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Evolution of FinTech: A Systematic Literature Review

Ewolucja FinTechów: systematyczny przegląd literatury

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Abstract. “FinTech” is a term derived from “Financial technology,” relating to innovative financial solutions permitted by technology. It denotes a contemporary combination of financial services and information technology. However, the integration of finance and technology has deep historical heritages and has advanced through four distinct eras: initially financial globalization then Analogue to digital, after transitioning to digital finance in the late 20th century. Since 2018, a new FinTech era has emerged globally, marked not merely by new financial products, but by state-of-the-art delivery methods driven by swiftly advancing technology, particularly in retail banking. This latest phase, Disruptive Technologies, presents regulatory and operational challenges, emphasizing the need to balance the potential aids of innovation against inherent risks. Our analysis of FinTech’s 157-year evolution maintains against premature or overly rigid regulation at this fundamental crisis.
Keywords: FinTech Evolution, Telegram, Blockchain, AI, ML, UPI, E-banking

Abstrakt. „FinTech” to termin wywodzący się od „technologii finansowej”, odnoszący się do innowacyjnych rozwiązań finansowych dozwolonych przez technologię. Oznacza nowoczesne połączenie usług finansowych i technologii informacyjnych. Jednak integracja finansów i technologii ma głębokie dziedzictwo historyczne i przeszła przez cztery różne epoki: początkowo globalizację finansową, następnie analogową i cyfrową, a pod koniec XX wieku przejście na finanse cyfrowe. Od 2018 roku na całym świecie nastąpiła nowa era FinTech, naznaczona nie tylko nowymi produktami finansowymi, lecz także najnowocześniejszymi metodami dostarczania, napędzanymi szybko rozwijającą się technologią, szczególnie w bankowości detalicznej. Najnowsza faza, technologie przelomowe, wiąże się z wyzwaniami regulacyjnymi i operacyjnymi, podkreślając potrzebę zrównoważenia potencjalnej pomocy w zakresie innowacji z nieodłącznym ryzykiem. Nasza analiza 157-letniej ewolucji FinTech potwierdza, że w obliczu tego fundamentalnego kryzysu nie ma przedwczesnych lub zbyt sztywnych regulacji.

Słowa kluczowe: ewolucja FinTechów, telegram, blockchain, AI, ML, UPI, e-bankowość

Introduction

The term's derivation can be outlined to the early 1990s and denoted to the "Financial Services Technology Consortium", a venture Citigroup began to simplify technical collaboration efforts. However, it is only since 2014 (Hassan, Rabbani, Ali, 2020) that the sector has attracted the focused attention of regulators, industry participants, and consumers alike. The term now refers to a large and rapidly growing industry representing between US\$ 12 billion 3 and US\$ 197 billion 4 in investment as of 2014, depending on whether one considers start-ups (FinTech 3.0) only or the full spectrum of applications, including traditional financial institutions (FinTech 2.0).

FinTech has been visibly developing in the obverse of our eyes ever since banks went online. With a gradually cashless society, apps and platforms have been shaped to support us well recognize and accomplishing our finances, while new banks have been bent that offer us a slicker knowledge. The financial technology known as FinTech is not a new idea (Shim, Shin, 2016) it is specified that due to the growth and newest evolution of FinTech, a new era is development; FinTech is an association between the financial industry, information technology (IT), and revolution. The term „FinTech” derives from the combination of the words finance and technology and denotes what condensation means, comprising the growth of technology and innovation to support banking and financial skills with the latest technologies. FinTech also describes the relationship between technologies such as online banking, cloud computing, mobile internet, big data, and Block blockchain (Gai, Qiu, Sun, 2016) with financial services businesses such as loans, payments, money transfer, and other banking. Many researchers have studied the FinTech phenomenon and its history, evolution, and ideas, though most scholars have intensive on the FinTech revolution and its impact within the banking sector.

Thus, FinTech continues to be emphasized in studies related to finance, attentive mainly to digitized products and services because of its secure, easy, and crystal-clear procedures. Moreover, the advancement of finance and technology is closely related to the industry 4.0 revolution, including Blockchain, Big Data, Robbo Advisor, Internet of Things (IoT), Cybersecurity, Cloud Computing, and Crowdsourcing. The number of annual publications improved gradually, until 2018. COVID-19 has vital implications for international finance and is increasing and restructuring the phenomenon of study in finance (Hassan, Rabbani, Ali, 2020; Le, Yarovaya, Nasir, 2021). Straight on from 2019, the field induced immense research interest, which resulted in a boom of annual publication numbers.

