

# Impact of Technology on Financial Services

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## I. Introduction

For centuries, technology has been a key catalyst for the growth and development of industries and the financial services industry has been no exception. Advancements in technology have created new possibilities and pathways for the delivery of financial products and services. The journey from a barter system of trade to cashless and biometric payments is marked by technological milestones that have enabled significant improvements in service efficiency, speed, security and customer experience within the financial services industry.

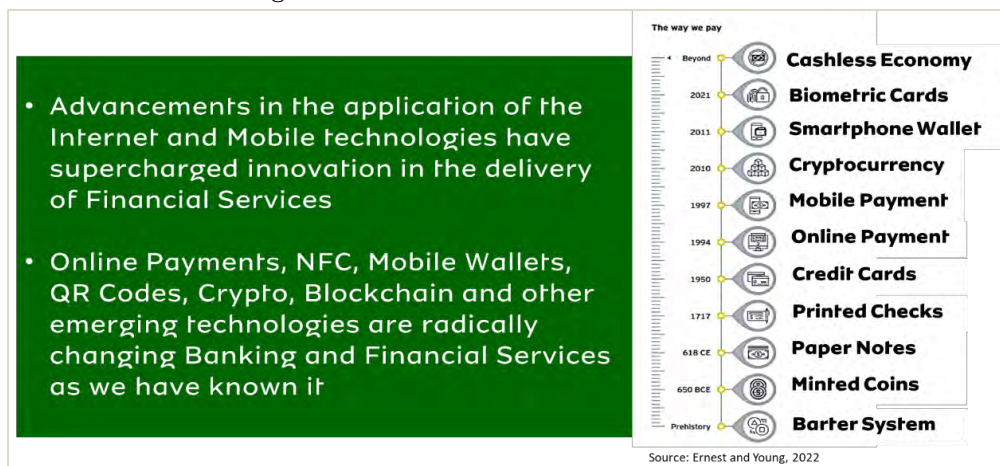
Indeed, the last few decades have seen financial service institutions adopt and adapt new technologies that significantly raise the level of service quality providers offer their customers. Remarkable innovations in the digitalisation of banking technology prompted and produced new service delivery models.

In more recent years, developments in the application of the internet and mobile technologies have supercharged innovation in the delivery of financial services. These technologies have been the wheels upon which new banking infrastructure, business models, platforms, channels, even new currencies and stores of value have emerged.

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Figure 1: Evolution of Financial Services



Source: Ernest and Young 2022.

Today, the application of digital technologies that seek to improve and automate the delivery and use of financial services are generally referred to as Financial Technology, better known as Fintech (Kagan, 2022). Fintech is the application of new technological advancements to products and services in the financial industry and aims at improving & automating the delivery and use of financial services (Allied Market Research, 2021).

Initially, Fintech only described the technology employed at the back-end systems of established financial institutions. However, there has been a shift to more consumer-oriented services and therefore has a more consumer-oriented definition. Fintech now includes different sectors and industries such as education, retail banking, fundraising & non-profit, and investment management, to name a few (Kagan, 2022).

Across the globe, Fintech is enabling companies, business and consumers better manage their financial operations, processes and lives using specialised software and algorithms installed on computers and smartphones. Fintech has made payments for goods and services faster, easier, more convenient, and cost-efficient as customers can now pay for various goods and services using digital money alternatives. The growth in the digital commerce market and proliferation of mobile technology has contributed to the growth of the digital payments sector.

According to the Business Research Company (2019), the global Fintech market was valued at US\$127.66 billion in 2018 and was expected to grow to

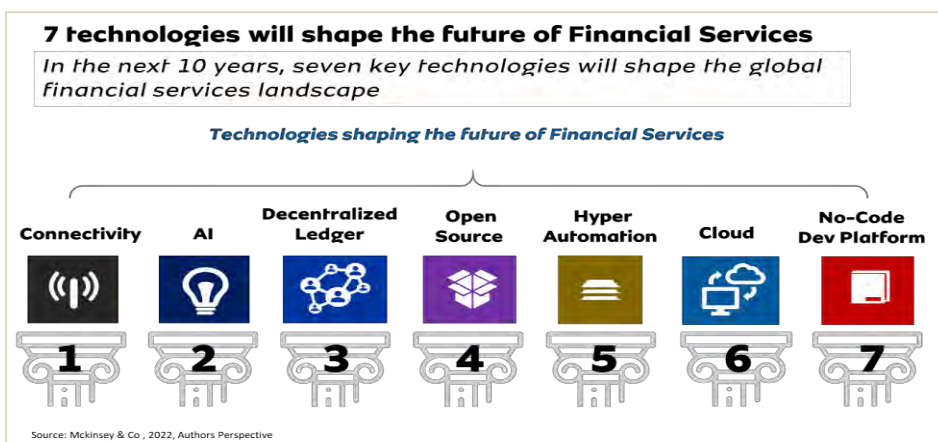
US\$309.98 billion at an annual growth rate of 24.8 per cent through 2022. Furthermore, Allied Market Research (2021) projects the global Fintech market to reach US\$698.48 billion by 2030, growing at a compound annual growth rate (CAGR) of 20.3 per cent from 2021 to 2030.

