MODERN BANKING

Shweta Verma
Manjula Jain

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CHAPTER 1

DIGITAL BANKING TRANSFORMATION

Manjula Jain, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- jainmanjula76@gmail.com

ABSTRACT:
A new age of banking has begun as a result of the quick development of technology, one that is marked by the radical transition of conventional financial services into digital banking. This abstract examines the broad effects of digitization on the banking sector, including modifications to client interactions, administrative procedures, and overall business models. The transition to digital banking signifies a fundamental change in the way that financial institutions interact with their clients. Smartphone use and increased internet accessibility have fueled the growth of mobile banking platforms and applications, enabling users to access and manage their accounts, complete transactions, and even seek financial advice with previously unheard-of simplicity. Real-time interactions are now possible, increasing consumer engagement. The customer experience has also become more convenient and tailored. Through digitization, underlying operational procedures inside banks have been greatly streamlined. Various banking operations, including account administration, loan processing, risk assessment, and fraud detection, are being optimized with the use of automation, artificial intelligence, and data analytics. These technology advancements boost productivity, reduce human error, and quicken the decision-making process.

KEYWORDS:

Banking, Coins, Digital, Electronic wallets, Finance, Transformation.

INTRODUCTION

Since the first coins were produced and affluent individuals understood they needed a secure location to put their money, banking has existed. For commerce, wealth distribution, and taxation, ancient empires also need a sound financial system. As they do now, banks were expected to play a significant part in that.

Banking Is Created

For the early tribes, the barter system of trading things for goods functioned rather effectively. As soon as individuals began moving from town to town in search of new markets for their products and new items to bring home, it became a problem.

In order to create a store of value for commerce, coins of different sizes and metals started to be struck throughout time. But coins need to be stored in a secure location, and old dwellings lacked steel safes. In Rome, wealthy citizens kept their money and jewelry in the cellars of temples. Given the presence of priests, temple employees, armed guards, and other security personnel, they seemed to be safe. It seems from historical accounts from Greece, Rome, Egypt, and Babylon that temples did more than just save money; they also lent it out. One reason temples were often looted during conflicts was that they frequently served as the financial hubs of their towns.

Coins were easier to trade and accumulate than other goods, such as 300-pound pigs, so a class of affluent merchants began lending coins to those in need in return for interest. Large loans, including those made to different sovereigns, were normally handled by temples, with the other loans going to affluent merchant money lenders [1]–[3].

Roman Imperial Banking

The Romans, who were skilled administrators and architects, separated banking from the temples and codified it inside separate structures. Moneylenders continued to make money at this period, much as loan sharks do now, but institutional banks were used for practically all government expenditures and legal business.

The World History Encyclopedia claims that Julius Caesar established the custom of enabling lenders to seize property in lieu of debt repayments. Landed noblemen had historically been untouchable, carrying debts on to their generations until either the creditor's or debtor's bloodline died out. This represented a dramatic change in power in the relationship between creditor and debtor.

The Roman Empire finally fell, but thanks to the assistance of papal bankers and the Knights Templar, parts of its financial institutions survived until the Middle Ages. Small-time lenders in the church's rivalry were often accused of charging usurious interest rates.

European Monarchs Find Quick Cash

The kings that ruled over Europe eventually recognized the need of financial organizations. The royal powers started to accept loans, often on the king's conditions, to cover shortfalls at the royal treasury since banks could only exist by the grace and sometimes the express charters and contracts of the governing monarchy. Due to their easy access to funds, monarchs engaged in extravagant spending, expensive battles, weapons competitions with nearby countries, and crippling debt. Due to multiple useless wars, Philip II of Spain managed to drown his country in debt in 1557, leading to the first national bankruptcy as well as the second, third, and fourth in quick succession. These occurrences took place as a result of the country's debt service accounting for 40% of its gross national product (GNP). Banks are still plagued by the tendency of ignoring the creditworthiness of wealthy clients.

The Origins of Free-Market Banking with Adam Smith

When Adam Smith, a British economist, presented his theory of the invisible hand in 1776, banking was already well-established in the British Empire. Moneylenders and bankers were successful in limiting government participation in the banking industry and the economy as a whole because to his belief in a self-regulating economy. The New World, which was set to see the emergence of the United States of America, provided favorable conditions for free-market capitalism and competitive banking [4]–[6].

The United States didn't have a single currency in its early years. Anybody who would accept it might get a money that banks would issue. The banknotes that a bank had issued lost value if it went out of business. A bank and its clients might be destroyed by a single bank heist. A cyclical cash crisis that might destabilize the system at any point added to these dangers.

The nation's first secretary was Alexander Hamilton. Treasury created a national bank that would accept banknotes from members at par, keeping banks solvent during hard times. This national

bank established a system by which national banks backed their notes by acquiring Treasury assets, so establishing a liquid market, and generated a unified national currency after a few stops, starts, cancellations, and resurrections. The national banks subsequently eliminated the competition by taxing the state banks, which operated mostly outside the law. However, the harm had already been done since the majority of Americans now viewed banks and bankers in a negative light. Due to this sentiment, Texas passed a statute that forbade corporate banks and was in effect until 1904.

DISCUSSION

Merchant banks gain control

Large merchant banks quickly took on the majority of the economic responsibilities that would have been handled by the national banking system, in addition to routine banking activities like loans and corporate financing. The merchant banks used their worldwide ties to leverage tremendous political and financial influence during this time, which lasted until the 1920s. These banks included J.P. Morgan, Goldman Sachs, and Kuhn, Loeb & Co. Michael & Co. With a limited fraction of American bonds trading in Europe, they first depended mainly on fees from foreign bond sales from Europe. This enabled them to accumulate wealth. Large industries began to grow, requiring a significant quantity of corporate funding, which no one bank was able to give. The only ways to obtain the necessary funds were initial public offerings (IPOs) and public bond issues. A bank's reputation was enhanced through successful offers, which allowed it to demand higher underwriting fees. By the late 1800s, a lot of banks sought seats on the boards of the businesses seeking funding; if the management was ineffective, they took over the businesses themselves.

J.P. Morgan Saves the Financial Sector

In the late 1800s, J.P. Morgan & Co. rose to the top of the commercial banks. It had strong political influence in the United States and was closely linked to London, which was the financial hub of the time. U.S. was founded by Morgan & Co. Through the innovative use of trusts and a contempt for the Sherman Antitrust Act, companies like Steel, AT&T, and International Harvester, as well as duopolies and close to monopolies in the railroad and shipping sectors, have been created.

However, it was still difficult for regular Americans to get loans or other financial services. Merchant banks seldom offered loans to the "common" people and didn't promote. Racism was pervasive. The smaller banks, which were still collapsing at an alarming pace, were left to handle consumer lending via merchant banks.

The Bank Panic of 1907, which resulted in a bank run and stock sell-offs, was caused by the share price collapse of a copper trust. J.P. was left to handle the situation as there was no Federal Reserve Bank to intervene to calm the situation. Morgan in person. The same way the Fed would today, Morgan gathered all the big players on Wall Street and convinced them to utilize the credit and money they controlled [7]–[9].

The Fed's founding and the end of an era

Ironically, Morgan's decision made guaranteed no private banker ever again had so much authority. The Federal Reserve Bank (the Fed) was founded by the American government in 1913. Although the merchant banks had a say in how the Fed was organized, their role was diminished as a result of its establishment.

Even after the Fed was established, Wall Street continued to have a disproportionate amount of financial and political influence. By the time World War, I was over, the United States had taken on the role of a major worldwide lender and had displaced London as the financial hub. The government then made the decision to restrain the banking industry. It mandated that before any American institution would provide them more credit, all debtor countries must repay their war debts, which were customarily forgiven, particularly in the case of allies.

This hindered global commerce and made many nations unfriendly to American products. Black Tuesday in 1929 saw a stock market meltdown that completely destroyed the already fragile global economy. Inability of the Fed to control the damage resulted in the collapse of 9,000 banks between 1929 and 1933. To save the banking industry and boost customer trust, new legislation were introduced. Commercial banks were prohibited from speculating with customers' savings after the Glass-Steagall Act was passed in 1933, and the Federal Deposit Insurance Corp. (FDIC) was established to protect accounts up to certain thresholds. Insured limits per account are $250,000 as of 2020.

WWII and the Development of Modern Banking

It's possible that World War II prevented the financial sector from collapsing entirely. The battle necessitated complex financial transactions involving billions of dollars for the banks and the Fed. Due to the big financing operation, which left businesses with enormous credit demands, banks merged to satisfy the demand. Global markets were covered by these enormous institutions. What's more, domestic banking in the US has now reached a level where, thanks to extensive mortgage lending and the introduction of deposit insurance, the common person may have faith in the financial system and decent access to credit. The contemporary age has come to pass.

Banking Moves Online

The introduction of online banking, which goes back to the 1980s in its earliest versions but really started to take off with the arrival of the internet in the mid-1990s, has been the most important advance in the world of banking in the late 20th and early 21st centuries. The tendency was further accelerated by the increasing use of smartphones and mobile banking applications. While many clients still do at least part of their business with physical banks, a 2020 J.D. 41% of them, according to a power poll, now solely use digital media.

What Performs a Central Bank?

A central bank is a financial entity that has been given permission by the government to supervise and control the country's commercial banks and monetary system. It creates and controls the country's currency. For such goal, central banks exist in the majority of the nations of the globe. The Federal Reserve System is the nation's central bank.

Who Controls American Bank Regulation, today?

Commercial banks in the United States are subject to regulation by a variety of government organizations, including the Federal Reserve, the Office of the Comptroller of the Currency (OCC), and the Federal Deposit Insurance Corp. (FDIC), depending on their kind of charter. The state in which they do business also regulates state-chartered banks. The United States heavily regulates investment banks. SEC stands for Securities and Exchange Commission.

What Sets a Commercial Bank Apart from an Investment Bank?

Both the general public and corporations may use the services offered by commercial banks. They run ATMs, accept deposits, and provide loans.

Only major corporations, institutional investors, and some very wealthy people are served by investment banks. These services include aiding businesses in acquiring loans, issuing stocks or bonds, or other forms of capital raising. They could also be deal-makers who help businesses combine and acquire one another.

The inference

Although banks have gone a long way from the temples of antiquity, nothing has changed in terms of their fundamental business operations. Although the details of the business model have changed throughout time, a bank's primary functions are always to issue loans and safeguard depositors' funds. Banks continue carry out these core duties even today, when internet banking and finance are replacing conventional brick-and-mortar establishments.

Brand-New Banking

Without banking, a nation's economy cannot be discussed or even considered. It is often seen as the foundation of a country's economic structure. The contemporary banking system in India is made up of local banks, cooperative banks, commercial banks, small financing banks, payments banks, regional rural banks, and specialized banks like NABARD. Over the last several decades, the financial services offered by new-age banks have greatly improved. Every industry has upgraded itself with numerous technical advancements as a result of technological advancements. Similar developments occurred in India's banking sector with the advent of online and digital banking.

The absence of technology in financial services was one of the key drawbacks in the banking sector in the past. Longer turnaround times and failed/delayed transactions were often the results of this. The use of mobile wallets, online bill payments, digital account transfers, online deposits, and other alternatives have all been made possible by advancements in banking technology. Digital banking practices have sped up and improved the client experience with banking. One of the most frequently used services is banking, and the introduction of technology like artificial intelligence (AI) has significantly changed Indian banking.

What Is New-Age Banking Made Up Of?

We may classify aspects of banking that were almost unthinkable a few decades ago under the umbrella of new-age banking.

Consumer banking

Retail banking, often known as consumer banking, offers products and services including credit and debit cards, loan approvals, account information, and savings accounts. Individual clients' banking experiences are becoming more secure and convenient thanks to retail banking.

Cellular Banking

Today, the majority of consumers use mobile devices, so it makes sense that banking functions like account transfers, deposits, and spending and income tracking are now available via mobile

banking. In addition to all of the standard banking operations, the IDFC FIRST Bank mobile app allows you to see and control anticipated costs as well as initiate a SIP.

It was stated that 4 out of 5 urban Indians now choose mobile banking apps as a result of the COVID-19 outbreak.

Banking online

Online or net banking gives you the option of accessing your bank accounts and banking profile using a web browser, and the concept is conceptually similar to mobile banking. By logging on to your IDFC FIRST Bank internet banking website, you can do a lot of things from the comfort of your home, such create new accounts, apply for loans, send and receive money, save money, and invest.

Only-Digital Banks

Digital-only banks are a novel and clever method used by modern institutions. To encourage the industry's shift to Banking as a Service (BaaS), traditional banks are implementing the digital-only strategy. Additionally, the government has recognized the strategic importance of digital-only banking for financial inclusion.

Current Banking Technologies:

1. **Open Banking**

One of the most important developments in the banking industry has been Open Banking, which uses APIs. It has boosted efficiency and perfect security while enabling companies and consumers to access personalized financial services. The contemporary banking sector usually adopts new technology first and benefits from them. Top banks throughout the globe, notably in India, are consuming the newest technology at a quicker pace than ever before for a variety of reasons, including combating competition and meeting changing customer expectations.

2. **Electronic Wallets**

Digital wallets have advanced to the point where no one can survive without them thanks to modern finance. Today, digital wallets have become a significant part of our lives and have taken over, simplifying our very busy lives. Money transfers, online payments, cellphone recharges, and standard business dealings all involved in a dispute? On your whatever-inch touch screen, it just takes a few swipes to do it perfectly.

3. **NFC (Near Field Communication)**

People used to have to barter their belongings for the things they needed. Following that, we transitioned to currency money, which was simpler to handle and administer once banks were invented. Of course, we had our glossy plastic credit and debit cards, which were a piece of butter in our life. A new wave of innovation is presently sweeping across the contemporary financial industry. Banking will become more cutting-edge thanks to NFC (Near Field Communication). Consider entering a convenience shop and quickly paying for products using your phone on the counter. As an alternative, you may pay using your watch or bracelet. Future versions of the wallet, loyalty card, pocketbook, credit card, and debit card are all digital.

4. Opening A Digital Account

Digital account opening has become a crucial aspect of banking in the current day. The majority of Private Banks have started this digital account opening system so that one can easily open a bank account while sipping their cup of tea! Customers today do not want to go to the bank to open a bank account or to withdraw money from the money machines; they want things to be on their thumb!

5. Biometric Technology

Customers expect the utmost degree of security and safety when giving banks their personal information. By balancing security, speed, and convenience, biometric technologies enable financial institutions to provide a seamless client experience. Intangible human characteristics like fingerprints, iris scans, and voice may be utilized as biometrics to verify a customer's identity. PINs and passwords cannot be lost or forgotten, and biometric identifiers are far more difficult to steal.

CONCLUSION

Traditional business models have to be rethought in light of the digital banking change. The financial services industry is being disrupted by fintech startups and digital behemoths, which is leading to more competition. In response, several well-established banks are embracing alliances and partnerships with fintech firms to take advantage of their creativity and technical capabilities. The advantages of digital banking are not without drawbacks. However, cybersecurity data privacy, and digital inclusion issues need to be given serious consideration. In an increasingly linked and fragile digital world, it is crucial to safeguard sensitive consumer data and ensure the security of online transactions. To guarantee that the advantages of digital banking are available to all facets of society, it is also crucial to bridge the digital gap. In conclusion, the shift to digital banking is redefining the financial environment and changing how banks do business, communicate with consumers, and operate. This shift, while providing previously unheard-of ease and effectiveness, calls for careful action to address security and inclusiveness issues. The environment of digital banking is primed for additional innovation and adaptation as technology advances, creating both possibilities and difficulties for the sector.

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CHAPTER 2

A BRIEF STUDY ON ONLINE BANKING SERVICES

Manoj Agarwal, Associate Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- agarwalmanoj21@gmail.com

ABSTRACT:
Online banking services have emerged as a result of the rapid expansion of internet access and digital technologies in the banking sector. This abstract explores the development, advantages, and difficulties of internet banking, showing how it has changed how people and organizations handle their funds. Online banking services have developed from being only brick-and-mortar banks' extensions to full-featured platforms that provide a variety of financial services. From the convenience of their digital devices, customers can now access their accounts, examine transaction history, transfer cash, pay bills, and even apply for loans. With 24/7 access to financial services without being constrained by physical branch locations, this transformation has redefined convenience. Online banking offers a variety of advantages. Customers no longer need to stick to regular banking hours because of improved accessibility, which enables them to handle their accounts whenever it suits them. This is especially important for those with hectic schedules or those who live in distant places. Furthermore, as it eliminates the need for physical infrastructure and related overhead, internet banking promotes cost efficiency for both users and banks.

KEYWORDS:

ATM, Credit card, Cheque, Debit card, Electronic Banking, PIN.

INTRODUCTION

Electronic banking, commonly referred to as electronic funds transfer (EFT), is simply using electronic methods, as opposed to a check or cash, to move money directly from one account to another. Electronic money transmission may be used for:

1. Request that your paycheck be transferred directly into your checking account at your bank or credit union.
2. Use a personal identification number (PIN) and an ATM to withdraw cash from your checking account whenever it's convenient, day or night.
3. Tell your bank or credit union to deduct certain monthly payments, such as your vehicle loan or mortgage, automatically from your account.
4. Request a monthly transfer of money from your checking account to your mutual fund account from your bank or credit union.
5. Request a direct deposit of your tax return or social security benefits into your bank account.
6. Use a check card at the point-of-sale to pay for groceries, petrol, and other items rather than cash, a credit card, or a personal check.
7. Use a smart card with a pre-loaded amount of money instead of cash at pay phones, toll booths on expressways, bookshops on college campuses, and copier machines in libraries.

8. Organize your whole personal financial management process using your computer and personal finance software, integrating information and tasks related to your income, spending, saving, investing, record-keeping, bill-paying, and taxes, as well as doing basic financial analysis and making decisions [1]–[3].

MANY TYPES OF E-BANKING:

1. **Banking Online:**

You may manage a variety of banking transactions using internet banking on your computer. You might, for instance, use your computer to examine your account balance, request account transfers, and make electronic bill payments. Customer service requests may be handled automatically without the involvement of customer service people using the Internet banking system and technique, which connects a personal computer through a network service provider directly to a bank's host computer system. The system is able to differentiate between customer service requests that can be handled automatically and those that need to be handled by a customer care agent. The technology is interconnected with the bank's host computer system, enabling remote banking customers to use the bank's other automated services. The steps in the method according to the invention are: entering a customer banking request from a menu of banking requests at a remote personnel computer; transmitting the banking requests to a host computer over a network; receiving the request at the host computer; identifying the type of customer banking request received; automatically logging the service request; and comparing the received request to a stored table of request types, each of the request types having an identifier (a).

2. **ATMs, or automated teller machines:**

A client of a bank activates an unattended electronic device in a public setting that is linked to a data system and associated hardware to acquire cash withdrawals and other banking services. Sometimes known as a cashier or an ATM; sometimes known as a money machine. In order to access their bank accounts, order or make cash withdrawals (or cash advances using a credit card), and check their account balances, customers of a financial institution can use an automated teller machine, also known as an automatic teller machine (ATM), which eliminates the need for a human bank teller (or cashier in the UK). In addition to accepting cash and checks, many ATMs now enable users to transfer funds between bank accounts, fill up their mobile phones' pre-paid balances, and even purchase postal stamps. The consumer inserts a plastic card with a magnetic stripe or a plastic smartcard with a chip, which carries their account number, to identify themselves at the majority of current ATMs. The consumer next enters a passcode, often known as a PIN (Personal Identification Number) with four or more numbers, to confirm their identity. A transaction may be completed by the consumer after successfully entering the PIN. Some ATMs may try to detain the card if the number is input incorrectly numerous times in a row (often three times per card insertion). This is done as a security measure to stop an unauthorized user from guessing the PIN. If the bank that issued the card is not the ATM owner, captured cards are often destroyed since it is impossible to establish the identity of non-customers. There are now around 17,000 ATMs in the Indian market.

3. **Call Center:**

With the advent of online telebanking services, it is now possible to conduct a wide range of banking-related activities, including financial transactions, from the comfort of the customer's

selected location anywhere across the GLOBE at any time of day or night. The client may access his account by contacting the provided Telebanking number from any location using a landline or a mobile phone, and by following the user-friendly menu, the complete banking process can be done using the Interactive Voice Response (IVR) system. When enough hunting lines are made available, consumer calls are unlikely to be dropped. The system is bilingual and provides the following services:

1. The default account's automatic balance speaks out.
2. All balance and transaction inquiries
3. Examining every term deposit account
4. Account statement sent through fax, email, or regular mail.
5. Request for a check book
6. Online and quick stop payments
7. Instantaneous and automated financial transfers via CBS
8. Paying utility bills
9. Instantaneous and automated term deposit renewal
10. One voice in the last five transactions

4. CARD SMART:

An integrated 8-bit microprocessor (a kind of computer chip) is often seen in smart cards. On one side of the card, the microprocessor is hidden behind a touch pad. Consider the microprocessor as taking the place of the traditional magnetic stripe seen on credit cards and debit cards. Security is the purpose of the smart card's microprocessor. In fact, the microprocessor and host computer "talk" to one other.

Access to the data on the card is restricted by the microprocessor. These cards' chips provide a wide range of transactional capabilities. A user might, for instance, make purchases using their credit card, debit card, or reloadable saved account value. The smart card's increased memory and processing power are several times more than those of conventional magnetic-stripe cards and may support many applications on a single card. Since it can store identity data, there will be no need to shuffle through many cards in the wallet in search of the proper one. Only the Smart Card will be required. Smart cards may also be used to authenticate users on a personal computer with a smart card reader adapter. In comparison to the United States, smart cards are far more common in Europe. Smart cards are widely used in the banking and health insurance sectors in Europe. A smart card for health insurance is available to every German citizen. Although smart cards have been in their current form for at least ten years, they have just recently begun to gain popularity in the United States [4]–[6].

5. Bitcoin Card:

Check cards are another name for debit cards. Debit cards resemble credit cards or ATM cards in appearance, but they function like cash or personal checks. Credit cards vary from debit cards in many ways. When you use a debit card, money is instantly taken out of your checking or savings account; in contrast to using a credit card, which allows you to "pay later," debit cards allow you to "pay now." Many establishments, including grocery shops, retail stores, petrol stations, and restaurants, accept debit cards. Anywhere that retailers show your card's name or emblem, you may utilize it. They provide an alternative to carrying cash or a checkbook.

6. E-CHEQUE:

1. An electronic check, or e-cheque, is a substitute for a paper check.
2. The information and legal framework for an electronic check is identical to that for a paper check.
3. It may now be used for any kind of remote transaction in lieu of paper checks.
4. An e-check functions in the same manner as a traditional cheque; the cheque writer "writes" the e-check using one of several different electronic devices, then electronically "gives" it to the payee. When the payee "deposits" an electronic check, they are given credit, and their bank then "clears" the check to the paying bank. Following the e-Cheque's validation, the paying bank "charges" the check writer's account.

Other electronic banking methods:

1. Direct Debit
2. Payment of bills online
3. Conversion to Electronic Checks
4. Stored Cash Value, etc.

DISCUSSION

PERKS OF ELECTROBANKING

To Banks:

Price: In the long term, a bank may save money by avoiding paying teller salaries or branch management costs. Additionally, using the internet for transactions is less expensive. Customer

Base: Because the Internet has no physical bounds, it enables banks to access a whole new market, one that is wealthy as well. For small banks looking to expand their client base, the Internet also offers a fair playing field.

Efficiency: By giving their clients access to the Internet, banks may increase the efficiency of what they currently do. The bank has access to a virtually paperless system thanks to the Internet.

Customer satisfaction and service: Customers who do their banking online have access to a complete range of services as well as others that are not accessible at any of the branches. It is not necessary for the individual to visit a branch where such service may or may not be provided. Instead of standing in line and asking a teller, a person may quickly look for information on the Internet, print information, forms, and applications, and conduct efficient information searches. A bank will unquestionably be able to improve consumer connections and contentment with more superior and speedier solutions. If a bank offers Internet connection, it projects a more modern image to customers. Even if someone doesn't wish to utilize Internet banking, the service's availability makes them feel as if their bank is on the leading edge [7]–[9].

To Customers:

Bill Pay: Bill Pay is an Internet banking service that enables customers to schedule bill payments to almost anybody. Bill Pay lets the customer choose the person or business to which he wants to send a payment, and then it will take the money out of his account and send the recipient a paper check or an electronic payment. Other crucial features: E-banking gives the customer complete control over managing his bank accounts. Customers may also avoid visiting to a physical bank by buying and selling securities online, checking stock market information, currency rates,

balances, and seeing which checks have cleared. The fact that Internet banking is free is the finest perk. Many banks don't force their customers to have a certain minimum balance. Better loan rates for the consumer are the second significant perk.

E-Banking Questions

As with any new technology, there are issues to be solved. Banks will need to establish a brand-new customer relations department to assist clients with customer service. When clients need support, banks must make sure they get it swiftly. Any significant issues or terrible events might easily and swiftly ruin the bank's image. You may increase the customer's faith in online banking by demonstrating to them the dependability of the Internet.

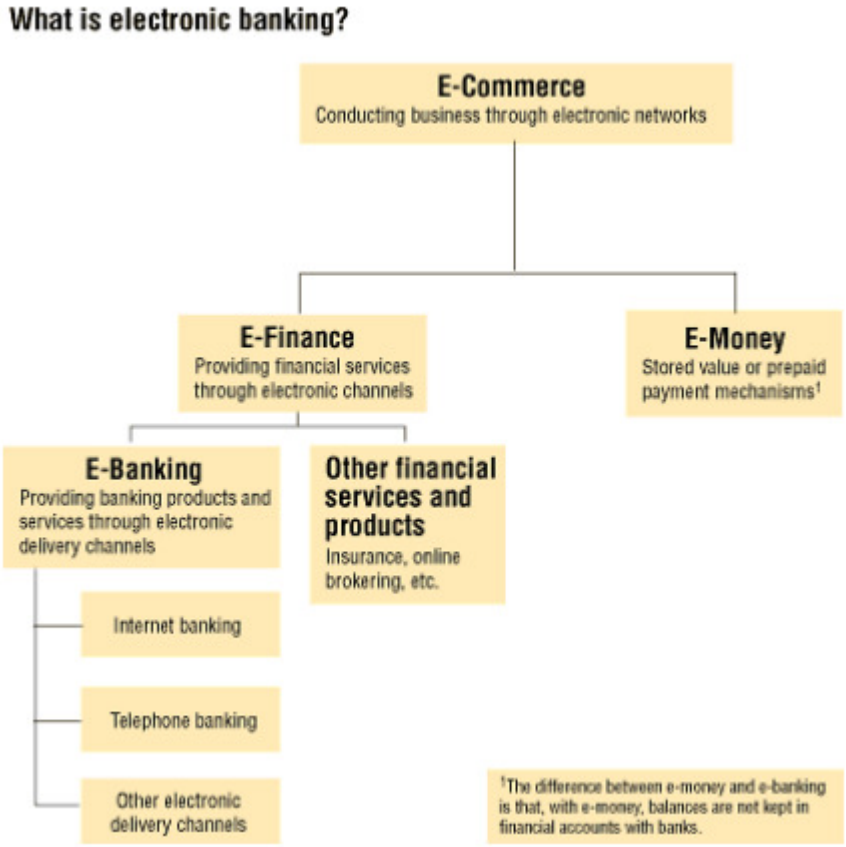

Figure 1: Electronic Banking [weebly.com].

1. **Laws:** Unlike traditional banking, which has state and national borders, online banking does not. Companies must ensure that they have a monopoly in the software industry by putting it in place.
2. **Security:** Customers are always concerned about their safety, security, or accuracy. Whether or whether anything happened is a subject of constant debate.

Other difficulties include: inadequate client understanding, bank location changes, etc. Figure-1: Electronic Banking [weebly.com]

A Global Perspective On E-Banking

The introduction of the Internet sparked an electronic revolution in the global banking industry. Utilizing a range of banking operations has been made possible because to the dynamic and adaptable character of this communication channel as well as its ubiquity. Innovative e-business models have led to the emergence of new financial intermediaries that provide whole new sorts of banking services. For banks in the US and in Europe, the Internet has become one of the key distribution platforms for banking goods and services. Initially, banks used the Internet to advertise their key competencies, such as their goods, services, and advice. They then began operating as suppliers and distributors of their own goods and services in the online market. Banks have lately learned that they may fulfill their fundamental function as financial intermediaries and facilitators of entire commercial transactions over electronic networks, particularly via the Internet, thanks to developments in Internet security and the emergence of relevant protocols.

Some banks have elected to have a direct online presence, while others have opted to either operate an electronic marketplace that focuses on financial services or to participate in an electronic marketplace that does not. Consumer demand and the increasingly competitive climate in the global banking business are both contributing factors in the trend towards electronic delivery of banking goods and services. Due to the Internet, consumers are now more price-sensitive and seek more specialized goods and services. Additionally, even well-established brick and mortar banks are seeing pressure on profitability from increased competition from pure internet banks. However, only a small number of banks have been successful in creating strategies that fully take use of the potential provided by the Internet. A clear and simple Internet commerce strategy is required for conventional banks to determine which niche markets to target and what goods and services to provide. As early as 1995, banking transactions were already being conducted online. By fostering client relationships, encouraging price discovery and expenditure aggregation, and expanding the reach, the Internet was positioned as the perfect platform for commercial exchange, assisting banks in achieving new levels of efficiency in financial operations. Banks had a lot of chances thanks to electronic finance to increase their customer base and streamline operations, while clients benefited from time and money savings.

The following four parts discuss the global e-banking sector:

1. **E-banking Scenario:** With an emphasis on India, the US, and Europe, it covers the current condition, future potential, and problems associated with e-banking in Asia. It also discusses how the structure of the banking business is affected by e-banking.
2. **E-banking Strategies:** It outlines the crucial tactics that banks must use to get the most out of the internet channel. It also provides direction for banks looking to launch internet companies.
3. **E-banking Transactions:** This section talks about how the internet has fundamentally changed banking transactions. The section focuses on electronic bill payment and presentment, B2B transactions, cross-border transactions, and mobile payments. Despite all the excitement, e-banking has failed to take off in a number of nations.
4. **E-banking Trends:** It discusses how banks are introducing new technology.

Scenario for E-Banking:

It is anticipated that the banking sector would dominate E-business. Banks in underdeveloped nations utilize the Internet as a medium for information transmission to strengthen their

relationships with consumers, while banks in rich nations do the majority of their business online as non-branch banks. About 60% of UK e-business was concentrated in the financial services industry in the beginning of 2001, and this percentage will rise further as the market for British e-business is predicted to grow by a factor of 10 by the year 2005. Online banking is used by around one-fifth of bank clients in Finland and Sweden, and it is increasing at a 60 percent annual pace in the United States, according to UNCTAD. By 2006, there were about 15 million online accounts. Banks have built online presences for a variety of reasons. The majority of them are now distributing their products on the internet. With the use of the Internet, financial services might be provided to more prospective clients in an equal quantity at a cheaper price. Any time of day or night, contacts might come from anywhere in the globe. As a result, banks are able to grow their market without adding additional locations. The US banks are using the web to take advantage of possibilities in three main areas, namely the marketing of information, the provision of banking goods and services, and the enhancement of client relationships.

The division of the banking sector in Europe into three distinct businesses—production, distribution, and advice is being accelerated by the Internet. The Internet is further propelling this recon Figure ration as a result of the combined effects of:

1. The development of fresh, more targeted business concepts
2. New technical advancements that lower transaction costs and the banking relationship.
3. There is a lot of uncertainty about how new competitors will affect existing business models.

Even while e-banking is still in its infancy in Europe, it is abundantly obvious that it is significantly altering conventional banking operations. Large banks in Europe, unlike those in the US, have a competitive advantage because they can spend extensively in new technology, but they have not yet fully embraced electronic banking. Therefore, if small and medium-sized banks and new businesses can act decisively and promptly, they may play a significant role in the development of e-banking.

E-Banking Techniques

Even while e-banking has a wide range of potential, fewer than one third of banks have a plan in place for it. A survey found that fewer than 15% of banks having transactional websites would see revenues that can be directly linked to such websites. Banks must thus acknowledge the gravity of the task at hand and devise a plan that will allow them to take advantage of the possibilities provided by the Internet. There is no one E-banking approach that works for all banking organizations. But regardless of whether they take an aggressive or defensive stance, they must continuously reassess their plan of attack. Banks must keep up with the rapidly changing business models and technological advancements in the Internet sector to remain competitive in the fast-paced economy. Early adopters of e-business, like Wells Fargo, not only pioneered the E-banking sector but also shown adaptability as the market evolved. Few banks have been as adept at doing business online.

However, there is growing pressure on all banks to create good e-business strategies that will draw in and keep more picky consumers. The key issue with the banks is that they continue to lose money on their online endeavors despite having previously made significant investments. Banks are not attracting a lot of new clients, despite enrolling some of their current customers in their online programs. Banks now question the usefulness of the internet channel in light of this. Just

signing up clients for internet banking may not be enough until and unless they actually utilize the platform. In order to properly coordinate the online channel with branches and contact centers, banks must work to enhance client utilization of their websites. The workers at the branch, the contact center, and the relationship manager should all be able to market banking services through an active internet channel. Compared to a collection of channels operating independently, integrated channels are much more efficient. Banks must determine the routes that customers in different customer categories are likely to travel among the channels in order to ease this integration. Then, these pathways may be used to get around the interactions in each channel. For instance, a call center agent must determine which channels the client used before to contacting her and which channels the consumer is most likely to utilize going forward. Customers must be welcomed at entrance and departure points on each channel before being sent to other channels. The importance of branch banking has been somewhat diminished as a result of the clients' rapidly changing lives and their need for more speed and convenience. Disintermediation of old channels is happening as a result of the spread of new technologies. Banks have the ability to go beyond their conventional function as a conduit for banking and financial services and turn into suppliers of individualized information. They may effectively use mbanking to:

1. Offer customized goods and services to certain clients to foster greater client loyalty.
2. Take advantage of extra income opportunities from purchases, subscriptions, and third-party referrals.

M-Banking offers banks the chance to considerably increase the number of customers they have, provided they take the right positioning. They need to build organized relationships with service affiliates and gain an edge in data collection, processing, and deployment if they are to take advantage of these prospects.

Transactions in E-Banking:

Banking transactions have undergone a significant transformation as a result of new technology. Customers used to need to physically visit the bank branch in order to do financial activities like transfers, deposits, and withdrawals. To physically complete all of such transactions, banks have to hire many tellers. Then, automatic teller machines (ATMs) were created, enabling consumers to do their banking independently, essentially whenever and wherever they pleased. This enabled the banks to reduce the number of tellers and concentrate on money management. The availability of another platform for users to conduct banking activities through the Internet reduced the demand for ATMs. Customers may conduct financial transactions using online banking from the comfort of their homes on personal computers.

Banks may now leverage the infrastructure and apps created for the Internet and shift them to mobile phones thanks to the development of Wireless Application Protocol (WAP) technology. People are no longer restricted to using a desktop PC for banking purposes. Customers may see account data, transaction details, pay bills, and even check credit card balances via the WAP interface, which is quicker and more practical than the Internet. The typical online payment transaction is quite inexpensive. According to several studies, a mobile phone transaction costs an estimated 16 cents, a fully automated bank using its own software costs 26 cents, a telephone bank costs 54 cents, a bank branch costs $1.27, an ATM costs 27 cents, and a transaction via the internet only costs 13 cents. As a consequence, in 1995, the usage of the Internet for business transactions began to pick up speed. With the expansion of online lending options, more than 2,000 banks

throughout the globe now have transactional websites. Banks are now being encouraged by recent changes to target small companies as a distinct loan category online [10], [11].

Trend in E-Banking:

Internet banking is developing. Banks are increasingly running websites where clients may do a variety of activities in addition to making inquiries about account balances, interest rates, and currency rates. Unfortunately, statistics on Internet banking are hard to come by, and definitional variations make cross-national comparisons challenging. Despite this, one discovers that Internet banking is especially pervasive in Austria, Korea, the Scandinavian nations, Singapore, Spain, and Switzerland, where more than 75% of all banks provide such services (see chart). The majority of Internet users are in Scandinavian nations, where E-banking is used by up to one-third of bank clients in Finland and Sweden.

CONCLUSION

The importance of the client experience is becoming more and more crucial as online banking services continue to develop. Customer trust and loyalty must be retained via the use of user-friendly interfaces, quick customer assistance, and tailored financial information. Furthermore, incorporating cutting-edge innovations like artificial intelligence and machine learning has the ability to improve financial suggestions, fraud detection, and predictive analytics. Finally, the accessibility and ease of internet banking services have completely changed how people and companies interact with their money. The continuing integration of technology and user-centric design promises a dynamic and continuously developing online banking market, notwithstanding the persistence of security and inclusion problems.

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CHAPTER 3

A BRIEF STUDY ON MOBILE BANKING APPS

Nazia Hasan, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- nazia_14m@yahoo.co.in

ABSTRACT:

Mobile banking applications are a revolutionary tool that have emerged as a result of the growth of mobile technology in the financial industry. The present study examines the development, capabilities, and effects of mobile banking applications on contemporary banking practices, emphasizing how they provide customers unmatched ease and control over their money. From simple balance-checking tools to sophisticated platforms that let users carry out a variety of financial chores, mobile banking applications have changed over time. Customers may use these applications to manage investments, pay bills, deposit checks, check account balances, and examine transaction history all from the convenience of their hands. Users are now free from the restrictions of in-person branch visits and conventional banking hours thanks to this progression, which has completely changed the banking experience.

KEYWORDS:

Apps, Banking, Fund Transfers, M-banking, Mobile, SMS-banking.

INTRODUCTION

M-commerce is a rapidly developing idea in e-commerce that offers a variety of eservices on mobile devices. As the number of people using smartphones and wireless internet continues to rise, m-commerce is becoming an increasingly popular technology worldwide. People may access a variety of m-services via m-commerce, including m-agriculture, m-education, m-finance, and m-shopping. Banks have recently introduced mobile websites and banking applications to provide their services via mobile devices. Mobile banking refers to using mobile devices to conduct banking operations, make payments, etc. It is also referred to as M-banking and SMS-banking. According to the Global Mobile Banking Report, m-banking is the most popular banking channel in terms of transaction volume and is quickly gaining new customers. The adoption rates are greatest in emerging nations, reaching roughly 60–70% in India and China, which was the most intriguing discovery. M-banking's growing popularity is mostly due to the convenience it offers for carrying out banking tasks whenever and whenever. M-banking provides clients with countrywide clearing and settlement of transactions as well as real-time cash transfers into any bank account, all while being carried out by users using mobile banking services from any providers [1]–[3].

Because of the ease of using a mobile device, users may access financial services whenever and wherever they need to. It not only saves customer’s time, but it also lowers costs for banks. There are several advantages to using mobile banking applications. These applications provide consumers access to real-time financial analytics in addition to the convenience of 24/7 access to financial services. Users are able to make knowledgeable choices and have more control over their finances with the use of budgeting tools, cost monitoring, and notifications for account activity.

These applications' user-friendliness and clear interfaces also promote better financial knowledge and participation.

The fusion of finance and technology in the current digital age has changed conventional banking procedures. The development of mobile banking applications, which have completely changed how people and companies engage with financial institutions, is one of the most amazing results of this convergence. This research seeks to provide a thorough overview of mobile banking applications, including their development, features, advantages, difficulties, and potential.

Mobile Banking App Evolution: From Concept to Reality

With the growth of mobile phones and the internet in the late 20th century, the idea of mobile banking applications started to take form. Banks began looking for methods to expand their services on online platforms in the early 2000s. The introduction of basic mobile banking features like SMS-based balance enquiries and notifications signaled the first steps towards the creation of feature-rich mobile banking applications.

Financial institutions recognized the opportunity to develop more user-friendly and feature-rich apps as mobile devices advanced, providing touchscreens and more processing power. Users may examine recent transactions and check account balances on the initial generation of mobile banking applications. However, security issues and limitations in mobile technology originally prevented the widespread use of these applications.

Functionality and Features of Contemporary Mobile Banking Apps

Mobile banking applications have developed into strong tools that provide a variety of features and capabilities as a result of technical improvements and rising customer demand throughout time. Users of today's mobile banking applications may carry out a variety of functions, such as:

1. **Account Management:** Users get access to real-time views of their account balances, transaction histories, and pending transactions, providing them with the most recent financial data.
2. **Fund Transfers:** Mobile banking applications make it simple to move money between accounts, including payments and transfers from one person to another (P2P).
3. **Paying bills:** Users may pay bills immediately via the app, avoiding laborious transactions and cutting down on the chance of late payments.
4. **Check Deposits:** By using the phone's camera to take pictures of actual checks, several applications make it simple to deposit them.
5. **Budgeting and cost monitoring:** To assist users in properly managing their money, several applications include budgeting tools, expenditure categorization, and cost monitoring capabilities.
6. **Investment Management:** A few applications let users check stock prices, manage their money, and get the latest financial news.
7. **Security Measures:** To secure sensitive financial data, mobile banking applications contain a number of security measures, such as biometric authentication (fingerprint or face recognition) and multi-factor authentication.

Usage of mobile banking apps

The use of mobile banking applications has revolutionized how people and companies engage with their financial institutions and has become a crucial component of contemporary banking operations. These applications provide unmatched ease, accessibility, and control over financial transactions and administration via a broad variety of capabilities that cater to varied financial demands. Some of the most common uses for mobile banking applications are as follows:

1. **Account Monitoring:** Users of mobile banking applications may instantly examine previous transactions and check their account balances. Users may keep track of their spending habits and get up-to-date information about their financial situation thanks to this function.
2. **Fund Transfers:** With the use of mobile banking applications, users may send money to others or transfer money between their accounts with ease. Making payments to friends and family, dividing bills, and giving presents all benefit greatly from this feature.
3. **Bill Payments:** Users of mobile banking applications may pay their invoices straight from their accounts. Utility bills, credit card bills, loan payments, and other costs may all be set up as regular payments by users, assuring prompt payments without the need for human involvement.
4. **Remote Check Deposits:** By utilizing the smartphone's camera to take images of actual checks, several mobile banking applications make it simple to deposit paper checks. By doing this, there is no longer a requirement to deposit checks at an actual bank location or ATM.
5. **Contactless payments and mobile wallets:** Some applications interface with mobile wallets, enabling users to safely store credit and debit card data on their smartphones. By making contactless payments possible in shops and online, this improves convenience and eliminates the need for carrying physical cards. Budgeting and spending monitoring functions are often included in mobile banking applications. Users may classify their spending, establish budgets for various categories, and get notifications when their allotted spending amounts are about to be reached.
6. **Investment Management:** A few applications include tools for managing investments, letting users keep tabs on their stock portfolios, stock prices, and market trends while also keeping track of their investments.
7. **Loan Applications:** Through mobile banking apps, users may apply for loans or credit lines, shortening the application process and enabling speedier access to financial aid.
8. **Customer service and support:** Mobile banking applications often provide customer service capabilities that let users communicate with customer care agents, solve problems, and request help without having to make a phone call or go to a physical location. Security features include biometric identification (facial recognition or fingerprint scanning), PINs, and multi-factor authentication in mobile banking applications. These precautions guarantee the security of private financial data.
9. **Account management:** Through mobile banking applications, users may modify their account settings, reset their passwords, and update their personal information.
10. **Financial Insights:** Based on their transaction history and financial activity, some applications provide users tailored financial insights, such as spending patterns, saving possibilities, and investment advice.

11. **Transaction History:** Users of mobile banking applications may access their transaction history, which makes it simpler to monitor and classify spending for financial planning.
12. **Travel Alerts:** Through the app, users may establish travel alerts to notify their banks of forthcoming journeys, which lowers the possibility that transactions will be marked as suspicious when they take place in other places.
13. **E-statements and Document Storage:** A lot of applications provide you the ability to view financial documents like tax returns and e-statements. Even more secure document storage is offered by certain programs, enabling users to save vital financial information online.

In essence, a broad variety of financial operations, from simple account monitoring to trickier jobs like cash transfers, bill payments, and investment management, are covered by the use of mobile banking applications. These applications' accessibility, ease, and security have revolutionized the way individuals handle their money, making banking and money management processes faster and easier than before [4]–[6].

DISCUSSION

Perks of mobile banking applications

Numerous advantages have resulted from the growth of mobile banking applications for both customers and financial institutions:

1. **Convenience:** Mobile banking applications provide consumers with unmatched convenience by allowing them to access their accounts and conduct transactions at any time, from anywhere.
2. **Time Savings:** Traditional banking activities that previously needed a trip to a physical branch may now be finished with a few clicks on a mobile device.
3. **Financial Literacy:** By giving users insights into their spending patterns, apps that provide budgeting tools and cost monitoring assist users in improving their financial literacy.
4. **Enhanced Customer involvement:** Real-time interactions between customers and their financial institutions are made possible through mobile applications, encouraging a higher degree of involvement.

Financial organizations may save money since mobile banking applications eliminate the requirement for physical infrastructure.

Problems and worries

While there are many benefits to mobile banking applications, there are also issues and obstacles that need to be addressed:

1. **Security:** Because mobile banking applications handle private financial data, their security is crucial. For protection against online dangers and data breaches, banks must consistently make significant security investments. The digital divide makes it possible for certain groups of people to be excluded from the advantages of mobile banking since not everyone has access to smartphones or dependable internet connection.
2. **Usability:** For broad acceptance, mobile banking applications must be simple to use and available to people with various levels of technology experience.

3. **Regulatory Compliance:** To make sure that mobile banking applications adhere to relevant rules and regulations, financial institutions must negotiate complicated regulatory environments.

Upcoming opportunities and innovations

Looking forward, there are a ton of opportunities for mobile banking applications in the future. The use of cutting-edge technology like machine learning and artificial intelligence has the potential to significantly improve user experiences. Predictive analytics, proactive fraud detection, and personalized financial insights are just a few of the advancements that may completely alter the functionality of these applications [7]–[9]. Additionally, the development of mobile banking applications will be influenced by the continuing advancement of mobile devices. App developers will have the chance to provide even smoother and integrated banking experiences as devices grow more sophisticated and networked.