This study adopts a systematic literature review (SLR) approach, exploiting an organized and predefined method to identify, evaluate, and synthesize related studies on the evolution of FinTech. The review process is divided into several phases: planning, selection, extraction, analysis, and reporting.

Table 1. Definition of FinTech

Year	Source	Definition
2015	Hussain	Financial innovation can be defined as the act of creating and then popularizing new financial instruments as well as new financial technologies, institutions, and markets. It includes institutional, product, and process innovation.
2016	Kim, Park, Choi	FinTech is a service sector, which uses mobile-centered IT technology to enhance the efficiency of the financial system.
2017	Wulan	According to IOSCO “The term of FinTech is used to describe a variety of innovative business models. And emerging technologies that have the potential to transform the financial service industry”.
2019	FinTech – ppt Download, 2024	FinTech is an economic industry composed of companies that use technology to make financial services more efficient. Financial technology companies are generally startups trying to disintermediate incumbent financial systems and challenge traditional corporations that are less reliant on software.

Source: Giglio, 2022

FinTech 1.0 (1866-1967)

In the late 19th century finance and technology were mutual to yield the initial period of financial globalization (Arner, Barberis, Buckley, 2015). John Maynard Keynes (1920) says “The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his door-step; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of the world, and share, without exertion or even trouble”.

In the phase of FinTech 1.0, the public was less aware of the financial services. This era laid the initial foundation for modern financial services by leveraging existing technologies to improve efficiency and connectivity within the financial sector. In those times, vital revolutions involved the telegraph, which enabled instant financial communication, mainframe computers, and credit cards, transforming consumer finance and banking convenience. Electronic Funds Transfer (EFT) systems reorganized payment processes, while the digitization of financial markets better-trading productivity and accessibility.

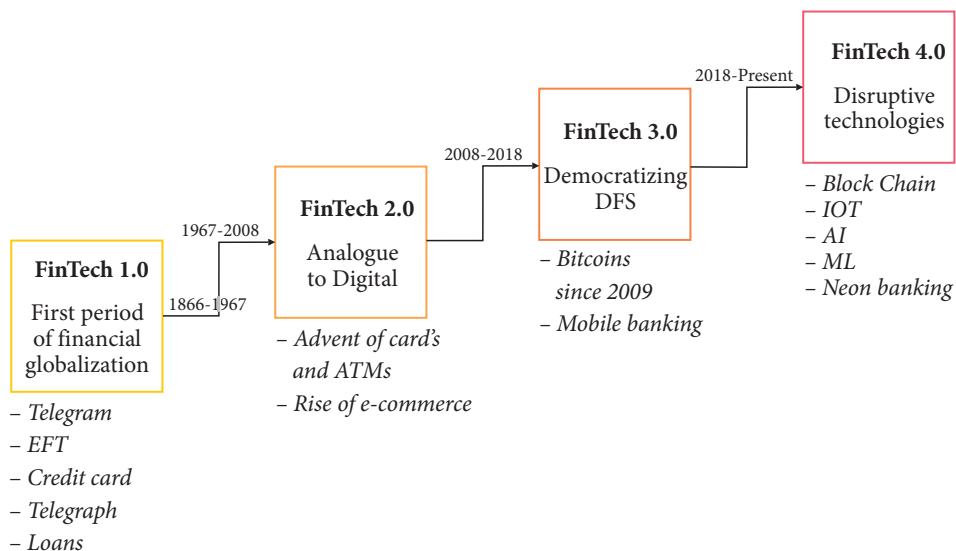


Fig. 1. Evolution of FinTech

Source: own elaboration

Table 2. FinTech 1.0

Title & Citation	Variables	Outcomes
The Post-Office Telegraphs and Their Financial Result (Jevons, 1875)	Money-order	The public is practically aware of the fact that they have, every money order office with the postal department. The telegraph usage customers are satisfied with the service.
An Empirical Examination of a Commercial Bank Loan Offer Function (Phillips, 1931)	Bank loan	This paper studies a large sample of commercial and industrial loan reports. It analyzes the behaviour of the borrowers and investors. The borrowers always go with the low interest rate and investors go with the higher interest rate, also they study the risk of the bankers and borrowers.
New Developments in Retail Financing (Robinson, 1959)	Instalment Credit	After World War II installment sales were increased in durable goods. Considering in terms of increased ownership of consumer goods, capital & labor required to produce and distribute these goods, installment credit has had a significant effect on our standard of living, and economic and social life growth.