In Nigeria, investments in and impact of financial technology have been massive. Driven either by their own interests or by the implementation of cashless policies by the Central Bank of Nigeria, a rapidly increasing number of consumers and business are letting go of the traditional financial practices and adopting new digital ways to carry out their financial transactions. According to financial reports of commercial banks in Nigeria, the first half of 2022 saw 10 commercial banks spend ₦81.92 billion on ICT services, a 58.7 per cent increase from the ₦51.62 billion spent by the banks in 2021 (Jaiyeola, 2022).

This paper reviews seven emerging technologies that are shaping the future of financial services across the globe, their impact on financial services, and the implication for regulation. The seven technologies are:

1. Mobile Connectivity;
2. Artificial Intelligence;
3. Decentralised Ledger;
4. Open Source;
5. Hyper Automation;
6. Cloud Computing; and
7. No Code Development Platforms.

Figure 2: Seven Technologies Shaping the Future of Financial Services



Source: Mckinsey &Co (2022), Authours perspective.

## II. The Impact of Mobile Connectivity on Financial Services

The rapid advancement of technology has transformed the financial industry, leading to the rise of Fintech. One of the most significant technological developments in recent years has been the widespread adoption of mobile connectivity, which has revolutionised the way we interact with financial services.

Some of the benefits of Mobile Connectivity on financial services include:

1. **Convenience and Accessibility:** With the rise of mobile connectivity, financial services are becoming more accessible and convenient. Customers can now access their bank accounts, manage their investments, and make payments through their mobile devices, eliminating the need to visit a physical bank or financial institution.
2. **Personalised Services:** Mobile connectivity allows for the collection and analysis of large amounts of data, enabling Fintech companies to provide personalised financial services. This includes personalised investment recommendations, customised loan offers, and tailored insurance policies.
3. **Increased Security:** Mobile connectivity has also improved the security of financial transactions, with mobile devices equipped with secure authentication methods, such as fingerprint scanning and facial recognition. This has increased customer trust in mobile financial services and reduced the risk of fraud.
4. **Disruption of Traditional Financial Institutions:** The rise of mobile connectivity has disrupted traditional financial institutions, as Fintech companies are able to provide financial services at a lower cost and with more convenience than traditional banks. This has led to increased competition and innovation in the financial industry.

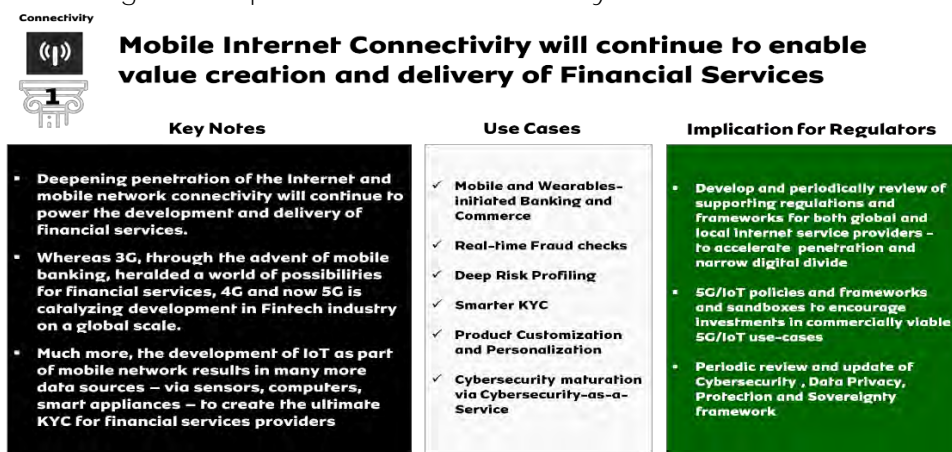
The future of Fintech is closely tied to the future of mobile connectivity. As mobile technology continues to evolve, it is likely that Fintech companies will continue to find new and innovative ways to use mobile connectivity to improve.

