BUDAPEST BUSINESS SCHOOL

FACULTY OF INTERNATIONAL MANAGEMENT AND BUSINESS

An Overview of FinTech on Digital Currency and Internet Banking

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International Business Development

Budapest, 01/05/2023

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Introduction

In the last ten years, technological advancements have revolutionized the creation, distribution, and use of financial services. There has been a fast acceleration of the digital transformation of economies throughout the world owing to the ubiquitous availability of cheap data on mobile devices, which has facilitated the rise of fintech, digitalization, blockchain technology, machine learning, and artificial intelligence. Lockdowns caused by Covid19 hastened the transition to digital banking services. This research highlights the primary domains and analyzes the current state of affairs in the realms of digitalization and financial services (Fintech) and suggests new areas for investigation. This study examines 583 articles published in journals from the Scopus database between 1984 and 2021 using bibliometric analysis and a thematic literature review. Our bibliometric study revealed four overarching concepts. A topical literature study is then conducted to go even further into these topics. We end by making some preliminary recommendations for where the field may go from here in terms of research (Bhatt, Joshipura, & Joshipura, 2022). The concepts of digital money and Internet banking have been introduced in this article along with other topics related to the financial sector. A primer on Bitcoin and Internet banking is provided here. Furthermore, the role that financial technology plays in connecting the two.

2. Internet banking and digital currencies are impacted by FinTech

In the realm of digital money, we find cryptocurrencies. Simply explained, they are a digital currency that allows users to make fast, decentralized payments to one another. There is no central authority behind cryptocurrency, therefore its value is entirely decided by supply and demand on the market. In contrast to national currencies, which benefit from widespread acceptance as legal currency, the value of digital currencies is not based on this fact. Apart from Bitcoin and Ether, there are a number of other cryptocurrencies in circulation (Philip & Tony, 2021).

Bitcoin was developed so that online monetary transactions might be facilitated more easily. It is a kind of electronic cash that functions identically to conventional money but is unregulated. It is

essential to be familiar with blockchain, decentralization, and cryptography in order to have a solid foundation for comprehending cryptocurrencies (Varma & Jain, 2023). Let's talk about blockchain,

2.1 How does blockchain technology work?

A blockchain, in its simplest terms, is a shared, decentralized ledger that is updated in real-time across a dispersed network of computers. A blockchain may be regarded as a digital database due to the fact that information is kept digitally. Blockchains have acquired global attention as an essential component of cryptocurrency systems like Bitcoin by serving as a decentralized and secure record of all transactions. The innovation of a blockchain is that it may be used to build trust in a transaction without relying on a trusted third party to authenticate the legitimacy of the transaction (Hayes, 2023).

A distributed ledger, or blockchain, is a system for storing and transacting digital currency and other records in a way that prevents their modification once they have been created and shared. Because of its distributed ledger nature, blockchain opens the door for immutable ledgers, which are databases that store records of transactions that cannot be modified, erased, or otherwise changed. As a kind of distributed ledger technology, blockchains are becoming important.

A new transaction is entered.

The transaction is then transmitted to a network of peer-to-peer computers scattered across the world.

This network of computers then solves equations to confirm the validity of the transaction.

The transaction is complete.

These blocks are then chained together creating a long history of all transactions that are permanent.

Once confirmed to be legitimate transactions, they are clustered together into blocks.

Source: Investopedia

Figure 1. Transaction Process of Blockchain

Figure 1: The blockchain idea was initially presented in 1991 as a research project, making it older than its first widely adopted implementation, Bitcoin, which appeared in 2009. Since then, blockchains have seen explosive growth thanks to the development of a wide range of cryptocurrencies, DeFi apps, NFTs, and smart contracts (Hayes, 2023).

2.2 How digital currency and Internet banking are affecting fintech

FinTech, which stands for "financial technology," is the application of computing and communications technologies to the financial sector in order to facilitate and streamline these services. It encompasses a wide range of products, services, and technologies that can help individuals and businesses manage their finances more efficiently, securely, and conveniently (Kagan, 2023). Customers may log in to their bank accounts and make transactions through the World Wide Web via Internet banking. The financial technology revolution has had profound effects on the banking sector. To combat the growing threat posed by peer-to-peer lenders and fintech startups, traditional financial institutions have begun using cutting-edge technological safeguards including smart chips, biometric sensors, branchless banking, AI, and machine learning (Urquhart, MvGowan, Neupane, & Koirala, 2022). It has been around for many years, but with the advent of FinTech, internet banking has become more sophisticated, user-friendly, and secure. FinTech has enabled banks to offer new features such as mobile banking, digital wallets, and real-time payments, which have made banking more convenient and accessible to customers.

Digital currencies, on the other hand, are a relatively new phenomenon that has been made possible by FinTech. Digital currencies such as Bitcoin, Ethereum, and Litecoin are decentralized forms of currency that use blockchain technology, third-party aggregators like banks and governments are rendered unnecessary, allowing for more private and transparent financial dealings (Rodeck & Adams, 2023). FinTech has played a crucial role in the development of digital currencies, providing the infrastructure and technology necessary to make them a reality.

3. Cryptocurrency

Cryptocurrencies, which have gained a lot of attention in the last few years, have been widely traded on financial exchanges throughout the globe. To this day, Bitcoin, the pioneer digital money, is widely accepted as the standard (Antonakakis, Chatziantoniou, & Gabauer, 2019). According to [Oswego](#) Developed as an alternative payment mechanism, cryptocurrencies are a kind of digital money based on cryptographic hashing algorithms. The use of cryptography to create a medium of exchange and a distributed ledger of financial transactions. A cryptocurrency wallet is a digital storage solution for digital money. The software that serves as these wallets may be hosted in the cloud, downloaded, and installed on a local computer, or even a mobile device. Cryptocurrency can only be used when its owner has verified their identity via a wallet.

3.1 Efficiency of Cryptocurrencies

In the section on environmental impact, it was said that the mining of cryptocurrencies raises the topic of efficiency because of the large amount of processing power (and hence energy) required for their manufacture. Cryptocurrencies can't function without the infrastructure provided by the electrical grid, despite their decentralized, peer-to-peer design (Chohan, Cryptocurrencies: A Brief Thematic, 2022). Simply said, a cryptocurrency is an electronic asset created for use as money and based on the principles of cryptography to regulate the issuance of new units of money and verify the transfer of existing ones. The platform's Concrete evidence (Consensus protocol) validation process causes Bitcoin to use vast amounts of energy, which has hurt the cryptocurrency industry's image. To attract green-minded backers, however, numerous new crypto projects are gearing up to provide a less power-hungry alternative. This article delves into the science behind the most resource digital currencies now available, discussing how these coins may substantially lower their energy footprint and explaining why such coins are so important in the modern world (Brooke, 2022).

3.2 Variety of cryptocurrencies, and how they work, explained.

According to Google, although the blockchain is the foundation for numerous cryptocurrencies, there are notable distinctions between them. Coins and tokens are the two main groups within the cryptocurrency ecosystem.

3.2.1 Coins and altcoins

The original cryptocurrency, Bitcoin, might be thought of as the "big bang" from which the whole cryptocurrency world radiated forth. Any digital money that isn't Bitcoin is known as a "alternative" to Bitcoin, thus the name "alternative coin" (or "altcoin"). Under this definition, any digital money that is not Bitcoin is an altcoin. But this definition does come with a disclaimer: not everyone will accept it. To put it simply, a coin is digital money that operates on its own individual blockchain network. Simply said, the coin is the native cryptocurrency of a certain blockchain (Montevirgen, 2022). According to the N26 article coins are digital assets that operate on their own separate blockchain. For instance, Bitcoin is a "currency" since it operates on its own network independently from other coins. The Ethereum blockchain is also used to manage Ether. When referring to a cryptocurrency that is not Bitcoin, the phrase "altcoin" is often used. Numerous alternative cryptocurrencies are based on Bitcoin's design and function. There are some, though, that is rather distinct, such as Dogecoin. Whereas Bitcoin is restricted to 21 million coins, Doge has an infinite supply.

3.2.2 Tokens

According to N26, coins, and tokens are also tradable digital assets. Tokens, however, employ the infrastructure of another blockchain and are thus considered non-native assets. Among them are Chainlink, Uniswap, and Polygon, as well as the Ethereum-hosted Tether. Tokens are a kind of cryptocurrency or digital asset that operates on the blockchain of another coin. Tokens are the building blocks of cryptocurrencies, and one such token is USD Coin (USDC), a stable coin based on the Ethereum network that is backed by the US dollar. A non-fungible token is a kind of crypto asset token (NFT). The Ethereum blockchain is the standard for NFTs (Montevirgen, 2022).

3.3 Types of Cryptocurrencies and how they work!

For convenience, we will refer to all future cryptocurrencies as "altcoins," with the exception of Bitcoin, which was the first. There is no way to definitively state which cryptocurrency is superior to Bitcoin or any of the other major altcoins out today due to their scalability, anonymity, and variety of functionality (Rossolillo, 2022).

Table 01: According to N26 10 popular types of cryptocurrencies and how they work. Based on the most recent statistics, the table below ranks the top 10 digital currencies by market

capitalization (in billions of dollars). The market capitalization of all cryptocurrencies is as follows: Bitcoin (BTC) $749 billion; Ethereum (ETH) $313 billion.
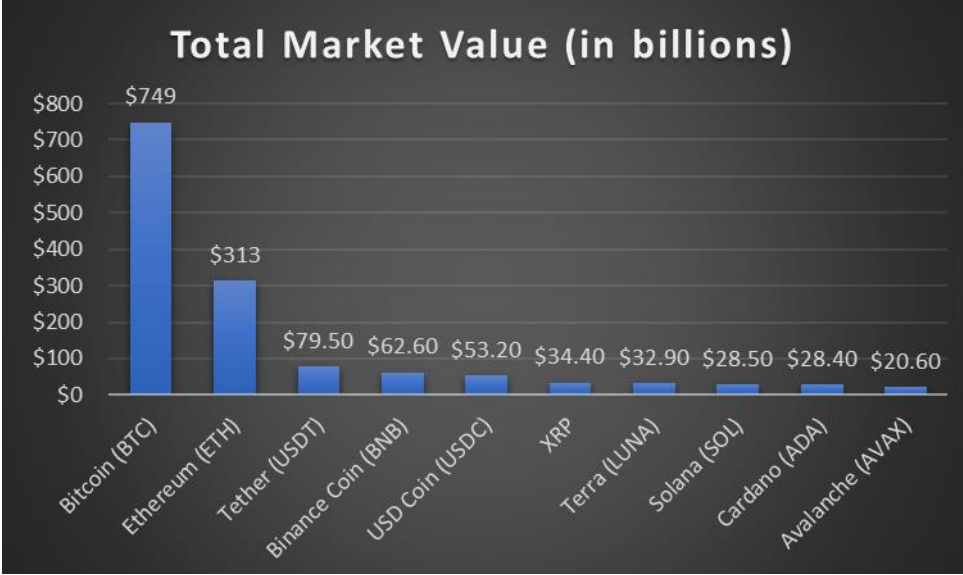
Figure 2.Cryptocurrency market value

Tether (USDT), Binance Coin (BNB), and XRP are among the many well-known digital currencies shown in the table. If you're a trader or investor interested in keeping tabs on the cryptocurrency market, you may utilize this data to your advantage.

3.4 How many cryptocurrencies are there!

Worldwide Cryptocurrency Market Cap from February 2013 to February 2023.

Over the past decade, the value of the cryptocurrency industry has skyrocketed. Market cap for all cryptocurrencies was less than $1 billion at the beginning of 2013, according to data from Comarkets. By the year's conclusion. it had reached a new high of about $10 billion (Gandal & Moore, 2021)

Late in 2017, the market's entire market cap hit about $100 billion and continued to rise significantly. After that, however, the market endured a severe downturn that reduced its value to under $30 billion by early 2019.

Year	Cyptocurrency number
2013	66
2014	506
2015	562
2016	644
2017	1335
Mar-18	1658
Nov-19	2817
Feb-21	4501
Jul-21	6044
Aug-21	5840
Oct-21	6826
Nov-21	7557
Jan-22	9929
Feb-22	10397
Nov-22	9310
Feb-23	8685

Source: Statista 2023

Figure 3.Quantity of cryptocurrencies in worldwide

Figure 03: Overall, there were a lot more virtual currencies in the first few months of 2022 than the approximately 9,000 that existed by 2023. It's important to remember, though, that many cryptocurrencies may be rather inconsequential. Due to the transparency of the blockchain, creating a cryptocurrency is a straightforward procedure. According to some estimates, just about 20% of all cryptocurrencies even exist (Best, 2023).