contd. tab. 2

Title & Citation	Variables	Outcomes
The Impact of Credit Cards on Demand Deposit Utilization (Marcus, 1960)	Substitute of Cash	Before World War II the customers are not aware of the credit card. It is used in major units in the field at its retail level. The customer's spending pattern was changed they are to advance the cash and decrease the deposit.
The Tripartite Credit Card Transition – A Legal Infant (Maffly, McDonald, 1960)	Third-Party Payment	The omnipotent credit card was used to procure U-drive automobiles, airlines, tickets, luxurious hotel suits, food, drinks, etc. It works between three parties those are issuing company, the cardholder, and the merchant member. After the credit card comes the factoring and letter of credit usage are reduced.
Credit Cards – A Prelude to the Cashless Society (Bergsten, 1966)	Cash Less	The legally intricate world of credit cards focuses on issues like unlawful use and cardholder defenses. He traces the evolution of credit cards from the 1920s to the modern era, accent milestones such as the launch of Diners' Club in 1950 and the emergence of general-purpose bank cards in 1959.
Credit Cards: A Primer (South, 1967)	Credit Card	South America discusses the swift evolution of credit card operations in American banking, leading to the emergence of a complex new area in commercial law and prompting ideas for its organization within the Uniform Commercial Code.
Alternative to the present check-collection system (Odom, 1967)	Payment Mechanism	With the new transfer instruments, the American economy relies primarily on the negotiable check for bulk transactions. Here they suggest two approaches: 1) utilize various technologies to improvements of the bank system; 2) adaptation of Direct-funds- transfer system.
Bank Statements Canceled Checks and Article Four in the Electronic Age (Penney, 1967)	Bank – customer – relationship	This paper deals with the specific problems that arisen under article 4. The purpose of this service is to afford the customer a record of debit and credit posted to the account and permit the transaction facts.

Source: own elaboration

FinTech 2.0 (1967-2008)

Paul Volcker (2009) says “The most important financial innovation that I have seen the past 20 years is the automatic teller machine, which really helps people and prevents visits to the bank and it is a real convenience”. FinTech 2.0, marked the digital innovation in financial services with the general adoption of Internet technology. This era saw the rise of Internet banking, empowering customers to access and manage their accounts online, and the expansion of electronic trading platforms, which improved market competence and transparency. Online payment systems like PayPal transformed e-commerce, while advances in data analytics enhanced risk management and personalized financial services. Mobile technology further developed banking by making financial services more available through mobile apps.

FinTech 3.0 (2008-2018)

Jamie Dimon, CEO of JP Morgan, says “Silicon Valley is coming: There are hundreds of startups with a lot of brains and money working on various alternatives to traditional banking [...] They are very good at reducing the «pain points» in that they can make loans in minutes, which might take banks weeks”. FinTech 3.0 is clear by rapid modernization and interruption driven by advanced technologies and evolving consumer behaviors. Blockchain technology and cryptocurrencies, like Bitcoin, have developed digital assets and decentralized finance. The extensive use of smartphones has led to mobile payments and digital wallets, enhancing transaction convenience. Peer-to-peer lending and crowdfunding platforms have democratized admission to capital, providing alternatives to traditional banking.

Table 3. FinTech 3.0

Title & Citation	Variables	Outcomes
Big Data in Finance and the growth of Large Firms (Begenau, Farboodi, Veldkamp, 2018)	Big data, firm size	Data is a storable, sellable, priced asset, then investment in data must be valued just as if it were investment in a physical asset. Considerate how to price data.
FinTech, Regulatory Arbitrage, and the Rise of Shadow Banks (Buchak, Matvos, Piskorski, Seru, 2018)	Shadow banks	FinTech investors seem to use different information to set interest rates relative to further lenders. A quantitative model of mortgage lending advises that regulation accounts for roughly 60% of shadow bank growth, while technology accounts for roughly 30%.

