology is of great importance in promoting the development economic, social, and cultural, and attempts to shed light on financial technology as one of the most important developments in the global financial economic arena that helps in the development of service Finance and banking.

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Stages of development of financial technology:

Financial institutions and banking services have a long history of adopting financial technology It went through three stages (Harfouche, 2019):

The first stage: In this stage, the first transatlantic cable was created, and the first invention was made

An automated teller machine this stage produced several technology-related products Finances, such as the Swift system, existed in the period between 1866 and 1967.

The second stage: In this stage, financial technology remained dominated by an industry sector Traditional financial service, which used financial technology to provide products and financial services. This period witnessed the beginning of the introduction of electronic payments and systems clearing and online banking services in the period between 1967 - 2008.

The third stage: Since the global financial crisis, new startups have emerged, which have embarked on Providing financial products and services directly to companies and the public, and this period extends from 2008 to the present day.

Financial technology and the development of financial and banking services:

The tremendous development in financial instruments and the expansion of the field of dealing with banking technologies, in addition to the tremendous development in electronic payment technologies has helped accelerate the development of financial and banking services.

a) Key factors of financial technology:

There are a set of key factors that must be present in a financial technology event The desired goals can be achieved, and these factors are:

1. Availability of the demand side for advanced financial services (individuals and companies).
2. Ease of access to financing for financial technology companies, especially emerging ones.
3. Availability of technical cadres with the ability to attract the best of these cadres.
4. The appropriate regulatory environment, including regulations and laws.
5. Appropriate infrastructure with the availability of business incubators

b) Distinctive techniques in financial technology:

There are many distinct techniques in financial technology, which have received widespread attention and significant in digital and technology circles, we mention among them **Sarah** (2021)

1. **Artificial Intelligence:** It is a technical model that can replicate human thinking in general, where artificial intelligence gives the machine the quality of intelligence It makes it capable of simulating human mental abilities. It is considered a science of computer science. Intelligent information systems are designed whose characteristics are like human intelligence. This type of intelligence deals with describing objects, events, and processes using their properties How and logical and arithmetic relationships in an intelligent way. It also focuses on building programs capable of studying and implementing repetitive activities performed by humans Amirham, (2022).
2. **Big Data:** It is a collection of data of huge size that can be Analyzing them mathematically to reveal patterns and trends, this technology can provide the user at the right time with the correct information from a mass of complex data, It was given this name because it is characterized by its large size and a

great degree of diversity What exceeds the capacity of traditional information systems in terms of storage and operation to handle With such data, companies' use of big data also contributes to their systems Improving operations and providing better services to customers, ultimately enabling them to increase Revenues and profits, it also supports a competitive advantage for those companies because they are able to Make faster and more accurate business decisions Ghoneim, (2021).

3. **Cloud Computing:** It is a multi-use technology data stored on servers across the Internet is used to make a pool of computing resources available quickly, efficiently, and at low costs this technology has contributed to the development of the field of banking technology by transferring banks to infrastructures with new technology, as banks turned to using cloud computing solutions.

4. **Block chain technology:** It is an open-source, decentralized database as one of the outcomes and achievements of digital currencies; So that two or more parties can carry out a transaction Financial or commercial without the need for a third party to build trust.

5. **Payment Services:** This means the most active banking activities and the flexibility that "Fintech" offers to many clients, providing them with a range of Various payment methods via mobile phone, money transfers abroad, cash flow management Payment for e-commerce and currency exchange at no cost.

6. **Retail banking services** directed to individuals: These include simple banking services directed to individuals via the Internet, without any physical presence of the agency, at low costs. They also include budget management capabilities as well as various tools for personal financial management.

7. **Investment and financing:** "Fintech" attracts individuals' savings through simplicity in awarded offers, and providing crowdfunding platforms for companies Whether in the form of loans or capital investment, as well as providing financial advice via the Internet.

c) The contribution of financial technology to financial inclusion:

