



ROLE OF FINTECH APPLICATIONS IN ENHANCING DIGITAL TRANSFORMATION OF SAUDI TRADITIONAL BANKS

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ABSTRACT

This paper aimed at a systematic review of the role of FinTech in enhancing the digital transformation of Saudi Arabian banks. Google Scholar was searched with related search terms to finally select 28 papers using the PRISMA process of screening and selection. There were very few papers directly dealing with the use of FinTech as a tool for digital transformation in banks, not specifically in traditional banks. There were a few papers on digital tools used in FinTech. Overall, the digital transformation of any kind of bank using FinTech tools had been slow and a small percentage of the total. The situation was worse in the case of Saudi banks despite the large amounts of budgetary allocations for technologies in banking as a part of its Vision 2030. This was because of the late entry of Saudi Arabia into these concepts. The need for Islamic banks to follow Sharia rules was not found to be a great problem. All these points indicate to the need for greater acceleration of using FinTech tools for the digital transformation of Saudi traditional banks. Some limitations of this review are the low rigour of the available papers due to methodological limitations, discussion papers without empirical data dominating and a wide range of aims provided in the papers. The need for substantially more work on Saudi banks has been highlighted. The validity of the conclusions from this review needs to be verified using empirical research.



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1. INTRODUCTION

Many basic aspects of FinTech have been described in Columbia-Engineering (2022). FinTech (financial technology) is a term referring to software, mobile applications, and other technologies created to improve and automate traditional forms of finance for businesses and consumers. In FinTech, technology can be used to alter, improve, or automate financial services for

businesses or consumers. Mobile banking, internet payment services, portfolio management applications, and trading platforms are some examples of FinTech services.

FinTech started with the credit cards of the 1950s when no technology was applied to them. Gradually, it permeated various financial institutions serving various

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customers. PayPal, established in 1998, is probably the first technology-enabled FinTech service.

FinTech is a multidimensional concept. However, it simplifies financial transactions making it easy to access and affordable. Many companies use AI, big data analytics and blockchain technology to simplify the transaction processes in a highly secure environment. Transactions are simplified by avoiding unnecessary steps and electronic technology for speed.

Some FinTech trends of 2022 were a projected compounded annual growth rate of 11.6% by 2026 in global digital banking; increasing use of blockchain technology, although there are regulatory hurdles to it in many countries; and increasing use of AI and machine learning for more efficient services, to reduce operation costs, detect fraud and increase customer value. These technologies facilitate the digital transformation of FinTech companies.

In this systematic review, we consider the role of FinTech in the digital transformation of Saudi traditional banks. According to Albarrak and Alokley (2021) the traditional Saudi banks are cautious. They are entering the FinTech sector slowly. The first traditional bank to offer FinTech services was Gulf International Bank with Meem Bank, which went digital in 2015. With two more banks licensed, the total number of traditional banks offering FinTech services is

only three. This indicates a hesitation of the banks for digital transformation. Adoption of FinTech could have accelerated digital transformation to offer more FinTech services in turn.

2. METHODOLOGY

Google Scholar was searched using search terms, ‘digital transformation’, ‘FinTech’, ‘traditional banks’ and ‘Saudi Arabia’. Only papers in English were selected. Abstracts were included if they contained any relevant information. The papers identified in the above manner were screened and selected through the PRISMA process to yield 28 papers finally for this review. The PRISMA flow diagram for this review is given in Figure 1.

Not many papers were available for traditional banks of Saudi, so papers on any Saudi bank were selected. Also, there were more papers on digital tools used in FinTech than FinTech as a tool of digital transformation. Both types were selected. Many papers were very general discussions without any empirical data. Since they contained some valuable points, they were also included.

Based on the above problems, the results are discussed in the following sections.

