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THESIS

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FINTECH

*Artificial Intelligence in Financial Technology: A Complete
Overview*



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Candidate's signature

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Introduction

With the use of certain data and technology, artificial intelligence, also known as machine learning, is an intellect that can possess the same capacities as a human brain. According to (Balakrishnan, 2022), Artificial intelligence is perhaps the biggest bet in the financial world today. The use of smart solutions can give financial institutions and banks a significant advantage over their competitors and help them adapt their offerings to this changing and unpredictable world. In recent decades, financial technology (fintech) and artificial intelligence (AI) have become increasingly incorporated into economics. Artificial intelligence is being used by e-commerce companies. According to (Albert Pang, 2022), in 2021, the top 10 banking and financial services software vendors accounted for nearly 47.9% of the global financial market. Almost all banks and financial services businesses, according to (Albert Pang, 2022), use AI software for financing, lending, securities, investment management systems, mortgages, risk calculations, forecasting, decision-making, and other financial activities. The most used applications are SAP, ORACLE, MS, TEMENOS, FINESTRA, COREPLUS, and many more (Iryna Kravchenko, 2022). By using that software, we can see they are making financial technology more powerful, accurate, and fast,

Additional Key Words and Phrases: Artificial intelligence, AI, machine learning, FinTech, finance, AI in FinTech, AI in finance

Let's talk more about the advantages and disadvantages of these functions. A huge amount of the business sector is currently using AI technology in their business to give fast services to the customer. At present in the world, lots of enterprises are using AI technology for financial activities. By using artificial intelligence, they can serve fast and accurate services, and also, they can gain more customer satisfaction. AI technology is mostly used in decision making, i.e., for customer support, for customer services by using a chatbot, in the management of wealth and insurance and they can easily access much more strong security to detect fraud. (Landyshev, 2021). Simply AI in FinTech refers to artificial technology in the business. Fintech solutions with artificial intelligence and blockchain technology are now set at a unique speed (Paolo, 2018). Artificial intelligence is an advanced pivotal for the future of financial technology. It can change financial services by providing more accurate and fast transactions. The Bank, business sector, and some food production companies are also using this technology to make their business procedure much more efficient. We believe that financial services and technology can transform the future of finance. Here I will discuss the foundation of financial activities through artificial intelligence. In terms of finance, Artificial

intelligence's vision is to create an innovative and collaborative environment that can benefit regulators and supervisory regulators (Paolo, 2018). According to (Cao, 2021), he thinks that many reviewers reference financial technology related to artificial intelligence. According to (Andersen, 2009) and (Cao, 2021), Financing, virtual projects, merge investment management, global logistics management, contactless banking, and cryptocurrencies will all be pretty standard in the future, he predicts, thanks to artificial intelligence and financial technology. Nowadays cryptocurrency is very popular in the world. The number of online shoppers has been increasing over the last couple of years. The number of online shoppers worldwide will escalate with the help of artificial intelligence in financial technology. Based on the recent statistics of [OBERLO](#). we can understand that our world has become smarter in the field of business activities and we can observe that people across the globe have been becoming wiser in the domain of finance. As it stands in 2021, the number of digital buyers is at around 2.14 billion. That makes up 27.6% (percent) of the 7.74 billion people in the world according to World population [statistics](#). And currently, all banks are issuing debit and credit cards to their customers. According to (Donepudi, 2017) artificial intelligence has been implemented in the banking sector to collect data and record data. In nearly every country banks have artificial financial technology such as mobile banking facilities, the internet, online payment systems, and so on.

This review summarizes long-term research on financial AI and aims to create a global, multidimensional, and socio-economic research landscape based on next-generation fintech technology.

1. AI used in FinTech:

Artificial intelligence is a computer program that is significantly used in every sector. Governments, military sectors, institutions, hospitals, manufacturing companies, chemical companies, and business and other financial services companies are also using this technology. In the current world, AI has become a more important and hotter topic according to google. Nowadays business and financial organizations are also encouraged to use this technology. Financial services companies, particularly banks are using artificial technology in recent years more and more. AI in banking is maturing, bringing the potential for highly sophisticated solutions that create positive impacts across business segments. Artificial intelligence is being used in financial and banking services companies for different uses in 2022. Artificial Intelligence is making significant roles in conversational banking, anti-fraud, risk and credit underwriting, etc.

Banks are using AI in this specific area, according to "Business Insider" (Digalaki, 2022). Here we can see,

Conversational banking	Anti-fraud and risk	Credit underwriting
AI biometrics technology	Anti-money laundering	Smart Contracts infrastructure
Personalized insight	Know your customers	

Figure 1: Table created by me, Information from:
<https://www.businessinsider.com/ai-in-banking-report>

Figure 1: This table describes the main areas of using artificial intelligence in the banking sector. The conversational banking sector means a form of digital marketing that allows banks and customers to communicate in real-time via text, voice, mobile apps, and websites for seamless service. Conversion banking mainly uses for communication with the help of AI, which is called a non-human interface to discuss and help clients' problems and solve their issues. This is only possible when a bank uses artificial intelligence. In the financial services company, AI can detect biometrics technology to make sure this is the right customer for their business. AI can personalize insight without any human interrupt, which is called a chatbot in the bank. The chatbot is a part of financial technology by using AI.

1.1 Chatbots in FinTech

According to (Landyshev, 2021), Because AI addresses the most typical and often encountered issues, its adoption can lessen the demand exerted on the telephone network. Each chatbot incorporates complex sentiment analysis made possible by artificial intelligence, despite how basic it sounds. This sentiment analysis concentrates on comprehending how customers feel about your product/service, locating its defects, and teaching the chatbot how to correct them. Computer software known as a chatbot may be employed by businesses to automatically service customers. According to an [Oracle survey](#), most companies and financial services companies use artificial intelligence chatbots to execute their business activities. In a survey conducted by Oracle poll, 40% of internet users globally prefer chatting to virtual agents while interacting online, and chatbots are expected to gain popularity as major sectors like retail and healthcare use digital technologies. According to an Oracle poll, 40% of organizations and enterprises now utilize automation technology, which is a subset of financial technology and a form of artificial intelligence, and 80% of businesses globally use chatbots as their main method of communication with clients.

(Onose, 2022) says within the year 2025 the global artificial chatbot technology market would reach 1.23 billion US dollars.

Six types of chatbots can be used in business according to ([Engati Team](#), 2022). Such as,

1. Menu/button based.

Bots with a menu or button interface are the most common and widely utilized forms of chatbots nowadays. This particular type of chatbot typically contains automatic features relating to frequently requested inquiries and responses. "How may I be of use to you? alternatively, "What are you seeking, and where can I get this?"

The user of a chatbot designed around menus or buttons, as the name indicates, is provided with a number of alternatives. After the user makes a selection, the bot presents him with a new set of possibilities.

Keywords: Chatbot, biometric technology, Anti-money laundering,

2. Machine learning,

This chatbot has human-like behaviors. (Onose, 2022) defines a machine-learning chatbot as a service that employs voice, text, or both for human interaction. Through a variety of methods, including Natural Language Processing, he discovered this (NLP). This chatbot is primarily used to save time for staff and can quickly and properly solve important consumer concerns. Machine-learning chatbots are progressively being used by banks and financial institutions. In the future, every organization and industry may benefit from machine learning and virtual agents.

3. Linguistic based,

This chatbot is mostly used to anticipate client inquiries. Your consumers may ask you certain automatic inquiries that you can set up. Linguistic-based chatbots are an excellent example of how to cut down on the time it takes to respond to several similar queries. The Facebook page or other social media sites used by content producers are the main places where this chatbot may be found. According to ([Engati Team](#),2022) First, The terminology for the chatbot has to be defined. Search for words, phrases, synonyms, and some other things. The exam type seems to be configurable. Customers can receive the finest assistance

as quickly as feasible if the incoming inquiry satisfies the chatbot's requirements. According to [Artificial Solutions](#), a linguistic-based chatbot can be defined as a “rules-based” chatbot.

4. The hybrid model,

You must provide the chatbot's vocabulary. Look up words, and phrases, and We do not want to squander our time since we are human. We constantly seek an immediate, exact solution because of this. Engineering created a remarkable chatbot to instantaneously speak directly

According to [KiwiTech](#), when it comes to major tasks in the digital era, hybrid intelligence, which combines human and artificial intelligence to complement one other, will be the protagonist.

Keywords: digital technology, Oracle, machine learning, natural language processing (NLP)

with clients for this very reason.

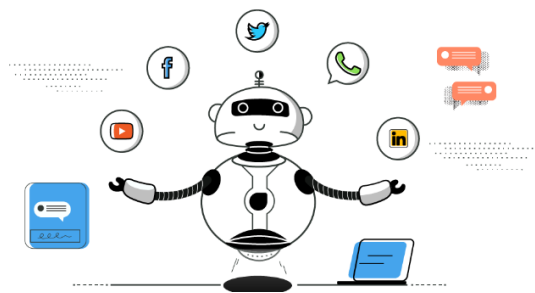


Figure 2: Hybrid Model Robot
<https://whizardapi.com/2022/05/11/CHATBOTS-ARE-THE-FUTURE-OF-MARKETING/>

According to [“RingCentral”](#), 80% of customers demand an immediate response from the service provider.

Figure 2: A hybrid chatbot can be used with messaging and live chat programs. For instance, services are offered by Facebook Messenger, WhatsApp, WeChat, and other social media sites. This chatbot is capable of performing simple tasks. As I mentioned, hybrid chatbots are software programs that converse with users and respond to them in an automated, tailored manner.

5. Keyword recognition based

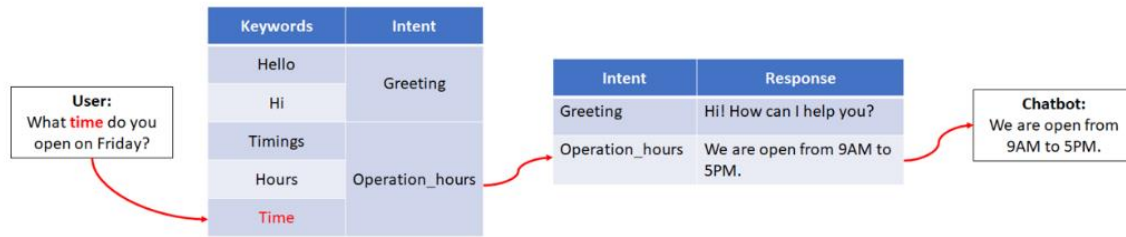


Figure 3: Diagram of Keyword Chatbot by <https://datasciencedojo.com/blog/rule-based-chatbot-in-python/>

Figure 3: A chatbot that operates on keywords can read queries that user’s type, comprehend what they're asking, and react appropriately. Natural language processing (NLP) software and special terms are used in these interactions to help the system decide how to answer the user.