Financial inclusion means that individuals and businesses have access to products and services Useful and affordable financial services that meet their needs for transactions, payments, and savings products Credit facilities, loans, and insurance services are provided in a responsible and sustainable manner (World Bank Definition of Financial Inclusion, 2018). Financial technology is concerned with enhancing financial inclusion, by reaching large segments of the population Society, especially marginalized segments, who do not find formal financial products that suit their needs Such as the poor and low-income people, especially women, and owners of small and medium enterprises, Micro, children, youth, and others, and financial inclusion includes access for all groups obtain financial products appropriate to their needs and circumstances, which leads to a higher standard of living, Thus reducing poverty rates and achieving economic growth for individuals and the state **Kamel**, (2021). A report issued by Standard Chartered Bank also confirmed that implementing strategic measures that enhance financial inclusion through digital transformation helps increase profitability and enhance the economic performance Of banks directly, as estimates indicate that empowering companies and adults who do not Those who own bank accounts from joining the formal banking sector will generate new revenues For banks, it is estimated at $380 billion, and the report indicated that developments in technology Finance allow banks to maintain their current customer base and target a larger segment Of the public, specifically those who do not have bank accounts, the report explained that Digitization technologies have become the largest and most important catalyst for the transformation process witnessed by the services sector Banking, especially in light of the increasing pace of technology adoption, has become a key priority to enhance results Key performance in banks, **Murad**, **Farah**, **Naima**, (2021).

d) The banking and corporate sector considering financial technology:

After the economic crisis in 2008 and the emergence of financial technology and so-called emerging projects, there was no choice for banks in their traditional form at that time but to work on modernizing work mechanisms digitizing its systems and products, and accepting the challenge imposed by reality and launched by fintech Banks' awareness of the threats and opportunities that arise from this challenge.

In addition, financial technology offers many solutions to improve financial management Companies, including solutions directed at banks, such as Blockchain technology, which is used in Recording transactions, as well as performing solutions in information systems, risk management, and taxes

Basel Committee on Banking Supervision indicates that financial technology is linked to three main sectors: credit, deposit, and wealth management. The development of financial technology includes two waves the first wave includes payment and lending solutions in contrast, the second wave includes introducing technology into wealth management and financial transfers (Wamda and Befort, 2016). It also shows the increasing use of Blockchain technology as a solution for recording transactions in currencies Digital, such as Bitcoin, which has become one of the most important financial trading tools in the world, and then With the rapid growth in financial technology, it has become a major challenge for banks to adopt On a partnership strategy with emerging companies that seek to find innovative solutions in the fields of Financing and lending operations, which have begun to attract a large number of banking clients Various financial and banking services.

e) The risks and challenges that accompany financial technology for banks

1. Information security risks, such as dependence on modern technologies can lead to increased interconnection of commercial banks ' business with insufficiently protected entities, which increases the likelihood of customer data being hacked. Therefore, there is an urgent need to strengthen the management and control of potential electronic risks by banks and fintech companies.

2. Banks can have difficulty adapting to financial technological developments; therefore, they cooperate with third-party companies to provide services. However, this collaboration may increase risks related to data security and privacy, and banks are now challenging their ability to monitor third-party risk management processes that take place outside their organizations.

3. There are challenges facing the application of fintech represented by the lack of awareness of digital financial services, regulatory restrictions and electronic security.

The researcher believes that there is a competitive advantage for banks compared to emerging companies because they have the advantage of trust among a large segment of customers, but emerging companies in the field of financial technology still provide solutions that banks cannot easily build on their own, and therefore banks that adopt a digital vision can significantly improve Its services, expanding and retaining its customer base, as well as enabling those SMEs it serves to interact with these startups in various ways, such as participating in markets, business and investments. Thus, it will become possible that the role of banks will not be limited to providing banking services only but will also have a greater role in supporting innovation and developing innovative financial solutions.

f) The technological revolution in the field of financial technology:

According to The Global Findex database, there are 515 million adults around the world who have Opened accounts either through financial institutions or through financial account providers Between 2014 and 2017. This means that 69% of the world's population in 2017 had accounts, compared to 62% in 2014 and 51% in 2011. In developed countries, the number of account holders reached 94%, while their number reached 63% in developing countries. The number of people excluded from financial accounts globally reached about 1.7 billion individuals in 2017. Because possession of financial accounts is consistent with global indicators in developed countries, excluded people are often found within societies **Demirguc-Kunt et al** (2018).

The most prominent financial technology companies in the world and the Arab countries:

The most prominent financial technology companies in the world.

1. **Amazon:** Its market value is estimated at approximately $1.7 trillion, and it is famous for its services such as e-commerce, cloud services, and smart audio devices.

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2. Apple: Its market value is estimated at $2.5 trillion, and it is famous for producing devices like iPhone, iPad, and laptops.

