

# FinTech Revolution: Key Trends and the Future of Digital Finance

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## Editorial

The FinTech financial services sector has undergone revolutionary changes in recent years. They concern both the products and services offered, as well as the interactions of both institutional and individual entities with financial institutions. The FinTech sector's landscape is evolving in an extremely dynamic way, affecting many other sectors of the economy. These changes also reflect technological progress and the changing needs of the digital economy. The purpose of this editorial is to highlight trends in the digital economy and finance sector. It will present both key research areas and the literature that underpins the future development of the FinTech sector.

Blockchain technology and cryptocurrencies remain at the forefront of FinTech innovation due to their unique properties related to decentralisation, transparency and security. Current research goes far beyond basic applications such as Bitcoin (Nakamoto, 2008; Buterin, 2013) to analyse more complex aspects of the financial ecosystem based on distributed ledger technology. Key topics in this area include decentralised finance (DeFi), smart contracts, and non-fungible tokens (NFTs). Decentralised finance (DeFi) is a growing sector that aims to eliminate intermediaries in financial services. Users can therefore obtain loans, trade assets, or manage funds using smart contracts where the contract terms are automatically executed. This eliminates the need to trust central institutions (Schär, 2021; Szabo, 1997). Non-Fungible Tokens (NFTs) are digital assets that confirm the ownership and authenticity of unique assets, such as works of art, music, or virtual real estate. The value

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of NFTs is based on their uniqueness, and they often use smart contracts to manage transactions (Dowling, 2022; Tapscott & Tapscott, 2016).

Research in this field focusses on the applications of NFT technology in various industries, such as entertainment, fashion and real estate, as well as on issues related to legal regulations (Ante, 2021; Regner, Urbach & Schweizer, 2019). Research in the above-mentioned areas also focusses on the security of the sector, its scalability, and regulatory challenges (Antonopoulos, 2017; Tapscott & Tapscott, 2016). One of the most important challenges in the blockchain and cryptocurrency space is the issue of transaction security and protecting users from cyberattacks. Furthermore, the topic of blockchain scalability holds significant importance, given the limited processing capacity of current technologies like Bitcoin and Ethereum. Therefore, researchers are exploring solutions like layer two networks, such as the Lightning Network, to boost efficiency. Due to a lack of uniform international legal regulations, the development of blockchain-based FinTech encounters obstacles related to the risk of money laundering, terrorism financing, and a lack of personal data protection. Therefore, this area is seeking solutions that strike a balance between technological innovation and the requirements of supervision and regulation.

Artificial intelligence (AI) and machine learning (ML) have gained significant importance in the FinTech sector in recent years, revolutionising the design, delivery and optimisation of financial services. They are now integral tools that accelerate the analysis of huge data sets, improving the accuracy of forecasts and offering more personalised solutions to clients (Russell, S. & Norvig, P., 2016; Goodfellow, I., Bengio, Y. & Courville, A., 2016). Artificial intelligence and machine learning have revolutionised financial trading, contributing to the development of algorithmic trading. Advanced AI-based models are now able to analyse huge amounts of market data, predict price movements, and identify complex patterns and anomalies. These features can effectively manage clients' investment portfolios and minimise risk by making quick trading decisions (Butaru, F., Chen, Q., Clark, B., Das, S., Lo, A. W. & Siddique, A., 2016).

Machine learning has played a key role in streamlining credit assessment processes, thus helping financial institutions more accurately assess the creditworthiness of customers. Traditional credit assessment models were based on limited data sets, such as credit history and income. The development of artificial intelligence now allows for the analysis of a much wider range of data, including alternative data such as online behaviour, social media data and household spending patterns. AI also facilitates the provision of customised financial services that cater to each customer's unique needs. Banks and FinTech companies therefore use AI to analyse user data to offer financial products that best suit users' profiles and preferences. It is therefore possible to individually and quickly tailor credit card, insurance, or mortgage offers based on an analysis of the spending history and predictions of the future financial behaviour of customers. More and more financial institutions are

now implementing AI in customer service, as chatbots and virtual assistants can provide 24/7 customer service support. Natural language processing (NLP) technology powers chatbots, enabling them to engage in natural conversations with customers, respond to enquiries, and resolve issues. Over the years, AI has improved its skills in understanding context, which allows for a more comprehensive service. Another aspect of using AI and machine learning is to improve security in the financial sector, especially fraud detection. In real time, machine learning algorithms can analyse users' transaction behaviour and identify suspicious or unusual transactions, allowing for an immediate response. Identity authorisation systems, including biometrics and multi-factor authentication, also employ AI.