6. Voice bots.

This chatbot can recognize the customers demand through voice detection. For example, if some of the customers unable to white something then he or she can chat with this chatbot via voice command.

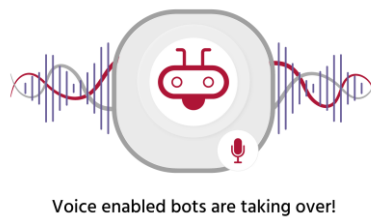


Figure 4: Voice chatbot <https://www.engati.com/blog/growth-of-voice-enabled-chatbots>

According to (Shubham Parmar1, 2019), the NLG platform uses natural language text and speech with set vocabulary In order to assess data, find trends, and disseminate information that is simple for people to grasp, evaluate, and comprehend, NLG software has strong mining capabilities. These chatbots are available on multimedia devices.

1.2 History of Chatbot:

As we already discussed chatbots. Do you know the history of how and when AI chatbots were developed? An advantage of artificial intelligence is the recent development of the corporate chatbot.

Name of Chatbot	Year of invented	Author/Company/book
Turing Test,	1950	Alan Turing, “ Computing Machinery and Intelligence ”
ELIZA	1966	MIT computer scientist Joseph Weizenbaum
Siri	2010	Apple inc.
Alexa	2015	Amazon co. inc.

Figure 5: History chat created by me
 Info taken from <https://en.wikipedia.org/wiki/Chatbot>

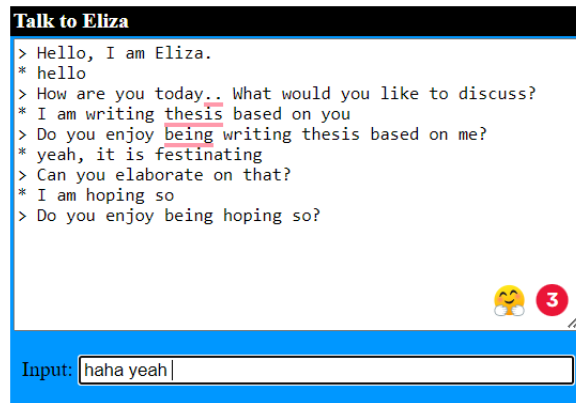


Figure 6: Chatting with Eliza chatbot
<http://psych.fullerton.edu/mbirnbaum/psych101/Eliza.htm>

Figure 6: Here you can see I had a conversation with [Eliza](#), if somebody would like to chat with this chatbot can easily chat with it. It is a great invention by scientist Joseph back in 1966. To simulate a Rogerian therapist, ELIZA is a computer software. If you have any questions or comments, just write them in and press enter. Eliza will answer your questions. As previously stated, the first chatbot was ELIZA. Joseph Weizenbaum developed this pattern-matching and substitution technique in 1966 so that computers could have simulated conversations. The software was developed with the goal of fooling humans into thinking it is human. It is the progenitor of modern digital assistants like Siri and Alexa and was created at MIT's Artificial Intelligence Laboratory (Singh S. , 2020). Just type in your questions and her responses to them to have a conversation with Eliza.

Additionally, to interact with users of such gadgets, Siri and Alexa were developed. The bot is enjoyable. All of these bots are, as far as we know, financial technology.

2. AI in Financial Services

Financial technology is being used in many aspects of finance. especially for daily use. Today's world is more inclined toward artificial technology than we may realize. As we are all aware, a lot has changed in the financial sector. To reduce banking operational

expenses, every financial services company going to accept self-service technology (Mugdha Y. Keskar, 2016). This means they are more likely to accept artificial intelligence in financial activities. According to (Yang, 2009) in recent years customers are using online banking, and every online banking service to pay groceries, utilities, and even their house rent as well. According to (Andersen, 2009) and (Cao, 2021), Financing, virtual projects, merge investment management, global logistics management, contactless banking, and cryptocurrencies will all be pretty standard in the future, he predicts, thanks to artificial intelligence and financial technology. Currently, cryptocurrencies are widely utilized all around the world. In the previous few years, there has been an increase in internet consumers. Financial technological intelligence will assist boost the number of online buyers globally.

2.1 AI uses in Internet Banking:

Artificial intelligence (AI) can help banks lower risks, track system problems, and improve the security of online financial transactions. AI and machine learning are able to detect fraudulent activity fast and alert banks as well as customers. According to (Singh, 2022) banks can manage cyber threats by utilizing AI. With 29% of all cyberattacks in 2019, the banking sector was the most often targeted industry. Due to artificial intelligence's capacity for constant monitoring in the financial industry, banks can respond to suspected intrusions before they affect people, clients, or internal systems. I conducted a poll based on AI in online banking, and the results show that customers think AI can be a reliable and quick decision-maker in the banking sector. Trust, which is a key factor in enhancing usability within the online banking environment, influences customer attitudes regarding Internet banking. The trust issue is more significant in online banking than in traditional banking since financial transactions of this kind include sensitive information and parties worry about unauthorized access to important files and information sent over the Internet..

2.2 Administration of surveys and creation of measurement:

Results of a survey based on artificial intelligence use in the online banking business using AI. A sample of 26 persons was randomly selected across the LinkedIn and Facebook

communities to participate in the survey approach that was utilized to gather the data.

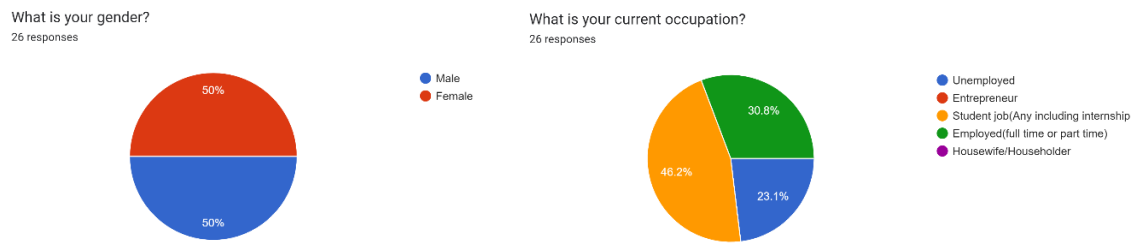


Figure 7: Survey results gender and occupation created by me.

Equal numbers of men and women participated in this questionnaire, which is fundamentally great. And also, Among the 100% ratio of people most of them are doing student jobs, the ratio is 46.2% for student job holders, also unemployed ratio is 23% and employed ratio is 30.8%.

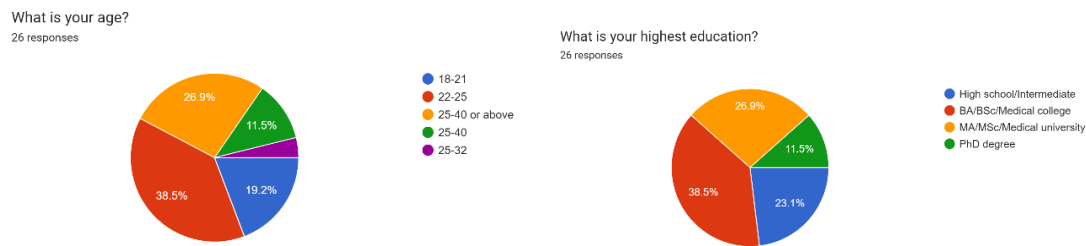


Figure 8: Survey results of age and education created by me.

The majority of participants range in age from 22 to 30. However, this poll shows that about 23% of high school graduates use internet banking. Additionally, 38% of online banking users are bachelor's degree holders. Meanwhile, about 26% of users have master's degrees, and 11% have PhDs.

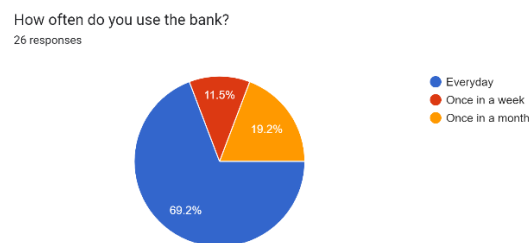


Figure 9: Bank related survey questions created by me.

As you can see, when I asked how frequently they utilized online banking, the majority of them said that they did so every day. Others using internet banking once or twice per week or

per month. It indicates how regularly individuals use internet banking. We can observe from this poll that internet banking is reachable to all individuals on a daily basis. Simply because it is more practical, helpful, and approachable, internet banking has become more and more advantageous. Both professionals and students prefer internet banking.

Do you have any idea about internet banking?

20 responses

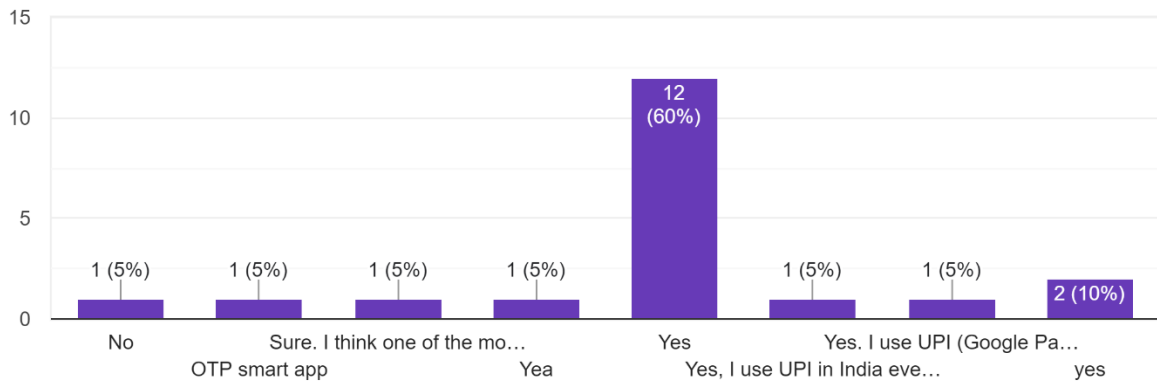


Figure 10: Internet banking idea (Survey created by me)

In this question, I've implied that if they have any insight, they might be able to respond to the next questions more effectively. As we can see, the majority of them are knowledgeable about online banking. Additionally, they use online banking methods like Google Pay, UPI, as well as the OTP intelligent app.

