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Smart Product in the Financial Sector

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Abstract

The financial sector is experiencing a transformative move driven by the combination of smart products driven by advanced technologies such as AI, ML, IoT, and blockchain. These smart financial products are reforming traditional financial services by offering improved functionality, automation, personalization, and safety. This paper explores the effect of modernizations such as AI-powered chatbots, robo-advisors, fraud detection systems, blockchain-based solutions, smart ATMs, and AI-driven credit scoring on the financial industry. By leveraging actual data analysis, automation, and analytical algorithms, these technologies are rearrangement operations, dropping costs, and distributing personalized user practices. The paper also examines how these innovations are driving financial inclusion and improving decision-making crosswise the sector.

Keywords*: Smart contracts, Digital wallets, Smart financial products, Artificial intelligence (AI), Machine learning (ML)*

Introduction

Smart products in the financial framework refer to digital or technology-driven financial instruments and services that influence advanced technologies such as AI, ML, IoT, and blockchain to offer improved functionality, productivity, and user experiences. These products are designed to be intelligent, connected, and capable of automating complex processes, making financial transactions and management more seamless, secure, and personalized. The main features of smart financial products include intelligence, connectivity, automation, personalization, and security. By utilizing AI and ML to analyse data, make predictions, and provide insights, smart financial products can offer personalized recommendations, automate decision-making processes, and optimize financial strategies. The connectivity aspect, leveraging IoT and blockchain technology, ensures real-time data sharing and secure, transparent transactions, creating a cohesive financial ecosystem. Automation allows these products to handle routine and complex tasks such as compliance checks, transaction processing, and investment management, reducing the need for manual intervention, minimizing errors, and increasing operational efficiency. Personalization is achieved by analysing user data and behavior, and tailoring services and recommendations to meet individual needs and

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preferences, enhancing user experience and engagement. Advanced encryption and blockchain technologies provide high levels of security, ensuring the integrity and confidentiality of financial transactions and data. Examples of smart financial products include robo-advisors, which are robotic investment platforms that use algorithms to succeed and enhance investment portfolios; smart contracts, which are self-executing contracts with terms directly written into code, enabling automated and secure execution of agreements without intermediaries; digital wallets, which are safe and convenient platforms for managing digital currencies and facilitating cashless transactions; and blockchain-based financial services, such as decentralized finance (DeFi) products that offer transparent, secure, and efficient financial services like lending, borrowing, and trading on blockchain networks.

Table 1.1 Smart Products in Finance: Applications and Statistical Data

Smart Product	Application	Statistical Data
AI-Powered Chatbots	Customer service, handling transactions, financial information	85% of client interactions will be handled by AI by 2022 (Jiang et al., 2022)
Robo-Advisors	Robotic investment management and financial planning	Robo-advisors to manage $1.2 trillion by 2024 (Statista)
Fraud Detection Systems	Real-time exposure and prevention of fraudulent activities	AI reduces fraud detection time by 50%
Blockchain-Based Solutions	Secure transactions, transparent operations, reduced fraud	Blockchain to reduce bank infrastructure costs by 30% (Yu et al., 2018)
Smart ATMs	Enhanced user knowledge and security	70% of banks plan to invest in smart ATMs by 2025 (Deloitte)
Personal Finance Management (PFM) Apps	Budgeting, spending analysis, financial goal setting	45% of consumers use PFM apps
AI-Driven Credit Scoring	More accurate and inclusive credit assessments	AI can increase support rates by 20% (Bughin, J et al., 2017)
Smart Contracts	Self-executing contracts for belief and transparency	Smart contracts to manage $300 billion in transactions by 2025 (Deloitte))
Voice Banking	Performing banking operations using voice commands	31% of consumers use voice banking

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AI-Powered Trading Platforms	Analysing market data, forecasting trends, executing trades	AI in trading is expected to save $1 billion in costs by 2025

Smart Financial Technologies Application Insights

The payments segment is predicted to account for a significantly large revenue share in the global small finance technologies market during the forecast period. This is due to the key advantage of smart finance technologies in the payment segment as these provide safer, faster, and simplified transactions. In addition, the latest advancements in biometric payment cards due to the major benefits of password-less operation, convenience, and limit-free contactless spending are also expected to drive revenue growth in this segment. For instance, on 23 November 2022, Sella Group, the holding company of the Italian bank Banca Sella announced the launch of biometric payment cards in partnership with IDEX Biometrics.

