

Fintech Security Challenges in the Financial Services Industry: A Systematic Literature Review (2018-2022)

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Abstract: Over the past year, financial technology (Fintech) has attracted more and more attention to practice and research. The emergence of financial technology is one of the major modifications to the financial environment caused by technical breakthroughs and the global financial crisis. Studies of financial technology have recently expanded into a number of areas, to the practical side. In addition to helping the Financial Services Industry enhance security, a clear understanding of uses of the fintech ecosystem will be instrumental in developing the most popular and secure fintech application. In order to identify topics for the financial technology research agenda, this study will conduct extensive examination, through conducting Systematic Literature Review, the aim is to reveal the security challenges topics of Fintech during 2018-2022, for future agenda.

Keywords: Fintech, Banking, Innovation, Security.

1 Introduction

Today banks face a challenge to cope with the increased competition in the banking industry, therefore, looking for opportunities and grasping them is a necessity. On the other hand, innovation has become a requirement in the banking sector these days, due to economic growth all over the world. The development of the 21st century does not fail to amaze us. In fact, its momentum is moving so quickly that we must give up any pretense of keeping up with the most recent technological developments. This astonishment manifests itself in finance more than it does everywhere else because of how widespread it is. It must be made clear that we no longer refer to finance as finance but rather as fintech. [1]

Fintech technology has revolutionized the way financial services are delivered. It has enabled companies to innovate and create new products and services that can be accessed through the internet of things. Fintech technology has also enabled businesses to streamline their processes, reduce costs, and increase customer satisfaction. By leveraging the power of advanced analytics, machine learning, artificial intelligence, and blockchain technologies, fintech companies can provide better customer experiences and more efficient services. Fintech technology is constantly evolving, with new innovations being developed every day. Fintech allows users to securely send and receive financial information over the internet, while also providing real-time insights into their finances. This has enabled businesses to better understand customer behavior and develop more tailored products and services. The rise of fintech technology has created a wealth of opportunities for businesses to innovate and create new products and services that can benefit both consumers and businesses alike.

Fintech innovations like mobile banking and peer-to-peer transactions provide the consumer with greater access to financial tools and services using the latest technology. These innovative technologies make financial services more convenient but come with the inherent risks involved in digital operations such as cyber security issues. There is a lack of knowledge and awareness regarding this technology which has increased fraudulent activities and scams [22]. Security issues are inherent in online operations and the digital platform. These issues became even more critical in the banking system which mainly operates on confidential data and financial transactions [3]. There has been a change in consumer behavior and perspective regarding the digital services that have been provided to the public. This has increased the relevance of this technology in the banking sector along with a lack of awareness of the innovative application and technology has led to an increase in fraudulent activities and the scale of damage due to cybersecurity attacks [4]. A clear understanding of the secure uses in the fintech system would not only help the bank to improve its security but also be helpful to develop a more celebrated and secure fintech application [5]. This would help to mitigate the risk of digital technology for both the consumer and the banking sector. There is a lack of literature on a concrete and systematic review

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of the current state of the challenges faced by the banking sector when it comes to fintech innovation in Islamic banking.

In the past decade, fintech technology has revolutionized the financial industry. As a result, it is important to review the literature related to this new technology and its implications for innovation. This review will discuss the current state of fintech technology, its potential impacts on innovation, and recommend further research in this area. It will also provide an overview of existing literature that examines these topics in order to inform future research directions.

2 Literature Review

2.1 Definition of Fintech

The term "fintech" refers to a technological breakthrough in financial services as well as changes in consumer expectations. Fintech companies use technology to provide their clients with the best financial solutions with the goal of digitizing the financial sector to reduce costs and create new working methods that will increase market transparency [6].

The fintech ecosystem consists of a number of components with a range of services and business models. Fintech startups, business investors, regulators, banks, strategy and technology consultants, corporates, academic institutions, industry associations, and incubators and accelerators make up the fintech ecosystem. Payment, wealth management, crowdfunding, peer-to-peer (P2P) lending, capital market, and insurance (insurtech) business models are additional examples of fintech business models. Studies on fintech have increased in recent years from various fields or focus, in line with the practical side. Review papers on fintech and understanding the potential of the fintech services in literature remains crucial in relation to the expanding fintech ecosystem, business models, and practices, particularly to assess and map the motivations of customers choosing fintech services, as shown in (Figure 1).

