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Financial Technology: Evolution, Innovation and the Effect of COVID-19 Pandemic

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ABSTRACT: In order to describe the importance of financial technology and its role in finance, in this paper, studies related to importance of Financial Technology, FinTech have been explained. In order to get a better grasp of this concept, the evolution and history of this industry has been elaborately discussed. The current position of the industry and recent developments of technology in the finance sector has also been discussed in the paper, along with some key innovations of this industry. Finally, the paper studies how the COVID-19 Pandemic has affected FinTechs across the world and also how they have responded to this situation.

I. INTRODUCTION

FinTech, or Financial Technology, refers to the techniques or methods that are used to improve, automate and simplify the use and delivery of financial services. It is the technology that is used to help businesses and firms, their owners and consumers for better financial management, using computer software or smartphone-based apps.

Today, FinTech refers to a specific, rapidly growing, industry that seeks to serve the interests of both consumers and firms in various ways. ^[1] According to an article published by T4 Research Team in August 2020, the global revenue of the Fintech Industry was about \$159 Billion in 2019 and is projected to grow by approximately 25% every year, as estimated before the emergence of the COVID-19 Pandemic.

While it may have attracted significant attention from industrialists and consumers after 2014^[2], this relationship between finance and technology has existed for a long time now.

II. EVOLUTION OF FINANCIAL TECHNOLOGY

According to a paper published by Buckley *et al.* ^[3], the evolution of the FinTech Industry can be divided into three main eras:

- A. FinTech 1.0: 1866 to 1967
- B. FinTech 2.0: 1967-2008
- C. FinTech 3.0: 2008-current

During the first era, it is perceived by the public that the industry used little to no digital means. While the industry was still linked with technology, it was largely analogue. This period (1866 to 1967) has been called FinTech 1.0 by the authors of this paper. The development of digital communication technology from 1967, led to the transformation of finance to a mostly digital industry. By late 1980s, finance in the developed countries was highly digitalized and globalized. This era, called FinTech 2.0, continued till 2008, when the traditional financial services industry, which primarily made use of technology to deliver products and services, saw a new trend. New start-ups along with established technological companies emerged which offered financial services directly to the businesses and the general public. This is the current era of the industry, called Fintech 3.0.

- I. FinTech 1.0 (1866 to 1967):** Technology and finance have remained interlinked for a long time. The origins of this relationship can be traced back to the transition of the hunter-gatherer groups to settled agricultural states, where



it contributed to the development of administrative systems for the state administration. Written records of some of the earliest civilizations, like Mesopotamia, show evidence of financial transactions^[4]. This shows the relation of finance with technology, written records being some of the oldest forms of information technology.

The first stage of financial globalization was from the beginning of the late 19th century till the beginning of the First World War. Inventions like the telegraph, railroads, canals and steamships helped to speed up the financial transactions, information, payments, etc. across borders. During wartime, however, financial globalization was limited and constrained. On the other hand, technological innovations continued to grow. This period saw the invention of code-breaking tools by International Business Machines (IBM), the first handheld financial calculator by Texas Instruments in 1967^[5]. Credit cards were introduced for the first time in the US, first by Diner's Club (1950), followed by Bank of America and American Express in 1958^[6]. By 1966, InterBank Card Associations (MasterCard)^[7] were established in the United States. By this time, the development of a telex network, the first fax machine (in 1963 by Xerox Corporation)^[8] and the first ATM by Barclays in the UK paved the way for the commencement of FinTech 2.0.

A. FinTech 2.0 (1967 to 2008):

This was the era when the financial technology industry transitioned from an analogue industry to a digital one. The industry saw a number of changes during this time in various areas like payments, securities, consumer and regulatory action.

The establishment of the Inter-Computer Bureau in the UK (1968), the US Clearing House Interbank Payments System (1970) and Society of Worldwide Interbank Financial Telecommunications (1973)^[9] are some indications of the changes that industry went through in the area of payments. It should be noted that Fedwire (established in 1918) became an electronic system in the early 1970s.

The first major regulatory focus on FinTech issues was also triggered during this time after the collapse of Herstatt Bank (1974). A major period of regulatory attention to the risks of cross-border financial interconnections and technology was marked by the year 1987. The "Black Monday" stock market crash and its reaction led to the introduction of various mechanisms to control the speed of price changes and stimulated the securities regulators to begin working on mechanisms to support cooperation. The Single European Act of 1986, the Big Bang financial liberalization process in 1986, the Maastricht Treaty (1992) along with a series of financial services Directives and Regulations from the late 1980s marked the onset of the eventual complete interconnection of the EU financial markets. The end of fixed securities commissions, the establishment of NASDAQ (National Association of Securities Dealers Automated Quotations) in the US (1971)^[10], and the development of the National Market System indicated the transition of the physical trading of securities to the current fully electronic securities trading. Online Banking was also introduced in 1980 in the US and in 1983 in the UK by the Nottingham Building Society^[11]. During this period, various financial institutions increased their IT usage in internal operations, replacing most paper-based mechanisms by the 1980s.