4. How Would a Central Bank Digital Currency (CBDC) Work

According to IDEX Biometrics ASA To exchange digital currency issued by a central bank in the same manner as fiat currency is known as central bank digital currency (CBDC). Every day,

we use methods such as bank transfers, digital wallets, and card payments to electronically trade "money," yet these methods are not identical.

Most online transactions are "digital checks," which are simple instructions for a bank to withdraw "actual" money from an account. This necessitates a plethora of parties working together to process payments and manage millions of separate accounts. On the other hand, a CBDC is a descendant of decentralized digital currencies like bitcoin and Ethereum, and it functions similarly to cash in that it bypasses intermediaries on its way from the user to the user or buyer to the seller (Radeck, 2023).
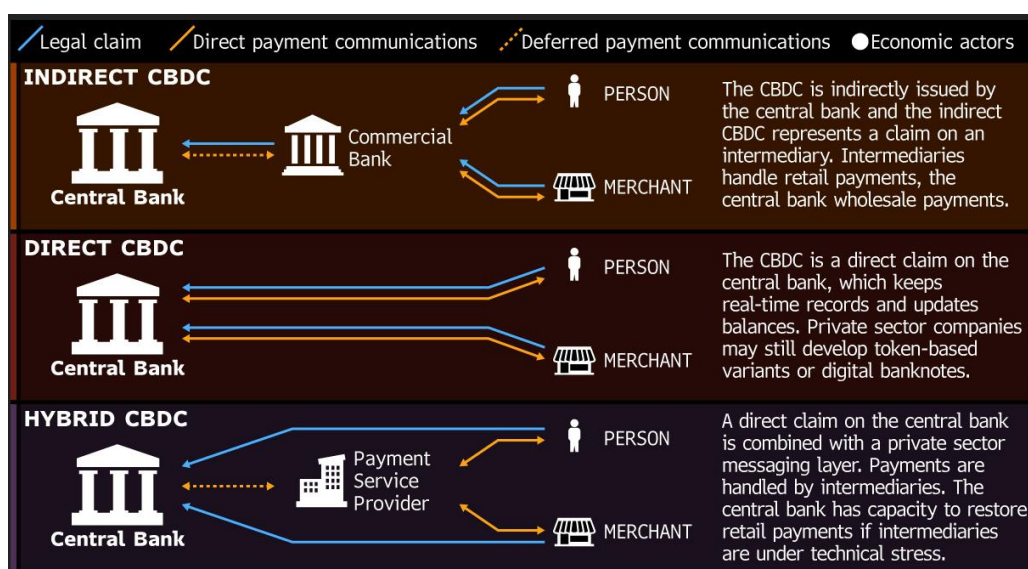
Source: Bloomberg

Figure 4.Central bank digital currency working process

Figure 04: The digital payments have replaced cash for most international transactions, To fulfill the needs of a digital financial system, a central bank may create a digital currency with the security and simplicity of cash. According to studies by Bloomberg Economics, the reasons for issuing CBDC, as well as the regulatory approach and technological designs, would vary greatly from one country or area to the next. Hybridization between a light-touch and full version seems to be the most plausible approach for a digital krona or a digital yuan, based on BIS terminology and what is known from China and Sweden on CBDC infrastructure and access (Jeansson & Qu, 2021).

4.1 Why should people prefer Central Bank Digital Currency (CBDC)

As compared to a bank account, CBDC is preferred since it is safe against bank failures. It would be in everyone's and the economy's best interest if that danger could be eliminated.

Some advantages exist:

> ➢ It could be less difficult to detect instances of money laundering.
> ➢ Payment and banking innovations have a lot of room to grow.
> ➢ It's more likely that people will be able to participate in the financial system.
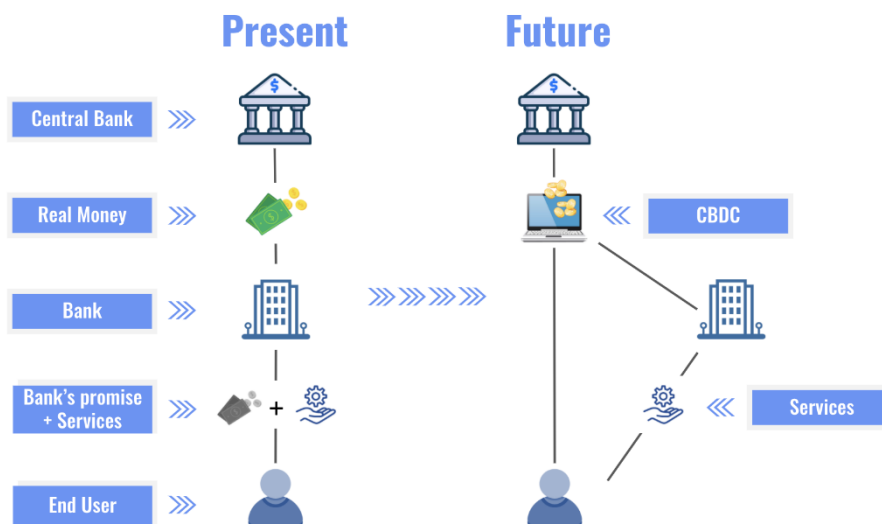
Figure 5.CBDC may eliminate user risk and banks concentrate on services

Figure 05: There will be a considerable reduction in the complexity and time required to move money across different banks and countries. In order to process these kinds of transactions, separate banking systems would not have to communicate with one another. It just takes a new entry in the bank's ledger to solve the problem. Its ease of use reduces costs and increases efficiency (Pilav, Digital asset, 202)

On the other hand, Customers may bypass traditional banking institutions altogether by using a CBDC wallet, which is a digital link between the central bank and the consumer. Using a CBDC wallet would streamline the process of saving, withdrawing, making payments, sending money,

and getting loans. CBDC wallet users are able to view, trade, send, receive, and exchange CBDC assets for the sake of conducting financial transactions (Chitra & Parkhe, 2022).

The following capabilities are necessary for a CBDC wallet to facilitate safe monetary transactions:

➢ Access control and data safety provided by stringent user authentication using biometrics, PIN, password, and one-time password.

➢ CBDC-initiated payments should be instantaneous, allow for a number of different forms of transfers (such as P2P or P2M), and enable a wide range of different merchant transactions.

➢ Access to different currency transactions for use in cross-border payments.

➢ Authentication of transactions to prevent unauthorized access to accounts and facilitate the transfer of payments across wallets.

➢ The CBDC Wallet has a minimal layout and basic functionality that inspires trust in its users and enables completing payments quick and easy.

4.2 How Digital currency works around the world.

Digital currencies, also known as cryptocurrencies, have been around for over a decade and have grown in popularity around the world. Here's a brief overview of how digital currencies have worked around the world (Mayers, 2022).

- United States: For tax reasons, virtual currencies in the US are handled similarly to other forms of property. Income or profits made from the sale or purchase of virtual currency must be reported to the Internal Revenue Service (Bal, 2019).

- European Union: For tax reasons, virtual currencies in the European Union are classified as a commodity. The European Central Bank has also issued warnings about the risks associated with digital currencies (Gikay, 2018).

- China: Both ICOs and cryptocurrency exchanges have been outlawed in China. However, the government has been developing its own digital currency, known as the digital yuan (Riley, 2021).

- Japan: Japan has legalized digital currencies and recognized them as a form of payment. The government has also established regulations for digital currency exchanges (Kirillova, Pavlyuk, Mikhaylova, Zulfugarzade, & Zenin, 2018).

- South Korea: South Korea has legalized digital currencies and recognized them as a form of payment. The government has also established regulations for digital currency exchanges (Jani, 2018).

- India: India has had a complicated relationship with digital currencies. In 2018, the Reserve Bank of India banned banks from dealing with digital currency exchanges (Chohan, 2018).

However, in 2020, the Supreme Court overturned the ban, allowing digital currency exchanges to operate once again.

- Africa: Digital currencies have become increasingly popular in Africa due to the high cost of banking services and the lack of access to traditional financial institutions. Several African countries, including Kenya, Ghana, and Nigeria, have seen a rise in the use of digital currencies (Sapovadia, 2018).

Some nations have openly embraced virtual currencies, while others have outlawed or severely limited their usage. Still, more and more nations are expected to enact restrictions governing the usage of digital currencies as their popularity increases. (Rodeck & Adams, 2023).

4.3 The uses and advantages of digital currency

The advantages of digital money are being recognized by more and more individuals and companies throughout the globe. Digital money, which is both convenient and safe, is increasingly replacing conventional fiat cash as a viable option, but how do their features stack up against one another? There are many reasons to choose digital money over cash, and we've listed seven of them here. Take in the rest of this text to find out (Brock T. , 2017).

- ➢ **Decentralization:** In the absence of a governing body or central authority, digital currencies may operate independently. since of this, the money is more secure and resistant to fraud since no one can control it (Ponsford, 2015).

- ➢ **Privacy:** When opposed to more conventional methods of exchanging money, digital currencies are more discrete and anonymous. Due to the anonymous and encrypted nature of the transactions, it is impossible to determine their origin (Albrecht, Duffin, Hawkins, & Rocha, 2019).

- **Lower transaction fees:** Transferring funds internationally using digital currencies is more cost-effective than with conventional banking systems due to reduced transaction costs (Auer, et al., 2022).

- **Faster transaction times:** When compared to the days it might take for a typical banking system to conduct a transaction, digital currencies are handled rapidly and can be transferred instantaneously (Grob & Klein, 2020).

- **Accessibility:** People in underbanked or rural locations may get better access to financial services via the use of digital currencies since they are available to anybody with an internet connection (Ozili, 2022).

- **Security:** To prevent fraud and preserve the integrity of financial transactions, digital currencies use complex cryptographic algorithms (Ajao, Umar, Olajide, & Misra, 2022).

- **Anonymity**: Compared to more conventional payment methods, digital currency transactions provide a greater degree of anonymity. Users that want anonymity and security in their money dealings may appreciate this feature (Auer & Böhme, The technology of retail central bank digital currency, 2020).

- **Transparency:** All transactions made with a digital currency are recorded and available to the public thanks to blockchain technology. This prevents any kind of systemic abuse or corruption (Laroiya, Saxena, & Komalavalli, 2020).

4.4 What is the risk of digital currency

With more and more people using digital currency, there is a greater chance of fraud occurring during financial transactions. There are several methods that may be used to conduct payment fraud. Yet, in the broadest sense, it encompasses all financial transactions that a cybercriminal does illegally (deRitis, 2021).

There are some common forms of payments fraud include:

- Internal manipulation
- Illegal payments
- Fraudulent payments
- Breach of embargos and sanctions
- Data theft

When dealing with monetary transactions that do not include a real exchange of goods or services, it is hard to verify the identity of the other party. It opens the door for hackers to steal private data or conduct money-in-digital-form fraud.

It's true that payment security has been becoming better, but so has the sophistication with which online fraudsters operate. Attempts to defraud financial institutions using fraudulent payment methods are on the increase and don't seem to be slowing down anytime soon (Grigg, 2022).

According to CFTC Digital currencies, such as Bitcoin and Ethereum, offer several advantages, including faster transactions, lower fees, and greater security compared to traditional currencies. However, there are also several risks associated with digital currencies:

- **Volatility:** There might be large price swings in digital currencies due to their extreme volatility. For instance, the price of a bitcoin has seen dramatic increases and decreases during the course of its existence (Baur & Dimpfl, 2021).
- **Security risks:** Hacking, theft, and fraudulent use of digital money are all possible. There have been cases of digital currency exchanges being hacked and the consequent loss of assets, despite the fact that blockchain technology itself is safe (Cumming, Johan, & Pant, 2014).
- **Lack of regulation:** Money laundering, funding of terrorism, and tax evasion are just some of the criminal actions that may occur with digital currencies since they are not governed by governments or financial organizations (Rahman I. , 2019).
- **Limited acceptance:** Many stores and services still won't take digital currencies, restricting their use despite their growing popularity (Tu & Meredith, 2015).
- **Technical issues:** Digital currencies are based on complex technology, and technical issues can arise that affect their performance, such as long confirmation times and high transaction fees (Allen, Čapkun, & Fanti, 2020).
- **Environmental concerns:** There have been concerns raised regarding the environmental effect of digital currencies due to the energy intensive mining process required to produce them. This is especially true with Bitcoin (Mohsin, 2021).

Overall, while digital currencies offer several benefits, investors and users should be aware of the risks associated with them before investing or using them.

5. How secure is internet banking

The safety of your online bank account is a top priority for banks; therefore, they take several measures to prevent unauthorized access. Examples of these security measures include password-protected websites, timed logouts, and other authentication procedures. To learn more, contact your financial institution (Lake & Murphy, 2023).

Online banking is typically risk-free. If you follow some simple guidelines and double-check your transaction data before submitting, you should have no problems.