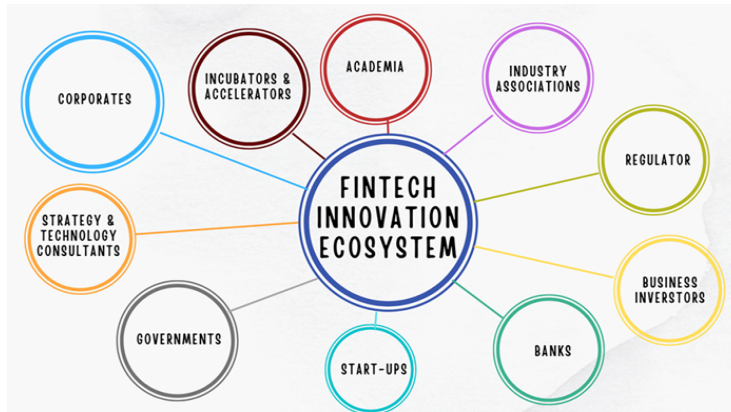


Fig. 1: Fintech Ecosystem

(Bahrain Fintech Bay Report, 2022)

2.2 Fintech Growth Factors

Technology advancements, innovation spirals, shifting consumer needs, and changes in the macroeconomic and financial landscape have all contributed to the expansion of the fintech industry. Better solutions and capabilities that influence customer behavior and expectations are at the heart of the evolving payments landscape, which is at the center of a significant industry transition. Businesses, especially startups, are using technical and payment system advancements including cloud-based solutions and application programming interfaces (APIs) to construct and modify their operations more effectively. The start-up industry has benefited from new cloud and API technologies, which have helped to upend established firms and hasten development. The widespread use of mobile devices has sped up the adoption of mobile financial services like payments and banking.

The development of mobile payment systems, online brokerage, and banking products—all necessary to support the more mobile lifestyle that smartphones have enabled—have all benefited from the advancements in smartphone technology. The expansion of e-commerce, which is largely driven by consumer demand, has aided the transformation of digital payment methods and the transition to a post-cash economy. The ease-of-use, convenience, and speed are valued by those tech-savvy customers who engage in online banking and shopping, which has encouraged businesses to adopt financial technology [7].

2.3 The World's Effect of Fintech

The banking sector and financial markets have seen the effects that were anticipated by fintech's. Processes have been

heavily digitalized, which has decreased transaction costs and improved end-user convenience. In particular, billions of people now have access to the internet and mobile devices, which has enabled a drop in transaction costs brought about by cutting-edge communications technology. In contrast to conventional middlemen, fintech's now provide clients with goods and services that are considerably more in accordance with their needs. Fintech companies are better equipped to deliver goods and services at reduced prices by minimizing the involvement of middlemen and enhancing operational efficiencies, increasing returns for customers [8]. Conventional financial intermediaries are under pressure to provide solutions that will satisfy customers' expanding requirements as a result of this decline in transaction costs [9]. The vertical integration of financial intermediaries and fintech companies may be a result of this shifting market structure. Additionally, the financial inclusion of the disadvantaged population and business sector, particularly in developing nations, has been impacted by the decline in transaction costs [8]. 45 percent of adults lack access to a financial account at a bank or other financial institution, according to [10].

2.4 Impact of Fintech

Fintech is thought to have a broad and long-lasting impact on the entire sector due to its innovation and capacity to disrupt the financial services industry [11] as shown in Figure 2. [12]. No sector of the industry will be spared, predicts the industry [13,14]. The Fintech genie is out of the bottle. According to research from the sector, investments in Fintech companies increased by 75% in 2015 to USD 22.3 billion over the prior year [15]. More than USD 50 billion has been spent in all.