RegTech is gaining importance as financial regulations become more complex and cybersecurity becomes a serious challenge. Therefore, there is a need to use technology to improve compliance processes, improve regulatory reporting, and reduce the risk associated with these processes (Zetzsche, Buckley, Arner and Barberis, 2017). Arner, Barberis and Buckley's (2015) research demonstrates the growing use of RegTech technologies for real-time compliance monitoring. Anomaly identification systems, for example, automatically recognise suspicious financial transactions. One of the main challenges for financial institutions is the requirement to prepare accurate and regular reports for various regulators. Zetzsche, Buckley, Arner and Barberis (2017), in their research, show that the implementation of RegTech tools significantly reduces the risk of errors in reporting and reduces operational costs, thus increasing the efficiency of companies. Furthermore, these technologies allow for flexibility in adapting reports to regulatory changes, which is critical in the context of rapidly evolving financial regulations. In turn, Jang and Lee (2021) argue that RegTech technologies based on artificial intelligence and predictive analytics are effective in the early detection of fraud risk, which minimises financial losses and improves operational risk management. The growing number of cyberattacks on financial institutions makes online security one of the priority areas for RegTech. RegTech tools such as identity management systems (Identity Management) and data encryption technologies help to increase the level of security, especially in relation to regulations such as the GDPR. Additionally, blockchain technologies used in RegTech can guarantee the integrity and immutability of financial data, which is a key value for institutions ensuring compliance with data protection regulations (Zetzsche et al., 2017). The digitisation of financial services, on the other hand, has increased the need to protect users in the area of cybersecurity. Research in this area is developing more advanced encryption methods, multi-factor authentication systems, and strategies to combat cyber threats such as phishing and ransomware attacks (Anderson, 2020; Schneier, 2015).

A critical issue in the development of the financial and technological innovation sector is the adaptation of traditional financial institutions to the ongoing changes. As a result, digital transformation strategies address the issue of partnerships

between traditional financial institutions and FinTech startups, as well as the development of hybrid financial services (Gomber, Koch and Siering, 2017; Philippon, 2016). Cooperation within the FinTech sector allows traditional financial institutions to access modern technologies that can significantly improve their operational activities. Thanks to partnerships with innovative startups, banks can implement modern solutions in the fields of data analytics, customer service, transaction security, and the automation of financial processes. Open banking serves as an example of a partnership that permits the sharing of bank customers' data, subject to their consent, with external financial service providers thereby enabling the provision of more personalised services. Partnerships with FinTechs specialising in cloud solutions allow financial institutions to increase their efficiency and scalability without having to invest in expensive data centres. The possibility of the described cooperation allows banks to implement new services faster, thus reducing operating costs. Many traditional financial institutions have launched incubation or acceleration programmes, which support the development of FinTech institutions through capital investments and cooperation on joint projects. Such activities allow banks to benefit from innovations while at the same time increasing their market attractiveness for young, ambitious technology companies. In addition, digital banks (neobanks) and financial institutions operating exclusively online are a new category of players in the financial market that challenge traditional banks by offering fully digital, automated banking services, often with lower fees and more personalised functionalities. As noted by Chesbrough and Spohrer (2006), digital business models require a new approach to value creation and focus on providing customers with more flexible and personalised financial services. They argue that the success of digital banking models is based on technological flexibility and the ability to continuously test and implement new solutions at the level of mobile applications. Thanks to the use of lean startup methodology and cloud architecture, digital banks are able to quickly respond to changing customer preferences and market regulations.

As FinTech grows, so do concerns about privacy, data security, and ethical considerations. Research addresses issues such as data ownership, the ethical use of AI in finance, and societal impacts of digital financial services (Floridi, 2014; Mittelstadt et al., 2016). The intersection of FinTech and sustainability is an emerging field. Researchers are examining how FinTech can support sustainable finance initiatives, such as green bonds, carbon credit trading and investment in renewable energy projects (Bocken et al., 2014; Weber & ElAlfy, 2019).

