

Fintech: Digital Transformation in Finance

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Abstract: This paper provides an overview of the rapidly expanding fintech sector and its impact on traditional financial services. Fintech has emerged as a customer-centric business model in response to the shortcomings of conventional financial services during the financial crisis and COVID-19. The fintech industry has created prospects in a variety of areas, including blockchain (specifically cryptocurrencies), robo-advisors, online payment services, and peer-to-peer lending platforms. However, the quick expansion of fintech also comes with risks, and investment decisions must be made carefully, considering project duration and volatility. Risk management is crucial to preserving financial stability, and legal oversight is necessary. Machine learning and deep learning techniques can be employed to recognize and mitigate these risks. Banking institutions must take precautions to protect customer data and manage unforeseen operations. The fintech sector has the potential to transform the financial industry while maintaining long-term financial health through a balance of innovation, regulatory monitoring, and financial stability.

Keywords: blockchain, robo-advisor, online payment, P2P lending

1. Introduction

In recent years, the term "fintech" has gained popularity as technological advancements continue to transform the financial industry. Fintech is a combination of finance and technology, representing technology-oriented financial innovation that uses modern science and technology to transform or innovate financial products and business models, resulting in better quality and more efficient financial services [1]. Fintech investments have seen tremendous growth as a result, with global investment hitting \$5.3 billion in the first quarter of 2016—a 67% rise from the same period last year—and investments in fintech firms in Europe and Asia-Pacific more than doubling.

The data shows that fintech has moved past the hype phase and has established itself as a significant participant in the financial sector. The promotion and application of fintech have made financial services more accessible to people who were previously underserved by traditional banking institutions. With the rise of mobile banking apps and online financial services, people can now manage their finances and access financial products and services from anywhere in the world. It increased competition in the financial industry, with new players entering the market and offering innovative products and services. This can improve cost efficiencies for consumers and offer a greater range of financial products to choose from. It also enabled faster and more efficient financial transactions, reducing the time and cost associated with traditional banking services. Financial services are becoming more secure, transparent, and efficient with the substantial development of

financial technology such as artificial intelligence and blockchain. Additionally, it promoted financial inclusion, providing services to previously excluded people from the traditional financial system. For example, peer-to-peer lending platforms and crowdfunding websites allow individuals and small businesses to access financing they might not have obtained from traditional banks. The substantial development of financial technology such as artificial intelligence and blockchain has made financial services more secure, transparent, and efficient. Peer-to-peer lending platforms and crowdfunding websites have also allowed individuals and small businesses to access the financing they might not have obtained from traditional banks. Furthermore, online payment services have made it easier and more convenient for consumers to make transactions and purchases. Mobile payment apps and digital wallets have become increasingly popular, allowing users to make payments from anywhere at any time [2]. These services also offer greater security and fraud protection than traditional payment methods. As a result, fintech has transformed the financial industry, making financial services more accessible, efficient, and inclusive than ever before.

Risk management must be prioritized to ensure that financial stability is maintained in the face of significant technological advancements in the financial industry. One way to address this is through the Financial Stability Board (FSB), which plays a critical role in identifying and monitoring fintech-related risks, particularly those related to cybersecurity, consumer protection, and financial stability. Machine learning and deep learning can effectively identify and reduce fintech-related risks. By analyzing large amounts of data, these approaches can uncover trends and anomalies that suggest potential threats, allowing financial institutions to take appropriate risk mitigation measures. Such measures may include enhancing security measures to protect customer data, monitoring transactions for fraudulent activity, and developing contingency plans to address unforeseen operational disruptions. Failure to effectively manage these risks can lead to financial losses, damage to reputation, and regulatory penalties for financial institutions. By utilizing machine learning techniques to identify and mitigate fintech risks, financial institutions can stay ahead of the game and ensure long-term financial health. Although fintech may completely transform the financial industry, it is critical to strike a balance between innovation, financial stability, and regulatory oversight.