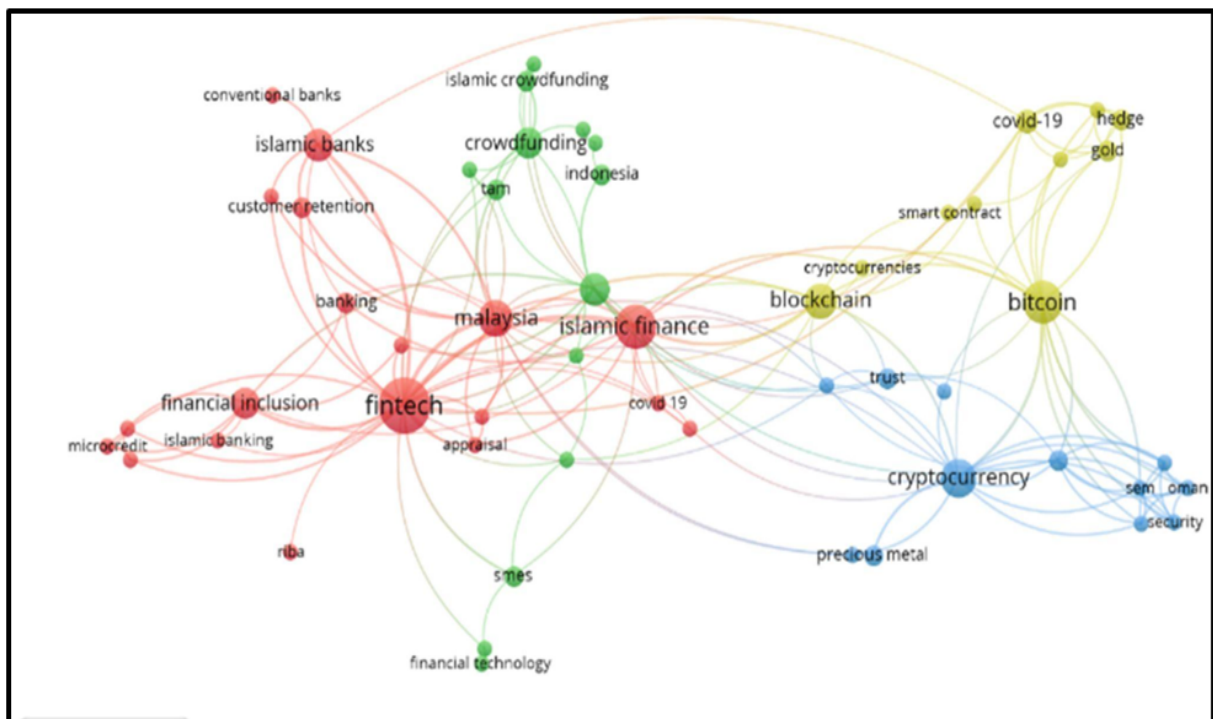


Fig. 2: Direction of fintech application in future
(Source: Alshater, Saba, Supriani & Rabbani, 2022)

The covid-19 had a major impact on financial services and operations of the banking sector, including Islamic banks. There has been an increase in the usage of fintech services among consumers to prevent major disruption in financial operations. The fintech services have played a critical role in the continuation of the operations of financial services [16]. The fintech innovation like mobile banking and peer-to-peer connection can be integrated into different platforms. The inherent security of this system is built to mitigate security issues however the inclusion of different platforms increases the security risk. These risks may result in a more complex operation that could loosen the financial integrity of the banking system [17].

2.5 Fintech Innovation in Financial Services Industry

Financial technology (Fintech) has been a major driver of innovation in the financial services industry. With the advent of new technologies, such as blockchain and artificial intelligence, fintech companies are able to offer more efficient and cost-effective solutions for their customers. As a result, fintech is transforming the way people interact with their finances and how they access financial products and services. Innovation has been at the heart of this transformation. Fintech

companies have made it easier for customers to access financial products and services by leveraging new technologies such as big data analytics, machine learning, cloud computing, mobile applications, and blockchain. These technologies have enabled fintech companies to develop innovative solutions that are faster, cheaper, and more secure than traditional banking systems. Consequently, customers can now manage their finances in a much more convenient manner.

Fintech has the ability to significantly alter financial services and financial inclusion environment. By lowering prices and enhancing access to financial services for the underserved, people in low-income groups, Fintech businesses may assist enhance competition and play a significant role in promoting financial inclusion. Smaller businesses without a track record of financial stability or credit history are now finally receiving the funding they deserve thanks to the introduction of creative alternative lending platforms Fintech innovation in banks. The elimination of fintech helps to increase the convenience for people in financial translation. However, this comes at a price which is an increase in security risk for the people and organization [18].

There is a constant increase in cyber-attacks and fraudulent activities that can employ innovative methods and techniques. This helps to cheat the consumer and shed light on the negative side of fintech innovation. Despite the boost to the economy and optimization of financial operations, fintech innovation is a critical risk for the financial operation of a country. Any lapse in the digital framework and pipeline of digital transition using the fintech invasion could result in complete disruption of the country and a serious blow to the organization. However, the implementation of Fintech technologies like blockchain can be helpful to increase the level of security and anonymity in financial operations. [19].

Fintech technology is the innovative use of technology to provide financial services. It is a fast-growing sector that has revolutionized the way we access and manage our finances. Fintech solutions are used for everything from online banking to cryptocurrency trading, and they have enabled us to make financial transactions quickly, securely, and conveniently. By leveraging innovation, fintech technology has opened up new opportunities for individuals, businesses, and institutions alike. [20].

