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Financial Technology in Banking Industry: Challenges and Opportunities

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ABSTRACT
In recent times, there has been a significant surge in the fascination surrounding financial technology, often abbreviated as FinTech. This modern financial trend is primarily defined by its extensive incorporation of technology in communication, sometimes referred to as network economics. The realm of FinTech services encompasses a diverse array of financial offerings, leveraging the rapid advancements in technology. These services encompass various aspects such as payments, clearing, and settlement. Additionally, they extend to include credit, deposit, and services related to raising capital.

Although FinTech players have garnered considerable global attention from financial industry leaders and legislators, the matter remains relatively underexplored as a subject of study. There exists a dearth of comprehensive scientific research in this domain.

The primary objective of this paper is twofold: firstly, to illuminate the unfolding waveof progress within the financial industry, characterized by the fusion of advanced technology; secondly, to elucidate the role that FinTech plays not only within the broader financial sector but also with a specific focus on its impact within the banking industry.

The paper has achieved its objectives through two primary phases. Firstly, it delves into the background and definition of FinTech, while also providing an overview of the existing market segments and landscape within the FinTech domain. Furthermore, the paper explores various alternative financing platforms within the FinTech realm. In the subsequent phase, the paper focuses on identifying the impact of FinTech on the banking industry and proposes necessary strategies to effectively respond to this impact. Additionally, the paper puts forth several prospective research proposals aimed at investigating the ramifications of FinTech on both the financial industry and the banking sector specifically, with a focus on Arab countries.

Key words: Financial Technology, Banking Industry, Platform Competition, Network Economics.

I. INTRODUCTION

Until recently, the financial sector had remained relatively unaffected. However, this landscape shifted dramatically with the emergence of companies utilizing technology to provide diverse financial solutions encompassing areas such as banking, payments, and personal financial management. These entities came to be known as FinTech firms.

The primary objective of FinTech firms is to engage customers by offering products and services that are distinguished by their user-friendliness, efficiency, transparency, and automation, surpassing the current offerings (Dorfleitner, Hornuf, Schmitt, & Weber, 2017).

Various notable examples of innovations at the heart of the present FinTech landscape include cryptocurrencies and Blockchain technology, novel digital advisory and trading systems, artificial intelligence and machine learning applications, peer-to-peer lending platforms, equity crowd funding platforms, and mobile payment systems.

Newcomers to the financial industry, facilitated by FinTech, pose a significant challenge to traditional banks, particularly in their core business area of credit. These globally prevalent electronic platforms have emerged as formidable contenders, particularly in the realm of personal and household credit provision. These emerging competitors hold a range of advantages over the conventional banking system, excelling in various aspects. Contemporary providers of financial services that effectively target underserved segments—such as crowd funding, peer-to-peer lending, and lending clubs—possess considerable potential to wield diverse modes of finance. These modes offer flexibility, cost-effectiveness, reduced regulatory demands, and time efficiency.

The scope of challenges extends beyond the credit function, encompassing marketing strategies, rapid and adaptable introduction of new services, wider client outreach, and

the inclusion of individuals who are under banked or even unbanked across the globe.
As outlined by Pierrakis and Collins (2013), these innovations possess the potential to disrupt established industry frameworks and obscure the distinctions between different industries. They can enable deliberate disintermediation, fundamentally reshape the manner in which established companies generate and provide products and services, establish fresh avenues for entrepreneurial endeavors, democratize the accessibility to financial services, and simultaneously introduce substantial challenges concerning privacy, regulatory compliance, and law enforcement.

Background, FinTech definition and dissemination

Via the medium of FinTech, interactions among issuers, investors, and intermediaries have undergone a transformative shift. They now engage in communication, research, social interaction, information sharing, collaboration, crowd sourcing, competition, and trading through methods that diverge significantly from traditional practices. This evolution in interaction methods presents a challenge to the prevailing regulatory framework. To illustrate, social trading platforms enable investors to track and emulate a lead trader, while on angel investment platforms, investors follow the lead of a primary investor. In the realm of market data platforms, the fusion of artificial intelligence and social media analytics plays a role in guiding the trading and investment choices of retail investors (IOSCO, 2017).

