International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 8 Issue 6, Nov-Dec 2024 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Fintech: An Introduction

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ABSTRACT

FinTech (also known as Financial Technology) is a catch-all term referring to software, mobile applications, and other technologies created to improve and automate traditional forms of finance for businesses and consumers alike. It refers to the application of innovative technologies to products and services in the financial industry. This has to do with mobile payment apps to complex blockchain networks housing encrypted transactions and so on.

The paper looks at the pros and cons of FinTech, the drawbacks and the possible solutions for the benefits of humanity.

KEYWORDS: *FinTech, mobile banking, blockchain, robo-advisors, cryptocurrencies, big data, artificial intelligence (AI)*

How to cite this paper: Paul A. Adekunte | Matthew N. O. Sadiku | Janet O. Sadiku "Fintech: An Introduction" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-8 | Issue-6, December 2024, pp.1074-1079, URL: www.ijtsrd.com/papers/ijtsrd72750.pdf

IJTSRD72750

INTRODUCTION

FinTech also known as "financial technology" is the application of innovative technologies to products and services in the financial industry, which involves an array of technological advancements in financial services, including mobile banking, online lending platforms, digital payment systems, robo-advisors, and blockchain-based applications such as cryptocurrencies [1]. Fintech refers to new applications, processes, products or business models in the field of financial services that are provided through the internet, as shown in Figure 1 [2]

HISTORY

FinTech evolution spans over a century and marked by significant technological innovations that have revolutionized the financial industry. The term "fintech" emerged in the late 20th century but gained prominence in the 1990s [3]. The term first appeared in 1967 in an article "The Boston Globe" titled "Fin-Tech New Source of Seed Money" – which reported on a startup investment company established by former executives of Computer Control Company, aimed at providing venture capital and industry expertise to startups in the financial technology industry [3].

The groundwork for early fintech was laid in the 19th century with the development of the "telegraph" and transactlantic cable systems – which helped to transform the transmission of financial information across borders, enabling faster and more efficient communication between financial institutions, as shown in Figure 2 [4].

In 1918 the Federal Reserve Bank established the Firewire Funds Services that brought about a significant milestone in electronic money movement. This was made possible by the use of telegraph lines to facilitate secure transfers between member banks, which marked one of the first instances of electronic money movement [4, 5]. The Diners Club International first introduced universal credit card in 1950, which reshaped consumer spending and credit. This innovation paved the way for the launch of American Express cards in 1958 and the BankAmericacard (later Visa) in 1959, further expanding the credit card industry [6, 7].

The digital revolution was in the 1960s and 1970s marking the beginning of the shift from analog to digital finance, as shown in Figure 3, followed by several groundbreaking developments that shaped the future of financial technology. The world's first ATM in London was introduced by Barclays in 1967 which revolutionized access to cash and basic services. Inspired by vending machines, the ATM marked a significant step towards self-service banking [8].

With the establishment of the Inter-bank Computer Bureau in the UK in 1968, Fintech infrastructure continued to evolve – this laid the foundation for the country's first automated "clearing house" system that evolved into BACS (Bankers' Automated Clearing Services) to facilitate electronic funds transfers between banks [9]. In 1971, the world of "securities trading" was transformed via the establishment of NASDAQ, the world's first digital "stock exchanges" [10]. Two years later, the founding of the SWIFT (Society for Worldwide Interbank Financial Telecommunication) standardized and secured communication between financial institutions globally. The SWIFT's messaging then became the global standard for international money and security transfers [11].

The introduction of electronic fund transfer systems, such as the ACH (Automated Clearing House) in the United States, facilitated faster and more efficient money transfers. The ACH network allowed for direct deposits, payroll payments, and electronic bill payments, significantly reducing the need for paper checks [12].

FinTech witnessed significant developments during the 1980s and 1990s with the rise of digital financial services and the early stages of online banking. A major breakthrough came when Michael Bloomberg founded Innovative Market Systems (later Bloomberg L. P.) and introduced the Bloomberg Terminal. This innovation revolutionized how financial professionals accessed and analyzed market data, providing real-time financial market data, analytics, and news to financial institutions worldwide [13]. During the early 1980s, the Bank of Scotland offered the first online banking service known as Homelink, where customers can view statements, transfer money, and pay bills using their televisions and telephones [14]. The late 1980s witnessed the development of EDI (Electronic Data Interchange) standards, that enabled businesses to exchange financial documents electronically and streamlining B2B (business-to-business) transactions [15].

Consumer digital banking came to the limelight in 1994 when Stanford Federal Credit Union launched the first internet banking website. The first Internet Bank was founded by David Becker, which marked a new era in online-only banking [16].