3. **Google:** Its market value reached about 1.5 trillion dollars, and it is famous for its services Internet search, email services, and tablet devices.

4. **Facebook:** Its market value is estimated at approximately $1.0 trillion, and it is famous social media networks such as Facebook, Instagram, and WhatsApp

5. **Allianz:** A market value estimated at approximately $100 billion. It operates in the insurance fields and risk management services.

6. **Forrester Research Inc.** It is a company specializing in the field of research Independent, analyzing the future of technological change and its impact on businesses, consumers, and society.

7. **PayPal:** leader, Dan Schulman, dedicated PayPal system services to answer Consumer-on-user inquiries.

8. **Codan Limited**: It is a company that provides financial technology services Designs, manufactures, and markets advanced communications devices, metal detectors, and other equipment Electronic for government, businesses, NGOs, and consumer markets.

The following figure shows the development of the volume of global investment in financial technology companies and the number of Transactions starting from 2018 to the second quarter of 2021.

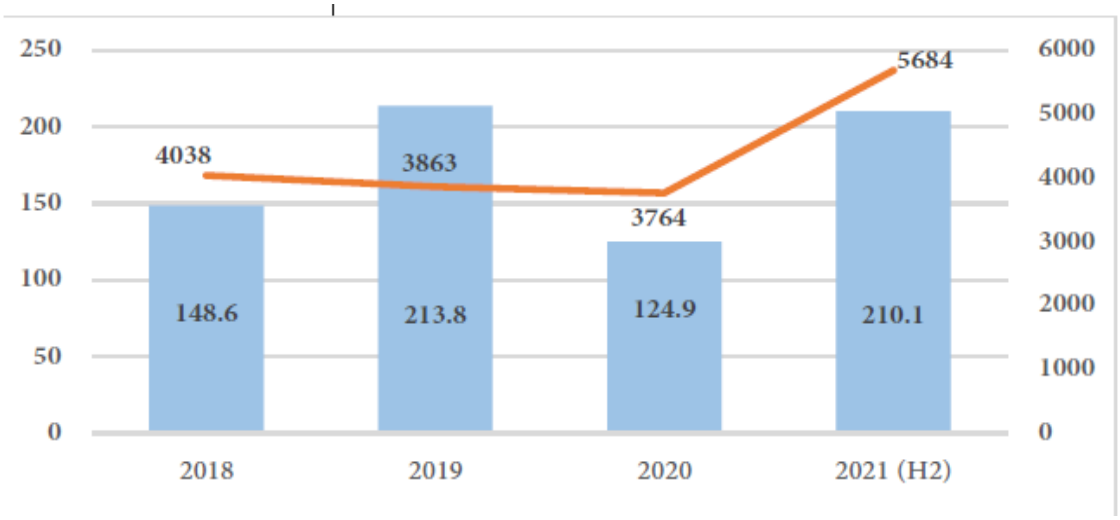

Figure (2) the development of the volume of global investment in financial technology companies

The most prominent financial technology companies in the Arab countries:

As of October 2019, more than 330 FinTech solutions have been monitored in 22 countries in the Arab world, and although FinTech solutions are monitored in virtually all countries of the region, 75% of them are concentrated in a small number of countries. The Gulf countries lead the countries of the region, with the United Arab Emirates adopting more than 60 of these solutions, followed by the countries of the North African continent, led by Morocco, Tunisia, and Egypt, along with the Levant, led by Jordan and Lebanon. Bahrain is considered the fastest-growing financial technology center, in part because Of its active regulatory laboratory and recent legislation on open banking, which allows third parties to obtain customers' financial information or initiate payments on their behalf, CGAP, Arabic Fin Dev Gateway, (2019).