- When anything seems odd on your bank statement, contact the bank immediately.
- Do not respond to emails pretending to be from your bank and asking for personal information.
- Don't forget to sign out of your online banking session every time you're done.
- If you must access your bank account online, do it only from a trusted Wi-Fi network.
- Avoid doing financial transactions or shopping while connected to a public wireless network. Safer to utilize a 3G or 4G connection when out and about with a mobile device or tablet.
- Always use the most recent versions of software, including operating systems and antivirus programs.
- Never use the same password for many accounts; instead, make up a new one by combining three unrelated words.

6. Banking and AI

Artificial intelligence (AI) is becoming more popular across a wide range of sectors, and it is now reshaping the financial sector by allowing banks to provide superior and more personalized goods and services to their consumers (Digalaki, 2022).

The banking industry is not immune to the disruptions brought about by artificial intelligence. Artificial intelligence is playing a game-changing role in several industries, including mobile banking and personalized customer support. Traditional bank customers will soon be able to get

the most fundamental banking services without having to stand in line for many hours. Because more and more people desire to access banking services without leaving the house, the demand for mobile banking has increased. According to a recent survey conducted by Insider Intelligence, mobile banking is one of the top three factors that customers evaluate when choosing a financial organization (Zafar, 2023).
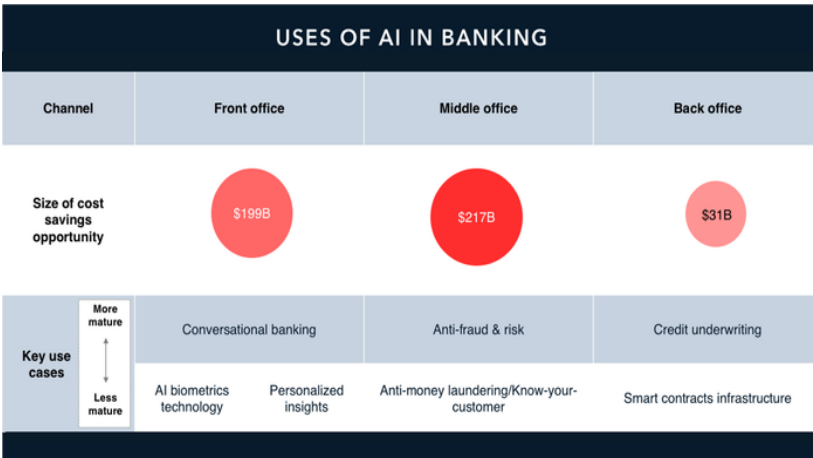
Source: Business insider

Figure 6. AI uses in Banking

Figure 06: The use of artificial intelligence (AI) in the banking industry is beginning to mature, which bodes well for the introduction of more complicated solutions that may provide a favorable return on investment (ROI) for all types of businesses. Artificial intelligence (AI) banking systems have recently gained widespread adoption. 56% of financial services firm's report employing the technology in the area of risk management, and 52% say they have used it to produce more money through the creation of new products and processes. These findings come courtesy of the Cambridge Centre for Alternative Finance and the World Economic Forum. Financial institutions (FIs) are expanding upon current solutions to take on more difficult problems as the use of AI grows in the banking industry (Digalaki, 2022).

The great majority of banks (80%) are aware of the potential benefits delivered by AI and machine learning, according to a survey performed by OpenText among professionals in the financial industry. It's true that several financial institutions want to roll out AI-enabled solutions. 75% of respondents at banks with over $100 billion in assets believe they are now embracing AI efforts, but just 46% say the same of banks with less than $100 billion in assets,

according to UBS Evidence Lab research seen by Insider Intelligence. A few of the most commonplace uses of AI in banks' day-to-day operations include chatbots in the front office and anti-payments fraud in the middle office (Singh S. , 2023).

6.1 How AI changing future of banking

Artificial intelligence (AI) has the potential to revolutionize the international financial system. Eighty-plus percent of financial services firms see AI as crucial to their future, and one-third anticipate a twenty-percent revenue boost because to the innovation (Biswas, Carson, Chung, & Singh, 2020).

According to Microsoft's Head of Banking, AI is being used by financial institutions to improve internal operations, stand out to customers, and provide novel offerings. Financial institutions can now leverage the trusted, secure, and compliant Azure platform to build AI solutions for complex processes like securities pricing prediction, client service request automation, and financial statement processing with the help of Microsoft Azure AI Cognitive Services and Azure Machine Learning. The financial services sector is now undergoing a change, and AI is and will be the driving force behind this future (Pramanik, Kirtania, & Pani, 2019)

Simple and repetitive jobs have been ideal for AI's first applications. More complicated activities, including financial planning and investment choices, are expected to be carried out with the help of this technology as it advances. Although this might have some positive outcomes, such as increased precision and productivity, it also carries the risk of significant negative consequences. If you want the whole story, keep reading (Atamjeet, 2022).

Current applications of AI in the financial sector

- Artificial intelligence (AI) be used to generate customized consumer experiences by mapping user travels and offering more tailored suggestions.
- Artificial intelligence is being used by financial institutions to detect and report potentially fraudulent transactions. Since this helps spot potential dangers early on, it also helps make banking and financial transactions safer.

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- Data input, document processing, and other mundane back-office activities are being automated with the help of AI, saving banks time and money. Earnst & Young has also revealed results similar to this, showing that using robotic process automation may save expenses by as much as 70 percent.

6.2 Benefits of using AI in internet Banking

Nowadays, the financial sector is all abuzz about artificial intelligence (AI). That's for a good cause, too. Machine learning, computer vision, and natural language processing are just a few examples of the kinds of technological developments in AI Banking that are reshaping the commercial world and the workplace. As a result, these innovations may lead to substantial results for banks, such as enhanced back-office operations, client experience, and staff happiness (Schmelzer & Tucci, 2023).

Here are some of the main benefits of artificial intelligence in banking and finance today, along with a discussion of some of the risks and challenges that financial services organizations face when using AI.

- **Cost and risk savings in operations**
  Although banks increasingly rely on digital methods, there are still many manual procedures that need paper documentation. Due to the high probability of human mistake in such procedures, banks incur substantial operating costs and suffer substantial risk (Königstorfer & Thalmann, 2020).
  Financial institutions are beginning to use robotic process automation (RPA) software, which automates repetitive, rule-based digital operations formerly handled by people, to reduce the amount of time and human error traditionally associated with gathering consumer information from various sources such as contracts, forms, and other documentation (Williamson, 2022).

- **Improved Investment Evaluation**
  For good reason, banking hours have a bad reputation. Late at night, on the weekend, or on a holiday, just when you needed them the most, banks were closed. In the past, calling

a help desk meant waiting on hold for a long period, and even then, the operator may not be able to fix the problem (Shahabi & Razi, 2019).

Robots ready to chat with you now. Conversational assistants, also known as chatbots, are a great example of how AI might be used in the banking industry. Customers are becoming more and more used to utilizing chatbots to do many of the routine banking procedures that formerly required human contact, and this is because chatbots, unlike employees, are accessible at all hours (Kimachia, 2021).

- **Enhanced Compliance and Fraud Detection**

  In recent times, Blockchain has received a lot of attention for its potential role in combating fraud. There is substantially less opportunity for fraud to occur in a blockchain network due to the blocks' transparency and immutability. However, financial institutions need to use machine learning-based techniques for effective detection. Naturally, you may combine the two for optimal efficiency (Owczarek, 2022).
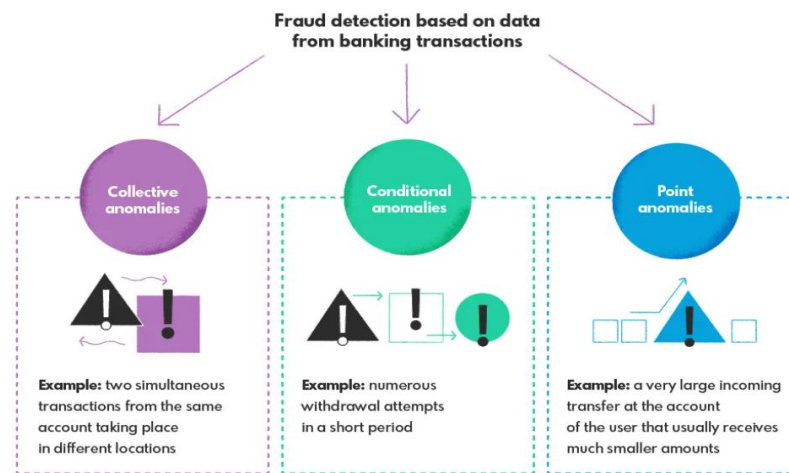
Source: Nexocode

Figure 7.Fraud detection

Figure 07: Several types of financial transaction fraud are detectable by the machine learning algorithms:

✓ collective anomalies: such as If there are two simultaneous purchases made with the same account in separate places, it is likely that both purchases are fake.

✓ conditional anomalies: such as repeated tries to withdraw money in a short time.

✓ point anomalies: such as large funds sent into a user's account that typically gets significantly lesser sums

- **A better approach to lending and credit evaluation**

  The same can be said for financial institutions, which are increasingly relying on algorithms driven by AI in order to provide clients with credit and loan options that are superior, more secure, and more profitable for the institution. Credit scores, credit histories, customer references, and financial transactions are still used by many banks as the only criteria for determining whether or not a person or business is creditworthy (Dumasia, 2021).

  People from all walks of life can attest to the fact that credit reporting systems include problems including inaccuracies, missing data, and incorrect classification of creditors. In addition to looking at the data that is easily accessible, artificial intelligence-based loan decision systems and machine learning algorithms are able to analyze patterns of behavior in order to determine whether a client with a limited credit history is a good credit customer or to identify consumers whose behaviors can raise the chance of default. This is accomplished by analyzing the client's behavior (Žigienė , Rybakovas , & Alzbutas, 2019).

- **Financial transactions are automated**

  Finally, some banks are increasing their usage of AI by relying on smart technology to support investment decision-making and research in investment banking. Swiss and Dutch firms UBS and ING use AI algorithms to scour markets for untapped investment opportunities that may be fed into their algorithmic trading systems. AI systems are enhancing modeling and finding to uncover even more alternatives while humans are still engaged in all of these investment decisions (Torralba, Rivera, & La Torre, 2018).

- **Enhancing the Assessment of Financial Resources**

  According to Actico Faulty data, incorrect categorization, and sloppy calculations underpin the use of credit scores in determining loan eligibility. As a result of the abundance of information currently at one's fingertips thanks to the internet, it is possible to form a more precise picture of the person or firm under consideration.

Despite efforts to ensure objectivity, even computer systems may show partiality. This is due to the fact that configurations are only as reliable as their creators. In a positive turn of events, most institutions get comparable funding requests, and the general public is aware of institutional bias. As a consequence, programmers may more confidently input optimal values while creating new software or updating existing programs (Khurshid, 2023).

6.3 Challenges and Limitations of AI in Banking

Financial institutions using legacy core systems have a daunting challenge: how to make sense of a deluge of data in order to get insight into consumer behavior and improve their products and services. Artificial intelligence (AI) is here to assist conventional financial service companies find new product and service options, red-flag anti-money laundering practices, and spot fraud, all while processing orders of magnitude more data than any person could ever process in a lifetime. It's also a growing tendency in the modern world (Ghandour, 2021).

There are some key challenges of AI in Banking such as

Source: Indusnet

Figure 8.Key challenges of AI banking

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Figure 08: Improvements in operational efficiency, client experience, risk management, and fraud prevention are just some of the ways in which artificial intelligence (AI) is revolutionizing the banking business. However, there are several difficulties in putting AI to use in the banking industry. Some of the major obstacles facing artificial intelligence in banking are listed below (Ashta & Herrmann, 2021).

- **Data quality and quantity:** AI models require large volumes of high-quality data to train and improve. In banking, data is often siloed and not standardized, which makes it difficult to extract valuable insights from it. Moreover, the data quality is often poor, which can lead to biased models (Bhushan, 2018).

- **Data privacy and security**: Privacy and security are paramount in the banking industry because of the sensitive nature of consumer information. The vulnerability to data breaches and cyber assaults is heightened since AI models want ready access to data. Financial institutions should take precautions to preserve customer information and prevent cyber-attacks (Meunier, 2018).

- **Regulatory compliance:** Compliance regulations in the banking business are sometimes country specific due to the global nature of the industry. Regulations such as General Data Protection Regulation, Know Your Customer, and Anti-Money Laundering must be met before artificial intelligence may be used in banking. It may be a tedious and time-consuming procedure, but banks must verify that their AI models adhere to all applicable laws and standards (Fernandez, 2019).