FinTech Definition

Despite the fact that there's no consensus about the best definition of FinTech and considering that premature to define a field that is rapidly evolving; tracking the different trials to define it will give a good view about this contemporary term. The term"FinTech" denotes companies or representatives of companies that combine financial services with modern, innovative technologies (Dorfleitner et al., 2017). According to IOSCO (2017), The term Financial Technologies or" Fintech "is used to describe a variety of innovative business models and emerging technologies that have the potential to transform the financial services industry. Financial Stability Board defined FinTech as a "technology-enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on the provision of financial services"(Financial Stability Board, 2017)

Segments of the FinTech Industry and global landscape

Given its nascent status, a universally accepted delineation of the distinct sectors comprising this industry has yet to be established. Despite numerous attempts to categorize its components, the majority of these endeavors center around enterprises heavily reliant on technology-driven innovations within the realm of financial services.
Dorfleitner et al. (2017) divided companies in the FinTech industry into four major segments in accordance with their distinctive business models. By analogy with traditional value-adding areas of a universal bank, FinTechs can be distinguished on the basis of their involvement in financing, asset management, and payments, as well as other FinTechs, a loose assortment of companies that perform other functions. Figure 1 illustrates this categorization .

Fig. 1: Segments of the FinTech industry

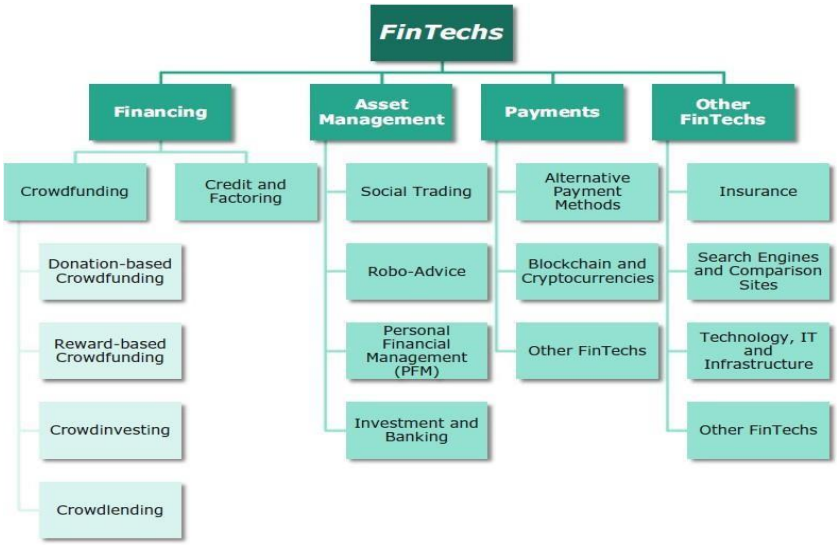
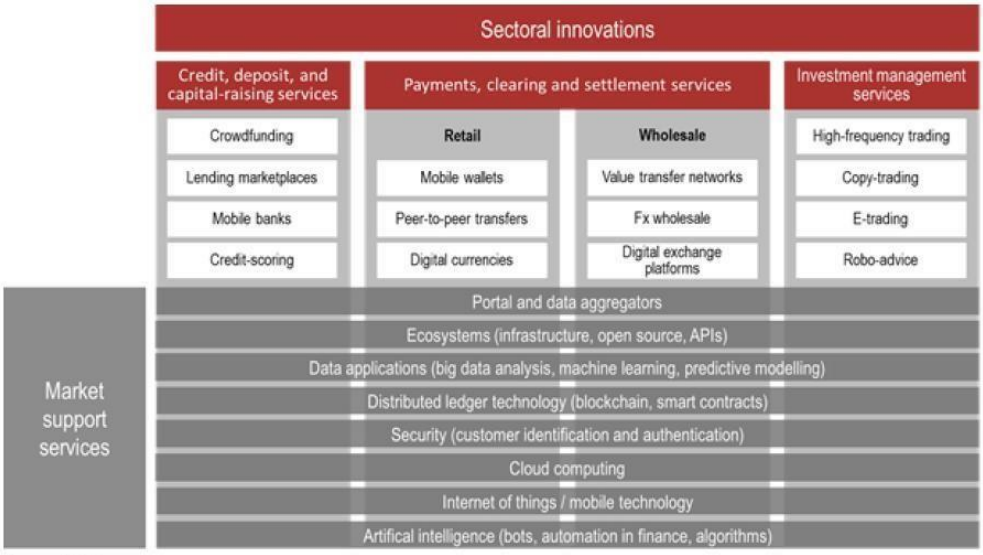