2. Blockchain

Blockchain technology has become a revolutionary innovation with the potential to transform various industries. It is a digital, decentralized ledger that securely records transactions, making it difficult to alter or hack. Nodes or computers in a network work together to verify and add transactions to the blockchain network, ensuring the network's integrity. The most well-known application of blockchain technology is the digital currency known as Bitcoin, which enables secure peer-to-peer transactions without the use of middlemen. Other cryptocurrencies have emerged, leveraging the same technology. After being introduced by computer hobbyists a few years earlier, Bitcoin's market value increased considerably in late 2013 and early 2014. This retail payment system does not require trusted intermediaries such as governments, central banks, or financial institutions, leading to lower transaction fees [3]. There are now a lot more Bitcoin ATMs, with North America accounting for more than 56% of all ATMs worldwide. In order to protect against fraud, maintain the payment system's integrity, and maintain user privacy, Bitcoin. It stimulates the decentralized nature of transfers, anonymity, and finality of payments associated with currency. Merchants are attracted to Bitcoin due to the reduced costs and the potential to gain new customers. However, the complex nature of Bitcoin technology and its cryptography scheme may deter the public from using it.

Cryptography is used by Bitcoin to process payments, verify transactions, and manage the currency's supply. Digital signatures and cryptographic hash functions are just a couple of the information security applications that make use of the cryptographic techniques utilized in the Bitcoin protocol. Regulators face a dilemma because Bitcoin is abstract and can be used for both legal and

illegal activities [4]. Users are concerned about the absence of government support, laws, and consumer protection for virtual currencies like Bitcoin. The acceptance and usage of Bitcoin and other virtual currencies may expand if there are encouraging signs for consumer protection regulations. Proper regulation is necessary to ensure that Bitcoin is used for legitimate purposes and not for illegal activities. This can be achieved through regulations such as KYC/AML requirements and taxation measures, which can help prevent money laundering and other forms of illicit behavior. Licensing requirements can also ensure that Bitcoin exchanges and other cryptocurrency-related businesses operate legally and are subject to regulatory scrutiny. While some may argue that regulation contradicts the decentralized and anonymous nature of Bitcoin, it is important to note that regulation can also protect consumers and investors from fraud and other forms of exploitation. As Bitcoin and other cryptocurrencies gain wider acceptance and undergo increased regulatory scrutiny, many countries and financial organizations are exploring ways to regulate the industry.

Despite the ongoing debates about the viability of Bitcoin and other digital currencies, a significant number of investors remain keen on exploring the cryptocurrency space. However, the question of whether a particular cryptocurrency will garner mainstream appeal, and when it is prudent for an investor to enter the market, is still subject to much conjecture. The level of demand for digital currencies is expected to increase in the future, despite the fact that the direction of this trend may be significantly influenced by investor sentiment. Since cryptocurrencies are purely digital assets, their market behavior is inherently unpredictable, and they are more volatile than conventional assets. This volatility is manifested in frequent and sudden price fluctuations that can vary more significantly than traditional assets.

3. Robo-advice

A financial planning service called robo-advising, also known as automated financial advice, combines technology and financial know-how to offer individualized investment guidance at a cheaper cost. Robo-advisors interact with clients in a manner akin to that of traditional financial advisors to learn about their preferences and develop customized investment plans that meet those demands [5]. Robo-advisors can leverage economies of scale to serve numerous clients with a single computer algorithm, while human advisors have a limited capacity to handle clients due to the need for personalized attention. Financial advice will become more readily available to those who are unwilling or unable to pay the fees associated with human financial advisors as robo-advisors acquire more clients with greater assets. The services that robo-advisors provide include asset management and tax advice for various financial goals such as saving for retirement or future college tuition. The robo-advising industry has seen significant growth since the late 2000s, with larger investment firms such as Vanguard taking notice. Robo-advisors primarily assist clients with managing their investments by leveraging the computer's ability to handle both routine and complex tasks. Customers register for an online account and provide information about their risk tolerance, assets, income, debt, and investment objectives. Following the client's input, the robo-advisor uses algorithms to present investment options, such as inexpensive mutual funds and exchange-traded funds (ETFs) for asset allocation and diversification. Additionally, Robo-advisors manage client portfolios and provide services like tax loss harvesting, dividend reinvestment, and periodic portfolio rebalancing to maintain the desired asset allocation [6]. Over 70% of US investors, according to a 2016 Gallup survey, think that human advisors are superior to robo-advisors. Human advisers better-serving customer interests, offering accurate investment recommendations, considering the complete financial picture, counseling clients on risks, fostering client confidence, and assisting clients in understanding their investments are among the reasons given.