- Talent and expertise: A group of people well-versed in data science, machine learning, and AI is needed to implement it in the banking sector. Competing for talent is difficult since there is a scarcity of qualified individuals in these fields. For successful AI implementation, financial institutions must spend in staff training or bring in outside experts (Biswa, Carson, Chung, Singh, & Thomas, 2020).

- **Explain ability and transparency:** Complicated and hard to decipher, AI models are not always easy to use. To guarantee that both clients and regulators can comprehend the reasoning behind banking decisions, financial institutions must make their AI models explicable and transparent (Riikkinen, Saarijärvi, Sarlin, & Lähteenmäki, 2018).

- **Integration with legacy systems:** Traditional banking institutions often use antiquated systems that aren't compatible with current AI tools. Integrating AI with these preexisting systems may be difficult but is necessary for full deployment (Ghandour, 2021).

6.4 Applications of AI in Internet Banking

Banks can now handle unprecedented amounts of high-speed data with the help of AI, allowing them to get invaluable insights as a result. Better service for more people is a side effect of technological advancements like online payment processing, artificial intelligence (AI) bots, and biometric fraud detection systems. The term "artificial intelligence" encompasses an enormous range of specialized topics, including machine learning, NLP, expert systems, vision, voice, planning, robotics, etc (Hadidi, 2022).

- **Chatbots:** Banks are increasingly turning to chatbots powered by artificial intelligence to handle customer service, inquiries, and even basic financial procedures like checking account balances and transferring funds (Suhel, Shukla, Vyas, & Mishra, 2020).
- **Fraud Detection:** The use of artificial intelligence in fraud detection allows for constant monitoring of financial transactions. They have the ability to study previous incidents of deception and adjust to new dangers (Tubb, Krause, & Garn , 2018).
- **Personalization:** With the help of AI, banks may tailor their services to each individual consumer by, for example, suggesting suitable financial products in light of their past purchases (Rajan, Lecinski, & Venkatesan, 2019).
- **Credit Scoring:** To determine a person's creditworthiness and make loan choices, AI may examine credit reports and other financial data (Dhaigude & Lawande, 2022).
- **Risk Management:** Financial organizations may benefit from AI's ability to recognize and manage risks including market risk, credit risk, and operational risk (Leo, Sharma, & Maddulety, 2019).
- **Robo-Advisory:** Investment advice and portfolio management are two of the services that AI-powered robot-advisors may provide their clients (Achary & Shelke, 2023).
- **Voice Recognition:** Voice recognition systems driven by artificial intelligence (AI) may be utilized for client authentication and identification, making sign-ins safer (Kaur, Sandhu, Gera, Kaur, & Gera, 2020).

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- **Cybersecurity:** Artificial intelligence (AI) has the potential to significantly improve the effectiveness of cybersecurity systems in anticipating and preventing attacks by drawing on previous threat data and making sense of apparently unrelated patterns and indicators (Truby, Brown, & Dahdal, 2020).

  When it comes to securing sensitive data, artificial intelligence (AI) is valuable not just for fending off external assaults, but also for monitoring internal security and providing advice on how to patch any holes it finds (Dumasia, 2021).

Overall, AI is transforming the banking industry and enabling banks to provide better customer experiences, reduce costs, and improve security.

7.Types of Internet Banking and Services

Around the middle of the 1990s, the World Wide Web became widely available, making previously inaccessible knowledge easily accessible. The Internet has made it possible to do anything from pay bills and make purchases to play games and learn about the latest news events. Over the last several years, a growing number of banks, both online and offline, have opened virtual locations from which their customers may transact business and keep tabs on their financial standing. Informational, communicative, and transactional online banking are the three main categories recognized by the United States Department of the Treasury (Gansle, 2021).

Here are some of the types of internet banking services available:

- **Account management:** Customers have the ability to read and download statements, as well as see and download transaction histories and account balances.
- **Bill payment:** Customers have the option to pay their bills, such as those associated with their credit cards, loan installments, and energy bills, online.
- **Funds transfer:** Customers have the ability to move money between their own accounts, accounts held at the same bank, accounts held at different banks, or even accounts held at other financial institutions.
- **Mobile banking:** Customers may check their balances, make transactions, and even pay bills from the convenience of their mobile devices thanks to mobile banking.

- **Investment management:** Through their online banking services, clients may buy and sell stocks, bonds, and mutual funds.

- **Loan applications:** Online loan and credit card applications are available to customers.

- **Online shopping:** Using the bank's internet banking infrastructure, customers may make purchases online.

- **Alerts and notifications:** Account alerts and notifications may be customized by the customer.

- **Personal financial management:** Online banking makes it easy for customers to monitor their spending, plan for the future, and control their current financial situation.

These are but a few of the many services that may be obtained via the use of online banking. The specific services may differ from one bank to the next, and certain financial institutions may provide supplementary options in addition to traditional banking services, such as insurance, trip reservations, and other similar services.

7.1 Security measures in internet banking

Internet banking has made it possible for consumers to take care of their money no matter where they are or what time it is. However, it also introduces new vulnerabilities that must be addressed. Internet banking services use a number of safeguards to keep their clients' private financial data safe (Burnette , 2021).

However, with the convenience of internet banking comes the potential for security risks. To protect against these risks, banks implement a range of security measures to ensure the safety and confidentiality of their customers' financial information. Here are some common security measures in internet banking (Lake, Online Banking Security: How To Protect Your Online Banking Information, 2023).

- **Strong Password Requirements:** Strong passwords, including upper- and lower-case characters, digits, and symbols, are a requirement of internet banking systems. Customers are also obligated to routinely update their passwords (Lake, Online Banking Security: How To Protect Your Online Banking Information, 2023).

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- **Two-Factor Authentication (2FA):** Two-factor authentication is an added layer of protection that necessitates the usage of more than one form of user ID when logging in. A password and a temporary code given to the user's phone or email are two examples of this (Mack, 2022).

- **Encryption:** To protect sensitive information, data might be encrypted and then deciphered using a special key. Customers' login credentials, account numbers, and transaction specifics are all encrypted inside online banking systems (Musaev, 2015).

- **Firewalls:** Financial institutions rely on firewalls to keep hackers out of their systems. The purpose of a firewall is to prevent unwanted users from gaining access to a network.

- **Anti-Virus and Anti-Malware Software:** Malicious software that might jeopardize the security of an internet bank is scanned for and removed with the use of anti-virus and anti-malware software (Burnette , 2021).

- **Session Timeouts:** In order to prevent unauthorized access to customer accounts on online banking systems, session timeouts are used. If the user logs out before leaving their computer alone, this feature will prevent anybody else from accessing their account (Charles, 2019).

- **Device Recognition:** Some online banking systems use device identification software to track down the specific computers or mobile gadgets from which customers access their services. Additional security procedures, such as answering security questions or supplying a one-time code, may be needed to validate the identity of a person attempting to log in from a new or unfamiliar device (Zaheri, 2022).

- **Risk-Based Authentication:** Risk-based authentication is a kind of authentication that takes into account the potential danger of a login attempts and modifies the necessary levels of verification appropriately. If a user is attempting to access their account from a place that they are not acquainted with, they may be asked to give extra identifying details (Atlam, Alenezi, Hussein, & Wills, 2018).

- **Fraud Detection and Monitoring:** Internet banking systems have measures in place to monitor for and identify fraudulent behavior. A few examples of this include informing the client or temporarily suspending the account if suspicious behavior is detected (such as a big transaction or a transaction from an unexpected area). authentication (Rohall, 2022).

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- **Secure Sockets Layer (SSL) Certificate:** With the use of SSL, data sent between a user's browser and a website may be kept private. When a consumer uses an SSL certificate on their internet banking platform, the information sent between their computer and the bank's server is encrypted (Dastres & Soori , 2020).
- **Regular Security Audits:** Audits of the security of internet banking platforms are possible to check for loopholes and verify the efficacy of the platform's current security protocols (Lake & Murphy, 2023).

While internet banking systems do their best to safeguard its users' financial information, it is ultimately the user's obligation to keep their own information safe. Users should take precautions against common security flaws such as using easy-to-guess passwords, disclosing login details to unauthorized parties, utilizing outdated hardware and software, and being unaware of security flaws (Zaheri, 2022).

7.2 Possible Risk factors of using Internet Banking

Most banks across the globe take the prevention of hacking and other forms of online banking fraud extremely seriously. However, cybercrime committed with financial gain in mind is on the increase. This tendency is mostly attributable to an increase in the "cyber-attack surface," as the report terms it. In 2015, there were two billion internet users throughout the globe. By the year 2030, projections estimate the number at 7.5 billion. Online financial scammers and other attackers now have 275% more possible victims than they did before (Daniels, Safe Online Banking, 2023).

One of the things your bank may provide is internet banking. More and more people are depending solely on internet banking to conduct their financial transactions. You should educate yourself on the potential dangers of using internet banking before you consent to online account access or open an account with an Internet-based bank (Tan & Teo, 2000).

- **Phishing:** Phishing happens when fraudsters send emails to naïve victims with bogus links in the expectation that the receivers will click on the links and divulge important information, according to the article titled "Banking Securely Online" written by the United States Computer Emergency Readiness Team. When you register for an online

banking account for the very first time, you can get one of these letters in the mail. If you follow the link, you'll be sent to what appears like a legitimate bank enrollment page, but it's really a phishing scam designed to collect your personal data and transmit it to bad actors. In point of fact, the online platform was developed with the express purpose of collecting your credentials. As soon as the thief obtains your password information, he or she will immediately register in and start taking your money and confidential data (Daniels, 2023).

- **Access:** As long as you have internet connection and a device that can connect to the internet, you may access your bank account whenever you choose, 24/7, throughout the whole year. When you have an online bank account, you will have the ability to utilize it to pay your bills in a digital format. At any time, you like, you can access your account information, make transfers, modify your profile settings, and examine your most recent account bills (Root , 2023)**.**

According to [CFI](#) Credit risk, organizational risk, market risk, and cash risk are all significant concerns for banks. Financial institutions are subject to government regulation and require complex risk management systems due to the large variety of hazards they face. Regulatory Bodies (Team, 2023). Following is the Types of Risks that are involved in Internet Banking System:

- ➤ **Security Risk:** Protecting monetary exchanges is of utmost importance. Customers are very protective about their personal information during financial transactions. Because of the internet's pervasiveness, hackers and cybercriminals have easy access to sensitive customer data and malicious software. In addition to the obvious financial costs, the loss of trust among banking customers is a direct result of hackers' attempts to gain access to sensitive bank data (Hagen, 2020).

- ➤ **Reputational Risk:** If the general public has a particularly negative opinion of your company, you stand the risk of losing a significant amount of money as well as customers if your reputation suffers. This kind of danger may be caused by behaviors that either greatly damage the public's faith in the capacity of banks to carry out vital activities or impair the relationship that exists between banks and the people who use their services. If the customer's expectations for the system or product are not realized, if there are serious

weaknesses in the system or a breach in security, if the customer is not supplied with appropriate information on how to use the product or handle any difficulties that develop, then the customer may be exposed to this risk, or if there are widespread issues with the communication networks that prevent customers from accessing their funds or account information (Adeabah, Andoh, Asongu, & Gemegah, 2022).

➢ **Legal Risk:** When the rights and responsibilities of the parties involved in a transaction are not explicitly specified in law, the possibility of legal ramifications rises significantly. There is a legal risk linked with the lack of clarity regarding rights and responsibilities as a result of the immaturity of the e-banking business. This risk is due to the fact that the industry is still young, as well as the possible lack of clarity surrounding the validity of laws and rules (Malhotra , 2022).

➢ **Operational Risk:** The most prevalent type of risk in internet banking is operational risk, which is also known as business risk. Unauthorized entry to the bank's systems and transactions, incorrect handling of financial transactions, invalidation of contracts, loss of data security, privacy, or secrecy, and so on (Şerbu, 2010).

➢ **Strategic Risks:** The credibility of the vendor (if outsourced), the impact on employees' work environments, the gap between the used and available levels of technology, etc., are all factors that contribute to this risk (Angeleski, Kostoska, & Janeska, 2007).

➢ **Credit risk:** As a result of consumers' incapacity to meet their monetary commitments, a new class of risk has emerged. While customers appreciate the convenience of being able to apply for a loan from any location, banks face additional challenges when trying to assess an applicant's creditworthiness when they ask for credit through an online banking platform (Brock & Eichler, 2022).

➢ **Compliance risk:** The lack of compliance with state legislation, policy tools, and ethical standards posed a certain danger. In light of this, it is imperative that the bank be informed of the applicable legislation and ensure that it is applied consistently with other directives, such as those pertaining to branch banking. The need to protect the privacy of customers' information also falls under the umbrella of regulatory risk (White D. , 2020).

