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Artificial Intelligence as a Driver of Fintech: Interesting Applications

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Abstract
This paper explores the transformative impact of artificial intelligence (AI) on financial technology (Fintech). With the rapid evolution of digital technologies, AI has become an important driver in reshaping financial services; where its effect is manifesting as increased net revenues of Fintech organizations. This short article examines various applications of AI in Fintech, including extraordinary payment systems, super-fast lending mechanisms and an example of a near real time insurance settlement system. This paper uses examples from industry to highlight how AI-driven innovations are not only enhancing efficiency and customer experience but also introducing new challenges, issues and considerations. The integration of AI in Fintech is altering traditional financial paradigms, prompting a discussion on the future of financial services, as well as organizational decision making, in an AI-dominated landscape.

Keywords
AI in Fintech, Conversational AI, Human-machine Environment, Organizational Decision-making, Bias in AI Algorithms

1. Introduction

Financial technology, also known as Fintech, refers to the convergence of financial services with advancements in technology, with particular emphasis on applications within payments, personal investments, online lending, digital insurance and myriad other applications. Fintech epitomizes the connection between contemporary AI and internet-related technologies, such as machine learning, cloud computing and the mobile internet, and established business activities within the financial sector, especially insurance, lending and transaction banking. (Gomber et al., 2017). Based on the point of view, whether service based, outcome based or otherwise, two different definitions of Fintech have been provided by different studies and these are tabulated in Table 1. below:

Table 1: Definitions of Fintech Source: Giglio, F. (2021)

Definitions	Source	Year
Fintech is defined as the digital innovation and modern technology that aims to enhance, develop and automate financial services	Al Hammadi and Nobanee	2015
Organizations combining innovative business models and technology to enable, enhance and disrupt financial services	Ernst & Young	2016

This evolution in the financial landscape denotes a shift toward innovation and disruption, compelling traditional financial institutions to respond to the heightened competition by embracing and investing in Fintech solutions.

Unlike their traditional counterparts such as established Banks and Insurance companies that are making moves to integrate technology within their offerings, Fintech firms leverage technology as a fundamental component for providing new services, forging new business models and penetrating previously inaccessible market segments.

Artificial intelligence (AI), refers to the design and application of computer programs capable of acquiring and applying knowledge autonomously without human intervention (Rich, 2009). This definition underscores the transformative potential of AI, positioning it as a critical driver within the Fintech ecosystem. AI in a Fintech context is discussed by many researchers and organizations, one noteworthy treatment being a report by Deutsche Bank Research (2019).

2. AI as a Driver of Fintech

The potential of artificial intelligence (AI) within the realm of Fintech has been substantiated by researchers, who posit that FinTech transcends mere e-banking and digital consumer interfaces (Belanche et al., 2019). Fintech is based on the advent of new, technologically facilitated instruments that cater to user demands. Within this framework, AI has emerged as a driver revolutionizing the financial services industry and, thereby, propelling business value for firms.

The literature indicates that intelligent technologies enhance frontline interactions between organizational personnel and clients, thus perpetually refining customer experience through AI's adaptive learning from such interactions. Innovations such as virtual and augmented reality are being employed to augment sales experiences within the Fintech sector (Marinova et al., 2017). According to these researchers, the use of AI by front-line customer facing executives enhances customer interactions, leading to increased sales and service through deepened customer relationships.

Other independent studies further delineate the significance of AI in financial services, stressing the imperative of real-time data analysis. Delays diminish data utility for commercial exploitation. AI empowers enterprises to scrutinize voluminous datasets promptly, enabling investment decisions and other value-added actions that were previously unattainable (Ashta & Hermann, 2021). Additionally, AI facilitates the tailoring of customer-specific offers by discerning client contexts and purchasing patterns, thereby enhancing fraud prevention mechanisms in personal banking by analysing behavioural data and locational information and expediting such detection cost-effectively.

Within microfinance, AI addresses two primary challenges: the disproportionate transaction costs associated with small loans and the information asymmetry due to a lack of borrower data. Innovations in online crowdlending and mobile banking have significantly reduced transaction costs. Additionally, AI-driven credit scoring models, utilizing data from platforms such as Facebook and LinkedIn, have contributed to significantly reducing the information deficit regarding borrowers, thus streamlining the disbursement of microloans (Bumacov, Ashta & Singh, 2017; Ashta, 2018).