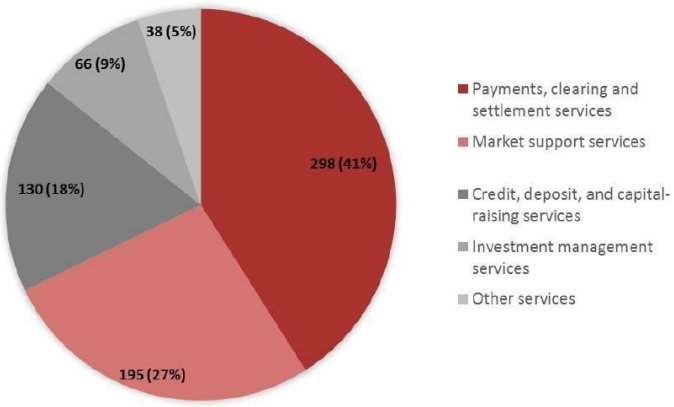
Fig 2: Sectors of innovative services



Source: BCBS.

According to an informal survey conducted by the BCBS within its member countries, asking them to identify the significant fintech products and services within their jurisdictions. The number of fintech companies reported for each sector is shown in Graph 3

Fig 3: key providers per fintech activity



As depicted in the diagram above, the largest concentration of fintech service providersis observed within the payments, clearing, and settlement sector, closely pursued by credit, deposit, and capital-raising services.

Alternative Financing FinTech Platforms

One of the noteworthy advancements in recent times is the rise of online alternative financing platforms, which serve the purpose of connecting enterprises and individuals seeking capital with those who possess funds available for lending, investing, or contributing (IOSCO, 2017). These platforms typically manifest in the form known as crowd funding, wherein financial resources are raised from a widespread group of capital providers, often referred to as "the crowd," without specific limitations on the funding's intended use (Moritz & Block, 2014).

(Schwienbacher, 2010)and Larraide defined crowd funding as "the financing of a project or a venture by a group of individuals instead of professional parties (like, for instance,banks, venture capitalists or business angels). According to Bradford (2012), crowd funding is "the use of the Internet to raise money through small contributions from a large number of investors".

peer-to-peer (P2P) lending

Peer-to-peer finance, often abbreviated as P2P lending, presents a promising alternative to traditional banks for extending credit. The concept gained substantial traction since its inception with "Zopa" in 2005, evolving into a dependable option not only for individual financing but also for business entities. P2P platforms have undergone significant development, embodying a reliable means of funding.

Peer-to-peer lending can also involve platforms similar to micro financing in that individuals directly provide capital to other individuals. Government and corporate accelerators offer a variation of P2P lending by helping entrepreneurs gain access to modest initial amounts of funding together with mentoring support(Bruton, Khavul, Siegel, & Wright, 2015) .

The P2P platforms as a contemporary FinTech premises disseminated around the globe,

in the developed and developing countries as a kind of crowd funding (Bradford, 2012; Xusheng, 2014). In USA, personal credit developed in an institutional form is known as Circle Lending. As of April 2013, the largest peer–to–peer business lending site in the UK."Funding Circle" has facilitated approximately GBP100 million in loans to over 1,700 companies to date (Pierrakis & Collins, 2013). The potential market indicates that the projected market of P2P market in USA will be USD150 billion by 2025. (Price Waterhouse Coopers PWC, 2015)1

Equity Crowd Funding (ECF)

Equity Crowdfunding (ECF) represents a business paradigm enabling individuals to invest in companies, often startups or early-stage ventures, in return for ownership stakes in those enterprises. Previously, this form of financial technology was primarily accessible to venture capitalists and angel investors (IOSCO, 2017). The intermediary platform functions as a facilitator, subject to oversight by the pertinent financial services regulatory body, while each instance of entrepreneurs offering shares (within a predefined timeframe) is referred to as a "pitch" (Estrin, Gozman, & Khavul, 2017).