Which kind of banking services are you using?

26 responses

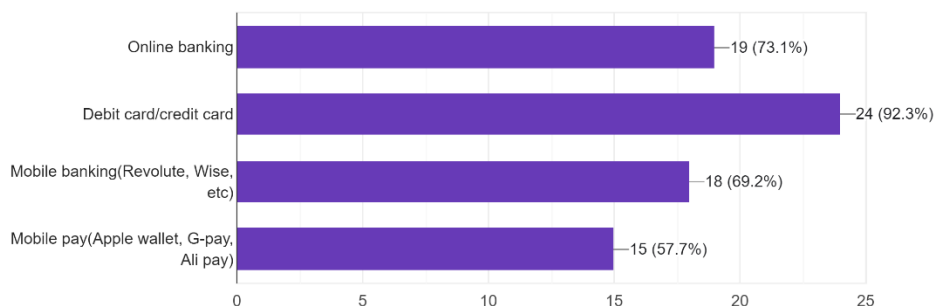


Figure 11: Survey of using of banking services (Created by me)

Approximately 19% of participants use internet banking, 24% using credit cards or debit cards, 18% use mobile banking (including Revolute, Wise, or others), and 16% use mobile pay (such as Google Pay, Apple Pay, or any other AI application wallet). According to my

analysis, debit/credit cards, internet banking, and mobile banking are all growing in popularity. The simultaneous use of this financial technology is steadily increasing throughout all participants.

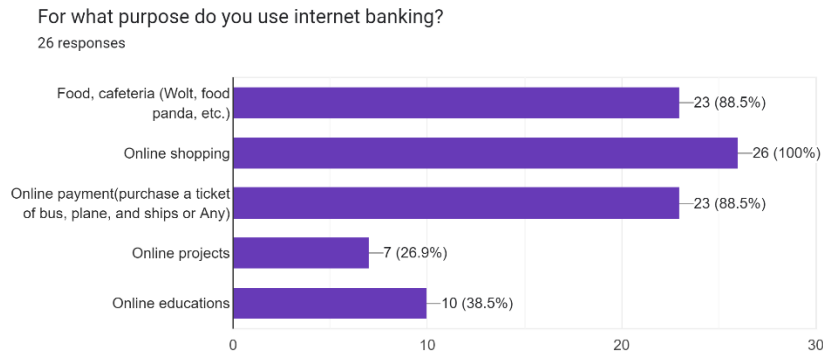


Figure 12: Purpose of using Internet banking (Created by me)

As we can determine from the results of the poll, 26% of participants use internet banking for online shopping, 23% use it to order restaurants online, 23% use it to make a payment online, and the rest of the participants use it for online projects or academic purposes.

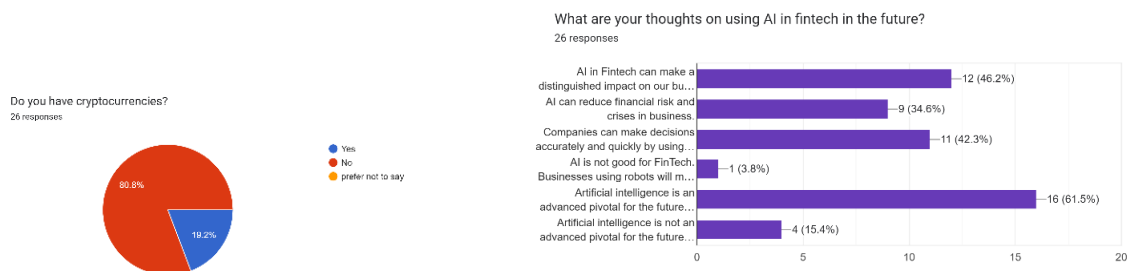


Figure 13: Thoughts of using AI in FinTech survey (Created by me)

The majority of people do not use cryptocurrency. Regarding artificial intelligence in financial technology, I have several questions. The majority of them feel AI may help businesses make choices more precisely and swiftly and decrease financial risk and crisis situations. They also believe that employing AI in financial operations would benefit the industry in the long run. Few people contest this. For believers, the ratios are 46% and 61%. Who, on the other hand, does not think that this has a lower ratio, like 3.8% and 15%? Artificial intelligence in internet banking can be a great example of progress for financial technology.

Keywords: Cryptocurrency, financial risk, online payments.

3. An Upward Trend in Financial Technology.

Because of the amount of data accessible and the decreased cost of processing power, FinTech is adopting AI. The financial sector may benefit from artificial intelligence in a range of ways, including by increasing profitability, creativity, and customer satisfaction (Sato, 2022). Risks toward financial sustainability were highlighted by the global financial crisis. A rebellion against the monopoly status of financial service companies has also occurred. This has resulted in a substantial rise in regulation, expenses associated with compliance, and inefficiency. FinTech has the ability to lower costs and increase regulatory efficiency (Anil Savio Kavuri, 2019). According to [iotforall](#), Artificial intelligence might be used by financial services firms to handle and analyze data from a variety of sources. These novel outcomes assist financial institutions in addressing common problems encountered when offering routine services like loan administration and payment processing. Essentially defined, The term "fintech" refers to the industry that uses information and communication technologies to serve the banking and financial needs of people and businesses. Both developed and developing countries are seeing the fastest growth in this sector of the economy, with Indian startups being in the top three globally. Some of the top technologies used by fintech companies to supply goods include blockchain, cryptocurrency, AI, data analytics, machine learning, big data, robotics, and the cloud (Pant, 2021). The preponderance of FinTech effectively uses AI in a variety of finance streams, encompassing cybersecurity and customer support. AI is also altering how internet banking functions. For instance, chatbots' emotional intelligence and natural language processing are proven to be affordable substitutes. AI also relies less on human assistance as it analyses more data (Sato, 2022). We'll now examine how AI can alter the future of the Fintech industry. According to [iotforall](#), You should expect to see some major shifts in the financial industry as a result of AI.

I. Safety Boosts as cybersecurity,

II. Enhance your dedication to your customers,

- Uses of chatbots in the financial technology &
- Automated, Customized Financial services Tools powered by artificial intelligence
- Analyzing How Users Act

III. Identifying Potential Cases of Fraud

3.1 Cybersecurity:

The rise in cyberattacks is helping to drive growth in the market for security solutions powered by artificial intelligence.

Figure 14: According to research published in July 2022 by [Acumen Research](#) and Consulting, the worldwide market had a value of \$14.9 billion in 2021 and was expected to grow to \$133.8 billion by 2030. The industry's leading artificial intelligence market trend that is driving demand is the growing need for sophisticated cybersecurity solutions. On the other hand, as per our evaluation of satirical intelligence in cybersecurity market, the sector is additionally being propelled by the introduction of disruptive digital technologies across a broad range of business verticals. As a nutshell, the artificial intelligence in cybersecurity market predicted that between 2022 and 2030, the CAGR might increase by 27.8%.

Cybersecurity is really important to ensure a secure business website as well. If we use artificial intelligence in FinTech, we can easily detect online fraud. It has learning patterns.

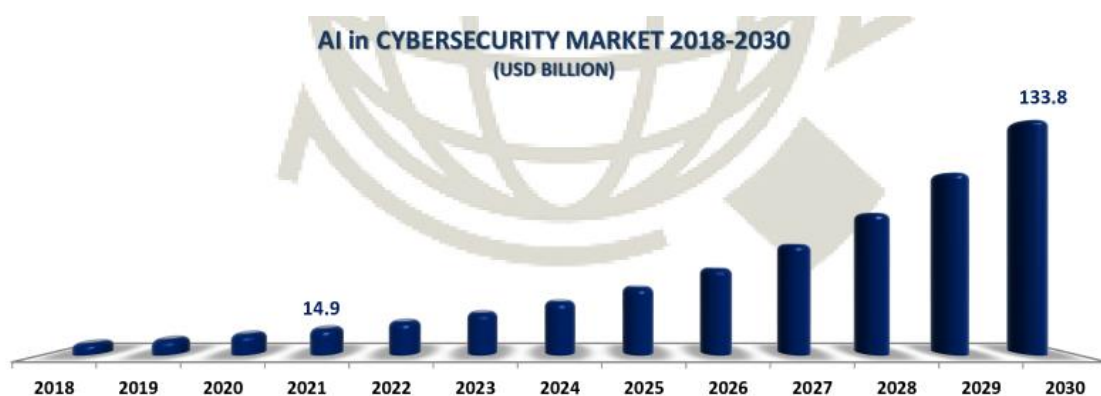


Figure 14: Cybersecurity Market research
<https://www.acumenresearchandconsulting.com/artificial-intelligence-in-cybersecurity-market>

AI is typically used to improve cyberattacks, then priorities actions based on actual danger according to [CNBC](#). Artificial intelligence is the most effective approach to tackling the complex problem of cyber security. Because of the rapid evolution of cyber-attacks and the

proliferation of connected devices, machine learning and AI may be used to "keep up with the bad guys" by automating threat detection and reacting more efficiently than traditional software-driven solutions according to [Balbix](#). The use of AI in cybersecurity for business has the following advantages.

Intelligent AI technology employs the capacity to gradually increase network security. In order to understand the evolution of business network activity, it employs machine learning and deep learning. recognizes patterns in networks and combines them Then, before taking any appropriate action, continually detects any policy violations or security events. Many financial solutions that attempt to improve safety measures are driven by artificial intelligence. For instance, some banking applications only allow access through biometrics (such as a fingerprint or face scan). Artificial intelligence is largely responsible for this becoming a possibility ([iotforall](#)). Computers and other electronic systems may be protected against hacking attempts with the use of cyber security measures. Protecting electronic infrastructure is the focus of cyber security, which employs a variety of measures. It also prevents malicious attempts to access the networks. Unauthorized access attempts like this may do serious harm to any computer system. The safety of their money is the primary concern of digital banking institutions that use cyber security measures. More and more individuals are avoiding using cash, which has led to a rise in the number of digital-only businesses and services. Debit cards, credit cards, mobile phones, and cryptocurrencies are just a few examples of digital money that people are utilizing to conduct transactions. Tight cyber security measures are required to safeguard this (Bicknell, 2022).