The body of literature on FinTech is expanding, with significant contributions from academic journals, industry reports and white papers. Understanding the end user is critical to the success of FinTech innovations. Future research should delve deeper into user psychology, the digital divide, and how to design inclusive financial products that cater to diverse populations (Rogers, 2003; Venkatesh, Thong & Xu, 2012). In conclusion, FinTech research is at a critical juncture, poised to shape

the future of financial services. As technology evolves and integrates more deeply into financial systems, the need for robust, multidisciplinary research becomes even more pressing. By staying ahead of trends and addressing the challenges head-on, researchers can ensure that FinTech not only transforms finance but does so in a way that is secure, inclusive and beneficial for all.

## References

1. Anderson, R. (2020). *Security engineering: a guide to building dependable distributed systems*. John Wiley & Sons.
2. Ante, L. (2021). *The Non-Fungible Token (NFT) Market and its Relationship with Bitcoin and Ethereum*. *FinTech Research Letters*, 1(1), 1–11.
3. Bocken, N., Short, S., Rana, P., & Evans, S. (2014). *A Literature and Practice Review to Develop Sustainable Business Model Archetypes*. *Journal of Cleaner Production*, 65, 42–56.
4. Butaru, F., Chen, Q., Clark, B., Das, S., Lo, A.W., & Siddique, A. (2016). *Risk and Risk Management in the Credit Card Industry*. *Journal of Banking & Finance*, 72, 218–239.
5. Chesbrough, H., & Spohrer, J. (2006). *A Research Manifesto for Services Science*. *Communications of the ACM*, 49(7), 35–40.
6. Dowling, M. (2022). *Is Non-Fungible Token Pricing Driven by Cryptocurrencies?*. *Finance Research Letters*, 44, 102097.
7. Floridi, L. (2014). *The Fourth Revolution: How the Infosphere is Reshaping Human Reality*. Oxford University Press.
8. Gomber, P., Koch, J.-A., & Siering, M. (2017). *Digital Finance and FinTech: Current Research and Future Research Directions*. *Journal of Business Economics*, 87(5), 537–580.
9. Goodfellow, I., Bengio, Y., & Courville, A. (2016). *Deep Learning*. MIT Press.
10. Jang, W., & Lee, J. (2021). *Artificial Intelligence for RegTech: Risk Detection and Regulatory Compliance in Financial Services*. *Journal of Financial Services Research*, 59(2), 159–186.
11. Mittelstadt, B., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). *The Ethics of Algorithms: Mapping the Debate*. *Big Data & Society*, 3(2).
12. Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. Accessed at: <https://bitcoin.org/bitcoin.pdf>.
13. Omarini, A. (2018). *The Digital Transformation in Banking and the Role of FinTechs in the New Financial Intermediation Scenario*. *International Journal of Finance, Economics and Trade*, 2(2), 1–6.
14. Philippon, T. (2016). *The FinTech Opportunity*. NBER Working Paper Series, No. 22476.
15. Regner, F., Urbach, N., & Schweizer, A. (2019). *NFTs in Practice – Non-Fungible Tokens as Core Component of a Blockchain-based Decentralized Market*. Proceedings of the 40<sup>th</sup> International Conference on Information Systems (ICIS).
16. Russell, S., & Norvig, P. (2016). *Artificial Intelligence: A Modern Approach* (3<sup>rd</sup> ed.). Pearson.
17. Schär, F. (2021). *Decentralized Finance: On Blockchain- and Smart Contract-based Financial Markets*. *Federal Reserve Bank of St. Louis Review*, 103(2), 153–174.

18. Schneier, B. (2015). *Data and Goliath: The Hidden Battles to Collect Your Data and Control Your World*. W.W. Norton & Company.
19. Szabo, N. (1997). Formalizing and Securing Relationships on Public Networks. *First Monday*, 2(9). Accessed at: <https://firstmonday.org/ojs/index.php/fm/article/view/548> (22.11.2024)
20. Tapscott, D., & Tapscott, A. (2016). *Blockchain Revolution: How the Technology Behind Bitcoin and Other Cryptocurrencies is Changing the World*. Portfolio Penguin.
21. Venkatesh, V., Thong, J.Y.L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1), 157–178.
22. Weber, O., & Elalfy, A. (2019). The Development of Green Finance by Sector and Industry. *Sustainability*, 11(21), 6012.
23. Zetsche, D.A., Buckley, R.P., Arner, D.W., & Barberis, J.N. (2017). Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation. *Fordham Journal of Corporate & Financial Law*, 23(1), 31–103.