The banking segment is expected to register a steadily fast revenue growth rate in the global small finance technologies market during the forecast period. This is because smart financing through banks or smart banking enables the customer to easily manage their capital by easy access to their account information through the integration of an Application Programming Interface (API) with devices. The other significant advantage of smart banking is easy automated payments replacing manual payments thus replacing traditional manual modes for timely payments of bills and emergency commodity purchases.

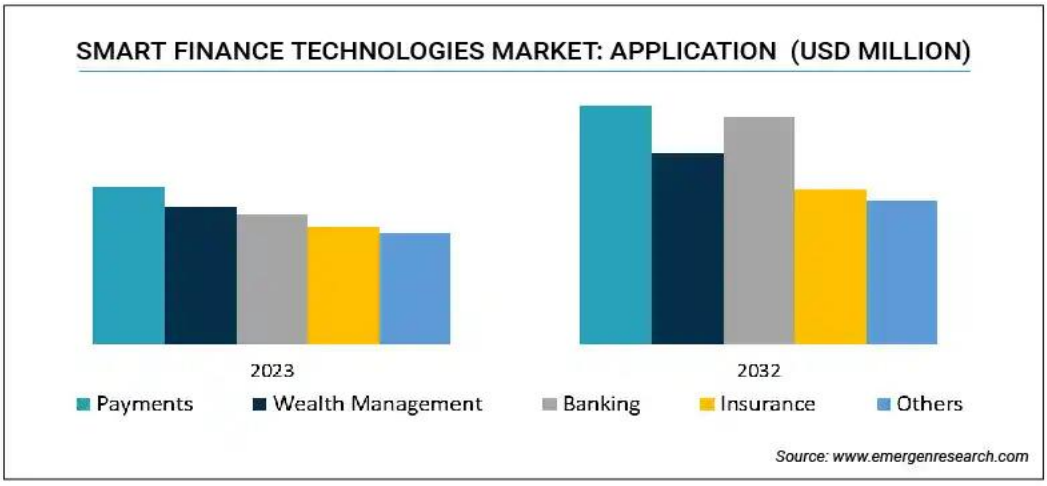

Figure 01: Smart Fintech Market

Source: Emergenresearch.com

In addition, the deployment of budgeting tools allows users to track their finances and spending to manage their finances regularly. Moreover, the advancement and development of quantum encryption is the next advanced level, which is being developed for enhancing secured transactions across various banking platforms. Hence, major companies are collaborating for the further development of major smart financing through banks. For instance, on 30 May 2023, Quantum, a

quantum computing firm, and HSBC announced exploratory initiatives examining the potential benefits of quantum computing for banking, including specific research in cybersecurity, fraud detection, and natural language processing

The Concept of Smart Finance

Though smart finance has previously influenced all aspects of our day-to-day lives, it is essential to be not aware of its concept yet. Thus, as a result, I would like to give a brief introduction. Smart finance is a kind of new finance format that can change the service mode of the traditional finance industry by relying on the IOT and by applying information technologies like big data, cloud computing, and the IOT. It can change the customer experience, business procedure, organization structure, monitoring, and risk control mode. It can bring smoother monetary circulation, more convenient finance service, more personalized customer experience, more effective risk control, and higher ability to serve the real economy (Song Zhixiu, 2020). Like traditional finance, smart finance does not change the essence of finance. The difference is that smart finance has the "smart" attribute and has the distinct characteristics of high intelligence, popularization, precision, personalization, and customization of finance products and services. In addition, smart finance has great advantages in the aspects of improving finance efficiency, decreasing finance cost, optimizing finance service, preventing finance risk, and improving finance popularization ability. What's more, smart finance uses robots, systems, or platforms to replace human service, which can reduce the labor investment in traditional finance. It drives traditional finance to transform and upgrade its operation mode and to improve the smart attribute of its finance products and services to provide customers with more qualified and competitive service (Han Zhixiong, Feng Xuefen, Zhao Quan, 2018). In conclusion, in the competition between smart finance and traditional finance, smart finance wins mainly because of its smart attributes.