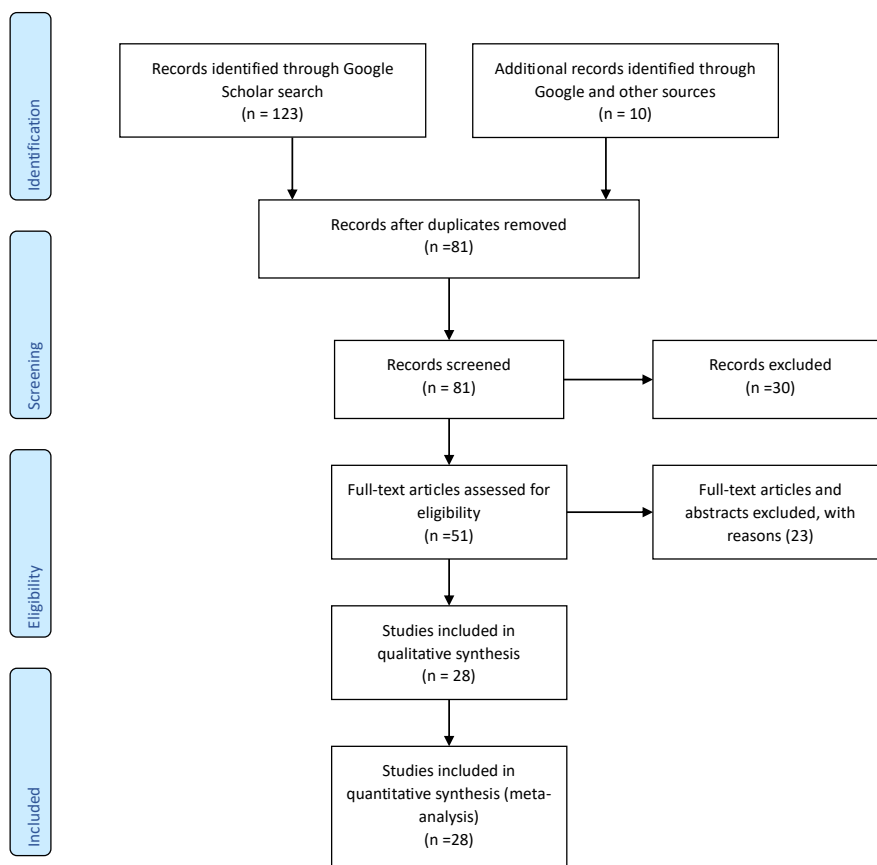


Figure 1. PRISMA flow

3. RESULTS AND DISCUSSION

3.1 FinTech as a tool for digital transformation

According to Abbas and Shaheen (2021) the adoption of FinTech technology in the banking sector has contributed to improved services to customers. Financial technology is being used by banks to move with the changing trends of the world, for which continuous implementation and innovation of technology are used for financial transactions.

In a study on customer awareness of cybersecurity in digitally transformed banking, Johri and Kumar (2023) observed that digital transformation enables FinTech transactions like mobile and internet banking. The need to provide FinTech services has quickened the digital transformation of Saudi banks.

How FinTech has helped banks' digital transformation was explained by Harris and Wonglimpiyarat (2023). The diffusion of FinTech-based innovations, with different levels of systemic characteristics, influenced the process of technology diffusion and this led to the digital transformation of banks has happened.

The relationship of FinTech with digital transformation was explained by Boratyńska (2019) using the theory of digital transformation, elements of ecosystems and corporate diplomacy elements. According to Karagiannaki, Vergados, and Fouska (2017) FinTech through, digital transformation technologies, is disrupting the FinTech ecosystems. This necessitates the transformation of business models from the traditional ones. Collaboration of banks with startups can accelerate the technological transformation of banks through innovative processes. FinTech's trust of the people can be combined with the agility of young startups. Traditional financial institutions have a tough time adjusting to these new developments. Digital transformation is the only way for them and the adoption of FinTech enables embracing technology as FinTech cannot be done without technology.

In a review, Takeda and Ito (2021) observed that research on FinTech was confined to studies done in Asian countries and the EU on new value added by new entrants to solve social issues of inclusion. Blockchain was the most researched technology.

3.2 RegTech and SupTech

Innovative changes through digital transformation have transformed FinTech institutions. Payment and payer service centres of FinTech firms function in virtual spaces in which non-banking FinTech firms operate. Innovations to offer products and services drive the digital transformation of banks and other financial institutions. Two types of information technologies exist in the FinTech sector. The first is RegTech (regulatory

technology), the technology of regulatory compliance on verification and protection of data, automation of reporting, risk management, and customer identification. The other is SupTech (supervisory technology), which automates and optimises various FinTech services (Manzhura, Pochenchuk, & Kraus, 2022).