## II.1 Considerations for Regulators

Mobile connectivity is transforming the way financial services are delivered and consumed, enabling consumers to access financial services anytime, anywhere, through their mobile devices. This is particularly important in emerging and frontier markets where mobile connectivity is the primary means of accessing financial services, and where traditional financial services are often unavailable or unaffordable.

However, the use of mobile connectivity in the Fintech sector also raises important regulatory questions, such as data privacy, security, and consumer protection that must be addressed by regulators.

Figure 3: Impact of Mobile Connectivity on Financial Services



Source: Mckinsey &Co (2022), Authours perspective.

## III. Impact of Artificial Intelligence on Financial Services

Artificial Intelligence (AI) is a rapidly growing field that has been changing the way businesses operate in various industries. With the rise of Fintech, AI has played a crucial role in streamlining financial services and enhancing customer experience.

Increasingly, AI is having a significant impact on the financial services industry – delivering benefits such as increased efficiency, security, and customer satisfaction. AI has made financial services more accessible, personalised, and convenient, improving the customer experience and increasing customer trust in Fintech companies.

Moreover, the use of AI in Fintech has also led to cost savings for financial institutions, as AI algorithms can perform tasks more efficiently and accurately than humans. This has allowed Fintech companies to invest in other areas of their business and expand their services.

Some of the applications of AI in financial services include:

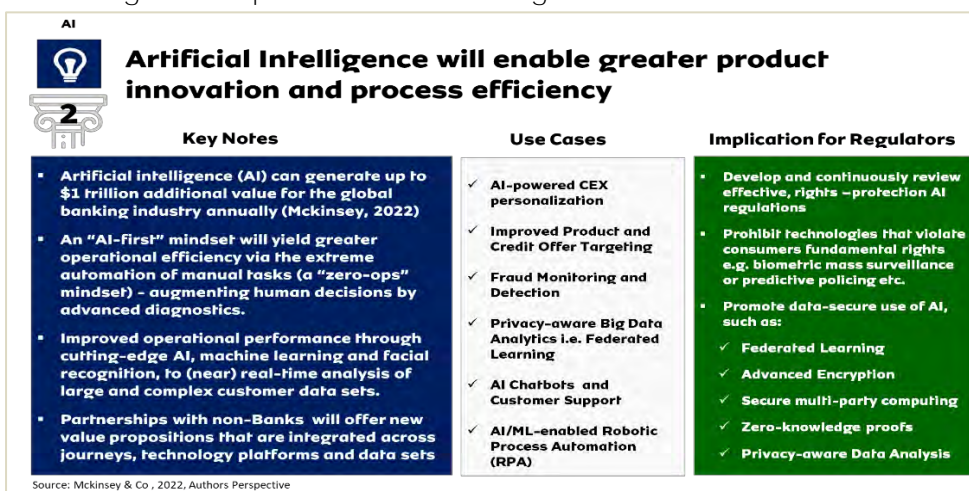
1. **Fraud Detection and Prevention:** AI has been widely used in the Fintech industry to detect and prevent fraudulent activities. AI algorithms analyse large amounts of data, such as transaction history and customer behaviour, to detect suspicious activities and prevent fraud. This has helped financial institutions to reduce the risk of fraudulent transactions, thereby increasing the security of customer information and funds.
2. **Risk Assessment:** AI can also be used to assess the risk associated with a loan or investment. By analysing data from multiple sources, AI algorithms can determine the creditworthiness of an individual or business, helping financial institutions to make informed decisions about loans and investments.
3. **Customer Service:** AI has revolutionised the way Fintech companies interact with their customers. Chatbots and virtual assistants powered by AI can respond to customer inquiries 24/7, providing quick and accurate responses. This has improved customer satisfaction and reduced wait times for customer service.
4. **Portfolio Management:** AI algorithms can be used to manage investment portfolios, making personalised recommendations based on an individual's financial goals and risk tolerance. This has improved the accuracy and efficiency of investment decisions and helped investors to achieve their financial goals.
5. **Personal Finance Management:** AI-powered personal finance management tools, such as budgeting and savings applications, help individuals to better understand their spending patterns and make informed decisions about their finances. This has helped to increase financial literacy and has made personal finance management accessible to a wider audience.