3.1.1 The importance of cyber security in the financial services sector

Financial institutions are not immune to the effects of cybercrime on both their consumers and their operations. To a greater extent, this is true whenever financial institutions attempt data recovery. The cost to banks to retrieve the data or intelligence will be substantial. As data breaches affect consumers' privacy and make it harder to trust the institution in the future, image and reputation are harmed, it is imperative that banks take effective cyber security measures. Strong cyber security measures in online banking will protect customer information. Many problems, including fraud, may arise if this information became public. Encounter different failures and feelings of hopelessness therefore (Bicknell, 2022). It is impossible to overstate the importance of cyber security in the banking industry. Having customers who put their faith in a bank is crucial to that institution's long-term survival.

Everyone should be worried about banking security for the same reasons. Digital currencies, including debit and credit cards, seem to have replaced paper money. Therefore, it is crucial that you take all necessary precautions to safeguard your personal information and privacy when online. If customers' personal information is taken, they may lose faith in financial institutions. For financial institutions, this poses a significant challenge. If customers learn that their data has been compromised owing to the company's negligence, they may quickly go elsewhere According to [HDFC bank](#).

3.2 Enhance your dedication to your customers

A number of applications exist where artificial intelligence (AI) may be used to better serve and delight customers. Such illustration of a recent worldwide phenomenon that has altered the customer service experience is the proliferation of chatbots in the financial industry. For banks in particular, the introduction of chatbots powered by AI has completely changed the way in which clients interact with financial institutions (Jon T. S. Quah, 2019). The banking sector will require more chatbots to provide excellent client experiences and meet the demands of the modern era, as the barrier between human and computer help becomes more blurred (Singh P. , 2022). The smart platform enables users to carry on conversations with their devices. This may be done verbally or via the use of computer-generated natural language. The phrases Communicative Interface as well as Natural User Interface (NUI) are often used indiscriminately, however they mean somewhat different things. Naturally, user

Keywords: Cybercrime, paper money, Debit/Credit card, safeguard, digital currencies.

interfaces (NUIs) allow users to communicate and do tasks by more intuitive means, such as voice, gesture, and motion (Daniel Wigdor, 2011).

3.1.2.1 Consumer Feedback:

The user's "thoughts and feelings, ideas, preferences, perceptions, bodily and psychological reactions, behaviors, and achievements which transpire during, between, and after usage" are all part of the contemporary notion known as "user experience." (ISO 9241- \s210, 2010).

That there are numerous moving parts to the user experience is implied by the breadth of the term. We define the scope of our research by separating the demands of the user experience into three distinct categories: utility, ease of use, and user pleasure (Duijst, 2017).

3.1.2.2 Analyzing How Users Act

As a means of gauging how well users would take to new technologies, the Technology Acceptance Model (TAM) was created. TAM following research questions were formulated

how practical and simple an IT system is perceived to be to its users (Davis, 1986).

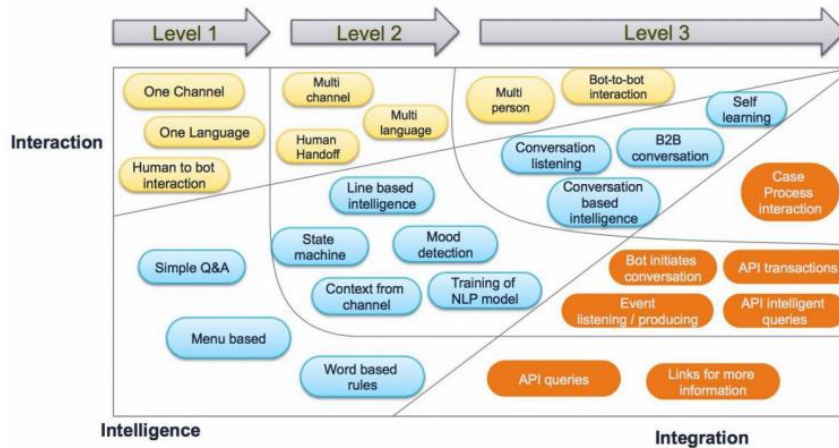


Figure 15: chatbot maturity model

<https://www.capgemini.com/ch-en/2017/04/how-can-chatbots-meet-expectations-introducing-the-bot-maturity/>

3.3 Identifying Potential Cases of Fraud

Artificial intelligence is a set of Automated processes used for detecting fraud that may be taught new information and given time to generate risk criteria based on earlier data on google. Following the creation of these rules, you will be able to prohibit or enable certain user activities including unauthorized logins, identity theft, and illegal financial transactions. Through examining and controlling user and other specified entity conduct in real-time, near-real-time, or in batches, fraud detection safeguards sensitive data, assets, accounts, and transactions for both customers and businesses (such as kiosks). Access and activity patterns of users and other specified entities are analyzed by server-based processes running in the background, and the results are compared to a profile of what is anticipated. Unless a user's actions are suspicious, fraud detection won't interfere with their experience, according to [Gartner Glossary](#). Here are a few cases where machine learning-based fraud detection can come in handy, research from (Tanant, 2021) .

1. Improved speed and accuracy of detection are achieved by allowing the system to automatically acknowledge suspicious patterns and behaviors that would have taken manual operators months to develop manually.

2. Huge amounts of data allow for more accurate forecasts since the machine learning algorithm can acquire and adapt to new information more effectively the more you give it. That is to say, whereas it might be difficult for humans to detect patterns in vast datasets, the situation is reversed when using an AI-driven technology.
3. An economical solution is to use a machine-learning system instead of hiring more RiskOPs personnel to handle the data. Businesses with seasonal fluctuations in client traffic, purchases, or signups will benefit from this strategy. A machine learning system may help your firm grow while cutting risk management costs.

3.3.1 How Fraud detection Work?

Machine learning, data methods, and the observation of user behavior are all used in the fight against fraud. If the system is able to spot suspicious behavior before any harm is done, it may put a stop to the fraudulent conduct. The effectiveness of a fraud detection system depends on its ability to analyse previous fraudulent activities (Taussig, 2021). Machine learning is a set of AI algorithms used for detecting fraud that may be taught new information and given time to generate risk criteria based on previous observations. Following the creation of these rules, you will be able to prohibit or enable certain user activities including unauthorized logins, identity theft, and illegal financial transactions (Tanant, 2021).

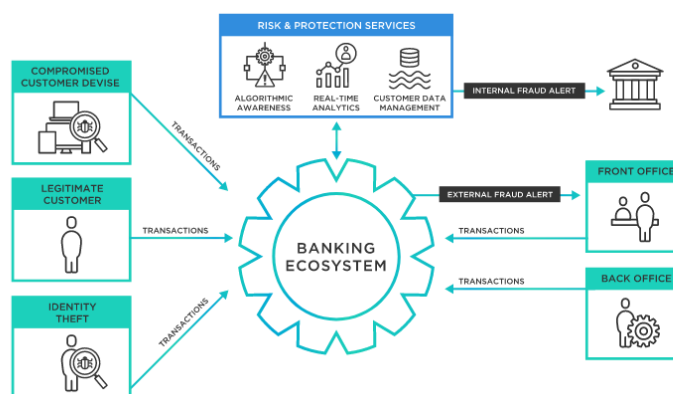


Figure 16: Explore How to Spot Financial Crime in a Real-Time

<https://www.tibco.com/reference-center/how-to-detect-banking-fraud-in-a-constantly-evolving-cyberspace>

Figure 16: A legitimate scenario of financial fraud detection is shown above. As long as there have been banks, there has been fraud in the financial system, but with the rise of online banking, the problem has taken on new dimensions. The banking sector must improve its ability to detect cybercrime and anomalies as technology advances. In order to remain competitive, banks must regularly upgrade their fraud detection systems.

Due to the time that artificial intelligence may cost-free for fraud detection that would otherwise be spent putting out cybersecurity fires, the cost-benefit analysis of using this technology to identify fraud is compelling. As a bonus, it makes your company far less likely to suffer a devastating financial loss due to a cyberattack, according to [DataDome](#).

3.4 Synopsis of Artificial Intelligence in the Financial Technology Industry

The use of AI in the financial technology business has several applications, including but not limited to: lending choices; customer service; identity verification; credit vulnerability assessments; coverage; financial advisory; and many more. Today's FinTech firms use AI to answer customer questions faster, with more accuracy, and in fewer steps. Artificial intelligence (AI) in the financial technology sector encourages innovation, which in turn improves services in ways that are more convenient for customers and safer for financial institutions. In other words, AI is here to stay in the world of finance. Better real-time client assistance, fraud recognition and prevention, coverage, wealth management, and specialized financial planning are just a few of the many ways in which financial institutions may benefit from artificial intelligence in fintech. With the use of Artificial intelligence and Machine learning , analytics may be improved in both speed and accuracy, leading to more satisfying interactions with customers (T., 2022).

4. Interactions Between AI and Banking challenges

Artificial intelligence (AI) has the potential to play innovative, essential, and crucial roles in resolving the many issues facing sensible EcoFin and FinTech (Cao, 2021). We begin with a discussion of the landscapes and challenges of financial firms and data, and then go on to a complete classification and evaluation of decades of AI research in the financial sector. Then, we lay out a plan for statistics analytics and learning in the context of financial institutions and data and present some instances. This section then compares and contrasts the conventional AI techniques now used in the financial sector with their state-of-the-art alternatives. Finally, we discuss the prospects and obstacles for further study of AI-enabled and AI-motivated financial systems. Many exciting and difficult research possibilities and problems arise from the foregoing artificial intelligence (AI) and financial technology (FinTech) industries. According to (Cao, 2021) planning, decision-making, monitoring, and optimization all have ties to the underlying corporate structures, procedures, activities, functions, rules, and management. Framework design and performance, prediction and

making predictions, portfolio planning and optimization, sales and marketing analysis, business profiling, sentiment and intention modelling, fault detection, compliance improvement, risk management, unbiased optimization, and investigations improvement are all examples of areas where there are opportunities and challenges to be addressed. Planning, reproducing, evaluating, and optimizing market mechanisms for a market, product, or service, such as the marketing strategies, pricing, and stakeholder relationship models of a new cryptocurrency, are all part of the process of mechanism planning and optimization (Weigand, 2017). However, many financial institutions have had difficulty expanding AI technology from feasibility studies with isolated use cases to the whole institution. This problem is exacerbated by a number of factors, including a lack of clarity in the company's AI strategy, a technology backbone that is both rigid and underfunded, a lack of cohesive data assets, and outmoded management practices that prevent effective collaboration between the business and IT departments. The spread of the COVID-19 virus has also accelerated various trends in digital interaction, with major technology firms seeing the financial services sector as the next adjacency. In order to survive and succeed in today's dynamic banking industry, traditional financial institutions must transform into "AI-first" organizations, embracing AI technology as the backbone of novel value propositions and differentiated client experiences (Suparna Biswas, 2020). Machines driven by artificial intelligence are already outperforming human experts in spotting early symptoms of disease, personalizing suggestions of digital material based on users' preferences, and designing clothes lines for stores. According to McKinsey, artificial intelligence technologies have the potential to bring \$1 trillion in annual value to the global banking industry (Company, McKinsey &, 2019). In addition, the results show that just a small percentage of organizations in each sector are seeing significant financial returns from AI, which may further increase the gap between the most sophisticated users of AI and the most cautious adopters. AI strong performers claim to have expanded faster, increased revenue, and reduced expenses more than their less successful competitors as a direct consequence of adopting AI strategies. Survey participants were requested by McKinsey to provide details on 33 different applications of artificial intelligence (AI) across eight distinct business functions, as well as the financial impact that implementing AI in these areas has had. The data points to the fact that AI is really providing real benefits to businesses (Arif Cam, 2019).