Characteristics of an application that transforms an industry

Applications that can revolutionize an industry are those that can improve user experience, handle frictionless transactions, and meet strict security requirements. These distinguishing characteristics will also serve as our standards for assessing the mobile app examples in the future.

UX/UI for customer experience

First and foremost, a top banking application in its field has to have an easy-to-use user interface. A well-designed application may greatly improve user experience and increase the probability that a user will become a devoted patron. Poor aesthetics are the main reason why 52% of current users won't return to a website, according to industry Figures. Non-monetary characteristics and frictionless transactions. A positive user experience has elements such as frictionless transactions and non-monetary services.

Successfully integrating app features like one-click payments, rapid transfers, and the ability to inform users of recent transactions are examples of great UX/UI. By doing this, it is made sure that clients are constantly aware of their financial activities while they do transactions. Services like identity verification, biometric scanning, facial recognition, secure document signing, and virtual ledgers provide frictionless transactions.

Services that Generate Revenue

An industry-defining mobile application should enable users to access a variety of services that have nothing to do with conventional banking, in addition to the cashless payments that these apps enable, such as but not limited to coupons, discounts, vehicle rentals, loan services, etc.

These value-added services may increase an institution's income while enhancing the user's interaction and overall satisfaction with the application. These incentives might take the form of cash refunds, reward programs, or loyalty points. Gamifying incentive programs increases engagement and loyalty.

According to research, gamified solutions increase user loyalty and engagement by up to 90%. Cashback. Examples of gamified services that provide win-win outcomes for the client and the consumer are cashback incentives for filling up with a partner or product prizes for successful app referrals.

AI for individualized insights

In the future, industry-defining banking applications will collect user statistics and customise insights using AI and algorithms. One of the finest business cases for using machine learning to enhance the user experience is the mobile environment. The unique habits and behaviors of users may be utilized to train AI and machine learning models. Machine learning-enabled applications are able to anticipate and evaluate user behavior and provide suggestions for similar user behavior. These robust models have the ability to identify developing patterns before they become obvious. Customers' habits and behaviors are a rich source of data for businesses, and the insights gained from them may greatly aid in product development. Customers experience is simplified as a consequence of firms understanding their needs.

High requirements for security

The manner that financial services are provided and accessed has been completely transformed by mobile applications, which has changed the banking sector. The focus on strong security standards to safeguard sensitive financial information and provide a secure user experience is one important part of this transition. Here are some examples of how financial services are evolving thanks to mobile applications, all while keeping strong security standards:

Modern techniques for biometric identification

Modern biometric authentication techniques, such as fingerprint, face, voice, and iris scanning, are being incorporated into mobile banking applications. These biometric features increase security by leveraging the user's particular physiological or behavioral traits to confirm their identification. In comparison to conventional password-based authentication, biometrics provide a more secure and practical substitute, lowering the danger of illegal access to the app or account.

Phone user profile

The user's phone may be profiled by mobile applications to produce a distinctive device fingerprint. This entails compiling data about the hardware, software, and settings of the device. The software can recognize any changes or irregularities in the device by analyzing this data, which enables it to spot and stop unauthorized access attempts. By guaranteeing that the app is used from the same registered device, profiling the user's phone improves security.

MFA, or multiple-factor authentication

Multi-factor authentication is a security measure often used in mobile banking applications that prevents unauthorized access to accounts. MFA often combines the user's characteristic (biometric data) with something they have, like a registered device, something they know, like a password, and something they know. This multi-layered strategy makes it far more difficult for unauthorized users to access the app or carry out fraudulent activities.

App-based transaction confirmation

Users must approve or authorize transactions immediately via mobile banking applications, which provide real-time transaction alerts. By taking this additional step, you can be confident that the account holder is fully aware of all account activity and is able to spot and report any fraudulent transactions right away.

The reciprocal exchange

The potential of mobile banking applications to provide two-way contact between clients and their banks or financial institutions is referred to in this sentence. Customers may contact with customer service agents or bank staff members directly from inside the mobile app thanks to features like chat and video chat. Customers are now able to use real-time communication to ask inquiries, solve problems, or perform transactions. Additionally, the option to submit required papers through the app makes it easier for the consumer and the bank to communicate. Through the mobile app, users may safely transmit documents needed for account verification, loan applications, or other procedures, expediting the entire client experience.

CONCLUSION

Mobile banking applications' integration with cutting-edge technology is crucial to their future success. It is possible for artificial intelligence and machine learning to provide individual financial insights, enable proactive fraud detection, and give specialized advice for saving and investing. Additionally, the seamless use of biometric identification, such fingerprint or face recognition, may improve security while guaranteeing comfortable user experiences. In conclusion, mobile banking applications have revolutionized how people handle their accounts by providing previously unheard-of levels of accessibility, comfort, and control. The constant technological advancement promises to substantially improve the functionalities and user experiences of mobile applications, reinforcing their status as essential tools for contemporary financial management even while security and inclusiveness remain significant problems.

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CHAPTER 4

A BRIEFS STUDY ON FINTECH INNOVATIONS

Manjula Jain, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- jainmanjula76@gmail.com

ABSTRACT:

A dynamic industry called financial technology, or fintech, was created as a result of the combination of technology and finance. This abstract examines the many and revolutionary advances in fintech that are redefining conventional financial services and altering how people and companies interact with their money. Fintech innovations include a broad range of advances that use cutting-edge technology to solve several facets of financial services. These technologies are altering long-standing processes, improving accessibility, and boosting efficiency across the financial ecosystem, from payments and loans to investing and insurance. Digital payments are a prominent fintech innovation area. The exchange of wealth has been expedited thanks to mobile wallets, contactless payments, and blockchain-based cryptocurrencies. This has reduced friction and improved transaction speed and security. Decentralized finance (DeFi) is a novel idea that provides new opportunities for peer-to-peer lending, borrowing, and trading without conventional middlemen.

KEYWORDS:

Blockchain, Cryptocurrencies, Fintech, Market, Regulatory Technology.

INTRODUCTION

Fintech, often known as financial technology, is more than simply a trendy term in the financial services industry. Users and companies are catching up to fintech developments to participate in the future of money. With fresh inventive breakthroughs bolstering the business, the fintech market has been growing quickly lately. For company executives who are interested in learning more about the benefits of fintech, being aware of the top fintech breakthroughs is normal procedure. Many factors, particularly the accessibility of financial services, call for a significant overhaul of the financial sector.

It's interesting to note that the benefits of blockchain, automation, digital-only banking, and improved delivery platforms have provided significant advances in financial services. The responses to "What are the top advancements in fintech? Can assist you in determining the key moments that would alter the direction of financial services. In the chapter that follows, let's learn about a few notable fintech technologies and their benefits with examples [1]–[3].

What Justifies Education on Fintech Innovation?

One of the most apparent answers to the topic would emphasize how the roots of innovation form the basis of fintech. The fintech industry is rapidly growing and has the potential to reach over $31.5 billion by 2026. The greatest fintech inventions have made significant contributions that have helped redefine how technology is used in the financial industry. Fintech talks were mostly focused on credit card use and the expansion of internet banking ten years ago. Fintech is now

putting more of an emphasis on important factors including financial service accessibility, protection from middlemen, and censorship resistance.

One of the intriguing developments in the blockchain and web3 arena is the emergence of fintech applications. Decentralized lending platforms, for instance, have altered how loans are portrayed. The ability to secure a loan via decentralized or peer-to-peer lending platforms without depending on a bank demonstrates the strength of fintech solutions. Fintech adoption will open up new professional options as it spreads. The development of fintech would also spur technology that underpins financial services and products to expand at rates that are very promising. Therefore, specializing in several fintech fields might equip you for lucrative positions as a fintech specialist. Seven crucial innovations will drive the reimagining of business models over the next ten years while also reshaping the financial sector's competitive environment.

Figure 1: Top Fintech Innovations [101blockchains.com].

The foundation of fintech growth is technological advancement and innovation, which will also fuel new, disruptive business models in the financial services industry. Seven important technologies, according to a McKinsey report, will propel fintech growth and alter the financial industry's competitive environment over the next ten years. Figure-1: Top Fintech Innovations [101blockchains.com]

DISCUSSION

Massive value creation will be fueled by artificial intelligence.

According to McKinsey, artificial intelligence (AI) has the potential to bring up to $1 trillion in value to the global banking sector each year. The adoption of an AI-first approach by banks and other financial institutions is predicted to improve their ability to fend against the invasion of growing technology companies. Automatic factor discovery, or the machine-based identification of the factors that cause outperformance, will spread across the financial services industry and aid in the improvement of financial modeling. Knowledge graphs and graph computing will also take on a bigger role as an important application of AI semantic representation. In the coming years, their capacity to help in creating connections and spotting patterns across intricate financial networks by using a broad variety of sometimes dissimilar data sources will have a significant impact.

Last but not least, analytics with improved privacy safeguards will encourage minimum data utilization, or the use of just relevant, required, and properly cleansed information, in the development of financial models. One of them is federated learning, a kind of decentralized machine learning that solves the privacy risk associated with centralizing datasets by bringing the computing capacity to the data rather than the other way around. Consumer protection will advance to a new level thanks to developments in advanced encryption, secure multi-party computing, zero-knowledge proofs, and other privacy-conscious data analysis techniques [4]–[6].

Applications of AI will permeate all facets of front, middle, and back office processes in the financial sector. Market trackers, automated transactions, robo-advisors, tailored products, personalized user experiences, personalized analytics services, intelligent service robots and chat interfaces, alternative credit ratings based on non-financial data, and facial recognition authentication are just a few examples of customer-facing applications. Smart procedures, improved information representation tools (epitomized by knowledge graphs), and natural language processing for fraud detection are examples of middle- and back-office applications.

Many financial organizations still use AI sporadically and haphazardly, often using it primarily in niche use cases or industry sectors. But leaders in the banking sector are revolutionizing their operations by systematically integrating AI into every stage of their digital operations. It is noteworthy that the financial sector is realizing that algorithms are only as good as their data. Gaining competitive advantage from previously underutilized consumer behavior data gathered via traditional operations is becoming a focus. This will unleash the ecosystem-based financing's hitherto unrealized potential, in which banks, insurers, and other financial services providers collaborate with non-financial entities to create smooth client experiences beyond the scope of their conventional purview.

With a "zero-ops" mentality and extensive automation of manual operations, the "AI-first" institution will increase operational efficiency for banks by replacing or supplementing human judgment with cutting-edge diagnostics. The widespread use of conventional and cutting-edge AI technologies, such machine learning and face recognition, to analyze vast and complex consumer data sets in (near) real-time will result in improved operational performance. Future "AI-first" banks will emulate the speed and agility of "digital native" businesses and customers. They will innovate quickly, introducing new features in a matter of weeks as opposed to years. In order to

provide new value propositions that are integrated across journeys, technological platforms, and data sets, banks will also work closely with non-bank partners.

Blockchain will challenge current financial practices.

The use of distributed ledger technology (DLT) enables the simultaneous recording, sharing, and synchronization of transactions and data across a distributed network of users as well as across various data stores. Some DTLs send and store their data using blockchains, and they record and synchronize the data throughout the network using algorithmic and cryptographic techniques. By enabling the simultaneous storing of financial transactions in many locations, DTL will progressively support ecosystem funding. Cross-chain technology, which enables chains built on various protocols to communicate and transfer data and value across activities and sectors, including payments processing and supply chain management, will increasingly simplify blockchain interoperability. The fundamental components of current fintech breakthroughs like digital wallets, digital assets, decentralized finance (DeFi), and non-fungible tokens (NFT) will continue to include smart contracts, zero-knowledge proof, distributed data storage and exchange technologies.

Additionally, established stakeholders like institutional investors and funds are steadily increasing the proportion of digital assets in their portfolios, expanding access to capital and raising the potential for blockchain and DTL to upend existing markets. For instance, decentralized finance (DeFi), a kind of blockchain-based finance that eliminates the need for a central intermediary by using smart contracts, is rapidly expanding. In the last 10 months, DeFi's total locked-up value (TLV) has increased by about 50 times, and the industry currently holds digital assets with a TLV of $2.1 trillion. Another sign of the growing technical value of blockchain is the $15 billion in income that digital asset exchanges generated in 2020.

DLT is also having an impact on how laws and regulations are made by the government. Early in 2020, the Bank for International Settlements (BIS) surveyed central banks, and it found that around 60% of them claimed they were testing or researching central bank digital currency (CBDC). For instance, the People's Bank of China has started running operational tests of a digital RMB initiative based on permissioned DTL, opening the door for better macroeconomic control over monetary policy and resource allocation.

Other blockchain-related uses that are noteworthy include:

a. **Real-time transaction settlement:** To increase the effectiveness and scalability of cross-border sales, banks are employing smart contracts to settle the cash and collateral portions of transactions simultaneously. Transaction processing, securities lending, and stock trading may also be resolved on the blockchain. In the meanwhile, trading securities backed by digital collateral on the blockchain allows for post-transaction equity settlement as well as more efficient, transparent, and secure capital management. Institutional investors are searching for DLT capabilities, such as tokenization for unlisted businesses or private equity funds, spot exchange between fiat currencies and cryptocurrencies on digital exchanges, and custody services like key escrow encryption on behalf of clients.
b. **Authentication ecosystems based on zero-knowledge proof:** Customers are using shared information from partner organizations to confirm their identity online, in person, or over the phone. This streamlines the authentication process

and provides faster access to government services and medical records. Only the data necessary for a certain transaction is provided; all other data is carefully stored on the server of the dependable provider.

c. **Decentralized finance (DeFi):** Decentralized non-custodial applications can eliminate intermediaries by automatically generating deterministic (or "always valid"). This enables the purchase of loans, the making of investments, or the trading of financial products without the need for centralized management of the financial institutions. DeFi uses deterministic smart contracts, which take away counterparty risks and intermediary expenses while enhancing market efficiency with real-time transparency.

DeFi, which is built on blockchain technology, is upending long-standing conventional value chains and institutions and ushering in a new age of possibility. DeFi is expected to grow significantly as financial rules and laws change.

Financial services players will be freed by cloud computing.

According to McKinsey study, the top 500 global corporations' EBITDA (profits before interest, tax, depreciation, and amortization) will exceed $1 trillion by 2030 due to cloud technology. According to our research, efficient use of the cloud can reduce downtime for migrated applications by 57 percent, increase infrastructure cost efficiency by 29 percent, and increase the efficiency of migrated application development and maintenance by 38 percent. This reduces the cost of technical violations by 26 percent. Cloud-based security procedures and controls that are incorporated and automated may also enhance platform integrity. A primary example of a cloud-based feature that lowers technical risks through a consistent, cross-environment technology stack is development, security, and operations (DevSecOps), or the notion that security is a responsibility that can be actioned across an organization in step with the growth of its development and operations [7]–[9].

Public cloud, hybrid cloud, and private cloud are the three main types of cloud services that financial institutions should be aware of. Public cloud refers to an infrastructure that is controlled by cloud computing service providers, who then resell their cloud services to the general public or a broad variety of businesses. Two or more kinds of cloud (private, public) that are maintained separately but joined by proprietary technologies make up hybrid cloud architecture. Private cloud refers to infrastructure that is created specifically for one customer's usage alone, deployable in business data centers or via other hosting facilities.

We have identified numerous key cloud computing trends for the near future, including:

a. **Edge computing and edge cloud are crucial:** Development of the edge cloud is accelerating as 5G communication drives new interactions and synergies across the internet of things (IoT), cloud computing, AI, and other technologies in areas like new retail, healthcare, industrial parks, smart cities, and industrial IoT. Partition and development logic based on the relationship between edge devices, data centers, and the cloud is increasingly recognized in numerous industries.

b. **The use of cloud containers encourages innovation:** The use of container technology, which enables numerous workloads to execute on a single operating system instance and therefore reduces overhead and improves efficiency, is aggressively promoted by public cloud providers. Platform as a Service (PaaS)

layer innovation in cloud delivery paradigms is being driven by this. Providers of cloud computing technologies will put more of their attention into creating platforms that use container as a service (CaaS).

c. Deep learning will continue to enhance services for a wider variety of consumers through cloud platforms. AI-cloud platform applications are blooming in categories like image and audio search, driving advancements in high-value areas like medical imaging. Financial institutions are freed from non-core operations like IT infrastructure and data centers thanks to cloud computing, which also makes flexible storage and computing services more affordable. In addition, the cloud is giving rise to fresh models like open banking and banking-as-a-service, upending the traditional partnership between clients and financial service providers.

Financial institutions will continue to depend on the cloud as they implement more agile capabilities and introduce new ventures that call for high market and customer response as well as flexible scalability. The need for cloud-based elastic computing, which enables computer resources to be dynamically modified to match changes in demand, will increase as a result of the at-scale deployment of big data analytics.

In the upcoming years, banks will also be aware of the potential for large-scale adoption of cloud-based microservice architecture, in which application programming interfaces (APIs) enable machine-to-machine communication and permit services to scale independently without having to increase the overall offering's coding base. The next generation of core banking applications will lead to a change in banking architecture that is driven by microservices.

IoT will lead to a new age of financial trust

IoT is now maturing after spending years on the lower reaches of the hype cycle, which has significant financial implications. IoT systems are made up of three layers: perception and smart sensor systems, wireless communication networks, and application and operations support. RFID tagging, which relates to sensors, still offers a lot of unrealized promise for automating item identification and logistics administration. IoT communication methods are developing as well, enabling a greater range of devices to interact through wired and wireless networks, near-field communication technologies, low-power wide area networks, narrow-band IOT, linked end-point devices, and centralized control management. Last but not least, smart and embedded technologies are advancing quickly and allowing more sophisticated communication with things.

Consider the reality that many investment strategies and governmental regulations are now influenced by environmental, social, and corporate governance (ESG) factors from the standpoint of financial applications. For instance, a number of important nations have committed to reaching carbon neutrality and peak emissions. Success in reaching these targets will depend on efficient monitoring and control of industrial energy and power efficiency in addition to increased usage of renewable energy sources. This offers the ideal situation for IoT applications. For instance, the indexing of carbon trading to IoT data will increase, creating new possibilities for savvy participants.

In the meanwhile, insurers are using IoT to more precisely assess risk, enhance client interaction, and speed up and streamline the underwriting and claims processes. For instance, in the past, auto insurers have used factors like a driver's age, residence, and creditworthiness as indirect indications to determine prices. IoT has made data about driver behavior and vehicle usage, like automobile

speed and frequency of nighttime driving, accessible. With the use of technology, insurers may communicate with clients more often and provide new services based on collected data. Since clients often only interact with agents or brokers and only contact the insurer directly for policy renewals or claim management, the industry is likewise primed for efficiency advantages. The management of client interactions may benefit from IoT, enabling insurers to build more extensive and focused consumer engagement.

By guaranteeing that accounting records match real-world transactions, IoT-based inventory and property finance in banking, which involves the combination of IoT and blockchain, is improving risk management and enabling a new system of trust. IoT is disrupting conventional trade finance in shipping and logistics by enabling banks to create new goods flow tracking-based solutions like on-demand liquidity and other innovations supplied through smart contracts. Another way that the Internet of Things (IoT) is bringing banks and their clients closer together is by integrating financial services into wearables, such as digital payments.

Entry barriers will be lowered through serverless, open source, and SaaS

For new enterprises and financial innovation, speed and scalability are essential, especially given the fierce rivalry and winner-takes-all characteristics of the digital economy. For technology companies and conventional financial institutions creating new fintech enterprises, serverless architecture, open-source software, and software-as-a-service (SaaS) have all become necessities.

While serverless architecture eliminates the need for businesses to manage their own servers, SaaS enables businesses to utilize software as required without having to own or maintain it themselves, freeing up time and resources for customers and operations. Because charges are tied to software code that has been performed rather than being created continuously regardless of business needs, serverless architecture also lowers costs. It also encourages flexible scaling that prevents loss and idleness, increasing the effectiveness of development. Since open-source software offers free-to-use source code that enables developers a head starts in creating their own apps, it is a godsend for businesses wishing to expand up quickly. 2019 saw the launch of Kedro, an open-source platform for data scientists and engineers to build data pipelines, for example, from McKinsey's analytics company, Quantum Black.

Although each technology may provide value on its own, when utilized together, businesses can grow infrastructure fast and create and deploy prototypes at a minimal cost. However, integrating the technology across IT organizational structures, development capabilities, and risk management capabilities presents substantial problems for conventional banking organizations. They will need to reconsider their IT strategy and prioritize fintech innovation by prioritizing quick reaction IT capabilities.

Application development will be redefined by no-code and low-code

No-code development platforms (NCDPs) and their closely related low-code platforms enable programmers and regular users to create programs without using conventional computer programming by using graphical user interfaces and setups (such as drag-and-drop). Although still in their infancy, the platforms potentially lessen the need to employ pricey and in-demand technical expertise.

Technically speaking, NCDP combines and applies design thinking, DSL (domain specific language), visual quick development tools, flexible workflow process orchestration, and

component reuse and assembly in software engineering. The advancement of cloud computing, DevOps, and other technologies that address issues like containerization, rigid scalability, and upkeep of high availability computing environments are all strongly related to NCDP development. Companies often employ NCDPs to hasten the creation of cloud-based apps while maintaining alignment with their business strategies. For instance, compliance may be enhanced and maintained since audit trails and document creation are automated on no-code or low-code systems. Financial institutions and fintech businesses who need to react swiftly to market changes would benefit greatly from this.

One of the biggest companies in the low-code and no-code software business, AppSheet, was bought by Google Cloud, which also invested in the no-code software platform Unqork. Both services enable non-technical personnel to create apps without needing to learn specific coding techniques. According to Unqork's Chief Marketing Officer, Alex Schmelkin, switching to "no-code" has made it possible for financial services organizations to execute activities that formerly took years to complete. Currently, Unqork employs roughly 100 programmers who mostly work in the financial services industry. In order to compete with fintech start-ups while pursuing company-wide digital transformation initiatives, no-code or low-code development platforms have the ability to free up essential R&D staff to work on many projects at once.

Manual labor will be replaced by hyper automation, which entails the use of AI, deep learning, event-driven software, and robotics

RPA and other technologies and solutions that enhance the effectiveness of decision-making and the capacity for labor automation. RPA is already a key part of digital transformation, making it simple for businesses to deploy software robots like chatbots at scale. However, technology is continually expanding its capabilities. The fundamental purpose of RPA is to assign the management of workflow data and business interactions to robots, automating and standardized business execution. The main requirements to confirm the viability of RPA technology are high repeatability, clear rationale, and robust stability. Future RPA will incorporate AI more thoroughly, enhancing its ability to handle increasingly complicated business situations and expediting the delivery of financial services.

For financial organizations, RPA is already in use throughout middle and back-office activities, automating financial procedures and accounting reconciliation. Process automation for payables and receivables, fund appropriation at shared finance and accounting service centers, work hour adjustment and review, automation of financial recording, reporting, and treasury processes, as well as period-end accounting and settlement are all areas where RPA is being used. Automation boosts productivity while lowering human mistake rates and enabling companies to adjust to demand variations. Although RPA is currently well-established among major financial firms, we anticipate that it will spread more widely across the sector. For instance, account payable procedures might be automated to the extent of 60% by deploying robots that mimic human decision-making and fundamental paperwork tasks.

Future competitiveness being unlocked

These important trends and technologies are entwining and integrating more and more, providing fintech and finance sector innovation a huge boost. It is now a specialized financial industry. The subsectors that are best at using technical advancements to introduce applications, produce value, and alter the competitive environment. Traditional financial institutions will need to use their

significant resources in the future to remain ahead of the growing wave of disruption in the financial sector.

CONCLUSION

Another element of fintech that tackles the difficulties of compliance and risk management is regulatory technology, or Regtech. These systems use AI and data analytics to keep an eye on transactions, spot any irregularities, and guarantee compliance with legal requirements. Fintech developments have great potential, but they also present difficulties. To protect sensitive financial information, strong safeguards are needed due to data privacy and security issues. To ensure consumer protection and sustain financial stability, regulatory compliance must also advance to keep up with the quickly evolving fintech industry. In conclusion, fintech innovations are drastically changing the financial services industry. The accessibility, effectiveness, and personalization of financial transactions are facilitated by these innovations, which include payments, lending, investing, insurance, and regulatory compliance. As technology advances, a future where financial services are more accessible, effective, and adaptive to the requirements of a digitally linked society is promised by the synergy between finance and technology.

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CHAPTER 5

CRYPTOCURRENCY AND BLOCKCHAIN IN BANKING

Chanchal Chawla, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- chanchalchawla0@gmail.com

ABSTRACT:

A paradigm change in how financial transactions are carried out and handled has been prompted by the banking industry's use of cryptocurrencies and blockchain technology. An overview of the main features and effects of this ground-breaking combination are discussed in this chapter. The first cryptocurrency, Bitcoin, has evolved as a decentralized digital form of money that runs without the help of conventional financial intermediaries. The majority of cryptocurrencies' underlying technology, blockchain, provides a decentralized, impenetrable ledger system. The fusion of these two factors has given the banking sector new possibilities and difficulties.

KEYWORDS:

Banking, Bloackchain, Cryptocurrency, Financial System, Technology.

INTRODUCTION

Global financial institutions have started to shift in the direction of business models driven by digitization, such mobile banking. However, the initiatives have mostly been shelved when it comes to using blockchain in banking. In contrast to the attention that blockchain technology is receiving in other sectors, banks are hesitant. The fact that the technology is expected to rise from $4.9 billion in 2020 to over $67.4 billion by 2026 is a proof of this. However, when seen from a bank's perspective, the reluctance is understandable. There are relatively few blockchain use cases in banking and finance that have been widely adopted. Additionally, there are ongoing regulatory obstacles that have made it difficult for blockchain to gain traction. Despite these difficulties, banks have begun a small-scale use of the technology. In this article, we'll examine the expanding significance of blockchain technology in banking as well as some of its practical applications. While we will spend the whole of this essay discussing the advantages of blockchain in banking, it is crucial to understand the problems with the present financial system [1]–[3].

What is wrong with the financial system as it is in the present?

The role of banks as a facilitator of various economic and financial operations, such as lending, trade, transaction settlement, and payment processing, has existed for millennia. However, the sector has become stagnant due to its length, making change adoption difficult. Due to the consistent demand, it has been experiencing, the industry is now growing at a steady rate, but it is too sluggish to develop. For instance, they still need a lot of paperwork, have several time-consuming and costly procedures in place, and are vulnerable to security threats. Now that the need for change in banking systems has been acknowledged, it is time to explore blockchain applications in the financial sector.

What various financial use cases exist for blockchain technology?

Numerous procedures in the banking industry employ blockchain technology. uses that decentralize the industry.

Payment exchange

Currently, extra fees and sluggish payments cause billions of dollars to be earned and lost, respectively. For instance, if you are in San Francisco and transfer money to London, both your bank and the bank receiving it will charge you a flat cost of $25.

On open blockchains, anybody may send and receive money instantly and without any transaction fees with cryptocurrencies like Ether and Bitcoin. Additionally, since the payment occurs on a decentralized network, there is no need to validate the transaction, which makes the money transfer using blockchain in banking and finance quicker and less expensive [4]–[6].

Systems for settlement and clearance

A typical bank transfer might take up to three days to complete. Not only are the customers affected, but the banks also have logistical challenges. Today, a straightforward bank transfer may skip a convoluted series of middlemen from the bank to the custodial service and directly go to the intended recipient. This is where blockchain technology in banking comes into play. Blockchain functions as a decentralized ledger that records transactions openly and transparently. It implies that the transactions may be settled on the open blockchain rather than depending on custodial services. This is one of the main ways that blockchain applications in banking speed up and simplify transactions.

Securities

Banks will need to keep track of who owns what in order to acquire or sell debt, stocks, or commodities. They communicate with several exchanges, brokers, clearing houses, custodian banks, etc. to get this information. The procedure is long and vulnerable to fraud due to the participation of these parties as well as the existence of an obsolete paper ownership structure.

By creating a decentralized database of unique and digital assets, blockchain technology in banking transforms the industry. Transferring assets using tokens that stand in for the assets "off-chain" is made simpler by a distributed ledger. The advantages of blockchain in banking revolve in the production of tokenized securities, which have the ability to completely eliminate middlemen and reduce asset exchange costs.

Credits and Loans

Banks often base their loan underwriting decisions on a credit reporting system. One of the most investment-friendly fintech industries, peer-to-peer lending, is made possible by blockchain in consumer banking. Additionally, when a customer applies for a loan, the banks assess the risk that they will be exposed to in the event of non-payment. They consider the debt to income ratio, ownership status, and credit score while making this choice. They get this information from credit reports, a centralized system that may be antagonistic to clients. An alternative lending system that uses blockchain in banking offers clients a quick, affordable, and secure way to receive personal loans. Consumers may apply for loans more easily with a decentralized register of payment history.

Client KYC

The solution to client KYC bottlenecks in the banking industry is also the solution to how blockchain technology functions. The KYC processes, which include picture and address verification as well as biometric verification, may take up to three months to complete in certain cases. Banks must pay a high KYC fee in addition to the time it takes to check consumers. In retail banking, blockchain technology facilitates the KYC procedure.

The way that blockchain is being used in banking right now is to store client data there. This makes it possible for banks to obtain KYC-related data. an occurrence that results in a 10% reduction in human costs, or $160 million a year. These are the several functions that blockchain technology has in retail banking. As we have indicated at the beginning of the post, blockchain acceptance in the banking industry has been gradual. However, there is a clear increase in the use of technology in the industry. Let's examine several usage scenarios from the actual world that demonstrate that.

Cryptocurrency

A unit of measure, a store of value, and a medium of exchange are all functions of cryptocurrency. Despite having no intrinsic worth, itself, cryptocurrencies are used to estimate the value of other assets. Bitcoin was introduced in 2009 and is generally regarded as the first digital asset. It is a cryptocurrency (a method of exchange), but it can also be seen as a speculative commodity (how much is it trading for). Digital representations of value, commonly referred to as crypto assets, are made feasible by blockchain technology and cryptography. Their initial purpose was to act as a means of value transfer without the involvement of a bank or other reliable third party. The three primary categories of crypto-assets (digital assets) are cryptocurrencies, crypto commodities, and crypto tokens. The idea of stablecoins, which are cryptocurrencies anchored to a reliable asset like the US dollar and may play a crucial role in decentralized finance (DeFi), is one that is currently under debate.

Technology behind blockchain

A protocol for a peer-to-peer electronic currency system was likely designed by Satoshi Nakamoto in reaction to the 2008 global financial sector meltdown. This protocol served as the basis for the distributed ledger technology known as blockchains. Blockchain functions something like a global ledger or spreadsheet. It operates on computers given by volunteers all around the globe and lacks a central database. Because a blockchain exists on the network rather than inside a single organization, anybody may examine it at any moment. A blockchain employs public and private keys to preserve some level of virtual security and is encrypted. Using a blockchain, one may securely transfer money to another person without going through a bank or other financial institution [7]–[9].

Blockchain technology is often referred to as distributed ledger technology in the financial services sector. And some believe that blockchain will be a more trustworthy database than their current ones. Some people think blockchain technology will replace the outdated banking sector technology as digital money becomes more commonplace and more people are estimated to hold smartphones (more than 50% of the world's population). This new alliance in financial technology may pave the road for widely accessible digital financial goods.

Cryptocurrencies are already attracting the attention of governments. 2015 saw the U.S. The Commodity Futures Trading Commission determined that commodities should be properly defined for the purposes of defining Bitcoin and other virtual currencies.

Blockchain is a kind of public database that houses digital data. One of the most extensively utilized fintech technologies, it often comprises of cryptocurrencies and adds security to a range of financial activities. Banks may use blockchain to record transactional data such as the date, time, and dollar amount of a recent purchase.

Blockchain technology use in India's banking industry

A distributed ledger that is digitally immutable and continually tracks transactions is known as a blockchain. By offering a variety of options for how individuals handle money and values, blockchain technology has the potential to completely change the global financial system. Each successive transaction must have the consent of the network's members, known as nodes, before being added to the ledger. This creates a continual system of control against manipulation, mistakes, and the quality, management, and direction of the data. Each block in a blockchain acts as a storehouse for information about a transaction and connects to the block before it in the same transaction. These interrelated structural elements provide a logical chain that acts as the main conduit for the principal transaction.

All data is shared as generic copies on the blockchain. Without a centralized authority, participants independently check information. Even if one node fails, the other nodes continue to operate or function, preventing any disruptions. A transaction on the Blockchain can only be finalized if all parties involved have agreed to it in full. However, consensus-based rules may be altered to take into account different situations.

Building blocks encrypt the chain and repair them. Since doing so would prohibit the production of true digital assets and maintain a high degree of reliability and trust, it is absurd to remove, alter, or duplicate already-created blocks before uploading them to the network. Decentralized storage on a blockchain is also widely recognized to be very failure resistant. Even in the absence of a sizable number of network members, blockchain removes the single point of failure. A blockchain maintains durable data.

1. **Bitcoin Public Blockchain**

Each and every public blockchain is open source. To put it another way, everyone may take part in this blockchain. Join the transaction made possible by the Blockchain, and each participant may see the newly added blocks. As a result, everyone can participate in the consensus on the method used to add blocks to the chain, rather than just the chain's present state.

Faster transactions and cryptocurrencies

Cryptography is used to restrict the creation of new units of money in cryptocurrencies, which operate as a medium of exchange, and to make speedier transactions more secure and safe. The most well-known digital currencies include Litecoin, Ripple, Bitcoin, Ethereum, and others. Cryptocurrencies aid in the Figureht against identity theft because users have control over their transactions. The transactions protect the operator against the danger of fraud and misrepresentation since they are definitive and cannot be undone once they are completed. Additionally, it enables the sending and receiving of money from anywhere in the globe at any

time without concern for a centralized authority. The immediate verification of the transactions is visible to all parties.

> The cost of the conversion into decree money is quite low. There are certain restrictions with digital currency, however. It's getting more and more important to use digital money. This will raise the danger, volatility, and cost of using digital currencies.

2. Blockchain with permissions: Trade Finance Application

In contrast to a public blockchain, a recognized blockchain allows only a select few carefully selected nodes to attest for a transaction. The blockchain may only be accessible to participants, or it may be made available to the whole public.

Credits and Loans

Reducing the challenges of the traditional loan procedure, especially in the identity verification process, is made possible in large part by the development of blockchain technology. The distributed ledger technology that underpins Blockchain, on the other hand, protects and decentralizes user data. It works by simply keeping customer information in distributed ledgers rather than centralized databases, reducing the threat of cybercrime. The exact, safe, and private client profiling enabled by blockchain technology. Additionally, all network members have access to information and transaction records without compromising the privacy of the customers. Due to the distributed ledger technology's avoidance of duplicate record maintenance, the procedure requires less time and money.

Furthermore, since blockchain relies on immutability, no one is allowed to change the transactions that are added to the distributed ledger. However, if a record-keeping error occurs, it must be added to error reversibility, which is always obvious. The advent of blockchain has guaranteed the trustworthiness, security, and effectiveness of the lending and borrowing procedure. The quality, timeliness, and openness of financial data recording improve credit risk assessment.

3. Application for Loyalty on Private Blockchain

A private blockchain allows just one company to publish. Auditing and database management are crucial applications or parts of a single entity. It is not essential in this instance to offer the public the opportunity to read or validate.

4. Application of Blockchain by Public Banking Institutions

Banks run by the government utilize the blockchain. The continual process of entering interbank payments into central bank records is known as real-time gross settlement, as opposed to settlement at the end of each day. Blockchain dramatically boosts transaction volume and network resilience, enabling central banks to handle RTGS more quickly and securely.

How are blockchains operated? An outline

As already stated, blockchains function as databases. They consist of blocks of transactions that are cryptographically connected to one another. The blocks also include data about the parties taking part in a transaction. Blockchain, for instance, will utilize a digital signature in place of any identifying information when recording a transaction. Blockchain-based data storage will also keep track of information that sets it apart from other data. It will keep a hash code that is unique to each piece of information so that it can categorize it.

For instance, if you buy the identical item from a website twice, the two transactions would be classified using different codes. Each block in a blockchain may hold up to 1 MB of data. As many as a few thousand transactions may be kept in a single block.

What the banking sector is going through with blockchain

Fintech and many other sectors have recently seen significant upheaval as a result of blockchain. Blockchain eliminates the need for an intermediary in transactions by allowing untrusted parties to concur on the state of a database. There is a ledger that is not kept up with. Without the assistance of a third party, such as a bank, the technology will provide financial services like payments. Blockchain therefore promotes decentralization, which may make it simpler for banks to concentrate on tasks other than monitoring payment transactions.

Blockchain technology has significantly altered banking in many different ways. Payments, settlement protocols, fund-raising, the administration of securities, loans, credit, and trade finance are just a few of the things it has impacted. Blockchain may provide speedier payments and cheaper rates than banks because to its decentralized payment ledger. Blockchain has an impact on clearing and settlement systems, as distributed ledgers may deliver more real-time transactions between financial institutions while lowering operational costs.

Offering Initial Coin Offerings has altered fundraising. Access to cash may be disentangled from capital raising services and businesses using a new paradigm of financing. Public blockchains are used to store securities such as stocks, bonds, and other assets. Capital markets become more effective as a result.

1. By eliminating the need for gatekeepers in the lending and credit industries as well, blockchain has transformed the financial sector. It has lowered interest rates and made borrowing money more secure.
2. By replacing the paper-intensive process with blockchain, trade finance has altered. Globally, it has improved trade partners' confidence, security, and transparency.

The top 8 advantages of blockchain

Blockchain has several advantages for banks. The benefits of blockchain for banking have aided financial organizations in figuring out how to carry out transactions in a more secure manner while also minimizing mistakes. As a consequence, banks should think about using blockchain more often to better serve their clients.

1. **Costs Are Cut:**

Cost savings are one of the advantages of blockchain for banks. Recently, banks discovered that by 2020, using blockchain, they may save up to $20 billion on infrastructure expenditures. Banks may minimize their interactions with counterparties and intermediaries by integrating features like smart contacts into a platform. They may also reduce the expense of managing and carrying out contracts. Banks may also lower the expenses associated with transactions between one bank and another.

2. **More Rapid Transactions:**

Offering speedier transactions is another benefit of blockchain in banking. In comparison to other conventional techniques, every transaction may be completed in a couple of seconds. As a result

of banks' ability to cut out intermediaries, clients may now complete transactions more quickly. Customers and banks will be able to complete and execute more transactions as a consequence.

3. **Enhanced Security**

Banks may benefit from using shared ledgers to strengthen transaction data security. Initially, they will be able to swiftly finish a transaction and lower the possibility of someone stealing transaction data or diverting cash. For every transaction, there are two security keys. Every user has access to a public key, whereas the participants to a specific transaction have a private key. Once a transaction's data has been confirmed, it cannot be changed.

4. **Increased data caliber**

Any sort of data may be stored on a modern blockchain, which also enables access to it in accordance with established guidelines. Smart contract technology automatically validates and upholds contracts. Banking data is transferred onto shared ledgers where it has access to blockchain's advantages.

5. **Electronic currencies**

Blockchain may help banks by using virtual currency. They may now accept digital money to carry out a number of different transactions. Banks will be able to process and complete financial deals more quickly and securely with the help of cryptocurrencies. In the future, banks will likewise try to make digital money the norm.

6. **Accountability**

Accountability will enable banks to gain from blockchain by lowering fraud and misappropriation of corporate assets. Banks won't have to worry about substantial mistakes being made with digitally created transactions. They won't need to be concerned about crucial facts being manufactured with. Since all transactions can now be easily checked and verified using blockchain technology, banks will be able to handle transactions more regularly and precisely.

7. **Compliance**

Better compliance from blockchain will also help banks. They might provide access to the blockchain to auditors and government officials. With this access, the government and auditors may see how business is conducted in total transparency. Banks may also expedite the auditing process and nab suspect transaction activity. Financial institutions and fintech companies generally are now able to supply easily accessible digital information and speed up the auditing process.

8. **Fewer reconciliation and error handling processes**

Banks have profited from blockchain by being able to more readily reconcile transactions. They can swiftly track down transactions and spot mistakes more immediately. They can so identify mistakes before a transaction is completed. As a consequence, they will be able to correct mistakes before they endanger the organization and its clients.

CONCLUSION

In conclusion, the banking industry has entered a new age of opportunities and problems with the introduction of cryptocurrencies and blockchain technology. Increased transaction security and

efficiency, as well as increased financial inclusion and creative asset tokenization, are just a few of the many possible advantages. These developments have the potential to fundamentally alter how financial institutions function and the services they provide. However, there are difficulties that need for careful thought, as with any transformational technology change. Regulatory systems must carefully balance encouraging innovation with protecting against threats including fraud, money laundering, and unstable markets. Additionally, significant expenditures in infrastructure, cybersecurity, and the development of knowledge are required to use blockchain technology. A collaborative strategy including financial institutions, technology developers, regulatory agencies, and other stakeholders is necessary for the effective integration of cryptocurrencies and blockchain into banking. Industry participants must collaborate to develop complete solutions to problems, ensuring that potential benefits are maximized and dangers are adequately handled.

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CHAPTER 6

A BRIEF STUDY ON OPEN BANKING AND APIS

Pirtibha Sharma, Associate Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India
Email Id- ica.pratibha.pdp@gmail.com

ABSTRACT:

The conventional banking environment has been completely transformed by the rise of open banking and the extensive use of Application Programming Interfaces (APIs). This presentation offers a thorough review of the idea of open banking and its consequences for the financial services industry. Through the use of standardized APIs, open banking symbolizes a paradigm change in which banks and other financial institutions make their systems accessible to outside developers and other service providers. Through the safe exchange of financial information and services, this strategy fosters cooperation, innovation, and customer-centricity.

KEYWORDS:

API, Banking Initiative, Financial Data, Open Banking, Open Finance.

INTRODUCTION

Open Banking

Open banking is the sharing of financial information and services with outside parties via the use of APIs. The technology, a service, or an app that makes use of the shared financial data and services is often provided by third parties to the bank's clients. The statements and transaction records belonging to the banks' clients are only a few examples of the shared financial data. This information cannot be made publicly accessible; rather, it is only disclosed at the express request of the consumer. The technical foundation and regulatory regulations for such consent-driven sharing are provided by open banking [1]–[3].

Open Banking is a worldwide phenomenon, yet there are significant regional variations in many distinct aspects:

i. Are Open Banking APIs provided by banks required?
ii. If open banking is required, how long will banks have to implement it and what deadlines do they have?
iii. Are banks required to collaborate with all qualified third parties, or may they opt to cooperate solely with certain of them?
iv. What qualifies as a third party eligible?
v. Do banks have to develop APIs in accordance with a specified specification?
vi. Which financial services and products are covered under open banking?

A global open banking initiative

Despite the fact that open banking is a worldwide phenomenon, each nation or area comes up with its own responses to the problems raised above. It might be challenging to maintain an overview

of the changes taking place in numerous nations. Some nations currently have regulations in place (such as the EU and Australia), while others (such as the UK) want to broaden the use of open banking. Still other nations intend to establish open banking. To get the necessary information on open banking efforts, it takes a lot of time and effort since it is dispersed, difficult to browse, and not always readily accessible.

This data is readily and universally made accessible on the openbankingmap.com website, saving time and acting as a jumping off point for in-depth study. Learn about global API projects, including standards, API specifications, legal frameworks, participating banks, market or regulatory motivations, the range of banking products and functions covered, and the implementation schedules and eventual market uptake.

Open Finance vs Open Banking

The initial emphasis of open banking has been on payments and checking/cash accounts. However, the range of financial products covered under open banking is becoming broader and longer. In some nations, open banking includes credit card accounts as well as savings accounts. The phrase "open finance" is used if more financial products are available through APIs, and this includes APIs for mortgages, loans, pensions, depots, trading accounts, and more.

Myth of open banking

Let's dispel a popular misconception: It is falsely assumed that open banking makes consumer data publicly accessible to anybody. However, this is untrue since open banking works hard to limit the list of permitted third parties and provide clients control over the disclosure of their financial information by demanding their express approval.

Then what does "open" in "open banking" mean?

Through the implementation of open banking, the formerly closed digital banking value chain is made accessible to outside parties. The banking stack opening up is a different angle. Customers, channels, and banking products make up the banking stack. When it is opened up, others are able to take part.

Typical difficulties facing banks

Banks are in a difficult position with regard to their digital transformation. When computers were still thought of as large mainframes, these companies were among the first to adopt and employ them. Automating internal bank processes those that clients never see involved using software. Through the bank branch, customers interacted with their banks. However, clients now communicate with banks via their smartphones, websites, or voice assistants. Customers use software to communicate with their bank. Additionally, software is becoming a differentiator. Customers of traditional banks are already moving some or all of their banking activity to new digital banks that provide superior digital services. In terms of providing consumers with digital channels, banks encounter a number of difficulties.

Shifting consumer demands

Customers continue to want more digital solutions from banks, but these systems are sometimes unnecessarily complicated, costly to update, and unable to meet the demands. New, cutting-edge applications are appealing to bank clients who want to handle various areas of their personal

money. There are many different types of financial apps available, such as those that offer a comprehensive overview of transactions and balances across multiple bank accounts (multi banking), personalized recommendations to optimize finances (personal financial management), or quicker and more efficient procedures to get a loan or mortgage approved. These innovative applications, which are provided by tech-savvy fintechs, often provide more functionality, convenience, and customisation than the apps that banks generally offer [4]–[6].

Regulation observance

Regulators promote competition in the banking industry by requiring banks to disclose data and enforcing open banking. A deadline must be met to execute regulatory obligations, and penalties are assessed for noncompliance.

Increased rivalry

The rivalry is heightened and there is more pressure to innovate as a result of open banking and integrated banking. Banks must discover new sources of income as conventional banking services become more commoditized. Financial services will probably become thoroughly integrated into a range of non-financial goods, leading to the development of increasingly specialized, individualized, and relevant niche offerings by digital businesses. These IT firms will purchase Banking-as-a-Service (BaaS) in the form of bank APIs, becoming clients of tech-savvy banks.

It's crucial to differentiate between tech-savvy and conventional banks as this new dynamic develops. While conventional banks are unable or unwilling to do the same, tech-savvy banks will allow embedded banking by giving BaaS to product firms as their clients, while the long tail of embedded banking services will force traditional banks to compete for end users. Currently, those conventional banks mostly face competition from other traditional banks that are similar to them, but they will also face rising rivalry from product firms outside the financial services sector that have distinct business strategies, technology stacks, and legal restrictions.