### III.1 Considerations for Regulators

AI is a rapidly growing technology that has the potential to revolutionise the financial industry. From chatbots that automate customer service to predictive analytics that help financial institutions manage risk, AI has the potential to bring significant benefits to businesses and consumers. However, the use of AI in the financial sector also raises a number of regulatory questions. For example, how can regulators ensure that AI algorithms are transparent and fair, and that they do not discriminate against certain groups of people? How can regulators ensure that AI-powered financial services are safe and secure, and that they protect consumer privacy?

AI has revolutionised financial services, providing financial institutions with new tools to improve their services and enhance the customer experience. AI has made financial services more efficient, secure, and accessible, and has had a positive impact on the industry. As AI technology continues to evolve, it is likely that the use of AI in Fintech will continue to grow, providing even greater benefits for both financial institutions and customers.

Figure 4: Impact of Artificial Intelligence on Financial Services



Source: Mckinsey &Co (2022), Authors perspective.

## IV. Impact of Decentralised Ledger Technology on Financial Services

The financial sector is undergoing rapid changes and is being reshaped by the latest technological advancements, including blockchain and decentralised ledger technology (DLT). The use of decentralised ledgers is

becoming increasingly popular and is expected to change the way financial transactions are conducted in the future.

Decentralised ledger technology refers to a database that is spread across a network of computers, rather than being stored on a single central server. This decentralised database is managed and maintained by the network participants and is designed to be secure, transparent, and tamper resistant. Each transaction in the database is verified and recorded on multiple computers, making it difficult for any single participant to alter the database.

Some of the benefits of decentralised ledgers in financial services include:

**Security:** Decentralised ledgers offer a high level of security because they use cryptographic algorithms to secure transactions. Transactions are verified by the network participants and are recorded in multiple locations, making it difficult for any malicious actor to alter the database. This reduces the risk of fraud and hacking, which is a major concern for financial institutions.

**Transparency:** Decentralised ledgers are transparent and provide all participants with equal access to information. This makes it easier to detect and prevent fraudulent activities and helps to increase accountability and trust in financial transactions.

**Cost Efficiency:** Decentralised ledgers reduce the cost of financial transactions by eliminating intermediaries and reducing the need for third-party verification. This can result in lower fees for consumers and increased profits for financial institutions.

**Speed and Scalability:** Decentralised ledgers offer faster and more efficient transactions than traditional centralised systems. They also can scale to meet the demands of a growing number of users, which makes them ideal for use in the financial sector.

#### IV.1 Applications of Decentralised Ledgers in Financial Services

**Payments and Transfers:** Decentralised ledgers can be used to create a decentralised payment system that is faster, cheaper, and more secure than traditional payment methods. This could potentially eliminate the need for intermediaries such as banks and payment processors.

**Digital Identity:** Decentralised ledgers can be used to create a secure and transparent digital identity system. This would allow individuals to securely store



and manage their personal information and financial data and could also reduce the risk of identity theft and fraud.

**Asset Management:** Decentralised ledgers can be used to manage and track ownership of digital assets such as cryptocurrencies, securities, and real estate. This could simplify and streamline the asset management process and make it more accessible to a wider range of users.

**Lending and Borrowing:** Decentralised ledgers can be used to create peer-to-peer (P2P) lending platforms that allow borrowers to access funding directly from investors. This could provide borrowers with access to lower-cost funding and increase the efficiency of the lending process.