Furthermore are the followings [1]:

- The Dot-com era, in the late 1990s and early 2000s
- PayPal in 1998
- The Post-financial crisis of the 2008 global financial crisis
- The invention of Bitcoin in 2008 by an anonymous creator who used the pseudonym Satoshi Nakamoto brought the evolution of digital currencies and decentralized finance, which resulted to the development in the field of cryptocurrencies, as shown in Figure 4.
- The developer-friendly APIs that simplified online payment integration, lowering the barriers to entry for e-commerce and online financial services
- The increasing adoption of smartphones
- The launch of Google Wallet in 2011 and Apple Pay in 2014 assisted to popularize mobile payments. There was also the rise of peer-to-peer (P2P) payment applications too, making it simpler for people to split bills, share costs, or send money to friends and family
- The global COVID-19 pandemic in early 2000 led to acceleration of the adoption of digital financial services due to lockdowns and social distancing measures that forced businesses and consumers to rely more heavily on digital channels with a surge in fintech solutions.

BENEFITS OF FINTECHS

Fintechs have put Spain in the 6th position worldwide for the number of fintech companies that are in the sector. Some of the benefits of fintech include [17]:

- Personalized service – by offering specific financial products and services adapted to customers' needs.
- Convenience and speed – they offer real-time, 24-hour services every day of the year.
- Easy access – this is by giving easy access to efficient, agile, and simple paperless operations without leaving the house.
- Technology – it can guarantee the veracity and security of transactions from any device.
- Financial inclusion and democratization of access to financial products – the access to financial products does not have to be in person and can be digital, thereby improving financial inclusion.

- Transparency and fewer fees.
- New products and services.
- They offer richer data, improved user experience and more modern platforms, as shown in Figure 5.

In the new financial ecosystem, both the traditional financial institutions and fintechs now collaborate leading to greater stability, wider range of products, and increased knowledge about the customer.

The financial sector's ability to respond to the pandemic has been fantastic due to the incorporation and use of innovative technologies such as Big Data or Artificial Intelligence, as shown in Figure 6, which are able to standardize, analyze, and process enormous quantities of data to assess the present situation, identify behavior patterns and devise effective strategies. Big Data in the financial sector is used to [17, 18, 19]:

- Proactively anticipate and mitigate fraud
- Automatically assess customer solvency
- Minimize the risk of financial decisions
- Improve security mechanisms and policies for transactions
- Adapt to financial regulations to prevent fraud
- Cost reduction
- Improve the customer relationship and user experience
- Personalize the customer experience

CHALLENGES FACED BY FINTECH INDUSTRY AND SOLUTIONS

The following are some of the challenges fintech industry faces and the solutions [20]:

1. Data security: this is a major concern in the internet world, be it mobile banking, payment apps, or Fintech in general. The traditional banking systems make use of security guards, CCTVs, vaults, and heavy bulletproof doors to keep their data safe and secure. However, as with virtual security, things are not as easy as we think. Vulnerabilities are much discreet and have potentially more impact on users, as not only their money is at stake but their personal data too. The solution can be achieved via a high-level security app with the help of the Fintech app development company. The security app will consist of:

- Two-factor authorization
- Biometric authentication
- Data encryption and obfuscation
- Real-time alerts and notifications
- Behavior analysis

2. Compliance with government regulations: finance is one of the most regulated sectors by the government. Therefore, the ways out are:

- to check for legal compliance before creating an application or utilizing the software
- if required, a legal consultant can be hired to lead one through all the basic details and policy
- before entering the market, ensure that the legal department is aware of the latest government policies

3. Lack of mobile and tech expertise: some finance companies or banks may not have proper or convenient mobile banking services. The solutions are that your mobile services must have the following features:

- QR-code for payments in public transport
- NFC chip in shops
- Automatic scanning of a credit card number with a lense
- Two-factor authentication with a finger-print

4. Big Data and AI Integration: the use of big data and AI are making their impact in every organization. Using big data, organizations can collect personal information about users, social status to financial behavior, habits, and in-app activity. With the help of big data, AI automates the whole process to detect fraud, perform a risk analysis, and manage transactions effectively. For AI and big data to combine, one needs to teach AI through machine learning, which requires large amounts of data to train the system. Need to train the machine learning system on smaller amounts of data because most banking apps are unable to process and fetch a large number of data sets.

5. Blockchain integration: the integration of a blockchain is a great challenge for many financial organizations. To integrate blockchain technology, one must ensure to adhere to government guidelines and laws, and avoid any government restrictions concerning your mobile services as they are still hesitant to allow massive blockchain adoption.

6. User retention and user experience: this is also a major concern for the fintech sector, but despite this, a fintech app should manage a balance between user experience and security. Hence, you should offer a mobile app banking service that is neither easy to break nor too hard to access. The solution is to:

- Develop a fintech app that the UI/UX part is secure and user-friendly
- Use two-factor authentication, but asking the details again and again for login may frustrate users

- Analyze your competitors and observe what they are using to offer a seamless user experience.