Objectives

To identify and describe recent innovations in smart financial services.

To evaluate how smart financial services are transforming traditional financial services.

Research Methodology

The research methodology purposes to afford a comprehensive thoughtful of the efficiency of smart financial products, including AI, ML, IoT, and blockchain technologies, by employing a mixed-methods method that integrates both qualitative and quantitative analyses. This method involves examining case studies of financial institutions that have effectively implemented these technologies, alongside analysing statistical data related to revenue growth, cost analysis, algorithm performance, blockchain transaction metrics, and technology investment. Data collection will be primarily through secondary sources such as industry reports from McKinsey, Gartner, IDC, and Statista; in-depth case studies from financial journals and company reports; peer-reviewed academic articles; and market research statistics on technology adoption and innovation outcomes. This collective approach allows for a thorough exploration of the topic through both numerical data and detailed case study insights.

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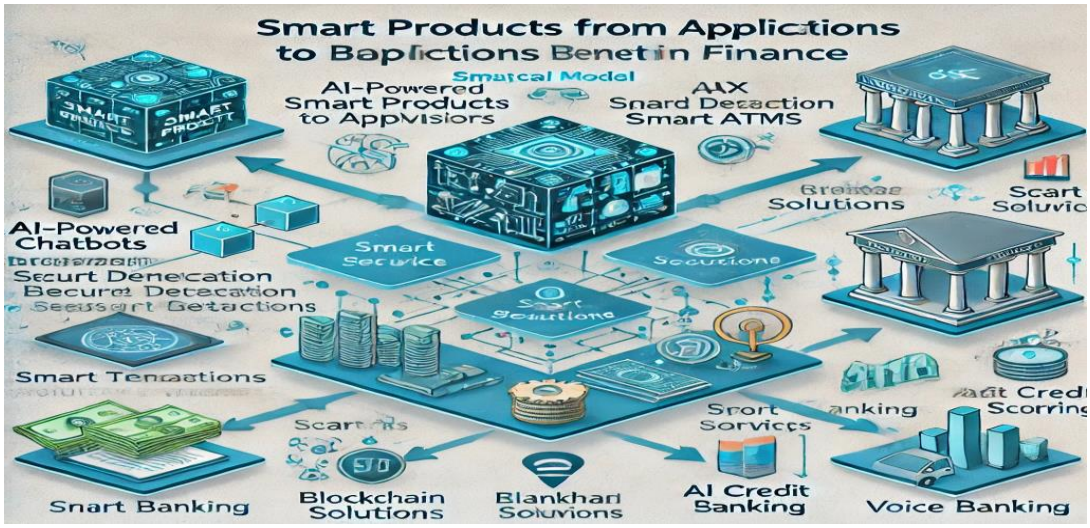

AI-Powered Chatbots

AI-powered chatbots have become integral to modern financial institutions, leveraging natural language processing (NLP) to provide 24/7 customer service. These virtual assistants can manage up to 70% of customer investigations without human interference, significantly reducing the burden on buyer service teams. As a result, financial institutions have reported a 30% reduction in customer service costs. Over 80% of banks and financial companies have adopted AI chatbots, recognizing their ability to enhance customer involvement while driving operational efficiency.

Bank of America's AI-powered chatbot, Erica, assists customers with financial tasks such as bill payments, money transfers, and providing spending insights. As of 2021, Erica had over 19.5 million users and had processed over 100 million requests.