Furthermore, in addition to areas such as investment, payments and lending, which have firmly established their presence, the financial sector is witnessing disruption through 'Robo-Advisory'—an AI-based service offering that provides ubiquitous access to financial advice. However, issues pertaining to customer trust persist as banks and financial institutions begin to adopt these services (Jung et al., 2018). The trajectory of growth in this domain is evidenced by the management of assets worth USD 880 trillion by Robo-

Advisory services, with a compound annual growth rate (CAGR) of 30% in 2019. Projections by Statista forecast that assets under management by Robo-Advisors will reach USD 1,372 bn in 2023, with a CAGR of 13.46% from 2023 to 2027, resulting in an anticipated market size of USD 2,274 bn by 2027.

In examining the role of AI specifically in Robo-Advisory within Fintech, scholars have highlighted that, as witnessed prior in payments and lending sectors of financial services, leveraging AI could significantly enhance product offerings and management practices, yielding benefits for both consumers and organizations (Jung et al., 2018). An example of the effect of AI in the evolving sector can be gauged from the significant reduction in cost for customer; passive funds now charge a mere 0.03–0.09% of assets under management annually, which is markedly lower than the fees charged by active managers, often by a factor of twenty. The decreased cost of executing trades implies that new information is promptly reflected in company prices. The leading brokerage sites predict that retail trading fees will eventually drop to zero. Similar trends are anticipated in other Fintech sectors where AI is making headway.

Experts from the Fintech industry assert that Fintech organizations are implementing various innovative methods that span beyond traditional methods like credit rating, physical verification and so on. The lending segment, for example, is leveraging digitalization advancements from other sectors, utilizing data from e-commerce platforms and web-based aggregators to make decisions. A specific example of such methods is the use of average order size and delivery addresses for orders on online commerce platform to determine the current address of an applicant. The sustainability of such data usage after the enforcement of stringent privacy regulations, such as the General Data Protection Regulation (GDPR), remains an area for future deliberation.

The overall effect of AI, along with other drivers, on the growth of Fintech can be gauged through revenues generated through Fintech and can be visualized by referring to Figure 1.

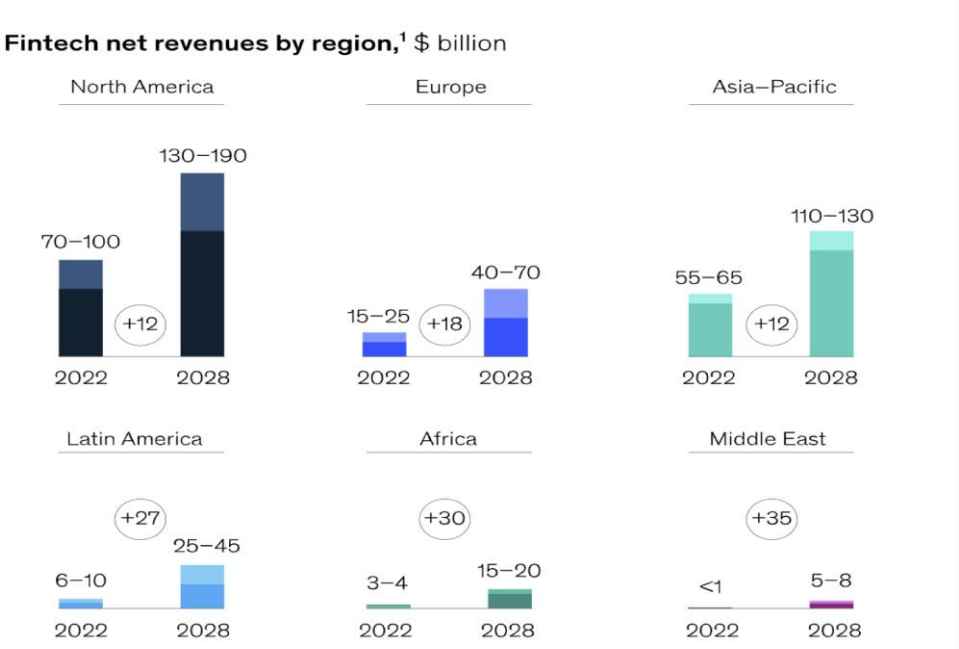

Figure 1: Net revenues through Fintech

Source: McKinsey and Co., 2024 (Numbers in circles indicate CAGR 2022-28)

Usage of AI within the Fintech domain is increasing at a rapid pace and this has given rise to several novel applications, some of which are discussed in the subsequent section.