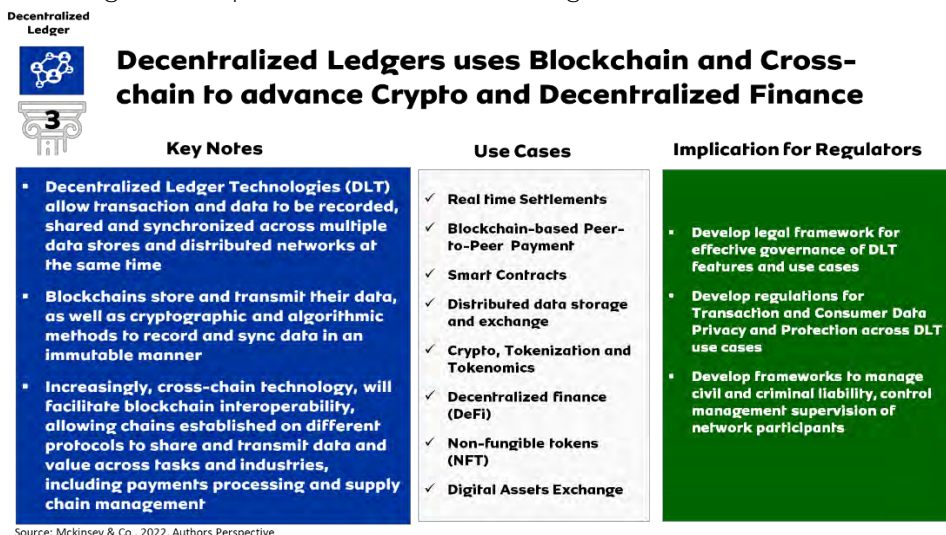
Decentralised ledger technology has the potential to transform the financial sector and shape the future of Fintech. Its benefits, including security, transparency, cost efficiency, and speed, make it ideal for use in a variety of financial applications, from payments and transfers to digital identity and asset management.

## IV.2 Considerations for Regulators

Decentralised ledgers, such as blockchain, are a relatively new technology that is being used in the Fintech sector to enable peer-to-peer transactions and secure data storage. Decentralised ledgers have the potential to bring many benefits to the financial industry, such as reduced costs, improved efficiency, and increased transparency.

However, they also present some regulatory challenges. For example, how can regulators ensure that decentralised ledgers are used in a manner that protects consumers and promotes stability in the financial system? How can regulators ensure that decentralised ledgers are used in a way that prevents money laundering, terrorism financing, and other financial crimes?

Figure 5: Impact of Decentralised Ledgers on Financial Services



Source: McKinsey & Co (2022), Authors perspective.

## V. Impact of Open Sourcing on Financial Services

The rise of Fintech has been driven in large part by the availability of open source technology. Open source refers to software that is freely available to use, modify, and distribute.

Some of the benefits of open source technology to financial services include:

**Cost Efficiency:** Open source technology is available at no cost, making it a cost-effective option for Fintech start-ups and small businesses. This reduces the barrier to entry for new entrants and allows for rapid innovation in the Fintech sector.

**Collaboration:** Open source technology allows for collaboration and contributions from a global community of developers. This leads to faster innovation and the development of more advanced and sophisticated technologies.

**Security:** Open source technology is transparent, which allows for regular security audits and updates to be made. This helps to ensure the security and reliability of the technology, which is essential in the financial sector.

**Customisation:** Open source technology can be easily customised to meet the specific needs of different businesses and industries. This allows for the

development of innovative solutions that are tailored to the specific needs of the Fintech sector.

## V.1 Applications of Open Source Technology in Financial Services

**Blockchain:** Open source technology has been instrumental in the development of blockchain, a decentralised ledger technology that is transforming the financial sector. Blockchain allows for secure, transparent, and tamper-resistant transactions, which has the potential to disrupt traditional financial intermediaries.

**Payments and Transfers:** Open source technology has been used to develop low-cost payment and transfer solutions that are faster and more secure than traditional methods. This is increasing access to financial services for people who were previously excluded from the formal financial system.

**Digital Identity:** Open source technology has been used to develop secure and transparent digital identity systems, which are becoming increasingly important in the digital age. These systems allow individuals to securely store and manage their personal and financial data and help to reduce the risk of identity theft and fraud.

**Lending and Borrowing:** Open source technology has been used to develop peer-to-peer (P2P) lending platforms that allow borrowers to access funding directly from investors. This has the potential to increase access to low-cost funding and reduce the cost of borrowing, which could benefit borrowers and investors alike.