Banks must be just as technologically aware as their clients in order to compete in this brand-new, rapidly expanding industry. They must also make their services available as appealing APIs. The financial services sector is being revolutionized by APIs, despite being a highly technical notion. Core banking operations including accounts, transactions, balances, and payments are made programmatically accessible using APIs both inside the company and to external parties. Given that the APIs are accessible outside of the company, cutting-edge fintech applications may interact with the financial data of a bank's clients, provided the consumer gives permission to share the data.

DISCUSSION

Distribution of banking goods across a long tail

By providing Banking-as-a-Service in the form of APIs to product firms, tech-savvy banks are driving banking to become more relevant and meaningful for end users. By integrating deeply embedded financial services into their digital products that end users already use, product firms (banks, non-banks, or near-banks) are able to provide more specialized, relevant, and customer-centric niche goods than mass-market banking can. These specialized niche items make up the so-called long tail distribution, which consists of a number of related but distinct niche products. Compared to mass-market items, each product has a much smaller distribution, but since there are

so many different products available, end customers are likely to discover one that perfectly suits their requirements. Product firms from a range of sectors must excel at consuming, orchestrating, and integrating financial APIs into their products if they want to capitalize on the expanding Banking-as-a-Service industry [7]–[9].

How to use open banking APIs to compete with lane changers

Banks now compete mostly with other banks that are similar to them in that they are well-known, operate under the same industry, and target the same broad market. However, with the introduction of Banking as a Service (BaaS), banks now have to contend with a new breed of rivalry that I refer to as "lane changers" since they come from a different sector of the economy and enter the market with speed and agility. Understanding how these lane changers operate and what conventional banks can do in a new competitive environment makes sense.

How banks use open banking APIs to address the issues

Customers of a bank may find open banking convenient. But why is open banking valuable to banks strategically? Will banks have to relinquish a lot of control? Banks employ APIs for system modernization, regulatory compliance, and the realization of ecosystem and platform business strategies in order to overcome the hurdles.

Modernizing the systems

Banks rethink their monolithic programs to make them more flexible and agile so they can respond to upcoming market developments faster. Decentralized micro service architectures with APIs are created from monolithic systems. These internal APIs are largely used inside the bank to support its many digital channels, including its website and mobile app. Whether internal APIs are utilized willingly for open innovation to create platforms and ecosystems or are required by a regulator, internal APIs may serve as the foundation for open banking activities.

Regulation observance

Make sure the bank complies with the future open banking legislation (a global trend, although regional rules apply) to avoid paying penalties for non-compliance. Prior until now, banks' open banking strategies have been centered on complying with regulations in order to avoid penalties for non-compliance, blocking impending regulations, and fending off threats from open banking competitors.

Play by ecosystem

Open banking has moved away from "check-the-box" regulatory compliance to creating innovative opportunities, making it a topic of strategic interest to the board. In an attempt to differentiate, prospects innovate together with ecosystem partners, participate in and orchestrate digital ecosystems (e.g. for home, mobility, etc.) by strategically sharing data. As open banking becomes a reality in many countries around the globe, the advantages for bank clients are clear: more choice on digital banking offers, personal financial management, multi banking or faster loan and mortgage approvals. Technically, open banking is based on API technology and allows clients to ask their bank to share their financial data conveniently, safely and securely with fintech companies. Banks work with a broad range of fintech partners, who develop digital products. Banks provide the data via open banking APIs to the partner - the partner provides the innovative digital solutions that customers are looking for. The partner's digital solutions simply use the

bank's open banking APIs. This ecosystem play has an attractive trade-off with limited costs for the banks, low risks shouldered by the bank, and it still allows customers to get the digital solutions they want. The digital solutions provided by fintech partners are not a threat – but they provide a moat for you as an incumbent bank, allowing you to ward off attacks by digital banks, neo banks or big-tech banking offers.

Banking customers benefit from open banking because they can use the new apps they want and need, and banks benefit because they can retain their most demanding digital customers without having to fund, develop, and provide a plethora of cutting-edge apps themselves.

Technology behind open banking

Clients need to trust banks to securely store their money, process transactions, and protect their data, so it is crucial for banks that their customers do as well. When banks introduce digital technology, such as open banking, it not only needs to enhance customer experience or enable the emergence of a vibrant digital ecosystem with a wide variety of apps and digital solutions. APIs, which are used to share financial data in the open banking ecosystem, are the most important digital technology that banks need to master in order to participate in the ecosystem. By using APIs and related technologies correctly, you can build a reputation with partners and customers as a reliable ecosystem participant.

i. **Partners:** It's critical to protect APIs and the data they contain in accordance with best practices, implement APIs in accordance with established specifications and industry standards, and offer a seamless onboarding experience if you want to build confidence with your partners.
ii. **Clients:** In order to build confidence with clients, banks must inform them, demonstrate that they are in charge of their data, get their permission before sharing it or authorizing any transactions that are sparked by the API, and provide a simple and pleasant user experience.

Security

This means that the API for sharing the data needs to be secure, all ecosystem players need to be properly authenticated & authorized, and the fintech receiving the data needs to be trustworthy. Sharing financial data securely is necessary for gaining the trust of clients as well as for the fintech partners.

The PSD2 regulation requires these certificates to build on TLS certificates and contain specific extensions, called QWAC and QSEAL. Banks check the validity of the certificate every time the fintech requests open banking data. Not every fintech can access open banking data. They typically need to go through a rigorous due-diligence process and, if successful, they get a machine-readable certificate.

Once the identities of both the fintech and the bank client have been established, typically based on current web-based or mobile authentication mechanisms, the bank authenticates and authorizes the identity of the bank client and typically based on existing web-based or mobile authentication mechanisms.

Consent

To support this crucial aspect, consent mechanisms are built into open banking; they ensure that bank customers are first identified and then actively and intentionally consent to sharing their data. The OAuth framework and its various security profiles (such as FAPI) are used as the technological protocol for implementing open banking. To trust an open banking system, bank clients must remain in control of their financial data, with final say over when and with whom their data is shared.

API guidelines and requirements

The API's shape and form, the formats and data structures involved, the technical standards for data exchange and calling functionality must be agreed upon by all ecosystem players. If all participants operate on the same interface specification, complexity is greatly reduced, there is no need for translation or unification, and the ecosystem evolves more quickly.

The development of open banking ecosystems

Therefore, open banking is more than just APIs for banks; it requires the emergence of a digital ecosystem that fosters the active collaboration between banks and fintechs. For open banking to be useful, banks must make their data available in the form of secure APIs; then, fintechs with innovative ideas will need to connect to those APIs, and leverage the data provided by the APIs. Open banking is more than just APIs for banks.

What type of ecosystem do we want to create and how do open banking ecosystems emerge?

Ecosystems for open banking

Imagine a tropical rainforest on one end of the spectrum and a structured English garden on the other. There are different types of ecosystems; in one, you design and enforce rules, resulting in a predictable but also more constrained system; in the other, you let things emerge, resulting in a more prolific, but also more intricate and even chaotic system. Therefore, you need rules - both fundamental and technological standards - with open banking resembling more the English garden than the jungle. What do these regulations cover?

Basic guidelines for open banking ecosystems:

First, it must be decided whether the government or the banking sector will be in charge of establishing the open banking rules. The former will result in a regulatory approach, while the latter will be driven by the market. Both will be based on a legal framework that outlines the rights and obligations of all open banking participants. Second, a consensus must be reached over the range of banking data and functionality that will be disclosed (payments, checking accounts, transaction data, balances, trading accounts, pension accounts, etc.) and whether it will be mandatory or optional for each bank to do so. Although the specifics vary from country to country, the aforementioned problems should always be addressed as open banking is becoming more prevalent. These underlying regulations serve as the basis for more specific regulations.

Open banking ecosystems' technical regulations:

The ecosystem's participants must agree on the technical requirements for data exchange and calling capabilities. Customers must be made aware that they are sharing their financial data and must actively and consciously agree to the sharing of their data in order to guarantee that they

maintain control over their data. Financial data exchange must be safe, which calls for a secure channel (API), effective authorization & authentication of all ecosystem participants, and trustworthiness of the fintech receiving the data. Banks must provide documentation of their APIs and simple onboarding procedures to make it simple for fintechs to access the APIs and obtain the data. Universally, APIs are chosen as the technical enablers and as the foundation for implementing open banking, so to master open banking, and create digital ecosystems, banks need to first master APIs.

How the value chain is changed by open banking APIs

By making basic banking operations, such as accounts, transactions, balances, and payments, digitally and programmatically accessible both inside the organization and outside to third parties, APIs are transforming the financial services sector. Open banking is built on this basis, but it also offers the security, legal, and regulatory context required to alter financial services and restructure the value chain. Open banking is more than simply the technological APIs in the financial arena alone. By making the conventional value chain of financial services more widely available, open banking reshapes the value chain. There are at least two ways to open the value chain: In the front of the value chain, where banks are API providers [10]–[12].

CONCLUSION

As a result of the introduction of open banking and the widespread use of Application Programming Interfaces (APIs), the banking sector has undergone a significant transition that has changed how financial services are provided and experienced. Undisputed advantages include improved consumer experiences, a thriving innovation environment, individualized financial solutions, and dynamic collaborations between established banks and fintech companies. By giving people control over their financial data and allowing them to access specialized services and solutions from a range of sources, open banking promotes a more customer-centric approach. The potential for innovation is enormous since APIs make it possible for new financial services and products to be developed quickly and deployed to meet a range of customer requirements. Collaboration becomes a pillar of this new era as conventional financial institutions join up with fintech firms to develop products that combine their own capabilities. But there are also difficulties in this collaborative environment, notably in terms of data security, privacy, and legal compliance. Building and sustaining confidence in the open banking ecosystem depends on finding the correct balance between innovation and risk management.

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CHAPTER 7

A BRIEF STUDY ON NEOBANKS AND CHALLENGER BANKS

Vivek Anand Singh, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- vivekanand.ima@gmail.com

ABSTRACT:

Neobanks and challenger banks have become more prevalent, bringing a dynamic and disruptive force to the conventional banking sector. The idea, effect, and consequences of neobanks and challenger banks on the financial landscape are thoroughly covered in this chapter. Neobanks and challenger banks are financial firms with a focus on technology that provide cutting-edge, client-focused banking services. In contrast to conventional banks, these organizations often operate without physical branches, depending instead on digital platforms and mobile applications to interact with consumers. Neobanks and challenger banks are causing the banking sector to undergo a fundamental change that is pushing existing banks to change and reshape their approach to serving customers. Their commitment to serving the needs of the consumer in tandem with technology advancement has the potential to increase financial accessibility, comfort, and affordability. To achieve long-term success, however, issues with legal compliance, cybersecurity, and trust-building must be successfully handled.

KEYWORDS:

APIs, ATM, Challenger banks, Financial organizations, Neobanks, SMEs.

INTRODUCTION

How Do Neobanks Work?

Neobanks are financial organizations that only do business online, never setting up shop in a branch to provide services. More crucially, compared to a conventional brick-and-mortar bank, they provide a considerably larger range of services. Neobanks are permitted to operate under certain restrictions, but they are not necessarily need to have a specialized banking license unless they want to provide their consumers with credit cards and loans. These are most often provided by neobanks that collaborate with established financial institutions in order to avoid the difficult licensing procedure [1], [2].

Online banking

The physical presence of neo and challenger banks is the first significant distinction between them. Neobanks are totally digital, cloud-based businesses that connect with their clients via websites and mobile apps. Neobanks were first introduced in 2010, with the goal of providing SMEs and new businesses with a more straightforward alternative. The first of its sort to start, Monzo and Atom Bank are now two of the top neo banks. Volt, Chime, Starling, N26, and Moven are further products now dominating the market.

Neo banks' services

The flexibility and availability to a broad variety of services that neobanks provide SME's and startups is their biggest value. Neobanks provide a platform that not only contains a current account but also includes other functions like automatic accounting, payroll, and spending management. Neobanks also provide a variety of add-ons that address the corporate finance issues that SMEs often encounter. Additionally, they enable the use of APIs to assist in the integration of corporate activities and banking needs. Neobanks, however, lack a banking license. Instead, they depend on a partner bank to function. They are therefore unable to provide more conventional banking services.

Challenger banks: what are they?

Challenger banks use technology to speed up the banking procedure as well. They are fintech businesses, but they also have a physical presence in brick-and-mortar locations. Compared to what is observed in the traditional banking sectors, their presence is usually often far more limited. Today, there are an estimated 100 challenger banks operating internationally.

These are distinct from neobanks since they each have a banking license and may provide consumers with a variety of conventional banking services in addition to online capabilities. In addition, it is easier to use and access these conventional services than it is to use traditional banks. Revolut, Allica, Tandem, Amicus, Monese, Metro, and MyBank are currently the top challenger banks in their respective markets.

The future of challenger banks and neo banks

Neo and challenger banks are here to stay, and they will soon emerge as a powerful sector in the commercial banking market. While it is up to each customer to choose which sort of bank works best for them, one thing is clear: they are here to stay. Neo and challenger services both provide favorable government rules, fast and simple account opening, round-the-clock financial help, and user-friendly interfaces, which are the grounds for this [3]–[5].

Advantages of Neobank

i. Opening an account is a pretty fast process.
ii. Because a neobank has no physical premises and reduced startup costs, it can afford to invest more in research and development, including data analytics and decision-making. The total fees are reduced for the same reason.
iii. Unlike challenger banks, neobanks are not required to do background checks on its clients before making a loan, for instance.
iv. Many neobanks, like Revolut, also provide a wide range of services, including as personal vaults, IBANs with different currencies, trading in shares, commodities, and even cryptocurrencies.
v. Drawbacks of Neobank
vi. It is impossible to physically deposit cash. By using a credit/debit card, an e-wallet, or a bank wire transfer, you must fill your account.
vii. Your particular bank provider has no physical branches or ATMs. Thus, when you withdraw money from any ATM, various restrictions or fees could be imposed.

viii. There are no locations where customers may visit to talk to a representative in person, and Neobanks' applications might be perplexing for those who are not tech-savvy.

How Do Challenger Banks Work?

Due to the fact that many smaller banks have a relatively small number of physical branches and have mostly operated online, they have begun "challenging" larger brick-and-mortar banks, thus the moniker challenger bank. Challenger banks are able to provide the complete range of financial services, including loans, credit cards, and overdrafts, since they have a real physical branch, which gives them the right and duty to be registered and regulated as a banking institution. Of course, neobanks may also provide comparable services, but only by finding a clever way to collaborate with conventional banks and financial organizations.

Benefits of Challenger Banks

i. Just like neobanks, challenger banks also provide speedy account opening, while background checks may add a little more time.
ii. On the whole cheaper fees, comparable to neobanks. It is possible that certain fees will be greater than those charged by neobanks but lower than those charged by conventional banks.
iii. Without the assistance of a separate bank, they are able to provide consumers the complete range of financial services, including loans and credit cards.

Drawbacks of Challenger Banks

i. Neobanks outsource the credit check to their collaborating banks, but challenger banks still do their own credit checks for credit cards and loans.
ii. Despite the possibility of a physical location, challenger banks have so few of them that the likelihood that you won't be close to one is considerable.

DISCUSSION

The Primary Disparities Between Challenger Banks and Neobanks

The main distinction between challenger banks and neobanks is that the latter have physical locations, whilst the former do not. Naturally, having a physical site or locations has extra expenses, advantages, and drawbacks. Because they don't have physical locations, neobanks often provide a greater range of cutting-edge goods than challenger banks and conventional brick-and-mortar banks. Costs are reduced and more money is spent on R&D when there are no physical offices. Neobanks concentrate on creating cutting-edge mobile platforms and applications that allow users to meet all of their demands.

What is the business model of traditional banks, and who are they?

Everyone is aware of Banks. A lot of us would have come in to apply for a student loan with our parents standing by to guarantee the loan. When they had to set up their salary accounts, a select few people would have had their first interaction. However, have you ever pondered how these banks generated revenue? How did they have the money to maintain the opulent front offices and lobbies?

Banks, on the other hand, serve as what may be described as a middleman, assisting people who have extra money to make money off of it while giving loans to others who are in need. The way they make money in this process is via the arbitrage between the rates they pay for deposits and the rates they charge for loans.

But let's go a little further to discover why certain banks are more lucrative than others, while performing the same fundamental role. I'd want to walk you through how I classify conventional banks so you can comprehend that. Deposit-oriented banks come first, followed by capital market-oriented banks. The banks that focus on deposits may also be broken down into those that cater to consumers or businesses. And to help us with this, the Indian banking sector has created the CASA ratio, which stands for Current Accounts and Savings Accounts [6]–[8].

Now, these banks that prioritize deposits often provide their depositors a tiny interest rate. Therefore, in order for these banks to become more profitable, the difference between what they pay for deposits (liabilities) and what they earn from loans (assets) must widen. And since the pay-outs for commercial deposits are so little, sometimes close to nothing, this is one reason why Commercial Deposit institutions tend to be more lucrative than Retail banks. Retailers like you and I have far more predictable behavior and tend to keep our money in our banks, therefore retail funded institutions tend to be much more stable, at least until anything bad occurs. which, incidentally, banks are quite good at foretelling!

What about banks that focus on trading, though? They heavily rely on the macro environment, so when the streets bleed, there's a good possibility they do too. This is thus because interbank borrowing and lending, for example, account for the majority of their income sources. And when markets are down, it's likely that individuals aren't stocking up on margins to trade stocks or purchase that item they may never use.

All of these banks place a great value on their physical presence, as you would have anticipated. For instance, at the end of 2020, Public Sector Banks in India had 2564 ATMs and 3078 branches. And each of the main four private players had around that many. One might only assert that a bank branch is present approximately every fifth round! I'd say that adding significantly to their operating expenses.

Business model of a Challenger Bank: What distinguishes a Challenger Bank?

Is there a way that knowing the largest expense for established banks to grow might be utilized as a competitive advantage when establishing a new bank? Because, let's face it, banks are the primary benefactors of cross-sided network effects, and overcoming that barrier is a very difficult task.

But what exactly are challenger banks?

These are tiny charter banks with little to no physical presence and a comprehensive online presence. Challenger banks often start off with only one product, which they deliver to their customers digitally. This lowers their operating expenses, which they sometimes pass along to their end customers. The lower charges to end users also serve as a successful word-of-mouth marketing strategy, enabling them to expand their clientele beyond the initial consumer persona, which is often the group that Traditional Banks underserve.

As a result, Challenger Banks begins developing other product lines to support their expansion. Traditional banking may conjure images of massive brick-and-mortar buildings, broken ATMs, and stacks of paperwork. Neobanks are a new breed of non-bank fintech (financial technology) firms that promise seamless online experiences and low- or no-fee services. Neobanks are challenging these assumptions by offering digital-first and sometimes, digital only banking platforms. The Neobank experience, however, is it really all that great for customers? Here is a list of some of the most well-known neobanks in existence today, their business strategies, and some things you may want to think about before switching.

How Do Neobanks Work?

Neobanks, sometimes known as "challenger banks," are fintech companies that provide software, applications, and other tools to simplify mobile and internet banking. These fintech companies often focus on certain financial products, such as checking and savings accounts. Even though many of them collaborate with these organizations to guarantee their financial products, they often exhibit more agility and transparency than their megabank rivals. These fintech companies are more often referred to as "neobanks" in the US. In the UK, the phrase "challenger bank" originally gained popularity. will discuss a number of fintech banking businesses that appeared during the financial crisis of 2007–2009.

The term "challenger" fits well. These businesses are often contrasted with digital disruptors in other sectors. The banking business is now being transformed by fintechs in a similar fashion to how Uber and Lyft transformed the transportation sector or Airbnb the hospitality sector. Some well-known neobanks in the US are gaining a ton of consumers. For instance, Chime was predicted to have 12 million consumers in February 2020, up from 8 million in the previous year. According to study conducted by Paris, France-based Exton Consulting, a strategy and management consulting business for the financial services industry, there were 256 neobanks globally as of December 2020.

Renowned Neobanks

Neobanks are abundantly available on the market. The benefits and downsides of some of the most well-known online banks were recently broken down by Forbes Advisor. The list features a variety of "hybrid" platforms and neobanks that provide comparable digital services but are connected to established organizations. Here are a some of the most well-known neobanks currently available.

Chime

Chime, which has more than 12 million subscribers, is undoubtedly the most well-known brand in the American neobank market. Many of the standard costs usually connected with physical banks are eliminated by the platform. Chime offers attractive annual percentage yields (APY), early access to direct deposit payments, credit-building possibilities, and automated savings tools. Chime is not a bank; it is a provider of financial technologies. The Bancorp Bank or Stride Bank, N.A., members of the FDIC, are the companies that supply debit cards and banking services.

Bank Varo

Neobank Varo Bank was established. However, the firm, which has around 2 million subscribers, became a bank in 2020 after receiving a full-service national banking license from the Office of the Comptroller of the Currency (OCC). Similar benefits to Chime are provided by this service,

such as no monthly or overdraft fees and no minimum balance requirement. To open an account, users are not subject to a credit check.

Current

Another neobank with a large user base in the United States is Current. It provides advantages including early direct deposit access, cost-free overdrafts, and cash back on debit card transactions.

Worldwide Challenger Banks

Popular challenger banks in the UK include Metro Bank, Revolut (which just made its U.S. debut), and Starling. N26 in Germany and NuBank in Brazil are two other competitors on the international stage.

Online banks vs neobanks

Neobanks should not be mistaken with online banks since they are mostly internet-only banking solutions without any physical locations. Online banks often have a bank charter and provide their clients a wider variety of services, including loans. For instance, Ally Bank is regarded as an online bank.

Established firms have introduced or enhanced their own products or divisions to compete with the emerging neobank market in reaction to the popularity of neobank platforms. For instance, Capital One 360 offers a fee-free checking account with comparable benefits including no minimum balance restrictions. There are several more, including Marcus by Goldman Sachs and Discover Bank by Discover Financial Services.

How do neobanks generate revenue?

Neobanks often operate on a different business model than established banks. They get a large portion of their income through interchange, which are fees paid by retailers when users use their debit cards to make transactions. Neobanks are permitted interchange percentages that are up to seven times greater than those offered to banks with more over $10 billion in assets since they are smaller firms. The amount of money challenger banks earns from clients utilizing out-of-network ATMs is another topic of discussion. In a recent story, Axios examined Chime's revenue sources and speculated that this sum may be "significant" upwards of 20%. In reaction to the article, Chime said that this revenue stream only accounts for a "small percentage" of total business sales and reaffirmed their statewide network of 38,000 fee-free ATMs.

Over the last ten years, venture investors have also poured money into neobanks. Chime received $485 million in Series F fundraising in 2020, which increased its worth to $14.5 billion. Varo received $63 million earlier this year, increasing its total capital in less than four years since its debut to more than $482 million.

However, not every challenger bank succeeds, and some doubters doubt such exorbitant values. Some early European darlings, like as Monzo, suffered greatly as a result of the epidemic and its effects on consumer purchasing. The Covid-19 problem and ensuing challenges in acquiring capital were cited as reasons for the collapse of the Australian neobank Xinja last year.

Simple, a 2009 startup, and Azlo, a fee-free bank for small companies, were two of BBVA's challenger bank acquisitions in the United States that were recently revealed to be closing. It's said that PNC Bank, which is in the process of buying BBVA USA, wants to entice Simple and Azlo

clients back to its own core services. The "strategic decision" is a good example of how shaky certain neobanks' prospects for long-term development are.

Should You Take into Account Changing to a Neobank?

It's simple to see why clients are drawn to neobanks given the rising need for digital financial services. It's handy to carry out routine chores like peer-to-peer payments and check deposits online without having to pay a ton of fees. Neobanks' agility, which often results in fewer regulatory obstacles to overcome, also frequently results in simpler account setup and quicker processing times.

Neobanks don't suit everyone, either. Compared to established financial institutions, they often provide less services. They often offer their clients no or little credit. They place a greater emphasis on fundamentals like checking and savings accounts than, say, lending money for mortgages or other types of loans. They also seldom construct physical branches, so customers are unlikely to have access to in-person account service [9], [10]. Customers who are thinking about switching from a traditional bank to a digital-first one should take into account the following:

i. The available financial products such as bank accounts, platforms for money transfers, etc. and how well they match your demands
ii. Accessibility and availability of ATMs
iii. Any additional fees or "fine print" costs that may apply, especially for overdrafts
iv. The interest rates for accounts that pay interest.
v. The platform's built-in tools for budgeting or financial education.

Prospective Neobank clients should evaluate their degree of familiarity with technological platforms. Would you install another app and provide it permission to see your financial information? Do you feel comfortable talking to a chatbot about your banking needs? Do you find customer care offered exclusively online attractive or do you prefer in-person assistance?

Another crucial point to address is what would happen if a neobank failed, despite considerable hand-wringing about the status of the European neobank sector at the moment. Users were given the reassurance that their accounts would be available for a few months after Simple declared its demise in January 2020 and would then be transferred to Simple's parent firm, BBVA. What about independent neobanks that aren't connected to significant institutions?

Due to the importance of the final criteria, it's crucial to ensure that any neobank with whom you create an account is federally insured. Make that the neobank you're thinking about is approved by the Federal Deposit Insurance Corporation (FDIC), or for people outside of the United States, covered by the Financial Services Compensation Scheme (FSCS) or other equivalent regulatory agencies. This provides some level of protection for money you put into online or mobile applications.

CONCLUSION

In conclusion, the rise of challenger banks and neobanks represents a turning point in the development of the banking sector. The way people interact with financial services has changed as a result of these digital disruptors. The conventional banks have been forced to reevaluate their strategy and adjust to shifting consumer tastes as a result of their concentration on customer-centricity, technological agility, and creative product offerings. The zeitgeist of the digital age has

been effectively tapped into by neobanks and challenger banks, who are catering to a tech-savvy youth that values ease, transparency, and individualized experiences. These organizations have eliminated the obstacles to entry for financial services, democratizing access for a larger audience by using cutting-edge technology and reinventing conventional banking procedures. Obstacles that must be overcome include regulatory complexity, cybersecurity worries, and the need to build trust in a digital context. Neobanks and challenger banks' capacity to preserve profitability while retaining their competitive edge will also be a key element in their long-term success as they develop and expand.

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CHAPTER 8

A BRIEF STUDY ON ARTIFICIAL INTELLIGENCE IN BANKING

Vipin Jain, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- vipin555@rediffmail.com

ABSTRACT:

A change in how financial institutions function, interact with consumers, and make strategic choices has been prompted by the integration of artificial intelligence (AI) in the banking industry. The present study offers a thorough summary of AI's function and effects on the banking sector. Banks are using artificial intelligence (AI) technology, such as machine learning, natural language processing, and predictive analytics, to simplify operations, tailor consumer experiences, and improve risk management. By integrating AI into banking, the sector is undergoing a paradigm shift that will lead to greater efficiency, individualized services, and data-driven decision-making in the future. Despite the significant potential advantages, there are still issues that must be resolved, including data privacy concerns, ethical issues, and talent shortages. Collaboration between technological specialists, regulatory agencies, and financial institutions will be necessary for the effective implementation of AI in banking, ensuring that innovation is balanced with ethical and responsible AI practices.

KEYWORDS:

AI, ATM, Banks, Financial Services, Fintech, Technology.

INTRODUCTION

Industries are being redefined by digital disruption, and firms are operating differently. Every sector is evaluating its alternatives and implementing strategies to provide value in the technology-driven environment. The most notable of these revolutionary shifts in the banking industry is the growing emphasis on the needs of the consumer. Customers that are tech aware and often interact with cutting-edge technology want banks to provide smooth experiences. For services like mobile banking, e-banking, and real-time money transfers, banks have extended their industrial landscape to include retail, IT, and telecom in order to satisfy these demands. While these developments have made it possible for clients to access the majority of banking services at anytime, anywhere, they have also come at a cost to the banking industry [1]–[3].

The integration of the banking industry with industries like IT, telecom, and retail has expanded the movement of sensitive data across virtual networks that are susceptible to fraud and cyberattacks. These accidents harm banks' reputations and relationships with consumers in addition to affecting their profits. Government rules have become more stringent as internet security dangers in financial transactions have increased. These restrictions have limited banks' capacity to keep up with the digital transition even if they are beneficial for monitoring online financial activities. Because they must maintain a capital adequacy ratio in accordance with international regulatory framework rules, banks are unable to invest in technology. Because they are not required to maintain a capital adequacy ratio, agile Financial Technology (FinTech)

businesses present a threat to banks. About half of clients worldwide expressed an increased chance to transfer banks with these companies, according to the World Retail Banking Report of 20161.

Using artificial intelligence as a strategy

By using cognitive technology and Artificial Intelligence (AI), banks may benefit from digitalization and better compete with FinTech competitors. According to a joint study by the National Business Research Institute and Narrative Science2, 32% of financial service providers now use AI technology like voice recognition and predictive analytics.

The use of sophisticated data analytics by artificial intelligence will transform banking in the future by reducing fraud and enhancing compliance. Anti-money laundering tasks that would often take hours or days may now be completed in a matter of seconds thanks to AI algorithms. Banks can handle massive amounts of data at lightning-fast speeds in order to get insightful information from it thanks to AI. With the help of features like AI bots, digital payment advisors, and biometric fraud detection systems, a larger consumer base may benefit from higher-quality services. All of this results in more revenues, lower expenses, and higher profits.

AI is enhancing banks' ability to compete by

Improved customer experience: AI has a deeper knowledge of consumers and their behavior based on previous encounters. By incorporating customized features and easy interactions, this allows banks to modify their financial products and services in order to create meaningful consumer engagement and build lasting connections with their clients.

AI aids banks in forecasting future events and trends because of its capacity to make predictions about the future based on previous behavior. This aids banks in detecting anti-money laundering patterns, identifying fraud, and providing consumer suggestions. Through a sequence of steps, money launderers provide the impression that the source of their illicit funds is legitimate. AI recognizes these covert operations and aids banks in saving millions of dollars thanks to the strength of machine learning and cognition. Similar to this, AI can handle fraud by spotting questionable data trends within enormous amounts of data. Additionally, AI uses its primary recommendation engines to analyze the past to forecast the behavior of data points in the future, aiding banks in effectively upselling and cross-selling [4]–[6].

Claims management is one of several information-intensive, expensive, and error-prone banking activities that can be automated thanks to the cognitive process automation feature. This guarantees ROI, lowers expenses, and assures correct and speedy service processing at every stage. Fundamentally, cognitive process automation automates a collection of processes that continuously improves upon earlier iterations via machine learning.

Realistic interactive interfaces: Chatbots recognize the context and emotions present in a text conversation and react accordingly. As a consequence of cumulative cost reductions, these cognitive robots help banks save millions of dollars in addition to saving time and enhancing efficiency.

Effective Decision-Making: Cognitive systems that behave and think like human specialists provide the best answers depending on the information at hand in the present. These systems maintain a knowledge database, which is a repository of expert knowledge. These cognitive mechanisms are used by bankers to make strategic choices.

Robotic process automation (RPA) is the automated evaluation and transformation of processes using AI. This makes it possible to automate around 80% of repetitive labor activities, freeing up knowledge workers to focus on value-adding tasks that need significant human involvement.

Future influenced by AI

In addition to empowering banks by automating their knowledge workers, AI will make the whole automation process smart enough to eliminate cybersecurity issues and competition from FinTech competitors. AI, which is essential to the bank's operations and procedures, continues developing over time without a lot of human work. Banks will be able to give individualized services while maximizing the use of human and machine skills thanks to AI. For banks, achieving all of these advantages is no longer a distant goal. Leaders in the banking industry have already adapted AI and acted responsibly to get these advantages.

The Financial Services Sector and Artificial Intelligence

The digital marathon that began with the emergence of the internet and has led organizations through numerous phases of digitalization has reached the Financial Services Industry's Artificial Intelligence (AI) phase. The rise of AI is upending the laws of physics in the sector, loosening the ties that have kept the elements of conventional financial institutions together, and creating space for new ideas and operating models.

The study of artificial intelligence, or AI, focuses on building intelligent computers that function and carry out jobs much like people. These machines possess the capacity to learn, organize, and understand data in order to build predictions on it. Consequently, it has developed into a crucial component of technology in the Banking, Financial Services, and Insurance (BFSI) Sector, transforming the way goods and services are provided.

DISCUSSION

Why Do Banks Use AI? "Why Now?"

The standard of goods and services that the banking sector provides is changing as a result of AI. It has not only improved user experience and created better ways to manage data, but it has also sped up, streamlined, and redefined conventional procedures to make them more effective.

Data has evolved into an organization's most valuable asset as a result of the availability of technology like AI. More than ever, banks are aware of the cutting-edge and economical solutions AI offers and realize that, despite its importance, asset size will no longer be sufficient to create a successful company on its own.

Instead, the capacity of BFSI organizations to leverage technology to harness the power of their data to produce new and individualized goods and services is increasingly used to gauge their performance.

What are the factors causing AI to disrupt banking?

i. The Big Data market is exploding, which has had a significant influence on the banking sector as a result of shifting consumer expectations. Customers now interact with their banks on a more digital level, and in addition to the traditional structured data, such as transactional data, organizations now gather large volumes of unstructured data through their customer service, social media platforms, and other means of data collection, such as

emails, text and voice messages, images, and videos. Banks are now able to provide more individualized services because to big data. A 360-degree picture of the customer's relationship with the brand, comprising basic biographical information, transaction history, and social media interactions, is being used by banking organizations to guide decision-making.

ii. Infrastructure is readily available (fast computers, hardware, software, cloud): The growth of cloud technology, together with the accessibility of high computing resources and infrastructure, enables rapid processing of enormous amounts of data at reasonable prices with good scalability. This indicates that businesses are more prepared than ever to use AI.

iii. Regulatory requirements: Banks must submit correct reports on schedule in order to fulfill their regulatory duties. This is something that regulators closely monitor. Processes for regulatory compliance need the gathering of data from diverse source systems. By automating the data gathering procedures, boosting the speed and quality of decisions, and raising the organization's ability to fulfill regulatory compliance needs, AI-driven solutions provide an opportunity to solve some of the difficulties in today's financial systems. The front and back offices of financial organizations will undergo a profound transformation as artificial intelligence advance. The rise of AI will need significant modifications to the global financial market structure as well as alterations to long-standing rules. In order to help banks become more future-ready, this transition presents an opportunity for compliance teams to deliberately invest in new technology.

iv. Competition: In order to provide their customers, the finest services possible, banks are continuously vying with their industry counterparts and, more lately, with FinTechs. As businesses use cutting edge technology to gather the enormous quantity of data they already have, technology has emerged as a differentiator in this market. As a consequence, banks are using AI to enhance their present service offerings, launch new ones, and provide clients a more individualized experience.

To fully capitalize on the benefits provided by AI, the aforementioned elements are continually changing and offering new benefits and possibilities to enterprises. The BFSI industry is well situated to take advantage of this disruption and make progress on its path toward digital transformation.

Applications of AI in the banking industry

We have already seen the use of this disruptive technology in a number of sectors of financial services. The BFSI sector has seen the largest influence from AI in the use cases listed below.

i. **Chatbots:** Natural Language Processing (NLP)-enhanced AI-powered chatbots engage and converse with clients online constantly. Chatbots are now able to assist with a variety of tasks, such as creating new accounts and forwarding complaints to the proper customer care departments, in addition to providing clients with the standard answers to their inquiries to guide them through their account data.

ii. **Fraud Detection & Prevention:** Up until recently, banks depended on anti-money laundering (AML) transaction monitoring and name screening systems that are based on

old rules and produce a large number of false positives. Enhanced AI components are being added to the existing systems to enable the identification of previously undetected transactional patterns, data anomalies, and suspicious relationships between individuals and entities in response to the alarming rise in fraud-related crimes and constantly evolving fraud patterns. As contrast to the conventional reactive method to fraud detection, this enables a more proactive approach where AI is utilized to stop fraud before it occurs. Customer Relationship Management: Maintaining positive customer interactions For banks, management is a crucial component. Banks now provide more individualized, round-the-clock services to each of its clients, including the ability to connect into banking applications using face recognition and voice commands. Additionally, banks are using artificial intelligence to analyze consumer behavior patterns and segment customers automatically, enabling targeted marketing and better customer engagement.

iii. **Predictive Analytics:** The emergence of Machine Learning (ML) & AI has made it possible to foresee and predict events accurately. Revenue forecasting, stock price forecasting, risk management, and case management are all areas where data analytics and AI are being used. The performance of the models has improved exponentially as data collection has increased, thereby reducing the amount of human interaction needed in the process.

iv. **Credit Risk Management:** Financial institutions are required to provide more dependable models and solutions as regulators continue to place a strong emphasis on risk management oversight. Especially in the Fintech and Digital Banking markets, the application of AI in credit risk management is growing in popularity.

By using data to anticipate the likelihood of default, AI is utilized to assess the creditworthiness of the facility borrower, helping to increase the precision of credit choices. As a consequence, the market is shifting away from expert judgment and toward insights-driven lending, which maximizes the rejection of high-risk consumers and minimizes the rejection of creditworthy people while also lowering credit losses suffered by financial institutions [7]–[9].

Credit and Loan Decisions

In order to make better, safer, and more lucrative loan and credit choices, banks have begun using AI-based solutions. Currently, many banks still only consider a person's or business's creditworthiness based on their credit history, credit ratings, and customer references. One cannot ignore the fact that these credit reporting systems often include inaccuracies, exclude real-world transaction histories, and incorrectly identify creditors.

Customers with little credit history may use an AI-based loan and credit system to analyze their patterns of behavior to assess their creditworthiness. Additionally, the technology notifies banks of certain actions that can raise the risk of default. In summary, these technologies are significantly altering the way that consumer financing will be done in the future.

Monitor Market Trends

Banks can evaluate massive amounts of data and forecast the newest market trends with the use of AI-ML in the financial services industry. Modern machine learning methods provide investment suggestions and assist in evaluating market sentiment.

AI banking solutions also recommend the ideal period for stock investments and provide alerts when there is a possible danger. This cutting-edge technology also helps to speed up decision-making and makes trading easier for banks and their customers because of its high data processing capability.

Information Gathering and Analysis

Every day, financial and banking organizations record millions of transactions. Due to the vast amount of information created, workers find it difficult to gather and register it. It becomes hard to structure and record such a large quantity of data without making any mistakes. In these situations, effective data gathering and analysis are made possible by cutting-edge AI and banking technologies. Thus, the whole user experience is enhanced. Additionally, the data may be utilized to identify fraud or make credit judgments.

Customer satisfaction

Customers are continually seeking for more convenient and superior experiences. For instance, ATMs were a success because they allowed users to access necessary services like money withdrawal and deposit even outside of bank business hours. More innovation has only been spurred by this degree of ease. Customers may now use their cellphones to establish bank accounts from the comfort of their homes. Artificial intelligence integration improves the user experience and degree of convenience for customers of banking and financial services. AI technology speeds up the recording of Know Your Customer (KYC) data and eliminates mistakes. Additionally, timely releases of new goods and financial offers are made. Clients may avoid the headache of manually going through the full procedure by utilizing AI to automate eligibility for situations like asking for a personal loan or credit. Additionally, AI-based software shortens the approval process for services like loan disbursement. An error-free account setup process is made possible by AI in banking customer care, guaranteeing a positive customer experience.

Management of Risk

The banking and financial sectors are significantly impacted by external events on a worldwide scale, such as changes in exchange rates, natural catastrophes, or political upheaval. Making business judgments with more caution is essential in such uncertain times. Generative AI in banking provides insights that help you remain organized and make timely choices by providing a pretty clear picture of what is to come.

By calculating the likelihood that a customer would default on a loan, AI for banking also assists in identifying hazardous applications. By examining historical behavioral patterns and smartphone data, it forecasts this future behavior. Learn how technology is influencing the future of digital lending by reading the provided blog.

Regulatory Conformity

One of the most strictly regulated industries in the world is banking. The use of banks by banking clients in committing financial crimes is prohibited, and governments utilize their regulatory authorities to guarantee that banks have appropriate risk profiles and don't see widespread defaults. Banks often have an internal compliance team on staff to handle these issues, but manual solutions take a lot longer and cost a lot more money. Banks must continually update their procedures and workflows to comply with the compliance rules, which are also often changed.

To read new compliance standards for financial organizations and enhance their decision-making process, AI and ML in banking employ deep learning and NLP. Although AI in the banking industry can't completely replace compliance analysts, it can speed up and streamline their processes.

Statistical Analysis

Predictive analytics and general-purpose semantic and natural language applications are two of the most often used use cases of AI in the banking sector. Data may have special patterns and connections that AI can identify that were previously invisible to conventional technologies. These trends could point to underutilized cross-sell or sales possibilities, operational data measures, or even revenue-impacting variables.

Automation of Process

By automating time-consuming, repetitive processes, robotic process automation (RPA) algorithms improve operational efficiency and accuracy while lowering expenses. Users may now concentrate on harder tasks needing human interaction. RPA is now being effectively used by financial organizations to speed up transactions and improve efficiency. For instance, CoiN technology from JPMorgan Chase examines papers and extracts data from them considerably more quickly than people can. To find out how RPA is changing the insurance industry, read the blog that is linked.

CONCLUSION

In conclusion, the use of artificial intelligence (AI) in the financial industry is showing to be a game-changing development with wide-ranging effects. By improving operational efficiency, customer experiences, and decision-making processes, the dynamic capabilities of AI, which include machine learning, predictive analytics, and natural language processing, are altering the conventional banking environment. Despite the enormous promise of AI, issues including data privacy, cybersecurity, and ethical concerns must be resolved in order for it to be successfully integrated. To achieve a balance between innovation and the ethical use of AI, cooperation between AI scientists, banking professionals, and regulatory agencies is crucial. As AI develops, it will change the way banking concepts are thought of, forcing institutions to adjust to the quickly shifting technological environment. By providing better services, increasing efficiency, and anticipating market trends, banks that use AI efficiently will gain a competitive advantage. In the end, the development of AI in banking is evidence of the sector's dedication to innovation, flexibility, and satisfying clients' changing demands. AI has the ability to transform banking by building a more effective, customer-focused, and secure financial ecosystem via careful and deliberate integration.

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CHAPTER 9

A BRIEF STUDY ON DATA SECURITY AND CYBERSECURITY

Pankhuri Agarwal, Associate Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- dreams.pankhuri@gmail.com

ABSTRACT:

The banking industry has entered a new age of digital connectedness and efficiency as a result of the confluence of technology and finance. However, in terms of data protection and cybersecurity, this change has created considerable issues. The present study offers a perceptive overview of the banking industry's critical need for data protection and cybersecurity. Banks serve as the guardians of sensitive financial data in an interconnected society, making them great targets for hackers looking to exploit weaknesses. The transformation of the banking industry into a digital environment necessitates continuous commitment to data protection and cybersecurity. Finding the right balance between innovation and protection is a difficult endeavor with serious repercussions. As technology advances, so do cybercriminals' techniques. As a result, strengthening the banking industry's roots in the digital era depends on its dedication to preventative measures, collaborative efforts, and a culture of security. By putting data security first, the banking industry can successfully negotiate the digital frontier, keeping consumer trust and safeguarding the integrity of financial systems.

KEYWORDS:

Banks, Cybercriminal Activity, Cybersecurity, Data Security, Financial Sector, Networks.

INTRODUCTION

Throughout its entire lifespan, data security is the activity of preventing unwanted access, corruption, and theft of digital information. It is a notion that covers all facets of information security, including administrative and access controls, logical security of software programs, and physical security of hardware and storage devices. Organizational policies and procedures are also included.

Strong data security plans, when properly put into place, can safeguard an organization's information assets not just from cybercriminal activity but also from insider threats and human mistake, which continue to be among the primary causes of data breaches in the modern day. Implementing tools and technology that improve the organization's visibility into where its crucial data is located and how it is utilized is a key component of data security. These technologies should ideally be able to automate reporting to speed up audits and ensure compliance with regulatory standards, as well as implement safeguards like encryption, data masking, and redaction of sensitive information [1]–[3].

The cybersecurity of banking is become more important as we move toward a digital economy. For the digital revolution to be effective, strategies and processes designed to protect the data must be used. Whether it's an unintended breach or a well-thought-out hack, the security of our

Personally Identifiable Information (PII) depends on how successfully banks' cybersecurity is implemented.

Since enormous financial quantities are at risk and there is a chance of considerable economic upheaval if banks and other financial systems are hacked, the stakes are high in the banking and financial sector. There is a strong need for cybersecurity professionals due to the exponential growth of financial cybersecurity. Browse the top Security certificates.

What does banking cybersecurity entail?

The "cybersecurity" set-up of technologies, protocols, and procedures is designed to protect against intrusions, damage, viruses, malware, hacking, data theft, and unauthorized access to networks, devices, programs, and data.

The main objective of cybersecurity in the banking industry is to protect the user's assets. There are more online activities and transactions as more individuals become cashless. People make purchases using electronic payment methods like debit and credit cards, which need cybersecurity protection.

Current Cybersecurity Situation in Banks

Indian banks reported 248 successful data breaches by hackers and criminals between June 2018 and March 2020; the government alerted Parliament on August 2, 2020. 11,60,000 cyberattacks were reported by the Indian government in 2020. It is predicted to increase by three times from 2019. India has been a victim of significant cyberattacks, including the phishing effort that almost led to a fraudulent transaction of $171 million against the Union Bank of India in 2016. Union Bank of India was the victim of a hack that included internet banking and caused a large loss. One of the officials opened a questionable link after falling for the phishing email, which gave the virus access to the system. Using phony RBI IDs, the attackers gained access to the system. Banks are required to improve their IT risk governance framework, which calls for the Chief Information Security Officer to take a proactive role in addition to that of the Board and the Board's IT committee in ensuring that the necessary standards are being followed.