Regulatory Technology (RegTech) leverages Information Technology and Digital Innovations to facilitate a bank's regulatory management. However, these technologies can be expensive and inefficient if deployed ad hoc and stand-alone. One option is to incorporate RegTech into the digital transformation strategy of a management function like the Treasury. Integrated adoption allows the deployment of the digital platform to support both strategic management activities and regulatory processes within Treasury, to align commercial objectives with prudential objectives (Von Solms, 2021).

3.3 Digital transformation technologies

Digital transformation usually involves AI, big data analytics, and machine learning. Blockchain is not included because it is not yet recognized in many countries. Financial services had always been early adopters of technology. Applications of mobile payments and financial advisory services are some examples of digital transactions. Financial services are predominantly run by traditional banks even now. Only certain areas of financial transactions are handled by FinTech but are rapidly spreading into other areas of transactions. One reason for the digital transformation of traditional banks is that competition from FinTech firms eats into the margins of traditional banks. The easiest way to digital transformation for traditional banks is to collaborate with private FinTech firms. Banks are now collaborating with FinTech startups. On the other hand, many global FinTech firms are collaborating in the reverse direction, i.e., payment services with the cooperation of banks. Digital platforms offer themselves as the single point of contact for consumers, banks, and providers of financial services. Collaboration of banks with FinTech startups confers many advantages to banks. Digital transformation and the choice of technologies like AI and Big Data reduce the cost to banks and improve the quality of the services provided. Technology also lowers the traditional barriers to entry in the credit and financial services markets. This encourages competition as FinTech firms are offering technology-intensive low-cost services already. Banks need to use technology more efficiently than just duplicate traditional activities, as they had been doing so far. They must replace traditional distribution channels with remote digital services. This may ultimately lead to no branches for banks in the long run (Panetta, 2018).

The term FinTech is applied to the combination of AI concepts and the continuously increasing volume, complexity, and variety of the data available with banks and processing these data for solutions and decisions on customer services. Five main areas provide improvements in business models for the banks. They are the introduction of specialized platforms, coverage of neglected customer segments, improvements in customer selection, reduction in operating costs, and optimisation of business processes. Business models and evaluation matrices have been developed for the assessment of the impact of these five factors (Voican, 2020).

The banking and Finance Industry (BFI) in Sri Lanka has been constantly evolving by transforming the entire BFI landscape by converging service delivery. This evolution is due to extended connectivity and increased speed of information processing using new business models and opportunities in BFI. The authors (Fairouz & Wickramasinghe, 2019) have presented a conceptual framework of digital transformation by BFI. External task environment, organizational innovativeness, technology factors and environmental factors lead to technology adoption for digital transformation. External task environment and organizational innovativeness are interrelated. The authors expect the digital transformation of BRI to be influenced by Big Data, IoT, robotics, cyber security, artificial intelligence Blockchain and cryptocurrency.

Considering chatbots as a digital transformation tool, Abdulquadri, Mogaji, Kieu, and Nguyen (2021) observed that many Nigerian banks already had chatbots to increase customer engagement and financial inclusion. It was most frequently used on the WhatsApp platform. Chatbots were often identified with the feminine gender. The chatbots were limited to responding at their pre-defined path. Although Nigeria is a multilingual country with English as the original language, chatbots did not use any of the Nigerian's local languages.

3.4 Regulations

Some regulations like the revised Payment Services Directive (PSD2) of Europe can accelerate the digital transformation of banks by forcing them to open consumer payment accounts for appropriately licensed, innovative service providers. This will require the development of Application Programming Interfaces (APIs) by banks (Cortet, Rijks, & Nijland, 2016).

3.5 Banks

Retail banks were leading in the technological revolution rapidly deploying innovation of digital services with a high degree of change and innovative breakthroughs to drastically change the conventional banking practice. The components of the digital

transformation of banks were identified by Krasnikolakis, Tsarbopoulos, and Eng (2020). The study results provide enough leads to banks on how exactly they should proceed with digital transformation.

