

Digital Banking and Financial Services using Artificial Intelligence and Internet of Things

Prof. Seng-Phil Hong

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Abstract: The field of artificial intelligence (simulated intelligence) is a quickly developing one internationally. One of the early clients of artificial intelligence is the banking business. Banks are trying different things with and applying innovation in various ways. Consistently, artificial intelligence improves and becomes more astute. The use of artificial intelligence in the Indian banking industry, as well as its benefits and hardships, will be shrouded in this paper. FinTech headways made conceivable by man-made intelligence, as well as the different ways it would assist Indian saves money with working all the more effectively. There are a few potential for banking and financial services because of the ability to utilize state of the art Internet of Things (IoT) innovation to extricate client bits of knowledge through investigation and shape the data into consumables for other connected frameworks. In this article, engineering for the banking and money industry in view of the Internet of Things is introduced. It oversees portable, home, wearable, and other detecting gadgets for various applications, including retail banking, protection, and financial planning.

Keywords: Artificial Intelligence, Banking, Financial Services, Development, IOT

1. Introduction

Artificial intelligence is modernizing the processes for dealing with finances in the sector of finance. Financial due diligence is using artificial intelligence to modernize and improve processes that range from credit determinations to a quantitative transaction and commercial risk management. Due to significant advancements in the financial services industry throughout time, as well as changes in business practices and the nature of professions, traditional banking has undergone significant change [1]. A long history of employing computational tools and a set of guidelines to facilitate assessment-making are both features of the financial services diligence. These serve as the foundation for AI coordination, and as a result, the industry is well-versed in how to integrate AI, placing it in the forefront of hiring and promoting since AI knowledge. AI can simulate human intelligence by spotting patterns and differences in large collections of data, which is important for tasks like anomaly recognition (instance; false dealings). In addition, AI may be used to estimate and programme repetitive menial tasks in a different way, such as complex computations like risk identifications for business transactions [2].

Artificial intelligence has gotten a handle on current market insight spreading designs. Artificial intelligence is presently being utilized essentially in different enterprises. Financial foundations are using artificial intelligence in exceptionally complex ways. The financial area is encountering a phenomenal tsunami because of the astounding making of artificial intelligence. Computer based intelligence is being utilized in most of day to day financial industry activities to diminish time responsibilities, kill costs, and besides acquire extra worth with speedier help (Eletter, Yaseen, and Elrefae, 2010). Furthermore, it has been accounted for that the notable, top-level, global corporate financial areas depend on artificial intelligence, which has been placed into utilization because of mechanical headways. This outcomes in artificial intelligence giving clients prevalent practical help, enlightening execution, and producing more noteworthy returns from pay sources (To and Lee, 2010).

The business people of today, with their state of the art business rehearses, know about the colossal benefits of modern digitalization on worldwide viewpoints, especially in the ongoing time. Google, Twitter, Facebook, Microsoft, and Apple innovation has impacted everyday official contacts and interchanges with each other over an extensive stretch of time (Kraus and Palmer, 2018). Computing, putting away, and exploring data is becoming less difficult as well as more adaptable and reasonable as I-cloud services proceed to create and the internet's organization is being overhauled toward the supposed "Internet of Resources." The change to the

Head Professor, AI Advanced School, aSSIST University, Seoul, Korea,
46 Ewhayeoadae 2-gil, Fintower, Sinchon-ro, Seodaemun-gu, Seoul, Korea,
03767,
sphong@assist.ac.kr

“Internet of Standards” has previously started to happen through network sequencing. In the year 2020, it is normal that 90% of new item electronic designing would utilize artificial intelligence, and financial reasonable level of effort will include exchanges worth \$1.2 billion in trustworthy digital forms of money universally. Richarder (2017)

Proficiency and supportability are the principal business needs in most of areas, and this is likewise valid for the banking area. Artificial intelligence is unparalleled in this cycle since it eliminates human predisposition from choice trees, which is the underpinning of supportability. Irrefutably, great preparation and dynamic will bring about development. Robotizing dynamic cycles is important to bring down the room for give and take as the banking area begins to embrace this idea.