Estrin and Khavul (2016) defined equity crowd funding as "an open marketplace for entrepreneurial finance that takes place on a two-sided online platform and operates within a social media environment".

ECF has provided the small investors good opportunity to equity investing in private companies. A smaller size of the companies involved in these platforms in comparison to those typically associated with a public securities offering considered as a great addition of these platforms, it provides entrepreneurs and investors access to an online social media marketplace where they can trade equity finance for ownership stakes (Cumming & Zhang, 2016; IOSCO, 2017; Rossi & Vismara, 2017).

FinTech challenge for banks and financial systems (Opportunities andThreats)

FinTech firms are emerging as formidable competitors to the conventional banking system, presenting a multifaceted challenge. Among these challenges, efficiency stands out as a prominent battleground.

The heightened efficiency of FinTech firms primarily stems from their ability to personalize loans and streamline processes by removing intermediaries. This strategic disintermediation substantially reduces transaction expenses for consumers (KPMG, 2016; Lines, 2016).

New technologies such as "BlockChain" also enhance efficiency(Peters & Panayi, 2016; Wood, 2015). As banks are usually less likely to adopt new technologies quickly due to the regulatory environment (Hannan & McDowell, 1984) and often rely on decades-old IT infrastructure these innovations expected to benefit FinTech firms more. According to Peters and Panayi (2016), reducing counterparty and settlement risks in shortening the settlement cycle from 3 days to 2 days will benefits several markets in reducing counterparty and settlement risks, and BlockChain technologies have the potential to lead to near-instantaneous settlement.

To offer a comprehensive assessment of the potential outcomes encompassing both the prospective risks and opportunities introduced by FinTech to the financial markets and banking sector, we have undertaken an exploration of various reports and studies. These encompass analyses conducted by prominent institutions vested in the financial markets and institutions, as well as published research. Some of these sources have deliberated

on the broad opportunities and threats presented by FinTech on a general scale (BCBS, 2017), while others have delved into specific segments within the realm of FinTech enterprises (IOSCO, 2017).

While our primary focus remains on the banking industry, we recognize that the impactof FinTech extends to the broader financial markets and banks with nuanced differentiations. It is essential to acknowledge that the degree of benefit from opportunities and susceptibility to risks varies across industries, influenced by factors such as local dynamics, management practices, and global shifts.

Opportunities

Different studies and specialized reports discussed the suggested the opportunities and benefits of Fintech for the financial industry from different perspectives, these opportunities related to consumer and investor protection, market integrity, competition and financial inclusion, in addition to coordination and cooperation to avoid duplication of work and reap synergies from the various efforts at the international level (Financial Stability Board, 2017).

According to the global specialized reports and studies (BCBS, 2017; Financial Stability Board, 2017; IOSCO, 2017; Peters & Panayi, 2016), we summarized the main opportunities as follows:

1. Greater access to capital: This appears in the P2P and ECF platforms in providing credit to borrowers, especially SMEs, who do not have access to bank loans and opening new possibilities of access to equity finance.

2. Financial inclusion**:** Digital finance has improved access to financial services by under-served groups. Technology can reach remote locations. FinTech Platforms are increasingly targeting larger sized trades and are shifting to firm and executable orders.

3. Better and more tailored banking services**:** banks can benefit from the specializationof FinTech firms to improve their traditional offerings to deliver them in a cost effective and flexible way.

4. Cost advantage: this comes from the fact that Fintech firms offers Lower transaction costs and faster banking services. fintech players may speed up transfers and paymentsand cut their costs, as the case of cross-border transfers, fintech companies can providefaster banking services at lower cost.