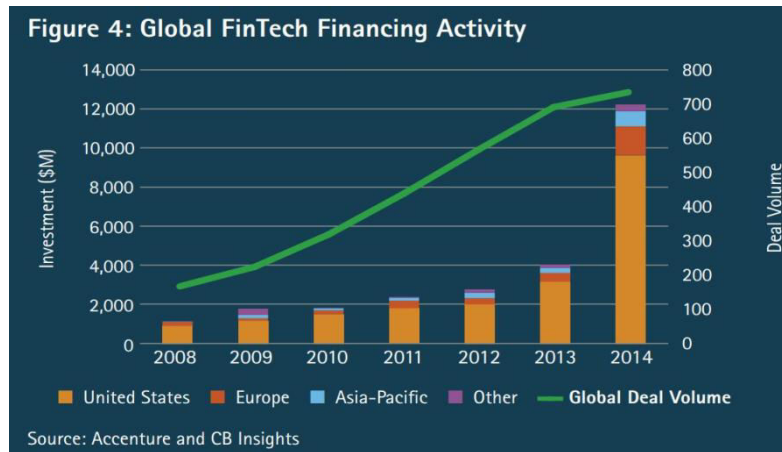
By 1998, the financial services industry had been digitized almost completely. The emergence of the Internet set the base for the next stage of development in the industry. It began in 1995 with the use of World Wide Web to provide online account checking by Wells Fargo^[12]. During the 2000s, banks in the US had secured a large number of online customers, the UK saw its first direct banks without physical branches and major jurisdictions of the world rapidly developed related regulatory frameworks to address the risks of this new development.

B. FinTech 3.0 (2008 - present):

This era has witnessed a shift in the mindset from the perspective of a retail customer to 'who' is capable of providing financial services in terms of availability of resources and legitimate means. The market conditions have aligned in a way that has encouraged innovative market players like economic conditions, public perception, political demand, etc. to emerge in the financial services industry.

III. FINTECH TODAY

The FinTech industry and its developments have clearly surprised the global financial markets and traditional banks with its achievements in recent years. According to Accenture and CB Insights data published in 2015 (shown in the graph below)^[13], the global fintech investment has grown by 201% from 2013 to 2014, accounting for more than USD 12 Billion worth of investment across more than 700 deals.



Most of this was contributed by the US, followed by Europe and other regions. However, Europe saw the most growth of all these regions, rising by more than 200%. The same report also emphasizes the domination of the UK and Ireland in the EU FinTech industry.

IV. SOME FINTECH INNOVATIONS:

1. P2P Lending: Traditionally, regulated financial institutions like banks were the only sources of lending transactions for individuals and business organizations. While the rate of interest on such loans was lower as compared to that of bank deposits, the process to obtain such loans was long and complex, involving a lot of collateral. This seemed to be a problem for start-ups or small-scale businesses as they often lacked credit points or collateral. P2P Lending, or Peer-to-Peer Lending, is based on networks with high security levels that link a number of computer systems. This new generation of fundraising model allows lenders to raise money for financing loans for many borrowers and borrowers have the facility to easily apply for loans using online application forms without having to submit other relevant documents or mortgaging their assets. Borrowers can also borrow from several money lenders at lower interest rates as compared to banks. However, the scope of this lending model doesn't end here. Companies like SoFi and Earnest have expanded its scope by using this model's activities for financing student loans or consolidating personal loans or mortgages. FinTech companies also offer faster services as compared to traditional banks. This makes them more competitive and attractive for borrowers.^[14]

2. Blockchain: Blockchain is a data structure that facilitates recording of transactions of a business network and tracking its tangible or intangible assets. It helps in maintaining transparency as it is a public database and the information can be easily accessed by all members using this software. However, the ledger can only be accessed by permissioned members of the network. Blockchain also gives more confidence, efficiency and opportunity to the members because all members share the same view of the information and can see all the details of the transactions. It can also help track payments, production, accounts, etc.^[15]

3. Crowdfunding: Raising money from a large number of people for a common goal in order to fund a project or business venture is called crowdfunding. Crowdfunding platforms allow users to easily set up online fundraising, promote and advertise their project or idea quickly and receive feedback at the same time (Augustine 2015). According to a thesis published by Oanh Truong, *'How the Fintech Industry is Changing the World'*, Kickstarter is the biggest and most popular fundraising platform for projects in the areas of art, music, design, technology, etc. The paper states that the company has helped fund over 10,000 projects, receiving an estimate of 5.5 million visitors each month. However, according to MassSolution's 2015CF The Crowdfunding Industry report, GoFundMe topped Kickstarter as the #1 Crowdfunding platform in 2014, raising about USD 156 million by the fourth quarter of 2014^[16].