As indicated by concentrate by (Alkaabi and Nobanee, 2019), the consistency of corporate insolvency is more exact when it is upheld by both macroeconomic and non-financial elements. Contrasted with simply financial factors, these are more prevalent. The techniques for effectively coordinating artificial intelligence into the different parts and connection points of the banking areas according to a worldwide viewpoint will be entirely analyzed in this survey. Advanced banking is the method representing things to come, and when its suggestions are painstakingly thought of, they are fairly surprising.

1.1. The Financial Services Sector and Artificial Intelligence

Banks and protection organizations work in the money area in a mind boggling, vicious industry that is under serious strain to change to get by. Keeping up with client unwaveringness, which incorporates fulfillment, trust, responsibility, and saw esteem, is critical in this setting [3].

Information juggernauts like Google, Facebook, and Apple have previously shown how relentless client center and the utilization of contemporary advancements might reform financial assistance methodology. Customary FS providers, nonetheless, oftentimes miss the mark in furnishing their clients with enough development and adaptability. Hence, FinTech is hailed as an outlook changing problematic development fit for overturning laid out financial business sectors [4]. These market members don't develop obsolete models; all things being equal, they utilize bleeding edge, contemporary innovations. FinTechs can increment client direction, cut costs, and accelerate advancement using lean and nimble methodology. These organizations, which are fundamentally new companies, have started critical progressions in various fields, including installments, abundance the board, loaning, and publicly supporting [4]

as well as the utilization of artificial intelligence and AI in financial services [5].

Conventional financial market players are being compelled to adjust by the presence of carefully conceived FinTechs, whose organizations are more clients centered: The volume of ceaselessly processed information where clients and establishments converge shows tremendous potential for assessment, investigation, and item suggestions. Conversational connection points are changing from structure based (severe default fields or complex structures) to discussion based correspondence, as featured by an update of computerized encounters: Through composition, talking, or in any event, motioning, man-made intelligence empowers clients to speak with organizations in a more normal manner [6]. Additionally, the client group known as “digital natives” (generations born after 1995) [7] anticipates from FS providers identical experiences to those attained with Facebook, Apple, or other digital suppliers. This includes financial goods that are simple to grasp, a highly sophisticated arrangement of all information, Optimized processes with quick throughput, and the ability of the good or service to be tailored to the demands of the consumer before and after the sale [7].

1.2. Artificial Intelligence in Markets and Financial Services

Given that we presently live in a technologically and financially advanced culture, financial markets are gradually starting to rely more on AI through the use of: underwriting, risk management, quantitative trading, personalized banking, cyber security, and fraud protection [8]. "The procedure by which an individual or entity assumes financial risk for a fee" is the definition of underwriting (Barton, 2020). Investment, loan, and insurance-related issues are typically the focus of underwriting. Artificial intelligence has the ability to change underwriting from a detect-and-repair mentality to a predict-and-prevent mentality, according to a recent article. [9]. Artificial Intelligence in Underwriting enables a corporation to convey financial analysis in terms of risks and decisions more quickly and accurately. Artificial intelligence can be utilized in risk the board to join guidelines, administrative changes, and arrangements, cycles, and controls to work on an association's consistence.[10]. When handling and analyzing both structured and unstructured data, particularly data that does not fit in a spreadsheet, artificial intelligence is incredibly useful. Artificial intelligence in regard to risk also enables financial organizations to enhance their analytical management and compliance capabilities, assisting in the earlier identification of hazards. In order to find and frequently act upon opportunities, quantitative trading is "a form of market strategy that depends on