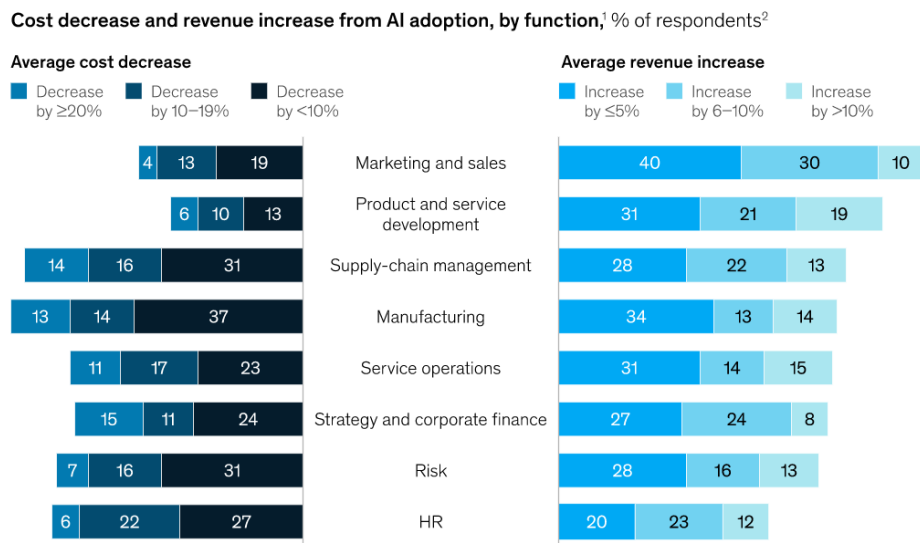


Figure 17: Survey Results from

<https://www.mckinsey.com/featured-insights/artificial-intelligence/global-ai-survey-ai-proves-its-worth-but-few-scale-impact>

Figure 17: Respondents from strong performers are almost three times as likely as those from other organizations to report revenue benefits of more than 10% from AI adoption in the business divisions where their companies utilize AI (across all use cases). Use cases including marketing, sales, and product/service development, as well as supply-chain management, are where respondents are most likely to see revenue increase as a result of AI. Pricing, prediction of probability to purchase, and customer-service analytics are three areas where artificial intelligence (AI) has been shown to enhance income for businesses. Making new AI-based goods and AI-based updates to existing ones are two examples of revenue-generating use cases in product and service development. Use cases that create money in supply-chain management are often cited by respondents, and they include sales and demand forecasts and expenditure analytics (Company, McKinsey &, 2019) (Arif Cam, 2019).

4.1 For what reasons must financial institutions prioritize AI implementation?

As a result of technological advancements, whole markets are being transformed, and firms' methods of operation must adapt. The advent of new technologies has forced every market to evaluate its alternatives and embrace new approaches to value creation. Major shifts are taking place in the banking industry, the most notable of which is the emphasis placed on customers. The administration has tightened regulations due to rising threats to the safety of internet banking. As a result of these restrictions, financial institutions have been slower to

adapt to the digital era, although online financial activity may now be better monitored. Banks are unable to invest in technology owing to the necessity to sustain an appropriate level of capitalization, which is a requirement of global regulatory framework norms. Due to the absence of a legislative need for them to maintain a capital adequacy ratio, banks are susceptible to competition from nimble Financial Technology (FinTech) enterprises. More than half of the customers polled for the 2016 [World Retail Banking Report](#) claimed they were more inclined to switch banks after dealing with these companies (Khurshid, 2022). For decades, banks have been redefining their customer service strategies in response to emerging technological trends. The first automatic teller machines appeared in the 1960s, and by the 1970s, banks were allowing customers to make electronic card payments. Mobile "banking on the go" became more popular in the 2010s, after the widespread acceptance of 24/7 internet banking in the 2000s, According to [Wikipedia](#). AI is becoming more widely accepted in the banking industry since it can improve a variety of services. For example, Improved satisfaction among paying customers, forecasting future events and developments, robotic process automation with cognitive capabilities, integrating realism into user interfaces, reasoned and efficient decision making, and automation of procedures with robot, according to Google and [Actico](#). This aids financial institutions in combating money laundering, detecting fraudulent activity, and providing personalized product and service suggestions to its clientele. Money launderers create the appearance that their illicit funds came from a legitimate source by performing a sequence of acts. AI's Machine Learning and Cognition capabilities reveal these covert activities, saving financial institutions a ton of money. Similarly, AI can do fraud management by scanning massive data sets for suspected trends. In addition, AI's primary recommendation engines may look into the past to foresee the future actions of data points, which is useful for up-selling and cross-selling purposes in financial institutions (Khurshid, 2022). The use of artificial intelligence is now becoming more commonplace in the banking and finance sectors (AI). In addition, a reasonable justification may be offered for it. Recent developments in learning algorithms, data analysis, and computational linguistics are just some of the AI technologies revolutionizing the banking industry, have the potential to have a huge influence not just on the working world but also on the business world. In addition, these technologies have the potential to provide major advantages for financial institutions, such as improvements in back-office procedures, the experience of customers, and the pleasure of employees.

4.1.1 Improved loan and facility inspections

In order to determine whether a person is qualified for a loan, creditors use credit scores. However, these ratings often rely on incorrect or out-of-date information, as well as on human error. A more accurate image of the person or company being evaluated may now be obtained via the wealth of data readily accessible online (Actico, 2021). When the individual or company providing the information has little paperwork, an AI-based system may nonetheless provide a recommendation for approval or rejection after taking into account other factors, according to [Actico smart decision](#).

4.1.2 Automated Teller Machine and Mobile Banking

On September 2, 1969, America's first automatic teller machine (ATM) makes its public debut, dispensing cash to customers at Chemical Bank in Rockville Centre, New York. ATMs went on to revolutionize the banking industry, eliminating the need to visit a bank to conduct basic financial transactions. By the 1980s, these money machines had become widely popular and handled many of the functions previously performed by human tellers, such as check deposits and money transfers between accounts. Today, ATMs are as indispensable to most people as cell phones and e-mail (History.com Editors , 2022). The first ever completely functioning banking app was released by the Royal Bank of Scotland in May of 2011. While it was at first solely accessible on Apple gadgets, it was eventually made available to BlackBerry and Android users as well. More than a billion people joined up in the first six months after the service launched, and more than a billion pounds was exchanged via the app According to [Wikipedia](#) and [NatWest Group](#).

4.2 Artificial Intelligence for Customers and users of financial services company.

Artificial intelligence's capabilities to protect financial institutions against fraud and cybercrime is a crucial use case for the sector. Banks and other financial institutions that offer customers with a sense of safety are in high demand. Artificial intelligence may detect and isolate anomalies in data that might otherwise go undetected through individuals. particularly considering that by 2023, losses from online payment frauds are projected to increase to \$48 billion annually, as reported by [Insider Intelligence](#). As AI continues to advance, more and more businesses are incorporating it into their products and services. However, the myriad ethical problems linked with the development and implementation of AI have left consumers with conflicting views of the technology (Shuili Du, 2019).

Today, financial institutions like banks and other businesses should create automated financial that may be utilized by a broad variety of customers. Customers' prior exposure to robots is an important factor that should inform marketing strategies (Daniel Belanche, 2019). Artificial intelligence (AI) is being used by the banking sector to enhance a number of customer-facing processes, such as fintech innovation, smart banking systems, smart insurance, and powerful advertising services (Qiang Yang & Philip S. Yu, 2021). In addition, banks and other financial institutions are providing convenient amenities, such as online billing and payment systems that use cutting-edge technologies. The cryptocurrency market, which operates on blockchain technology, is well known. However financial technology using artificial intelligence is getting improved day by day. Modern financial technology ethics or security are getting far secure and trustworthy to the consumers, and also this technology preventing financial risk. On the other hand, AI-powered advancements in the finance sector are constantly improving. Ethics and security in today's financial technologies are improving to the point where customers may have more faith in them (Qiang Yang & Philip S. Yu, 2021).

4.2.1 Smart Payment System

A smart payment system is a combined payment gateway that can process several payment types and can be integrated with other company management tools to streamline the checkout process and improve customer satisfaction, according to [Payanywhere](#). Changing business practices and new marketplaces are emerging as a result of the shift to a knowledge-based economy. One such example is the development and dissemination of digital music. Here, new tools and efforts from all along the value chain, when we zoom in on the payments sector, we can see that many of the proposed shifts are already being debated. Rapid payment systems are maturing, especially in the United States. Numerous companies, including ExxonMobil, American Express, JPMorgan Chase, Citibank, Bank of America, and others, issued 11 million contactless cards in 2005. Pay Pass is accepted at over 25,000 businesses, including McDonald's and others. By the end of 2005, more than 150,000 contactless readers had been installed. Asian countries like Malaysia, Taiwan, Hong Kong, Japan, and Korea all have their own versions of "Top Gun," so they're not far behind the United States in terms of air force aviators and also China has WeChat to pay online or Alipay (Riel Miller, 2006) . However currently in the world according to data from the [Smart Payment Association](#), in 2021 the number of contactless payment cards and modules delivered worldwide surpassed 2 billion for the first time and accounted for more than three quarters of the entire total of 2.63

billion smart contactless payments and functionalities. A smart payment system is a pecuniary integrated unit that is enabled by software development and managed by financial institutions (banks, card issuers, etc.). (currency, laws, central banks, etc.). To perform all types of transactions (including very complicated ones) and deliver value-added services that may be connected with the data created via transaction activity, "smart" payment systems utilize information (data), enabled by software and technology built by firms like Gemalto (Riel Miller, 2006). Since COVID-19, there has been a worldwide uptick in the use of contactless payment technologies, as customers increasingly choose non-contact or low-contact methods of making purchases. Nearly two-thirds of customers (65%) prefer to use contactless payments as much as they do today, and just 16% said they would return to their previous ways of payments post-pandemic, according to [Visa's Back to Business Study](#) (pdf). Around half of all thefts in 2019 included some kind of card's theft. Rising card theft rates may be a side effect of raising the contactless limit (Graham Farrell, 2021). Customers are urged to use contactless mobile payments, since they are recommended by the same research. They can't be used by the thief until the owner enters a PIN or scans their fingerprint, making theft of them impossible. With further growth, the smartphone penetration rate in the UK is expected to reach 93% by 2022. There has been a noticeable rise in the rate of smartphone ownership among those aged 55 and over, even though the poll changed the split of respondents over the age of 55 beginning in 2016. The percentage of respondents over the age of 55 who possessed such a gadget increased from less than half in 2016 to more than eighty-two percent by 2022 (Laricchia, 2022).