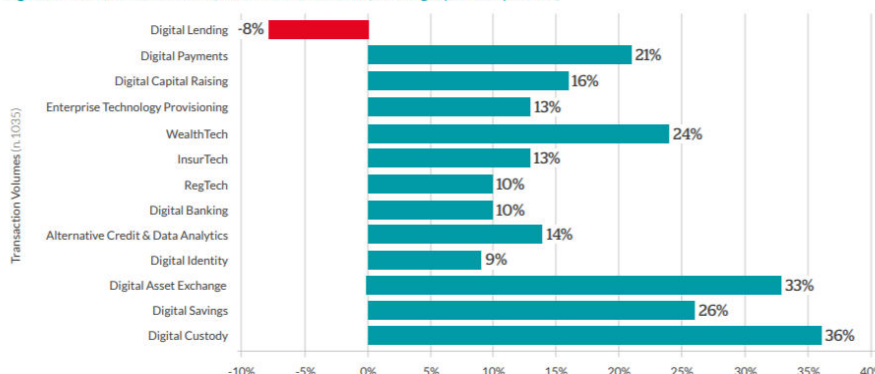
4. Robo-Advisors: As suggested by the term, robo-advisors are digital financial advisors that manage investments and provide financial advice with minimal human intervention. They deliver advice based on the inputs from the investor. Algorithms are used to understand and predict investor preferences, goals and risks. This is generally done by means of demographic or psychographic questions that help devise a model portfolio.^[17]

5. Cryptocurrency: Cryptocurrency is a digital currency that serves as a medium of exchange, store of value or a unit of measure.^[18] Inherently, cryptocurrencies have little value, but they are used to price the value of other assets. Many cryptocurrencies are based on a blockchain network^[19]. The first such cryptocurrency was Bitcoin, launched in 2009. Bitcoin was originally developed by Satoshi Nakamoto and Martti Malmi. When Nakamoto left Bitcoin.org, he transferred ownership to additional people, apart from the developers of the software. Today, this site is an open-source independent project^[20]. Along with bitcoin, many other cryptocurrencies have emerged in the market today, some as clones of Bitcoin and some developed from scratch.

V. FINTECH AND COVID-19:

According to a study by the University of Cambridge^[21], FinTechs across the world have experienced growth during the COVID-19. Their response to the pandemic has been resilient. Out of 13 firms surveyed by the study, 12 reported growth in the first half of 2020 as compared to that of 2019. On average, the firms reported a year-on-year increase of 13% for the first quarter of 2020 and about 11% for the second in terms of their transaction numbers and volume. However, this growth has been very uneven across various markets and geographical regions. Among the markets, all FinTech business verticals reported growth, except for digital lending which experienced a contraction in its transaction volume.

Figure 4: Transaction Volumes, All FinTech Verticals (% change, year-on-year H1)



Source: The Global Covid-19 FinTech Market Rapid Assessment Study, University of Cambridge

FinTechs across all geographical regions have reported growth, despite the rate of growth varying throughout. The highest increase, of about 40%, was reported in the Middle East and North Africa. North America and Sub-Saharan Africa weren't far behind with a 21% increase in their transaction volume.



The report also observed that FinTechs in countries where lockdowns were highly stringent saw about 50 per cent higher growth in transaction volume as compared to those in countries with less stringent lockdowns.

In response to COVID-19, FinTechs changed their existing services, products and policies along with introducing new ones and responded to higher cyber-security risks. Despite significant willingness of firms, they failed to make significant contributions in the delivery of COVID-19 relief.

Although FinTechs have reported growth, they are also facing quite a lot of challenges posed by the COVID-19 pandemic: operational challenges leading to rise in costs, which are even more of a problem for FinTechs operation in countries with more stringent lockdown measures. Subsequently, the financial position of the firms has deteriorated and there are mixed views among the firms with regards to future fundraising.

VI. CONCLUSION

After an elaborate discussion about FinTech, how long it has existed, its transition from an analogue industry to a digital one, and then further studying the exponential growth seen in the industry, the innovations of this industry, and finally the impact of COVID-19 pandemic on the financial technology industry, it can be concluded that the role of financial technology is a very significant one, and that this relationship between technology and finance has existed for a very long time now. It is also true that with time, technology has embedded itself into the core of finance and has now become an indispensable part of finance and its services. FinTech has revolutionized the finance industry and it is expected to continue growing, as is suggested by many authors like Sanjay Phadke in his book FinTech Future: The Digital DNA of Finance.

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