The Importance of Cybersecurity in Banking

Cybersecurity has a high priority in the financial sector. Building credibility and trust is crucial since it forms the basis of banking. Here are five reasons you should be concerned about cybersecurity in the banking sector. They include:

1. Everyone seems to be completely cashless and making purchases online using debit and credit cards. In this situation, it is crucial to make sure that the necessary cybersecurity precautions are in place to secure your privacy and data.
2. It could be challenging to trust financial institutions after data breaches. That's a big problem for banks. A poor cybersecurity solution might easily result in their customer base relocating their company elsewhere due to data breaches.
3. When a bank's data is hacked, you often lose time and money. It might be uncomfortable and time-consuming to recover from the same. It would include canceling cards, going through bills, and keeping an eye out for problems.

4. Your sensitive information might be used in potentially damaging ways. Even if the cards are banned and fraud is immediately dealt with, your data is sensitive and may reveal a lot of information that might be used against you.
5. Banks must use more caution than the majority of businesses. The cost of keeping the type of valuable personal data that banks do is that. The bank's information might be compromised if it is not protected against cybercrime concerns.

DISCUSSION

Principal Cybersecurity Threats to Banks

The frequency of cybercrimes has escalated over the last several years to the point where it is believed that they are one of the biggest threats to the financial industry. Hackers' technology and skill have advanced, making it challenging for any financial sector to constantly withstand the assault. Among the threats to banks' cybersecurity include the following:

1. Attacks by Phishers

Phishing attacks are one of the most prevalent cybersecurity issues in the banking industry. They may be used to get into a financial institution's network and launch a more serious assault like an APT, which can have catastrophic results for such businesses. In an APT, a user who is not authorized may enter the system and utilize it for a prolonged period of time without being detected. This might have serious negative financial, data, and reputational effects. Phishing attacks against financial institutions reached their height, according the poll, in the first quarter of 2020.

2. Trojans

The word "Trojan" refers to a number of risky strategies hackers employ to trick their way into protected data. Before it is loaded on a computer, a Banker Trojan seems to be reliable software. But it's a malicious computer program designed to get access to sensitive information processed or stored by online banking services. A backdoor in this kind of computer software makes it possible to access a computer from the outside. In the first quarter of 2020, there were around 54,000 installation packages for mobile banking trojans worldwide. When compared to the same quarter last year, there has been an increase of more than 53%. The number of trojan packages that target mobile banking surged in the fourth quarter of 2020 after decreasing for the first three quarters.

3. Ransomware

Important data is encrypted by the cyberthreat known as ransomware, which prohibits owners from accessing it unless they pay a hefty fee or ransom. Ransomware is a serious danger to financial institutions since 90% of them have experienced it in the last year. Ransomware impacts bitcoin in addition to presenting a risk to financial cybersecurity. Cryptocurrencies' decentralized design makes it possible for scammers to hack trading platforms and steal money.

4. Spoofing

In this sort of cyberattack, hackers use a clone site. They; by pretending to be a financial website;

i. Create a layout that, in terms of both look and functionality, is similar to the original.
ii. Create a domain with a minor spelling change or domain extension.

Through a third-party communications service, such as text messaging or email, the user may visit this counterfeit website. When a user is not paying attention, hackers may get their login credentials. Many of these problems may be resolved with seamless multi-factor authentication.

In 2020, 604 billion Indian rupees in bank frauds were recorded by the Reserve Bank of India (RBI). This was a decrease from more than 1.3 trillion rupees in 2020.

Banking Cybersecurity Applications

Threats to cybersecurity are ever-evolving, so the financial industry has to take precautions to stay safe. When more current attacks are threatened by new defenses, hackers adapt by creating tools and security-compromising techniques. The system for securing financial transactions is only as powerful as its weakest component. To safeguard your data and networks, you must have a variety of cybersecurity tools and techniques at your disposal. A few essential cybersecurity tools are listed below:

1. Network Security Monitoring

Continuously scanning a network for indications of risky or invasive conduct is known as network monitoring. It typically works in conjunction with other security tools like firewalls, antivirus programs, and IDS (Intrusion Detection Systems). Both manual and automated network security monitoring are supported by the program.

2. Computer Security

Applications that are crucial to company operations are protected by application security. You may coordinate your security rules with file-sharing rights and multi-factor authentication using its capabilities, which include an application that allows listing and code signing. Software security will undoubtedly be improved by the application of AI in cybersecurity.

3. Management of Risk

Risk management, data integrity, security awareness training, and risk analysis are all parts of financial cybersecurity. The appraisal of risks and the mitigation of their negative effects are crucial components of risk management. The protection of sensitive data is a concern of data security.

4. Safeguarding Crucial Systems

Wide-area network connections shield large systems from threats. It follows the strict safety guidelines that have been established by the sector for consumers to adhere to while taking cybersecurity precautions to secure their devices. It continually keeps track of all running applications and scans the network, servers, and users for security flaws.

How can banking institutions become more secure online?

A wonderful way to express your worry about an organization's cybersecurity is via security ratings. However, you must also show that you are adhering to industry and legal best practices for IT security and basing your choices on the long term. Having a cybersecurity framework might be useful. You may enroll in an ethical hacking course to expand your education [4]–[6].

Top Bank Cybersecurity Framework

For security professionals across nations and businesses, a cybersecurity framework offers a common language and set of standards that allow them to comprehend their own security postures and those of their providers. Having a framework makes it simpler to specify the steps your firm must take to evaluate, track, and reduce cybersecurity risk.

Let's examine several prevalent frameworks for financial cybersecurity:

1. NIST Framework for Cybersecurity

Improving Critical Infrastructure Cybersecurity, the previous president's executive order, called for more collaboration between the public and commercial sectors in order to identify, assess, and manage cyber risk. The NIST Cybersecurity Framework was developed in response. NIST has established itself as the industry benchmark for assessing cybersecurity readiness, identifying security flaws, and upholding cybersecurity regulations even when compliance is voluntary.

2. The CBEST Vulnerability Testing Framework from the Bank of England

The Council for Registered Ethical Security Testers (CREST) and Digital Shadows worked with the UK Financial Authorities to establish the CBEST vulnerability testing methodology. It is a testing framework driven by intelligence. The formal launch of CBEST occurred on June 10, 2013. CBEST uses information from reliable government and commercial sources to identify potential attackers for a certain financial institution. It then mimics these possible attackers' techniques to see if they can effectively get past the institution's defenses. This makes it possible for a business to identify the areas of its system that are weak and to develop and carry out corrective action plans.

3. The CIPHER Framework is a cybersecurity and privacy framework for privately held information systems.

Privately Held Information Systems, or PHISs for short, are computer systems that are under the authority of both public and private entities and that house personal information collected from its customers. The CIPHER framework covers digital information types, electronic systems, and techniques for data exchange, processing, and maintenance (not paper documents). The main objective of the CIPHER methodological framework is to provide guidelines and best practices for safeguarding privately held information systems (PHIS) online. The primary characteristics of the CIPHER methodological framework are as follows:

1. The capacity to be employed by any organization operating in any area, even when current technologies degrade or are superseded by newer ones, is known as technology independence (versatility).
2. The three main groups of users who concentrate on this user-centric strategy are PHIS owners, developers, and citizens.
3. Describes potential safeguards and procedures to enhance or confirm if the company is protecting data from internet threats.
4. It is easy to use and doesn't call for specialist expertise from organizations or people.

Challenges in Banking Cybersecurity Implementation

Digital cybersecurity in banking has been significantly hampered by a few contributing factors. Some of them are as follows:

1. Lack of Information

The general public's knowledge of cybersecurity has remained low, and few companies have made major investments to increase it.

2. Insufficient funding and poor management

Cybersecurity typically suffers budgetary short shrift due to its low importance. Top management continues to pay little attention to cybersecurity, and projects that help it are given low priority. The reason being that they could have undervalued how significant these hazards are.

3. Access and Identities are Badly Managed

Identity and access management has always been a key element of cybersecurity, particularly in the current climate when hackers are in charge and might get access to a company network with only one hacked login. Even though this region has made a little progress, much more work has to be done.

4. Growth of ransomware

Our attention has been drawn to the rising danger of ransomware as a result of recent computer assaults. Cybercriminals are starting to use a variety of strategies to evade detection by endpoint security software that focuses on executable files.

5. Mobile devices and apps

Nowadays, the majority of financial institutions largely use mobile devices for business. The base expands daily, making it the finest choice for exploiters. Mobile phones have become a more appealing target for hackers as a result of the rise in mobile phone transactions.

6. On social media

As a consequence of the widespread use of social media, hackers have intensified their exploitation. Less savvy customers provide their data to the public, which the attackers then utilize.

Career Opportunities in Cybersecurity in the Banking Sector

The employment outlook is more stable in the cybersecurity industry than in many other professions. For instance, between 2020 and 2030, the BLS forecasts a 33% growth in employment for information security professionals. The importance of information security in banking has also skyrocketed, and there is a significant need for workers who can defend against cyberthreats to the banking sector. The banking sector needs the following capabilities for cybersecurity [7]–[9].

1. Skills in Problem Solving

Problem-solving will be essential in your day-to-day job as a cybersecurity professional. People in the sector are challenged to address and resolve complex information security issues across a variety of new and existing technologies as well as digital environments.

2. Technical Expertise

Cybersecurity, as its name indicates, focuses on technology. It's likely that you'll be tasked with tasks including putting in place continuous network monitoring, diagnosing, maintaining, and upgrading information security systems, and providing real-time security solutions. One has to be digitally proficient to perform a cybersecurity professional's day-to-day responsibilities.

3. Skills in Communication

As a cybersecurity specialist, you will work directly with individuals in a variety of departments and positions, therefore it's critical that you have the ability to communicate your findings, concerns, and solutions to others. It is essential to be able to communicate cybersecurity strategy and policy in a clear and succinct manner, as well as to convey technical ideas to individuals with different levels of technical experience.

CONCLUSION

In conclusion, the banking industry is at a turning point in terms of both technical advancement and the need of data protection and cybersecurity. The crucial need of protecting client data, financial assets, and the integrity of the financial system is becoming clearer as financial institutions digitize their operations and services. Data breaches and cyberattacks have serious consequences for the financial industry. In addition to causing financial losses, breaches may harm institutions' and consumers' reputations and destroy customer confidence. Banks are under a lot of pressure to safeguard the security and privacy of client information due to the regulatory environment, which is defined by strict data protection legislation and industry standards. The difficulty of Figurehting against cyber-attacks is increased by the interconnectedness of contemporary banking ecosystems, including internet transactions, mobile applications, and digital consumer interactions. As the sector embraces cutting-edge technology like blockchain, AI, and open banking, new opportunities for innovation as well as new potential weaknesses appear.

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CHAPTER 10

A BRIEF STUDY ON BIOMETRIC AUTHENTICATION IN BANKING

Roma Khanna, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- romakhanna11@gmail.com

ABSTRACT:

The banking industry is witnessing a seismic change toward more user-friendly and safe authentication techniques in the digital era. Because traditional authentication methods like passwords and PINs have been shown to be vulnerable to many security flaws, there is a greater need for more robust security measures. By using distinctive physiological and behavioral attributes for identity verification, biometric identification has become a cutting-edge response to these issues. The importance of biometric identification in banking is examined in this abstract along with its benefits, drawbacks, and potential future applications. For the banking industry, biometric identification has enormous potential because it strikes a perfect mix between increased security and consumer comfort. Despite obstacles, the continued development of biometric technology, together with strict privacy protections and regulatory frameworks, is set to fundamentally alter the financial authentication environment and promote a safer and more streamlined digital banking experience.

KEYWORDS:

Banking Industry, Biometric, Consumer, Indian Banking, Pins, Security.

INTRODUCTION

Technology Using Biometrics in Indian Banking

Technology development has raised the bar for security. Biometrics technology has been crucial in this area. This technology could have been included in your cell phones. Especially in the banking industry, biometric technology has the ability to enhance many business sectors.

Biometric technology development in the Indian banking industry

The Indian banking industry has made great strides in its use of technology. Customers have benefited from not having to wait in line at bank offices and from being able to do business from the convenience of their homes. Technology has made it feasible for this to happen. Due to security worries, the majority of clients were still hesitant to utilize online or mobile banking. Although they thought it was hazardous, consumers now feel safer knowing that their accounts cannot be accessed without their permission thanks to the usage of biometrics in banking. Because they are believed to be more secure than passwords, biometrics are likely to become more widely used in the future. Many individuals think using a fingerprint instead of a regular PIN to confirm card purchases and other transactions is considerably secure. The biometric industry is anticipated to grow, not only in India but also internationally [1]–[3].

What Role Does Biometric Technology Play in The Indian Banking Industry?

Banks all over the globe are now undergoing a fast digital transformation in an effort to get more advantages. Additionally, it entails reducing cyber hazards. Banks handle vast quantities of money and customer data, making them one of the most popular targets for hackers. Hackers pose a constant threat to banks, endangering them with damage costing millions of dollars, not to mention reputational harm. As a result, banks have stepped up their security, and it should go without saying that all banks and financial institutions need to be completely cyber protected.

Banks have continuously implemented strategies and tools to reduce cyber threats and frauds throughout the years. These security mechanisms include, among others, biometrics, OTP, hardware and software tokens. To reduce the risk of fraud, banks use multifactor authentication and demand that users furnish biometric identification. Fingerprints, speech patterns, iris scans, and other biometric factors are some of the most frequently employed biometric parameters in the Indian banking industry today.

New financial age

Identity verification and consumer experience are entering a new age thanks to biometrics. Different biometric technologies are now often utilized to assist organizations in user verification for KYC and fraud detection reasons. In the digital era, biometric verification has various applications, but its use in the financial sector has increased dramatically. Banks are employing biometrics more often to enable quick, secure account openings and transactions, replacing passwords, passcodes, two-factor authentication, and knowledge-based authentication.

How is the usage of biometrics in banking?

The majority of individuals are acquainted with using biometric authentication to access their mobile banking app. But this is only one example of how biometric technologies are used in banking. Customers may establish a bank account with the use of biometrics in a quick and safe manner. Banks must take certain steps to confirm client identities upon account opening in order to meet KYC and AML compliance obligations. Historically, a branch has been used to do this in person. However, a fresh round of market participants, like Revolut, Monzo, and Chipper Cash, altered that. They established an entirely digital onboarding procedure that was supported by Onfido-style identity verification [4]–[6].

The rest of the industry swiftly adopted this strategy, particularly to remain competitive as clients embraced the new opportunity to create bank accounts regardless of location. A bank account may now be opened entirely online or using a mobile banking app. They just need to snap a picture of their official identification, collect their biometric data, and they are immediately prepared to begin making payments.

Another area of banking where biometrics are employed is payments. Our phones may now be used to make payments immediately, all it takes is a fingerprint or face recognition. Biometric authentication is once again useful for consumers who wish to transfer significant sums of money. When a higher-risk transaction is being made, it provides a fast and simple method for companies to verify that the account is being used by the legitimate owner. The bank may verify that the customer's identification matches that which is registered to the account by asking them to re-complete a biometric check (authentication).

DISCUSSION

Why is biometrics needed by banks?

Biometrics in banking has a number of benefits. They are great at detecting fraud, to start. According to our Identity Fraud Report 2020, average ID fraud rates were 5.9%, but average selfie fraud rates were 1.53% and 0.17% for video. Biometric verification is significantly more difficult to falsify than document verification. Secure technology that effectively prevents fraud improves security. It implies that fewer criminals are able to access online bank accounts, giving your clients a more secure experience. Their funds are kept secure, and your company is shielded from the financial and reputational damage that fraud entails.

A bank's KYC, AML, and general compliance procedures depend on accurate identification verification. Before a consumer may open a bank account, the bank must confirm their identity. One method by which banks may fulfill this KYC requirement is biometric technology. Additionally, since biometrics are so secure, institutions are better guarded against the hazards of financial crime and money laundering that sometimes accompany fraud.

Last but not least, biometrics provide banking consumers a quick and simple option to open and reopen online bank accounts. The use of biometric and document verification eliminates the need for manual identity verification methods like filling out paperwork or visiting a branch in person. Customers may now access their bank accounts and begin making payments immediately rather than having to wait days. This goes a long way toward exceeding customers' expectations and giving them a wonderful experience, which may help a firm acquire more customers. Eight out of ten clients believe biometrics to be both easy and safe, according to our Digital by Default research.

Because biometric verification is automated, banks can operate more effectively and save money. By eliminating the requirement for manual verification, internal teams are freed up, and less money is needed.

What biometrics are used by banks?

1. Fingerprints (touch ID): Banks may require customers to utilize the touch ID function on their mobile device to scan their fingerprint in order to use the app.
2. Facial verification: In order to use a bank's app, a user may need to do a facial recognition scan. This verifies that the person accessing the account and launching the app is the true owner of the device. A new client may now create an account with several banks using their mobile device from anywhere by using face verification. These banks utilize facial scanning technology, such as Onfido, to determine if an identity document is authentic by comparing it to the face of the person presenting it.

A biometric payment is what?

Apple Pay and Google Pay are both well-known to consumers of digital devices. This enables mobile device payment using touch or facial ID. In this case, biometrics are saved on the device, and in order to make a payment to a merchant in person, online, or via a transfer, a user must confirm their identity once again by providing a biometric sample. When a consumer performs a high-risk transaction, such one involving a significant amount of money, banks also use biometric verification.

What Kinds Of Biometric Authentication Technologies Are There?

Various physical or behavioral characteristics are used in biometrics because they are thought to be more secure and robust. To build an impenetrable system, many biometric authentication techniques have been used.

1. **Eye scan:** Iris scan is a technique that analyzes the patterns of a tiny circular structure in a person's eye. It is a trustworthy technique for biometric identification. In India, several institutions have already embraced this kind of technology, and it will only get worse from here.
2. **A fingerprint reader:** You probably utilized this biometric technology on your mobile phones since it is one of the most widely used types. This analyzes the patterns on human fingertips in great detail. It is also the most typical and well-liked method of confirming an individual's identification.
3. **Speech recognizing:** Although it is a sophisticated sort of biometric technology, banks still like it. Banks would utilize this technology at ATMs, enabling users to complete transactions without the need for passwords or cards.
4. **Recognition of faces:** This technology utilizes the user's face to confirm access, however it can only be used under certain conditions, such as under light.

What Applications Does Biometric Technology Have In Banking?

We provide the following examples of how banks use biometrics to enhance their banking services:

1. Bank branches that use biometrics: Branch banking in the banking industry uses biometrics. For access authentication during financial transactions, banks utilize fingerprints or vein patterns. Banks may use it to recognize consumers inside of their locations. The access is prohibited if the biometrics do not match the system.
2. **At-machine biometrics:** In several nations, biometrics are widely used in ATMs. The introduction of fingerprint biometric systems has made using ATMs to conduct banking considerably safer. Once matched, the biometric is used to retrieve your account, allowing you to conduct transactions [7]–[9].
3. **Mobile banking using biometrics:** The use of biometrics into mobile banking has improved its credibility and attracted more users. Because they are hard to remember, passwords are no longer used. It has sped up and improved the security of banking.
4. **Internet banking using biometrics:** For online banking, several banks use multi-factor biometrics. Some banks require users to first produce a biometric credential in order to access their accounts. In addition to using regular passwords, some banks require multifactor authentication, often known as biometric authentication.

What Advantages Do Banks Get from Using Biometric Technology?

Banks are using biometrics more often since it is one of the safest security solutions and offers the following advantages:

1. **Guards' private information:** Banks may safeguard sensitive information by using biometrics and unique authentication. It safeguards banks against illegal access to private data.
2. **Easy accessibility to banks:** A rapid method for login into accounts is made possible by biometrics in banking. It has sped up and simplified banking.

3. **Safe Internet Banking:** People were hesitant to utilize online banking because of cyberattacks, but thanks to biometrics, consumer identities are now safeguarded while using online banking.
4. **Trails of audits:** Using biometric technology, banks can keep track of and monitor consumer and staff behavior inside the system to provide transparent audit trails.
5. **Enhanced customer care services:** Earlier telephone verifications were time-consuming, and clients had to provide a long list of answers to queries about their credentials. Voice verifications, however, have overcome all of these difficulties, which has enhanced customer care services.

What Benefits Can Banks Expect from Biometric Technology in Banking?

Inclusion in banking has greatly increased recently. In 2020, 71% of individuals had access to a bank account, up from 42% a decade earlier, according to the World Bank. Two-thirds of individuals globally now make or receive a digital payment, up from only 35% in 2014. This development is mostly due to the digital revolution. By 2024, Juniper Research predicts that there will be more than 3.6 billion consumers of remote banking.

Although remote banking has numerous benefits for both banks and clients, it also presents a significant difficulty. Remote banking depends on the user having some amount of confidence in their identification, and cyber-enabled crime may take advantage of that confidence. Banks often unintentionally open the door for fraudsters when they increase consumer convenience and remote access to digital services.

In reality, banks are under pressure from all sides since customers demand to create accounts quickly and easily when banking online. In the meanwhile, thieves are using internet methods to steal money and undermine security. Banks are simultaneously threatened with penalties related to KYC and AML compliance. In response, several banks are using cutting-edge verification technology to verify and enroll the new generation of online bankers, replacing time-consuming manual procedures and outmoded authentication techniques like passwords and passcodes.

In particular, biometric verification technology may help banks offer a simple user experience, increase customer inclusion, lower user annoyance, and provide the security required to guard against fraud while maintaining regulatory compliance. However, not every option offers the same degree of security.

What Roles Do Biometrics Play in Banking?

A few significant applications of biometrics in banking include: Client Onboarding: Verifying a new remote customer's identification is the first and most important step. This allows banks to screen out possible bad actors, bots, and false identities early and help compliance efforts (demonstrating they "know" their clients). This way, banks can be confident they're dealing with a real person right away. Banks may verify each new customer's identification without ever meeting them by scanning a trusted identity document, such a driver's license, and then doing a quick biometric face scan. Because you don't know a user's risk until you enroll them, onboarding is the moment of greatest risk. As a result, it's critical to start with the highest degree of identity assurance to protect against risks like synthetic identity fraud. Through the client lifetime, the trust created at onboarding will remain.

User Identification: A lawful account onboarding might result in account takeover fraud, identity theft, phishing, or other fraudulent behavior, which would subsequently jeopardize the account. Biometric face authentication makes guarantee that the individual attempting to access an account (the "visitor" or "owner") is always the same person who originally established the account. Returning authentication doesn't need the same rigorous procedure and may be accomplished with a simplified liveness check after the individual's identity has been verified using the highest degree of assurance, unless anything has changed to increase the amount of danger. Customers who seek a new line of credit, add a new authorized user to their account, ask for a password reset, set up a new device, or rebind an existing device are a few examples of this. In certain situations, a bank may choose to increase authentication and demand an extra biometric scan to make sure that the client requesting the modifications is indeed the one making them. This makes it possible for banks to provide consumers the ease and flexibility they seek. For banks to provide remote services easily and securely, the two aforementioned procedures have become absolutely necessary, with biometric technology at their heart.

What Are Some Banking Applications for Biometrics?

Numerous methods may be used to deploy biometric technology. To develop a multi-factor authentication or step-up authentication system, for instance, it may be paired with other authentication techniques.

Strong customer authentication regulations in certain regions mandate that banks use numerous security factors.

Why Is Biometric Technology Needed by Banks?

Using biometrics in banking offers the following major advantages:

1. To protect against fraud, including identity theft, account takeover, and other types of fraud.
2. To assist regulatory compliance: Many countries establish Know Your Customer (KYC) and Anti-Money Laundering regulations, which are most often related to banks, in reaction to the development of fraud, money laundering, and other illegal activities. More information on how biometrics may shield banks from money laundering can be found here.
3. To provide a quick, safe substitute authentication method: 32% of users had to ask for password reminders in the previous day. Password forgetfulness is a major problem that results in high administrative expenses and lost revenue.

iProov Biometric Face Verification for Banks: Benefits and Advantages

Not every biometric solution offers the same degree of security. This is due to the fact that they do not all have the same capacity for judging the "liveness" of the alleged person who is attempting to establish their identification in order to make sure they are who they say they are and present at the moment. When Figurehting against generative AI attack techniques like deepfakes and face swaps, this is crucial.

There may also be usability differences that have an impact. When analyzing solutions, it's critical to know crucial details like if any equipment or technological requirements apply and whether the user will be required to make any motions that would reduce completion rates [10], [11].

iProov technology offers the following major advantages:

1. Lower operational expenses: Cut down on mistakes and manual procedures, as well as fraud charges, by verifying that consumers are who they claim to be.
2. iProovs are generally > 98% in production applications, which is an outstanding completion rate for top biometric systems.
3. The highest standards of security: Unparalleled security may be provided by a powerful biometric solution. There is a reason why the Department of Homeland Security, UBS, the UK Home Office, and other banks like Knab and Rabobank have picked iProov among the world's most security-conscious enterprises.
4. Fraud prevention for both consumers and businesses: By ensuring that clients are present throughout the authentication and onboarding processes, you reduce the opportunities for fraudsters to take advantage of your services, which ultimately lowers fraud costs and creates safer, more secure user accounts.
5. True inclusiveness, accessibility, and privacy: iProov technology is usable and accessible to all people, regardless of their age, gender, race, or mental capacity. Technology is unobtrusive and passive. The user authenticates by merely glancing at their smartphone; they are not need to grin or move their head. A solution has a wider reach the more individuals who can utilize it. You can learn more about how iProov biometric technology promotes equality & accessibility as well as data privacy here.
6. Decreased chance of compliance fines and reputational harm from bad press: Biometric technology helps banks to adhere to regulations while ensuring clients, which may safeguard the organization's brand.
7. Supported KYC and AML Compliance: By providing safe, reliable client onboarding and continuous authentication, biometric technology helps KYC and AML compliance. As a result, KYC and identity verification are less expensive and take less time, relieving banks of most of the load placed on them by the KYC/AML ecosystem.
8.

CONCLUSION

In conclusion, biometric authentication represents a significant development in the fields of user experience and financial security. The industry's defenses against cyber threats have improved thanks to its capacity to harness the distinctiveness of physiological and behavioral features for identity verification, which has also made the authentication procedure for clients simpler. Banks have strengthened their barriers against illegal access and identity theft by using biometric indicators including fingerprints, face characteristics, speech patterns, and behavioral factors. Because users are relieved of the stress of having to remember passwords or carry physical tokens, this increased security is accompanied with a noticeably improved user experience. Consumer satisfaction has increased because too quick and safe account access, which has also increased consumer confidence in the banking industry. However, implementing biometric authentication is not without its difficulties. Due to the sensitive nature of biometric data, privacy issues are a major concern, calling for strict data protection procedures and adherence to changing rules. Technology constraints, such as problems with accuracy under different situations, serve as a reminder that continuous research and innovation are essential to enhancing and extending the capabilities of biometric systems.

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CHAPTER 11

PERSONAL FINANCIAL MANAGEMENT TOOLS IMPROVING DECISION-MAKING AND FINANCIAL WELLNESS

Anshu Chauhan, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- anshuchauhan1411@gmail.com

ABSTRACT:
People want for efficient ways to manage their money and attain financial well-being in a time of rising financial complexity and digital connectedness. Tools for personal financial management (PFM) have become essential solutions, enabling users to thoroughly monitor, evaluate, and improve their financial operations. The relevance of PFM tools is examined in this abstract, along with the advantages, difficulties, and revolutionary effects they have on personal financial management. PFM tools have significant potential in the future as the digital environment develops more. Enhanced integration with cutting-edge technologies like blockchain and Open Banking APIs might simplify and secure data access even further. The development of a seamless ecosystem that supports consumers' financial journeys may also be facilitated by increasing cooperation between financial institutions and PFM tool suppliers. PFM technologies end up being crucial allies for contemporary people navigating their financial environments. These technologies aid in building a more financially literate and resilient population, encouraging responsible money management, and providing actionable information, eventually paving the way for a more prosperous financial future for everyone.

KEYWORDS:

APIs, Blockchain, Financial institutions, Open banking, PFM, Transactions.

INTRODUCTION

Managing one's own money has become both necessary and challenging in an age of internet connectedness and ever-changing financial complications. With the introduction of Personal Financial Management (PFM) technologies, people can now manage their finances with unprecedented simplicity and insight, ushering in a new era of empowerment. This introduction goes into the world of PFM tools, examining their importance, features, and the radical changes they bring to people's financial life [1]–[3].

The need for efficient financial management has increased dramatically as a result of the growth of different financial accounts, transactions, investments, and expenditures. Digital allies, PFM technologies provide a consolidated platform to collect, arrange, and analyze financial data from many sources. Understanding and being able to understand one's complete financial environment is crucial because it enables people to take well-informed choices that are in line with their objectives.

PFM tools are primarily composed of a variety of features intended to simplify and improve financial management. These programs cover a range of financial requirements, from basic budgeting and cost monitoring to more complex features like goal setting, investment analysis,

and retirement planning. Users may examine minute data, classify expenses, keep track of trends, and get individualized insights that encourage wise financial decisions.

PFM tools also represent the core of financial literacy. Users obtain essential insights into their spending habits because to the real-time data and visual representations of financial habits that are provided, which enables them to spot areas for development and progress. The capacity to make thoughtful and educated financial choices increases along with financial literacy, eventually leading to increased financial stability and independence.

The blending of technology and finance has cleared the path for developments like integration with artificial intelligence (AI) and machine learning as PFM technologies continue to progress. With the use of these technologies, PFM solutions may be transformed into dynamic platforms that respond to users' changing financial requirements and situations. They can provide predictive analyses, individualized suggestions, and proactive notifications.

We will explore more into the advantages, difficulties, and potential they have to transform the personal finance landscape, ushering in a new era of financial well-being, empowerment, and informed decision-making in the investigation of personal financial management tools that follows [4]–[6].

What are apps for personal finance?

You may track your monthly spending with a variety of money-saving apps available on Google Play and the App Store. These programs may record costs such as food purchases, taxi tickets, and phone recharges, among other things.

For proper history keeping, several of these programs link your data with these digital payment wallets. You may be able to quickly invest in mutual funds using these budgeting tools, as well as get a loan. This suggests that a few of these programs may help you with various facets of personal finance in addition to money and expense control.

Why is a personal finance app necessary?

Saving money may be quite tricky since it can be difficult for small company owners and even those of us with personal accounts to effectively monitor and control spending. Numerous applications and pieces of personal finance software may serve as your personal financial adviser and assist you in effectively managing your money and personal finances.

Finding the ideal balance between your income and expenses is a wise money management strategy no matter what. An excellent method to manage your money is by keeping an eye on your expenses and creating a weekly or monthly budget. It is beneficial for maintaining good financial health and avoiding needless expenditure.

It would take an unreasonable amount of time and effort to manually track every rupee. We sometimes forget to account for certain costs. However, if you find it difficult to manage your monthly budget, there is no need for concern.

As your financial manager, these money management tools may help you identify areas where you can save costs. These financial planning tools will also inform you of the best possible investment avenues that will yield you the most return on your investment. Many users find these programs

to be quite beneficial for managing their funds. You can review and rate these personal finance applications in India on Google Play.

DISCUSSION

Best Indian Personal Finance Apps

Read the list of the top personal finance apps available in India to help you manage your money.

Lio

Lio is the program that aids in life organization. With Lio's assistance, you can manage everything, whether it be your house, workplace, school, or anything else. The program provides a variety of themes, and you may choose one and use it depending on your company. Additionally, you have the option of creating your own template depending on your demands and needs.

You may manage your company strategy, staff, taxes, cash flow, clients, rival businesses, and every other aspect of it on Lio. With Lio, you can essentially run your whole company and keep organized. You may work on this with others and see changes take place in real time. The software also provides the ability to upload and save significant images and documents.

Walnut

Walnut is a thorough money management application that makes keeping track of your transactions straightforward. It will record transactions performed using credit cards, mobile wallets, internet banking, and ATMs. Walnut keeps track of your expenditures and often reminds you to pay your bills. Graphs are used to simplify things. For a full picture, you may also include monetary payments. Walnut gathers data from SMS and groups costs according to their kind. You may also make a personal expense budget with the software. This software's ability to manage shared spending with friends and family and settle the debt through the app is one of its many valuable features.

Key attributes

Uses BHIM UPI; shows nearby ATMs; allows you to make cost reports;

a. Verify your bank balance;
b. Record reservations for, among other things, trains, cabs, movies, and activities.
c. You research and disseminate information on the places you visit online and with your friends.

Wallet Budget Bakers has collaborated with more than 4000 institutions worldwide to make the idea of "banking under one roof" a reality. Your bank accounts may be connected to the wallet app. You may also link any other payment methods you use, including your debit and credit cards. In addition to letting you see all of your financial transactions at once, Wallet also analyzes the information and provides useful recommendations. When you link your debit and credit cards, Wallet will access your data, retrieve your spending information, and use a machine learning algorithm to categorize it [7]–[9].

It uses straightforward images to compare your monthly spending and reveal what you've been overspending on. This personal financial program enables you to create a budget and communicate it with your loved ones in order to encourage systematic and planned spending. Never before has

keeping track of your spending been so simple. Key features include automated synchronization of transactions, graphs and other financial overviews, notifications of upcoming payments, support for many currencies, and receipt and warranty monitoring.

ET Cash

One of the most sophisticated personal finance apps on the market right now is ET Money. With its state-of-the-art technologies, you may choose from a range of mutual fund options. ET Money won't charge you any more money for the services they provide.

1. You may invest directly using this program in pension plans, term deposits, insurance, and mutual funds.
2. You can easily keep track of your bills and expenditures to reduce your tax liability. You will always have access to your credit score, which will be generated for free. Using the app, you can also submit a loan application.
3. Key features include voice search, payment alerts, analysis, and accessibility in eight Indian languages.

Groww

Groww is a Bangalore-based company that was founded in 2016 by former Flipkart employees. Groww is an excellent tool for investing in mutual funds. According to investor requirements, it categorizes plans into high-return investments, tax-saving investments, investments that beat fixed-interest securities, and SIPs with a minimum investment requirement of Rs. 500, to name a few.

Using the app, you may immediately invest in equities and gold. The app is updated in real-time in order to provide real-time market information. You may use Groww to submit an IPO application with only one click. Less steps are required to place orders, watch lists may be customized, and there are several charting tools.

Paytm Cash

Stock investing is made easier with Paytm Money. On the go, you may use it to calculate brokerage costs, see your stock statements, and establish price alerts. All of the market indices may now be monitored from the convenience of your own home! Since Paytm Money provides all the tools you need for a flawless trading experience, you no longer need to visit several websites to set up alerts. Simple search features, no transaction costs, and free digital KYC are the main benefits.

Goodbudget

This software can end up becoming your everyday go-to for personal financial needs. The program will keep track of your expenditures for nearly everything you input, including food, travel, education, and other expenses. Regular bill reminders will be sent to you, and it will also assess your spending patterns. You'll be able to determine if you are going over budget and where your expenditures are being spent the most. The next time a charge arises out of nowhere, don't be alarmed.

Key characteristics include automatic data backup and intelligent payee and category recommendations. Simple transfers between accounts and envelopes Easy evaluation of expenditure Carrying over unused monies to the next month

CRED

Every time a customer makes a payment, CRED rewards them with enticing incentives and prizes to encourage them to pay their credit card bills. You may connect all of your credit cards to this app to get a reminder to make on-time bill payments.

Different billing cycles won't be an issue for you since CRED will handle it. You get reward points for payments that you make, each of which is worth one rupee.

Features: You may accumulate reward points.

Users may see their payment history

Monefy

You can keep track of receipts and payments made in several currencies with the help of the money tracker and financial organizer Monefy. With its sophisticated password protection, this program is completely safe and secure. You can never make a mistake while doing calculations that are essential to your success thanks to its built-in calculator! You can always export and back up your data.

Key features include a straightforward user interface, the ability to keep a multi-currency log, a budget tracker tool, Google Drive and Dropbox syncing, and password security. Money Manager Budgeting is enjoyable with the help of a money manager. You manually enter the spending and submit receipt photographs for the record when you pay a little charge to have access to extra features like limitless accounts and account administration from a PC.

If you don't want other money management programs to have access to your financial transactions, Money Manager is an excellent piece of software to utilize. Key features include managing credit and debit cards, easy monitoring of budgets and spending, bookmarking, and a backup/restore option.

With improved financial perspectives and monitoring, PFM program performs a variety of activities, including:

Account aggregation: This allows for a consolidated view of several accounts, such as bank accounts, credit cards, and other investment accounts, in a one location. To consolidate and monitor all of your financial data on a single platform and manage your cash flow more effectively, utilize the PFM tool.

1. **Transaction monitoring and customization:** This lets you go through your transactions and classify them so you can keep tabs on your daily spending. Clear, enhanced transactional data is provided through an intuitive interface, which improves your understanding of your money. To prevent problems in the future, keep an eye on your projections for your incoming and departing cash flows.
2. **Categorization:** You may classify transactions using this functionality. According to your needs, the categories may be manually or automatically updated. You may examine expenditure and income by category.
3. **Budgeting:** This may help you determine your financial objectives, cut down on or stop wasteful spending, and create savings programs to better control your spending restrictions.

By establishing spending limits based on your spending patterns, it helps keep costs under control.

4. **Payment calendar:** Use a heat map calendar to visualize, deconstruct, and schedule transactions for stress-free spending. You may keep track of regular invoices or payments to prevent unpleasant shocks and foresee any problems with payback.
5. **Predictive insights and notifications:** Find spending trends and quickly visualize them to decide what to do next based on your financial status. To better understand and analyze spending, foresee problems with personalized solutions and alerts that give relevant and usable messages in real-time.

In general, the PFM application gathers all of your financial data in one location, analyzes cash flows, monitors earnings and outlays, and provides the user with suggestions and actionable insights. In general, they enable Planning that is stress-free, time management that is optimized, improved financial wellbeing, and objectives that are achieved more quickly.

PFM Tools Benefits:

Holistic Financial Insights: PFM systems compile information from several financial accounts to provide consumers a comprehensive picture of their earnings, outgoings, investments, and debts. Users are better able to grasp their financial situation, make wise choices, and establish practical objectives thanks to this all-encompassing view. Budgeting and expense tracking are made easier by PFM systems, which classify expenses, spot spending trends, and establish spending limits. Users may keep track of their spending patterns, identify places where they might make savings, and modify their behavior as necessary.

Goal Setting and Monitoring: With the help of these tools, users may set both short- and long-term financial objectives, such as vacation savings, debt repayment, and retirement investment. Regular goal-setting, monitoring, and visualizing increase accountability and motivation.

PFM Tools Challenges:

PFM technologies need access to sensitive financial data, which raises questions regarding data security and privacy. To earn users' confidence, providers must utilize strong encryption and authentication technologies and adhere to data protection laws.

User participation and Adoption: PFM systems provide insightful data, but users may find it difficult to sustain constant participation. Adoption and sustained use may be improved by creating user-friendly interfaces, providing individualized suggestions, and including instructional material.

PFM technologies depend on good data synchronization from numerous financial institutions for accuracy and integration. Financial assessments might be erroneous as a result of technical errors or postponed updates, necessitating ongoing efforts to guarantee smooth integration.

PFM Tools Impact Transformation:

1. **Financial Empowerment:** PFM tools provide people the ability to take charge of their money, generating a feeling of empowerment and self-assurance in making choices that are in line with their objectives.

2. **Behavioral Change:** By visualizing spending patterns, consumers may spot wasteful spending and adopt new behaviors that will improve their money management and boost their savings.
3. **Adaptive Insights:** PFM solutions may provide tailored financial insights and suggestions based on individual spending habits and financial objectives when combined with AI and machine learning.

CONCLUSION

In conclusion, personal financial management (PFM) technologies have emerged as game-changing solutions in the contemporary era, enabling people to confidently and clearly navigate the complexities of their financial life. How individuals manage their money is changing as a result of the advantages they provide, which range from providing comprehensive financial data and assisting with budgeting to supporting goal monitoring and behavioral change. PFM tools promote prudent financial practices in addition to giving consumers a thorough snapshot of their financial health. These tools are essential for building financial discipline and empowering users to achieve their goals because they promote budgeting, monitoring spending habits, and goal-oriented saves. However, issues like data security, user involvement, and integration continue to be important factors. The protection of consumers' private financial information is still of utmost importance, and efforts must be made to increase user involvement via user-friendly interfaces and tailored suggestions. For the legitimacy of these instruments, integration procedures must also be improved in order to guarantee accurate and current financial information. The potential of PFM tools is vast in the future. The accuracy and effectiveness of these tools might be improved by incorporating cutting-edge technology like AI and blockchain, and more seamless financial ecosystems could result from collaborations between financial institutions and PFM providers. PFM tools have the potential to build a society where people are better able to manage their finances, make informed choices, and accomplish their objectives. This will be possible as PFM tools continue to develop.

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CHAPTER 12

A BRIEF STUDY ON CONTACTLESS PAYMENTS

Amit Kansal, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- amit.kansalmrt@gmail.com

ABSTRACT:

A significant change in the way financial transactions are carried out in India has been brought about by the growth of contactless payments. The rise of contactless payment systems, including Near Field Communication (NFC) technology, mobile wallets, and Unified Payments Interface (UPI), as well as their profound influence on India's payment system, are discussed in this chapter. In India, where the smartphone market is expanding and the digital economy is flourishing, contactless payments are gaining ground quickly. The ease and quickness provided by quickly touching a smartphone or credit card on a payment terminal has completely changed how customers engage with retailers. In line with the government's goal of a cash-less economy, this has not only sped up transactions but also decreased the need on real money. The popularity of contactless payments has been significantly aided by mobile wallets and UPI. These systems enable smooth peer-to-peer and merchant payments for users, opening up financial transactions to a wider range of society. As people from rural places acquire access to digital payments and actively participate in the contemporary economy, financial inclusion has considerably improved.

KEYWORDS:

Communication, Contactless payments, Digital payments, NFC, UPI.

INTRODUCTION

Contactless payments have emerged as a driver for transformational change in the constantly changing financial technology ecosystem, transforming how transactions go in India. This introduction explores the contactless payment phenomenon, a blend of innovation and practicality that has quickly acquired traction in the nation's dynamic payment environment. India is seeing a significant change in the way payments are made, from busy metropolitan areas to isolated rural areas. The quick touch of a smartphone or credit card on a payment terminal, known as a contactless payment, has taken center stage and elevated the customer experience to new levels of speed, effectiveness, and simplicity. India is clearly establishing itself as a participant in this global movement, altering the age-old practice of paying for products and services as the globe adopts digital transactions [1]–[3].

Several enabling technologies are driving this transformation, with Near Field Communication (NFC) technology taking the lead. This technology eliminates the need for actual currency or even card swipes by enabling smartphones, wearables, and cards to connect smoothly with payment terminals. This transformation is further accelerated by the introduction of mobile wallets and the Unified Payments Interface (UPI), which provide consumers simple platforms for quick peer-to-peer and merchant payments that are supported by strong security measures. A substantial cultural change toward financial inclusion is also being supported by contactless payments. Contactless payment technologies eliminate the divide between urban and rural regions in a country with a

wide range of socioeconomic strata, allowing people from all backgrounds to participate in the digital financial ecosystem. This openness is consistent with India's goal of a less cash-dependent economy in which obstacles to using contemporary financial services are being removed. Despite the landscape's tremendous potential, difficulties still exist. Concerns about cybersecurity, infrastructure preparedness, and rural adoption are issues that need continuing attention. Addressing these difficulties is essential if the nation is to provide all users with a smooth and safe experience as it works toward universal adoption.

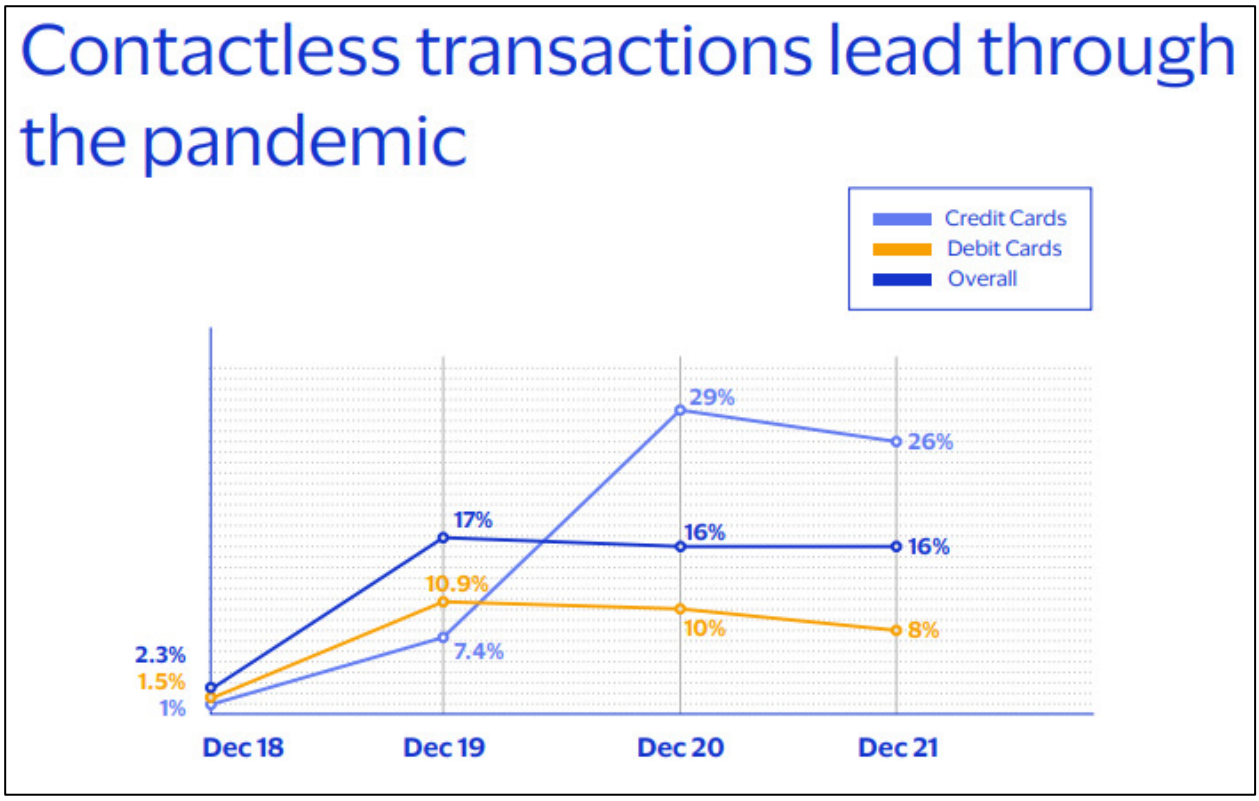

Figure 1: Contactless transactions lead through the pandemic [worldline.com].