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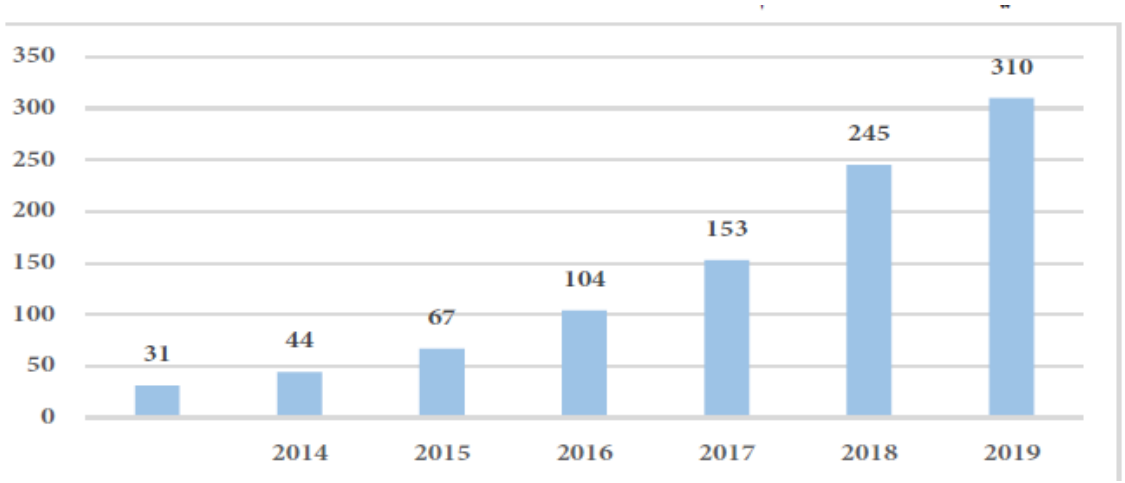
The number of emerging financial technology companies in the countries of the region has grown at a rapid pace during over the past years, there are currently 310 startups active in the sector in the Middle East and North Africa region, according to a report by the Magnit platform in cooperation with the Abu Dhabi Global Market. According to the report, emerging financial technology companies succeeded in attracting funding worth $237 million during the period from 2015 to 2019. The UAE is the largest attraction for financial technology companies in the Middle East and North Africa region, as it accounts for 46% of the total startups in this sector, 47% of the total deals, and 69% of the total funding during the year (MAGNiTT) 2019.

Number of startup companies in Arab countrie

Figure (3) Growth in the number of financial technology companies in the Arab world



Source: Prepared by the researcher based on the Magnit platform report (2019).

Experience of the Arab Republic of Egypt

The current indicators in the communications and information technology sector in Egypt reflect the achievement of many achievements during the year 2022, as a result of the implementation of the "Digital Egypt" strategy, which covers all aspects of this sector. The growth rate of the communications and information technology sector recorded 16.3% in the fiscal year 2022, making it the fastest-growing sector among the country's sectors for five consecutive years. This sector also achieved revenues amounting to 315 billion pounds in the fiscal year 2022, an increase of about 75%. In an indication of the progress of this industry in Egypt, Egypt ranked third globally in the "Confidence Index in Cross-Border Paving Services for the year 2022", up from 11th place within a year, according to a report by Rayan Strategic Consulting Company. Also, Egyptian financial technology companies indicate that there are opportunities It is large in the North Africa and Middle East region, where the Egyptian user can obtain various financial services and reduce the digital financial access gap.

Within the framework of the Central Bank of Egypt's strategy for financial technology and innovation, FinTec Egypt launched the first digital academy in Egypt to develop the skills of workers in the banking and financial sector and financial technology, within the framework of the Central Bank of Egypt's strategy for financial technology and innovation, which aims to transform Egypt into a center for the financial technology industry in the Arab and African countries. And a home for the next generation of financial technology cadres in line with the vision of Egypt, affiliated with the Central Bank, as the first digital academy specialized in developing technical, artistic, and technological skills, directed to workers in the banking and financial sector, and emerging financial technology companies (CBE, 2023).Egypt also includes 17% of financial technology companies in the Middle East and North Africa, where it comes in second place after the United Arab Emirates, which includes 46% of Financial technology companies according to 2018 statistics. Egypt acquired 27% of FinTech deals in the MENA region from 2015 to 2019 (Magnit and Abu Dhabi Global Market, 2019). Egypt accounts for 3 of the 16 crowdfunding platforms in the MENA region (Marmore, 2019). Because these indicators represent important opportunities for providing digital financial services, financial inclusion in Egypt is considered low when compared to many countries in the world. Especially African countries. **Rashdan** and **Eissa**, (2019)

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The applied aspect

The applied aspect of this study is to test the opinions of workers in the banking sector and some Start-up companies on the role of financial technology, as one of the tools of the Industrial Revolution in the development of financial and banking services, by applying it to the Egyptian business environment and the possibility of adopting financial technology.