5. Potential positive impact on financial stability due to increased competition: The entry of new players competing with incumbent banks could eventually fragment the banking services market and reduce the systemic risk associated with players of systemic size.

6. Regulation Technology (Regtech)**:** Contemporary innovative technologies can help financial institutions comply with regulatory requirements and pursue regulatory objectives (as prudential requirements including reporting, consumer protection). bankscan benefit from regTech with more effective ways to improve their compliance and risk management.

7. Enhancement in security**:** For one of the core developments ik FinTech, security is built into the blockchain through encryption of the blocks and the linkages between the blocks. Furthermore, attacking every node in a blockchain is more difficult with present state technology than to attack a central database.

Threats

Like any development, the Fintech encapsulate not only benefits and opportunities, it presents a wide variety of risks that cut across various sectors and often blend both tactical and strategic risk elements. The FinTech risks and threats come mainly from concerns about the operational risk, compliance, liquidity and volatility of bank funding sources, and the severe competition. The following risk associated with FinTech, particularly in the banking sector.

1. Competition on market share (Strategic risk)**:** The potential for rapid unbundling of bank services to non-bank fintech or BigTech firms increases risks to profitability at individual banks.

2. Risk of collapse, fraud or malpractice by the platform or some of its users: certain cases of platform fraud have materialized3. Fraud can occur with parties offering (and buying) securities on the platform.

3. High operational risk – systemic dimension**:** The rise of fintech leads to more IT interdependencies between market players (banks, fintech and others) and market infrastructures, which could cause an IT risk event to escalate into a systemic crisis, particularly where services are concentrated in one or a few dominant players.

4. High operational risk – idiosyncratic dimension**:** A proliferation of innovative products and services may increase the complexity of financial services delivery, making it more difficult to manage and control operational risk. Legacy bank IT systems maynot be sufficiently adaptable or implementation practices, such as change management,may be inadequate. This kind of risk mainly attributed to the dependence on the robo- advisers, which cause technical dilemmas like errors in algorithms, overly complex algorithms, overly simplistic algorithms, and static client information.

5. Compliance risk with regard to data privacy**:** The risk of not complying with data privacy rules may increase with the development of big data, more outsourcing due totie-ups with fintech firms, and the associated competition for ownership of the customer relationship. The availability of platform being operated by unregistered entities could increase this risk.

6. Cyber-risk**:** Heavier reliance on application programming interface (APIs), cloud computing and other new technologies facilitating increased interconnectivity could potentially make the banking system more vulnerable to cyber-threats, and expose large volumes of sensitive data to potential breaches.

7. Liquidity risk and volatility of bank funding sources: The use of new technology and aggregators creates opportunities for customers to automatically change between different savings accounts or mutual funds to obtain a better return. While this can increase efficiency, it can also affect customer loyalty and increase the volatility of deposits. This in turn could lead to higher liquidity risk for banks.

Table 1: List of risks and opportunities emanating from financial technologies and innovation (BCBS, 2017)

	Risks	**Opportunities**
Impact on consumer sector	A. Data privacy B. Data security C. Discontinuity of banking services D. Inappropriate marketing practices	A. Financial inclusion B. Better and more tailored banking services C. Lower transaction costs and faster bankingservices
Impact on banks and banking system	A. Strategic and profitability risks B. Increased interconnectedness between financial parties C. High operational risk – systemic D. High operational risk – idiosyncratic E. Third-party / vendor management risk F. Compliance risk including failure to protect consumers anddata protection regulation G. Money laundering – terrorism financing risk H. Liquidity risk and volatility of bank funding sources	A. Improved and more efficient bankingprocesses B. Innovative use of data for marketing andrisk management purposes C. Potential positive impact on financialstability due to increased competition15 D. Regtech

Source: BCBS.

Future expectations for the FinTech growth and Banks' strategic response todeal with it

The strategic and long term direction of FinTech is subject to different expectations; these expectations differ according to the backgrounds and experiences of the experts. Some argue that the FinTech firms will gobble up key parts of the franchise of traditional retail banks. Others suggesting either that the digital banking start-ups will simply fail, or that the traditionalbanks will contain these firms and acquire them.