This investigation of contactless payments in India will examine the advantages, difficulties, and development of this digital transition. It will explore how this innovation is opening the way for a new age of financial inclusion, convenience, and technical growth in addition to altering the way transactions take place. Figure 1 showing the Contactless transactions lead through the pandemic.

At Point-of-Sale (POS) terminals, contactless payments are cashless transactions that don't need card swipes or dips. Near-Field Communication (NFC) technology is used by a number of devices, including credit and debit cards, key fobs, smartphones, and some mobile devices, to start contactless transactions. This technology enables contactless debit or credit credentials to communicate with NFC-enabled terminals at close range (typically 4 cm or less). On current Apple and Android devices with NFC capabilities, NFC also enables mobile wallet applications like Apple Pay®, Samsung Pay®, and Google PayTM. The expansion of contactless payments in many established and emerging economies has been greatly aided by the use of EMV chip cards. Contactless payments are likely to develop faster than any other form(s) of payment technology because they provide customers, merchants, and payment processors with a seamless experience of convenience, speed, and better security features in face-to-face transactions.

The epidemic has caused us to place a fresh emphasis on contact hygiene, which has led to an increase in contactless payments globally. According to Visa's The Back to Business Study, which included 5,000 adult consumers and 2,250 small companies in 9 countries, 60% of customers "expect to use contactless wherever possible" and 67% anticipate "brick-and-mortar retail stores to accept contactless" in the future. Contactless payments are probably going to overtake traditional methods of payment in the near future, especially with the rise in digital literacy, smartphone penetration, and fintech innovation [4]–[6].

DISCUSSION

Prejudice among consumers toward contactless payments is growing

Despite the fact that the COVID-19 epidemic has had a negative impact on the economy and payments as a result, data from 2020 suggests that contactless transactions are rebounding more quickly than other types of F2F payments. Cardholders are increasingly adopting contactless form factors as a result of the ongoing focus on contactless payments. The use of contactless as the standard method for card acceptance has also increased among businesses, particularly in high frequency market categories including supermarket, pharmacy, restaurants, and QSRs.

There is no doubting that COVID-19 has sped up the implementation of digital payments, particularly contactless payments, in India. The market is primed for change as more consumers do business using contactless payment methods including contactless "tap and go" using debit or credit cards and contactless "scan and pay" QR codes. Many industrialized nations, like France, Spain, the UK, and Australia, prefer contactless smart cards even in other nations. 'Tap-and-go' is progressively becoming available to Indian retailers as well.

In October 2020, contactless payments as a percentage of all transactions increased by more than 12% according to Pine Labs. The majority of payment terminals in India now support contactless payments, and as we release additional contactless payment-related products, exciting times lie ahead for our merchant partners. With effect from January of this year, even the banking regulator, The Reserve Bank of India, lifted the cap on contactless card transactions to Rs. 5,000.

Advantages of contactless transactions

Going contactless while accepting payments has certain benefits, including the following:

Aware of the times: The transactions are not only contact-free, but they are also often completed swiftly since the clients do not need to give the merchant their card or use another device to enter a PIN. Customers get a better user experience, faster checkout, and shorter transaction times as a consequence. Customers see your company favorably when contactless ordering and delivery are required.

Secure contactless payments: Making a purchase just requires one touch, and it is just as safe as swiping your card. The contactless card systems are safe, as each scan or tap only processes one payment. It is a somewhat safer and more secure alternative for all transactions since the card stays with the users the whole time.

Acceptance of many payment methods: Contactless payments may be made using a variety of payment methods, including debit/credit cards, UPI, Bharat QR, and others, in addition to the simplicity and security of the transaction.

Payments made using contactless technology are here to stay and may expand your company. According to a poll, about 30% of participants started utilizing contactless payment during the epidemic, and 70% of them said they would keep doing so.

Customers may use Contactless Payment, which uses RFID technology in their Debit or Credit Cards, to pay for products and services. When it comes to making an in-store purchase, using these cards is one of the most common payment options. These cards streamline transactions by enabling contactless payment from customers.

Contactless payment: What is it?

Customers may pay using Contactless Payment without needing cash or a card swipe. To utilize this technique, clients must 'Tap' or 'Wave' their card over a card-reader. The terminal will then establish a connection with the bank account, which will immediately result in the payment.

What Is the Process for Contactless Payment?

Radio Frequency Identification (RFID) technology is used in cards that let users make contactless payments. The card connects with the card-reader to complete the transaction when it is held close to one.

When touched on or waved in front of the card-reader, the information on the card is verified. The transaction is then sent to the card issuer by the merchant's point-of-sale system. After reviewing the transaction, the card issuer authorizes it.

If consumers prefer to conduct purchases using their phones, contactless payment is another possibility. If consumers prefer to conduct purchases using their phones, contactless payment is another possibility.

It's a safe way to pay

People could believe that contactless payment is hazardous since their card information can be stolen by anybody. But contactless payments are very safe. As validated payments, they are difficult to hack. The card's info is encrypted. As a result, it is more challenging to carry out unauthorized logins and steal card information.

It's a safe way to pay

Because they enable consumers to complete their purchases fast, contactless payments are growing in popularity. Since clients do not need to input their PIN while making payments, time is saved. Additionally, clients are not required to carry cash. Contactless Payments simplify transactions as a result.

According to a report, more Indians are using contactless payments even while making physical purchases. According to a recent research by Visa and Worldline India, contactless card payments have increased by six times in three years as acceptability has built around it being a need rather than a choice. The epidemic has also increased its use.

In only three years, the proportion of contactless purchases in all face-to-face (F2F) transactions increased by more than six times. According to a recent research by Visa and Worldline India, contactless purchases made up 2.5% of all F2F transactions in 2018 and 16% of all F2F transactions towards the end of 2020.

India enters into a Contactless Market, a Report Future research will examine India's transition to contactless payments and the customer categories that adopted this payment system. The rapid adoption of contactless payments over the last several years is evidence of the surge in acceptability of safer and quicker forms of cashless payments across consumer sectors, according to Ramakrishnan Gopalan, vice president, head of products and solutions, for Visa in India and South Asia.

Gopalan said that after looking at other payment methods, they came to the conclusion that availability, convenience, usefulness, security, and other factors were the main factors driving the expansion of contactless payments. He said that they are optimistic that these many elements will support the widespread adoption of contactless payments in the future. The objective of a society with less currency will be substantially advanced, he continues, since "we are confident that it is a sustainable payment solution for seamless face-to-face transactions." According to Pranay Jhaveri, managing director of India and South Asia for Euronet Worldwide, contactless payments are here to stay and have been massively accelerated by the epidemic.

"We think that India is firmly on course to become the digital payments market with the highest rate of growth worldwide. The proliferation of NFC-enabled terminals demonstrates a significant shift in consumer and business behavior. The proportional rise of businesses accepting contactless payments has also contributed to the development of contactless transactions through time, according to Jhaveri, as a result of customers' increasing demand. This transition to contactless payments has been made possible in large part by technological and legislative advancements. The use of contactless payments will only increase over the next years with simpler and more secure consumer interfaces, he continues.

Indian contactless transactions have increased sixfold in only three years.

Today, convenience in the payments industry is a key aspect, and several financial institutions are implementing solutions to promote it extensively across all company types. According to a survey from Worldline Visa, as a consequence, contactless transactions increased in India by more than 6 times, from less than 2.5% in December 2018 to 16% in December 2020. At a Point of Sale (PoS) terminal, contactless payments are transactions that do not need the swipe of a credit or debit card.

Key participants

In January 2020, 25% of all purchases at supermarkets were contactless, and by January 2020, 31% of transactions were contactless. As a consequence of the epidemic, 60% of all card transactions and 80% of contactless transactions have come from Quick Service eateries (QSRs), other eateries, grocers, drugstores, and pharmacies. The modification of the contactless payment method cap in 2020 has also resulted in an increase in contactless debit card transactions in the aviation industry. According to the survey, cardholders that primarily use digital buying channels including e-commerce, luxury travelers, and frequent e-wallet users had a higher adoption rate for contactless transactions [7]–[9]. The majority of contactless transactions in India have been recorded in metro areas of the states of Maharashtra, Karnataka, Delhi NCR, Andhra Pradesh, Telangana, Tamil Nadu, Gujarat, Kerala, Haryana, and Uttar Pradesh.

The motorists

The availability of several media to handle contactless transactions is one of the main factors promoting its rise. More and more small businesses are opening up contactless payment options

like "tap to phone" without charging POS costs. Another factor that makes contactless transactions a practical method of payment is the speedy procedure they entail. They may complete checkouts more quickly while making purchases since they don't need a signature, PIN, or One Time Password (OTP).

Finally, there is a lot of security in place when they are in use. The Reserve Bank of India (RBI) restricts the total amount of contactless payments to INR 5000 in order to lessen the risk of fraud in the event that a debit or credit card is lost or stolen.

Way ahead

According to the research, cards account for 26% of all digital transactions but produce 53% of the total value of all digital commerce. According to the survey, the next phase of development will be driven by the industries of fuel, clothes & accessories, hotel, and retail goods, which may boost the percentage of contactless transactions. More than 2 billion debit and credit cards with contactless technology are thought to be in use worldwide, and by 2028, it's predicted that the industry for contactless payments will be worth US$6.25 trillion.

CONCLUSION

Despite the quick expansion, problems including inadequate infrastructure, security worries, and the lack of general knowledge still exist. Continuous work is needed to make sure that businesses, especially those in rural regions, are set up to take contactless payments. Strong security measures are also essential to protect private financial data and foster customer confidence in the technology. The trend of contactless payments in India seems positive going ahead. The ecosystem is expected to see more innovations, better security precautions, and seamless interaction with other financial services as technology develops and customer behavior changes. Contactless payments may become a common and essential part of India's payment environment as the infrastructure develops and user acceptance increases. In conclusion, the widespread use of contactless payments in India is a crucial step toward the development of a safe, productive, and inclusive digital economy. Contactless payments have established themselves as a revolutionary force that supports India's transition to a less cash-dependent economy and strengthens its position as a technology-driven global player by providing ease, safety, and accessibility.

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CHAPTER 13

A BRIEF STUDY ON PEER-TO-PEER LENDING

Gurleen Kaur, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- gurleenkaur234gk@gmail.com

ABSTRACT:

The experience of borrowing and lending has been redefined by peer-to-peer (P2P) lending, which has emerged as a disruptive force in the financial environment. This abstract explores the topic of P2P lending, including its workings, benefits, drawbacks, and shifting effects on investors and borrowers. P2P lending, at its foundation, enables a direct link between people asking for loans and those eager to invest their resources. Online platforms enable investors to diversify their portfolios and possibly earn lucrative returns while borrowers obtain access to capital without the need of conventional financial middlemen. P2P lending is appealing because it is effective, accessible, and inclusive. These platforms use technology to expedite the borrowing process, providing quicker approvals and less paperwork. For borrowers who would not be eligible via traditional routes, such as small enterprises, independent contractors, or those with unconventional credit histories, this democratization of lending opens options.

KEYWORDS:

Borrowers, Collateral, Credit, Lenders, P2P lending.

INTRODUCTION

Traditional borrowing and lending practices are drastically changing in a financial environment that is changing very quickly. Peer-to-peer (P2P) lending has become a disruptive force, changing the way that people, small enterprises, and investors access capital and look for investment possibilities. This introduction examines the idea of peer-to-peer lending, going in-depth on its history, workings, and the revolutionary ways it is changing the nature of contemporary finance.

Financial institutions have traditionally acted as middlemen between borrowers and lenders, creating some degree of separation between them. However, P2P lending creates a paradigm change by enabling direct interactions between investors and borrowers through online platforms. P2P lending simplifies the borrowing process by getting rid of middlemen, making it more effective, available, and transparent.

P2P lending's capacity to promote financial inclusion is at its core. Entrepreneurs, individuals, and small businesses that may have had trouble obtaining loans through traditional means find a lot of resonance in this approach. P2P lending systems provide a level playing field by using technology to analyze creditworthiness and risk, allowing a larger range of borrowers to access critical funds for varied reasons.

P2P lending's promise for diversification and greater returns appeals to investors as well. Investors may customize their portfolios to meet their level of risk tolerance and financial goals by selecting from a variety of loans. The combination of this variety and the chance to proactively help people and companies gives investment strategies a special dimension.

But P2P lending's expansion is not without its challenges. The lack of customary collateral, borrower risk evaluation, and regulatory control constitute difficulties that the sector must prudently overcome. Maintaining the P2P lending model's viability still depends on finding a balance between innovation and risk reduction.

We will examine P2P lending in more detail in the sections that follow, going through its mechanisms, benefits, drawbacks, and prospective effects on financial landscapes. We discover how P2P lending is revolutionizing how people and businesses interact with their financial futures as we explore the complexities of this revolutionary financial model. P2P lending is not only redefining the borrowing and lending process, but it is also fostering an era of financial inclusivity and direct engagement.

People have long loaned money to one another in India. It might be in the form of extended families aiding one another in times of need or in business communities where individuals borrow money to satisfy working capital needs. The majority of this lending is done on the basis of faith, with no collateral or guarantee to support the loans. Technology is transforming this conventional method of lending, just as it is transforming every other part of our life. Peer-to-peer lending, often known as (P2P) lending, is the new contemporary form of lending to one another [1]–[3]. We will go into great depth about P2P lending in this blog post. We will also address if you ought to invest in peer-to-peer lending.

Peer-to-Peer (P2P) Lending: What Is It?

When they need money, people often turn to banks or other financial organizations like Non-Banking Financial Companies (NBFCs) for a loan. However, these banks often reject loan applications due to issues with income, incomplete documentation, poor credit, etc. When this happens, friends and family from their social network sometimes step in to help out by lending money. However, people who lend money only do so when they have a relationship with the borrower and are certain that they will be reimbursed. This sort of lending model has the drawback that individuals can only lend to and borrow from a small number of others in their network. As a result, many individuals struggle to get funding at crucial points in their lives.

Peer-to-peer (P2P) lending may be helpful in these trying times. P2P lending serves as the crucial connecting tool between individuals looking to lend money and those who need it. Interest is paid by the borrowers, while interest is earned by the investors/lenders. Financial institutions like banks are not required to serve as the intermediary since the transaction is conducted directly between the two parties via a website or application.

P2P lending therefore has the potential to increase financial inclusion on a global scale as a source of funding. P2P financing is quite accessible to persons with bad credit or those who fall into the low-income group. Borrowers may get a loan via P2P lending to pay for their education, debt consolidation, company expansion, etc. P2P lending is practical since you may do it using P2P lending platforms, which are websites or apps.

What Is the Process of P2P Lending?

P2P lending is carried out via a website that directly links lenders and borrowers. Open a lender account on a P2P network if you wish to lend money. And anybody in need of a loan registers as a borrower. These systems then assess borrowers based on a variety of criteria. They don't only focus on credit ratings while evaluating anything. They carry out their investigations, looking at

things like the borrower's job, income, credit history, etc. Furthermore, these platforms use a lot of technology to track borrowers' behaviors via their use of social media and other apps.

The creditworthiness of borrowers is determined based on this evaluation, and they are divided into several risk categories. It forms the foundation for how much interest a borrower must pay. A borrower's interest rate will be lower the better his creditworthiness is. Additionally, the borrower must pay a greater interest rate the worse their creditworthiness is. The platform has performed assessments for a variety of borrowers, and lenders may review these assessments and choose which borrowers to lend money to base on the risk and return they are willing to assume. Similar to this, borrowers may contact lenders by seeing their profiles. The monthly payments or transactions between the lender and the borrower are not subject to a margin on P2P platforms. Instead, they demand payment from both parties for the services they provide. RBI controls these platforms to ensure that they don't engage in any dubious or fraudulent activities, such as hoarding lenders' or borrowers' repayment funds [4]–[6].

Indian peer-to-peer (P2P) lending

One way to get money for your company is via peer-to-peer lending, or P2P lending. P2P operates as an online platform that gives lenders and borrowers convenience, flexibility, and choice when lending and borrowing. P2P models combine lenders and borrowers and make it easier for lenders and borrowers to match. Borrowers may access money at a cheaper interest rate than banks while lenders can make more income than they would from bank deposits.

P2P economic model

The crowd-funding approach is the foundation of peer-to-peer lending. The majority of P2P lending platforms are set up as NBFC fintech firms (Non-Banking Financial firms). The P2P model, in contrast to conventional banking and financial institutions, is a contemporary credit model to address present company credit demands. Faircent, Paisadukaan, Finzy, Rupeecircle, and other P2P platforms are a few that provide services.

P2P lending provides a forum for the collection of all kinds of funds from private people, wealthy persons, Hindu Undivided Families (HUFs), and other non-banking organizations. In accordance with the P2P business model, a loan demand auction is held, with the borrower having the option to accept or reject the lender's offer. Additionally, the platform may provide services like credit evaluation, debt recovery, and others. Typically, the platform coordinates the deal between the lender and the borrower.

RBI guidelines

Anyone may use the P2P lending platform, including individuals, groups of persons, HUFs, businesses, societies, and other artificial entities. The Master Directions for NBFC Peer to Peer Lending Platform, published by the RBI in 2017, govern P2P lending. With RBI approval, only an NBFC may register as a P2P lender. The RBI should provide a certificate of registration to each P2P lender. Every currently operating NBFC-P2P that is not a bank must register with the Mumbai-based Department of Non-Banking Regulation. Additionally, the P2P must fulfill additional requirements set down by the RBI and have a net owned fund of at least $20 million. P2P lenders must maintain a leverage ratio that is no more than 2.

DISCUSSION

How does the P2P model work for borrowers?

Both lenders and borrowers must register on the P2P lending platform's website. Before enabling people to take part in their company, the platform screens prospective lenders and borrowers. A KYC procedure is used by the P2P to verify the borrowers.

Requirements for P2P registration

a) In order to provide P2P lending services to the participants, the firm must be formed in India and possess the requisite technical, entrepreneurial, and management capabilities.
b) The organization should have a sufficient financial structure and management to engage in P2P lending.
c) The business plan that the firm filed details how it would operate its peer-to-peer lending platform.
d) A Certificate of Registration (CoR) is issued to the business so that it may act in the public interest.
e) Any other requirements the bank may cite for the purpose of starting the company or carrying on the operation in India.

The RBI gives preliminary clearance for the establishment of a P2P lending platform upon fulfillment of the aforementioned requirements. The platform has 12 months to put the necessary technology and paperwork in place so that operations may begin before the permission expires. The RBI may, subject to criteria that the bank deems appropriate, award a CoR as an NBFC P2P if it is satisfied that the P2P platform is prepared to begin operations [7]–[9].

The kind and scale of P2P lending

a) A P2P lender may serve as an intermediary by giving participants access to an online marketplace or platform.
b) Under Section 45I(bb) of the RBI Act of 1934 or the Companies Act of 2013, a P2P lender may not solicit deposits.
c) A P2P lender is unable to make loans on its own and is unable to organize or offer credit enhancements or credit guarantees.
d) With the exception of loan-specific insurance products, a P2P lender is not permitted to lend on its own, permit an international flow of money, or cross-sell any other products.
e) A P2P lender should make sure that participants follow the rules set out by the different relevant laws.
f) Manage storage of the data on hardware based in India and process all data pertaining to its participants and activities.

Loan-to-loan business policy

P2P should have a policy that has been established that specifies the requirements for participation, the cost of the P2P services, and the guidelines for matching lenders and borrowers. Contracts must be signed in order for lenders and borrowers to authorize loans.

They are unsecured P2P loans. P2P is required to make available on its website the process used to evaluate credit and the variables taken into account, the grievance procedure, a description of the business model, the contact information for the grievance officer, and other information.

P2P participant guidelines

A P2P lender should do due diligence on its participants, evaluate the borrowers on its platform for creditworthiness and risk, and disseminate this information to potential lenders. A P2P lender should have evidence of loan agreements and accompanying paperwork, as well as prior and express authorization from the participant before accessing their credit information. Additionally, a P2P lender need to help with loan distribution, repayment, and recovery.

The P2P network will use an escrow account system run by a bank-sponsored trustee to move money between users. Two escrow accounts should be kept by the P2P, one for receiving money from lenders and the other for collecting money from borrowers. P2P is not allowed to conduct monetary transactions.

What is the lending and borrowing restrictions?

The minimal loan amount is between Rs. 500 and 750. Over the course of all P2P sites, the maximum amount per lender is set at Rs 50,000. If a lender loans more than Rs 10,00,000, they must first get a certificate from a practicing Chartered Accountant attesting to their minimum net worth of Rs 50,000. A single lender's total loan to a specific borrower under a one-on-one arrangement cannot exceed Rs 50,000. A certificate from the lender or borrower attesting to the P2Ps' compliance with the borrowing and lending restrictions should be obtained.

Requirements for transparency and loan tenure

The maximum term for loans made via peer-to-peer lending is set at three years. The borrower's information, including the credit score and specifics of the loan conditions, must be disclosed to the lender through the P2P. Other than the borrower's name and contact information, a P2P is required to provide the lender's information to the borrower.

Regarding Credit Information Companies (CIC) and others, compliance

Every CIC should accept a P2P as a member. The P2Ps are required to provide data (including historical data), store and maintain credit information, and update the data regularly to the CICs. Additionally, the P2P is obliged to provide to the RBI certain quarterly statements, such as the statement of loans closed, disbursed, and outstanding throughout the quarter. Moreover, a report on the money kept in the escrow account.

Failure to pay back P2P loans

The P2P is in charge of collecting the loans that were made utilizing their platform. The P2P should include a reliable mechanism for participant screening and data updating to reduce loan payback defaults. The P2P can also provide services for debt recovery on its network. The P2P, however, is liable for the deeds of its service providers, which includes recovery agents. Additionally, the P2P must protect the privacy of participant-specific data that is shared with its service providers.

Cancellation of P2P NBFC's registration

The registration may be canceled by the RBI in the following circumstances:

a) P2P NBFC stops operating in India as a platform for peer-to-peer lending.
b) Not adhering to the terms on which the CoR is granted.
c) The CoR is no longer available to P2P.

d) Disobeying any instructions given by the bank.
e) Failing to keep accounts, publish financial information, and report financial condition as required by law, RBI orders, or directives.
f) Failing to provide or provide for examination when the RBI requests books of account or other relevant documents.

What Rules Apply to P2P Lending in India?

P2P lending falls under the Reserve Bank of India (RBI) since it is a kind of lending. The RBI has established rules for how P2P lending services must operate. For example, any business that want to provide P2P lending services must apply for an NBFC-P2P license with the RBI.

In its capacity as regulator, RBI also makes sure that these platforms pose no substantial systemic risk. According to RBI rules, the company's board will follow a previously determined Business Continuity Plan if a P2P platform chooses to shut down. The strategy includes every detail needed to safeguard the data of all lenders and borrowers. The plan provides further details about debt servicing for the duration of the loan in the event that the platform is closed.

These are just a few of the many regulatory steps the RBI has implemented to lower the risks associated with peer-to-peer lending. Despite this, investing in P2P lending carries some risk. Let's learn more about the dangers of peer-to-peer lending.

Understanding The Risks of P2P Lending

Market-linked goods including stocks, bonds, gold, and mutual funds have daily price fluctuations. P2P lending, however, does not include any market-related risk. Therefore, the value of your P2P lending assets won't change every day. Peer-to-peer lending entails the risk of borrower failure, or the borrower failing to make interest and principal payments. A P2P platform may help lenders recover money if a borrower fails and can even take legal action against the defaulter.

The evaluation of possible risk that a borrower brings to the table becomes crucial since default risk is the main risk you are assuming as a lender. One defense used against credit risk is that investors may spread their money across a variety of highly creditworthy borrowers. Even while this method may help you reduce risk to some level, investments still have some risk involved.

Returns on P2P Lending: How Much Can You Make?

Like any investment, P2P lending has a return that is based on how much risk you are prepared to accept. Two factors may be used to assess the risk of peer-to-peer lending: first, the creditworthiness of the borrower. Second, the duration of the loan. The returns increase with the length of the loan duration. Additionally, the larger the returns, the worse the borrower's credit history. To illustrate how much money investors may make through P2P lending, there aren't any industry-wide statistics available. For example, the P2P platform Faircent reports that the average portfolio return for the lenders is 12–14% for a one-year holding term. LenDenclub, a P2P platform, reported a similar 13.47% annual return for the year 2020.

When analyzing the returns from P2P lending, the default rate and platform fees are two important factors to take into account. That's because they will diminish your real return. For instance, if your investment generates a 20% return and the non-performing assets provide 5% of that return, your net returns will be 15%. If the platform cost is 2%, then your net return will be 13%.

Taxation of P2P Lending Profits

Investors in P2P lending effectively get interest on the money they lend. Therefore, interest income from P2P lending is taxed, just like interest income from other instruments like FDs.

P2P lending interest is categorized as "Income from Other Sources," added to the lender's income, and taxed in accordance with the tax band the lender is in. Therefore, if a person is in the 30% tax bracket, the interest generated will be subject to a 30% tax.

Consider the following scenario: You invested Rs. 1 lakh in P2P lending, and you received 15%, or Rs. 15,000, in interest. If your tax bracket is 30%, your tax payment will be Rs. 4,500 (30% of Rs. 15,000). Your final returns are significantly impacted by this tax treatment. Your actual post-tax return in the aforementioned case is 10.5%.

Is P2P Lending Worth Your Money?

When banks only provide 7% interest on 1-year certificates of deposit, the potential of earning 10% to 12% percent via peer-to-peer lending seems appealing. But like with any investment that offers larger profits, there are certain hazards associated [10]–[12].

The possibility of some borrowers being unable to repay the loan exists with P2P lending. To reduce these risks, the RBI has established standards for P2P NBFCs. Since P2P lending involves more risk than FDs, the rewards are larger. But it's not as terrifying as stocks, where investors may see a 20% to 30% correction in a matter of weeks, or the opposite. Additionally, investors must be aware that although P2P lending offers large returns, such gains are not guaranteed. So, before you invest, be aware of these hazards.

CONCLUSION

Peer-to-peer (P2P) lending is a dynamic force that has upended conventional lending structures and democratized access to money in the world of contemporary finance. This paragraph summarizes the profound effects of P2P lending on both borrowers and investors while stressing its advantages, disadvantages, and the changing environment it has shaped. The attractiveness of peer-to-peer lending is in its capacity to close the gap between investors looking for enticing returns and borrowers in need of capital. The borrowing process has been simplified, made quicker, more transparent, and less dependent on conventional financial institutions thanks to the digitalization of lending platforms and the use of algorithms for risk assessment. Investors are simultaneously given the ability to diversify their portfolios with loans that suit their risk appetites and financial objectives. Through P2P networks, lending has become more accessible to borrowers, giving them access to money that would not have been available through traditional channels. This open-minded attitude to money aids people, business owners, and startups in achieving their goals and expansion prospects. P2P lending offers investors, with varied levels of risk, a way to potentially earn larger returns than conventional investment vehicles.

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CHAPTER 14

A BRIEF STUDY ON ROBO-ADVISORS IN WEALTH MANAGEMENT

Ashish Juneja, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- ashishjunejahr@gmail.com

ABSTRACT:

The way that people obtain individualized financial advice and investment plans has been redefined by robo-advisors, who have emerged as a transformational force in the wealth management industry. This abstract explores the idea of robo-advisors, their functions, advantages, and difficulties, as well as their significant influence on changing the face of conventional wealth management. Historically, high-net-worth people were sometimes the only ones who could afford wealth management services, which required significant funding and individualized advising engagements. By using technology to provide automated financial advice and portfolio management to a larger audience, robo-advisors challenge this paradigm. Based on the risk choices, financial objectives, and market movements of users, these platforms utilize algorithms and data analysis to provide specialized investing solutions. Robo-advisors' accessibility, affordability, and data-driven insights are what make them so alluring. Investors may access diverse portfolios that have been tailored to their risk tolerance and goals, regardless of their level of financial sophistication. The democratization of wealth management enables people to choose investments that are in line with their specific needs.

KEYWORDS:

Digital Platforms, Economic Factors, Evolution, Growth, Robo-Advisors, Wealth Management.

INTRODUCTION

The introduction of robo-advisors is one such technological advancement that is creating ripples in the dynamic world of wealth management. The notion of robo-advisors, their impact on wealth management, and the nuanced ways they are redefining the client-advisor relationship are all covered in this introduction. Long linked with individualized advising services, often catered to high-net-worth people, wealth management. The development of robo-advisors, on the other hand, heralds a trend towards democratization by opening up sophisticated investing techniques and financial planning to a wider audience. These digital platforms bridge the gap between expert counsel and technology efficiency by using algorithms and data analysis to give automated investment advice and portfolio management [1]–[3].

The appeal of robo-advisors resides in their capacity to provide simple, cost-efficient solutions with enhanced transparency. Investors may access diverse portfolios that are tailored to their risk appetite and financial objectives, regardless of their financial background. Individuals now have more influence over their financial destinies thanks to the democratization of wealth management, which also lessens their reliance on conventional financial consultants.

In a time when decision-making is more data-driven, robo-advisors are intriguing. These systems may provide customised investing plans that match customers' goals by examining market movements, economic factors, and personal preferences. Additionally, robo-advisors' automated processes remove human prejudices and emotional judgment, which could result in more disciplined investing practices. Although robo-advisors have unquestionable benefits, there are still problems. The level of guidance given raises concerns given the necessity for customization in special situations and the lack of a human touch in complicated financial choices. As these platforms develop, it is also essential to guarantee client data security and regulatory compliance.

The function of robo-advisors in wealth management is likely to grow as the financial environment continues to change. The development of more advanced financial planning, risk management, and investment strategies may be made possible by improved integration with artificial intelligence and machine learning. In order to provide customers, the best of both worlds, a hybrid approach that blends robo-advising technology with human advisory skills is emerging as a viable option. We shall examine the functions, benefits, drawbacks, and revolutionary effects of robo-advisors on wealth management in the section that follows. We examine how robo-advisors are changing the advice environment and enabling smart financial planning for a wide spectrum of investors as we traverse the complex intersections between technology and finance.

DISCUSSION

Robo Advisory in India

A robo advisory is what? You may complete your investment with only one click! A robo-advisory is a kind of financial advisor that offers online financial advice or portfolio management with little to no human involvement. You may also call it pre-programmed financial advice for individuals. An automated service called a "robo advisor" may assist you manage your finances and even purchase certain financial items. From registration through execution, virtually little human involvement is required with robo-advisory. While the majority of robo-advisors claim to employ AI and machine learning, the reality is that they use rule-based reasoning. There have recently been a few fundraising rounds in the robo advising market in India.

There are differences in the final suggestion despite the fact that all robo advising platforms provide a variety of options for quick, understandable, and scientific investment advice. But the fundamental idea is still the same. For example, it is recommended to allocate between equities and fixed income assets for short-term requirements if your long-term objectives span more than five years.

Causes of Growth & Evolution

1. The emergence of a new class of investors who are tech-savvy professionals who want automated and digital counsel for managing their money.
2. High minimum investment requirements from offline advice services where customers and investment managers meet one-on-one to make investment choices. Small investors are unable to use the services as a result of the high number.
3. Financial advising businesses demand very expensive investment advisory fees. The robo financial adviser cost is much lower when compared to them.

4. Human judgment regarding market timing and future market movement often went incorrect. Investors have greater faith in the financial plans built on sophisticated computer algorithms than in those other ones.

Characteristics

a. **Availability around-the-clock:** Robo financial advisers may be beneficial for every investor, regardless of wealth. The best benefit of being online is that it is always accessible.
b. **Low Costs:** Because there is no human contact, costs are much lower and robo advisers are substantially less expensive than conventional advisors.
c. Robo investment advisers are transparent about costs, transactions, and portfolios, among other things.
d. **Effectiveness:** Every modification in the portfolio may be ordered with efficiency.
e. **User Experience:** Convenient features provide a relaxing user experience
f. **Targeting to Small Investors:** Some Robo Advisers are focusing on small investors who are used to digital technology and are likely to become affluent customers in the future.

Advantages of Robotic Advisors

1. **Low costs:** Before robo advice platforms were introduced, clients were fortunate to obtain professionally managed help with investing for less than 1.0% of AUM (Assets under management). That paradigm has altered thanks to robo advising companies.
2. **Little Minimum Balances:** Receiving expert robo advice management service is a godsend for investors with extremely little net worth. no minimal balance robo advisers with a technological edge. For individuals who are interested in access to portfolio monitoring, Personal Capital is completely free. Higher balance levels are designated for exposure to specialized financial counseling.
3. **Tax optimized:** As every investor is aware, taxes may significantly affect the rate of return on an investment. This is especially true for short-term capital gains since they are subject to ordinary income tax rates. Robo advisers are designed to avoid capital gains taxes since they are completely automated.
4. **Continual Rebalancing:** It is just a matter of time until even a portfolio with excellent asset allocation sometimes becomes out of balance. The allocation is distorted by changes in asset categories that are either greater or lower. The portfolio has to be rebalanced as a result. It must be carried out at least once year. However, more regularly is preferable. Markets may see double-digit percent changes in a short of weeks.

Offerings from Robo Advisors

All businesses in this field have user-friendly, interactive platforms that efficiently retain all the data pertaining to each and every financial transaction that has previously been completed as well as personal information about objectives, desires, income, and profile. Full risk profile is conducted upon account opening via a series of inquiries, including a list of one's assets, obligations, and investments. Every online platform has goal and portfolio trackers that allow users to keep track of their progress and determine if they are on track to reach their goals or not [4]–[6].

If the user is off course, the automatic system proposes modifications that are essential to reach the goal. The algorithm directs the user as to what needs to be sold or added to the portfolio even

while a new investment may be considered sometimes owing to cash flow issues or in times of need. Additionally, a portfolio review is performed on a regular basis to assess if the user needs to rearrange his portfolio as he or she approaches the set objective or aim.

India's Robo Advisors for Investments

There aren't many robot advisors in India, and the list of them will be brief. But many young individuals in today's society are becoming interested in this. Numerous businesses have been operating in the robo advising sector in recent years. According to Tracxn, a data analytics business, there are 39 robo advising firms operating in India at the moment. In the robo advising space, 10 out of 39 fintech businesses have disclosed receiving investment. FundsIndia.com entered the market quite early. From the Foundation Capital, Inventus Capital Partners, and Faering Capital, they have already collected $15.41 million. MyUniverse and Scripbox are two further robo advising firms that have garnered significant financing.

Various models

The manner in which Indian robo advising businesses provide their services varies. However, they mostly provide a selection of mutual funds that you may expect to invest in. Some have an advising business model and levies an advice fee. When you use the platform to invest in mutual funds, the platform will additionally charge you convenience fees for enabling the end-to-end transaction. Direct plans avoid paying a commission to the distributor but usually charge clients advising fees or transaction costs instead. The second group of businesses use a distribution strategy similar to that of conventional consultants. They provide free advice on how to invest in money and assets, and the transaction is executed on the site.

In exchange, the platforms get a commission from the house of the mutual fund organization. For instance, FundsIndia.com makes fund recommendations based on internal and extensive research to achieve the objectives. The platform is free to use. simply to put money into recurring plans. You must invest separately in direct plans if you choose to do so.

Additionally, several systems use a hybrid approach. If you have the ability to make a transaction on your own, they will charge you for the advice. Consider the story of Arthayantra. The annual price for the financial guidance is $1000. You may also purchase the units directly from the fund house at your discretion. But if you decide to use their platform to make your investment, they'll forego the service charge and provide you free counsel. This is so they may receive a fee from the fund firm by facilitating the investment in the normal option.

On the other hand, BigDecisions (not a genuine robo advice) just offers advise using calculators on how much corpus you must grow to achieve certain objectives. It redirects you to websites like FundsIndia.com so that you may invest. Most robo-advisors provide a mix of debt and equity mutual funds. Some companies, like Scripbox, only provide a small number of funds inside this, all of which have been pre-selected by their computer algorithm and in-house specialists.

Others may provide a larger range of funds, and some may also have a larger asset base, such as bonds, gold ETFs, and tax-saving investments. Depending on the state of the market and your choice of liquid funds, some advisers may also advise you to store your money in cash. Future plans for all of these platforms include becoming a one-stop shop for all financial guidance, including loans, insurance, property, and services like tax preparation.

What's Different in India

In India right now, automated financial consulting services are booming. But they have been living in the US for a while. The robo advising services provided in the US and India vary in at least three respects. One, in the US, the service is often totally automated. For instance, money is chosen & invested automatically without the user's involvement. In India, the services are not automatic; the user must start the transaction [7]–[9].

Two, passive investments known as Exchange Traded Funds (ETFs) are made using the money of investors in the US. The robo advising services are seen as substitutes for conventional, very actively managed mutual funds. Exchange Traded monies are yet in their infancy in India, and monies allocated to robo advice are put in actively managed mutual funds.

Third, the AUM (Assets Under Management) is the basis for the fee structure in the US. For instance, Betterment charges 0.15 to 0.35 percent depending on AUM, whereas Wealthfront charges 0.25% of AUM yearly. In India, the cost structure is either free or consists of an annual flat fee plus set transactional fees.

There are also a ton of additional distinctions. Users used to paying advising fees are those in the US. However, it undoubtedly leads to conflicts of interest in India, where consultants are allowed to get commissions. When a commission-free product investment is made possible online, a change is required to encourage customers in India to pay for the advice or services they choose. Additionally, the advisory service in the US provides a very low-cost solution to the investor base already in place; in India, robo advisors aim to improve penetration by providing reasonable counsel. A crucial component of robo advising services in the US is tax loss harvesting, which entails selling assets that are losing money to offset gains in order to pay less in taxes. In India, taxes are not yet a top priority.

Indian Robo Advisory Companies to Simplify Financial Planning

Betterment and Wealthfront are well-known robo-advisors in the US. NUTMEG is one of these well-liked robot advisors in the UK. Similar to this, several businesses in India have already started to make such services more accessible by developing certain automated web solutions. These are the top 5 robot advisors in India:

1. **Arthayantra, available at arthayantra.com:** According to ArthaYantra, it was the first and one of the oldest online financial adviser platforms in India. They are a startup company from Hyderabad that specializes in automated personal financial planning.
2. **BigDecisions, available at bigdecisions.com**: Instead of being a robot counselor, BigDecisions is more of a content portal. They assert that you may visit the BigDecisions website if you want to make wiser selections about investments, retirement, home loans, life insurance, etc. They are also a very well-known internet resource that helps people reach their financial objectives.
3. **FundsIndia, available at fundsindia.com:** One of the biggest robot advice companies in India is called FundsIndia. They got going quickly and garnered clients. But as time goes on, I find their platform to be rather complex. Additionally, you may only use them to acquire ordinary money.
4. **Scripbox (www.scripbox.com):** Similar platforms include ScripBox, where one may effortlessly create a SIP and get assistance for their first mutual fund investment. The

platform is simple to use, and anybody may create a SIP by following the step-by-step instructions provided under How It Works. The fact that you have no financial options is a downside. They are the only money that you may purchase. Similarly, Scripbox exclusively offers conventional money.

MyUniverse ZIPSIP is available at myuniverse.co.in/zipsip

It is one of the newest products the Aditya Birla group's Robo Advisory family has introduced in India. Additionally, they are focusing more on SIP investments in mutual funds. You may have seen a few adverts appearing around the same material as your own. To outperform the present competition in India's Robo adviser category, they are truly investing a considerable lot of money to advertise their new firm.

Deficits in Current Platforms

1. **Automatization:** The whole range of services must be automated. For instance, money is chosen & invested automatically without asking the user to make a single effort. The current systems in India do not operate entirely automatically like those in the US; instead, the user must at least begin the transaction.
2. **Exchange Traded Funds vs. Mutual Funds:** In the US, exchange traded funds (ETFs), which are passive investments, are purchased directly by investors. Therefore, investing in robo advising services is seen as an alternative to doing so in conventional, very actively managed funds. ETFs are still in their very early stages in India, and money invested by robo advising services goes into actively managed mutual funds.
3. **Disparate Pay Structures:** The entire fee structure in India is either free or a flat fee that is charged annually plus fixed charges per transaction, and some advisors, such as fundsindia and scripbox, earn commissions, which undoubtedly creates a conflict of interest, whereas the fee structure in the US is entirely based on Assets under management (AUM).

Why don't robot advisors fill the void?

1. **Lack of knowledge:** One of the main issues in India is that people are not aware of these platforms. Even after spending money on advertising, relatively few people are aware of mutual funds.
2. **Complicated:** Despite robo-advisors' assertions that they have streamlined the investing process, I believe they fall far short in terms of what can be done to attract new investors.

CONCLUSION

With the emergence of robo-advisors, wealth management has become more accessible to people from all walks of life, giving them access to specialized investing techniques and guidance. Robo-advisors build portfolios that match investors' risk tolerance, financial objectives, and market circumstances by using advanced algorithms and data-driven insights. This change frees a larger segment of the population from the historical constraints imposed by conventional advising services so that they may actively participate in strategic wealth-building. The appeal of robo-advisors is that they can provide fair, effective, and efficient financial advice. Disciplined, emotion-free decision-making underpinned by unbiased research is advantageous to investors. Individuals who may not have previously considered professional wealth management are now able to understand difficult financial concepts thanks to the user-friendly interfaces and

transparency that further increase the attractiveness. However, like with every invention, there are drawbacks as well as advantages. In complex circumstances, the lack of human empathy and tailored guidance raises concerns about the extent of the help provided.

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CHAPTER 15

A BRIEF STUDY ON AUTOMATION OF BANKING PROCESSES

Vikas Singh, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- vikassamar@gmail.com

ABSTRACT:

The financial sector has seen a significant transition thanks to the automation of banking procedures, which has redefined conventional procedures and moved institutions toward a future characterized by increased accuracy, efficiency, and client satisfaction. This abstract explores the idea of automating banking procedures, stressing its ramifications, advantages, and difficulties as well as the path it paves toward a financial environment that is technologically sophisticated. Banking institutions are adopting automation to improve client relations and simplify processes in response to the demands of the digital age. Automation provides a variety of solutions that increase productivity, reduce mistakes, and speed up service delivery, from account administration and transaction processing to customer support and fraud detection. Automation has benefits beyond improved operational efficiency. Customers now benefit from quicker, easier services that are available around-the-clock and provide individualized experiences. Banking employees may spend more time making strategic decisions, encouraging innovation, and developing deeper client connections by automating repetitive operations.

KEYWORDS:

AI, Automation, Banking Processes, Business Services, Machine Learning, RPA.

INTRODUCTION

The banking sector is in the front of a digital revolution at a time of accelerating technological development. A disruptive phenomenon known as banking process automation has evolved, changing conventional methods and reinventing how financial institutions function. This introduction explores the idea of automating banking procedures, examining its importance, implications, and the significant changes it makes to the financial industry. Banking, historically associated with physical locations and labor-intensive processes, is going through a profound transformation. Every aspect of banking operations is now automated because to advancements in artificial intelligence, machine learning, and robotic process automation. The use of automation is altering the basic foundation of how banks operate, affecting everything from client interactions and transaction processing to risk management and regulatory compliance.

Automation's capacity to improve effectiveness, accuracy, and client experiences is what makes it so alluring. Algorithms and intelligent systems now efficiently carry out mundane and repetitive operations that formerly required a lot of time and resources. As a result, human talent is freed up to concentrate on strategic decision-making, and it also prepares the door for more creative and unique consumer encounters [1]–[3]. Automation's effects go beyond simple operational advantages. Modern consumers want simplified services, timely information, and the ease of

anytime, anywhere banking. In order to provide 24/7 services, individualized advice, and quick answers to consumer requirements, institutions must embrace automation.

However, automation has its share of difficulties, just like every revolutionary path. Banks must appropriately answer challenges posed by the fusion of diverse technology, data security issues, and the human element in financial counseling. An important factor to take into account is finding a healthy balance between technology's benefits and human expertise's distinctive traits. We will explore further into its applications, benefits, problems, and the dynamic role it plays in transforming the financial environment in the investigation of banking process automation that follows. We demonstrate how automation is a pathway to a more responsive, customer-focused, and futuristic banking environment as the lines between technology and finance become hazier.

What is Automation in Banking?

Banking automation is the use of automation by banks, credit unions, and other financial organizations to improve fundamental business operations. The excessive amount of repeated work in banking and financial business processes make them perfect candidates for banking automation technologies. And although part of this digital transformation has included the creation of sophisticated automation tools for fraud and investment detection systems, some of the biggest advantages have come from automating smaller, more routine actions that are performed by these institutions more often. By using data, banks have been able to increase their present product and service offerings as a result of the automation transformation. What could you be able to do if you knew your consumer better?

Particularly, the banking sector has adopted low-code and no-code technologies like document AI (Artificial Intelligence) and robotic process automation (RPA). Why? Once installed, these technologies need no human interaction, cost little to no expenditure, and benefit every department of the company, from the C-suite to customer service. There has also never been a better moment to advance digital acceleration than now, when technology is dramatically altering the consumer and financial ecosystems.

Overview of Banking Procedures

Knowing the many kinds of bank accounts and the services that banks provide is the first step in comprehending the role of automation in the banking sector. Banks are there to assist you in handling your money. Banks provide a range of services to assist in managing an individual or company account. Quick overview of banking services:

Person-to-Person Banking Services:

Opening current and savings accounts, processing debit and credit cards, insurance, and asset management are all services provided by banks to people.

Banking Services for Business and Retail:

Banks provide checking/savings accounts, debit and credit card processing, merchant services, and treasury services for commercial and retail accounts.

Omni-channel banking services or digital banking:

Banks must provide digital or Omnichannel banking services to their consumers as a result of technology's disruption of the banking and finance industries. Standard online banking services comprise

1. Bank via a tablet, smartphone, or online
2. Check deposits through mobile
3. Text notifications and alerts
4. eStatements
5. Bill payment services online

Lending:

Another crucial financial function is lending. Personal, business, housing, vehicle, boat, and home equity loans are all available from banks. The duration of the loan processing and approval procedure consumes the banking staff's productive time.