5. Some of the potential drawbacks of using AI in the banking industry.

Artificial intelligence's major drawback is that it cannot be taught to be creative. Artificial intelligence (AI) can learn over time provided given data and experiences, but it can never replace human ingenuity. Artificial intelligence (AI) cannot be developed by humans since it requires an enormous quantity of training data and prior knowledge. Artificial intelligence excels at routine tasks, however if we wish to make adjustments or additions, we need to go in and tinker with the scripts manually. It was a challenging time to invest on the stock market or elsewhere. A loan or credit card application used to take forever to process. However, AI has overcome all of the conventional limitations of financial institutions (Soni,

2022). The AI is efficient and produces quicker results, but the correctness of the outcomes is dependent on the method it uses. Errors and incorrect outcomes may be caused by using the wrong algorithm or command. Accordingly, it is crucial to implement the method correctly, according to [Meru Accounting](#). We'll also go through a few counterarguments, such how they lead to higher prices, an increase in unemployment, a decrease in empathy, and so on.

5.1 Heavy Expenditures

Building an artificial intelligence capable of mimicking human cognition is a significant technological achievement. It may be quite costly in terms of both time and money. Artificial intelligence is expensive since it always has to be upgraded to match new requirements and run on cutting-edge hardware and software (Duggal, 2022). The development of AI has just begun, and its most cutting-edge technologies are still rather pricey. The majority of businesses, particularly the ones on the smaller and medium-sized scale, simply cannot afford them. It means this is a very large and costly concept to implement at once, which means not all financial businesses may be able to continue.

5.2 Imperilment to Human Employment

Robots are one example of how AI is being used, and they are replacing human workers in several industries. That's why some people worry that chatbots and robots will put them out of work (Duggal, 2022). Human employment is under jeopardy as robots increasingly take over formerly human-only tasks. Several well-known authorities in their respective disciplines have sounded the same alarm on this matter (Soni, 2022). Some technologically sophisticated countries, such as Japan, replace human labor with robots in their industrial industries. However, this is not always the case, since it both increases the number of job openings for people and the number of jobs that can be done by machines, all in the name of efficiency (Duggal, 2022). Jobs in the fields of Big Data, Data Mining, and Artificial Intelligence will continue to grow, even if AI systems can eventually teach themselves new skills. Similarly, the healthcare industry is secure because we will always need medical professionals such as doctors, nurses, and dentists; AI is not yet reliable enough to entrust with our lives (Robertson, 2021). Even though 72% of Americans are concerned about being replaced by robots or AI in their employment, this fear is unfounded, according to [Forbes's projections](#). Because of artificial intelligence our life is becoming easier gradually. But losing a job can make a huge difference in our society. Without job it would be really difficult to live. I can say this is the biggest disadvantages of using AI in business.

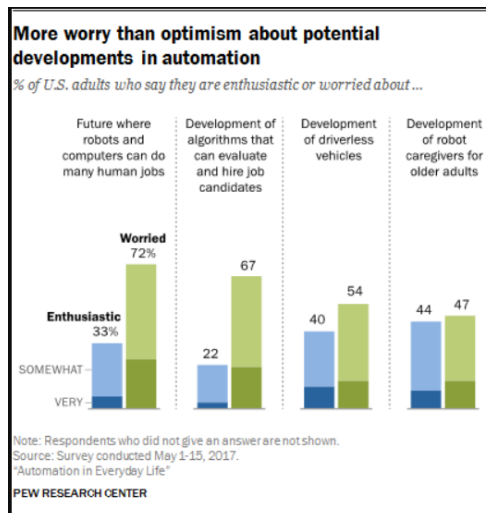


Figure 18: Survey that shows people are worried about AI

https://www.pewresearch.org/internet/2017/10/04/automation-in-everyday-life/pi_2017-10-04_automation_0-01/

Figure 18: Concern about the effects of artificial intelligence on employment is widespread. According to the study, 72% of Americans are concerned about a future in which robots and computers can handle numerous tasks presently performed by people, while just 33% are excited about the prospect. There aren't many occupations that AI can't improve upon, but that won't always be the case. There is always a feedback loop at work, so that may happen. There are certain jobs that machine learning just isn't cut out to do. There is no area of human expertise, judgement, or capacity to synthesize data that can be automated by AI (Robertson, 2021).

5.3 Finding and using the right algorithm

Technologies like machine learning and NLP are used by artificial intelligence that are very difficult for humans to comprehend and interpret. The AI is efficient and produces quicker results, but the correctness of the outcomes is dependent on the method it uses. Errors and incorrect outcomes may be caused by using the wrong algorithm or command. Accordingly, it is crucial to implement the method correctly ([Meru Accounting](#)).

5.4 Make people sluggish

Humans should keep an eye on AI, but it doesn't imply we're always the best choice to manage the technology, trusting algorithms leads to laziness on the part of people (Leprince-Ringuet, 2020). The vast bulk of boring and routine work can now be handled by AI programmers. People nowadays utilize their brains less and less since they no longer have to recall information or solve complex problems to complete their tasks. Future generations may struggle because of our current addiction to AI (Duggal, 2022).

6. Pros of using AI in the Financial services Company

AI is prevalent in every sector today, and the banking business is no exception. To survive in today's market, financial institutions and fintech firms must rapidly incorporate new technology. Automation, efficiency, efficiency gains, and enhanced customer service are just some of the ways in which artificial intelligence might aid the financial services industry. Predictive modelling, fraud detection, natural language processing, visual image identification, and many more applications of AI have already been implemented in the banking sector. Financial institutions may get a leg up on the competition by investing in technologies for machine learning. In the last several decades, the banking industry has witnessed a remarkable digital revolution. That may come as a surprise, given the stereotype that banks have a hard, unyielding structure built on the need to provide maximum safety for their customers' money. Yet, from a broader perspective, they have achieved impressive headway in a short period of time (OWCZAREK, 2022). With the use of AI, banks may replace manual processes with automated ones that use machine learning to identify patterns the visual system might miss. Lenders may save resources by eliminating the need for time-consuming human reviews, while borrowers benefit from decisions that are made much more quickly thanks to credit scores that are more accurately reflective of their current financial standing thanks to the use of timely, relevant data. The benefits of using Artificial intelligence is wide. By using Artificial intelligence in business will provide their customer experience better and better. And also, financial risk can moderate by this technology. Financial technology using machine learning and artificial intelligence can also increase productivity and predicted accuracy. The most comprehensive benefit is decision making. Many of organizations can't decide what are they going to do in the next financial year. Artificial intelligence can make decision accurately and it can make business profitable.

Below we can see a chart that describes how artificial intelligence can be useful for business and financial industry. Financial technology has various pros and cons but now we will talk about benefits of using artificial intelligence in financial technology. That will change future of FinTech.

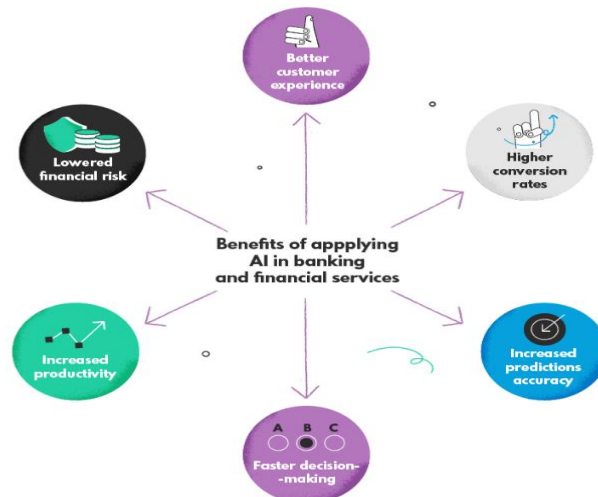


Figure 19: Pros of using AI in the banking sector

<https://nexocode.com/blog/posts/ai-in-banking.applications-and-benefits-of-artificial-intelligence-in-financial-services/>

This article will examine and describe the positive effects of applying AI to the banking industry.

6.1 Methods of Auditing and Analyzing

There are a lot of market stresses that businesses have to deal with. In a competitive job environment, it's important for them to provide auditors meaningful work they can take pride in. Clients, meanwhile, are looking for more for their money. As the number of customer interactions increases dramatically, audit sample sizes also rise. Historical auditing practices are insufficient for the rigorous standards of today (Wolters Kluwer Tax and Accounting, 2021). Making AI in the financial sector understandable is a crucial step. In view of growing compliance and regulatory scrutiny of AI and machine learning, businesses must make sure their models are objective and can be presented simply. According to Sri Ambati, CEO and cofounder of H2O, due to the profound impact AI will have on the software industry, it is imperative that every business become an AI business. The ability to generate novel data is the true secret weapon of an AI firm (Ajao, 2022). First, when it comes to audit analytics, auditors are spending too much time filling out compliance requirements and writing reports that nobody reads. Forrester claims that machine learning is replacing human designed questionnaire in the process of evaluating transaction risks (Clair, 2022). With advanced ML and NLP extraction, even unstructured text like emails may be used. Because of its high commercial value, potential for disruption, and lack of governance concerns, the adoption profile is also quite promising. Nevertheless, a present skills deficit is shown by educating

auditors in ML issues. Audits that are data-driven begin with a thorough risk analysis. In many organizations, risk assessment is seen as a necessary evil, something that must be done to comply with the AICPA's risk-based criteria. One possible reason for this is because people don't see it as being worthwhile, and as a result, they don't put in much effort. Contrary to risk assessment, a data-driven audit focuses on the facts. Auditors should adjust their approach to auditing based on the results of a comprehensive risk assessment. If more effort and time are placed into assessing risk and evaluating high-risk areas, then inevitably fewer audits will be performed on low-risk areas. In accordance with the results of the risk assessment, the auditors will use their best judgement to focus on the areas that pose the most threat (Wolters Kluwer Tax and Accounting, 2021). A few of the more promising applications of artificial intelligence (AI) in analytics that I've come across so far are listed below.