mathematical and statistical models" [11]. In the trading world, artificial intelligence aids in the estimation of stock prices, enabling the trader to make better decisions based on more precise risk projections. Clients may now more easily determine where to trade, at what price, and in what quantity thanks to the application of artificial intelligence and computer algorithms [12]. Never the less, artificial intelligence has altered how banks communicate with their clients. As the speed and accuracy of digital computers spread, it is highlighted that "AI as a symbol of present and future affects all sections of the banking sector" [13]. Financial institutions have been compelled to go digital, shifting customer interaction to mobile devices as a result of the younger, more tech-savvy generation known as millennials. This has increased the use of artificial intelligence as well as social media analytics. The power of social media is starting to have a significant impact on the banking sector as a whole. Banks and other businesses can monitor how they promote their goods and services, including product and service design, risk management, and business forecasts, by strategically utilizing social media. According to research, "banks may extract crucial insights that will enable them to better product and service development, customer service, marketing, risk management, and company performance by evaluating the huge volumes of data available on social media" [14]. With this, banks and other businesses may study their rivals more effectively and educate customers on pertinent topics. The ability to perform almost anything on a cell phone today is available to individuals all around the world. Banks and other financial institutions have developed mobile banking apps using artificial intelligence that let users customize their online banking experiences. Convenience and customer satisfaction are crucial success factors in today's young, technologically advanced society. Cybercrime, often known as computer-oriented crime, is a significant issue in today's business world and may pose a threat to the safety and financial stability of an individual, a corporation, or both. Though security technologies now analyze data from millions of cyber occurrences in order to identify potential risks, "Artificial Intelligence and Machine Learning are playing a growing role in cyber security"[15]. An employee account, for instance, acts suspiciously by clicking on trolling links or adverts that may result in a potential infection or even a system crash in some situations. In order to promptly detect and respond to these kinds of suspected difficulties, artificial intelligence and machine learning are also used, further preventing prospective problems from affecting company.

1.3. Technology and Indian Banks

One more significant angle in the reception of new advancements in the Indian banking area is the Hold Bank

of India's practical position. The RBI has as of late taken on a wary yet functional way to deal with embracing new innovations, habitually driving banks to embrace new advancements through guideline, any place it can possibly further develop client experience and effectiveness utilizing a specific innovation. This is particularly obvious during the governorships of Raghuram Rajan and his replacement Urjit Patel. The forceful advancement of new innovation use by RBI goes past basically creating administrative systems. To simplify everything and more productive, it has used a mix of regulation, evangelism, and even coordinated effort with the business.

One model is the foundation of the Public Installment Company of India (NPCI), which has incredibly diminished the expense of electronic exchanges. The controller likewise has a scholar/research division called the Establishment of Improvement and Exploration in Banking Innovation (IDRBT), which is continuously exploring the benefits and impediments of arising mechanical fields. The way that both of these associations have been effectively engaged with block chain proof of idea testing is no happenstance.

The circumstance with India is really uncommon. India is without doubt middle for innovation. India is a critical area for innovation reevaluating and the home of organizations with a sizable worldwide piece of the pie in center banking. Infosys and TCS, two of the main three suppliers of center banking arrangements, have their corporate offices in India. As of late, there has been a great deal of action in the fintechs area in India too. The country has formed into one of the world's fintechs centers. While banks and fintechs have had a strained relationship in many created markets, India's most ground breaking banks, including ICICI Bank, Pivot Bank, and HDFC Bank, has effectively connected with fintechs. These banks have coordinated challenges and hackathons to track down the best advancements, and incidentally they have even imparted their APIs to these fintechs.

2. Technology Using Artificial Intelligence in Banking and Finance

2.1. Financial Services that are Customized

As mechanized financial advisors and organizers offer their insight in pursuing financial choices, customized interface will arrive at new levels. They give suggestions on values and securities in the wake of dissecting market feeling according to the client's financial goals and individual portfolio.