In order to better serve the changing demands of millennial customers, banks are modernizing their offerings. Along with knowing about bank services, it's important to comprehend regular actions that take place at a bank. Knowing a bank's operational operations will make it simpler and more efficient to identify the ones that call for and benefit from process automation.

The following are operational activities in the banking sector:

1. Opening an account and accepting deposits
2. Lending money
3. Clearing of demand drafts and checks
4. Transfer of Funds
5. Use of safe deposits and lockers
6. Payment of bills online
7. Online banking
8. Controlling credit and debit cards
9. Money management
10. Banking on investments
11. Services for overseas banking

DISCUSSION

Automating Bank Procedures is Required

Numerous tasks are carried out by banking and financial services both in the front and the background. Over the last several decades, the face of banking and financial services has changed. One of the biggest users of information technology and services is the banking sector. According to a Gartner analysis, $742 billion would be spent globally on IT in the banking and financial services sector by 2024. Banking and financial organizations are still forced to use disjointed, unintegrated systems despite possessing extremely advanced technologies like Marketing Automation (MAS), Customer Relationship Management (CRM), and Enterprise Resource Planning (ERP) [4]–[6].

Although digital technology has disrupted several industries, some banks are still using manual processing techniques. Manual processes are not only a waste of time and energy, but they may also be inaccurate and inconsistent. From the viewpoint of an employee, manual procedures deprive them of their productive work hours and sense of fulfillment at their jobs. The workflow of the banking industry may be streamlined and optimized through automation technologies, greatly enhancing client satisfaction. Here are 5 strong arguments in favor of banks using banking workflow solutions:

a) Faster and more effective client service
b) Fewer or nonexistent human biases or mistakes
c) Enhanced output and operational effectiveness
d) Lower operating expenses
e) Greater happiness and engagement among employees

Automation of bank workflow management is the way of the future for forward-thinking financial organizations that want to cultivate solid client connections.

Workflow for Banking Process Automation

The management of bank process workflows is an approach used to improve coordination across different banking processes. A banking institution analyzes the current workflows and creates new, simplified, and optimized workflows for boosting productivity using banking process workflow software.

The downsides of manual processing are eliminated, and operational effectiveness is increased, when the banking process is automated. The banking procedure may be automated using user-friendly banking process workflow software like Cflow. Automation also helps in resolving the risk and compliance problems that banks have as a result of significant regulatory changes that regularly take place.

Banks and other financial institutions are using robotic process automation (RPA) to stay ahead of the market's fierce competition. RPA is a robotics and artificial intelligence combination used to supplement or replace human processes in banking. According to a Forrester report, the RPA industry will surpass $2.9 billion by 2020. RPA may be used to automate repetitive and low-value jobs.

Banking Process Automation Use Cases

Workflow management for banking processes has shown to be more efficient in certain financial activities than others. Following are a few examples of banking process workflow software's successful use cases:

a) Account creation
b) KYC
c) Client onboarding
d) Processing loans
e) Fraud prevention
f) Managing risks and compliance

Other banking activities like wealth management and credit and debit card processing are also candidates for automation.

What can automated banking accomplish for user?

The majority of the goods and services that banks and other financial organizations provide either include automation or have benefitted from it. Response times have been substantially reduced thanks to banking automation technology, which has also raised the value of each work hour. Other advantages of financial automation include:

Enhanced Trust: Customers desire to do more tasks faster and get advantages from dealing with their financial institutions. These requirements have been satisfactorily satisfied by quicker front-end consumer products, such as online banking services and AI-assisted budgeting systems. Behind-the-scenes banking technology has enhanced anti-money laundering initiatives while freeing up workers to devote more time to luring new business. As a consequence, there is a greater emphasis on personalization and trust.

More precision: In order to achieve cost savings, banking automation decreases human mistakes and the amount of time required to execute these jobs. Better business outcomes and fewer operating expenses are the end results.

Efficiency: One of the easiest and most economical methods to streamline backend procedures like document processing is via banking automation. To increase operational efficiency, these automation solutions reduce time-consuming operations and interact with downstream IT systems. Financial institutions have greater control over their data thanks to banking automation, which also allows for a more complete study of their information and the discovery of new potential for efficiency.

Scalability: Traditional software programs can have a number of restrictions, which makes it difficult to scale and adapt as the firm expands. For instance, experts previously devoted hours to finding and scanning the papers required to identify market trends. As a consequence, their expansion was limited by the quantity of available staff hours. Today, a number of use cases have shown how document AI and banking automation overcome these obstacles.

Improved Investments: The financial services sector, including banks, can now manage huge databases with a variety of sources, data types, and formats. As a consequence, they are more adept than ever at spotting investing possibilities, identifying subpar assets sooner, and matching investments to particular customers swiftly.

Service Modularity: Previously, the banking industry was only concerned with providing financial services. Many of these same groups are now able to provide financial literacy, economic education, and fiscal well-being thanks to their newly acquired skills. These modern banking procedures often contain investing software, retirement data, and budgeting tools that help the general public save money.

Who employs automated banking?

Many business procedures used in the financial and banking sectors are excellent candidates for automation. RPA and other automation are already being used by many professionals to lighten their burden and improve accuracy. However, banking automation may go far beyond these procedures, enhancing overall organization-wide consumer and employee interactions, compliance, and security.

Loan Procedures: In order to improve productivity throughout the process, including loan origination and task distribution, lenders depend on banking automation.

Regulatory Conformity: Banking automation aids in creating dependable, specialized operations to meet regulatory requirements. Audit trails may be used by staff members to keep track of different processes and requests.

Customer Services: To enhance the client experience, digital transformation and banking automation have become essential. Automation of account opening, transfers, and client onboarding, to mention a few, have produced some of the most notable benefits. The use of chatbots and other intelligent communications is growing.

Information Protection: Banking automation is often used by infosec experts to address security risks with little human labor. The pace at which automated procedures take place considerably improves these time-sensitive applications for increased threat identification and reaction.

People Resources: These days, banking scripts, algorithms, and software are often used to automate timesheets, vacation requests, training, new employee onboarding, and many HR procedures.

Additional Services: Financial institutions' ambition to deliver more real-time, automated services has been aided by banking automation. These extra services include international money transfers, prepaid credit cards, gold and silver purchases, travel insurance, and foreign cash orders.

What does banking automation do? Why? How then?

It is more crucial than ever for banks to improve and modernize their operations due to rising client demands, more regulations, and fiercer competition. Banks all across the globe are using automation to help them respond to organizational and economic changes, lowering risk and delivering cutting-edge client experiences [7]–[9].

What drives bank automation?

With the aid of banking automation, banks can remain ahead of the competition and attract and keep consumers while also lowering costs and enhancing customer and staff experiences.

Banks may link their systems and eliminate human work by using automation. As a result, the strain on employees is reduced, which makes them feel more satisfied and productive since they have the information and time, they need to provide clients the greatest experience.

How does banking employ automation?

Typical use cases for financial automation include:

a) **Customer onboarding:** Automating customer onboarding speeds up the procedure while assuring accuracy and compliance by streamlining data collecting and verification.
b) **Loan origination/credit processing:** Automation links diverse systems, enabling visibility of all the data required for reporting on statuses and making data-informed choices to swiftly conclude cases.
c) **Compliance:** Automating highly regulated operations enables you to include compliance into processes and monitor it on a single platform, enhancing transparency and giving you immediate access to an audit trail for more effective reporting.

d) Fraud detection is made simpler by banks' ability to see clients and transactions holistically thanks to the orchestration of data on a single platform.
e) **Back-office operations:** By digitizing jobs and processes, staff spend less time looking for and filing papers, which boosts productivity, minimizes mistakes, and lowers expenses.

How can automation be used to enhance banking operations?

Boost performance: Operations across departments are sped up by orchestrating technologies like AI (Artificial Intelligence), IDP (Intelligent Document Processing), and RPA (Robotic Process Automation). Employees are spared from having to manually extract and analyze data by using IDP, which does it more quickly and accurately. Business logic eliminates easier choices from staff processes by using data analysis and decision-making to make business decisions. Additionally, RPA bots may do jobs that were previously handled by people more quickly and without the need for breaks. The biggest bank in Colombia, Bancolombia, combines human, robotic, cognitive, and analytic automation technology to reduce laborious, repetitive operations. With front office automation, they were able to liberate over 515,000 hours each year in branches.

Increased awareness: To provide workers throughout the business more visibility, connect people, apps, robots, and information under a consolidated platform. Greater visibility not only makes it easier to see if activities are being completed as they should be, but it also sheds light on where delays in the process may be happening. Additionally, this improved visibility facilitates decision-making, simplifies reporting, and assists in identifying areas for development. By displaying the data kept in Bizagi apps, award-winning global asset management firm Insight Investment enhanced transparency around its end-to-end business processes, simplifying process management and future process optimization.

Enhance the experience for customers

Customers anticipate quick, individualized service from the moment they sign up until their last encounter with the bank. Employees may better serve customers by delivering a great contact and encouraging loyalty by having access to customer information at the proper time in the engagement, which ultimately gives them a competitive advantage. Old Mutual, a leading provider of financial services in South Africa, combined many platforms to provide staff members a comprehensive understanding of consumers and services. As a result, they were able to enroll consumers 10 times quicker, maintain 9 times shorter branch lines, and increase service-related revenues.

Improve employee satisfaction

Banking companies are continuously vying for highly qualified people to fill their open positions as well as consumers. Repetitive activities may be automated to lessen the burden of employees and free up their time for higher-value work that benefits the bank and makes them happier in their jobs.

In order to implement a rule in the loan origination process that automatically rejects loans that don't fulfill minimal standards, one financial company adopted automation. Employee burden is lessened as a result, allowing them to concentrate on the clients who will bring in revenue.

Cut down on operational risk

By automating compliance processes, banks can simply exchange and analyze data while ensuring that the rules are always being fulfilled. This frees up compliance divisions to concentrate on fostering a compliance culture across the whole business. Automated systems can also spot and alert to questionable behaviour that might endanger the bank and its clients. Another advantage of automation for Bancolombia was the 28% reduction in operational risk that resulted from automating routine, manual data-based processes.

Boost agility

Banks can react fast to market developments like new rules and competition thanks to automation. Rapid change-making also enables the speedier delivery of new, innovative goods and services that provide them an advantage over rivals.

CONCLUSION

The financial sector has entered a new age of efficiency, precision, and customer-centricity thanks to the automation of banking activities. This summary highlights the revolutionary effects of automation on banking procedures while also outlining its advantages, drawbacks, and the way it's paving the way for a technologically sophisticated financial environment. Traditional banking procedures have been reimagined thanks to technology, which has streamlined operations and reduced human error. Automation has streamlined mundane processes, from client onboarding to transaction processing, enabling banking employees to devote more time to strategic decision-making and individualized customer interactions. Automation has benefits beyond improved operational efficiency. Customers now get services that are quicker and more seamless, and digital solutions are always accessible. The customer experience has reached new heights thanks to real-time transaction processing, tailored insights, and improved security measures, promoting loyalty and satisfaction.

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CHAPTER 16

VIRTUAL REALITY AND AUGMENTED REALITY IN BANKING

Anshu Chauhan, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- anshuchauhan1411@gmail.com

ABSTRACT:

A new era of client engagement and financial transactions has begun as a result of the banking industry's use of virtual reality (VR) and augmented reality (AR) technology. This abstract explores the intersection of VR and AR with banking, stressing its importance, benefits, and difficulties as well as the tremendous opportunities it presents for transforming the way financial services are provided. VR and AR have completely changed how clients interact with financial institutions in an increasingly digital environment. Customers may browse virtual branches, see financial data, and get individualized financial advice via immersive experiences. Traditional banking transactions have been improved by these technologies, which also provide ease, engagement, and a greater comprehension of intricate financial ideas. The power of VR is its ability to mimic real-world settings that are defiant of physical limitations. Virtual reality (VR) enables consumers to make educated choices via interactive experiences, from property tours to financial simulations. Contrarily, AR improves in-branch experiences by adding digital information on top of real-world environments, making them more logical and instructive.

KEYWORDS:

AR, Augmented Reality, ATM, Banking, Financial Services, Virtual Reality, VR.

INTRODUCTION

Envisioning the Future of Financial Interactions

The integration of virtual reality (VR) and augmented reality (AR) has emerged as a revolutionary force in the constantly changing world of technology and finance, surpassing conventional boundaries and reshaping how people engage with banking and financial services. This introduction launches into a thorough investigation of the integration of VR and AR within the banking industry, exploring their origins, mechanics, uses, benefits, problems, and the profound influence they have on transforming the future of financial transactions [1]–[3].

The banking industry was not an exception to the significant shift that the advent of the digital era sparked throughout sectors. Institutions looked for creative methods to improve client engagement, optimize processes, and provide individualized experiences as technology advanced quickly. In this environment, immersive, interactive, and experienced solutions provided by VR and AR have emerged as revolutionary technologies that have the potential to reshape the fundamental foundation of banking.

With its capacity to produce virtual reality worlds that accurately reflect real-world experiences, banking has entered new waters. On the other side, augmented reality offers a novel technique to improve reality by superimposing digital data onto the actual environment. In order to increase

consumer engagement, rethink financial education, expedite internal operations, and provide creative solutions that improve the whole banking experience, VR and AR are coming together.

The importance of VR and AR rests in their ability to transform conventional banking models by overcoming the constraints of physical branches and allowing clients to interact with financial services in previously unheard-of ways. VR improves financial education by immersing users in dynamic settings that replicate real-world circumstances, allowing them to visualize difficult concepts like investment portfolios, market patterns, and real estate holdings. Customers are better able to grasp the product and make wise judgments thanks to this immersive approach.

Parallel to this, augmented reality (AR) has enhanced in-branch interactions by superimposing digital data onto actual environments. Customers may get customised suggestions and real-time information while effortlessly interacting with their environment. Using this interactive layer, advisers may illustrate and clarify complex financial topics in a way that is concrete and approachable, enhancing advice sessions.

Customer-centricity is emerging as a pillar of innovation as the banking industry navigates the digital transition. The consumer experience may be reshaped in novel ways thanks to VR and AR, which provide a seamless fusion of convenience and involvement. Customers may investigate financial services and products at their leisure and without regard to time or place thanks to virtual branches. Customers feel more empowered when they can interact with individualized financial data visualizations, which enables them to actively pursue their financial objectives.

The use of VR and AR in banking, however, is not without its share of difficulties. Consideration must be given to issues like data security, privacy concerns, regulatory compliance, and the smooth integration of new technologies inside the current financial infrastructure. To achieve a safe and responsible deployment of VR and AR, the appropriate balance between technology innovation and adherence to industry norms must be struck.

The use of VR and AR in banking is widespread, including internal processes and staff training in addition to client involvement. Simulated training environments made possible by VR speed up skill development, streamline onboarding, and improve teamwork among banking employees. By enhancing staff knowledge via the use of immersive technology, client interactions and service delivery are ultimately improved.

Future potential for VR and AR in banking is brimming with opportunity. These technologies' potential uses grow as they develop. VR could make it possible for virtual advice sessions to be as intimate and interesting as in-person meetings in a future where distant work comes first. The future of AR may provide real-time financial data overlayed into consumers' actual environs, enabling them to make choices while they are on the road.

We will explore further into the workings, benefits, difficulties, and uses of these technologies in the next investigation of virtual reality and augmented reality in banking. We demonstrate how VR and AR are more than simply technical innovation tools; they are also catalysts for bridging the gap between the digital world and the human touch via incisive analyses of real-life use cases and industry developments. As we go through this dynamic environment, we see how these immersive technologies have the potential to transform the entire nature of banking, paving the way for a day when informed, individualized, and customized financial transactions will become the standard [4]–[6].

Enhanced Data Visualization Virtual & Augmented Reality Banking and Fintech Trends

The depiction of data is perhaps the most significant part of adopting AR and VR technology in the financial industry. So players may now follow and see the financial market in more detail in a three-dimensional and interactive environment thanks to enhanced AR and VR-backed stock trading and investment.

This has altered how financial institutions evaluate their reporting insights. Financial data, graphs, charts, and projections may now all be shown in a 3D virtual environment. This makes it much simpler to interact with models to forecast better results and establish convincing connections. Are you worried about the potential returns on an investment product in various economic situations? Simply alter the variables in the simulated setting to see how your surroundings change.

Financial professionals may now concentrate more intensely than ever on every data point thanks to the potential of virtual and augmented reality banking. The StockCity app from Fidelity Labs is a potent illustration of this. The Oculus Rift app StockCity allows users to explore the financial world by donning a headgear and exploring the stock market as a 3D metropolis.

Online Trading

The concept of "workplace anytime, anywhere" has emerged as a result of this significant change in data display and analysis. Users are now able to consult virtual agents while using computers, smartphones, and virtual rooms. Additionally, by working together to analyze crucial data, coworkers and business partners may enhance decision-making via collaboration.

The virtual reality experience offered by TD Ameritrade is one instance of this. This software program begins as a "street view" that instructs users on how to operate a stock market. In order to provide real-time advice, it then switches to a "helicopter view" of active markets employing holography and 3D charts.

Financial Support & Advice

Managing money is seldom easy. However, thanks to virtual and augmented reality banking, experts now have the resources to inform their clients as well as staff members about the specifics of their investment and company plans. Once again, the amazing potential of virtual data visualization enables this.

The integrated augmented reality platform "Your Way Desjardins" from Desjardins Bank is an incredible illustration of this that currently exists in the financial industry. The platform's virtual assistant Penny provides relevant and integrated retirement planning and financial guidance. Penny supports education by using interactive films and data storytelling. She is also capable of offering highly tailored suggestions to clients about savings programs. Such tools are highly effective for developing marketing strategies that will appeal to customers of all types.

Better Services

One aspect of how AR and VR may enhance customer service is via educational experiences like "Your Way Desjardins". These resources have a number of advantages, including as mobile apps that direct users to bank branches, ATMs, and other financial organizations. This is made possible by augmented reality's capacity to overlay significant information over the actual environment. Customers therefore get to enjoy a straightforward method of receiving assistance and guidance.

A customer may now completely seek assistance in a virtual environment thanks to the virtual experiences that many financial institutions have embraced. There, virtual assistants may provide detailed visual explanations and interactive facts to almost any topic. The main advantage of this online environment is that clients may get the guidance they want without ever having to leave their homes. This has proved to be quite helpful since the COVID-19 epidemic has pushed the current shift toward digital first thinking.

Payments in the Online World

Although customer shopping habits have always changed with the times, current events have accelerated the shifts more than before. Daily transactions may soon shift even more as augmented reality shapes mobile and web payments. AR and e-commerce have grown in significance as more businesses adopt a "digital-first" approach. For instance, Vertebrae, Meta's AR partner, claims that during the COVID-19 epidemic, consumer engagement increased by 19% in stores using AR technology. Additionally, the conversion rate among clients using AR increased to an astounding 90%. Financial professionals should pay attention to these developments since adopting AR and VR technologies may have significant benefits, especially in difficult economic times.

Increased Security

Today, every online encounter is accompanied with the possibility of cybercrime and data breaches. Because of this, financial institutions make investments in security measures to ensure the confidentiality of their customers' data. Typically, this entails multi-factor authentication and highly secured firewalls. These security measures, nevertheless, sometimes fail, infuriating both clients and financial experts. To combat this, several businesses have started to provide AR and VR login processes that precisely authenticate the user's identity using biometric scans of their face or irises. For safe and convenient access to banking in a virtual environment, speech recognition may also be used. These security measures provide a flawless experience when paired with AR or VR technologies. One that completely protects all data.

DISCUSSION

Augmented Reality: What Is It?

In augmented reality, users' physical surroundings are improved with computer-generated input in some areas. It may provide a realistic, interactive experience of a virtual setting [7], [8]. Users may act as they would in the real world and utilize AR to make illusions seem genuine. AR has the power to change how people currently see the actual world.

Why Is Augmented Reality Necessary in Banks?

Users of augmented realities may layer digital content over the physical world. AR technology uses current cellphones or head-up displays to enhance the immersive experience. Through the millions of compatible smartphones already in use, banks and other financial institutions can engage clients and provide fresh, engaging experiences. Financial service providers may use AR to engage both current and future banking clients. The necessity for augmented reality in the banking industry may be inferred from the fact that it will allow customers to examine the information in a clear, interesting, and immersive way. This presents a hurdle for the banks, which AR can assist them overcome.

Additionally, banks have struggled to provide customers more options and to give them more insight into their spending habits and activities. Although there have been problems with banks in this area, AR has the potential to have a significant influence since it will empower people to make wise spending choices. Customers will have a new method to understand financial data and information thanks to it.

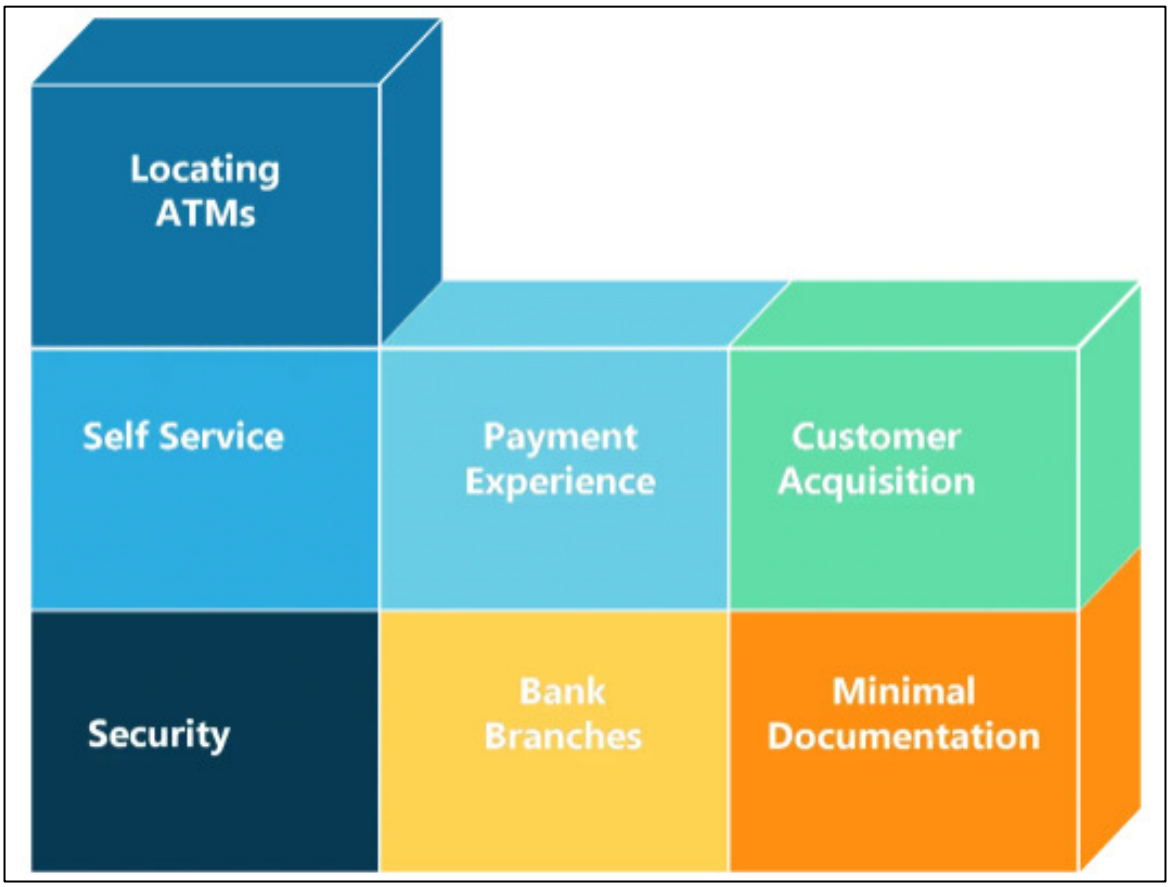

Figure 1: Ways of using augmented realities in banking: [enterslice.com].

What Opportunities Does Augmented Reality Offer the Banking Industry?

a) **Finding ATMs:** Customers may now use AR phone apps to find local ATMs and bank locations. For this goal, the Axis bank in India released the augmented reality app "Near me". These applications give up-to-date information on the location, accessibility, and services offered at these ATMs.

b) **Customer service:** Customers now prefer to do their banking online rather than going to a physical bank location. Because they make transactions simpler and easier, banking applications are likewise becoming more and more popular. When it comes to banking apps, augmented reality will aid clients by providing information about their bank accounts, loans, mortgages, etc. Customers will benefit from a wonderful user experience as a result.

c) **Payment encounters:** By identifying the features and cost of an item and superimposing the information on consumers' experiences with the real world, augmented reality banking applications may stimulate purchases. This may make it easier to monitor and pay accounts.

d) **Client Acquisition:** The technology-dependent millennial generation need systems that can change along with them. Due to the widespread adoption of augmented realities by many institutions across a wide range of industries, the technologies are predicted to develop. Whether banks are able to incorporate new trends and innovations in banking will determine how successful they are in acquiring new customers.
e) **Protection:** When combined with biometric security measures like voice recognition and retinal scanning, augmented reality in banking may increase security. It will aid in preventing hackers' illegal access.
f) **Bank locations:** More individuals are using virtual banking than ever before, which has decreased the number of people visiting bank locations. These virtual banks mix self-service with capable AR assistants, such as chatbots and other tools that provide consumers crucial information. AR makes it possible to see account information, which will enable banks to provide individualized banking advice. Data may also be shown in a novel way, assisting buyers in comprehending distinct investment plans.
g) **Little to No Documentation:** Imagine filing all of those tangible papers one by one. As AR advances, this may be decreased. You may provide bank statements, advice, letters, and even checks digitally. Time will be much reduced. It will also make the laborious, paper-intensive loan application procedure simpler. Figure 1 shows the ways of using augmented realities in banking: [enterslice.com]

Obstacles in the Banking Industry's Use of Augmented Reality

Banks are having certain difficulties while using augmented reality. Below are some of these difficulties discussed:

a) **Technical difficulties:** When it comes to banks, they could need a lot of parts in order to develop a practical augmented reality solution. Banks may have difficulties as a result, and AR cannot be effectively depicted until these technological limitations are resolved.
b) **Absence of rules:** There are currently no such laws that inform companies and customers about the kinds of AR apps that are allowed to be utilized, as well as the processing of data. Therefore, the information might be exploited maliciously.
c) **A general lack of knowledge:** Although augmented reality (AR) is a popular issue for techies, the general population is uninformed of the technology. Lack of public understanding might result in privacy and security issues while adopting AR technology.

How Can Augmented Reality (AR) In Banking Benefit Customers?

a) It fosters a private experience. Because there are so many personalization options with AR, clients who utilize banks' services may have a distinctive and customized experience.
b) It's fresh and fascinating. Customers want convenience and distinctiveness, and AR can provide both. Customers find it intriguing because of its originality.
c) It's interesting. The potential for AR to be engaging is one of its key features. Users all across the globe are very appreciative of this feature. They have a wonderful user experience as a result, which keeps them coming back. Figure 2 shows the wys by which customers can benefit from AR [enterslice.com]

Figure 2: Ways by which customers can benefit from AR [enterslice.com].

The Use of Augmented Reality in Banking in The Future

With the advent of cutting-edge technology that have made the whole digital banking experience easier, the future of the banking industry seems solid. The day when you had to wait in a big line has long since passed. To reach the next generation of clients, more and more banks are using online and digital platforms.

In this effort, AR is in the driver's seat. The combination of consumer data research and analysis with cutting-edge technology is the only way to keep conventional banks alive and competitive in this digital economy, and it is the future of banking technology since it adapts so quickly to the demands of financial technology.

CONCLUSION

Customer interaction and financial services have seen a significant transition as a result of the banking sector's use of virtual reality (VR) and augmented reality (AR). The effect, benefits, problems, and exciting prospects that VR and AR bring for the future of financial transactions are highlighted in this conclusion, which summarizes the revolutionary path of these technologies in banking. The way clients engage with banks has changed as a result of the advent of VR and AR technology. Customers may now browse digital branches, speak with virtual advisers, and visualize complicated financial data via immersive experiences. Traditional banking transactions have been given new life by these technologies, which also offer clients a level of participation and convenience never before possible. The appeal of VR resides in its capacity to design interactive, immersive experiences that go beyond the bounds of the actual world. Through immersive learning, VR helps users to make educated judgments on anything from mortgage walkthroughs to investing portfolio simulations. Contrarily, augmented reality (AR) overlays digital aspects onto the physical environment to improve in-branch interactions and make difficult financial concepts easier to understand via interactive representations.

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CHAPTER 17

A BRIEF STUDY ON CUSTOMER EXPERIENCE IN BANKING

Aditya Sharma, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- adityahr2018@gmail.com

ABSTRACT:

Customer experience has become a crucial element in determining how contemporary banking will develop. In-depth discussion of the importance of the customer experience in banking is provided in this abstract, which also focuses on its transformational effects, benefits, and difficulties as well as the changing role it plays in encouraging customer involvement and loyalty. The meaning of banking has changed from being transactional to being experienced in an age of quick technology advancement and shifting consumer expectations. Personalized services, smooth interactions, and deep relationships all go under the umbrella of customer experience, which goes beyond simple convenience. Banks can foster trust, client loyalty, and long-lasting relationships by anticipating and meeting their requirements. An outstanding client experience in banking is alluring because it has the ability to leave a lasting impression. Banks may provide seamless omni-channel experiences by using a comprehensive strategy that combines physical and digital touchpoints. This includes user-friendly kiosks, sympathetic in-branch encounters, and smart mobile applications, all of which are designed to provide a seamless and memorable trip.

KEYWORDS:

Banking, Business, Customer, Customer experience, Digital banking, Financial institutions.

INTRODUCTION

Every business, including banks and financial institutions, must now adapt to a constantly changing environment, cutting-edge competition, and escalating client demands. To effectively serve their clients, many insurance and financial service providers must stay current with emerging trends. Every strategy approach used by banks to satisfy consumer needs must include the customer experience (CX). To provide a consistent banking experience whether it is online or in a physical location, banks and other financial institutions need to undergo a digital transformation.

Digitally operating banks have seen lower expenses and more efficient operations. In addition, this end-to-end connection enables business transformation using artificial intelligence (AI) and contributes to the delivery of an engaging client experience in financial services. Customer Experience (CX) in Banking: What Is It? The term "customer experience" (CX) in the context of banking refers to all the initiatives you do to make each customer feel valued when they deal with your bank. Additionally, it is the culmination of every encounter that a consumer experiences during their whole trip. According to the Digital Banking Report, banks and other financial service providers should prioritize "improving the customer experience in banking".

Banks that invest in customer experience trends see better rates of referral, a larger proportion of wallets, and a higher likelihood of up-selling or cross-selling goods and services to current clients.

Financial services' consumer experience

For the financial services sector, providing top-notch customer service is essential. The leading causes of consumers leaving their banks and credit unions were found to be poor service and bad financial advice. In the long run, improving the customer experience can have a considerably greater effect. In order to modernize the banking and financial services experience, banks should embrace new trends and techniques [1]–[3].

What do customers want to get out of their experience with digital banking?

Customers no longer perceive their experiences in an industry silo as CX has grown to be of utmost significance in recent years. They anticipate that banks will put their efforts into developing an experience culture that meets their demands, fosters trust, is individualized, and goes above and beyond their expectations.

The following are the main client expectations for a digital banking experience:

1. **Simple accessibility:** Financial institutions and banks must provide simple-to-use digital platforms that can be accessed from a variety of devices, namely smartphones. Mobile devices accounted for 15% of banking consumers. Customers often seek for a variety of services, a top-notch banking experience, and a simple method to contact immediately.
2. **Real-time support:** Customers that want "real-time" assistance do so sincerely. According to 49% of consumers, establishing loyalty requires quick assistance. Banks may grow their service using chatbots and provide real-time support by utilizing live assistance features like co-browsing and video chat.

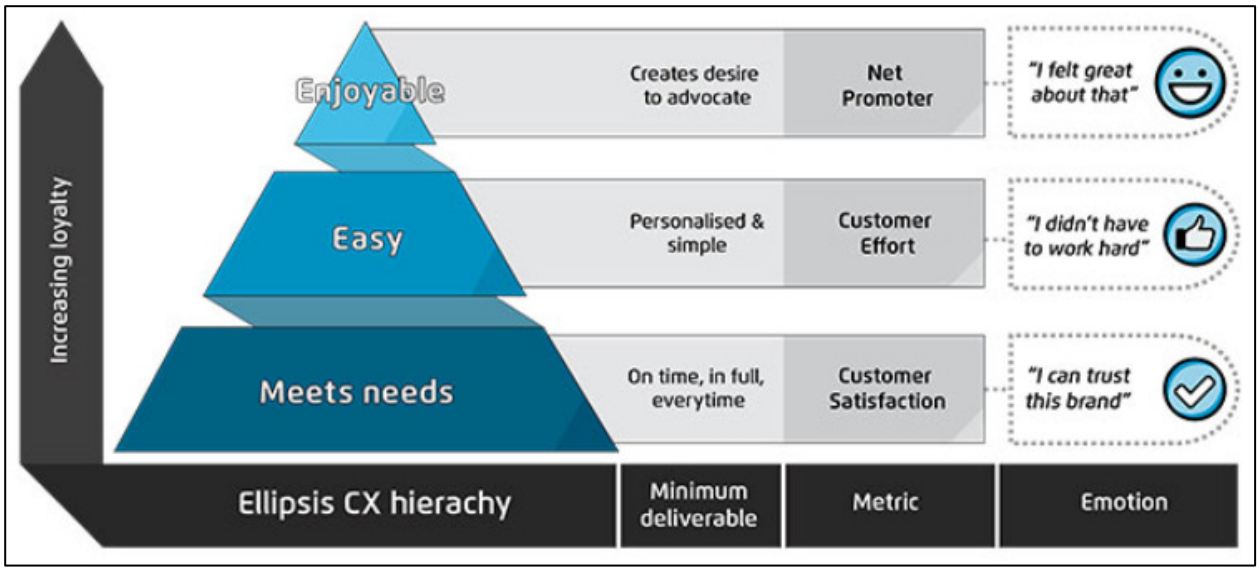

Figure 1: Customer Expectations for the Digital Banking Experience [revechat.com]

3. **Individualized services:** Customers are constantly in favor of relevant and individualized services. They search for goods and services that meet their requirements. Banks have the ability to pinpoint the main business motivators and provide specialized assistance that will help to mold the banking experience for customers.

4. Data security - In banking and financial services, data security has always been of utmost importance. Customers want to feel comfortable disclosing to the bank all of their personal information and data. To maintain a positive connection with clients, banks should be able to develop trust. Figure 1 shows the customer expectations for the digital banking experience [revechat.com]

DISCUSSION

Trends to Improve the Banking Digital Customer Experience

With all of the demands of the digital transformation age, the customer experience is a difficult environment for financial institutions to negotiate in the current banking industry. So, what can be done when CX issues in digital banking are becoming worse every day?

To establish a digital client experience in banking, we have customized eight trends. Let's start:

1. Active participation for better financial management

Financial institutions have been able to vary their customer engagement tactics and improve client connections by providing real-time help thanks to innovation in data collecting, analytics, and channel strategies. Instead of limiting themselves to location-based offers, banks and financial service providers will be able to deliver insightful information that will enable clients to take advantage of possibilities quicker than before while lowering their risks.

How can banks benefit from proactive client engagement?

a) **Educate consumers:** Banks may better inform their clients about the goods and services they provide, enabling them to make wiser financial choices.
b) **Alert consumers:** To keep their customers informed about their transactions, banks might alert clients about bills, application status, or announcements.
c) **Survey:** To detect and comprehend the gaps between clients and banks, banks should proactively gather customer feedback.

2. Give real-time support

A great technique to acquire a thorough insight of your customer's experience is to map out their banking journey. It can benefit banks by:

a) To identify typical consumer concerns
b) Discover ways to enhance the client experience.
c) List the interactions that clients have with your bank.
d) Be more aware of your customers' expectations.

No matter whatever customer touchpoint they utilize, banks can deliver consistent and great customer care by understanding the banking customer path mapping. You may provide live support based on consumer issues using cutting-edge techniques like co-browsing and video chat [4]–[6]. A full range of visual engagement capabilities are available via REVE Chat to assist in real-time customer collaboration and the provision of a customized initial answer. Register right now to enable your company to provide real-time financial help. Banks may provide their clients quicker answers in real time by using visual customer interaction. Additional advantages that Bank might get include:

a) **Decrease the amount of time it takes consumers to resolve issues:** Bank representatives may assist clients in navigating the challenging banking application process by working with them in real-time.
b) **Shorten the sales cycle:** Direct communication with clients enables quicker issue identification and delivery of workable solutions.
c) **Multiple touchpoints:** By identifying the problem at the initial touchpoint, live support helps to give an accurate solution.
d) A fantastic example of how to enhance the client experience in banking is ICICI bank. The bank has: by using the sophisticated co-browsing solution
e) Simplified the complicated process of filling out forms, which included many touchpoints and numerical errors.
f) The bank has drastically cut down on typical operating times by 50%, raised client satisfaction levels by 65%, and boosted contract closure rates by 62%.

3. Your "Financial Concierge" may be a chatbot.

Real-time assistance is one of the crucial factors that directly affects the customer experience. According to Gartner, "85% of banks and businesses will perform customer engagement with the help of AI chatbots by 2020." The greatest tool banks may employ to automate basic and common actions (such as checking account balances, credit card balances, changing addresses, etc.) when human interaction is not required is a chatbot. Your bots may be trained to conduct interactions correctly and adapt to the person's preferred language and timing. When bots are properly employed, they lower the volume of support queries and increase team productivity.

Here are a few possible applications for chatbots in banks:

a) Today's customers need 24/7 accessibility and quicker help. Chatbots for financial services may engage clients around-the-clock and provide fast assistance for basic questions.
b) Why Chatbots in banking allow customers who prefer self-service a method to communicate with their bank in a conversational manner even when they are only asking for information.
c) User account information may be accessed by in-app chatbots, who can then provide entirely individualized information, assistance, or even financial advice depending on data.
d) By engaging your customers in casual voice or text chats, Nina, an AI assistant created by Swedbank, is intended to give an intuitive, automated experience for all your digital channels. According to the bank, 81% of the 40,000 discussions that Nina bot conducts each month are resolved.

4. Give the seamless omnichannel customer experience a priority.

Today's consumers desire to interact with companies via several platforms. Whether customers use a website, a mobile app, a contact center, a bank's branch, or any other channel, they may carry out the same banking procedures. According to studies, digital channels are becoming less important every year, yet close to 50% of clients also demand access to branch services. It implies that offering the same level of service across both online and physical channels is the key to providing outstanding customer service in the banking industry. Giving clients an omnichannel banking customer experience involves having the same set of services accessible to them across all channels, both online and off.

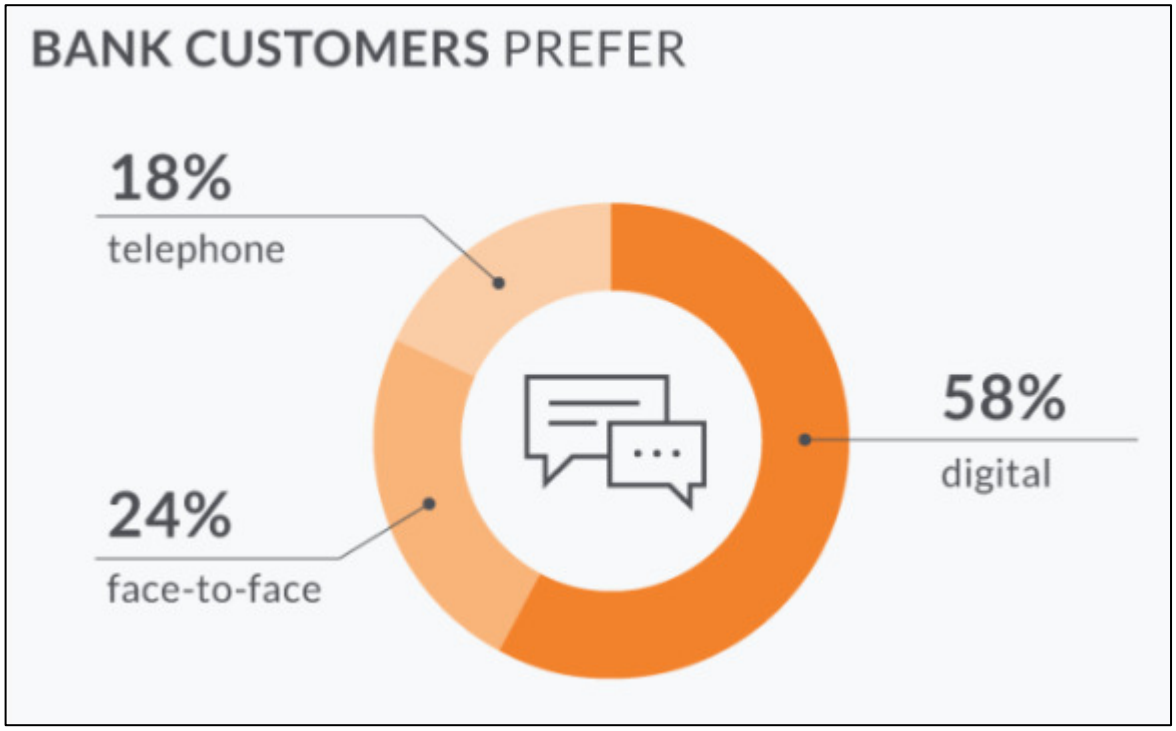

Figure 2: Customer preferences [revechat.com].

Real-time data synchronization across various channels is another feature of the omnichannel banking platform itself. Customers may, for instance, begin the onboarding process with one channel and end it with another without having to repeatedly enter the same information. Figure 2 shows the customer preferences [revechat.com].

5. Recognize the client experience

Today's banks want to provide customers with an unmatched experience, but how can they do this? By providing a seamless consumer experience. It is the sequence of events that consumers experience when they engage with your business and brand. It could continue after clients have made a purchase or registered for a new account.

Following the creation of the travel map, it is time to:

a. To what degree do customers feel that their present experience lives up to their expectations?
b. What areas need improvement?
c. What enhancements may be made?

At every point of the customer journey, needs, motivations, actions, and obstacles to action should be taken into account. What, for example, drove that persona to do that action? What would spur them on to go on their journey's next leg? What challenges may they encounter? Delivering a fantastic experience in banking requires a thorough understanding of your customer's journey.

6. Utilize analytics and large data

Understanding clients is the cornerstone of a long-lasting competitive advantage in the world of digital banking. It takes a genuine knowledge of your consumers and the ability to relate to them in their language to improve the retail banking experience. This entails using the data available and getting a 360-degree perspective of your banking consumer. Making important business choices and improving the financial services experience both depend on big data analytics. The need of using big data analytics to acquire in-depth insights into client wants is brought on by the growing variations in those needs.

Key Reasons Why Banking Places a High Priority on Customer Experience

Consumers are demanding great customer service from banks in return for their loyalty, according to the annual Consumer Banking Survey by NGDATA. In order to have the tools necessary to become completely customer-centric, banks and other financial institutions must speed up the adoption of digital technology and set positive digital transformation examples across their respective companies. Customers must be the focal point of their whole architecture, and service providers must live up to their higher standards. The following main factors make customer experience in retail banking a major priority:

a) **Consumers demand humanized digital interactions:** Banks have recognized that the digital world presents them with a brand-new set of challenges. The chance to rethink the consumer experience is enormous. An intelligent banking chatbot may automate digital engagement while still providing live chat help to consumers as needed.
b) **Digital transformation must go beyond cost reductions:** Banks must make sure they have a return on investment (ROI) based on the cost when using sophisticated customer care systems like chatbots and live chat. Cost-savings should not be the exclusive goal.
c) **Humanized personalization at scale:** When it comes to scaling customized assistance, banks must take into account both the concrete and intangible elements of the course, such as customer pleasure, loyalty, and success.

Banking Customer Experience Trends

People's interactions with their financial providers are changing dramatically as a result of significant alterations in customer expectations. A number of significant developments are highlighted in the "Performance Against Customer Expectations" (PACE) report, which illustrates how swiftly the banking business is evolving. These are the top five customer engagement trends in banking:

Increasing the mobility of goods and services

"72% of all bank interactions are digital," according to the FIS Consumer Banking Report. More people use mobile banking than any other retail delivery channel, including desktop computers, ATMs, and physical branches. No bank can afford to have a badly functioning mobile application turn off prospective new clients. It's time to concentrate on enhancing the data in mobile applications if you want to remain competitive.

Be a financial counselor to customers at all times.

Customers who are looking for financial guidance visit the websites but leave perplexed about how to implement the detailed instructions realistically. Banks may use these chances to enhance

the client experience for financial services. The creation of customer profiles that provide financial professionals a complete picture of client needs is made possible with the use of CRM technology [7]–[9].

The client experience of physical branches and online banking are same. Although clients no longer often visit physical branches, this trend should not be overlooked. It is crucial that brick and mortar services function similarly to online banking in order to compete with it and improve client experience. Physical banks have benefited from the benefits of allowing clients to utilize technology and seek out consultation services. Maintaining simplicity, online banking users should take use of comparable functions, self-service choices, and cutting-edge technology to have a highly customized banking experience.

Automate ordinary chores by using artificial intelligence (AI)

One of the annoying situations for clients is having to wait a long period to get their question addressed. AI-powered chatbots are the ideal solution to the banking industry's customer care problem. In order to respond to FAQs, bots may converse with clients around-the-clock. This speeds up responses and lowers the volume of help queries.

Emma from OCBC is an excellent illustration of a pattern in which banks are using males as beneficial acquisition and lead-generation engines. The Emma bot is designed for home and renovation loans and offers conversational guidance to consumers and prospects. It gathers user information and sends it to a mortgage specialist to provide a customized user experience. In addition, conversational banking is using AI to provide a better experience.