Robo-Advisors

Robo-advisors are transforming the investment landscape by offering automated, algorithm-driven financial planning and investment management services. These platforms provide personalized investment advice at a fraction of the cost of traditional financial advisors, making financial planning more accessible. The global assets under management (AUM) by robo-advisors reached $987 billion in 2023, with projections to grow to $2.5 trillion by 2027. This growth is driven by their ability to deliver cost-effective, efficient, and unbiased financial advice to a broad audience.

Betterment is one of the leading robo-advisors, offering personalized investment management services. As of 2023, Betterment managed assets worth over $33 billion for more than 700,000 clients.

Fraud Detection

AI-driven fraud detection is revolutionizing how financial institutions detect and prevent fraudulent activities. These systems analyse huge amounts of operation data in real-time, recognizing patterns that suggest fraudulent behavior with an accuracy rate of 95%. By implementing AI-based fraud

detection, financial institutions have managed to reduce fraud losses by up to 50%. This knowledge not only enhances security but also builds trust with customers by protecting their assets more effectively.

Mastercard's Decision Intelligence uses AI to detect fraudulent transactions in real-time. The system analyses billions of transactions annually and has significantly reduced fraud rates for merchants and consumers.

Blockchain-Based Solutions

Blockchain technology is making a significant impact in the financial sector, particularly in areas like cross-border payments, trade finance, and digital identity verification. Blockchain-based solutions have dramatically reduced transaction times from days to seconds and cut transaction costs by up to 30%. The global blockchain market in finance was valued at $3.1 billion in 2023, with expectations to grow to $22.5 billion by 2028. These benefits, combined with enhanced security and transparency, are driving widespread adoption of blockchain in finance.

Ripple's blockchain-based solution, RippleNet, facilitates cross-border payments for financial institutions. RippleNet is used by over 300 financial institutions in more than 40 countries, reducing transaction costs and increasing speed.

Smart ATMs

Smart ATMs are the next generation of automated teller machines, offering a range of services beyond simple cash withdrawals, such as bill payments, account transfers, and even video conferencing with bank representatives. The adoption of smart ATMs has led to a 25% growth in transaction efficiency and a 20% reduction in operational costs for banks. With 60% of banks planning to upgrade to smart ATMs in the near future, this technology is set to further enhance customer.

Diebold Nixdorf provides smart ATMs that offer advanced services such as contactless transactions, video conferencing, and personalized customer experiences. These ATMs are deployed in banks globally, including Barclays and Wells Fargo.r convenience and streamline banking operations.

Personal Finance Management (PFM) Apps

PFM apps are empowering individuals to take regulator of their finances by tracking spending, setting budgets, and providing personalized financial advice. Users of PFM apps typically save 15% more money than those who do not use such tools. The worldwide market for PFM software was valued at $1.5 billion in 2023 and is expected to grow to $3.3 billion by 2028. These apps are becoming progressively popular as consumers seek more personalized and automated ways to manage their financial health.

Mint is a popular PFM app that helps users manage their finances by tracking spending, setting budgets, and providing financial insights. Mint has over 20 million users and is one of the greatest widely used PFM tools.

AI-Driven Credit Scoring

AI-driven credit scoring systems are enhancing the accuracy and inclusivity of credit assessments by analyzing a wider range of data, including non-traditional metrics like social media activity and transaction history. These advanced models have improved credit approval rates by 15-20% while

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reducing default rates by 25-30%. Over 60% of main financial institutions have implemented AI-driven credit scoring (Li, 2012), recognizing its potential to make credit more accessible while minimizing risk.

Upstart uses AI-driven credit scoring to assess loan applicants, considering non-traditional data points like education and employment history. Upstart's model has resulted in 75% fewer defaults at the same approval rate as traditional credit scoring.