➢ **Interest rate risk:** Threat caused by fluctuating interest rates. Since e-banking lets customers easily assess the interest rates of various institutions, competition among banks

is fierce and banks must act swiftly to keep or win over customers' loans and savings in this environment (White C. , 2022).

7.3 Advantage and disadvantage of Internet banking

Benefits such as convenience and cost savings are offset by hazards and technological issues that must be considered while using internet banking. Customers should weigh the benefits of online banking against any possible drawbacks in order to make a well-informed decision regarding their money management needs. When used properly and correctly, online banking may be a convenient tool that improves the banking experience for customers (Beers & Howard, 2022).

Pros	Cons
Convenience: Internet banking frees clients from the need to physically visit a bank in order to do transactions such as accessing their accounts, transferring monies between accounts, and paying bills. clients may perform these transactions from any location and at any time (Omar, Sultan, Zaman, & Bibi, 2011).	**Security Risks:** When you bank online, you expose yourself to the possibility of becoming a victim of identity theft and fraud. If the bank does not have sufficient security measures in place, it is possible for hackers and other types of cybercriminals to obtain login passwords, personal information, and financial data (Ojeniyi, Edward, & Abdulhamid, 2019).
Timesaving: Because using internet banking removes the need to wait in line at a bank or ATM, transactions are able to be completed in a more timely and effective manner (Dhoot, Nazarov, & Koupaei, 2020).	**Technical Issues:** Customers may be unable to access their accounts or complete transactions through the internet if there are problems with their Internet connection or with the functioning of the system. The consumers may experience inconvenience as well as irritation as a result of this (Datta, Tanwar, Panda, & Rana, 2020).
Accessibility: Customers have the convenience of being able to handle their	**Limited Cash Transactions:** Some clients may find it inconvenient if online banking

accounts whenever they like thanks to the accessibility of internet banking, which is accessible around the clock (Pham, Wentz, Nguyen, & Pham, 2021).	doesn't support making cash deposits or withdrawals (Jolly, 2016).
Cost Savings: Online banking may save you money since its transaction costs are often cheaper than those of other banking options and some banks even don't charge you anything at all to conduct a transaction via their website (Rahman, Prodhan, & Sarkar, 2017).	**Lack of Personal Interaction:** Some clients may feel abandoned or frustrated by banks when they have sophisticated financial concerns and can't get help via Internet banking (Mansumitrchai & Chiu, 2012).
Environmentally Friendly: Using an online banking service is environmentally friendly since it cuts down on paper consumption and other banking-related emissions (Yoon & Steege, 2013).	**Dependency on Technology:** Customers who want to use online banking must have access to a computer or mobile device, as well as a constant data connection to the internet (Pampori, Baba, & Najar, 2018).

8.Data Analysis

I have collected some data on digital currency and internet banking from the google form on online survey. In this particular I have gotten some great response from the people on internet banking and digital currency. In this survey I most the participants are university students and few of them are job holder. And I also I realized that people are highly interested to participated and to share their opinion and also their great experience on it.

What is your gender ?

22 responses

○ Male
● Female

27.3%

72.7%
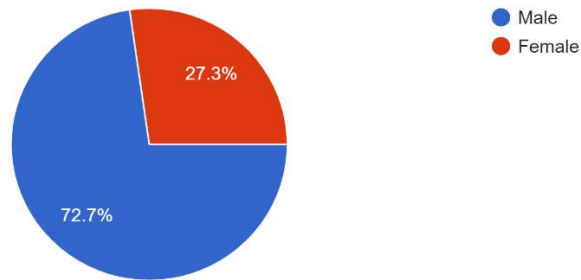
Figure 9. Internet banking and digital currency between male and female

Figure 9: The gender distribution of respondents showed that 72.7% of the total sample were male, while 27.3% were female. This gender skewness in the sample has implications for the findings of the study, particularly in the area of gender-based differences in the adoption and use of FinTech, digital currency, and internet banking.

AGE

■ Age ■ under 20 ■ 21-30 ■ 31-40 ■ 41-50 ■ Over 50

6% 4%

14%

22%

54%
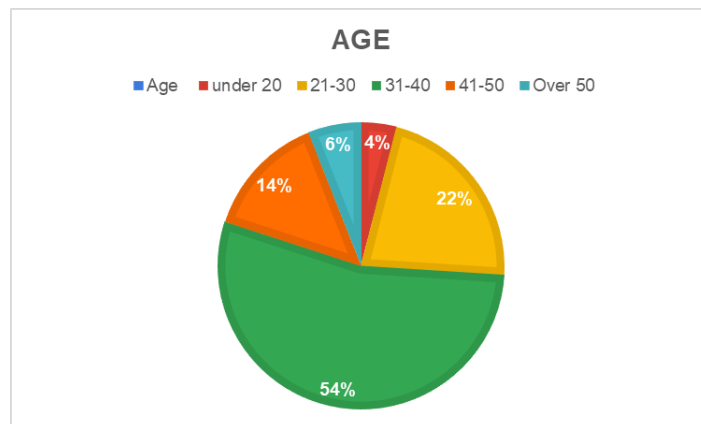
Figure 10. Age between male and female

Figure 10: Based on the data, the largest age group is 31-40 years old, with 54 respondents (54% of the total sample) falling within this age range. The second-largest group is 21-30 years old, with 22 respondents (22% of the total sample) falling within this age range.

The remaining respondents are distributed among the older age groups, with 14 respondents (14% of the total sample) being between 41-50 years old, 6 respondents (6% of the total sample)

being over 50 years old, and only 4 respondents (4% of the total sample) being under 20 years old.

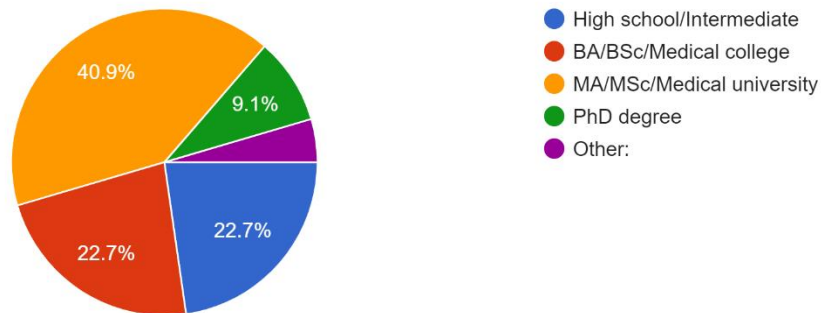What is your current occupation?
22 responses
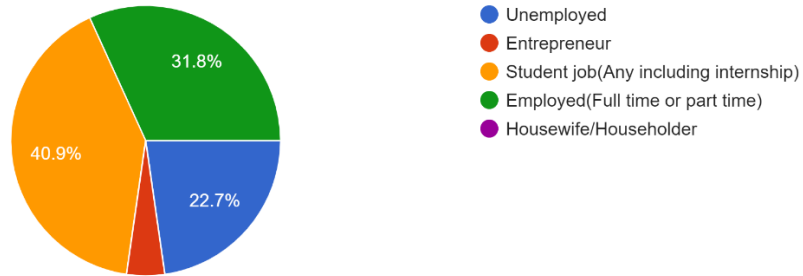
Source: Author's own findings from google forms survey

Figure 11. Different types of occupation using internet baking and digital currency

Figure 11: The occupational distribution of respondents showed that the largest occupational group was students, with 40.9% of the total sample. The next largest group was employed individuals, with 31.8% of the total sample. A significant percentage of respondents (22.17%) reported being unemployed, which may indicate the potential impact of FinTech on job creation and job loss.

What is your highest education?
22 responses

Source: Author's own findings from google forms survey

Figure 12: According to the distribution of respondents' levels of education, those with an MA/MSc/Medical degree made up the biggest group (40.9% of the overall sample). Next came those with a BA/BSc/Medical Degree (22.7%), followed by those with a High School Diploma or its International Equivalent (22.7%). The remaining respondents had a wide range of academic backgrounds, with 9.1% holding a PhD and 4.1% holding some other advanced degree.

How often do you use the internet banking?
22 responses
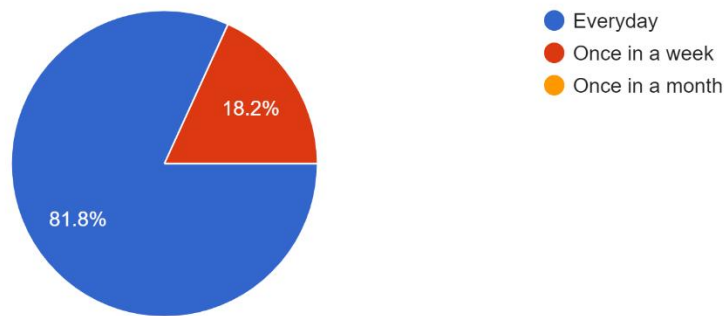
Source: Author's own findings from google forms survey

Figure 13. How many times people are using internet banking

Figure 13: The data represent that there are large number of people are using internet banking everyday (81.8%). And 18.2% people are using internet banking once in a week.

## Do you have any idea about internet banking ?

17 responses
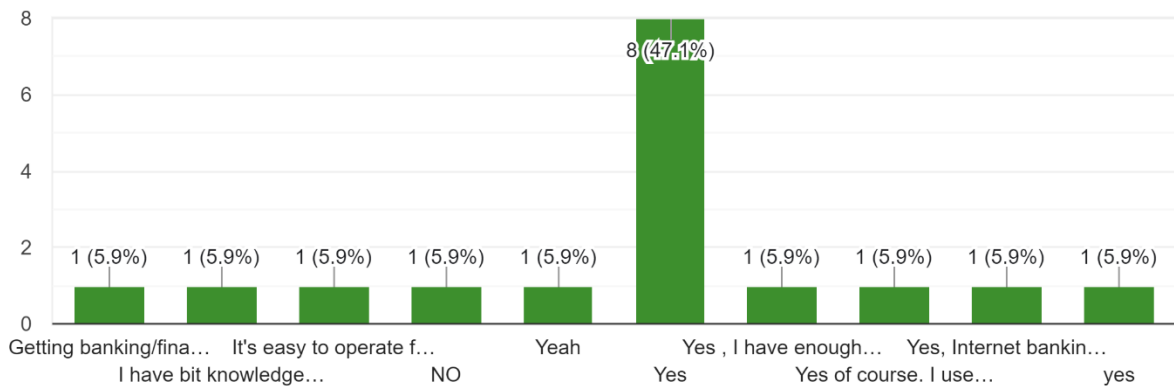
Figure 14. Overall, how much knowledge about internet banking

Figure 14: The demographic characteristics of my sample are important factors to consider when interpreting the findings of the study. The graph shows that most of the people they have good knowledge about internet banking sector and very few people they have little idea about it.
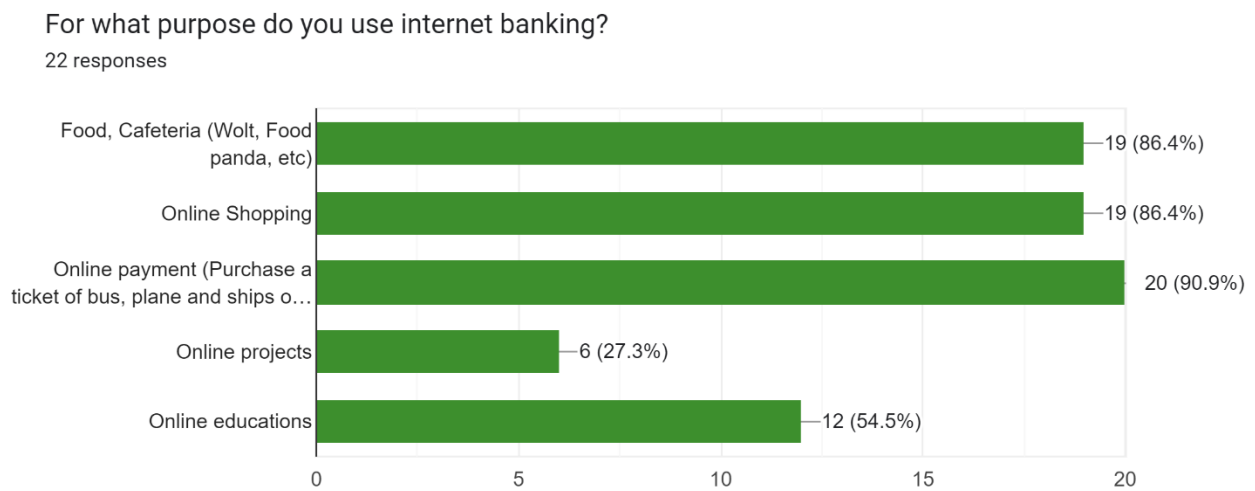
Which kind of banking services are you using ?