CONCLUSION

Customer experience is anticipated to become more important as the banking industry changes. Artificial intelligence, machine learning, and data analytics are among the technological advancements that are expected to significantly improve consumer interactions. Customers' expectations for service are going to change as a result of predictive analytics, real-time support, and hyper-personalized products that are soon to be available. Innovation in the banking industry will continue to be driven by a comprehensive and customer-focused strategy. The importance of seamless omni-channel experiences, where consumers can move easily between physical locations and online platforms, cannot be overstated. The human touch will continue to be a crucial component of the customer experience with investment in staff training and the promotion of an empathic culture. In conclusion, success in the banking sector now hinges on the quality of the client experience. Banks build a route to customer-centric excellence by reinventing interactions, providing tailored solutions, and creating lasting relationships. Institutions assure not just their own development but also the empowerment of their customers as they navigate the complexity of contemporary finance by continuing to innovate, adapt, and invest in upgrading the customer experience.

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CHAPTER 18

A BRIEF STUDY ON REGULATORY COMPLIANCE AND BANKING

Manoj Agarwal, Associate Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- agarwalmanoj21@gmail.com

ABSTRACT:

In order to provide stability, accountability, and transparency in the banking sector, regulatory compliance serves as a crucial foundation. This abstract explores the crucial role of regulatory compliance in banking, stressing its importance, difficulties, advantages, and the changing financial industry environment it defines. Regulatory compliance is a vital protection for the integrity of the banking sector in a setting marked by rapid change and increased scrutiny. Compliance refers to the complicated network of rules, laws, and policies designed to reduce risks, stop financial crimes, and safeguard the interests of stakeholders. The appeal of strict regulatory compliance in banking is found in its capacity to advance economic stability and consumer confidence. Banks can foster a climate where customers are confident in the security of their funds and transactions by upholding strict standards. Additionally, compliance promotes an even playing field, assuring fair competition and minimizing the possibility of unethical behavior.

KEYWORDS:

Banks, Banking, Financial Transactions, Regulatory Compliance, Risk Management.

INTRODUCTION

Banking Compliance

The term "banking regulatory compliance" refers to the set of standards and procedures that banking organizations must follow in order to adhere to industry rules and other pertinent laws. Several aspects of the banking sector are subject to regulatory compliance, including: Risk management, information processing, data dependability, security and infosec, and ethical behavior.

Regulatory compliance in banking aims to stop deviations or unlawful activity as well as deal with these and other problems within the business's operations. In the banking business, regulatory compliance is continually changing, which is a reflection of the financial sector as a whole. The previous several years have seen the emergence of new technologies and new procedures.

In order to provide stability, transparency, and protection for both the sector and its clients, regulatory compliance in banking is an essential framework that controls the activities and behavior of financial institutions. When it comes to conducting financial transactions, controlling risks, and distributing capital, the banking industry is crucial to the world economy. To preserve integrity, reduce systemic risk, and stop financial malfeasance, banks are subject to a number of strict rules owing to the potential for negative effects on economies and society [1]–[3].

Regulatory compliance refers to the observance of a body of laws, regulations, and standards put out by national and international organizations, including central banks, financial regulatory agencies, and groups like the Basel Committee on Banking Supervision. These rules are intended to solve a number of issues, such as:

Financial Stability: Regulatory frameworks make sure banks have enough capital reserves to cover any losses, which lowers the danger of bankruptcy and lessens the possibility of a financial catastrophe.

Risk management: Effective risk management procedures, such as the identification, measurement, and mitigation of a variety of risks, including credit, operational, and market risks, are mandated by compliance standards.

Regulations are in place to protect the interests of customers by assuring fair treatment, open information, and prudent lending practices. This fosters consumer trust and deters exploitative conduct.

Anti-Money Laundering (AML) and Counter-Terrorist funding (CTF): As part of the worldwide effort to Figureht financial crime, banks are expected to put strict safeguards in place to identify and prevent money laundering and the funding of illegal activities.

Data Privacy and Security: Banks are required to abide by data privacy laws in order to protect client data from breaches and unauthorized access since they are the custodians of sensitive financial information.

Market Integrity: By eliminating insider trading, market manipulation, and other unethical actions, regulatory compliance strives to safeguard the integrity of financial markets.

The Basel Accords define the minimum amount of capital banks must retain in accordance to their risk exposure and set requirements for capital adequacy. This guarantees that banks have a safety net to withstand losses.

Banks who violate regulatory rules risk serious repercussions, such as penalties, legal action, reputational harm, and even license revocation. Banks spend a lot of money on compliance divisions and technology to make sure these rules are followed. The development of technology in recent years has created new possibilities and problems for regulatory compliance. Regulators have had to modify their frameworks in response to fintech developments like internet banking, mobile payments, and blockchain that nonetheless support conventional banking ideals.

Regulatory compliance serves as the cornerstone of a healthy banking sector by encouraging consistency, responsibility, and moral behavior. Following these rules promotes public trust in the reliability of the global financial system while also protecting the interests of financial institutions.

The Function of Banking Compliance Divisions

Due to the increased danger of criminal behavior in the banking sector, compliance procedures are essential for safeguarding both banking customers and banking companies. Because of this, the majority of banks have an entire department devoted completely to compliance, making ensuring that every bank complies with the legislation and standards set by the sector. Any potential security issues, such as identifying and freezing accounts at risk of potential fraud, are within the purview

of these departments. Such activities assist in preventing or minimizing losses on a financial and administrative level.

Additionally, compliance divisions strive to stop illegal activities like tax evasion, money laundering, and other behaviors that conflict with the bank's moral and legal commitments.

Banking regulatory compliance's difficulties

Despite the fact that these divisions are often well-run, banks nonetheless have a number of difficulties in establishing and maintaining regulatory compliance, such as the following.

The majority of Governance, Risk, and Compliance (GRC) functions are centralized and often have a narrow focus. GRC is a framework that gives companies the tools they need to run their operations effectively and compliantly, which gives them a feeling of security. Frameworks for GRC are often centralized. There may be a misalignment between GRC procedures and organizational objectives since each department or unit within the firm is focused on achieving its own objectives. The interpretations of compliance risks by GRC departments might be isolated from the bank's overall risk management procedure [4]–[6]. When the compliance office and the bank's internal risk management process disagree, regulatory compliance in the banking industry faces another problem. Dysfunction and gaps in risk management may occur from the separation of these two sectors.

Due to their antiquated and inefficient documentation procedures, which demand for phone calls, emails, spreadsheets, and other antiquated forms of communication, several departments have difficulty implementing GRC. When systems and procedures are dispersed far, it may be challenging to keep up with everything. The design of systems strategies that enable banks to compile all relevant data and prioritize important tasks, such as audit operations, is one strategy to address this.

Absence of Preventative Defense Techniques

Too often, compliance offices respond to crisis management with temporary fixes that may be put into place right away. Instead of using reactive models and tactical remedies, the compliance department's efficiency and overall effectiveness in handling regulatory concerns or meeting management expectations may be increased by adopting a holistic framework plan.

DISCUSSION

Uncoordinated or haphazard management and implementation

Unorganized management is a sign of a dispersed system. The intersection of all of the aforementioned problems creates the conditions for disorganized or poorly planned compliance management. If GRC is not implemented fully and with consideration for all units, the results might range from reactive tactical corrections to isolated data sets. The role of compliance staff is often advisory; they do not actively identify risks.

As already indicated, the function of compliance employees often shifts from advising to reactive if a risk materializes. GRC may be more effective if compliance staff begin to actively identify possible risks and dangers in accordance with the most recent applicable rules and regulations. In the field of banking regulatory compliance, there is a persistent shortage of talent, making it challenging to identify and hire qualified candidates.

Members of the risk and compliance departments are essential to a firm, particularly in the banking industry. Regulatory compliance, however, suffers from a persistent skills shortage that makes it challenging to locate qualified employees in the first place. The search for excellent individuals is considerably more difficult. Potential employees with the appropriate attitude, skill set, and knowledge may assist in preventing non-compliance problems for financial institutions.

Banking regulations are always changing.

The speed at which regulatory requirements are changing is one factor that makes compliance activities at banks more difficult given the possibility for crossed wires. It is quite challenging to keep up with the regulations and practices needed in every area where a bank does business.

What Does Regulatory Compliance Mean for the Banking Sector?

Regulatory compliance seeks to guarantee that the bank works within the law, preserving its integrity and standing in the community. The job handles a variety of responsibilities, including safeguarding bank information, avoiding penalties from the government, avoiding tax evasion, monitoring and reporting anti-money laundering operations, evaluating risks, and making sure there are no violations of banking ethics [7]–[9].

By proactively communicating the compliance policy to personnel, maintaining an ethical bank culture, and standardizing processes, the regulatory function meets its demanding objectives. Leading banks are able to increase their capacity for innovation and realize development opportunities by collaborating with banking domain specialists like Maveric on industry-first RegTech Solutions.

Regulations for the Protection of Financial Data

1. **GDPR (GDPR):** The GDPR of the European Union is strict (EU). It controls internet privacy and EU data.
2. **PCI-DSS (PCI DSS):** Financial data security standards guard customer information. It harmonizes the handling, storage, and transmission of cardholder data.
3. **Gramm-Leach-Bliley (GLBA):** This legislation requires financial institutions to make their data-sharing practices public. Safeguard important data.

Regulation of Financial Compliance by Laws

1. **Sarbanes-Oxley (SOX):** The US approved the Sarbanes-Oxley Act in response to Enron, Tyco, and WorldCom. The Act covers organizations' financial reporting and recordkeeping. It will Figureht against business fraud and corruption. Cybersecurity is necessary for financial service compliance in order to safeguard financial data.
2. **AML guidelines:** AML guidelines stop the funding of terrorism and money laundering. It aids in harmonizing EU rules.
3. **EMIR:** MiFID II of the EU governs financial markets. It protects investment. It harmonizes procedures in financial services.

Figure 1: Regulatory compliance focus in banking [maveric-systems.com].

The Banking Industry's Increasing Need for Regulatory Compliance

Businesses must adhere to additional regulatory advice as customer behavior and technological advancements change. There was no internet or digital assets decades ago. The economy is fueled by these things. As a result, strong rules are required for the welfare of both businesses and consumers. Regulatory compliance is a top priority for businesses today, as expected. Data losses and security breaches are decreased through compliance. Additionally, compliance avoids license revocation, financial penalties, reputational harm, and high consumer churn. Figure 1 shows regulatory compliance focus in banking [maveric-systems.com].

The Price of Compliance Failure

Your company will be impacted by rules and regulations non-compliance in more ways than one. Customers of financial services choose trustworthy companies that adhere. Customers could be hesitant to utilize your financial services if they read online about a data breach or CFPB fine. A major danger of non-compliance is litigation brought by clients. Target paid $18.5 million to resolve claims, while Nationwide Insurance was penalized with a $5.5 million fine. Penalties and lawsuits may harm your company. You can lose access to customers who want third-party assurance on the money placed at your bank, for instance, if you violate FDA restrictions.

However, one compliance error may ruin years of work you've put into building your company's image with clients and other businesses.

Steps to Take Before Regulatory Compliance

1. Conduct a compliance audit to identify the weak points and inefficiencies in the company.
2. Evaluating the effect on your company, both quantitatively and qualitatively. This activity results in concrete improvements.
3. Designating a Chief Compliance Officer: A Corporate Compliance Officer is in charge of promoting the morals, responsibility, and integrity of the company.
4. Establish Internal Company Policies: Regular self-assessment exercises and institutionalizing compliance handbooks keep employees knowledgeable about different requirements.
5. Regulatory Compliance Training: It's critical to inform staff members of updates and modifications to business compliance standards.

Making Sure of Regulatory Compliance

1. **Industry regulations:** Based on the firm's location and industry, determine which laws apply to it.
2. **Establish legal requirements:** Each legal requirement's compliance needs are determined by the firm and its activities. Assess the obligations for particular compliance.
3. **Document processes:** Accurate documentation demonstrates how corporate operations adhere to legal requirements to prevent penalties when audited.
4. **Consistently review standards:** Cybersecurity regulations change over time. Track compliance obligations to remain compliant.

CONCLUSION

The symbiotic link between technology and regulatory compliance will deepen in the banking industry. If banks use technology solutions, they will be better able to negotiate the complex regulatory landscape while upholding the highest ethical standards. In conclusion, the integrity of the banking sector is based on regulatory compliance. Banks provide financial stability, consumer trust, and ethical business activities by upholding strict standards. The nexus of technology and compliance will open the door for a regulatory environment that is more effective, proactive, and robust as the sector develops. Banks support a strong and sustainable financial future by managing the complexity of compliance with foresight and adaptation.

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CHAPTER 19

ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) BANKING

Nazia Hasan, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- nazia_14m@yahoo.co.in

ABSTRACT:

A paradigm change has been brought in by the incorporation of Environmental, Social, and Governance (ESG) concepts into banking, redefining the industry's role beyond profit production. This abstract explores the relevance of ESG banking, stressing its revolutionary effects, benefits, and difficulties as well as the route it paves for sustainable financing and beneficial social effects. A significant change in how financial firms see their duties is reflected in ESG banking. It includes a dedication to social responsibility, environmental stewardship, and strong governance processes that place a priority on openness and moral judgment. Banks want to create positive change, advance sustainability, and persuade businesses to adopt ethical standards by aligning operations with ESG criteria. The demand of ESG banking is due to its capacity to allocate funds to projects that promote social progress and environmental resilience. Banks play a crucial role in tackling global issues including climate change, social inequity, and ethical governance by incorporating ESG principles. By positioning banks as engines of sustainable development, this strategy appeals to socially responsible investors and customers who value morality.

KEYWORDS:

Banking, Banking Sector, ESG, Ethical Governance, Financial Activities, Risk Management.

INTRODUCTION

ESG banking is a reflection of the understanding that financial institutions have the capacity to positively impact change on a global scale, addressing pressing issues like corporate responsibility, social injustice, and climate change. This strategy incorporates three important dimensions: governance, which ensures moral behavior, openness, and efficient risk management; environmental, which measures the impact of financial activities on the environment; social, which measures contributions to societal well-being and equity [1]–[3].

ESG banking appears as a pro-active solution as the globe struggles with urgent concerns including resource depletion, social injustice, and the effects of unrestrained corporate activity. Not only does it need a change in operating procedures, but it also necessitates a fundamental rethinking of the role and significance of financial institutions. Banks are being compelled by this paradigm change to innovate, adapt, and align their strategy with the demands of a world that is changing quickly.

This study of ESG banking focuses on the guiding principles behind this change, its effects on the banking sector and society at large, and the ways that financial institutions are adapting their strategies to meet the needs of a more sustainable and just future. By adopting ESG principles, banking is moving beyond operations that are just concerned with making a profit and adopting a

comprehensive commitment to the welfare of the world, its inhabitants, and the fundamentals of ethical governance.

Banking and financial sector ESG: The banking sector is at a turning point. Banks are concentrating their attention on providing a smooth digital experience as a result of the increasing competition. Banks are required to demonstrate their global sustainability at a time when these more integrated digital solutions are opening them new prospects. Banks are regarded nowadays not just for their innovations but also for their ESG implementation capabilities. Insuring corporate social responsibility and driving the global shift away from carbon-emitting businesses are crucial roles played by banks. It has become an integral aspect of how banks operate and expand their businesses as they struggle to navigate this challenging terrain. So, what does ESG mean for banking? How can banks comply with the rules and specifications that might make or ruin their businesses? Environmental, social, and governance (ESG) aspects are taken into account in the banking sector. It entails assessing how investments and business activities affect society, the environment, and corporate governance standards.

What are the banks' ESG risks? Since these issues and factors are interwoven and a crucial element of the financial system, ESG is urgently needed by banks. Prioritizing investments is the first stage in ensuring sustainable development since Environmental, Social, and Governance (ESG) is quickly moving from optional to required. For instance, all processes, including client onboarding, data processing, fraud detection, customer accounting, lending of money, and regulatory compliance, are hazardous and must comply to strict ESG standards. In reality, investors and banking partners are seeking for solutions to streamline the procedures for a successful ESG implementation. Every bank is accountable for maintaining sound governance, fostering a diverse society, and conserving the environment.

How Important Is ESG for Banks?

ESG (Environmental, Social, and Governance) has become a crucial component for banks, affecting investor choices and impacting how they operate. It is essential for banks to comprehend the importance of ESG if they want to improve their sustainability performance and draw in new customers and investors. Banks must put a priority on investing in their infrastructures and procedures to conform to ESG criteria now that ESG ratings are being used as a benchmark. Banks acquire the trust and confidence of prospective customers by doing this and demonstrating their commitment to upholding industry standards [4]–[6].

ESG factors currently influence operations and decision-making across many sectors of the banking sector. Integrating ESG principles demonstrates a bank's dedication to ethical business practices, which is a strong justification for banks to publish their sustainability performance in an objective and quantifiable manner. Investors give preference to banks that meet ESG requirements, according to the changing business environment. For investors looking for sustainable and ethical investment alternatives, banks that exhibit a strong commitment to ESG principles stand out as viable investment choices.

Building a Sustainable Future with ESG in Banking

Now that we've seen what ESG in banking entails, we know that it's all about taking ownership of the bigger problems in our community. Banks can offer a cutting-edge, seamless customer experience and create a community that is based on respect, trust, and long-term value when they

integrate ESG controls across numerous departments. It needs discussions on the environmental effect of global operations to allow compliant, resilient operations since banks are quickly changing their environment to meet clients who expect round-the-clock service delivery. The effects are long-lasting, capable of proactively restoring confidence in financial institutions, and provide a foundation for resource management that is sustainable. ESG also assists banks in using private client data covertly and using technology to guarantee security and privacy. Additionally, it promotes ethical behavior across corporate divisions and open reporting.

Despite the banking industry's many unconnected systems and banks' anxiety about gaining clients' confidence, ESG can alter how they operate. What does ESG in banking mean in conclusion? How does ESG relate to financial services? ESG-compliant banks have been shown to be less prone to risk and more reliable, and the dedication to minimizing the environmental impact of banking activities may assist banks in addressing pressing social issues and presenting fresh solutions. ESG banking may now map crucial business services to climate adaptation and resilience by adhering to this crucial paradigm change.

Opportunities and hazards related to environmental, social, and governance (ESG) are growing increasingly and more important for financial organizations. ESG factors are advantageous for the environment, and sustainable business practices are also associated with higher economic success. Therefore, banks are worried about both their own ESG footprint and the ESG opportunities and dangers they face as a lender in addition to their own ESG footprint. Together with a steady stream of new rules, this is posing significant compliance and horizon scanning difficulties for banks.

DISCUSSION

Some things to think about as banks work to integrate ESG throughout their businesses are:

Strategy

a) How does the Bank stack up against its rivals?
b) How will the Bank fulfill its stated public pledges to achieve net zero?
c) From an ESG standpoint, are the items being provided ready?
d) Does the intended operational model include the ESG?
e) How does a bank interact with its customers and their transition plans?

Functional efficiency

a. Does the Bank understand how ESG issues affect all aspects of its operations, including processes, systems, and controls?
b. Are ESG factors taken into consideration throughout functional decision-making?
c. Are ESG factors taken into account while designing goods and services?
d. Are ESG opportunities and risks included into processes and policies?
e. Is the Bank using the possibilities that IDE policies may present?

Reporting and adherence to regulations

a. Is the business prepared to meet current and foreseeable regulatory requirements?
b. What holes have been previously identified?
c. Does the business collect, analyze, and disclose non-financial ESG data that is essential to comprehending strategic purpose, risks, and opportunities?
d. Who is in charge of ESG at the Bank's functional and board levels?

Example, KPMG experts can assist

Professionals from KPMG may assist banks that are dealing with these ESG issues. They are adept in carrying out intricate, multidisciplinary work programs, from evaluation through assurance.

Banks may get assistance from KPMG companies with the following:

a. Transition frameworks for target operational models and ESG governance
b. Climate risk stress testing, scope 3 emission capture and reporting, and decarbonization methods;
c. Tooling and customisation for ESG data collecting and reporting
d. Risk management, including integration of ESG risks, which includes full consideration of the ESG risk drivers and impact relationships with known risk types (taxonomy/risk inventory/risk strategy), integration into the existing risk and model landscape, selection of risk assessment tools, participation in reporting and forecasting processes—consideration of ESG factors in business and capital planning (via scenario or sensitivity analysis).
e. Services for ESG assurance

ESG data governance is becoming more crucial for banks.

A forward-looking road plan for ESG data and technology may assist banks in staying ahead of escalating consumer and regulatory expectations as well as technological debt. The banking sector is under increasing pressure to keep up with rapidly evolving environmental, social, and governance (ESG) requirements. Greater openness and disclosure of ESG-related data are required by new and changing rules (see sidebar, "ESG regulatory and disclosure requirements"). Investors and stakeholders are paying more attention to how business actions affect the environment and society. Consumers are pushing banks to better ESG standards as well; in 2019, consumers controlled around 14% of total client-driven revenues, with their banking selections affected by considerations of purpose and sustainability [7], [8]. Banks must modify their IT systems to systematically gather, consolidate, and report on a wide variety of ESG data in order to satisfy these requirements. Many financial institutions, however, still lack a thorough strategy for incorporating ESG data into their current risk reporting.

The IT infrastructure will need to undergo considerable modifications in order to achieve this aim, including changes to applications, data integration, architecture, and governance. The administration and collection of ESG data as well as funded emissions models, climate risk models, ESG scorecards, climate stress tests, and climate-adjusted ratings are just a few of the new uses. ESG data has to be integrated into already used procedures, such decision-making and credit approvals. To properly manage and disclose ESG data, banks will also need to modify their data architecture, specify a data gathering strategy, and restructure their data governance model. Banking IT executives will be able to swiftly construct these new capabilities and solutions without racking up technical debt if they invest in the appropriate objectives from the start.

a path plan for ESG data

A road plan for ESG data and technology that strikes a mix between tactical, short-term fixes and a strategic, long-term vision is something that banks may start by creating. Banks should take into account the following elements and actions throughout the procedure.

List possible ESG platform solutions

a. Construct a single source of truth by setting up a central data platform that is connected with current risk and financial systems.
b. Develop a data architecture that incorporates interaction with other data sources (through APIs) and adherence to ESG data regulations in order to collect ESG data at the certificate level.
c. Give investors real-time access to information on the ESG components of their investment portfolios.
d. To decrease technical debt and update the technological infrastructure for future solutions, replace outdated ESG platform solutions with cloud-based ones.

Integrate ESG standards with basic banking operations

a. Implement new workflows into current procedures, such as using artificial intelligence to include ESG data into selection procedures (such as credit choices).
b. Using a deliberate change management strategy, spread awareness of the ESG standards across the business and engage all workers.
c. Examine and alter current data-processing procedures to conform to shifting ESG standards (for instance, increasing the frequency of data updates).
d. Create a detailed strategy to aid in the incorporation of new ESG regulations (such as how to add new certifications to investments).

Construct a reliable ESG data governance mechanism.

a. Identify the organization's primary ownership and accountability (for example, by designating an ESG data officer to function as a point of contact).
b. Establish a cross-functional steering group for ESG data governance with shared responsibility and decision-making procedures, involving executives from the business, technology, data, risk, and finance areas.
c. Implement ESG data controls to guarantee adherence to legal requirements (for instance, to show if a certificate has been given to an investment).
d. Ensure that the governance of ESG data takes into account changes in market demand (such as investments in offshore wind farms) and regional legislative requirements (such as Germany's 2030 investment ban on combustion engines).

Common dead ends and diversions

According to our experience, three traps may cause banks to incur severe delays and technological inefficiencies. Banking IT executives may improve their odds of success and shorten the time to effect by making an early decision to avoid these roadblocks.

Operative silos

Organizational silos often result in fragmented data architecture and disconnected procedures that prevent collaboration amongst ESG use case scenarios. Even while some redundancy may be necessary, there is often a significant overlap between data demands. Therefore, for effective ESG data governance, various stakeholders must work together in a centralized manner. Only a culture of open communication, cross-functional cooperation, and tight integration of business and IT processes can enable this. The most important need is that the ESG data and technology plan be

thoroughly included into the overall ESG and business strategy, with active sponsorship and a specific directive from the highest levels of leadership.

Process barriers

Banking IT executives must strike a balance between two extremes when revamping operations to include ESG data governance and avoid two typical pitfalls. On the one hand, a tight emphasis on uniformity and simplicity often prevents the essential modifications from being made to fit with current business and IT procedures. On the other hand, relying too much on outdated procedures might stifle the ESG data governance model and add needless complexity. Therefore, banking IT executives must strike a balance between building new and enhanced ESG-related operations and taking into account the needs of existing processes.

Technology debt

ESG technology solutions are always balancing the requirements of the present with those of the future. Attempting to tackle every problem at once or coming up with the best feasible solution can increase the pressure to apply quick tactical fixes and result in long-lasting technological debt. Banks should instead adopt a use case-driven strategy to roll out new ESG capabilities in the proper order and at the appropriate times.

Specific ESG use cases may be identified and given top priority by leaders, who can also establish clear stage gates and gather data to monitor progress in between stages. Think about how, for instance, customer data collecting, risk assessment, credit monitoring, and reporting will all be connected with ESG data throughout the credit approval process (exhibit).

Effects of ESG banking

Financial institutions, their stakeholders, and the larger global economy will all be significantly impacted by the emergence of Environmental, Social, and Governance (ESG) banking. These effects have an impact on a number of areas, including risk management, legal compliance, market competitiveness, and long-term sustainability. The following are some important effects of ESG banking:

1. **Risk Management and Long-Term Resilience:** Risk assessment and mitigation are intimately related to ESG variables. Banks that include ESG factors into their business operations are better able to foresee and control risks connected to societal unrest, regulatory changes, and reputational harm. Banks may increase their long-term resilience to systemic shocks by concentrating on sustainability and ethical operations.
2. **Regulatory Environment and Compliance:** Regulatory bodies from all across the globe are adopting ESG concepts into their frameworks. Financial firms who do not comply with these changing standards risk legal and economic consequences. On the other hand, proactive ESG integration may help banks become market leaders in compliance and lower their risk of facing legal consequences.
3. **Reputational Enhancement:** ESG banking has the potential to improve a bank's reputation dramatically. Being recognized for moral business conduct, environmental protection efforts, and charitable donations may attract ethical partners, clients, and consumers. On the other hand, ignoring ESG issues might harm one's image and jeopardize investor and consumer confidence.

4. **Product Development and Innovation:** The drive for ESG banking promotes the development of new financial services and products. Banks are creating new products including green bonds, sustainable investment portfolios, and financing for good causes. This invention diversifies income sources while also satisfying the market's rising desire for sustainable solutions.
5. **Access to Capital:** When making investment choices, investors are giving ESG factors more weight. Strong ESG performance by banks increases their likelihood of attracting money from socially conscious investors, which may result in better financing options and reduced borrowing costs.
6. **Talent Attraction and Retention:** Companies with strong ESG principles often attract younger generations of workers. Employing top talent and cultivating a diverse and socially aware staff are two benefits of embracing ESG principles by banks. Increased employee happiness and productivity may result from this.
7. **Low-Carbon Economy Transition:** Banks may help in financing the shift to a low-carbon economy. Banks support international efforts to slow down climate change by funding eco-friendly technology, sustainable infrastructure projects, and renewable energy ones.
8. **Reporting and Transparency:** In ESG banking, transparency is essential. Financial institutions must provide precise and thorough ESG disclosures so that stakeholders may assess their sustainability performance. Better reporting procedures may increase accountability and confidence.
9. **Technology Integration:** Technology is a key component of ESG banking, assisting with data gathering, analysis, and reporting. In order to track and manage ESG risks throughout their operations, banks are using sophisticated analytics, AI, and blockchain.
10. **Social Impact and Community Development:** Financial institutions may support social welfare and community development by using ESG banking. Supporting initiatives that improve access to affordable housing, healthcare, education, and other social necessities may improve society as a whole. A rising understanding of how business practices and the health of the environment and society are intertwined has caused a dramatic change in the banking and finance sector in recent years. A new paradigm known as Environmental, Social, and Governance (ESG) banking has emerged as a result of this change. ESG banking is fundamentally different from traditional financial methods in that it places more emphasis on factors like sustainable development, moral behavior, and responsible stewardship than just profit margins and shareholder value.

CONCLUSION

The incorporation of Environmental, Social, and Governance (ESG) concepts has gone beyond being a passing fad to become a revolutionary force in the ever-changing world of finance. This paragraph summarizes the development of ESG banking, noting its importance, advantages, difficulties, and the paradigm change it is bringing about in the financial industry. ESG banking signifies a sea change in how banks see their responsibility to the community and the environment. Banks are becoming aware of the need of coordinating their operations with more expansive social aims and are no longer only focused on profit maximization. This coordination includes social responsibility, environmental stewardship, and transparent, accountable governance procedures. ESG banking has the ability to promote sustainable financing, which helps not only the economy but also the environment and its inhabitants. Banks may allocate resources toward projects that support social fairness, climate resilience, and ethical leadership by including ESG criteria into

decision-making processes. This comprehensive strategy portrays banks as agents of good change, able to shape sectors and promote long-term, sustainable development.

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CHAPTER 20

A BRIEF STUDY ON CROSS-BORDER PAYMENTS AND REMITTANCES

Aditya Sharma, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- adityahr2018@gmail.com

ABSTRACT:

Cross-border payments and remittances are essential for bridging economic divides, promoting global commerce, and enhancing the welfare of people everywhere. This abstract explores the importance of cross-border payments and remittances, stressing their influence, difficulties, benefits, and the changing environment they create in the field of international finance. The frictionless transfer of money across international boundaries is essential for economic expansion and financial inclusiveness in a world that is becoming more linked. By providing the financial framework necessary for cross-border transactions, cross-border payments facilitate trade links, investment flows, and global partnerships. Effective cross-border payments and remittances are attractive because of their ability to promote economic growth, lower transaction costs, and increase global financial inclusion for people. Remittance transfers that are timely and economic benefit communities and families, ensuring financial stability and access to necessities in home nations.

KEYWORDS:

Banks, Businesses, Cross-border payments, International payments, ISO 20022, Remittances.

INTRODUCTION

Cross-border payments: what are they?

Cross-border payments are transnational transactions that include parties from at least two distinct countries, including people, businesses, banks, or settlement organizations. These payments include both wholesale and retail operations. By 2020, experts anticipate that cross-border money flows would total US$156 trillion.

The market for cross-border payments has long been rife with problems and inefficiencies from a time and cost standpoint, leading to high transaction costs and challenging, drawn-out payment processing procedures. Businesses will increase their return on investment (ROI) and gain greater control over international payments and payment security as a result of the worldwide movement to strengthen cross-border payment techniques.

Problems with international payments

The foundation of international banking and commercial activity is cross-border payments. However, this is directly at odds with four persistently significant problems that cross-border transactions face:

a) High prices

b) Slow motion
c) Restrictive access
d) The absence of total transparency.

Enhancing cross-border payments by making them quicker, less expensive, more inclusive, and transparent would offer several advantages for promoting financial inclusion, international commerce, and economic growth. However, bringing about change takes time, and effective adoption of new, competitive cross-border payment techniques across all nations necessitates international collaboration [1]–[3]. New companies are making significant ripples across some of the foundations of cross-border payment systems, posing challenges to the tried-and-true correspondent banking model.

The evolving nature of international payments

A stronger global infrastructure for international payments is increasingly needed, and end users increasingly require access to cross-border payment services that are as effective and secure as similar domestic payment services. Innovative new players and business models are as a consequence developing. Let's start by taking a look at some of the patterns that affect growth.

Trend 1: Modifying customer preferences

The market for cross-border payments is evolving at a faster rate now, and this is directly related to the quickly shifting customer expectations.

Customers are less inclined to pay for pricey financial services now that they are aware of the many options available to them. They also anticipate a seamless, quick, and secure international payments procedure. Existing players are finding it difficult to fulfill new demands brought about by the proliferation of smartphones and the popularity of digital access points like alternative payments methods (APMs) for remittances. Alternative solution providers may outperform banks if they provide cross-border payment solutions that are quicker, less expensive, and more transparent.

Trend 2: Expanding commerce with developing nations

Another significant development in cross-border payments is the increased emphasis on developing economies in Africa, Latin America, and Asia as their proportion of global transactions rises. Initiatives like the African Continental Free commerce Area and China's Belt and Road Initiative are promoting development in international cross-border commerce. On the other hand, protectionist measures in developed countries, such as Brexit and trade disputes with the US, are anticipated to restrict development.

Trwnd 3: Accessibility of mobile phones and ePayments

People now have almost unlimited access to banking services and ePayment options thanks to the rise in smart phone ownership throughout the globe, with mobile wallets seeing strong, consistent growth. According to Worldpay, global mobile wallet use in eCommerce is expected to increase to almost 52% by 2020. Volumes of international trade are rising as a result of this increase. Manufacturers extending their supply chains internationally are among the other significant reasons affecting the expansion of cross-border payments.

a) International investment flows and transnational asset management

b) Growing e-commerce and international trade;
c) International remittances from migrant workers.

DISCUSSION

How international payments operate

Transferring money in a case involving domestic payments is much simpler than international transactions. The transfer of money from one nation to another sometimes involves many banks, which results in high bank fees at each payment gateway. Significant factors to take into account also include currency exchange rates and national taxes for each nation [4]–[6]. Bank transfers, credit card payments, and alternative payment methods like the ones just mentioned, eWallets, and mobile payments, are some of the most popular cross-border payment options.

Monetary transfers

A basic cross-border transaction, sometimes known as a wire transfer, would include a payment message giving instructions to debit an account in Bank A and credit an account in Bank B. Both accounts would be kept at each bank. Figure 1 shows cross border transaction from Bank A to Bank B [ir.com]

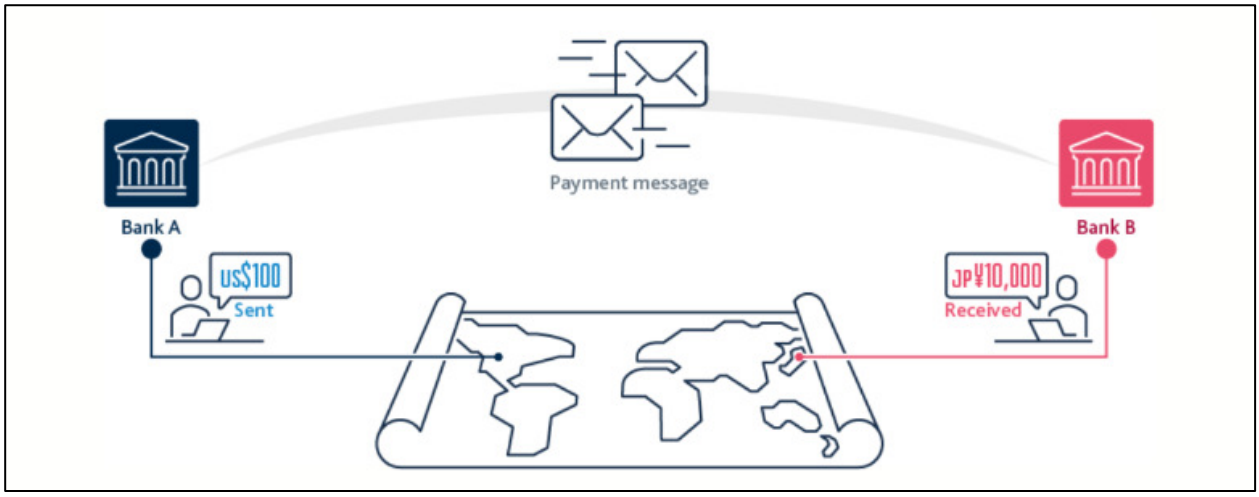

Figure 1: Cross border transaction from Bank A to Bank B [ir.com].

As not all banks have direct connections to one another, transactions may need the use of a correspondent banking network or an intermediary. Bank A and Bank B's respective accounts are provided via a correspondent bank, facilitating the transaction. For cross-border transactions, the correspondent bank is a crucial part of the global payment system. Figure 2 shows the role of correspondent bank in cross border transaction from Bank A to Bank B [ir.com].

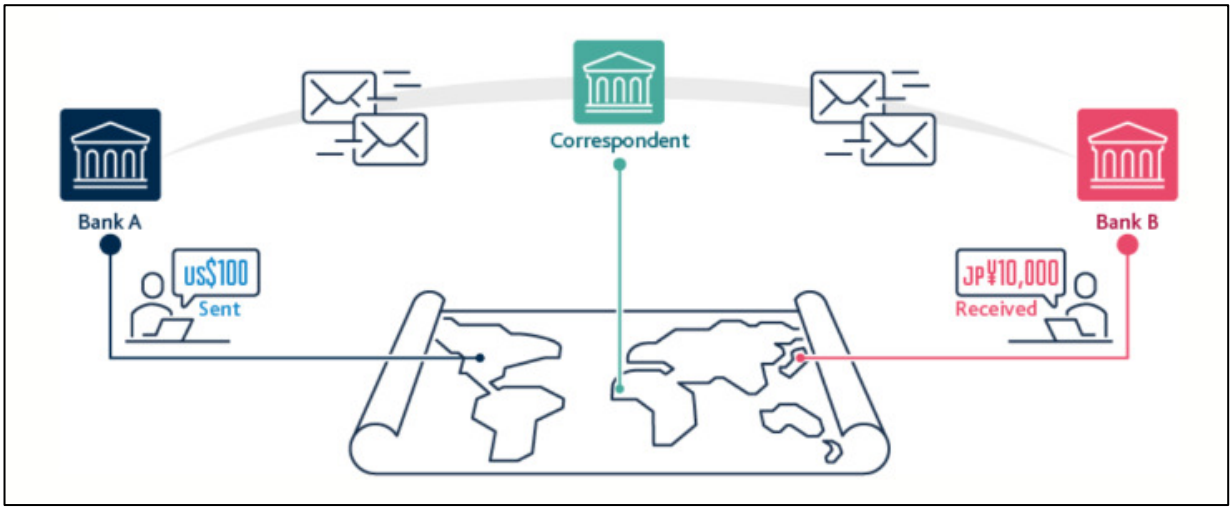

Figure 2: Role of correspondent bank in cross border transaction from Bank A to Bank B [ir.com]

Paying using a credit card

Credit cards are a popular choice for many customers and play a big part in cross-border payments. Consumers just need to submit their card information and wait for the transaction to be validated. As with any payment procedure in the global financial system, there is more going on in the background. Credit card networks and acquiring banks participating in cross-border payments must do additional work since they must convert between two distinct currencies. Due to the increased workload, there are additional costs that are passed forward via the payment system.

eWallets

eWallets like PayPal, Neteller, Alipay, Apple Pay, and Google Pay are often accessible via applications for smart devices and enable users to securely store their preferred payment cards so they may make purchases. Some eWallets allow you to make international orders and support numerous currencies. Although they do not strictly qualify as cross-border transactions, wallet-to-wallet transfers do make the transaction easier.

cross-border payment types

With the transaction breakdown below, the size of the global payments market is expanding at a pace of 5% (CAGR) annually:

a) Business-to-Business (B2B) transactions, which are estimated to account for US$150t, make up the vast majority of transactions.
b) C2B transactions, such as cross-border eCommerce and offline travel expenditures, are anticipated to total US$2.8 trillion.
c) In 2020, it is anticipated that business-to-consumer (B2C) transactions, such as interest and salary payments, would total US$1.6t.
d) Consumer-to-Consumer (C2C), or remittance payments, make up the smallest portion of the market and are projected to reach US$0.8t in 2020.

Cross-border payments in bulk

In order to support the activities of their clients or to conduct their own cross-border business (such as borrowing and lending, foreign exchange trading, the trading of equity and debt, derivatives, commodities, and securities), financial institutions typically engage in wholesale payments.

In order to conduct bigger transactions resulting from the import and export of products and services or trading on financial markets, governments and larger non-financial enterprises also employ wholesale cross-border payments. Click here for additional information about cross-border wholesale payments. Usually, they are agreements between people or companies. Person-to-person, person-to-business, and business-to-business are the three main categories. Remittances are one of them, namely the cash that migrants send back to their home nations.

Local acquiring – what is it?

With the correct links to local banks in any region where they have a local presence, eCommerce businesses might often avoid paying high fees. Local acquisition occurs when the issuing bank for the buyer and the seller are both located in the same area or nation. Due to the greater chances of fraud in these sorts of transactions, international transactions are more likely to be refused when the banks are located in separate areas.

Changes in cross-border payments

With cutting-edge business methods, new competitors are posing a threat to market leaders. Banks have always had exclusive control over the international payments sector. Cross-border transactions suffered from pain points for both private customers and enterprises due to dominant global correspondent banks' lack of competition, including a lack of transparency, protracted settlement times, high transaction fees, and restricted accessibility.

These variables are more common in cross-border transactions using exotic currencies than they are in domestic transactions with liquid currencies (such as USD/EUR). For instance, depending on the transaction size, fees for transfers from French bank accounts to Senegalese bank accounts might be more than 100€ and take up to seven days to clear. Even then, it was common for the sender to not get a confirmation of the transaction's success [7]–[9]. The World Bank estimates that in the fourth quarter of 2020, the average cost of mailing $200 was 6.5% worldwide.

The expansion of cross-border payments experts

Due to the pressing need to enhance cross-border payments and solve pain points, two new groups of specialized actors have emerged: Back-end networks and money transfer companies with digital capabilities.

Operators of electronic money transfers

These experts focus primarily on digital cross-border payments and interact directly with senders, whether they are consumers or businesses.

These providers often create direct banking ties and net payment flow between the sending and receiving nations when dealing with liquid currency pairings (such as USD/EUR). Setting up an overseas bank account number may be difficult in many developing nations, where capital regulations make payment outflows difficult and payment mechanisms are often fragmented.

Because of the circumstances in these nations, companies that facilitate digital money transfers often depend on partners like back-end networks.

Reverse networks

These experts often collaborate with the banks or wallet providers of the sending and receiving parties rather than having a direct interaction with them. Back-end networks provide interoperability in cross-border payments by building partner networks through direct links with regional banks and APMs in both liquid and non-liquid markets. For instance, a Paypal account may send a deposit in Euro to a Kenia Schilling M-Pesa account. Front-end providers are increasingly leveraging these non-traditional back-end networks rather than conventional bank rails since this is not feasible with CBNs.

How ISO20022 promotes change

An international standard for transmitting electronic communications between financial organizations is ISO 20022, which was originally released in 2004. Extensible Markup Language (XML) and Abstract Syntax Notation (ASN.1) protocols were used in its development to provide the banking sector with a standardized platform for delivering payments messages and exchanging payments data.

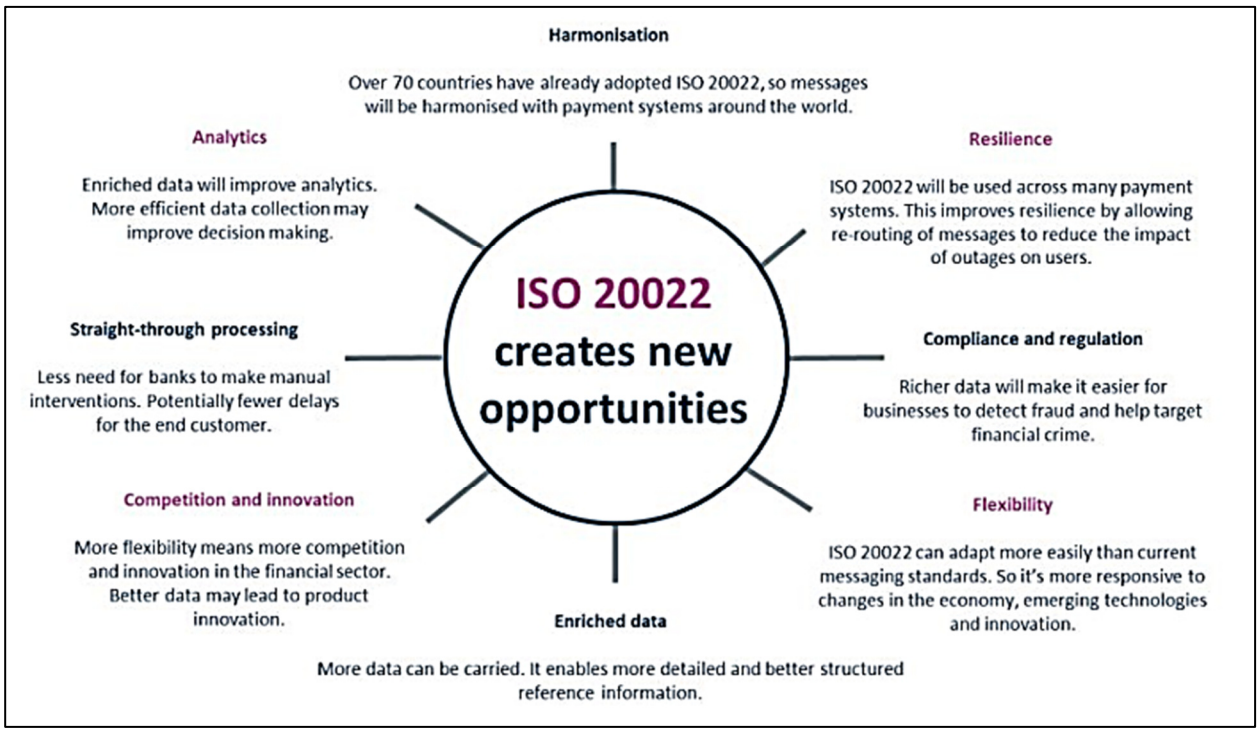

Figure 3: ISO 20022 creates new opportunities [ir.com].

In order enable user organizations and developers to utilize the same message structure, form, and meaning to send transaction information worldwide, ISO 20022 was created as a flexible framework.

ISO 20022 acceptance will provide a universal language and paradigm for payments data. For everyone participating in the payments chain, it will deliver better data, which translates to greater

quality and quicker payments. The adoption of ISO 20022 will provide an open standard that may change to accommodate evolving requirements and novel ideas in the payments sector. It can be utilized by anybody in the financial services business and deployed on any network since it won't be governed by a single interest.