AI is very good at discovering insights and patterns in massive datasets that humans just cannot notice, thus this is a good place to start when attempting to discover new ideas. That, and it does it rapidly and on a large scale. Furthermore, an AI analytics tool may advise you on what to do in response to the possibilities it detects in your data (Kaput, 2022).

Results and effective strategies may be anticipated with the aid of AI. Systems driven by AI may sift through data from potentially thousands of sources to determine which recommendations will be the most successful. AI may also do in-depth analyses of client data to make educated guesses about things like future product directions, sales channels, and customer tastes. And data forecasting is very helpful for businesses. They may find that all of these tools provide them the most accurate predictions for their business. Artificial intelligence (AI) has the ability to estimate product demand based on a variety of factors, including stock levels, seasonality, customer history, and more. Companies may use this information to refine their stocking practices, inventory acquisitions, and supply chain management. Moreover, they may utilize the information gleaned from AI demand forecasting to allocate resources elsewhere in the company or the marketing strategy. There are some useful AI tools which can be good use for data analysis for financial companies, such as Adobe analytics, Google analytics, Google cloud, IBM planning analysis, BlueConic and many more on the website.

6.2 Methods for Managing Financial activities

To some extent, financial planning and evaluation have already progressed beyond your imagination. Although most finance departments rely on Excel or little reporting from highly

specialized supplier platforms, monetary analytics offers significant promise for AI help. But in the future, simulation, optimization, and ML-based statistical modelling will be used in budget planning and forecasting to bridge the gap between corporate strategy and operations. Vena Solutions is an organization that provides a financial and accounting software that is Microsoft-centric and has Power BI built in so that users can access and use predictive analytics and machine learning with no effort (PAML) (Clair, 2022).

Major changes are occurring in the financial advisory sector. Here are some examples we will see how AI will change the financial activities planning more useful. For example, improved Portfolio Analysis Reports with Individualized Data, Robotic Portfolio Management and so others.

An improved portfolio analysis reports with individualized data details the returns on existing holdings and makes suggestions for new investments. An investor's financial profile may be better understood with the help of this report. The process of developing one's own unique set of financial insights and suggestions is complex and time-consuming (Baker, 2022). In the robotic portfolio management system a robot-advisor gathers information about a consumer liquidity statements, analyses pertinent financial data, and makes investment recommendations and evaluates their success (Baker, 2022).

Artificial intelligence (AI) is becoming more popular among financial advisors, and not only because it streamlines mundane administrative duties like data input. AI is also having far-reaching effects on the advisor-client dynamic (Bramwell, 2022). When it comes to financial forecasting and analysis, huge databases containing thousands of data points are the norm. However, it might be difficult to make good use of this data if humans are the only ones involved in processing it. Using AI, FP&A teams may spend less time on routine, time-consuming chores and more time exploring new prospects. Evaluation of data for a certain time frame is the essence of trend analysis. To my knowledge, this is the first artificial intelligence capacity to be included into the "predictive analytics" arsenal. It use both human and AI resources to conduct data queries, spot patterns, and verify hypotheses (Manole, 2022). According to (Manole, 2022), there are few financial planning analysis way that can be done by AI which are trade analysis, Correlation Analysis, Utilizing Neural Networks to Improve Predictions, Data Models, and Decision-Making and Administration Processes that are fully automatic.

6.3 Banking statement or accounts reconciliation

Banking statement and accounts reconciliation is another area where AI may be used to fix data problems. Many accounting and finance companies are using AI for this procedure, especially those involving the withdrawal of funds from a bank account, need the use of not one but two independent sets of records that are in agreement with one another. Common areas to examine for discrepancies include prepaid costs, bad debts, fixed assets, cash accounts, and general ledger and sub-ledger duties. It's common for transactions to get unrecorded, accounts to go unbalanced, and rollovers to be used inappropriately. As I am also using these technologies in my daily uses. Being as an accounting analyst in our company we are using macro technology to complete our banking reconciliation. ML can "learn" the data sources and patterns, with data control rules in a centralized place, and can handle a broad range of structured data sources in different forms (CSV, XML, SQL, or NoSQL). Artificial intelligence allows for the expansion of reconciliation beyond the typical two data sources. Robotic process automation (RPA) bots facilitate data extraction, assist data input, and manage the approval procedure (Clair, 2022).

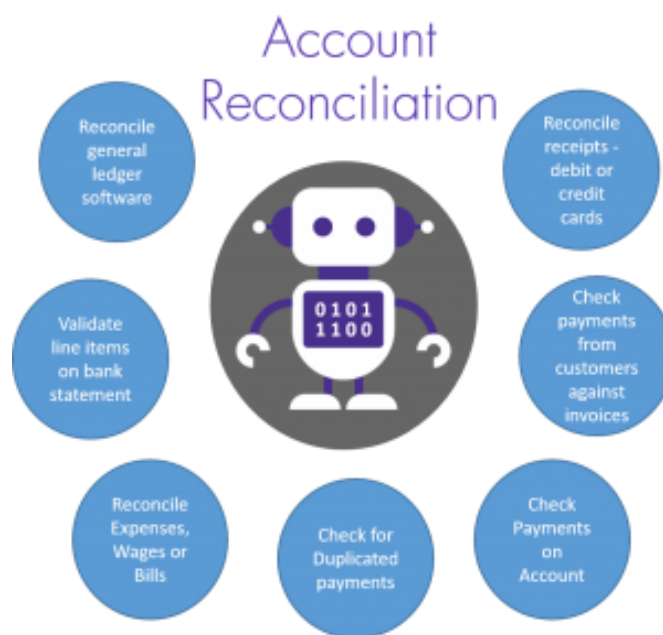


Figure 20: Demonstration chart

<https://robocloud.co.uk/automate-your-monthly-accounts-statement-reconciliation/>

Paycheck Stubs every month the process of reconciling is going to become less complicated. With the aid of Robo cloud's cloud-based software robots, you may have two-way matching performed automatically, cutting down on exceptions by as much as 80 percent (Cahill, 2019). According to Forrester, while the technological readiness in the area of account

reconciliation is excellent, the adoption profile is only average owing to issues with data consistency and low business and disruption value. As a subset function of close, reconciliation is frequently essential. And also, in a financial industry or any other industries are also using these technologies to monthly or quarterly closing their financial activities. In my employers I am using artificial technology to complete my most of the tasks in the end of the month closing. Workflow automation is the backbone of the monthly and quarterly closing processes. There are several F&A groups that are giving serious thought to automating the closing procedure. An efficiently executed closing is indicative of an organization that is well-managed. Issues of openness, promptness, precision, and conformity with reporting schedules are of paramount importance. Integration with workplace applications, spreadsheets, and other accounting systems is essential for close automation in order to properly record data and spot discrepancies.

7. Artificial Intelligence-Utilizing Non-Profit Organization

The application of AI in the nonprofit sector has the potential to greatly enhance fundraising outcomes and efficiencies by standardizing and refining the segmentation process. Exactly why, therefore, do they need to standardize and refine the segmentation process? It is simple, the "Fundraiser's Paradox" refers to a well-known difficulty in fundraising. If you've ever organized a large-scale fundraising campaign or sent out a postal appeal, you'll be acquainted with it. In most fundraising campaigns, reaching out to more contributors results in more money being raised, but at the expense of a smaller return on investment (Paris, 2021). Many nonprofits needed the resources necessary to implement artificial intelligence technologies, and those that did required the technical expertise to make use of them. Now more than ever, businesses and nonprofits of all sizes may leverage use of AI to improve their fundraising efforts. AI-driven crowdfunding campaigns have been successful for both large and small schools, hospitals, and other NGOs (Paver, 2021). There are some nonprofit organizations who are using artificial intelligence currently. Such as, School. Hospital, NGO, government service agency, military and charity organizations, according to Google. To build these intricate associations, machine learning algorithms may take use of dozens or hundreds of data aspects or variables. In light of its potential impact on the future of their missions, organizations should investigate artificial intelligence (AI) and maybe make some first investments in it. Artificial intelligence may facilitate the elimination of redundant steps and the saving of time, particularly in relation to data. Another way that AI might aid a charity in

achieving its goals is via its use in fundraising (RAIHAN, 2022). Let's take a look at some of the ways in which AI may help non-profit organizations.

AI can help nonprofit organization like fundraising AI that works with human operators, stronger analysis of data and trend forecasting, enhance the publicity for charity, make more people interested in the content and brand of charity, and reach a large number of people via social media and learn more about your audience's make-up (RAIHAN, 2022).

There are some few more examples how AI is helping non-profit organization:

7.1 Streamlining the process of assisting clients via automation

A successful business may reap the benefits of using AI, as I've already discussed. AI may also be used in nonprofit organizations. Chatbots powered by artificial intelligence are being used by NGOs of all sizes to streamline their interactions with donors. Common questions, including how to make a donation or find out about future events, may be answered by these chatbots. Similarly, clients may get assistance whenever they need it thanks to chatbots, which are available around the clock. Incorporating AI streamlines the process and reduces effort for everyone involved (Jordan, 2020).

7.2 Predicting and solving global water and food shortages using AI

According to [HungerMap data](#), nearly 828 million people suffer from hunger globally, November 2022. As a result of the complexity of the causes and effects of food insecurity, information is vital for developing effective policies and programmers to address the problem. Here is where AI is playing a role in reducing hunger caused by the many causes of food insecurity. Predicting when and why hunger develops and optimizing food distribution are two areas where artificial intelligence and machine learning may be put to good use.