Smart Contracts

Smart contracts are self-executing contracts with the terms directly written into code, often implemented using blockchain technology. These contracts automatically execute and enforce the terms of an agreement, dropping the need for intermediaries and lowering transaction costs by 30%. Smart contracts can also decrease contract execution time by 40-50%, making them an increasingly popular choice in the financial sector. By 2030, it's expected that 45% of all financial agreements will be managed through smart contracts.

Ethereum is the most extensively used platform for creating smart contracts, allowing decentralized applications (dApps) to operate on its blockchain. Smart contracts on Ethereum facilitate billions of dollars in transactions across industries, including finance and real estate.

Voice Banking

Voice banking is a developing technology that permits customers to perform banking communications (Zolait, 2014) and access services through voice commands, using AI-powered voice recognition. The adoption of voice banking has seen a 30% year-over-year increase, reflecting its growing popularity among users who value convenience and hands-free interaction. By 2025, it is anticipated that 20% of all banking interactions will be conducted via voice, making it a key area of growth for financial institutions looking to enhance customer experience.

HSBC introduced Voice ID for customer authentication in telephone banking. The system uses voice biometrics to identify customers, enhancing safety and convenience. HSBC has seen an important reduction in fraud challenges since implementing Voice ID.

AI-Powered Trading Platforms

AI-powered trading platforms utilize ML algorithms to analyse market data, predict trends, and execute trades autonomously. These platforms have demonstrated the ability to increase returns by 5-10% compared to traditional trading strategies. The market for AI in trading platforms was valued at $2.6 billion in 2023, with a projected growth of $12 billion by 2030. The adoption of AI in trading is driven by its capacity to process huge amounts of data quickly, enabling more informed and profitable trading decisions.

Kensho, a subsidiary of S&P Global, uses AI to power its trading platform, analysing massive datasets to provide real-time insights and predictions for traders. Kensho's technology is used by leading financial institutions like Goldman Sachs to inform trading decisions.

Table1.2 Metrics on the effectiveness of AI and ML algorithms in detecting and preventing fraud in financial transactions

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Metric	Value/Statistic
False Positive Rate (FPR)	Some models report a False Positive Rate as low as 0.1% when detecting fraud, reducing the number of legitimate transactions flagged as fraudulent.
Operational Efficiency	AI-driven fraud detection systems can process and analyse thousands of transactions per second, significantly improving operational efficiency compared to manual methods.
Reduction in Fraud Losses	Financial institutions have reported a reduction in fraud losses by up to 80% after implementing AI/ML-based fraud detection systems.
Detection Accuracy	AI and ML models have achieved detection accuracy rates as high as 99.8% in certain financial transaction fraud cases, especially with advanced algorithms like ANN.

Conclusion

The incorporation of smart products into the financial sector has developed the trade by leveraging progressive technologies such as artificial intelligence (AI), machine learning (ML), the Internet of Things (IoT), and blockchain. These technologies enhance the functionality, safety, and personalization of financial services, generating an efficient, automated, and data-driven network. The extensive adoption of AI-powered chatbots, robo-advisors, fraud detection systems, blockchain-based solutions, and personal finance management apps has efficient operations, reduced costs, and enhanced customer experiences. Furthermore, modernizations such as AI-driven credit scoring and voice banking are making financial services more available and inclusive, though smart ATMs and smart contracts afford greater suitability and security for users. The research determines that smart products are renovating traditional financial services by improving decision-making, enhancing security, and increasing operational efficiency while offering a more modified and seamless experience to consumers. These improvements are not only restructuring financial institutions' service delivery but also driving substantial economic value across the industry.

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Abbreviation

DeFi - Decentralized Finance

AI – Artificial Intelligence

ATMs- Automatic Teller Machines

API- Application Programming Interface

AUM- Assets under Management

FPR- False Positive Rate

HSBC-Hong Kong and Shanghai Banking Corporation

ML- Machine Learning

IOT – Internet on Things

PFM - Personal Finance Management

NLP- Natural language processing

D-Apps - Decentralized Applications

ANN- Artificial Neural Network