This could create challenges for the region such as the training of the employees to adapt to the new infrastructure and implement a more elaborate digital infrastructure along with strong security. Islamic banks have recently increased in the development and inclusion of fintech innovations such as the establishment of digital branchless banks. [17]. These along with other innovations such as internet banking help to improve the facilities provided by the banking sector (The concept of fintech innovation and its application in financial services and operations can be understood with the help of the figure below. Figure.3. [21]

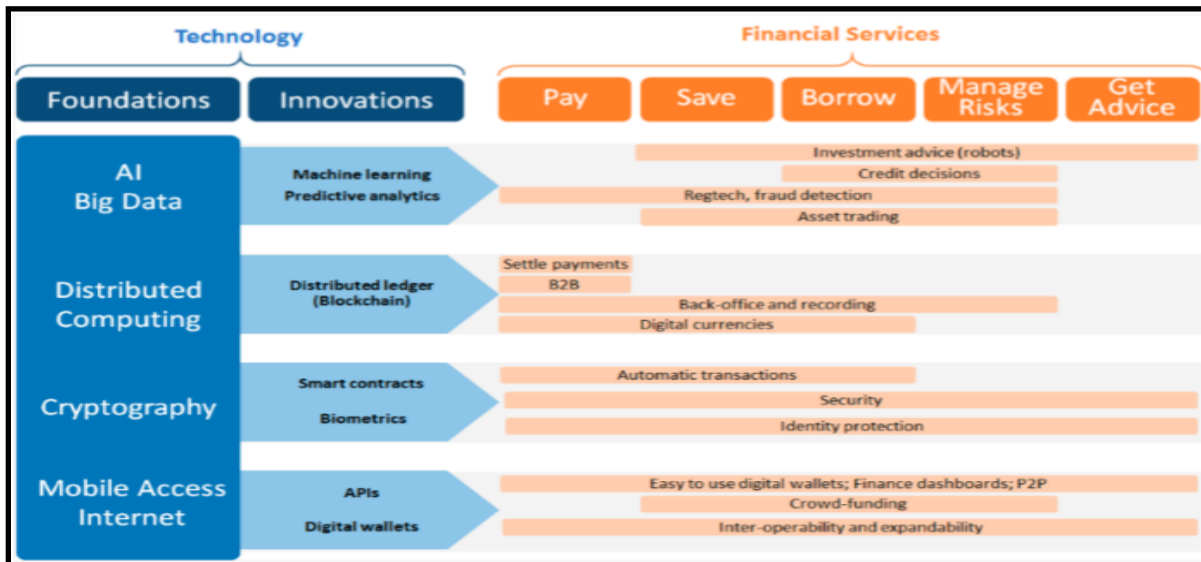


Fig. 3: Major technologies transforming financial services.

(Source: Gulrez, 2021)