7. Effective marketing tactics to acquire customers: fintech organizations fail to understand their niche, target audience, and strategies. There is need to:
- Ensure that you are significantly better than your competitors by investing a bunch of money, effort, and human resources to offer seamless services to your customers or walk along with the traditional banks.
- Come up with a strong and effective marketing strategy that consists of advertising, collaboration, etc.

8. Personalized services: this has been the primary and core factor of banking for a long time. In today's world, personalization means interacting with a user at the right time on their preferred channel with a proper solution to their exact needs. The fintech organizations should:
- Have precise customer insights
- Understand the behavior of users and get insight into the user's health, social interactions, and events
- Develop trust with customers
- Keep user's data secure and safe.

CONCLUSION

Fintech offers opportunities as a fast growing technology to enhance the quality of financial services, improve customer satisfaction/experience, increase financial inclusion, support economic growth, and welfare gains. However, there is the need to prepare for known and new risks that may likely emerge to threaten financial stability, economic growth and social welfare. Moreover, fintech startups are to offer more efficient and effective solutions to benefit SMEs by providing them with increased access to more diverse funding options. India is adopting AgriTech, HealthTech and ProTech startups to disrupt traditional ways of doing business in these three industries to facilitate the nation's most vital necessities of food, healthcare, and shelter for citizens – this should also be adopted by all other countries.

More information on Fintech can be found in [21, 22] and the related journal:
- American Journal of Financial Technology and Innovation (AJFTI)

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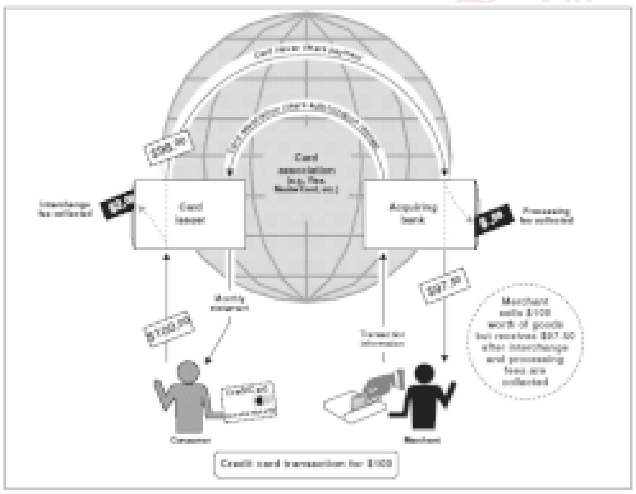

Figure 1. Fintech

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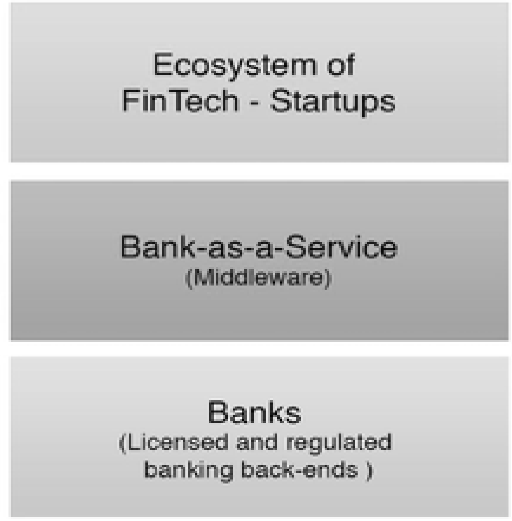

Figure 2. Banking as a service

Source:https://www.google.com/search?sca_esv=d7e7d90bd6b3a957&sxsrf=ADLYWIJcO9zr53mtMtJTZIJPOGy7i3BWA:1733927547466&q=images+on+fintech+by+wikipedia&udm=2&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkWd8nbOJfsBGGB5IQQO6L3JzWreY9LW7LdGrLDAFqYDH32tgteNhtZOxnGezgnEGc8k4dQgIn4td5_IKOvJAVYNMpBG_vzv09_z3ozdsV1574v_l4gmjMdaDFLpg9ELpUCM3lLnYw1mpVTSmqh03mtH24pA&sa=X&ved=2ahUKEwj5t6G895KAxWwX0EAHaHAFSwQtKgLegQIFBAB#vhid=bHIhnFtjCywcoM&vssid=mosaic