3. Novel Applications of AI within Fintech

The incorporation of artificial intelligence (AI) within the Fintech sector necessitates enhancements in product usability and service offerings. Despite these challenges, numerous innovative products utilizing AI capabilities have emerged over the past few years.

3.1 Payment System without a Physical Device: "Smile to Pay"

In a seminal paper on AI applications in financial services, Qi and Xiao highlighted three significant innovations warranting consideration (Qi and Xiao, 2018). One such innovation by Ant Financials in 2017, named "Smile to Pay," leverages deep learning algorithms for facial recognition, allowing customers to execute payments with a mere smile on a vending machine. This technology, when fortified with robust security protocols and supported by legislative frameworks, has the potential to revolutionize payment methods, positioning the consumer's facial biometrics as a proxy for traditional payment instruments.

3.2 Super-Fast Lending Systems

The "3-1-0" system, a paradigm for microloans, epitomizes the efficiency of AI in financial services. This system, represented by three minutes for application processing, one second for decision-making, and zero human intervention, significantly reduces the cost of loan disbursal, as evidenced by its application to millions of small traders in China. Ant Financials employs a synergy of technologies—blockchain, AI, security, the Internet of Things (IoT), and computing (BASIC)—to facilitate this system. Deep learning and natural language processing (NLP) are integral to automating customer queries, with an astounding 97% of such interactions occurring without human mediation. In 2017, the efficacy of this system surpassed that of human performance in terms of customer satisfaction.

The acquisition of iZettle by PayPal for USD 2.2 billion underscores the value of data analytics in determining the creditworthiness of small merchants, a service now known as Zettle and operational in various countries.

Despite its subsequent acquisition and closure, Mybucks innovatively utilized data from digital transactions and facial recognition to extend nano-loans to clients in the low-income bracket.

Zest AI distinguishes itself by leveraging myriad data points to foster transparency in lending practices, reportedly aiding lenders in reducing underwriting losses by approximately 35%. It is likely that underwriting for lending will be completely automated and will lead to fast and near-perfect lightning decisions

3.3 Insurance Claims in Minutes

In the insurance sector, expeditious responses and precise estimates are paramount for customers, while insurers strive to deter fraudulent claims without compromising quality of service (QoS). To this end, around 2018, Ping An in China introduced AI-driven services for insurance clients, enabling the filing of auto accident claims through the submission of photographs from the accident site. Rapid processing and immediate provision of payment estimates are enabled by advanced AI technologies, including image recognition and processing techniques that have been refined through model training using large amounts of data.

3.4 Service, Analysis and Fraud Detection at Scale

Ocrolus offers a document processing solution that amalgamates AI with human verification to enhance the speed and accuracy of financial document analysis, claiming a 99% accuracy rate in document review. The widespread use of such systems will likely revolutionize analysis, alter the skillset needed for the workforce and change the expectations of clients.

Kasisto has developed a specialized conversational AI that assists customers with inquiries regarding their

financial standing, expenditures, and savings. Usage at scale within large organizations may involve nearly ubiquitous self-service by customers, and a large number of customer service personnel may need to be reskilled for different tasks.

Furthermore, ThetaRay utilizes unsupervised machine learning algorithms to analyse vast datasets, enabling the detection of sophisticated money laundering and terrorist financing activities, which remain formidable challenges for banking institutions globally.

4. Integrating AI within Organizations

The integration of AI within any organisation, especially those operating in the Fintech domain, is contingent upon an organization's ability to engage with humans on a social level, a concept referred to as 'human and automated social presence' by contemporaneous researchers (Han and Young, 2018).