Despite the perception that robo-advisors are more objective and rational in investment management, concerns persist regarding the possibility of data bias in algorithmic decision-making.

The caliber and inclusiveness of the data sets utilized to train their algorithms determine the fairness and accuracy of robo-advisors. Data bias may arise if historical discrimination or exclusion tendencies are present in the data used to train the algorithm, leading to limited investment opportunities and skewed results for users [7]. Additionally, the limited human engagement offered by robo-advisors may make it difficult for users to comprehend the underlying biases in their recommendations. As a result, regulatory organizations have called for greater accountability and transparency in robo-advisor practices. The SEC and FINRA have issued guidelines that encourage firms to disclose their algorithms, provide clients with a comprehensive explanation of their investment strategies, and caution clients about the limitations of automated investment recommendations. While expert judgment can provide the emotional intelligence and critical thinking that algorithms may lack, human advisors may be better equipped to consider a client's specific situation, including their risk tolerance, financial objectives, and personal preferences. This may result in a more tailored investment plan that aligns with the client's goals and values. A hybrid approach that combines algorithmic recommendations with expert opinion could provide investors with the benefits of both methods, reducing the risk of human bias and error while delivering a personalized and informed investment recommendation.

4. Online Payment

The development of e-commerce and the spread of the Internet have made it possible to digitize payments using a variety of online payment options, including electronic currency, debit and credit cards, contactless payments, and mobile wallets, among others. This has led to online payment systems being favored over cash-based currency systems due to the convenience of monetary transactions and the secure and expedient access to financial resources, among other factors [8]. An online payment system, also known as an Electronic Payment System (EPS) or Inter-Organizational Information System (IOS), refers to a type of financial transaction system that connects multiple organizations and individual users. The EPS/IOS exhibits unique characteristics that distinguish it from traditional internal information systems in terms of technological, relational, and organizational complexities, necessitating extensive collaboration and integration among its various components.

Recent advancements in mobile fintech payment services include Apple Pay, which relies on both hardware and operating systems developed by Apple and is compatible only with Apple devices and iOS. With this payment service, transactions can be completed without having to unlock the device's screen, and fingerprint recognition is used for biometric authentication. Transaction information is kept private by employing encrypted one-time token data, and security is improved by using a separate Secure Element (SE) to store sensitive data safely. Apple Watches and iPhones both support Apple Pay, making it more convenient. It only supports Near Field Communication (NFC), unlike Samsung Pay, which limits its applicability in the current payment infrastructure. Contrarily, Alipay is a fintech mobile payment service based on payment platform providers that can be utilized on any device, regardless of the maker of the hardware or operating system. Alibaba, the largest e-commerce company in China, launched this payment method, which authenticates users using a special barcode or Quick Response (QR) code displayed on their smartphone screens. The payment information is approved when the cashier scans the code, and it does not require a costly smartphone with fingerprint identification or NFC for near-field communication. Aside from barcode scanners, the payment provider does not need to install any additional hardware, such as POS devices. However, the installation of a specific Alipay app is necessary for its widespread use, which restricts its applicability to places where it is popular. To reload cash, users can create a separate Alipay account that is connected to a bank. Additionally, WeChat Pay, a popular payment system in China, enables users to send or receive money using a QR code. WeChat Pay has a substantial social media following, which keeps users from switching to other messengers and draws in new ones. These payment methods

enable mobile payments through a single payment provider without the need for several financial services, and they have the advantage of straightforward password or biometric authentication. They benefit retailers who sell goods both online and offline, not just those who use payments [9].

As the application of online payments has matured, new opportunities have emerged for connecting with Bitcoin payment platforms and making investments. This expansion of platforms offers promising prospects for investors as cryptocurrencies and internet payments continue to gain popularity. The success of mobile fintech payment services depends heavily on their ability to provide both security and efficiency. Getting there can be difficult because of issues with atomicity, integrity, privacy, and availability as well as difficulty with mutual authentication and authorization. However, to safeguard users' personal and financial data, online payment businesses have implemented measures like two-factor authentication, biometric verification, and advanced encryption. Compared to traditional payment methods, online payments are both more efficient and faster, allowing consumers to complete purchases and transfer funds with just a few taps on their mobile devices, without the need for physical currency or bank cards. But failing to meet these requirements can quickly erode user trust and acceptance. Thus, mobile payment solutions must prioritize both security and efficiency to remain competitive and successful in the marketplace.