3. Research Models used in Fintech

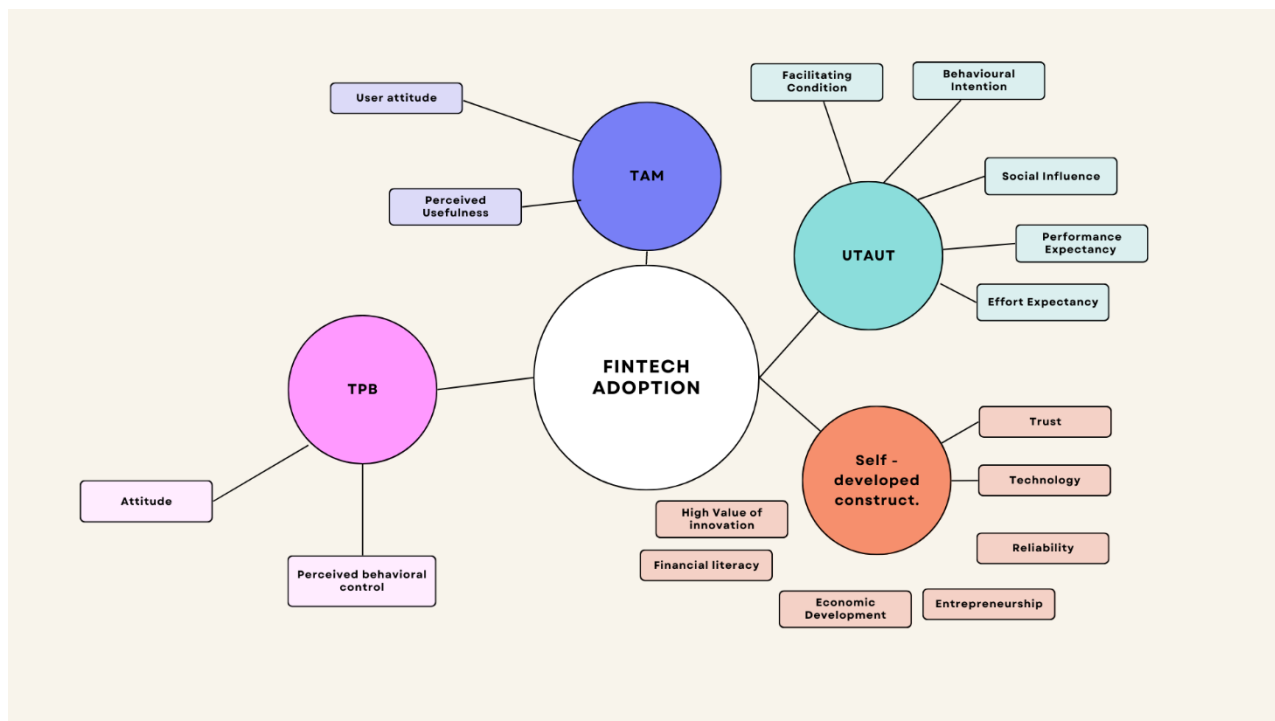


Fig. 4: Determinates of Fintech Innovation adoption in GCC

(Source: Authors)

3.1 TAM- Determinants

Most of the documents in our dataset are based on the Technology Acceptance Model, which can be used to understand the factors that influence the adoption of fintech (TAM). TAM is one of the theories that explain how people accept and use new technology. In our dataset, [22]'s found that consumer attitudes, mass media, and subjective interpersonal norms are the factors that positively influence the adoption of robo-advisors were found (one of the fintech business models). Their results concur with those of (Hasan et al. 2021), who found that customer adoption of mobile payments is influenced by perceived usefulness and ease of use.

3.2 UTAUT Determinants

The second-highest number of documents in our dataset use UTAUT as the foundation for their search. Performance expectancy, effort expectancy, social influence, Behavioral intentions, and facilitating conditions are the five factors that positively influence the adoption of Fintech. [24]

3.3 TPB Determinants

The Theory of Planned Behavior (TPB) model, which is the only one used in our dataset, reveals that the adoption of fintech services is significantly influenced by the customer's level of trust. According to this logic, customers must deal with risk and uncertainty when spending their money, making trust more important than any other factor. It is crucial for fintech companies to gain the trust of their clients and adhere to their commitments. Customers may leave the business and switch to other fintech companies if something goes wrong. However, using TPB as a research foundation reveals that perceived behavioral control and attitude are two key elements influencing cryptocurrency adoption. [18]

3.4 Self-developed construct

Our dataset also contains information on a number of factors that empirically influence the adoption of fintech in addition to some of the widely accepted and existing theories or models. For instance, one factor that influences customers to choose a fintech platform is trust, which is absent from any of the popular models mentioned above. According to some studies, the fact that fintech transactions are conducted entirely online without any face-to-face contact underscores how important trust is. Therefore, building customer trust should be a key component of a fintech company's strategy to succeed in the market, particularly in the highly competitive environment of today, where new players can enter the

market with relative ease and the business environment is susceptible to disruption. [18]

4. Research Methodology

To provide a transparent, reproducible secondary data analysis using a systematic literature review has been employed for this paper to conduct an in-depth analysis of fintech innovation and develop a better understanding of determinants of Fintech adoption and the security risk in GCC. The different aspects of the methodology that has been employed for this study will be discussed below. The overall methodological approach includes the following steps:

1. Identify the need for the review, prepare a proposal for the review, and develop the review protocol.
2. Identify the research, select the studies, assess the quality, take notes and extract data, and synthesize the data.
3. Report the results of the review.

4.1. Research design

The descriptive research design has been employed for this research to help in the discussion of the concept for a better understanding of the determinants of adoption in fintech innovation and security issues and challenges that are faced by the GCC in the upgradation and implementation of these innovative technologies. This design helps to analyze the arable more efficiently with the help of a descriptive design. The observation that has been identified using the descriptive design could be more effectively analyzed using this method.

4.2. Locating studies

A systematic literature search was carried out in October 2022 without timeframe restrictions and the results were subsequently updated in November 2022. This research paper has mainly focused on the use of keywords as the fundamental strategy for the selection and identification of suitable papers. Scopus was used as the main scientific database in which the terms ranging from “determinants of adopting in fintech innovation” was searched in all articles’ titles. Further, “the security and challenges faced by the big select in GCC” have also been employed to gather more relevant data. This is followed by a more elaborate selection process, which helps to filter the journal articles and research papers that have been identified.