22 responses
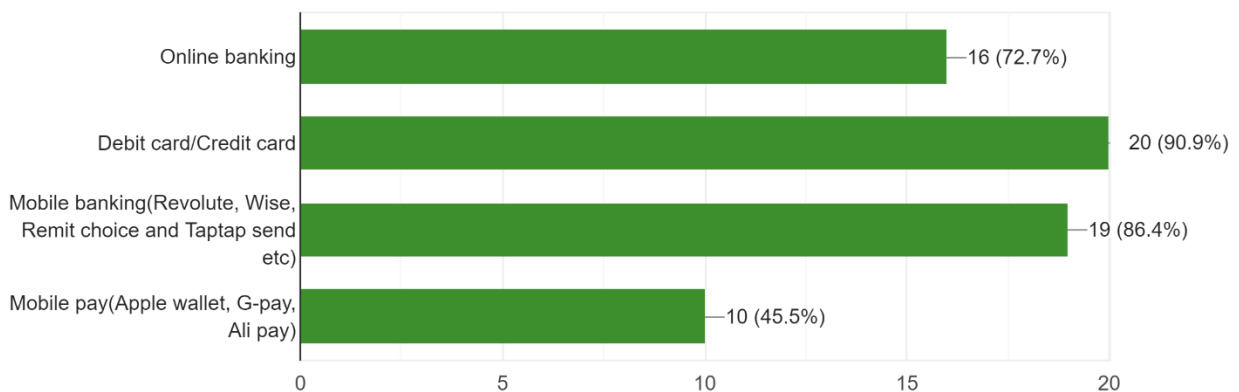
Figure 15. Different types of banking services

Figure 15: There are different types of banking service we have but, in this survey, people are highly using Mobile banking and most using Debit Credit card paying methods. The graph represents that large number of people are using mobile banking, Debit card/credit card and their rate is high. And online banking percentage is very close to them. On the other hand, it clear that people are also using nicely online baking in their daily life. Online baking is going to more popular day by day. People feels that very easy and convenient. Recently, Revolute, Wise transfer, Remit choice, transfer go, and Taptap send are using more for sending money to other country.

For what purpose do you use internet banking?
22 responses

Purpose	Value
Food, Cafeteria (Wolt, Food panda, etc)	19 (86.4%)
Online Shopping	19 (86.4%)
Online payment (Purchase a ticket of bus, plane and ships o…	20 (90.9%)
Online projects	6 (27.3%)
Online educations	12 (54.5%)

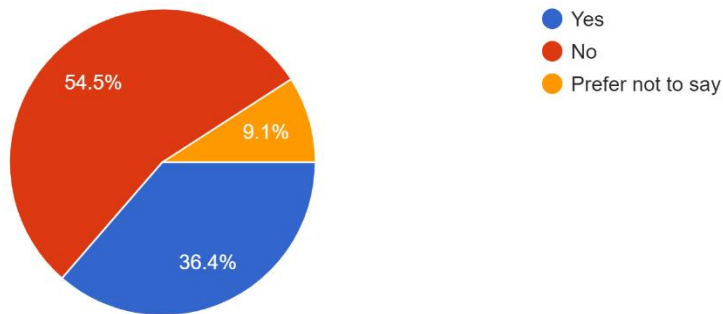*Source: Author's own findings from google forms survey*

Figure 16. Using internet banking for different purpose

Figure 16: In daily life people are using internet banking for different purpose such as for food (wolt, food panda) and also online shopping, Buying tickets for train, bus, plane. The purpose of the using internet banking for food, cafeteria, and online shopping same 86.4%. And the other hand people are most using for online payment 90.9%

Do you have cryptocurrency?
22 responses

- Yes
- No
- Prefer not to say

54.5%
9.1%
36.4%

Figure 17. Using of cryptocurrency

Figure 17: There are few numbers of people are not willing to express about cryptocurrency but there are larger number of people they are using cryptocurrency and also taking as profession. They have good number of cryptocurrency 36.4% and recent perspective people are going to more familiar of it.

Which kind of cryptocurrencies have you used?
23 responses

- Bit coin
- Ethereum
- Others
- Binance Coin
- I do not use
- Other:

47.8%
8.7%
13%
8.7%
17.4%
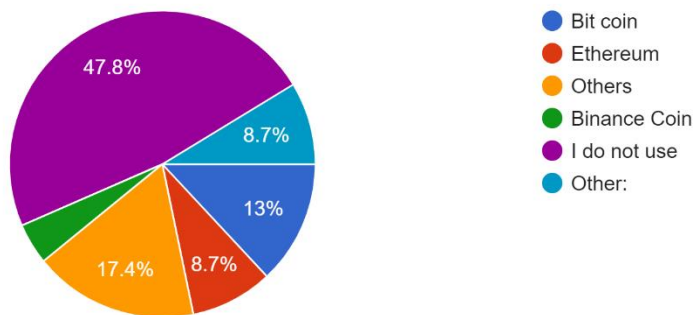
Figure 18. Using different types of cryptocurrencies

Figure 18: High rate of people is not using cryptocurrencies, but Bitcoins and other cryptocurrency percentage is between 13% and 17.4%.

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I could collect current situation of the internet banking and digital currency and how much percentage of the people are using internet banking and digital currency and familiar with this.

9.Conclusion

By introducing in this thesis paper new technologies like digital currencies and internet banking services, FinTech has completely altered the financial services sector. Bitcoin and Ethereum, two examples of digital currencies, may one day pose a serious threat to the status quo of monetary systems because of the advantages they provide in terms of speed, safety, and openness. However, there are serious problems that must be solved, such as the absence of regulation and the risk of fraud and cyber assaults. Customers may take use of the banking services they need at any time and place thanks to Internet banking solutions such as mobile banking applications and online platforms. Further, they help banks simplify their processes, save expenses, and boost satisfaction levels among their clientele. However, the digital divide and other issues regarding the safety and privacy of online banking must be addressed before they can be considered adequately solved. As a whole, FinTech on digital currency and online banking has changed and will continue to change the face of the financial services sector, posing new possibilities and difficulties for businesses, governments, and the general public.

Internet banking and virtual currencies are two examples of how fintech has changed financial services. Bitcoin and Ethereum, for example, have disrupted the banking sector. Internet banking has also changed people's financial outlook. Banking services may now be accessible anytime, anywhere.

FinTech's ongoing financial sector disruption poses dangers and challenges that must be addressed. Because of its decentralized structure and the uncontrolled nature of digital money, online banking is subject to fraud.

As a consequence of this, it is of the utmost importance that politicians, regulators, and financial institutions work together to develop a regulatory framework that achieves an appropriate equilibrium between fostering innovation and protecting clients. and hacking. As a result, it is

critical that policymakers, regulators, and financial institutions collaborate to create a regulatory framework that strikes a fair balance between encouraging innovation and safeguarding customers.

Digital money and online banking have revolutionized monetary transaction in recent years. Bitcoin and online banking have made financial solutions more efficient, safe, and simple

Digital money and internet banking have many benefits, but regulation and safety remain problems. Internet banking and digital money might revolutionize the global economy by cutting transaction costs, expanding financial access, and eliminating the need for physical cash.

To keep pace with technology, governments and financial institutions must follow strict laws and security procedures. Virtual currencies and internet banking may enhance economic development and provide people more financial autonomy if properly regulated and protected.

References

Dhaigude, R., & Lawande, N. (2022). Impact of Artificial Intelligence on Credit Scores in Lending Process. *IEEE*. Retrieved from https://ieeexplore.ieee.org/abstract/document/9791511

Root , G. (2023). The Risks & Advantages of Online Banking. *CHRON*. Retrieved from https://smallbusiness.chron.com/risks-advantages-online-banking-2249.html

Truby, J., Brown, R., & Dahdal, A. (2020). Banking on AI: mandating a proactive approach to AI regulation in the financial sector. *Taylor & Francis*. Retrieved from https://www.tandfonline.com/doi/full/10.1080/17521440.2020.1760454

Williamson, R. (2022). Benefits of AI to Fight Fraud in the Banking System. *data science central*. Retrieved from https://www.datasciencecentral.com/benefits-of-ai-to-fight-fraud-in-the-banking-system/

Achary, R., & Shelke, C. (2023). Fraud Detection in Banking Transactions Using Machine Learning. *IEEE*. Retrieved from https://ieeexplore.ieee.org/abstract/document/10091067

Adeabah, D., Andoh, C., Asongu, S., & Gemegah, A. (2022). Reputational risks in banks: A review of research themes, frameworks, methods, and future research directions. *Journal of Economic Surveys*. Retrieved from https://onlinelibrary.wiley.com/doi/full/10.1111/joes.12506

Ajao, L. A., Umar, B. U., Olajide, D. O., & Misra, S. (2022). Application of Crypto-Blockchain Technology for Securing Electronic Voting Systems. In Blockchain Applications in the Smart Era. 85-105. Retrieved from https://link.springer.com/chapter/10.1007/978-3-030-89546-4_5

Albrecht, C., Duffin, K. M., Hawkins, S., & Rocha, V. M. (2019). The use of cryptocurrencies in the money laundering process. *Journal of Money Laundering Control*, 210-216. Retrieved from https://www.emerald.com/insight/content/doi/10.1108/JMLC-12-2017-0074/full/html

Allen, S., Čapkun, S., & Fanti, G. (2020). Design choices for central bank digital currency: Policy and technical considerations. *National Bureau of Economic Research*. Retrieved from https://www.nber.org/papers/w27634

Angeleski, M., Kostoska, O., & Janeska, M. (2007). Risk-Based Analysis of Electronic Banking. *research gate*. Retrieved from https://www.researchgate.net/publication/273856041_Risk-Based_Analysis_of_Electronic_Banking

Antonakakis, N., Chatziantoniou, I., & Gabauer, D. (2019, July). Cryptocurrency market contagion: Market uncertainty, market complexity, and dynamic portfolios. *Journal of International Financial Markets, Institutions and Money, 61*, 37-51. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S1042443118303469

Ashta, A., & Herrmann, H. (2021). Artificial intelligence and fintech: An overview of opportunities and risks for banking. *Wiley online library*, 211-222. Retrieved from https://onlinelibrary.wiley.com/doi/abs/10.1002/JSC.2404

Atamjeet. (2022). The Future Implications of AI in Banking and Finance. *ciospeak*. Retrieved from https://ciospeak.com/articles/the-future-implications-of-ai-in-banking-and-finance/?utm_source=rss&utm_medium=rss&utm_campaign=the-future-implications-of-ai-in-banking-and-finance

Atlam, H., Alenezi, A., Hussein, R. K., & Wills, G. (2018). Validation of an Adaptive Risk-based Access. *International Journal of Computer Network and Information Security*. Retrieved from http://www.mecs-press.org/ijcnis/ijcnis-v10-n1/IJCNIS-V10-N1-4.pdf

Auer, R., & Böhme, R. (2020). The technology of retail central bank digital currency. *ssrn*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3561198

Auer, R., Frost, J., Gambacorta, L., Monnet, C., Rice, T., & Shin, H. S. (2022). Central bank digital currencies: motives, economic implications, and the research frontier. *Annual review of economics*, 697-721. Retrieved from https://www.annualreviews.org/doi/abs/10.1146/annurev-economics-051420-020324

Bal, A. (2019). Developing a regulatory framework for the taxation of virtual currencies. *Intertax*, 219 – 233. Retrieved from https://kluwerlawonline.com/journalarticle/Intertax/47.2/TAXI2019019

Baur, D., & Dimpfl, T. (2021). The volatility of Bitcoin and its role as a medium of exchange and a store of value. *Empirical Economics*. Retrieved from https://link.springer.com/article/10.1007/s00181-020-01990-5?module=inline&pgtype=article

Beers, B., & Howard, E. (2022). Internet Banks: Pros and Cons. *investopedia*. Retrieved from https://www.investopedia.com/articles/pf/11/benefits-and-drawbacks-of-internet-banks.asp

Best, R. d. (2023, 3 8). *Number of cryptocurrencies worldwide from 2013 to February 2023*. Retrieved from statista: https://www.statista.com/statistics/863917/number-crypto-coins-tokens/#statisticContainer

Bhatt, A., Joshipura, M., & Joshipura, N. (2022). Decoding the Trinity of Fintech, Digitalization and Financial Services: An Integrated Bibliometric Analysis and Thematic Literature Review Approach. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4292368

Bhushan, K. (2018). Artificial Intelligence in Indian banking: Challenges and opportunities. *livemint*. Retrieved from https://www.livemint.com/AI/v0Nd6Xkv0nINDG4wQ2JOvK/Artificial-Intelligence-in-Indian-banking-Challenges-and-op.html

Biswa, S., Carson, B., Chung, V., Singh, S., & Thomas, R. (2020). AI-bank of the future: Can banks meet the AI challenges? *McKinsey*. Retrieved from https://www.mckinsey.com/~/media/McKinsey/Industries/Financial%20Services/Our%20Insights/AI%20bank%20of%20the%20future%20Can%20banks%20meet%20the%20AI%20challenge/AI-bank-of-the-future-Can-banks-meet-the-AI-challenge.pdf

Biswas, S., Carson, B., Chung, V., & Singh, S. (2020). AI-bank of the future: Can banks meet the AI challenge? *mckinsey*. Retrieved from https://www.mckinsey.com/industries/financial-services/our-insights/ai-bank-of-the-future-can-banks-meet-the-ai-challenge

Brock, T. (2017). 7 benefits of using digital currencies. *The Business Journals*. Retrieved from https://www.bizjournals.com/bizjournals/how-to/growth-strategies/2017/06/7-benefits-of-using-digital-currencies.html

Brock, T., & Eichler, R. (2022). Credit Risk: Definition, Role of Ratings, and Examples. *investopedia*. Retrieved from https://www.investopedia.com/terms/c/creditrisk.asp

Brooke, C. (2022). The Most Energy-Efficient Cryptocurrency to Invest In – Top 10 Projects Reviewed. *Cryptonews*. Retrieved from https://cryptonews.com/news/most-energy-efficient-cryptocurrency.htm#:~:text=Ethereum%20(ETH)%20%E2%80%93%20Most%20Popular,Efficient%20Crypto%20for%20dApp%20Developers

Burnette , M. (2021). Is Online Banking Safe? How to Boost Your Banking Security. *nerdwallet*. Retrieved from https://www.nerdwallet.com/article/banking/online-banking-security#:~:text=Standard%20measures%20include%20using%20anti,institution%20uses%20these%20security%20measures.