FinTech innovation leads to digital transformation. Some examples of these provided by Rauniyar, Rauniyar, and Sah (2021) are most customers prefer to visit the bank only occasionally prompting the UK banks to introduce the first direct telephone and internet-based bank division in the UK. This was replaced by the internet later. In the mid-1960s, the UK bank licensed a PIN code system on the card, which enabled the creation of automated teller machine (ATM) machines. These financial innovations were the starting point of modern FinTech like mobile banking, internet banking, electronic commerce, high-frequency trading (HFT) etc.

The past, present and future of FinTech and banks were traced by Legowo, Subanidja, and Sorongan (2021) especially in Indonesia. FinTech development has been categorised into three periods of FinTech1.0 (1866-1967: analogue to digital transformation), FinTech 2.0 (1967-2008: digital financial services by banks) and FinTech 3.0 (2008-present: democratisation of financial services). In traditional banks, mechanical banking was introduced around 1960. Computer-based banking was started in the 1970s. In the 1980s, computer-based banking communication was introduced. Now, banks are rapidly changing towards virtual banking implying non-branch banks, as electronic media are used for banking services on anywhere anytime basis. Banks help customers by sending messages and financial information about consumer transactions, account balances, accessing other banking services, and goods to transfer funds from anywhere at any time. In future, banks are predicted to become FinTech banks combining the functions of FinTech and banking. It can happen by conversion of the current banks into FinTech banks and by the establishment of new FinTech banks.

When a bank undertakes digital transformation, all management levels should collaborate to formulate a long-term strategic roadmap for the right business model to integrate suitable FinTech projects. It affects both internal and external stakeholders. Internally, all managerial processes and workflow are upgraded and reviewed and fitted with the digital transformation strategy. The external aim is to satisfy digital customer needs. The challenges for achieving the desired effect of a bank's digital transformation strategy are the choice of the main digital projects for deployment, development and education of staff, the prioritisation of digital FinTech projects, analysis of customer-centric problems to commence digital solutions, building internal human resources digital culture, training and development for digital skills, preparing a digital customer journey roadmap, redefining bank's communication network processes to build future digital customers (Mustafaoglu, 2022).

Dapp (2017) noted the structural change in traditional banks due to digital transformation. They need to abandon their conservative methods and embrace technology forming the required alliances along the entire value chain. However, most traditional banks are satisfied with digitalising only the customer end of their services. The silo approach of strategy does not favour innovation. Holistic digital transformation is necessary to achieve the full potential of technology. New players in the financial sector are from the non-banking sector and they are fully equipped with digital transformation. They easily dominate traditional banks in financial markets. They are also ready to adopt new emerging technologies for various services. Banks can effectively use the large volumes of customer data in their possession by analysing the changing needs of customers and tailoring their products accordingly. FinTech services become important in this respect. Traditional banks have better data security and protection as a competitive advantage over other financial institutions.

Only a small percentage of traditional banks have set up FinTech labs and others remained passive investors in FinTech start-ups than initiating their own programs. Transformation to FinTech by these banks requires digital transformation. Blockchain as one of the digital transformation technologies was discussed by El-Masri, Al-Yafi, and Sherif (2019). To avoid being overshadowed by non-banking FinTech firms, traditional banks need to undergo digital transformation with the help of FinTech technologies.

According to Iwashita (2022), the financial industry in Japan is still dominated by face-to-face interactions with little digitisation. Despite sophisticated financial services being available before the widespread use of the internet, most people do not wish to conduct financial transactions through their smartphones. Japan introduced a country-wide financial transaction system about 50 years ago when no internet existed. With the internet and other technologies, the system has become much faster. No problems have arisen in this system so far. Hence, people tend to stick to this well-established system rather than experiment with new unknown systems with possible security risks. Older generations prefer traditional financial systems, and they have the most financial asset and most active financial users. There had been very little digitisation of accounting work in corporations. Investments in FinTech had been very small in Japan. Even during covid pandemic, the cash balance had been increasing in Japan, whereas it was declining in many other countries. The financial assets of Japanese households are restricted to cash and bank deposits. Most of them do not want to invest in risky assets. These conservative behavioural trends are the reasons for the slow penetration of FinTech in Japan. FinTech lending and loans are practically non-existent in Japan. In other countries, FinTech firms operate in areas where bank branches are fewer, household incomes are lower, and there is a sizeable

population of minorities. In Japan, banks are expanding their lending activities, hence there is less space for FinTech firms in this sector. Even personal loans based on credit scores are yet to pick up in Japan. Apart from such limited demand for services based on new technologies, the higher risk of cyberattacks and high transaction costs are cited as reasons for the slow migration of banks to new technologies. However, this stagnation in digitization on the demand side may change with large-scale digitisation in the government sector and the introduction of a new invoice system in 2023.