4.3. Study selection and evaluation

The systematic literature review of the framework developed by [10]. This approach helps us in creating an organized and systematic process for our research. The process of conducting the Systematic literature review includes 4 stages: The Identification stage, the screening, the third stage illegibility, and last inclusion. **Fig. 4.**

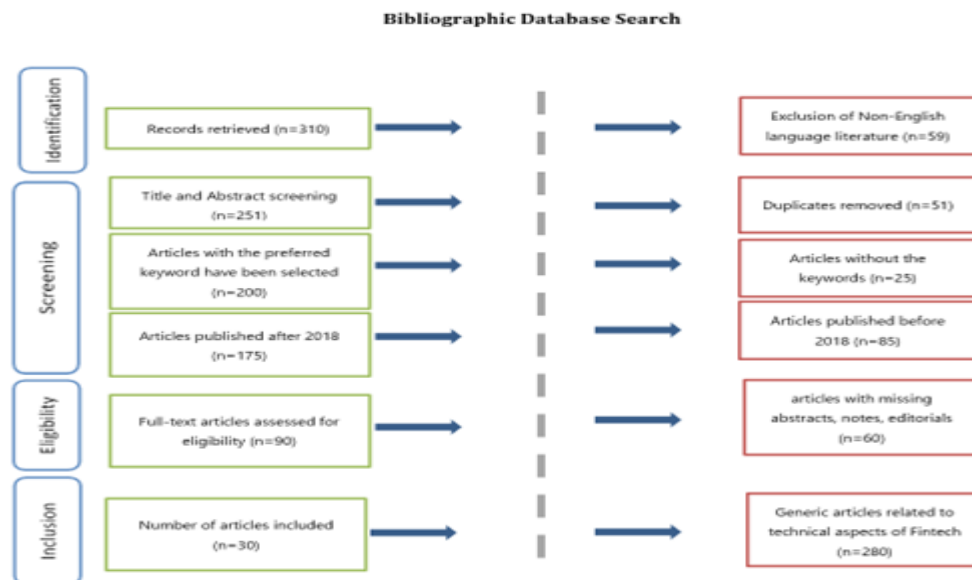


Fig. 5: Flowchart of the search strategy

(Source: Authors)

Table 1: Inclusion exclusion criteria

<i>Selection criteria</i>	<i>Scientific database</i>
<i>Inclusion</i>	The articles that have been published after 2018 have been included in this research
	Peer-reviewed articles have been a preference
	Articles that have full-text pdf have been included
	Articles with the preferred keyword have been selected
<i>Exclusion</i>	Articles that have been published before 2018
	Articles that have not yet been published have been excluded
	Articles that do not have full text have not been included
	Articles without the keywords have been excluded
	Non-English articles, articles with missing abstracts, notes, editorials
	Generic articles related to technical aspects of Fintech

(Source: Self-created)

4.4. Analysis and synthesis

The search outcome of this search has been positive because of the collection of enough articles to conduct an accurate analysis of determinants of adopting fintech innovation, and the challenges and issues faced in the region of GCC. There has been an increase in the application of fintech technology, especially in the banking sector which has resulted in the publication of enough articles for the conduction of this systematic literature review. Further 310 articles have been called among which 30 articles have been selected for this research.

The thematic analysis has been employed in the research to conduct a more simple and systematic analysis of the adoption determinants and security challenges in the region of GCC. This has been helpful to optimize the process of analysis and inching closer to the objectives of the research.

5. Descriptive analysis

The study analyzed 30 research papers that have been published in 2018 or after. The descriptive analysis helps to analyze the current research trends in fintech technology and security issues faced by customers and organizations. There has been an increase in the documentation and publication of papers regarding fintech, especially during the year 2020. This provides deep insight into the trends in the research and study that have been conducted in the field of fintech. These range from the probable application of fintech to the challenges and issues faced in the development and execution of this technology in the Islamic banking sector. However, there has been a decline in the citations well as documentation in the field of fintech in Islamic banks. Thus, there is a need for an in-depth analysis of recent literature to get an insight into the recent development as well as to identify the bottleneck in the direction of the research and study.

These articles discuss and dwell into a range of issues faced by the development of the implementation of fintech in banks such as security issues. There are also risks in fintech innovation like blockchain and cryptocurrencies such as regulatory uses and other issues like consumer behavior and employee training as well the cost of the development and integration of this technology. This will be discussed and analyzed in more detail below.