contd. tab. 3

Title & Citation	Variables	Outcomes
Online Peer-to-Peer Lending – A Literature Review (Bachmann, Becker, Bürckner et al., 2011)	P-2-P lending	The reviewed literature gives insights on how the elements affect the borrowers' likelihood of successful funding, the final interest rate that has to be paid as well and the connection of the borrowers' characteristics and lending success.
Bitcoin: The Revolution of the Payment System? (Wonglimpiyarat, 2016)	Bit coin	Findings show that while Bitcoin and other electronic money innovations are advancing, they are not strong enough to create a paradigm shift. The paper offers insights to support the spread of Bitcoin innovation.
UPI a Catalyst Tool Supporting Digitalization – Utility, Prospects & Issues (Chaterji, Thomas, 2017)	UPI	UPI is a suitable and affordable tool for monetary transactions, though it faces challenges. A strong Aadhar platform, increased financial inclusion, smartphone adoption, and telecom subscription indicate confident prospects for UPI.
Mobile Banking Adoption: A Literature Review (Shaikh, Karjaluo, 2015)	Mobile banking	This article reviews studies, identifying key drivers such as compatibility, usefulness, and attitude. Most focus on SMS banking in developing countries, neglecting smartphones and tablets. The study calls for more inclusive research in mobile banking.
Analysis of FinTech Mobile App Usability for Geriatric Users in India (Lee, 2017)	Mobile application	The study investigates the usability of FinTech mobile apps across diverse age groups, focusing particularly on the geriatric population in India. This research aims to clarify how FinTech apps cater to varying age demographics, especially among older users in India.
A Review of Crowdfunding Research and findings (Kuppuswamy, Bayus, 2018)	Crowdfunding	With the growing number of online crowdfunding communities, the availability of public data, academic research is beginning to explore the drivers behind successfully crowdfunded projects. Results from reward-based, lending-based, equity-based, and donation-based crowdfunding studies.
FinTech and Financial Innovation: Drivers and Depth (Schindler, 2017)	FinTech services	This paper investigates why FinTech is presently prominent by examining the application of existing technologies to financial services and stressing the unique depth of revolution in FinTech compared to traditional financial innovations. It argues that FinTech's transformative potential, driven by deep innovations, has a greater effect on financial stability than conventional financial innovations.

Source: own elaboration

FinTech 4.0 (2018 – present)

David M Brear, says “Technological innovations will be the heart and blood of the banking industry for many years to come and if big banks do not make the most of it, the new players from FinTech and large technology companies surely will”. FinTech 4.0, the present and future of financial services, is noticeable by the convergence of advanced technologies and enlarged personalization. AI and ML will drive hyper-personalized financial services to complete cultured data analysis and real-time decision-making. Blockchain technology will continue to disrupt traditional financial systems by offering reorganized, peer-to-peer financial services. Major computing is expected to revolutionize encoding and risk management, enhancing security and efficiency. Moreover, the combination of Internet of Things (IoT) devices will facilitate seamless, automated financial transactions, even though augmented reality (AR) and virtual reality (VR) will transform customer involvement in banking and financial services. FinTech 4.0 will create interconnected financial ecosystems, promoting collaboration between traditional financial institutions and advanced tech companies.

Table 4. FinTech 4.0

Title & Citation	Variables	Outcomes
Creating credit by making use of mobility with FinTech and IoT (Nakashima, 2018)	IoT (Internet of Things)	For companies of every size, an essential business activity in modern society does not mean simply using technology, but achieving social creation through the use of technology.
Applications of Machine Learning in FinTech Credit Card Fraud Detection (Lacruz, Saniie, 2021)	ML	The study of how AI and machine learning algorithms can lead to credit card fraud detection. The results obtained with both methods are promising as we were able to predict fraudulent transactions with 94% certainty.
FinTech and Financial Inclusion in Southeast Asia and India (Morgan, 2022)	FinTech and financial inclusion	This article concludes that FinTech promotes financial inclusion in two contexts: payment and alternative finance. The literature related to lending or alternative finance is in a nascent stage.
The Impact of FinTech and Blockchain Technologies on Banking and Financial Services (Kumari, Devi, 2022)	Block Chain, FinTech	This study shows that FinTech and blockchain have a strong influence on digitalization trends. The research emphasizes processes of modernization in banking and financial services in addition to a particular focus on the public.
Analyzing Mobile Banking Security using Biometric Authentication (Ali, 2022)	Biometric	Ensuring sustainability hinges on addressing security concerns through secure login and payment methods. The financial sector’s embrace of FinTech innovations underscores their mutual benefits for institutions and customers alike.