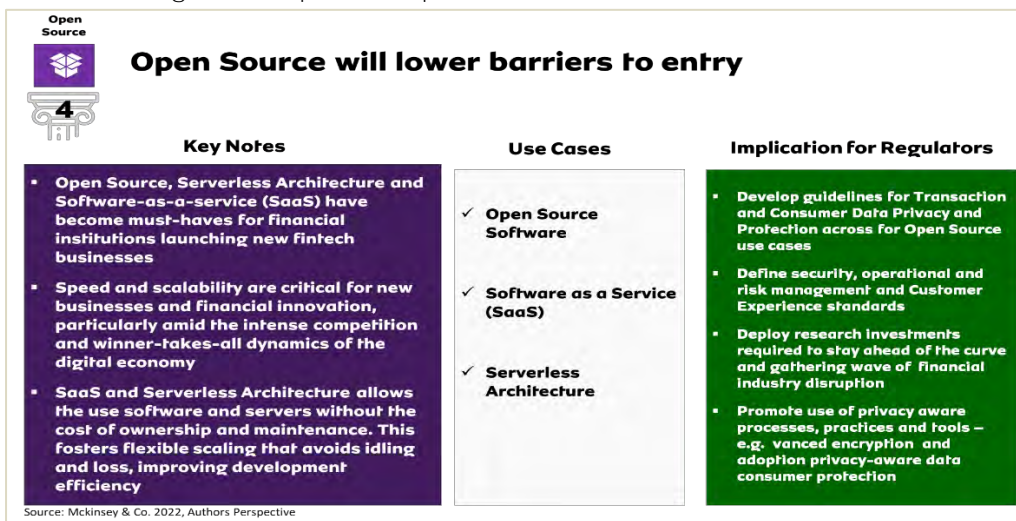
Open source technology is playing an increasingly important role in shaping the future of Fintech. Its benefits, including cost efficiency, collaboration, security, and customisation, make it ideal for use in a variety of financial applications. As the use of open source technology continues to evolve, it is likely that it may lead to more disruptive innovation in the Fintech sector, which could have far-reaching implications for the financial industry and society.

## V.2 Considerations for Regulators

Open source platforms are increasingly being used in the Fintech sector to develop new financial products and services, and have the potential to bring many benefits to the financial industry, such as increased collaboration, faster innovation, and reduced costs.

However, it also presents some regulatory challenges. For example, how can regulators ensure that open source software used in the financial sector meets standards for security, privacy, and reliability? How can regulators ensure that open source software is used in a manner that protects consumers and promotes competition?

Figure 6: Impact of Open Source on Financial Services



Source: Mckinsey &Co (2022), Authours perspective.

## VI. Impact of Hyper Automation on Financial Services

Hyper automation is a term used to describe the integration of advanced technologies such as artificial intelligence (AI), machine learning (ML), and robotic process automation (RPA) to automate business processes. The rise of hyper automation is having a profound impact on the financial services industry and is set to shape its future in significant ways.

Some of the benefits of hyper automation in financial services include:

**Increased Efficiency:** Hyper automation can automate many routine and repetitive tasks, freeing up employees to focus on higher-value activities. This

can result in increased efficiency and reduced costs for businesses, making them more competitive in the market.

**Improved Customer Experience:** Hyper automation can be used to improve the customer experience by automating customer service and support processes. This can lead to faster response times, more accurate responses, and a higher level of customer satisfaction.

**Data Management and Analytics:** Hyper automation can be used to manage and analyse vast amounts of financial data, which can help businesses to make better decisions, identify new business opportunities, and reduce the risk of fraud and other financial crimes.

**Compliance and Risk Management:** Hyper automation can be used to automate compliance and risk management processes, helping businesses to ensure that they comply with relevant regulations and minimise risks.

## VI.1 Applications of Hyper Automation in Financial Services

**Digital Banking:** Hyper automation can be used to automate many of the routine and repetitive tasks associated with digital banking, such as account opening, loan applications, and customer service. This can reduce the time and cost associated with these processes and improve the customer experience.

**Payments and Transfers:** Hyper automation can be used to automate payments and transfers, reducing the time and cost associated with these transactions and improving the speed and accuracy of the process.

**Investment Management:** Hyper automation can be used to automate investment management processes, such as portfolio management, risk management, and compliance. This can result in improved investment performance and reduced costs for investors.

**Insurance:** Hyper automation can be used to automate many insurance processes, such as underwriting, claims processing, and customer service. This can result in faster and more accurate processing of claims, reduced costs for insurance companies, and improved customer experience.

Hyper automation is set to have a major impact on the future of Fintech, bringing significant benefits to businesses and consumers alike. Its ability to automate routine and repetitive tasks, manage and analyse vast amounts of

financial data, and improve the customer experience are just a few of the many ways that hyper automation is shaping the future of Fintech.