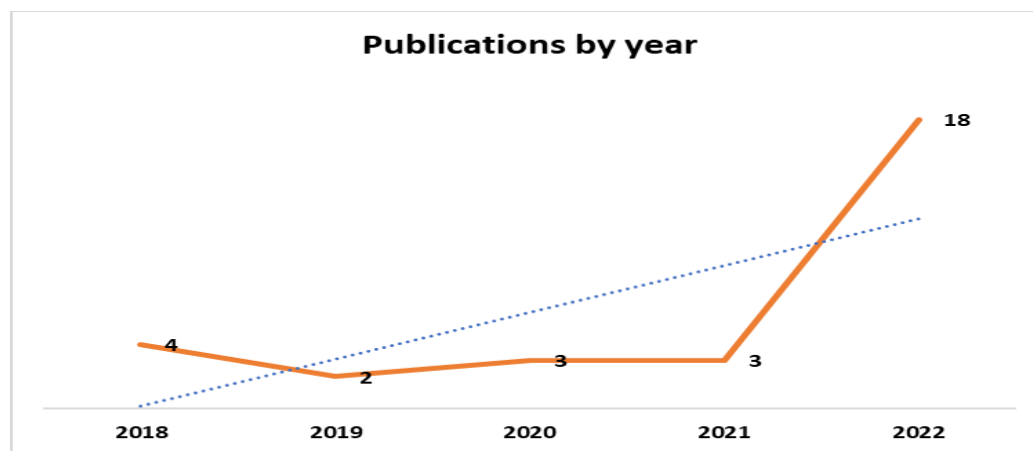


Fig. 6: year-wise analysis

(Source: Authors)

A year-wise analysis of the selected papers is illustrated in Figure 6. It is worth noting that during 2022 the number of publications has skyrocketed. This upward trend highlights the emerging and growing nature of Fintech in Islamic banks and the growing academic interest.

6. Fintech Innovation topics

The security challenges faced by Financial Services industry due to fintech innovations shown in Figure 7 are as follows:

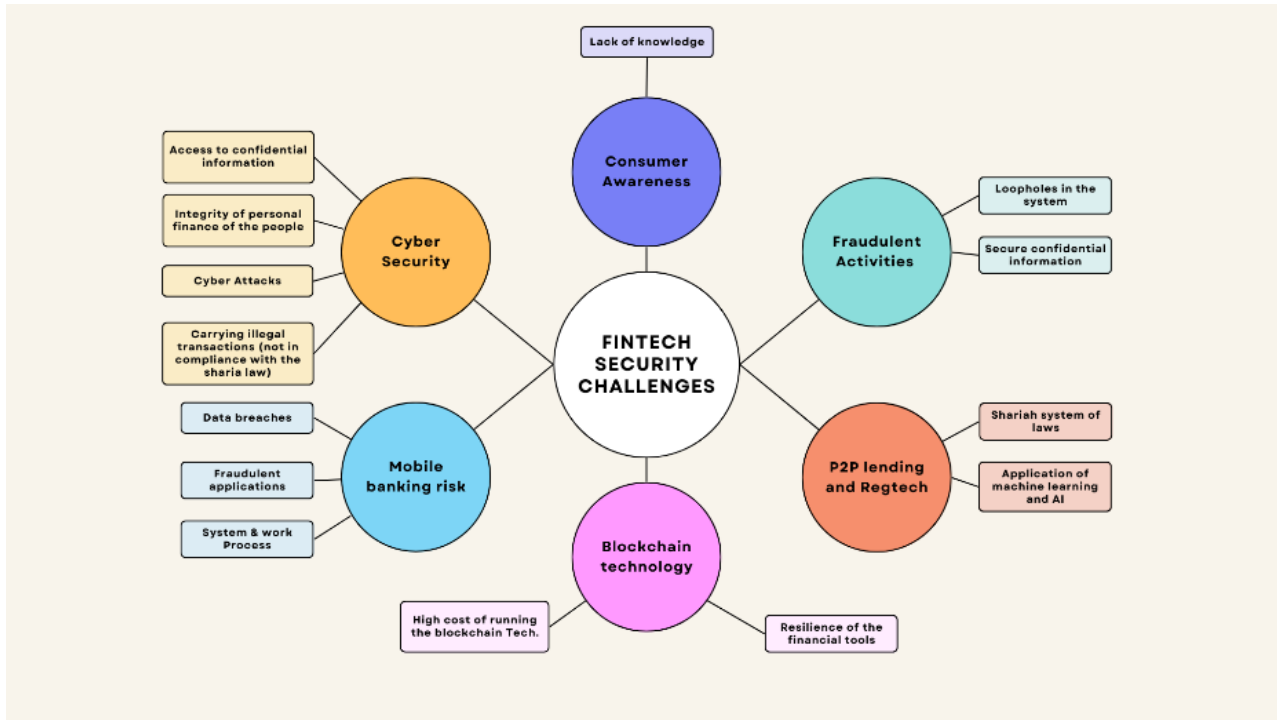


Fig. 7: Fintech Topics

(Source: Authors)