contd. tab. 4

Title & Citation	Variables	Outcomes
FinTech and Artificial Intelligence in Relationship Banking and Computer Technology (Jain, Rastogi, Ramesh et al., 2023)	AI, Bank	The essay advocates banks' version of technology and FinTech competition, underlining the value of long-term relationship banking over transactional methods. Its attention to solely focusing on transaction banking stresses the importance of AI and behavioral insights to enhance decision-making and ensure banking stability.
Factors Affecting FinTech Adoption: A Systematic Literature Review (Firmansyah, Masri, Anshari, Besar, 2022)	FinTech Adoption	The main key factors like TAM and UTAUT, as well as trust, financial literacy, and safety as significant determinants. The study emphasizes the ongoing evolution of FinTech adoption and calls for continued research to reflect changing customer behaviors and technological advancements.
FinTech: Emerging Trends and the Future of Finance (Taherdoost, 2023)	FinTech	FinTech transforms finance with digital processes, promising safer, faster services despite adoption challenges. It embraces innovation for evolving customer needs, shaping the future of financial services.
The Role of Chatbots in FinTech (Arnone, 2024)	Chatbots	It emphasizes the balance between automation and personalization, using NLP and machine learning for intelligent chatbot development, with real-world examples demonstrating their role in enhancing efficiency and user engagement in the FinTech industry.

Source: own elaboration

Table 5. Key variables of development of FinTech

FinTech 1.0	FinTech 2.0	FinTech 3.0	FinTech 4.0
1866: First transatlantic cable	1967: First ATM (Barclays), handheld calculator (Texas Instruments)	2007: iPhone launched	2018: AI chatbot
1918: Fedwire	1968, 1970: BACS, CHIPS	2008: Wealth Front is founded and provides automated investment services	2018: Neno banking
1950: Diner's Club	1971: NASDAQ	2009: Bitcoin launch. Square was created, to provide mobile payment solutions	2018: Regtech

contd. tab. 5

FinTech 1.0	FinTech 2.0	FinTech 3.0	FinTech 4.0
1966: Telex	1973: SWIFT	2009: Kickstarter introduced a reward-based crowdfunding platform	2019: Insurtech
	1981: Bloomberg	2011: P2P money transfer service TransferWise is created	2019: biometric authentication for mobile banking apps
	1983: Mobile phone		
	1987: Program trading		
	1986: Big Bang, Single European Act		
	1990s: Quantitative risk management/VAR		
	1999: Internet/Dot. Com Bubble		
	2008: Global Financial Crisis		

Source: own elaboration

Conclusions

FinTech’s development mirrors the broader technological advancements in society, transitioning from the foundational innovations of FinTech 1.0 (1866-1967), through the digital transformations of FinTech 2.0 (1967-2008), to the disruptive innovations of FinTech 3.0 (2008-2018), and finally to the current era of FinTech 4.0 (2018 – present).

Each phase of FinTech has carried significant changes to the financial landscape. FinTech 1.0 arranged the groundwork with the integration of technologies such as telegraph and mainframe computers, revolutionizing financial communication and consumer banking. FinTech 2.0 saw the advent of Internet banking & electronic trading platforms, which improved market efficiency and transparency. FinTech 3.0 introduced disruptive technologies like blockchain & cryptocurrencies, democratizing access to capital & financial services through mobile payments and peer-to-peer lending platforms. The current phase, FinTech 4.0, is marked by the union of advanced technologies such as artificial intelligence, machine learning, blockchain, and the Internet of Things, driving hyper-personalized financial services and creating interconnected financial ecosystems.

The systematic literature review highlights how FinTech has grown in tandem with technological advancements, leading to significant developments in productivity, convenience, and user-friendliness in financial services. The industry's rapid growth and transformation emphasize the importance of constant innovation and adaptation. As we move advancing, the combination of developing technologies will further reshape the financial landscape, offering new opportunities and challenges for traditional financial institutions and new market entrants alike. FinTech's continuing growth promises to enhance financial inclusion, security, and customer experience, solidifying its role as a essential force in the upcoming of finance.

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