The factors influencing the competitiveness of Ukrainian banks were identified by Kolodiziev, Krupka, Shulga, Kulchytssky, and Lozynska (2021). The factors were economy digitalisation, the dynamic spread of electronic payments and e-commerce, and innovative technologies to provide digital services. Online business platforms can expand the product range, attract more customers, and facilitate the implementation of strategies for competitive advantages. Impact studies on these factors clearly demonstrated the importance of digital transformation of banks to remain competitive.

Reduced business due to competition from FinTech firms was given as the main reason for Indonesian banks' digital transformation. A case study on one bank by Said and Angelit (2020) revealed that one-third of employees did not think the bank was ready for digital transformation. The application Programming Interface introduced by the bank resulted in higher revenue generation. In addition, the bank established social connections with its customers and collaborated with all FinTech firms to top up their applications. The bank should also have a disruption strategy for its mobile application. Customer, competition, data, innovation, and value are the five domains of digital transformation. The prerequisites for the digital transformation of banks identified by Tsindeliani, et al. (2022) were low margins of banks, the transformation of business models to create ecosystems by financial market participants, increasing customer penetration of digitalised FinTech firms, loss of monopoly of banks in traditional services, the significant role of non-financial institutions in financial markets, quasi-state controls on banks and desire of banks to partner with startups and tech companies. In the case of Russia, many laws and regulations have been passed to increase the pace of the digital transformation of banks for sustainable business. As a result of increased digital transformation, Russian banks have closed 3200 branches in the last two years.

Restrictions imposed during the Covid pandemic led to the creation of a situation of urgency for the digital transformation of Tunisian banks. This was advantageous to these banks in the short and long term. Digital transformation also helped as a path for innovative opportunities and sustainable practices (Theiri & Alareeni, 2023).

Among one of the first digital transformations of traditional banks was the automated teller machine (ATM), based at Barclays Bank (the United Kingdom). The invention of Texas Instruments' portable calculator TI 2500 Data Math, released in 1972, was the forerunner of the modern smartphone. In 1967, the digitalization of analogue systems started. In 1968, the Inter-Computer Bureau, today's BACS (Bankers' Automated Clearing Services), was created in the UK. In 1970, the United States created the CHIPS (Clearing House Interbank Payments System). Thus, the early FinTech technologies was developing gradually. Some trends from the early 1970s to the late 1980s were the creation of domestic and international payment systems like SWIFT (Society for Worldwide Interbank Financial Telecommunications), providing a communication channel between financial institutions for the high volume of cross-border payments between them; the creation of NASDAQ, the world's first digital exchange in 1971; replacement of paper documents by electronic documents, internal risk management IT technologies, and the beginning of the internet banking in parallel with the advent of the internet in the 1980s.

During the period of 1987-2008, traditional digital financial services were being developed, and financial markets were deregulated and liberalised. More and more financial transactions were carried out over the internet. By the beginning of the 21st century, internal processes of financial institutions, and interaction with outsiders and retail customers were fully digitalized. By 2005, the first direct banks without physical branches (ING Direct, HSBC Direct) came into existence in the UK. Now, the digital transformation of financial markets was happening more rapidly and was affected by global instability and technological, social, behavioural, and demographic changes. Therefore, the growth of financial institutions depends on attracting new customers and expanding the range of products. Customers expect lower prices with high-quality services. Major threats to the growth of financial institutions are the speed of technological change, consumer behaviour change, staff shortages, cyberattacks, customer retention and confidence building as new technologies spread fast accounting for 76% of banking services and the capital market, 72% of insurance. Many top-level managers of large US, European and Asian financial institutions believe that market leadership will remain with major banking institutions for some more time. Others believe that unconventional financial services will be a threat to traditional banks Since transactions are done through networks, the significance of branches will be lost. FinTech cuts jobs but provides opportunities for special skills. Now, the stress is not on selling products or services, but on serving customers according to their needs, feelings, emotions, and customer behaviour, to provide them with real value in changing their lives for the better. Digital customers are attracted to emotions rather than information (Lomachynska & Kuzina, 2020).