Research sample:

The research population can be defined as employees in the private banking sector in the Egyptian environment and sample research for employees in the banking sector.

The field study community is divided into two categories:

The first category includes banks, given that they are The most important sources of applying financial technology, and the researcher in the study sample focuses on several branches (National Bank, Banque Misr, Commercial International Bank, **QNB** Bank, Arab African Bank), which are The largest bank in the Arab Republic of Egypt, the National Bank of Egypt ranks first as the largest bank in terms of assets, as its assets amounted to 4.370 trillion pounds by the end of 2022, occupying market shares amounting to 33 and 38% of the total assets of the banking sector, and it applies technology Finance and Banque Misr come in second place among the banks with the highest assets in Egypt, acquiring a market share estimated at 5.58% of the total assets of the sector at the end of 2022, with an asset value of 635 billion pounds, and fourth place comes QNB Al Ahli Bank, which acquired 4.22% of the total assets of the banking sector in Egypt by the end of 2020, with an asset value of 483.279 billion pounds, and the Arab African International Bank is in fifth place, with its assets reaching 13.2 billion pounds by the end of 2022. , equivalent to $325.477 million according to the dollar price In December 2022 (Central Bank of Egypt)

All these banks have 4 to 8 FinTech implementation officers Employees, with an average number of 6 employees per branch. The questionnaire list was designed to be relied upon as the main source for obtaining the necessary data. To test the positive and reliable extent of financial forecasts using financial technology techniques, it was designed to test the research hypotheses through 7 statements that express the extent of the influence of the independent variable and the dependent variable.

The second category includes some financial technology companies such as (Valu, E-Finance, and Fawry), as they are the main companies responsible for technological initiatives and financial innovations in Egypt, as well as those responsible for development, research, training, and implementation work in the field of financial technology. This category is divided into two sectors. They are Payment Consultants Sector Electronic collection, and the financial sector.

The questionnaire was distributed equally to **150** workers in accounting and information technology departments, 120 questionnaires were retrieved, and **90** questionnaires were used for statistical analysis as valid questionnaires for analysis.

The following table shows the number of questionnaires distributed, retrieved, and valid among the sample categories represented in the distributed questionnaires.

Table (3) Distributed and retrieved questionnaires suitable for analysis

sample	questionnaires distributed	questionnaires returned	valid questionnaires	Percentage %
150	**150**	**120**	**90**	**60**

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Research tools and statistical methods

To achieve the goal of the research and its hypotheses, the questionnaire was relied upon as a research tool, and the extent of the validity of the questionnaire and its purpose was tested, and the extent of validity of the questionnaire was tested with binary validity by calculating the structural correlation coefficients for each item, and the total score of the question, as well as the correlation coefficients between each item and the score the totality of the tool, and the adoption of a five-point, graduated **Likert** scale to determine the answers of the sample members, make it possible to obtain continuous data and to ensure a normal distribution of the data so that it accepts the application of statistical methods to it.

Table (4) Degrees of agreement for the questionnaire list

1	**2**	**3**	**4**	**5**
Strongly Disagree	**Disagree**	**Neither Disagree nor Agree**	**Agree**	**Strongly Agree**

Note that all axes of the questionnaire are at the (0.05) level, as the probability value is less than (0.05), and the reliability of the questionnaire for all its axes reached (**Cronbach's alpha)** to measure the reliability of the questionnaire (0.758) and the honesty coefficient (0.848), which is a high-reliability coefficient. , while ranging Validity coefficients range between (0.83 - 0.854), which indicates that the questionnaire enjoys reliability and validity.

Statistical methods are used considering the normal distribution of data to conduct statistical tests Suitable for analyzing study data, by analyzing statistical treatments using a program SPSS, by calculating percentages, frequencies, and arithmetic averages for testing Hypotheses statistically, in addition to conducting a T test.

Testing the study hypotheses:

Testing the first research hypothesis:

First hypothesis

Null: H0: There is no statistically significant effect of financial technology on the development of financial and banking services.

First hypothesis

- Null: H1 There is a statistically significant effect of financial technology on the development of financial and banking services.

The second null hypothesis:

H0: There is no statistically significant positive effect of financial technology on the financial inclusion process.

The second alternative hypothesis:

H1: There is a statistically significant positive effect of financial technology on the financial inclusion process.