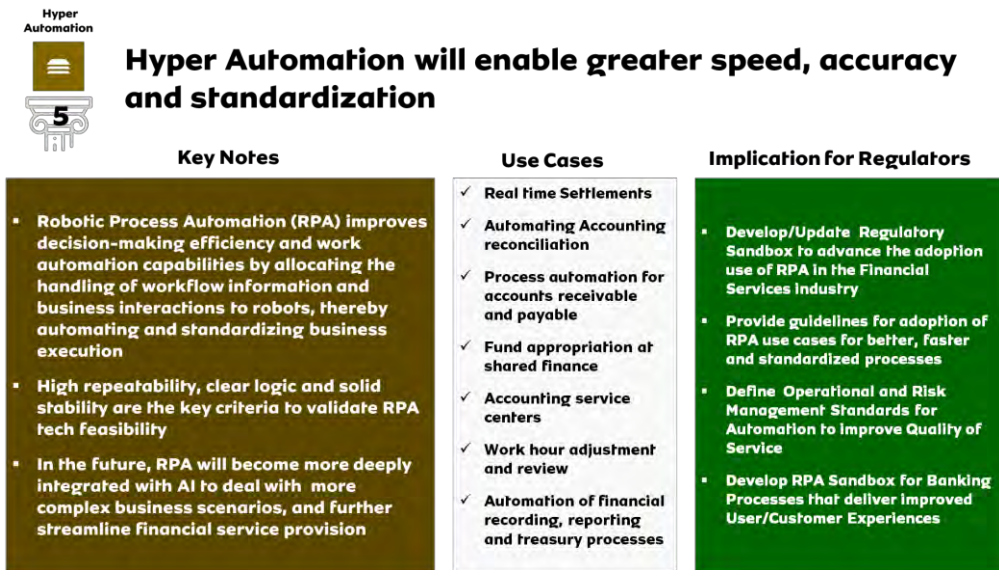
As the use of hyper automation continues to grow, it is likely that we will see more disruptive innovation in the Fintech sector, which could have far-reaching implications for the financial industry and the society.

## VI.2 Considerations for Regulators

Hyper automation is a technology that uses a combination of advanced technologies, such as artificial intelligence (AI) and robotic process automation (RPA), to automate complex business processes. This technology has the potential to transform the Fintech industry by enabling faster, more efficient, and more accurate financial services.

Yet, hyper automation also raises important regulatory questions. For example, how can regulators ensure that hyper automation algorithms are transparent, fair, and do not discriminate against certain groups of people? How can regulators ensure that hyper automation-powered financial services are safe, secure, and trustworthy, and that they protect consumer privacy?

Figure 7: Impact of Hyper Automation on Financial Services



Source: McKinsey & Co. 2022, Authors Perspective

Source: McKinsey &Co (2022), Authors perspective.

## VII. Impact of Cloud Technology on Financial Services

Cloud computing is a rapidly growing technology that is changing the way financial services are delivered and consumed. By leveraging the power of the cloud, Fintech companies can offer a wide range of financial services, from digital payments to insurance and wealth management, in a fast and cost-effective manner.

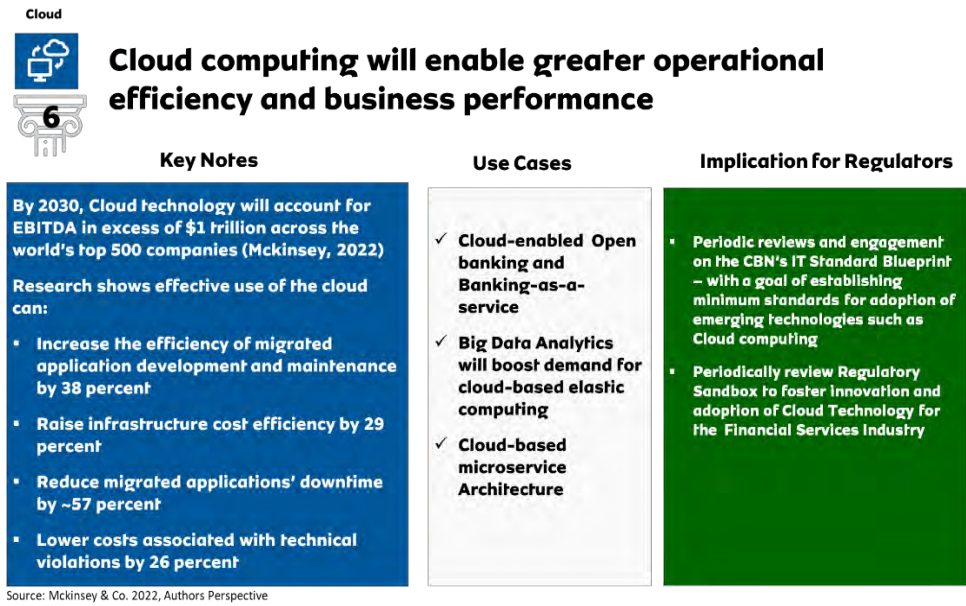
Additionally, the use of cloud computing can enable Fintech companies to more easily scale their operations and expand into new markets, allowing them to reach a wider customer base and increase their market share. However, the use of cloud computing in the Fintech sector also raises important regulatory questions, such as data privacy and security.