3.6 Digital transformation of Saudi banks

Yons AS, Andys M (2019), as cited by Rashwan and Kassem (2021) observed that the concept and benefits of digital transformation and knowledge of the challenges it faces, and know-how are important for Saudi banks. A field study was done on Saudi Al Rajhi Bank to study the importance of digital transformation and its impact on improving the quality of banking services, achieving customer satisfaction, reflecting increased utilization of digital services, and achieving digital leadership. The findings led to the recommendation of the need for a clear strategy for digital transformation in Saudi banks and work to raise the skills of employees in providing digital banking services by training them in the latest technologies to keep up with modern digital services. This leads to increasing the competitiveness of banks, achieving digital leadership for Saudi banks, and developing and launching new business models compatible with digital transformation.

The usefulness of big data as a FinTech technology for the digital transformation of Saudi banks aimed at offering better services to customers was studied by Zaki, et al. (2020). Big data are useful to increase the speed in service provision, inclusiveness, and diversity, function as an alternative to general services, achieve inclusiveness and increase loyalty.

Adaptation of FinTech technology by Islamic banks of Saudi Arabia is determined by the knowledge, attitude, and subjective norms of customers. Awareness had only a moderate positive effect. In Saudi Arabia, the Islamic banking sector had been slow to involve in the FinTech market, as the sector does not prefer spending on technologies. Recently, some leading banks in the country responded to the FinTech disruption by allotting capital to identify potential investments in the start-up space. Some other banks adopted a proactive strategy by collaborating with start-ups offering FinTech solutions like payment gateways and remittance solutions. In 2015, Riyadh Bank partnered with Gemalto, an international digital security company, to introduce a contactless payment system for customers, for the first time in Saudi Arabia. In 2018, SAMA made an agreement with Ripple (real-time gross settlement system, currency exchange and remittance network), to support its banks with blockchain payment systems. However, Islamic banks are yet to adopt strategies to match the pace of innovation in the industry and shape their business models as per customer expectations. Generally, it is believed that the adoption of FinTech by Islamic banks does not violate Sharia (Oladapo, Hamoudah, Alam, Olaopa, & Muda, 2022).

4. DISCUSSION

Some broad trends identified during this review are discussed below.

4.1 Frequency of papers on the topics of this review

The frequencies of papers on the topics of this review are presented in Fig 2. As should be the case, the highest percentage of papers (43%) were on banks using FinTech for digital transformation. The next two highest values were for FinTech as a tool for digital transformation (21%) and digital transformation technologies (14%). There was only one paper on regulations on FinTech. These frequencies are on the desirable lines, though the numbers were low.

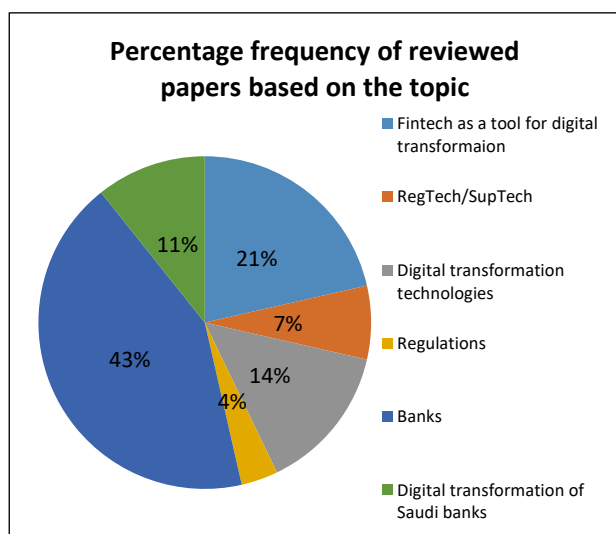


Figure 2. Percentage frequency of reviewed papers based on topics.

4.2 Trend of Aims

Some broad trends of aims of the papers are given in Fig 3.