Charles, A. (2019). Security Issues Relating to Internet Banking. *azcentral*. Retrieved from https://yourbusiness.azcentral.com/security-issues-relating-internet-banking-21683.html

Chitra, T., & Parkhe, R. P. (2022). Do consumers prefer Central Bank Digital Currency wallets, digital assets, or traditional currencies? *Oracle*. Retrieved from https://blogs.oracle.com/financialservices/post/do-consumers-prefer-central-bank-digital-currency-wallets-digital-assets-or-traditional-currencies

Chohan, U. (2018). *Critical Blockchain Research Initiative*, 115-126. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3042248

Chohan, U. (2022). Cryptocurrencies: A Brief Thematic. *Critical blockchain initative* . Retrieved from
https://ssrn.com/abstract=3024330

coinmarketcap. (n.d.). *Cryptocurrency Historical Data Snapshot.* Retrieved from
https://coinmarketcap.com/historical/

Cumming, D., Johan, S., & Pant, A. (2014). Regulation of the Crypto-Economy: Managing Risks,
Challenges, and Regulatory Uncertainty. *Risk and financial management*. Retrieved from
https://www.mdpi.com/1911-8074/12/3/126

Daniels, N. (2023). *vpnoverview*. Retrieved from https://vpnoverview.com/internet-safety/secure-
browsing/safe-online-banking/

Daniels, N. (2023). Safe Online Banking. *vpnoverview*. Retrieved from
https://vpnoverview.com/internet-safety/secure-browsing/safe-online-banking/

Dastres , R., & Soori , M. (2020). Secure socket layer (SSL) in the network and web security. *International
Journal of Computer and Information Engineering*, 330-333. Retrieved from
https://hal.science/hal-03024764/

Datta, P., Tanwar, S., Panda, S. N., & Rana, A. (2020). Security and issues of M-Banking. *IEEE*, 1115-1118.
Retrieved from https://ieeexplore.ieee.org/abstract/document/9198032

deRitis, C. (2021). Digital Currencies: Risks and Opportunities. *Global Association of Risk Professionals*.
Retrieved from https://www.garp.org/risk-intelligence/technology/digital-currencies-risks-and-
opportunities

Dhoot, A., Nazarov, A., & Koupaei, A. A. (2020). A security risk model for online banking system. *IEEE*, 1-
4. Retrieved from https://ieeexplore.ieee.org/abstract/document/9078655

Digalaki, E. (2022). The impact of artificial intelligence in the banking sector & how AI is being used in
2022. Retrieved from https://www.businessinsider.com/ai-in-banking-
report#:~:text=Banks%20can%20use%20AI%20to,could%20also%20benefit%20from%20AI.

Dumasia, J. (2021). *ibs intelligence*. Retrieved from https://ibsintelligence.com/ibsi-news/5-applications-
of-artificial-intelligence-in-banking/

Dumasia, J. (2021). *ibs intelligence*. Retrieved from https://ibsintelligence.com/ibsi-news/5-applications-
of-artificial-intelligence-in-banking/

E-SPIN. (2017). *Types of Online Banking or E-Banking.* Retrieved from https://www.e-
spincorp.com/types-online-banking-e-banking/

Fernandez, A. (2019). Artificial intelligence in financial services. *Banco de Espana Article*. Retrieved from
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3366846

FRANKENFIELD, J. (2022). What is Online Banking? Definition and How It Works. *Investopedia*. Retrieved
from https://www.investopedia.com/terms/o/onlinebanking.asp

Gandal, N., & Moore, T. (2021). The rise and fall of cryptocurrency coins and tokens. *Decisions in Economics and Finance*, pages981–1014. Retrieved from https://link.springer.com/article/10.1007/s10203-021-00329-8

Gansle, D. (2021). Types of Internet Banking. *techwalla*. Retrieved from https://www.techwalla.com/articles/types-of-internet-banking

Ghandour, A. (2021). Association for Information Communication Technology Education and Science. Retrieved from https://www.ceeol.com/search/article-detail?id=997662

Ghandour, A. (2021). *tem journal*. Retrieved from https://www.temjournal.com/content/104/TEMJournalNovember2021_1581_1587.pdf

Gikay, A. A. (2018). Regulating decentralized cryptocurrencies under payment services law. *Journal of Law Tech. & Internet*. Retrieved from https://heinonline.org/HOL/LandingPage?handle=hein.journals/caswestres9&div=3&id=&page=

Golden, C. (2021). The Four Key Challenges of AI in Financial Services. *appen*. Retrieved from https://appen.com/blog/key-challenges-of-ai-in-financial-services/

Goncharenko. (2023). Top Countries by Crypto Users in 2023. *Metaverse post*. Retrieved from https://mpost.io/top-countries-by-crypto-users-in-2023/#:~:text=In%202021%2C%20the%20countries%20with,than%20880%25%20in%20adoption%20worldwide.

Grigg, G. (2022). Innovator Q&A: Digital currency risks may be on the rise, but there's hope for tracking fraud. *Thomson Reuters*. Retrieved from https://www.thomsonreuters.com/en-us/posts/investigation-fraud-and-risk/innovator-q-a-digital-currency-fraud/

Grob, J., & Klein, M. (2020). he digital euro and the role of DLT for central bank digital currencies. *Reserachgate*. Retrieved from https://www.researchgate.net/profile/Jonas-Gross-2/publication/341354711_The_Digital_Euro_and_the_Role_of_DLT_for_Central_Bank_Digital_Currencies/links/5ebc116a92851c11a867533a/The-Digital-Euro-and-the-Role-of-DLT-for-Central-Bank-Digital-Currencies.pdf

Hadidi, A. (2022). Use Cases of Artificial Intelligence in Banking. *progres soft*. Retrieved from https://www.progressoft.com/blogs/use-cases-of-artificial-intelligence-in-banking

Hagen, K. (2020). Security Risks of Mobile Banking -- and How to Avoid Them. *the ascent*. Retrieved from https://www.fool.com/the-ascent/banks/articles/7-security-risks-mobile-banking-how-avoid-them/

Hayes, A. (2023, April). *Learn how these digital public ledgers enable crypto and NFTs*. Retrieved from Investopedia: https://www.investopedia.com/terms/b/blockchain.asp

Jani, S. (2018). The growth of cryptocurrency in India: Its challenges & potential impacts on legislation. *Research gate publication*. Retrieved from https://www.researchgate.net/profile/Shailak-Jani/publication/324770908_The_Growth_of_Cryptocurrency_in_India_Its_Challenges_Potential_Impacts_on_Legislation/links/5ae1720a458515c60f660076/The-Growth-of-Cryptocurrency-in-India-Its-Challenges-Potential-Imp

Jeansson, J., & Qu, D. (2021). Here's How a Central Bank Digital Currency Could Work. *Bloomberg*. Retrieved from https://www.bloomberg.com/news/articles/2021-03-22/here-s-how-a-central-bank-digital-currency-could-work-chart?utm_medium=cpc_search&utm_campaign=NB_ENG_DSAXX_DSAXXXXXXXXX_EVG_XXXX_XXX_Y0469_EN_EN_X_BLOM_GO_SE_XXX_XXXXXXXXXX&gclid=Cj0KCQiAutyfBhCMARIsAMg

Jolly, V. (2016). The influence of internet banking on the efficiency and cost savings for banks' customers. *International Journal of Social Sciences and Management*, 163-170. Retrieved from https://www.nepjol.info/index.php/IJSSM/article/view/15257

Kagan, J. (2023). *Financial Technology (Fintech): Its Uses and Impact on Our Lives*. Retrieved 4 28, 2023, from Investopedia: https://www.investopedia.com/terms/f/fintech.asp

Kaur, R., Sandhu, R. S., Gera, A., Kaur, T., & Gera, P. (2020). Intelligent voice bots for digital banking. *Springer Link*. Retrieved from https://link.springer.com/chapter/10.1007/978-981-13-8406-6_38

Khurshid, A. (2023). AI is strengthening competitiveness of banks through. *wipro*. Retrieved from https://www.wipro.com/business-process/why-banks-need-artificial-intelligence/

Kimachia, K. (2021). Top 5 Benefits of AI in Banking and Finance. *it business edge*. Retrieved from https://www.itbusinessedge.com/development/top-5-benefits-of-ai-in-banking-and-finance/

Kirillova, E. A., Pavlyuk, A. V., Mikhaylova, I. A., Zulfugarzade, T., & Zenin, S. (2018). Bitcoin, lifecoin, namecoin: The legal nature of virtual currency. *Journal of Advanced Research in Law and Economics*, 119-126. Retrieved from https://www.ceeol.com/search/article-detail?id=695029

Königstorfer, F., & Thalmann, S. (2020). Applications of Artificial Intelligence in commercial banks—A research agenda for behavioral finance. *Journal of behavioral and experimental finance*. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S2214635019302503

Lake, R. (2023). Online Banking Security: How To Protect Your Online Banking Information. *forbes Advisor*. Retrieved from https://www.forbes.com/advisor/banking/how-to-protect-your-online-banking-information/

Lake, R., & Murphy, R. (2023). *Forbes Advisor*. Retrieved from https://www.forbes.com/advisor/banking/how-to-protect-your-online-banking-information/

Laroiya, C., Saxena, D., & Komalavalli, C. (2020). Applications of blockchain technology. In Handbook of research on blockchain technology. *sciencedirect*, 213-243. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/B9780128198162000095

Leo, M., Sharma, S., & Maddulety, K. (2019). Machine learning in banking risk management: A literature review. *MDPI*. Retrieved from https://www.mdpi.com/2227-9091/7/1/29

Mack, J. (2022). What's Changed for Cybersecurity in Banking and Finance: New Study. *rapid7*. Retrieved from https://www.rapid7.com/blog/post/2022/05/10/whats-changed-for-cybersecurity-in-banking-and-finance-new-study/

Malhotra , R. (2022). Legal Challenges in Internet Banking. *legal service india*. Retrieved from https://www.legalserviceindia.com/legal/article-2513-legal-challenges-in-internet-banking.html

Mansumitrchai, S., & Chiu, C. (2012). Adoptation of Internet banking in UAE: factors underlying adoption characteristics. *International Journal of management and marketing Research*, 103-115. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1957230

Mayers, Z. (2022, 6 7). *WHY WOULD ANYONE USE A CENTRAL BANK DIGITAL CURRENCY?* Retrieved from Insight: https://www.cer.eu/insights/why-would-anyone-use-central-bank-digital-currency

Meunier, S. (2018). THE IMPACTS AND CHALLENGES OF ARTIFICIAL INTELLIGENCE IN FINANCE. *internationalbanke*. Retrieved from https://internationalbanker.com/finance/the-impacts-and-challenges-of-artificial-intelligence-in-finance/

Mohsin, K. (2021). Cryptocurrency & its impact on environment. *International Journal of Cryptocurrency Research*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3846774