5. P2P Lending

Another Fintech trend that has gained popularity in recent years is peer-to-peer (P2P) lending platforms. These platforms function as online marketplaces, connecting borrowers and lenders directly without the need for intermediaries like banks. The first P2P lending platform, Zopa, was launched in the UK in 2005, and it has since served as a model for other similar systems. The founders of Zopa, who were former employees of online bank Egg, identified an opportunity to disrupt intermediation and focused on unsecured personal loans [10]. P2P lending platforms provide borrowers with a faster and more convenient option to obtain loans, with minimal paperwork requirements compared to traditional banking procedures. Lenders can potentially earn higher returns compared to other financial options like savings accounts, bonds, or equities. P2P lending platforms use algorithms and outside credit scoring companies to assess the creditworthiness of both borrowers and lenders, which helps evaluate the likelihood of default.

Despite these advantages, P2P lending platforms have faced challenges, including a lack of transparency and high default rates among borrowers who may be using P2P lending as a last resort. These challenges impact market efficiency. Fintech technologies have tried to improve the lending process through alternative credit models, online data sources, and quicker lending procedures. However, P2P lending's success or failure is significantly influenced by interest rates, which are beyond the control of businesses. Debt consolidation and credit card refinancing are the primary focus of P2P lending, while crowdfunding aims to raise money for projects. Therefore, P2P lending and crowdfunding differ in their goals and objectives.

The P2P lending industry requires strong legal oversight to ensure the safety of both borrowers and lenders. This is especially true in China, where the P2P lending industry has faced significant challenges due to increasing default rates. The industry has grown rapidly since 2007, with investors providing large amounts of capital and small and medium-sized enterprises driving demand. However, the lack of regulations has been a major concern, and many fear that more businesses may fail before regulations are implemented. Although China's first online lending regulations were issued in August 2016, the delayed nature of their implementation has allowed some district officials to loosen regulations to secure more funding. This lack of oversight has led to some borrowers abusing the system by defaulting on their loans, resulting in the shutdown of platforms and significant losses for millions of investors [11]. Therefore, it is imperative to establish stringent regulations and ensure that they are enforced to prevent such occurrences in the future. P2P lending systems offer a modern

approach to lending that benefits borrowers and lenders alike. However, to guarantee the security of P2P lending platforms for all participants, issues concerning credit risk, transparency, and regulatory frameworks must be resolved. In order to make informed investment decisions, it is essential that investors stay up-to-date on the regulatory and policy landscape as the P2P lending industry grows.

6. Conclusion

Fintech has had a major impact on the traditional banking industry, driving innovation and leading to a number of benefits. For example, fintech has boosted productivity and cut costs for financial institutions, which has in turn led to improved client satisfaction. Additionally, fintech has made financial services more accessible and inclusive, particularly for those who may have been underserved by traditional banking. In conclusion, digital transformation has changed the traditional banking sector by introducing technological innovations. The COVID-19 pandemic has accelerated the growth of fintech as conventional financial services have been hampered by the current economic crisis. The fintech sector is rapidly evolving, driven by opportunities arising from cryptocurrencies, robo-advisors, online payment systems, and P2P lending platforms. However, such rapid innovation comes with risks, including cyber-attacks, data privacy concerns, and credit, market, and liquidity risks. To ensure financial stability, proactive risk management strategies are critical. A balance between innovation and regulation is required to achieve long-term financial stability. Financial institutions can collaborate with technology startups to expand their customer base and product offerings, while also considering volatility and project longevity when investing in fintech. Cybersecurity and regulation of innovative products can significantly reduce the risks of fintech that affect consumer protection and financial stability. Machine learning and deep learning techniques can be employed to identify and mitigate fintech risks. The future of the banking and insurance industries' business models looks promising, thanks to the fintech sector.

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