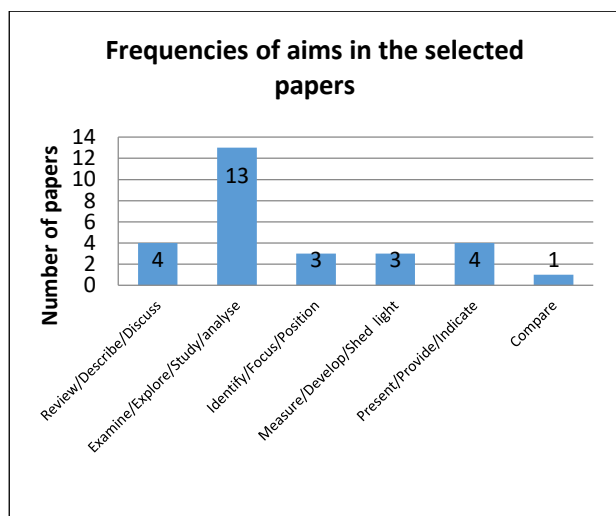


Figure 3. Frequencies of papers according to their aims

Papers aimed at examination, exploration, studies, and analysis of phenomena related to the review topic were maximum (13). Papers related to other topics were less than five. There was only one paper with comparison as the aim. Papers with the aims of examination etc. provided maximum information regarding the use of FinTech as a tool for digital transformation. Higher numbers of identifying etc and measuring etc would have been better. In general, the observed pattern was more or less in line with their importance.

4.3 Methodology trends

Frequencies of papers using same methodologies are given in Fig 4. Discussion papers were maximum (10). Generally, they contained little empirical data, as the discussions were based on literature, some theories and frameworks and some observations. More rigorous methods of surveys and case studies were used in seven papers. This trend affected the quality of this review also.

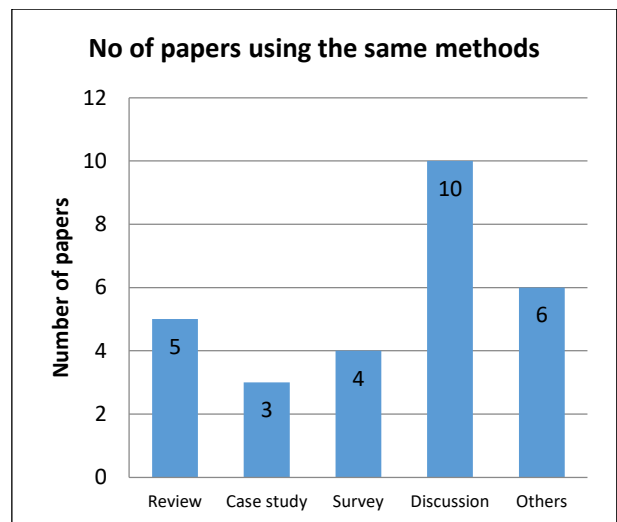


Figure 4. Number of papers using the same method

As discussed above, the findings were mostly on the slow uptake of FinTech tools for digital transformation by banks, and the need to accelerate the process due to competition from FinTech firms, need for banks to modernise their services using digital tools and collaborating with FinTech firms and startups and the adverse consequences on banks not doing so. There were only three papers specifically dealing with Saudi banks and one of them was on Islamic banks. All the trends show the need studies using rigorous methods which can provide generalisable empirical data. Much more research on Saudi banks is required.

5. CONCLUSION

Overall, digital transformation of any kind of banks using FinTech tools had been slow and a small percentage of the total. The situation was worse in the case of Saudi banks despite the large amounts of

budgetary allocations for technologies in banking as a part of its Vision 2030. This was because of the late entry of Saudi Arabia into these concepts. The need for Islamic banks to follow Sharia rules was not found to be a great problem. All these points indicate to the need for greater acceleration of using FinTech tools for the digital transformation of Saudi traditional banks. The main limitation of this review is the lack of papers dealing with the review topic exactly. A further

limitation is the deficiency of research on Saudi banks. The third limitation is the dominance of discussion papers without providing empirical data. A related limitation is the absence of rigour in the methodologies used in the other reviewed papers. There had also been a wide range of aims given in the reviewed papers. Therefore, the conclusions of this review need to be verified using empirical research.

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