Descriptive statistics for research variables:

In this part, a descriptive analysis of the study's axes will be carried out by extracting measures of central tendency and measures of dispersion. The following table shows a set of descriptive statistics for the study variables the four are as follows

Table (5) Descriptive statistics for study variables

Research variables	**Arithmetic mean**	**Mean**	**Standard deviation**	**variance**
The impact of financial technology on the development of financial and banking services	**4.15**	**4.04**	**0.582**	**0.336**
A statistically significant positive impact of financial technology on the financial inclusion process	**4.05**	**3.37**	**0.858**	**0.732**

It is clear from the previous table that the impact of financial technology on the development of financial and banking services It obtained the highest mean value (4.15), followed by a statistically significant effect of technology Finance has a positive impact on the financial inclusion process with a value of (4.05),

The first variable of the impact of financial technology on the development of financial and banking services obtained the lowest standard deviation (0.582) and the lowest variance value (0.336), which means that the opinions of the respondents regarding this axis are very similar, and they do not vary and differ in the same proportion as their opinions on the other variable This confirms the validity of the questionnaire.

Thus, the researcher has confirmed the validity and stability of the study tool, in addition to the validity of the normal distribution of the study data, as well as setting the study hypotheses, whether null or alternative, in addition to extracting descriptive statistics for the axes of the survey list, which makes the researcher confident in the validity of the questionnaire and its suitability to analyze the results and answer questions. The study and testing of its hypotheses will be discussed in the next part of the study.

Research hypotheses:

Testing the null hypothesis,

The first hypothesis: There is a statistically significant effect of financial technology on the development of services Financial and banking, as in Table (6), a table of means, deviations, and relative weights

It is clear from Table (6) and the results of the Independent Samples **T-test** for the hypothesis The first is the significant difference between the average opinions of the research sample of (120) categories, and the presence There is a statistically significant impact of financial technology on the development of financial and banking services, reaching The significance level is (0.00), which is less than (0.05). Accordingly, the first null hypothesis is rejected and the hypothesis in its alternative form is accepted (there is a statistically significant effect of financial technology on the development of Financial and banking services.

The results of the tests (I.S.T Test) show a significant difference between the average opinions of the two categories of the research sample, in the order of the questions received (3, 5, 4, 1, 2, 6, 7), and a significance of (0.000). All the answers of the research sample indicated the possibility of adopting methods of financial technology; it is Innovative methods that improve traditional banking services

Table (6) Mean and deviations

t	Type of question	Arithmetic mean	Standard deviation	Ranking	Test results	
					%	**Test**
1	We have sufficient knowledge of the approved financial technology methods in providing banking services.	4.06	0.76	4	0.00	significant

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2	FinTech adoption requires specific frameworks of oversight and oversight	3.94	1.16	5	0.00	significant
3	There are risks associated with adopting financial technology that depend on the nature of the service provided.	4.19	1.20	1	0.00	significant
4	The use of financial technology enhances customer confidence in the bank or company and improves the services provided	4.13	0.83	2	0.00	significant
5	Institutional and knowledge resources foster the shift toward financial technology	4.16	1.05	2	0.00	significant
6	Accustomed to financial technology stimulates the innovative spirit of employees and creates new value for the bank	4.05	0.72	6	0.00	significant
7	Banks/companies leverage financial technology to improve their traditional services and create new ones.	4.12	1.04	7	0.00	significant

Testing the second null hypothesis:

There is a statistically significant positive impact of financial technology on the financial inclusion process. Table (7) shows the descriptive statistics to test the second research hypothesis regarding the presence of a statistically significant positive impact of financial technology on the financial inclusion process.

Table (7) Descriptive statistics of the opinions of the research sample

t	Type of question	Arithmetic mean	Standard deviation	Ranking	Test results	
					%	**Test**
1	The bank/company has a strategy based on financial technology to ensure services and achieve financial inclusion	2.01	0.56	6	0.00	significant
2	We have a good infrastructure of technological methods and knowledge capabilities to transform from the traditional to the electronic form	4.00	1	1	0.00	significant
3	There are development opportunities that we offer to shift from manual services to electronic services	4.19	1.20	3	0.00	significant
4	We seek to reduce overall costs, which is reflected in the prices of electronic financial services	4.16	1.06	2	0.00	significant