7.2.1 Predicting food shortages

The timing is essential for food help. When disasters occur, such as climatic or economic shocks, or when there is conflict or migration, availability is typically disrupted. Forecasting that are spot on allow aid to be distributed more efficiently and faster. The complexity and rapid change of the food insecurity landscape are addressed in a research released in January 2022 by the University of Illinois, which describes how machine learning models may aid in facilitating more informed and speedy decision making (BERNABE, 2022). In addition for the first responders to be able to effectively intervene on the field, it is necessary to use

statistical models and publicly accessible data on pricing, weather, and demography for accurate forecasts. Which can be done by AI models. Charity's [Yes! chatbot](#) is an AI that spreads awareness about the need of safe drinking water. WFP's technology monitors and makes projections on food security in near-real time. Accessible and free of charge, WFP's interactive map provides insights by merging crucial elements such as weather, illness, population, conflict, nutrition, and macroeconomic statistics, for example: [Hunger map live](#).



Figure 21: A screenshot from Hunger map live
<https://hungermap.wfp.org/>

7.3 Methods of Fundraising using AI

Using artificial intelligence, the Children's Society in the United Kingdom has created a chatbot to help disadvantaged kids in the United Kingdom's Wales and England. A chatbot was built, and it provided prospective contributors with information about the campaign. As a result, chatbots became a useful tool for campaigners to mobilize communities and collect donations for children in need (Jordan, 2020). Data records need to be accurately tagged for machine learning to produce coherent conclusions when searching for patterns, therefore human intelligence and engagement are equally crucial when utilizing AI and machine learning to understand data and generate models and predictions to utilize in campaign (May, 2021). As a result, we can use AI in good works. Your sales process may benefit greatly from the use of AI since it can analyze data and spot trends in customer behavior far more quickly and accurately than a person. That is why method of using AI can be a good fundamental method for rising fund for a nonprofit organization.

7.4 Government Agency using AI for their financial activities.

According to EY, many of the challenges that government organizations dealing with taxation and finances now face may be overcome with the use of artificial intelligence (AI) and associated technologies. Public financial management (PFM) and tax administration may be improved by streamlining internal procedures, allowing government organizations to

perform more with less resources (Atalla, 2019). To reiterate what I said earlier. AI can assist with the reduction of accounting mistakes, the identification of risks, and the prevention of tax fraud and financial crime by enhancing controls and finding abnormalities in vast amounts of data in the government organization as well. And also, by automating mundane tasks, they free up staff time to use data-driven insights to make more informed policy choices. Government tax collection organizations may benefit greatly from the use of AI. According to Atalla from EY, authorities in some nations are using analytics and artificial intelligence models to identify potential tax cheats in an effort to increase compliance.

At this point, I feel confident in saying that AI can be utilized in the same ways by governments and charities as it is by for-profit businesses. They may employ artificial intelligence to protect themselves from fraud, improve customer service, streamline international money collection, and even foresee financial catastrophes.

Keywords: Public financial management, non-profit organization, charity fundraising using AI

8. Uses of AI in Personal Financial Planning

Artificial intelligence can be used in personal financial uses as well. Programs that analyze your spending patterns and provide advice on how to save money, grow your wealth, and reach your financial objectives may help you feel more confident and secure in your life. Incorporating AI into a financial management software is a certain method to make it more useful to its target audience and, therefore, more commercially successful. AI can change our personal financial patterns in various uses. In the recent world we can see artificial intelligence in the financial technology creating remarkable changes as I previously talked about it. Economic growth throughout the world has resumed after the Covid-19 pandemic, but a complete recovery is still years away. Fifty-three percent of Americans have been affected by the pandemic's cost to their wallets, according to a poll by Charles Schwab. In light of these factors, the problem of efficient personal financial management has taken on more urgency, and aids that might facilitate it are in higher demand than ever (Luchaninov, 2022). Now I will discuss it about little bit. Here is some example that can be done by AI in personal financial uses.

8.1 Banking with Artificial Intelligence and Personalized Features

Exploring novel methods to deliver extra advantages and comfort to specific consumers is where artificial intelligence really shines. Intelligent chatbots in the banking industry are

made possible by artificial intelligence (AI), which allows make AI to give customers with in-depth self-help options while also decreasing the burden of contact centers. There's been a meteoric surge in the popularity of voice-controlled virtual assistants like Amazon's Alexa, and this is because of their built programming function, these technologies continue to advance in intelligence with each passing day. You may use either tool to see your account balance, set up automatic payments, and view your transaction history, among other features. Some banks are proving these facilities to the customers. There are some banks like, OTP, Revolute, CIB, and many banks are currently operating mobile applications as mobile banking facilities. Mobile Bank can calculate how much money its customers spend in a day. Mobile banking applications will calculate your daily spending credit and appear on the screen to remind you to maintain whether your daily financial spending is high or low. And these baking applications mainly programmed by artificial intelligence.

Keywords: Personal finance, Covid 19 pandemic, self-help technology.

9. Additional uses of AI in Business.

Many of the specifics of how AI may be used to FinTech and business have previously been discussed in detail in the aforementioned sections. Again, I'd want to expand on this list with a few more AI-related business topics. According to [Nibusinessinfo](#), claims that AI may be used for a variety of tasks in corporate administration.

Among the many uses of AI in corporate administration are:

1. Defending against spam

As spam filters improve over time, the chances that a spam email would reach a user's mailbox have decreased dramatically. Criteria may be as basic as a blacklist or as complex as an advanced machine learning algorithm, but even the simplest rules can be used to exclude communications containing suspicious phrases.

Using ai techniques, computers can interpret data and learn without being explicitly programmed. Though it has the potential to improve over time, a spam filter based on machine learning requires training employing a huge quantity of data from previously identified spam emails in order to understand and apply its learned patterns.

Following this, the ML system will generate a brand-new spam filter rule without any more human intervention (Michael Baxter, 2022).

2. Classifying emails in a smart way

Corporations large and small are increasingly discovering the value of deploying robots to automate menial activities, and many of them are trying to expand their operations by incorporating AI. It might be difficult to respond quickly to emails or messages when resources are limited. However, email categorization may be automated with the help of AI and cognitive services, leading to quicker and more accurate answers for customers (Homann, 2022).

3. Voice command can be used in Business

The majority of business owners and managers (88%) agree that using a voice assistant may be beneficial to their company's growth, according to a survey conducted by [Global Banking and Finance Review](#). Now that virtual assistants are experiencing a renaissance thanks to AI and machine learning, companies can take advantage of a wide range of shifting consumer behavior patterns (Makarenko, 2022).

Keywords: spam filtered, voice command, email filtering.

4. Gadgets that learn from user habits and adapt accordingly

Technology has undeniably altered businesses' methods of operation. Allows users to search virtually everywhere before making a purchase, and that includes social media sites, video sharing websites, and marketplaces like Amazon. Also, buyers may get more in-depth responses to and evaluations of items on Videos online, as well as see how those things stack up against the competition (Taylor, 2022).

10. E-Commerce platform using AI

By leveraging acquired firm and client data to make better business choices and more precisely forecast the future, AI can assist modern online merchants in providing an improved consumer experience on and off their online businesses. [Watson, IBM's](#) artificial intelligence retail solution, leverages real-time data that more closely represents a customer's current purchase state to assist retailers in creating more tailored shopping experiences.

Watson's efforts improve customer happiness, lower risk and boost compliance, generate ads, and provide useful IT solutions. As an example of how an application may make advantage

of the Watson Assistant service, consider the diagram below.

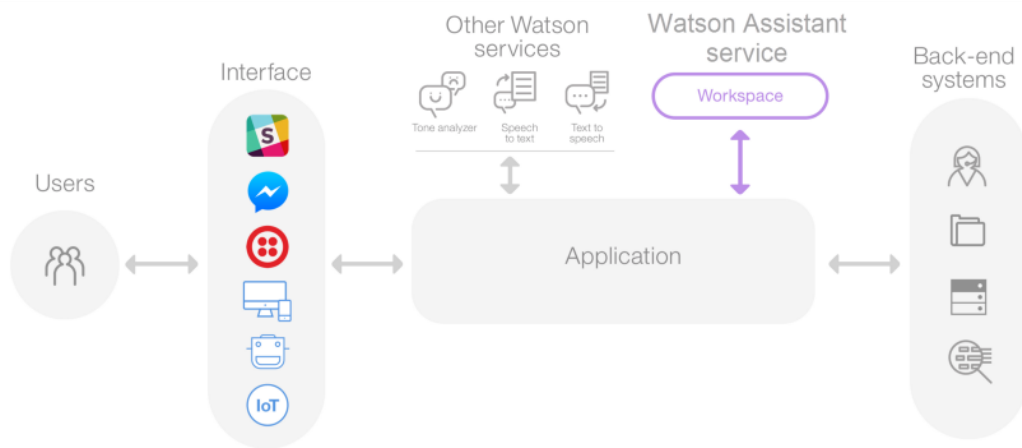


Figure 22: Watson Assistant service Diagram
<https://console.bluemix.net/docs/services/conversation/index.html>

The Interface layer, shown by the arrow in the above diagram, is the point at which the user initiates communication with the service. This may be done via a more conventional channel (such as Messenger, Slack, Telegram, etc.) or through the service's own frontend (web or mobile). Also, there's the app itself (Application), which will talk to Watson Assistant and may talk to other services as well (Machado, 2018).

According to [website](#), there are some additional benefits of using AI in e-commerce organization such as:

1. Optimal pricing.
2. Brilliant organization and transport.
3. Estimating revenues and consumption patterns.

AI has applications across the spectrum, in both for-profit and non-profit enterprises.

11. Conclusions

This article provides a thorough analysis of AI's role in the FinTech industry. In recent years, AI has grown more intertwined with the next generation of financial technologies. The period of artificial intelligence-driven economy and finance is being propelled by digital marketing, advanced analytics, and machine learning, and it presents endless possibilities for conveying and disseminating intelligent economic philosophy, experiments, and methods, as well as wise financial practices for the modern society. Everything in today's modern world uses

some kind of artificial technology. In this article, I discuss the advantages and disadvantages of using AI in financial services corporations and other types of businesses. And I assume AI will fundamentally change the financial industry. The utilization of artificial intelligence is getting more esoteric in all areas of finance, and the future of business is expanding rapidly. The future of economics and finance is promising attributable to the potential presented by artificial intelligence. When it comes to providing customers with services, businesses are now equipped to use artificial intelligence to provide such services quicker and with more accuracy. It's safe to assume that this phenomenon is just getting momentum from here on out. However, we must take precautions while implementing AI systems. We hope that with the help of AI, financial technology will become a fraud-free service, allowing business providers to provide better services and supports their clients.

Thanks

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The End

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