As a new development in the marketplace; the FinTech and its firms represents challenge that banks should face to capitalize from the opportunities and benefits it provides, and minimize to the largest degree the threats and risks associated with it.

Suggested response required by banks to deal with FinTech

In spite of the rising wave of FinTech and aggressiveness in taking place in the global financial and banking system, traditional banks have not yet exhausted the possibilitiesfor improvements along these lines (Mackenzey, 2015). As it's discussed earlier; FinTech

as a challenge encapsulates many challenges for the traditional providers of financial services in general and banking industry in particular.
Many bank leaders around the globe looking at FinTech shows it as an opportunity to "pump" new blood to the traditional banking system as a complement to the retail banking services. This can be obtained through joint partnerships, service outsourcing, venture capital funding, or acquisitions. For these banks, FinTechs seem to benefit them more than disrupt them (Lines, 2016). Moreover, collaborations between banks and different FinTech firms as start-ups also benefit these firms, it may get access to global payment systems and the banks' own customer base. This lowers the barriers ofentry for FinTech firms to the financial sector and enables them to gain more trust from their customers (Juengerkes, 2016)

Existing banks may also acquire FinTech companies to gain access to new technology, which would make it more difficult to find a direct relationship between FinTech funding and incumbent retail bank stock returns. For example, Capital One, the tenth largest bank in the US in terms of total assets and market capitalization, acquired FinTech start-up Level Money in 2015(Li, Spigt, & Swinkels, 2017). According to Mackenzey (2015); "an overarching challenge for banks is how to "open up" structurally – both in terms of how they leverage partnerships and how they permit other entities to access their capabilities. Those banks that pursue a thoughtful approach to meeting this challenge will be best positioned to evolve their business models and find new sources of value for their customers, while performing well financially".

Different institutions suggested required response of banks to benefit from the accelerating wave of FinTech to maximize the opportunities and minimize the treats that FinTech firms represent for the banking industry or the risks associated with adopting Fintech solutions in banking works. Ten key observations identified by BCBS (2017) and ten recommendations suggested to deal with FinTech base on these recommendations, they concentrated on the required actions to be taken by the banks'management, such as ensuring the safety and soundness of the banking system with minimising the risk of inadvertently inhibiting beneficial innovation in the financial sector, acquiring effective governance structures and risk management processes and effective IT and other risk management processes. In addition to investigating and exploring the potential of new technologies to improve their methods and processes and review their current regulatory, supervisory and licensing frameworks in light of new and evolving risks arising from innovative products and business models.

Use data-driven insights and analytics holistically across the bank.
Competitor FinTech providers powered by data and analytics, large consumer ecosystems (e.g. Facebook, Google, Apple), or some of the more progressive financial institutions are opening up new battlegrounds in areas like customer acquisition, customer servicing, credit provision, relationship deepening through cross-sell, and customer retention and loyalty. Consider the provision of credit - one of banking's lastbig moats.

The large-scale availability of new and big data (and the fact that banks no longer havea monopoly on such data which they have built and leveraged over centuries) is pushing

banks to radically transform just to keep up. Building a comprehensive data ecosystemto access customer data from within and beyond the bank; creating a 360-degree view of customer activities; creating a robust analytics and data infrastructure; and leveraging these to drive scientific (versus case law-based) decisions across a broad range of activities from customer acquisition to servicing to cross selling to collections - all are critical to a bank's future success.

The proliferation of mobile devices and shifting preferences among demographic groups mean that customers expect more real-time, cross-channel capabilities (e.g. status inquiries, problem- resolution) than ever before. Physical distribution will still be relevant, but far less important, and banks must learn to deliver services with a compelling design and a seamless unconventional customer experience.

Build digital marketing capabilities that equal E Commerce giants.

Today, banks are in a fight for the customer, not only with other banks but also non-banks. In order to fill the gap in marketing skills that currently exists between e commerce players and banks, banks should mastering digital media, content marketing, digital customer lifecycle management and marketing. Building these capabilities and recruiting and retaining digital marketing talent will require considerable time and investment.