5	The bank/company is interested in providing flexibility in times of obtaining financial services.	4.11	0.81	5	0.00	significant
6	The management seeks to perform all functions and activities more efficiently to facilitate access to financial services.	4	1.00	3	0.00	significant
7	The bank/company develops work procedures and reduces unnecessary steps and stages to provide electronic financial services at the lowest possible cost.	3.94	1.16	4	0.00	significant

It is clear from the data in Table (7) that the results of the independent samples T-test The second hypothesis has a significant difference between the average opinions of the research sample regarding the presence of a statistically significant positive impact of financial technology on the financial inclusion process. Accordingly, the null hypothesis is rejected and the hypothesis is accepted in its alternative form that there is a statistically significant positive impact of financial technology on the financial inclusion process, as the results of the T-Test showed a significant difference between the average opinions of the research sample; The arithmetic averages of the research sample's answers change to their agreement about the positive contribution of financial technology to the financial inclusion process.

RESULTS, RECOMMENDATIONS, AND FUTURE DIRECTIONS FOR RESEARCH:

Conclusion

Based on the presentation and analysis of the main themes that achieve the research objectives, the reality of financial technology in Egypt was reviewed, and the results showed that this technology has become an inevitable necessity in the development of financial services in banks and emerging companies, which prompted all these banks and companies to confront these challenges by developing their infrastructure The Egyptian state also seeks to encourage innovation and support emerging companies that provide these financial technologies

Theoretical results:

1. Financial technology depends on digitization or digital transformation in comprehensive data services and the information provided, to provide financial services available to all segments of society via electronic programs and applications; To facilitate access to financial services at any time In the fastest possible way and at the lowest cost.

2. Financial technology has risks associated with its application that affect its effectiveness, so precaution must be taken These risks are mitigated through strict regulatory procedures.

3. Digitization and digital transformation toward financial technology help integrate banking operations It contributes to providing more quality banking services.

4. Financial technology works to improve and develop the economic work environment by providing Innovative tools of digital financial services, increasing the funds available for lending, and through Lending platforms that help finance small and medium enterprises.

Field study results:

1. From the results of testing the first hypothesis, the significance of the difference between the average opinions of the research sample becomes clear regarding the existence of a statistically significant impact of financial technology on the development of financial and banking services, The significance level reached (0.00), which is less than (0.05), accordingly, the first null hypothesis is rejected accepting the hypothesis in its alternative form that there is a statistically significant effect of financial technology on

The development of financial and banking services, as all the answers of the research sample indicated the possibility of adopting Financial technology methods are innovative methods that improve the traditional services of banks.

2. From the results of testing the second hypothesis, the significance of the difference between the average opinions of the research sample becomes clear There is a statistically significant positive impact of financial technology on the inclusion process Financial. Accordingly, the null hypothesis was rejected, and the hypothesis was accepted in its alternative form that there was a significant effect Statistics on financial technology has a positive impact on the financial inclusion process and the opinions of the research sample. Where the arithmetic averages of the research sample's answers change to their agreement about the contribution financial technology has a positive impact on the financial inclusion process

Recommendation

Many recommendations for future research are included, the researcher proposes a set of recommendations that, when applied, will help identify the importance of financial technology in improving the speed and effectiveness of financial services, and highlight the importance of financial technology in increasing the transparency of financial services and achieving financial and banking justice, which are:

1. More regulations and legislation must be put in place to regulate and ensure this type of innovation Protecting consumers and investors and limiting the risks that the state may face in this regard, as these laws must be flexible enough to meet the needs of the market, especially since technology is constantly changing, and at the same time ensure that these technologies are not exploited in illegal ways

2. Digital transformation is greater and deeper, reaching remote and rural areas.

3. Financial technology is considered a promising and fertile research field for many future studies, as researchers and graduate students should be encouraged to explore and increase research work on this topic.

4. Maximizing the benefit of companies, banks, and organizations from the advantages of financial technology, and directing

5. Financial information flows to advance the financial technology system.

Future research Recommendation directions:

1. Enhancing GDP growth because of quality financial technology services.

2. The impact of digital finance on new technologies on the financial services industry. The impact of non-banking financial institutions such as insurance companies and finance companies, and the increased competition between them and banks, as they began to provide financial services like those provided by banks,

3. Increasing customer acceptance of technology-enabled financial services thanks to its positive impact.

4. Study the applications of financial technology and its impact on improving the accuracy of information for the decision-making process Investment decisions.

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