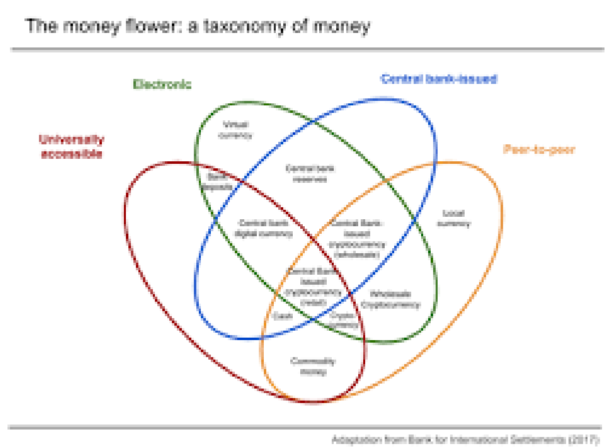

Figure 3. Digital currency

Source:https://www.google.com/search?sca_esv=d7e7d90bd6b3a957&sxsrf=ADLYWIJcO9zr53mtMtJTZIJPOGy7i3BWA:1733927547466&q=images+on+fintech+by+wikipedia&udm=2&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkWd8nbOJfsBGGB5IQQO6L3JzWreY9LW7LdGrLDAFqYDH32tgteNhtZOxnGezgnEGc8k4dQgIn4td5_IKOvJAVYNMpBG_vzv09_z3ozdsV1574v_l4gmjMdaDFLpg9ELpUCM3lLnYw1mpVTSmqh03mtH24pA&sa=X&ve=2ahUKEwj5t6G895KAxWwX0EAHaHAFSwQtKgLegQIFBAB#vhid=_Hopn_AOg2ynhM&vssid=mosac

Figure 4. Cryptocurrency

Source:https://www.google.com/search?sca_esv=d7e7d90bd6b3a957&sxsrf=ADLYWIJcO9zr53mtMtJTZIJPOGy7i3BWA:1733927547466&q=images+on+fintech+by+wikipedia&udm=2&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkWd8nbOJfsBGGB5IQQO6L3JzWreY9LW7LdGrLDAFqYDH32tgteNhtZOxnGezgnEGc8k4dQgIn4td5_IKOvJAVYNMpBG_vzv09_z3ozdsV1574v_l4gmjMdaDFLpg9ELpUCM3lLnYw1mpVTSmqh03mtH24pA&sa=X&ved=2ahUKEwj5t6G895KAxWwX0EAHaHAFSwQtKgLegQIFBAB#vhid=WUHEkJGGw7HO5M&vssid=mosaic

Figure 5. Opay

Source:https://www.google.com/search?sca_esv=d7e7d90bd6b3a957&sxsrf=ADLYWIJcO9zr53mtMtJTZIJPOGy7i3BWA:1733927547466&q=images+on+fintech+by+wikipedia&udm=2&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkWd8nbOJfsBGGB5IQQO6L3JzWreY9LW7LdGrLDAFqYDH32tgteNhtZOxnGezgnEGc8k4dQgIn4td5_IKOvJAVYNMpBG_vzv09_z3ozdsV1574v_l4gmjMdaDFLpg9ELpUCM3lLnYw1mpVTSmqh03mtH24pA&sa=X&ved=2ahUKEwj5t6G895KAxWwX0EAHaHAFSwQtKgLegQIFBAB#vhid=KSv0trpyqHjOlM&vssid=mosaic

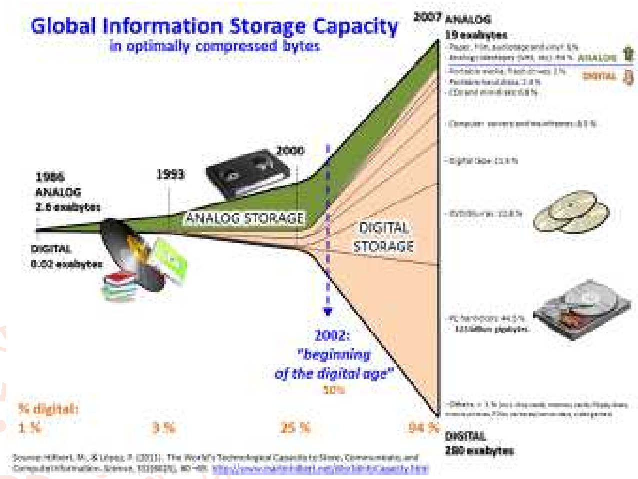

Figure 6. Big data

Source:https://www.google.com/search?sca_esv=d7e7d90bd6b3a957&sxsrf=ADLYWIJcO9zr53mtMtJTZIJPOGy7i3BWA:1733927547466&q=images+on+fintech+by+wikipedia&udm=2&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkWd8nbOJfsBGGB5IQQO6L3JzWreY9LW7LdGrLDAFqYDH32tgteNhtZOxnGezgnEGc8k4dQgIn4td5_IKOvJAVYNMpBG_vzv09_z3ozdsV1574v_l4gmjMdaDFLpg9ELpUCM3lLnYw1mpVTSmqh03mtH24pA&sa=X&ved=2ahUKEwj5t6G895KAxWwX0EAHaHAFSwQtKgLegQIFBAB#vhid=qm_X_d-ZifIq-M&vssid=mosaic