Aggressively mitigate the potential cost advantage of attackers through radical simplification, process digitization and streamlining.

After the last dot-com boom, banks successfully electronified core processes. Now they must digitize them.

This will be a multi-year process for banks, as it will require the integration of multiple legacy systems and potential re-plat forming to enable truly digitized processes. Simplification, digitization and streamlining opportunities exist across large swaths of banking operations.

Rapidly leverage and deploy the next generation of technologies, from mobile to agile to cloud.

The technology agenda for banks and bank CIOs has become even more demanding and complex. First and foremost, "mobile-first" is not just a buzzword – it is the clearest directive banks could receive from consumers about how they want to interact with their service providers. Secondly, banks must fortify not only their technologies, but also their internal processes and cultures, to defend customers' data from breaches. Third, the pace of innovation in banking is accelerating rapidly, requiring banks to increase their speed to keep up, including software development through techniques such as agile and continuous delivery. Finally, significantly faster, more nimble and dramatically lower-cost versions of processing and storage technologies are now commonplace.

Banks need to move onto such platforms, retiring and replacing legacy systems quickly. Since such systems are neither easily nor quickly replaced, many banks may choose tomove to a "two-speed architecture" approach that builds more flexible layers of technology on top of existing systems, but still draws on and interacts with those systems to provide the next generation of technology agility and seamless customer experiences.

From providing truly scalable application architecture with a particular emphasis on mobile to addressing the cyber security threats they face every day to learning agile delivery and modernizing their infrastructure, banks have a challenging but important road ahead in building next-generation technology capabilities.

Rethink legacy organizational structures and decision rights to support a digital environment.

The typical organization chart of any bank will show a matrix of products and channels, with physical distribution usually leading in size and scope. The P&Ls that accompany these matrices vest power in the owners of the channels and products that are most likely to be in the firing line of FinTech attackers.

These attackers are typically oriented to customer metrics tied directly to their financial performance. In contrast, most banks have consensus oriented cultures that require a long time to build alignment. Banks must complement their existing P&Ls with approaches that enable faster adaptability to external changes and foster cultures that support speedier decision making. Banks must think hard about how best to organize to support the five preceding imperatives.

Concluding remarks and future research

In this paper, we endeavor to illuminate the emergence of FinTech as a transformative wave within the financial industry, facilitated by the convergence of advanced telecommunications and information technology. Our focus is directed towards unraveling the multifaceted role that FinTech assumes within the broader financial landscape, with a specific emphasis on its implications for the banking sector.

Despite the global resonance FinTech commands among industry leaders and policymakers, it is noteworthy that its exploration as a subject of scholarly inquiry remains relatively nascent. The body of rigorous scientific research dedicated to this phenomenon remains limited.

The primary objective of this paper is two-fold: firstly, to cast a spotlight on the evolutionary trajectory of FinTech as it intertwines with high technology within the financial sphere; secondly, to provide a comprehensive elucidation of the precise rolethat FinTech occupies within the broader financial realm, with a special emphasis on its significance for the banking sector.

To achieve these goals, we undertook a comprehensive approach. Initially, we delineated the prevailing FinTech market segments and global landscape, drawing insights from the latest authoritative reports and studies issued by prominent international bodies vested in the financial and banking domains. Moreover, we delved into illustrative instances of alternative financing platforms within the realm of FinTech.

In the subsequent phase of our research, we delved into an examination of the profound impact exerted by FinTech on the banking industry, while also elucidating the requisite

strategies to effectively confront this disruptive force. We engaged in a contemplation of potential future scenarios that could shape the banking landscape, exploring the array of opportunities and threats encapsulated within the realm of FinTech. Furthermore, we presented a series of recommended responses to effectively navigate the challenges posed by the FinTech phenomenon.

Conclusively, our paper extends its contribution by offering suggestions for further research endeavors, specifically tailored to the context of Arab countries. These proposed research areas encompass the anticipated influence of FinTech on the banking sector within the region, strategies for Arab banks to adeptly address the FinTech challenge, strategies for bank preparation in embracing the FinTech era, and an exploration of customer receptivity to engaging with FinTech firms.

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