➤ Mobile Wallets

With significant organizations like Google, Apple, Paypal, and others getting on board with that temporary fad and making their own installment doors, advanced

wallets are being proclaimed as the rush representing things to come for customary installment techniques. This decreases dependence on genuine cash, stretching out the utilization of cash to more significant levels.

➤ **Underwriting**

The protection business is moreover encountering a tempest as they change to predictable mechanization. The organizations are given more point by point data to help their choices by utilizing computer based intelligence devices that mechanize the endorsing system.

➤ **Vocal Assistance**

Banking As innovation empowers clients to get to banking services with voice orders and contact screens, actual presence is step by step disappearing. Normal language handling innovation can deal with questions to give data, answer requests, and connection customers to various financial services. Thus, productivity is arranged, decreasing human blunder.

➤ **Data-Driven**

Artificial intelligence loaning choices Applications that are consolidated in end-client gadgets, individual robots, and financial organization servers are fit for examining colossal measures of information and creating projections, calculations, and prompt that are explicitly customized to the client. Through investigation into different custom-made speculation open doors, credits, rates, expenses, and so forth, these applications can likewise build financial plans and procedures and track the outcomes.

➤ **Customer Service**

We are drawing nearer to when PCs could deal with most of client service requests as discourse handling and normal language handling innovation advance. Clients would be more joyful because of the finish of line pausing.

➤ **Using Digitalization Rather Than Branch Lines**

The extended course of banking has generally been hampered by lengthy lines and slow help. In any event, opening a ledger was seen adversely in light of the fact that unhinged clients would run starting with one piece of desk work then onto the next. Documentation digitization decreases this uneasiness and constructs a strong stage for interfacing clients and specialist co-ops.

➤ **Block Chain Accelerates Payments**

The computerized transformation, especially web-based entertainment and portable, is driving a critical change in the purchasing propensities and inclinations of the customer base that banks administration. There is a rising requirement for more decision and control in how individuals collaborate with banks. Slow installment methods will be a relic of days gone by because of Block

chain, which is scheduled to present the advantage of continuous installment handling, speeding up the installment interaction and helping backing and fulfillment.

3. India's Artificial Intelligence Banking

The worldwide interest in computer based intelligence applications arrived at USD 5.1 billion (EUR 4.3 billion) in 2016, as per the PwC FinTech Patterns Report (India) 2017. PNB, yet additionally other Indian banks including SBI, HDFC, ICICI, HSBC, and Pivot banks have embraced computer based intelligence.

4. Bank of India State (SBI)

Prescient examination, fintech/block chain, computerized installments, IoT, man-made intelligence, AI, BOTS, and mechanical interaction computerization are only a couple of the innovations that are the focal point of SBI's cross country hackathon, "Code For Bank," which is available to designers, new businesses, and understudies. The bank by and by utilizes an artificial intelligence based arrangement made by Chapdex, the triumphant group from its first hackathon, which records purchaser looks and helps in breaking down client conduct.

5. Conclusion

We suggested an IoT-based conceptual framework for the banking and financial services industry in this research. We suggested a framework for the interaction of heterogeneous items with the physical world. High reliability, multicast, dynamic expansion utilizing a modular architecture, effective quality of service management, and built-in analytics platforms are some of this framework's distinguishing characteristics. This methodology coupled bottom-up reasoning about design principles with an examination of the technical effects of architectural design decisions using a case study. The Internet of Things innovation is setting out various open doors for the eventual fate of banking and financial services. Supporting heritage IT foundation is a major obstruction in the approach to conveying IoT in banks. In this manner, it should be revamped to effectively oblige current advancements while additionally smoothing out complex frameworks. Personality the board, energy-proficient detecting, greening IoT, versatility, security and protection, correspondence systems, incorporation of brilliant parts, and global participation are a portion of the innovative issues encompassing the internet of things.

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Declarations

Author(s) declare that all works are original and this manuscript has not been published in any other journal.

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