6.1. Cyber Security

Cyber security is a major issue that poses a threat to the integrity and security of the fintech innovation that has been implemented by Islamic banks. The use of fintech innovations like smart banking and mobile banking among others also poses major security issues for the organization. Methods like spoofing take advantage of the loopholes in the identification system of the banking system [16]. This might provide people with access to confidential information and data as well as the integrity of personal finance of the people. There is also the scope of other technological crimes like wiretapping and cyber-attacks into the digital framework of the banking system. There can also be other security threats that can be encrypted on carrying illegal transactions which are not in compliance with sharia law [25]. These security issues may result in transactions that are beyond the accountability of Islamic banks. Further, it is also difficult to check the identity or background of the people or organization when carrying out quick transaction using a mobile application or mobile banking which may result in transaction exchange between people that have not researched well Islamic banks [3]. There is also high scope for digital disruption in the banking sector as well as a rise in tech innovation in the GCC which makes it difficult to develop a well-knit and secure universal banking system with the integration of different innovative technology. This also raises security risk and makes the system more prone to security attacks [26].

6.2. Mobile banking risk

The diverse range of mobile devices with their range of security makes it difficult to develop a more elaborate system that encompasses the security of these devices and secures the finance of the consumer and the bank [27]. There is also an increased risk of data breaches as well as fraudulent applications to trick people [23]. Also, the mobile application and mobile banking may be complicated for some people, which would make it difficult to understand the system and work process.

6.3. Blockchain technology

Blockchain technology is a bleeding-edge technology that is still in development to increase its application and lower the cost of operations for the integration of blockchain into the system [28]. This increases the security of the system, which could benefit the Islamic banks in the GCC. However, this technology comes with its own set of challenges. This could be helpful to increase the resilience of the financial tools and operations [29]. However, the main drawback of blockchain technology is the high cost of running and the trail of carbon footprint left behind by it. This provides a high level of security and anonymity to the transaction as well as the scope of ease in the scalability of operations.

6.4. P2P lending and Regtech

CP2P and regulatory technology (Regulatory) are also leading fintech innovation that also provides challenges to Islamic banks. This makes it difficult to implement the shariah system of laws that has been weaved into the solid of the Islamic banks into the fintech innovations [30]. Thus, it causes major security challenges to the authority of the Islamic banks in the GCC. Regulatory requires the application of machine learning and AI to analyze the large quality of secure and confidential data to carry out regulatory action which is automated using it. P2P technology makes it easier for people to interact with each other in the financial sector for offering and borrowing amounts [31]. This increases the scope of fraudulent and criminal activities and reduces accountability without the supervision of Islamic banks in the GCC.

6.5. Fraudulent Activities and Consumer Awareness

One of the major security issues that have been identified in the implementation and execution of fintech innovation in the banking system is the human element. The criminal and fraudster continuously work to identify the loopholes in the system for illegal access to the confidential information of the user which can now be more easily used to carry out transactions that may cause loss to the consumer [21]. These align with the lack of awareness among the people regarding the different elements of fintech innovation like the lack of knowledge treating the consequences of sarong OTP with a stranger. This causes major security risks to the Islamic banking system in the GCC too. The convenience provided by fintech innovation sometimes makes it easy to carry out scams within a short period to reduce the time given to the consumer to think about the consequences of their action [32].

7. Conclusion and Future studies

The results of this study show that a number of potential topics in the fintech services have been described in this paper. This SLR-based study also reveals that some studies used self-developed constructs and discovered a number of significant factors influencing fintech adoption, including trust. Fintech businesses must gain customer trust in order to maintain a long-term relationship with their customers. One of the keys to establishing a long-term relationship with customers is earning their trust. Customers interact virtually with fintech companies and demand a high level of platform trust as a result.

In addition, it can be concluded from the above discussion that Fintech innovation causes serious security challenges in the implementation when it comes to the banking system. Despite the strong need for elaborate implementation of innovative technology like Regulatory technology blockchain mobile banking and digital translation using frameworks like the UPI, there are some inherent security issues in the system.

Cyber security issues like cyber-attacks and wiretapping and spoofing are a range of threats to the security of the financial system. These are a constant threat to security and despite the development of technology, there will be a constant threat of cyber security to the digital system using fintech innovation. However, rises could be mitigated by constant improvement in the secret of the system. Technology like blockchain technology may be helpful to improve the security of the system but it also requires more research to improve efficiency and reduce the drawbacks of this system. Figure 6 can help to understand the future scope and direction of the study on fintech innovation in the banking sector and the interconnectedness between the different fintech innovations.

The future of fintech technology is bright and full of innovation. With the advancement of technology, more and more companies are investing in fintech products and services to make their operations easier and more efficient. This has led to an increased demand for innovative solutions that can help financial institutions better manage their operations and provide better customer service. As a result, we can expect to see a lot of new technologies being developed in the near future that will revolutionize the way financial services are provided. From artificial intelligence-enabled chatbots to blockchain-based payments, there is no limit to what fintech technology can do for businesses in the future.

Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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