### VII.1 Considerations for Regulators

Cloud computing is a rapidly growing technology that is transforming the way financial services are delivered and consumed. By leveraging the power of the cloud, Fintech companies can offer a wide range of financial services, from digital payments to insurance and wealth management, in a fast and cost-effective manner.

However, the use of cloud computing in the Fintech sector also raises several regulatory questions. For example, how can regulators ensure that cloud providers meet standards for data privacy and security, and that customer data is protected against cyberattacks? How can regulators ensure that Fintech companies that use cloud services are transparent and accountable, and that they are operating in a manner that promotes stability in the financial system?

Figure 8: Impact of Cloud Computing on Financial Services



Source: Mckinsey &Co (2022), Authors perspective.

### VIII. Impact of No-Code Development Platforms on Financial Services

No-code development platforms (NCDPs) are tools that allow businesses and entrepreneurs to build and launch new financial products and services without writing any code. These platforms have the potential to democratise access to financial services, making it easier for businesses and entrepreneurs to build and launch innovative Fintech products and services.

Additionally, no-code development platforms can help to lower the barriers to entry for Fintech start-ups, increasing competition in the sector and driving innovation. However, no-code development platforms also raise important regulatory questions, such as the risk of financial fraud and the need for consumer protection that must be addressed by regulators.

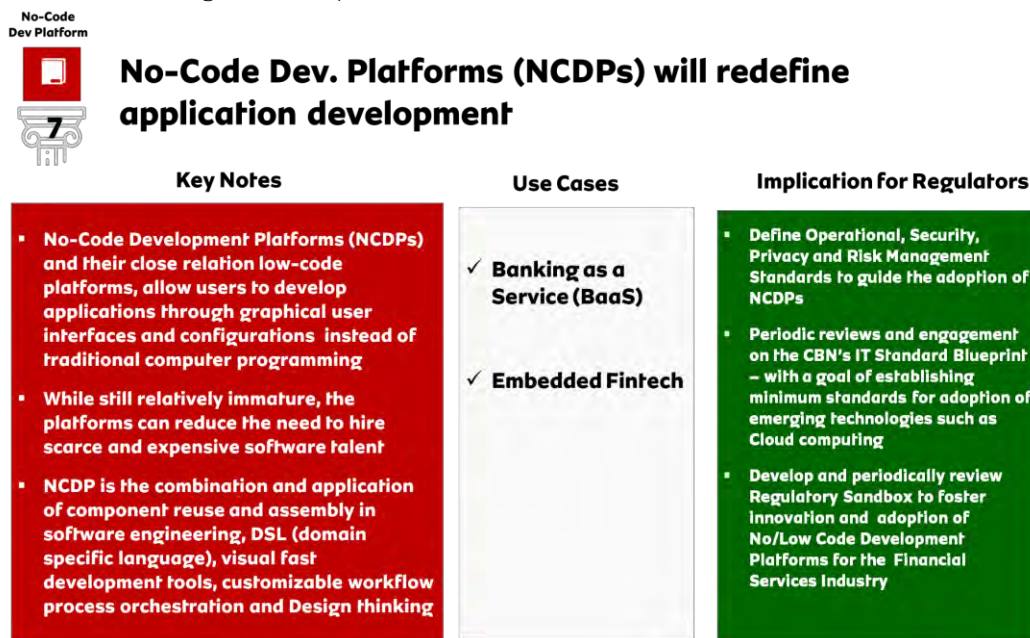
#### VIII.1 Considerations for Regulators

It is important regulators ensure that no-code development platforms are used in a manner that promotes competition and protects consumers, and that they are not being used to build and launch fraudulent or illegal financial products and services. They should also ensure that the financial services built



on no-code development platforms meet standards for security, privacy, and reliability.

Figure 9: Impact of NCDPs on Financial Services



Source: Mckinsey & Co. 2022, Authors Perspective

Source: Mckinsey &Co (2022), Authours perspective.

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