Montevirgen, K. (2022). Altcoins, Coins, and Tokens: What's the Difference? *Britannica Money*. Retrieved from https://www.britannica.com/money/what-are-altcoins-tokens

Musaev, E. (2015). A Review on Internet Banking Security and Privacy. *ICIT*, 366. Retrieved from http://icit.zuj.edu.jo/ICIT15/DOI/E-Technology/0070.pdf

Ojeniyi, J., Edward, E., & Abdulhamid, S. (2019). Security risk analysis in online banking transactions: Using diamond bank as a case study. *International Journal of Education and Management Engineering*, 1-14. Retrieved from https://www.mecs-press.net/ijeme/ijeme-v9-n2/IJEME-V9-N2-1.pdf

Omar, A., Sultan, N., Zaman, K., & Bibi, N. (2011). Customer perception towards online banking services. *journal of Internet Banking and Commerce*, 16(2). Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2035807

Owczarek, D. (2022). AI in Banking. Applications and Benefits of Artificial Intelligence in Financial Services. *nexocode*. Retrieved from https://nexocode.com/blog/posts/ai-in-banking.applications-and-benefits-of-artificial-intelligence-in-financial-services/

Ozili, P. (2022, 7 18). Can central bank digital currency increase financial inclusion? Arguments for and against. 241-249. Retrieved from https://www.emerald.com/insight/content/doi/10.1108/978-1-80262-637-720221013/full/html

Pampori, B. R., Baba, A. M., & Najar, Z. A. (2018). ecurely eradicating cellular dependency for e-banking applications. *International Journal of Advanced Computer Science and Applications*. Retrieved from https://pdfs.semanticscholar.org/7fb5/fa2dd3bdd06afce9c787735d64c1df9aa2fb.pdf

Pham, D. J., Wentz, B., Nguyen, T., & Pham, T. (2021). The decline of branch banking and the transformation of bank accessibility. *Review of Integrative Business and Economics Research*. Retrieved from http://gmp-riber.com/uploads/3/4/9/8/34980536/riber_11-3_01_k21-044_1-19.pdf

Philip, L., & Tony, R. (2021). *Dgital currencies*. Retrieved from Reserve bank of Australia: https://www.rba.gov.au/education/resources/explainers/cryptocurrencies.html#:~:text=Cryptocurrencies%20are%20digital%20tokens.,for%20them%20in%20the%20market.

Pilav, D. (202, 5 19). Retrieved from Digital asset: https://blog.digitalasset.com/developers/what-is-a-central-bank-digital-currency-and-why-should-people-prefer-cbdc-over-bank-accounts

Pilav, D. (2020). What is a Central Bank Digital Currency and why should people prefer CBDC over bank accounts. *Digital Asset*. Retrieved from https://blog.digitalasset.com/developers/what-is-a-central-bank-digital-currency-and-why-should-people-prefer-cbdc-over-bank-accounts

Ponsford, M. (2015). A comparative analysis of bitcoin and other decentralised virtual currencies: legal regulation in the People's Republic of China, Canada, and the United States. *heinonline*, 29. Retrieved from https://heinonline.org/HOL/LandingPage?handle=hein.journals/hkjls9&div=7&id=&page=

Pramanik, H. S., Kirtania, M., & Pani, A. (2019). Essence of digital transformation—Manifestations at large financial institutions from North America. *Future Generation Computer Systems*, 323-343. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0167739X18308951

Radeck, D. (2023, 2 16). *Digital Currency: The Future Of Your Money*. Retrieved from Forbes advisor: https://www.forbes.com/advisor/investing/cryptocurrency/digital-currency/#:~:text=Benefits%20of%20Digital%20Currency&text=Using%20digital%20currency%2C%20you%20can,currency%20transactions%20are%20very%20expensive.

Rahman, I. (2019). Regulating Cryptocurrencies to Combat Terrorism-Financing and Money Laundering. *Centre for Strategic and Contemporary Research*. Retrieved from http://journal.cscr.pk/stratagem/index.php/stratagem

Rahman, M., Prodhan, S., & Sarkar, M. I. (2017). Problems and prospects of electronic banking in Bangladesh. *Researchgate*. Retrieved from https://www.researchgate.net/profile/Md-Nazirul-Islam-Sarker/publication/316347868_Problems_and_Prospects_of_Electronic_Banking_in_Bangladesh_A_Case_Study_on_Dutch-Bangla_Bank_Limited/links/638f2fe411e9f00cda21abec/Problems-and-Prospects-of-Electronic-Ban

Rajan, B., Lecinski, J., & Venkatesan, R. (2019). Understanding the role of artificial intelligence in personalized engagement marketing. *SAGE Jornuals*. Retrieved from https://journals.sagepub.com/doi/abs/10.1177/0008125619859317?journalCode=cmra

Rawwash. (2020). Factors affecting Jordanian electronic banking services. *Management Science Letters*, 915-922. Retrieved from http://growingscience.com/beta/msl/3531-factors-affecting-jordanian-electronic-banking-services.html

Reddy. (2018). A tool and target for cybercrime. Acta Criminologica. *African Journal of Criminology & Victimology*, 71-92. Retrieved from https://journals.co.za/doi/abs/10.10520/EJC-14d902942d

Riikkinen, M., Saarijärvi, H., Sarlin, P., & Lähteenmäki, I. (2018). Using artificial intelligence to create value in insurance. *International Journal of Bank Marketing*. Retrieved from https://www.emerald.com/insight/search?q=Ilkka%20L%C3%A4hteenm%C3%A4ki

Riley, J. (2021). The current status of cryptocurrency regulation in China and its effect around the world. *China and WTO Review*, 135-152. Retrieved from https://pdfs.semanticscholar.org/7aad/0aac65fe072a2bd41ca44b95b1610f4f0ec3.pdf

Rodeck, D., & Adams, M. (2023, 2 16). *Digital Currency: The Future Of Your Money*. Retrieved from Forbes Advisor: https://www.forbes.com/advisor/investing/cryptocurrency/digital-currency/

Rohall, P. (2022). Fraud Detection and Prevention in Banking Explained. *seon*. Retrieved from https://seon.io/resources/banking-fraud-detection-and-prevention/

Rossolillo, N. (2022). Types of Cryptocurrency. *The Motley Fool*. Retrieved from https://www.fool.com/investing/stock-market/market-sectors/financials/cryptocurrency-stocks/types-of-cryptocurrencies/

Sapovadia, V. (2018). Financial inclusion, digital currency, and mobile technology. In Handbook of Blockchain, Digital Finance, and Inclusion. *Academic Press*, 361-385. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/B9780128122822000140

Scheithe, E. (2020). Online and mobile banking tips for beginners. *Consumer financial protection bureau*. Retrieved from https://www.consumerfinance.gov/about-us/blog/online-mobile-banking-tips-beginners/

Schmelzer, R., & Tucci, L. (2023). The top 5 benefits of AI in banking and finance. *techtarget*. Retrieved from https://www.techtarget.com/searchenterpriseai/feature/AI-in-banking-industry-brings-operational-improvements

Şerbu, R. R. (2010). Operational risk and e-banking. *research gate*. Retrieved from https://www.researchgate.net/publication/268175816_Operational_risk_and_e-banking

Shahabi, V., & Razi, F. F. (2019). Modeling the effect of electronic banking expansion on profitability using neural networks and system dynamics approach. 197-210. Retrieved from https://www.emerald.com/insight/content/doi/10.1108/QRFM-11-2018-0117/full/html

Shyam. (2020). What Are The Types Of Internet Banking. *credit mantri*. Retrieved from https://www.creditmantri.com/forum-what-are-the-types-of-internet-banking/

Shyam. (2020). What Are The Types Of Internet Banking. *credit mantri*. Retrieved from https://www.creditmantri.com/forum-what-are-the-types-of-internet-banking/

Shyam. (2020). *What Are The Types Of Internet Banking.* Retrieved from https://www.creditmantri.com/forum-what-are-the-types-of-internet-banking/

Shyam. (2020). What Are The Types Of Internet Banking. *credit mantri*. Retrieved from https://www.creditmantri.com/forum-what-are-the-types-of-internet-banking/

Singh. (2013). An exploratory study on internet banking usage in semi-urban areas in India. *International Journal of Scientific and Research Publications*, 1-5. Retrieved from https://d1wqtxts1xzle7.cloudfront.net/40313794/ijsrp-aug-2013-print.pdf?1448330456=&response-content-

disposition=inline%3B+filename%3DKinetics_of_Lead_and_Bio_concentration_f.pdf&Expires=1
682183724&Signature=PfQ1SWMXtBtOc5GpPiw7JYi94XII-yZK1NI2UZAAHku0ung

Singh, S. (2023). AI in Banking – How Artificial Intelligence is Used in Banks. Retrieved from
https://appinventiv.com/blog/ai-in-
banking/#:~:text=Artificial%20intelligence%20in%20financial%20services%20helps%20banks%2
0to%20process%20large,sentiments%20and%20suggest%20investment%20options.

statista. (2022). *Online banking penetration in selected European markets in 2021.* Retrieved from
https://www.statista.com/statistics/222286/online-banking-penetration-in-leading-european-
countries/

Suhel, S. F., Shukla, V. K., Vyas, S., & Mishra, V. P. (2020). Conversation to automation in banking
through chatbot using artificial machine intelligence language. *IEEE*. Retrieved from
https://ieeexplore.ieee.org/abstract/document/9197825

Tan, M., & Teo, T. (2000). Factors influencing the adoption of Internet banking. *Journal of the
Association for information Systems*. Retrieved from
https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1188&context=jais

Team, C. (2023). Major Risks for Banks. *CFI*. Retrieved from
https://corporatefinanceinstitute.com/resources/risk-management/major-risks-for-banks/

Torralba, L., Rivera, J., & La Torre, I. (2018). The Fintech Revolution. *Arcano economic reserach*.
Retrieved from http://www.ignaciodelatorre.com/wp-
content/uploads/2020/04/20181030_The-Fintech-Revolution.pdf

Tu, K., & Meredith, M. (2015). Rethinking virtual currency regulation in the Bitcoin age. *Heinoline*.
Retrieved from
https://heinonline.org/HOL/LandingPage?handle=hein.journals/washlr90&div=8&id=&page=

Tubb, N. R., Krause, P., & Garn , W. (2018). How Artificial Intelligence and machine learning research
impacts payment card fraud detection: A survey and industry. *science direct*. Retrieved from
https://www.sciencedirect.com/science/article/abs/pii/S0952197618301520

Urquhart, A., MvGowan, D., Neupane, B., & Koirala, S. (2022). *Is fintech disrupting the banking sector?*
Retrieved from Economics Observatory: https://www.economicsobservatory.com/is-fintech-
disrupting-the-banking-
sector#:~:text=The%20fintech%20revolution%20has%20provoked,learning%20to%20protect%2
0against%20fraud.

Vadapalli, P. (2022). Artificial Intelligence in Banking 2023: Examples & Challenges. *upGrad*. Retrieved
from https://www.upgrad.com/blog/artificial-intelligence-in-
banking/#:~:text=Artificial%20intelligence%20(AI)%20technology%20is,correctly%20determine
%20a%20borrower's%20risk.

Varma, K., & Jain, A. (2023). *What Is Digital Rupee? How Is It Different From Cryptocurrency?* Retrieved
from Forbes Advisor: https://www.forbes.com/advisor/in/investing/digital-currency-in-

india/#:~:text=Digital%20currency%20is%20a%20form,manage%20its%20balances%20and%20ledgers.

White, C. (2022). Rising Interest Rates Bring Opportunities and Risks for Banks. *stlouisfed*. Retrieved from https://www.stlouisfed.org/on-the-economy/2022/nov/rising-interest-rates-bring-opportunities-risks-banks

White, D. (2020). Compliance in the Age of Digital Banking: An Overview. *tech funne*. Retrieved from https://www.techfunnel.com/fintech/compliance-in-the-age-of-digital-banking-an-overview/

Yoon, H. S., & Steege, L. B. (2013). Development of a quantitative model of the impact of customers' personality and perceptions on Internet banking use. *Computers in Human Behavior*, 1133-1141. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0747563212002737

Zafar, M. (2023). How artificial intelligence is changing the face of banking. *worldfinance*. Retrieved from https://www.worldfinance.com/banking/how-artificial-intelligence-is-changing-the-face-of-banking

Zaheri, R. (2022). The state of security in digital banking. *securityinfowatch*. Retrieved from https://www.securityinfowatch.com/cybersecurity/information-security/article/21279033/the-state-of-security-in-digital-banking

Žigienė , G., Rybakovas , E., & Alzbutas, R. (2019). *Artificial Intelligence Based Commercial Risk Management Framework for SMEs*. Retrieved from MDPI: https://www.mdpi.com/2071-1050/11/16/4501