Leadership teams within organizations face a critical responsibility in ensuring successful implementation of AI in multiple areas within any organization. This mandates a proactive approach to identifying and mitigating potential biases within algorithms and datasets used for training models that later execute underwriting, risk rating and other tasks necessary for seamless operations within a Fintech organization. Leaders can address this challenge by ensuring that the following considerations are met or exceeded:

4.1 Data Governance

Establishing robust data governance frameworks that prioritize data privacy, fairness, and accountability (Mittelstadt et al., 2019). These frameworks should encompass procedures for sourcing and using data for AI applications, along with clear guidelines for responsible data disposal.

4.2 Algorithmic Transparency

Advocating for transparency in algorithmic decision-making processes used in operations helps foster trust. Understanding how AI models arrive at outputs, like risk ratings, underwriting decisions or performance ratings, increases belief in such models and enables leadership oversight where needed (Jobin et al., 2019). Leaders can work with data science teams to develop explainable AI (XAI) solutions that provide insights into the decision-making processes used by AI models.

The successful adoption of AI in organizations thus demands a leadership style characterized by innovation, ethical awareness, and a focus on human-centered design. Leaders can pave the way for the responsible integration of AI by proactively addressing these challenges, fostering a positive employee experience in the age of AI.

5. Issues and Risks

Apprehensions surrounding the utilization of artificial intelligence (AI) in the Fintech industry include the potential for market dominance by prominent technology conglomerates, specifically Google, Apple, Facebook and Amazon or GAFA, in the United States and Baidu, Alibaba and Tencent or BAT in China. Such dominance could marginalize established banking institutions and nascent Fintech entities, ultimately leading to the formation of oligopolies. (Ashta & Biot-Paquerot, 2018).

Market operators additionally express concerns regarding accountability for errors stemming from nonrepresentative data. The integrity of data is imperative for its efficacious application in AI systems, and concerns arise, especially with respect to data volume and variety. Current discourse lacks consensus on mechanisms to ensure that data scientists select representative datasets and amalgamate extant knowledge to effectively mitigate bias (Pozen & Ruane, 2019). An illustrative case of such bias is the reported disproportionate rejection of loan applications from African American and Hispanic individuals

by U.S. banks (Yale, 2018).

The pivot to AI as a fundamental component within Fintech implies a paradigm shift for legacy organizations. To remain competitive in an environment increasingly influenced by the AI and analytics proficiencies of technology leaders, these organizations must undertake a profound transformation of their core technological and data infrastructures to accommodate AI-augmented decision-making processes. Whether such organizations can successfully navigate this transition remains an open question (Blumberg et al., 2023).

Scholars examining decision-making processes within organizations have posited numerous queries that necessitate resolution to realize the full potential of a synergistic human–machine work environment, which will likely soon become the norm for machines working side by side with humans (Shrestha et al., 2019).

In the broader context, the assimilation of human-like AI capabilities challenges the sustainability of a collaborative labor division between AI systems and human employees. Recent analyses by McKinsey (Manyika et al., 2017) suggest that approximately half of current occupational activities are susceptible to automation, potentially resulting in up to 15% of the global workforce being displaced. The emergent job landscape is likely to demand a divergent skill set from that currently in vogue, a development that could impact the Fintech domain itself.

With the advancement of AI, a shift towards collaborative work models, emphasizing the complementary strengths of humans and machines with cognition, will likely evolve. This will necessitate the formulation of regulations and laws to ensure that ethical and practical concerns related to the human workforce are adequately addressed. Considering the social and economic implications of AI-based automation,

6. Conclusion

Artificial intelligence (AI) has emerged as a pivotal antecedent to the evolution of the Fintech industry, significantly enhancing customer engagement and enabling financial democratization. This paper highlights the dual-edged nature of the increasing use of AI in Fintech: helping advance business through better service and optimal use of large volumes of data on the one hand and the issues and risks associated with its widespread use. This underlines the urgency for incumbent financial institutions to evolve technology to fully harness the potential of AI, while at the same time promoting leadership characteristics to promote a balanced, equitable approach to AI integration within organizational processes.

While the future of Fintech, propelled by AI, promises increased business through greater inclusivity and personalization in financial services, it also carries with it dire possibilities for the workforce. It is paramount that this transition be managed with thoughtfully to ensure that AI's trajectory remains beneficial to all stakeholders in the financial services ecosystem and that minimal upheavals occur in human society (Daniel, 2023).

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Web Resources

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