Globally, banks and financial institutions are getting ready to switch from using SWIFT payments to the new, highly structured, and data-rich ISO 20022 standard. By 2025, it will enable 80% of global transaction volumes and 87% of global transaction value, making it the de facto standard for high- or large-value payments systems of all reserve currencies. With the European Central Bank declaring ISO 20022 go-live dates of November 2020 for the standard, SWIFT payments will move sooner in Europe. Figure 3 shows ISO 20022 creates new opportunities [ir.com]

CONCLUSION

Cross-border payments are fraught with difficulties, from complicated regulatory environments to problems with security and interoperability. Traditional processes are often plagued by delays, exorbitant costs, and a lack of transparency. However, as cutting-edge technologies, like blockchain and digital platforms, emerge to solve these pain points and redefine the way cross-border transactions are carried out, the sector is going through a transformational transition. Collaboration is still essential as the trajectory of cross-border payments and remittances develops. To synchronize legislation, develop secure, interoperable systems, and expedite operations, financial institutions, technology suppliers, and regulatory authorities must collaborate. By doing this, the sector will be able to fully realize the benefits of financial connectedness on a global scale, fostering new levels of economic development and financial inclusion. Finally, in an increasingly linked world, cross-border payments and remittances serve as a testimony to the ability of finance to reduce gaps in society and promote connectedness. The sector lays the way for a future in which financial boundaries are less constrictive, economic opportunities are more accessible, and people all over the world may fully participate in the global economy by overcoming obstacles, embracing innovation, and encouraging cooperation.

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CHAPTER 21

REAL-TIME PAYMENTS AND FASTER PAYMENT SYSTEMS

Chanchal Chawla, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh
India,Email Id- chanchalchawla0@gmail.com

ABSTRACT:

The world of financial transactions has seen a sea change because to real-time payments and speedier payment systems, which have revolutionized the speed, ease, and accessibility of money transfer. This abstract explores the relevance of real-time payments and speedier payment systems, emphasizing their influence, advantages, and difficulties as well as the shifting financial environment they are influencing. The conventional speed of financial transactions has been put to the test in a time of rapid communication and digital connections. Faster payment systems and real-time payments are emerging as solutions that meet the demands of contemporary customers and enterprises. These methods allow for the almost immediate transmission of payments, shattering geographical and temporal boundaries. Real-time payments have the potential to revolutionize how financial transactions are carried out, which is what makes them so appealing. Bills, cash transfers, and purchases may all be settled instantly for both individuals and organizations. Increased liquidity, less delays, and higher financial agility are all benefits of this real-time accessibility.

KEYWORDS:

Faster payments, Financial transactions, Mastercard, Real-time payments (RTP), Transfers Visa.

INTRODUCTION

Real-time payments: what are they?

Real-time payments (RTP) are transactions that are started and finished almost instantly. The digital infrastructure that enables real-time payments is known as a real-time payments rail. Real-time payment networks should ideally have 24/7/365 accessibility, which implies they are always available to handle transfers. Weekends and holidays are included in this.

The Clearing House's RTP network is the most well-known instance of a real-time payments network in the United States. A real-time network will also include FedNow, the Federal Reserve's projected real-time solution. FedNow is expected to become live in 2020, according to the Federal Reserve.

Faster payments vs real-time payments

It's vital to remember that the terms real-time payments and speedier payments shouldn't be used interchangeably. Despite their similarities, there are also significant distinctions. quicker does not always imply instantly, but quicker payment systems, like Nacha's Same Day ACH, post and settle payments more quickly than conventional payment rails.

The push payment systems offered by Mastercard and Visa, for example, will convey transactions in a matter of seconds or minutes. Push payments are seen as speedier but not real-time payments since they do not also settle transactions promptly [1]–[3]. Despite the fact that all real-time payments may be categorized as quicker payments, not all faster payments take place in real time.

The benefits of real-time payments

1. Real-time payments provide several benefits. They are quick, which is the first point. very quick. Instantaneous settlement payments may be accessed as rapidly. Instant access might be a game changer for people or companies that need the money right now.
2. End-to-end communication is another benefit of real-time payment rails. The flow of communication has always been from the payer to the payee. The information-sharing between the two parties must take place outside of the payments system. In a single transaction, real-time payments link the payment and payment data.
3. Communication may also be hampered by delays and a lack of openness about the delivery of the funding. All things considered, a fragmented communication process presents difficulties that affect risk management, liquidity, and business flow.
4. Fortunately, real-time payments overcome these difficulties. A more effective payment journey is the consequence of bilateral communication via integrated information flows, fast payment confirmation notifications, and settlement finality. Financial control, cash positioning, and liquidity management are now possible thanks to real-time payments.
5. The Clearing House's (TCH) real-time payments train has shown that there are several use cases for making payments in real time, in addition to communication enhancements.

Additionally, real-time payments are irrefutable, which means that once received, payments cannot be disputed or recovered by the sender.

Major players in the RTP industry

The idea of real-time payments is not new. The original RTP system was really created in Japan in the 1970s. By 2010, additional nations have their own RTP railways included the United Kingdom, China, and India. FIS estimated that 54 nations have real-time payment systems active as of 2019 a fourfold increase from 2014.

In terms of real-time payment implementation, the US lags well behind several other countries. Because of this, real-time payments only currently include two significant players: The Federal Reserve's FedNow (which is still in the experimental phase) and The Clearing House's RTP.

The RTP network for The Clearing House

The Clearing House's RTP network was introduced in 2017. It was the country's first brand-new payment system to be introduced in forty years. TCH RTP now provides effective real-time payments for a variety of use cases, such as: B2B real-time transactions P2P real-time transactions Payroll Request for pay (RfP) And more.

Technology Companies

Banks that are interested in joining the RTP network often collaborate with a technology supplier that has a simplified procedure for doing so. This integration would not have been possible without suppliers like FIS, Sherpa Technologies, PayFi, ACI Worldwide, Fiserv, Volante, Jack Henry, and Alacriti.

According to Matt Richardson, Head of Product Solutions at Citizens Bank, "If you can enable those providers, you can effectively enable all of those banks that use those providers."

The impending FedNow service from the Federal Reserve

The Federal Reserve is a second significant participant in the field of real-time payments. The Federal Reserve Board stated in August 2019 that FedNow, an RTP rail, was being developed by the Federal Reserve banks. The first notification said that FedNow will debut in 2020 or 2024. The launch date was then changed to 2020. The Federal Reserve started a FedNow trial program in January 2020. More than 200 financial institutions and processors are participating in the FedNow pilot initiative, which will assist the creation, testing, and uptake of FedNow.

As stated in the news release announcing the pilot program, "key objective in selecting participants for the pilot was to ensure diverse representation across financial institutions and service providers, connection types, settlement arrangements, and experience levels." In response to the announcement, Sarah Grotta, Director of Debit and Alternative Products Advisory Service at Mercator Advisory Group, wrote that the list of processors who will be working to develop the integration tools to assist their financial institutions with the technology requirements to connect to FedNow and take advantage of the opportunities of real-time payments is "of particular importance." ACI Worldwide, Finastra, Finxact, Fiserv, Jack Henry, and Shazam are a few of these processors. Here is a complete list of everyone who signed up for the FedNow trial program.

DISCUSSION

P2P payment applications and real-time transactions

Peer to peer (P2P) payments have become more popular recently, taking the place of cash, cheques, and IOUs with the use of applications like Zelle, Venmo, and PayPal. Now, people can instantly transfer payments to one another whether they wish to divide the cost of a meal, a ride-sharing service, or rent and utilities [4]–[6].

Findings from the Mercator Advisory Group show that customers are use P2P payment applications more often. While PayPal is unquestionably the most popular service, others are rapidly gaining ground: In the previous year, 54% of customers have used PayPal, up from 47% in 2017. In 2020, 14% of customers used Venmo, the second-most popular app. In 2020, 13% of users used Zelle, up from 1% in 2017.

What connection does this have to real-time payments? The RTP network of The Clearing House is integrated with a number of P2P payment applications, enabling fast money transfers from the app to a bank account. For instance, PayPal's Venmo introduced quick transfers using the TCH RTP network in August 2019. Soon after the agreement was revealed, Sarah Grotta of Mercator stated, "This new option will require the individual to input their checking account details and the transaction will route through The Clearing House's RTP network [as] one of the most visible applications of the network."

Early Warning Services and The Clearing House announced in February 2020 that Zelle transactions may now be legitimately cleared and paid through the RTP network. The first banks to transfer Zelle payments through the RTP network were Bank of America and PNC Bank.

New use cases for real-time payments in B2B

Beyond P2P payments alone, The Clearing House's RTP network's integration with programs like Zelle has far-reaching effects. The RTPs offered by P2P applications are now motivating businesses who previously relied on antiquated manual procedures to complete B2B payments.

For instance, according to a Mercator Advisory Group Viewpoint on the B2B faster payments market, 60% of respondents questioned by the Association for Financial Professionals (AFPs) for its 2019 payments study stated that, when compared to other types of transactions, B2B transactions will benefit the most from faster and RTP systems.

RTPs have a number of benefits and B2B use cases, including:

The capacity to transfer rich data (through the implementation of ISO 20022) that may provide useful insights into business customer demands Payment confirmation; enhanced timing control; liquidity management; and immediate bill payment, Data on remittances are available. Real-time payments are valued by businesses of all sizes.

Adoption and use cases will continue to grow as merchants, companies, and banks come to understand the advantages of real-time payments. In reality, businesses already understand its worth. Nearly 90% of corporate executives are interested in real-time payments, according to Citizens Bank's second annual Real-Time Payments Outlook. Real-time payments and open banking were preferred by 80% of retailers, retail banks, and billing organizations, according to the 2018 Global Payments Insight Survey from Ovum and ACI Worldwide.

With sales of at least $5 billion, 82% of billing organizations and 92% of merchants anticipate real-time payments to enhance customer service. 84% of local retailers, retail banks, and billing companies expect real-time payments to enhance customer experience. In other words, businesses of all shapes and sizes are keen to accept real-time payments because they see them as beneficial.

During COVID-19, real-time payments increased.

Without mentioning COVID-19, we cannot discuss about payments. The epidemic affected every region of the planet, including real-time payments.

In reality, the usage of real-time payments soared during the pandemic, according to the findings of the 7th annual FIS global RTP trends study, Flavors of Fast. The study's meta-analysis of the worldwide payments data research from April and May 2020 is included in the report.

a) The FIS study included the following noteworthy discoveries: Over 130 financial institutions in the United States were deploying RTPs, a five-fold increase from September 2019.
b) The RTP network of The Clearing House is now linked to 50% of demand deposit accounts in the country.
c) From 14 nations only six years ago, 56 countries now have a live RTP rail.
d) India has the highest volume RTP market, with 41 million payments daily.
e) The Philippines saw the biggest yearly percentage value rise, at 482%.
f) Bahrain saw the biggest yearly percentage volume rise, at a startling 657%.

FIS According to Raja Gopalakrishnan, the head of global real-time payments, "[t]he continued adoption and evolution of real-time capabilities all over the world signals that real time is no longer a nice-to-have or an afterthought; it must be a priority."

What prospects do real-time payments have in the future?

The projected FedNow rollout by the Federal Reserve is only the start of future innovation and competition. FedNow and The Clearing House's RTP network compatibility is still an open subject. Both new players and new use cases have not yet been created in the market. The debut of TCH's RTP network in 2017 may have been a late entry for the United States, but it started a snowball effect that is currently accelerating. Even if it is hard to foresee every aspect of real-time payments, there are unquestionably fascinating advancements in the works. When it comes to implementing various use cases on the current (and planned) RTP rails, companies should keep an eye out for a number of improvements on the path to real-time payments modernisation.

What distinguishes real-time payments from quicker payments?

Real-time payments and quicker payments are distinct even though they are similar in nature and sometimes confused with one another. Compared to typical payment systems, faster payments post and settle faster, but they aren't instantaneous or even close to it. In actuality, speedier payments might finish in a few minutes to a few hours. Faster payments, as a general rule, are always credited by the end of the next business day. Since there is no delay between when money is taken out of the payer's account and made accessible to the payee, RTP are genuinely immediate.

Is there a real-time ACH technology?

In a nutshell, the answer is no. Faster payment methods include Automated Clearing House (ACH) payments, which post and settle payments in batches as opposed to instantly. Even same-day ACH transactions require a full business day to complete, while being quicker than conventional payment methods. While this represents a major improvement over conventional ACH transactions, which typically took three days to complete, it still lags below real-time payments in terms of speed.

What is FedNow and why is it significant?

Real-Time Payments Network from The Clearing House and Zelle from Early Warning System, LLC are the two RTP systems that are already operational in the US. A third is presently under development. FedNow, the third real-time payment system, is an interbank 24-hour real-time gross settlement service with integrated clearing capabilities that aims to provide financial institutions the tools they need to offer consumers speedier end-to-end payment services.

How can I put real-time payments into practice?

Banks must first update their current payments infrastructure before implementing real-time payments. This involves spending money on a platform that can:

a. Support back-office operations and real-time payments processing
b. Enable current digital touchpoints
c. Deliver value-added services
d. Act as a gateway or endpoint to the central scheme.

ACI Worldwide specializes in providing software that enables banks, merchants, and billers to quickly launch new value-added services in response to consumer demand and adapt to changing regulatory mandates. ACI Worldwide is the real-time payments partner of choice for numerous organizations worldwide.

Our ACI Enterprise Payments Platform serves as the main processing infrastructure for Malaysia's Real-time Retail Payments Platform, STET's Real-time Payments Platform, and handles 50% of the UK's Faster Payments and 75% of Hungary's AFR transactions [7]–[9].

CONCLUSION

Real-time payments and quicker payment systems are positioned to become the rule rather than the exception in the future. Their acceptance is expected to spur economic expansion, improve financial inclusion, and alter how cultures see and use money. The financial sector prepares the way for a future in which instantaneous transactions serve as the cornerstone of a dynamic, linked global economy by adopting these disruptive technologies. In summary, real-time payments and quicker payment systems mark a significant advancement in financial transactions. These technologies enable people, companies, and economies to work with previously unheard-of speed, efficiency, and accuracy by changing the pace at which transactions occur. Real-time payments are a tribute to the industry's ability to adapt, develop, and transform the fundamental nature of financial transactions as the financial environment continues to change.

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CHAPTER 22

A BRIEF STUDY ON MACHINE LEARNING FOR CREDIT SCORING

Vipin Jain, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- vipin555@rediffmail.com

ABSTRACT:

In the field of credit scoring, machine learning has become a transformational force, transforming the evaluation of creditworthiness with unmatched precision and inclusiveness. This abstract investigates the importance of machine learning for credit assessment, emphasizing its influence, advantages, and difficulties as well as the shifting environment it creates in the lending industry. In the world of financing, credit scoring is crucial in Figureuring out someone's or a company's creditworthiness. By using enormous datasets to build prediction models that accurately evaluate credit risk, machine learning algorithms bring about a paradigm change. These models examine a wide range of factors, from standard financial measures to unorthodox data sources, allowing for a comprehensive assessment of credit applications. The appeal of using machine learning for credit assessment is its potential to democratize loan availability. Machine learning models improve financial inclusion by analyzing candidates who may have been ignored by conventional approaches by taking into account a larger variety of data, including non-traditional criteria like digital footprints and transaction histories. This data-driven strategy improves justice, reduces prejudice, and gives lenders greater control over their choices.

KEYWORDS:

AI, Credit Risk, Credit Scoring, Creditworthiness, Data Science, Machine Learning.

INTRODUCTION

Machine Learning-Based Prediction of Credit Scores

Credit scores are now a crucial factor in determining a person's creditworthiness for lenders, and they have an influence on a variety of decisions, from acquiring a mortgage to renting an apartment. Big data and machine learning have changed the credit scoring process, making it more precise and effective. In comparison to conventional credit scoring methods, machine learning algorithms are capable of analyzing enormous volumes of data and making predictions that are more accurate. This essay will examine both the advantages and drawbacks of utilizing machine learning to forecast credit scores [1]–[3].

Importance of credit score

A person's creditworthiness is represented numerically by their credit score, which is based on their credit history, income, and other financial criteria. When evaluating whether to grant a loan or extend credit, it is an important element for lenders and credit card firms. The range of a credit score is 300–850, with higher numbers indicating more creditworthiness. A credit score of 700 or more is normally regarded excellent, while one of 600 or less is considered bad.

Machine Learning's Advantages in Credit Scoring

By making more accurate forecasts of creditworthiness, machine learning algorithms have changed credit scoring. Machine learning methods may recognize patterns and forecast outcomes more accurately than conventional credit scoring models since they are trained on enormous volumes of data. In order to create more precise predictions, machine learning algorithms may also include a wider variety of data, including non-traditional data sources like social media.

The capacity of machine learning to decrease bias in credit assessment is one of its key advantages. Traditional credit scoring algorithms often have biases built into them that are based on things like ethnicity or gender. Since they are educated on data and do not take into account any preexisting prejudices, machine learning algorithms are created to be impartial. Fairer credit-scoring determinations are the outcome of this.

Traditional credit scoring techniques are less effective than machine learning algorithms. They can quickly evaluate enormous volumes of data to provide judgements about credit scores that are almost immediate. This speeds up and improves the efficiency of the financing process for both borrowers and lenders.

Machine Learning's Challenges in Credit Scoring

Although machine learning offers numerous advantages for credit scoring, there are also difficulties to take into account.

a) The complexity of machine learning models is one of the major difficulties. Because machine learning algorithms are often "black boxes," it might be difficult for lenders to comprehend how the algorithm determined a credit score. Because of this, it may be difficult for borrowers to comprehend why they were turned down for loans or how to raise their credit ratings.
b) The need for a significant volume of high-quality data presents another difficulty. For machine learning algorithms to produce reliable predictions, a lot of data must be available. However, the algorithm may not be able to provide precise predictions if the data is of low quality or has a narrow scope.
c) When utilizing machine learning algorithms for credit rating, privacy is also an issue. Borrowers may be concerned that machine learning models need access to their financial and personal information. Lenders are required to take action to preserve and secure borrower data.

DISCUSSION

How Credit Scoring Tools Operate: Using Data Science with Machine Learning

Today, artificial intelligence is advancing at a breakneck pace, providing enormous help to individuals across all business and economic sectors. The phrase "artificial intelligence" (AI) refers to a wide range of technologies and algorithms that mimic human cognitive processes. Decisions made with the help of computers are made much more quickly with AI since computer systems analyze data much more quickly.

The following are the main advantages of using AI systems in the financial sector:

Automation of repetitive tasks and accelerated service times

The expenses associated with completing routine activities will go down, big volumes of data will be processed more accurately, and the client support system will be of higher quality.

In the financial and banking industries, artificial intelligence (AI) refers to cutting-edge analytical tools with enormous potential that enhance the payment environment for all parties, from banks to end users. The International Data Corporation research estimates that by 2020, financial institutions would spend $11 million on AI and ML operations. According to PricewaterhouseCoopers, these businesses will see exceptional returns on their investments thanks to AI-based innovations like underwriting and credit scoring engines that have the potential to boost the financial sector's GDP by up to 10% in less than ten years.

What You Need to Know About AI-Powered Credit Scoring

The most promising and applicable one is probably AI-based credit scoring. In a word, credit scoring is an assessment of a customer's ability and willingness to pay back debt. There is a clear demand for more intelligent credit scoring systems with 2.5 billion unbanked individuals worldwide and just less than half of the banked population being considered creditworthy.

Numerous pieces of information are used by AI to determine credit scores, including overall income, credit history, transaction analysis, employment history, and even Google Analytics. In essence, scoring is a mathematical model that takes into consideration a lot of data and is based on statistical techniques. As a consequence, credit scoring utilizing AI generates more sensitive, personalized credit score judgments based on a variety of extra real-time variables, granting access to financing to more individuals with potential for income.

How Can AI Improve the Evaluation of Credit Risk?

Most financial institutions still base their credit rating models on the scorecard method, or the dynamics prevalent at the time of their creation. To be regarded as "scorable," a prospective borrower must have a significant amount of historical information on prior borrowing behavior. Even creditworthy consumers cannot get credit if such history information is missing (which is normal for new clients of the banking industry).

AI-powered credit scoring software is more sensitive to real-time indicators of the potential borrower's creditworthiness, such as the current level of income, employment opportunities, and their potential earning capacity, in contrast to traditional credit scoring methods (such as the scorecard method), which focus on the borrower's past performance. As a result, credit programs only accept high-potential borrowers; individuals who technically pass the traditional credit score examination (such as credit card churners) are not eligible. In other words, credit scoring powered by AI enables accurate profit forecasts based on clever AI models [4]–[6].

How Artificial Intelligence is Transforming the Credit Scoring Industry

Loans are always subject to risk, including the danger that the borrower won't repay the loan. As a result, the goal of credit scoring is to reduce risk exposures, which contributed to a widespread issue of limited access to credit funding. Credit scoring is transformed by AI in various ways, marking a paradigm change in this area. The benefits of using AI into credit scoring are as follows.

Improved Customer Focus

Because of their homogeneity and lack of sensitivity to individual variances and subtleties, traditional credit scoring techniques are often criticized as outmoded, and to a greater extent. Banks now have access to unique insights into their clients' financial behavior based on projected revenue projections in addition to previous data thanks to the adoption of AI in credit scoring systems. In

order to price and market their credit products to the appropriate clientele, financial institutions are able to segment and rate their customers more effectively based on the related credit risk.

Higher Speed

AI applications, namely in credit scoring, are becoming more and more popular as a result of their capacity to expedite the process of making loan choices without sacrificing accuracy or quality. To create the client's credit score in the past, banks used decision trees, regression, and other mathematical studies. In order to make better credit-related judgments nowadays, massive amounts of redundant, unstructured, and partly structured data are incorporated in analysis (e.g., social media usage, mobile phone activities, etc.). However, with the aid of AI, the pace of data processing remains high.

Greater Credit Access

In contrast to outdated, past-focused methods, data science has enabled credit scoring to become more future-focused. In this manner, more borrowers today (such as students, company owners, and foreign immigrants) have access to finance, which encourages their enterprises and helps them launch their ideas. The process of obtaining one's first credit has also gotten less complicated since it is now based on AI financial estimates about the client's career and income prospects.

Gains for Every Stakeholder

The use of AI tools for credit scoring and lending decisions can help banks make data-driven decisions, focus on margin maximization instead of risk minimization, analyze smooth risk vs. profit curves instead of relying on pre-calculated scoring card brackets, and increase the number of customers for the bank while reducing risk. Prior to the broad use of AI and data-gathering tools, this strategy was all but impossible. The application of AI in credit scoring has advantages for both banks and consumers: banks get more clients and profit; people who need credit have easier access to better lending options.

The Problems with AI in Credit Scoring

Before AI is widely embraced for credit rating, there are a few issues that must be resolved, including:

Data accessibility: To train, AI models need a lot of data. Lenders may struggle with this because they lack access to the relevant information.

Interpretability: AI models may be complex and challenging to understand. Due to this, it could be difficult for lenders to comprehend why a certain borrower received a certain credit score.

prejudice: If the data that AI models are trained on is skewed, they may be subject to prejudice. This may result in unfair lending practices and erroneous credit ratings.

How to Get Ready for AI's Role in Credit Scoring in the Future

Lenders may take the following steps to be ready for the use of AI in credit rating in the future:

Gather additional information: Lenders must begin gathering more information about their borrowers. Then, more precise and prognostic AI models may be trained using this data.

Understand AI: Lenders must have a deeper understanding of how AI operates. They will be better able to comprehend the output of AI models and determine who deserves credit as a consequence of this.

Lenders must deal with the problems caused by bias in AI algorithms. This may be achieved by making sure that their AI models are just and equitable and by using ways to remove bias in their data.

Machine Learning-Based Credit Scoring

Is intelligence of the human kind still the most significant kind that can successfully manage complicated industrial risks? There is growing concern that manual business practices, which are largely driven by human intelligence, are no longer adequate to effectively perform complex industry tasks on their own, in a timely and cost-effective manner, or to manage complex interconnected and interdependent industry risks. This is because the digital global age is becoming increasingly large and complex.

There are many stories coming in from different countries that demonstrate how machine learning has successfully entered complicated business processes in many different sectors. Thousands of machine learning applications have already been deeply ingrained throughout complicated corporate processes, from credit lending to credit scoring, robot control to remote sensing. These are only a few examples, and this is only the beginning.

In order to strengthen some of the most crucial interconnected and interdependent operational, tactical, and strategic technologies, processes, and initiatives, entities across nations, including their governments, industries, organizations, and academia (NGIOA), will undoubtedly need to go beyond simple tasks and processes like computing data and collecting metrics. This will probably have an influence and modify business, management, and governance paradigms in addition to technology and procedures both individually and collectively.

Implications of Machine learning for credit scoring

The use of machine learning in credit scoring has far-reaching and revolutionary effects that will completely change how lending institutions determine a borrower's creditworthiness. As machine learning algorithms become more common in this field, they have a number of important ramifications:

1. **Increased Precision and Accuracy:** Machine learning algorithms are capable of processing enormous volumes of data and seeing complex patterns that conventional credit scoring methods would miss. This improved accuracy enables more precise evaluations of the creditworthiness of borrowers, which improves lending choices and lowers the incidence of both false positives and false negatives.
2. **Better risk management:** Machine learning models are capable of analyzing a wider variety of data, including alternative data like internet activity and social media use. Through a more thorough understanding of the financial habits and risk profiles of the borrowers provided by this new data, lenders are better able to evaluate and manage risk.
3. **Greater Inclusivity:** Conventional credit scoring methodologies sometimes exclude those with scant credit histories or those who have none at all. Lenders may evaluate a larger spectrum of borrowers thanks to machine learning, which can combine alternative data sources

like utility bill payments and rental histories. For people who were previously underserved by conventional credit evaluation techniques, this encourages financial inclusion.

4. **Rapid data processing and analysis:** by machine learning algorithms results in quicker loan approval procedures. This helps lending institutions run more effectively while also helping borrowers who require quick access to money.
5. **Customized Loan conditions:** Machine learning enables lenders to more accurately adjust loan conditions to each borrower's risk profile. Strong credit histories may result in more favourable terms, while greater risk profiles may still result in the ability to get loans with modified terms.
6. **Lessened Human Bias:** Lending choices made by machine learning algorithms are driven by data analysis rather than human judgment, which might lessen bias in the credit rating process. This lessens the likelihood of prejudice by promoting fairer and more impartial lending procedures.
7. **Adjusting to Changing Economic circumstances:** Machine learning models are better able to adjust to shifting economic circumstances and borrower behaviour. This flexibility is especially important in dynamic markets because it enables lenders to act quickly in the face of changes and uncertainty in the economy.
8. **Continuous Learning and Improvement:** Machine learning models have the capacity to adjust their predictions over time by learning from fresh data. As they meet more examples and data points, the models become better and more efficient thanks to this ongoing learning process.
9. **Adherence to Regulatory Frameworks:** Using machine learning for credit scoring necessitates compliance with a number of regulatory frameworks, including data privacy and consumer protection regulations. Lenders must make sure that the data sources and algorithms they utilize comply with all applicable laws in the locations in which they do business.
10. **Considerations about Data Privacy and Security:** The usage of alternate data sources raises questions about data privacy and security. In order to safeguard the private information of borrowers and keep their confidence, lenders must carefully manage these difficulties.

Machine learning's effects on credit rating are revolutionary, ushering in a time when lending procedures are more precise, inclusive, and effective. Although this technology breakthrough has many advantages, it also has to be used responsibly to address issues with data privacy, bias, and regulatory compliance. Leveraging machine learning may result in improved financial results for both borrowers and lenders as the financial sector continues to develop [7]–[9].

CONCLUSION

The direction of machine learning in credit scoring indicates toward a future where lending choices are data-driven, accurate, and inclusive as the technology environment develops. To overcome obstacles and develop innovation that benefits both lenders and borrowers, constant cooperation between data scientists, financial institutions, and regulatory agencies will be crucial. In conclusion, the way loan choices are made has been reimagined by machine learning for credit rating. Lenders may evaluate creditworthiness with previously unheard-of precision and inclusiveness by using the power of data-driven insights. The ideal of a lending environment defined by equitable access to credit, decreased defaults, and empowered borrowers becomes not just a theoretical potential, but a concrete reality as the industry continues to adopt these disruptive technologies.

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CHAPTER 23

A BRIEF DISCUSSION ON CLOUD COMPUTING IN BANKING

Pankhuri Agarwal, Associate Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- dreams.pankhuri@gmail.com

ABSTRACT:

In the banking sector, cloud computing has become a disruptive force that is redefining how financial organizations operate, innovate, and engage with their clients. This abstract explores the importance of cloud computing in banking, stressing its implications, advantages, and difficulties as well as the shifting financial environment it has shaped. Cloud computing gives banks a flexible platform to improve efficiency, agility, and client experiences at a time when digital transformation is the norm. With the help of this technology, banks may move their operations to scalable, secure cloud environments, which lowers infrastructure costs and hastens the rollout of new services. Cloud computing's appeal in the banking industry is due to its ability to promote innovation. Banks may experiment with cutting-edge technology like artificial intelligence, machine learning, and data analytics by using cloud-based resources. This results in the development of customized financial solutions, simplified business processes, and improved risk management techniques.

KEYWORDS:

Banks, Banking, Cloud Computing, Efficiency, IT cloud, Reliability.

INTRODUCTION

Over 90% of firms use cloud computing technology, according to a study by O'Reilly, and usage is growing steadily across sectors. The poll from the previous year, which found that 88% of enterprises throughout the world use the cloud, makes clear the surge in adoption rate. While several sectors have begun to depend on cloud services for their various data and operational demands, one sector, banking, is taking its sweet time to embrace the notion on a comprehensive basis. Banks and other financial organizations are moving too slowly with cloud computing because they are taking their time to examine every part of it from a security and privacy perspective.

However, if COVID-19 has taught us anything, it is that customers require services at their fingertips without visiting a physical store - whether it be for managing their end-to-end banking needs or doing their grocery shopping online. In light of this, banks are aware that their 2030 iteration will look substantially different from their current one, regardless of how slowly they implement IT cloud infrastructure and cloud computing virtualization. And that they must take steps now to be ready for their future selves [1]–[3].

Cloud computing advantages for banks

In light of banks' cautious but gradual transition to IT cloud infrastructure, it's critical to emphasize the advantages of cloud computing for the banking industry.

Improved data security

Cloud computing for banks demonstrates to be a security-first method for a bank's operations with routinely updated software. However, it is crucial to choose a cloud computing service that satisfies the following requirements to guarantee that the goal is met:

a) Conformity and accreditation
b) Reliability and performance
c) Including next-generation technologies
d) Migration assistance
e) Constant service assistance
f) decreased cost of infrastructure

Although there are no exact data, banks' dependence on on-premise systems continues to be an international issue. Now, although they are able to protect user data via this dependence, a major issue with it is the complex-level adaptability to organizational-level changes. Any modification to the workload management system, IT infrastructure, etc. takes time, which causes significant customer downtime. By using cloud services, banks are able to increase their product offerings right away while also making IT infrastructure modifications that are more manageable.

improved operational effectiveness

A financial organization is much more efficient when using a cloud environment. Banks may get the following advantages by putting their services on the cloud:

a) Quality assurance
b) Recovery from disaster
c) Adaptability
d) Loss mitigation
e) Risk control

The institutions may concentrate on reducing their fixed and variable costs with a 99% uptime guarantee by hosting financial portals in the cloud.

Utilization of software programs

Banking organizations now have access to CRM and ERP software programs that are designed to enhance their customer and staff experiences. The SaaS approach for these applications gives the banks total control over the data that is entered into them and the level of customisation.

helps to ensure company continuity

The financial companies benefit from higher degrees of fault tolerance, data security, and disaster recovery thanks to cloud computing. Additionally, cloud computing offers a high degree of redundancy and backup at a reasonable price. The technology provides financial organizations with all the components they need to be future-proof.

Due to the on-demand nature of the cloud, the infrastructure expenditure is reduced, which reduces the setup time. All of this shortens the time it takes to create new items, increasing efficiency and hastening client responsiveness.

Payment depending on use

For a traditional institution like banking, there is a pervasive distrust of technology. So, when it comes to implementing new technology, cloud computing allows businesses the flexibility to do so using a pay-as-you-go business model.

A green IT

Relocating financial functions to the cloud reduces energy use and carbon emissions. Additionally, it reduces idle time, which increases how effectively computer power is used. After examining the obvious advantages of cloud computing for financial services, it is time to decide which cloud services are appropriate for banks. Choosing the ideal cloud computing architecture for the financial services industry

Banks now have the option to switch from a capital-intensive business model to a flexible one that lowers operating costs while maintaining data security as the top priority thanks to the cloud. Choosing the appropriate cloud computing architecture, however, is essential for a smooth cloud development and integration process. There are three main categories of cloud computing services in the ecosystems for banking from which institutions may choose:

Models for cloud services

Business software and data associated to it make up the SaaS cloud type, which customers may access using web browsers. Customer relationship management, invoicing, accounting, service desk administration, and content management are some of the business use cases that may be hosted on SaaS.

a) **PaaS -** This cloud type focuses on giving users a comprehensive platform for developing programs, databases, and user interfaces as well as doing testing. It helps banks to simplify development, cut down on IT expenses, and lessen the need for hardware and software.
b) **IaaS -** With this cloud model, banks may utilize the software, data centers, and servers on an outsourced basis rather than acquiring them.

Models for cloud deployment

Private cloud: This sort of cloud infrastructure is run by a single bank. The bank itself or a third party operating from the location often manages it. It is often advised for banks to put their services on a private cloud since it allows them more flexibility and control. Due to its deployment behind the company's firewall, a private cloud also reduces the danger of security breach.

Public cloud: Owned by the company that offers cloud services, this infrastructure is available for use by the whole banking sector. If banks want to take advantage of economies of scale, they may use public cloud.

Hybrid cloud: This infrastructure consists of both private and public clouds, each of which is used for a different kind of business usage.

Operating models for the cloud:

Virtual captives: In this concept, a pool of centers and resources that are specifically designated to assist banks with their cloud operations is made available on demand.

Employing personnel with the appropriate skill sets allows banks to acquire cloud competence. Since the team is domestically located, it offers more flexibility when it comes to answering urgent requests.

Vendor outsourcing: This strategy uses resources and personnel located abroad to handle cloud operations. Under this approach, the personnel and resources often serve many banks.

These were the many cloud models that a financial organization may use. Now we comprehend how challenging it may be for a new cloud approach to choose amongst them. Let us simplify things for you. Here are the cloud choices that we often use to expand a BFSI brand digitally.

App inventive trusts these cloud computing models

Although major banks handle their own debit and credit cards, we rely on Visa, MasterCard, and Stripe cloud solutions for our nascent BFSI customers when it comes to mobile payment processing. They provide the financial institutions specific experience in security and fraud detection in addition to simple integration.

For client relationship management, most financial institutions have marketing issues. Few banks are aware of what their clients' demands are or if their services are meeting those needs. Salesforce, Mailchimp, Zendesk, and other cloud service providers are some of the ones we rely on for this. Together, they are quickly establishing themselves as CRM and sales cloud suppliers.

For core banking: While big financial institutions have a core banking system, credit unions and small banks may not necessarily have one. For them, picking a turnkey cloud banking service provider with services like online banking, teller lines, etc. is the ideal option.

For this use case, we are confident in Jack Henry & Associates, Trident, FSI, and Fiserv as cloud service providers. Several banks are looking at cloud-based human resource management systems that include software for payroll, talent management, etc. Popular options for this use case include Workforce Now, Darwinbox, PeopleStrong, SAP/SuccessFactors, and Oracle HCM.

Banks are preferring to migrate their app development and testing operations to the Infrastructure-as-a-Service model as a result of the rising expenses of data centers, according to IaaS. Banks may easily enhance their digital products since IaaS providers are recognized for giving quick software updates and affordable hardware. In the IaaS industry, some of the systems we trust are Microsoft Azure, Google Cloud Platform, and Amazon Web Services [4]–[6].

Now, there are certain inherent difficulties with cloud adoption in banking, regardless of the cloud architecture you choose for your bank. Knowing what they are will not only help you choose the ideal model, but it will also make it easier for you to utilize cloud services with greater assurance.

DISCUSSION

Banks' difficulties adopting the cloud

The use of cloud computing by banks is hampered by a variety of obstacles. Let's examine some of the major difficulties.

Latency

Through the introduction of latency problems, the physical distance between a data center and the cloud service provider might impact performance. The basic banking operations, such as card authorization, may be delayed as a result of this latency. Additional delay may result from moving the systems from a data center to a cloud environment in addition to the physical distance.

The use of data

There are a number of "data ownership" concerns that come up when data is housed in the cloud. This problem is made worse by regulatory compliances since the government has placed restrictions on where a number of financial organizations are allowed to keep their data.

Resilience

Even if there are less and fewer outages than in conventional IT setups, they still happen. As banks now risk a high-level data security breach and a downtime that is beyond their capacity to handle in real-time, cloud failures, unlike conventional IT outages, have a far wider effect.

Banking and the Use of Cloud Computing

A sort of on-demand service known as "cloud computing" gives users online access to pooled resources, software, or storage. Financial organizations may now store and analyze data on distant servers rather than on in-house systems. Banks may take advantage of the greater security, quicker processing times, and reduced prices that cloud computing provides. Although the financial sector has been slow to adopt cloud technology because of worries about letting go of its legacy on-premises applications, regulatory compliance, and data privacy issues, this attitude is starting to change as more financial institutions become aware of how technology can help them meet their business objectives while also meeting customer needs.

Use of Cloud Computing in Banks

Currently, the majority of financial institutions collaborate with outside service providers to operate their cloud, such as outsourcing services or cloud management service providers. However, according to Gartner's poll for 2020, many banks intend to use fewer external service providers and to take on more of their own cloud operations. As an example, some businesses have built private clouds where computer resources are housed on a network utilized by only one company and situated within their very own data center.

Several uses of cloud computing exist in banks, including:

a) **Customer Relationship Management (CRM):** To handle customer interactions and data, banks utilize cloud-based CRM solutions. Regardless of location or time of day, this enables financial institutions to maintain track of all consumer contacts. The correct cloud methods can help banks provide individualized service depending on client requirements and preferences.
b) **Fraud Detection:** Banks utilize the cloud to analyze vast volumes of data from many sources in order to identify and prevent fraud. These aids financial organizations in identifying questionable behaviour before any harm occurs.
c) **Data analysis:** In order to acquire insights into patterns and trends in client behavior, banks are increasingly leveraging the cloud for sophisticated analytics. Banks may develop new

solutions that better fulfill consumers' demands than ever before by analyzing how customers engage with financial goods.

Use of cloud technologies in the banking industry has six advantages.

Some significant benefits of utilizing public clouds for banking and financial services include the following:

a) **Better customer experience:** By enabling anytime, everywhere access to financial services, banks can deliver a better client experience.
b) **Cost savings:** By transferring their data and applications to the cloud, banks may save money. The utilization of public clouds by financial firms is more economical because to their pay-as-you-go pricing model.
c) **Faster processing times:** Cloud systems are built for speedy performance and can easily and quickly handle enormous volumes of data. This enables banks to accelerate the processing of transactions and lower latency issues.
d) **Greater scalability:** Cloud systems allow financial institutions to scale up or down as necessary, giving them the flexibility they need to provide the best client service.
e) **Enhanced security:** The public cloud provides numerous levels of security against data breaches and other assaults, making it a more secure environment than the majority of on-premises systems.
f) **Regulation compliance:** Banks may satisfy regulatory compliance requirements by using cloud platforms that abide by the rules governing the financial sector.

Challenges in the Banking Industry with Cloud Computing

Even if employing cloud technology in banking has numerous advantages, the difficulties associated with cloud adoption may be the reason why so many financial organizations lag behind other sectors. Forbes reports that just 18% of financial organizations have extensively used cloud services as of the end of 2019. When switching to the cloud, financial institutions often encounter the following problems:

a) **Data privacy and security:** Banks must guarantee the safety and security of their customers' data when it is kept on the cloud. Additionally, they must ensure that their systems abide with any data privacy laws that may be in force.
b) **Regulatory compliance:** Banks are required to abide by a number of rules governing the financial sector, many of which specify precise protocols for managing consumer data. When banks' systems are housed on the cloud, it might be challenging for them to adhere to all of these standards.
c) **Lack of control:** Financial institutions may worry that when they migrate their systems to the cloud, they may lose some control over them.

Risk Control for Online Banking Systems

Given the variety of risks that financial institutions encounter, risk management plays a significant role in their daily operations. They must successfully manage these risks, as McKinsey notes, in order to lessen the likelihood that they will have a negative impact on the bank's financial performance. The following are some instances of the many dangers that institutions must deal with:

a) Regulatory risk describes the potential for banks to break laws controlling financial services in the region or nation in which they do business. If this happens, regulatory agencies may levy fines in addition to other sanctions like license suspensions or charter cancellations. Because cloud-based technologies may not be in compliance with local rules and regulations controlling banking operations within a particular region or nation, this sort of risk is particularly widespread when financial institutions utilize them.
b) Reputational risk is the danger that financial institutions might experience harm as a result of unfavorable coverage of their services and goods in conventional media venues, such as newspapers or magazines.
c) Operational risk involves the possibility of financial losses brought on by insufficient internal controls over business operations. For instance, if proper procedures are not followed when handling customer transactions, it is possible that employees who shouldn't have been able to do so grant unauthorized access and expose sensitive data in the process. It also involves risks associated with technological breakdowns as they might result in downtime, which can create issues for clients trying to access online services.
d) Strategic risks include the departure of a significant player from a certain financial sector or any form of change in governmental rules that would impair financial institutions' capacity to effectively operate in that market.

Financial institutions may find the cloud to be a useful tool for reducing different kinds of risk, but it's crucial that they comprehend the many hazards that are unique to their sector and business. Strong risk management procedures must also be in place for them to be able to recognize and respond to any possible hazards without delay [7]–[9]. By making sure that its IT infrastructure complies with all relevant legislation controlling data privacy and security measures, financial institutions can best address these problems. Strong internal procedures that assure compliance with laws and regulations governing the financial sector are also beneficial for banks.

CONCLUSION

A key driver of the banking sector's transformation, cloud computing propels institutions into a new age of agility, creativity, and customer-centricity. The voyage of cloud computing in banking is summarized in this conclusion, which also highlights its importance, benefits, and difficulties as well as the significant influence it has had on changing the financial environment. Cloud computing's importance in banking goes beyond simple technology advancement; it signifies a strategic change in how financial organizations function and provide value. Banks may simplify operations, advance digital projects, and improve customer experiences by using cloud infrastructure and services. The basis for the growth of new goods and services is provided by cloud technology. Cloud computing's appeal in the banking industry is due to its ability to promote innovation. Banks may experiment with cutting-edge technologies that enhance client interactions and enhance internal procedures by giving them access to scalable computer resources. The development of individualized services, data-driven insights, and revolutionary solutions made possible by this innovation-driven strategy keeps banks at the forefront of market innovations.

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CHAPTER 24

FINANCIAL INCLUSION AND BANKING THE UNBANKED

Roma Khanna, Assistant Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- romakhanna11@gmail.com

ABSTRACT:
With the goal of extending financial services to underrepresented people and enabling their economic participation, financial inclusion has developed as a revolutionary mission within the banking industry. This abstract examines the relevance of financial inclusion and banking the unbanked, stressing their influence, difficulties, benefits, and the changing financial environment they shape. Millions of people are still not included in the official financial system in a world where financial services are becoming more and more computerized. By giving underprivileged and rural people access to banking, credit, and insurance, financial inclusion initiatives aim to close this gap. In addition to promoting economic development, this strategy gives people the capacity to manage their money and seize opportunities. Financial inclusion has the ability to end the cycle of poverty and unleash the economy, which is what makes it so alluring. Financial inclusion enables people to create enterprises, invest in education, and prepare for unforeseen obstacles by giving them access to savings accounts, credit facilities, and secure payment mechanisms. In turn, this promotes social advancement and wider economic growth.

KEYWORDS:

Banking, Credit, Financial Inclusion, Financial Literacy, Savings, Transactions.

INTRODUCTION

Financial inclusion refers to the availability of practical, reasonably priced financial goods and services for people and enterprises, including payments, transactions, savings, credit, and insurance, that are responsibly and sustainably provided.

i. Seven of the 17 Sustainable Development Goals have been highlighted as being made possible by financial inclusion.
ii. The G20 reiterated its commitment to putting into practice the G20 High-Level Principles for Digital Financial Inclusion and pledged to promote financial inclusion globally.
iii. According to the World Bank Group, financial inclusion is a crucial tool for reducing extreme poverty and fostering shared prosperity.

Since a transaction account enables individuals to keep money and make and receive payments, having access to one is a first step toward greater financial inclusion. The World Bank Group (WBG) continues to place a high priority on ensuring that everyone may access a transaction account since it serves as a gateway to other financial services. The World Bank Group's Universal Financial Access 2020 effort, which came to an end at the end of 2020, was particularly interested in it. Even if this campaign yielded numerous successes, the fact that more work has to be done, is a sign of how difficult the situation is [1]–[3].

Daily life is made easier by having access to money, which also helps families and companies prepare for anything from long-term objectives to unanticipated crises. Account holders are more likely to utilize additional financial services like credit and insurance to launch and grow enterprises, make investments in their children's or own health or education, manage risk, and recover from financial setbacks, all of which may enhance their overall quality of life. The demand for greater digital financial inclusion has been furthered by the continuing COVID-19 dilemma. Digital financial inclusion entails the use of cost-effective digital means to provide populations that are currently underserved and financially excluded with a variety of formal financial services that are responsibly delivered at a cost that is affordable for customers and sustainable for providers.

Financial inclusion has advanced significantly, and between 2011 and 2017, 1.2 billion people globally gained access to an account. 69% of individuals worldwide have accounts as of 2017. More than 80 nations have already introduced digital financial services, some of which have attained a sizeable market, including those using mobile devices. As a consequence, millions of formerly underserved and excluded poor clients are switching from just using cash for formal financial transactions to doing so while utilizing a mobile phone or other digital technologies.

The next stage for nations (China, Kenya, India, Thailand) where 80% or more of the populace has accounts is moving from access to use. These nations depended on reforms, innovation from the business sector, and a drive to develop low-cost accounts that accepted mobile and electronic payments. According to the most recent Findex statistics (2020 data expected), about one-third of adults - or 1.7 billion people - were still without a bank account in 2017. Roughly half of these individuals were women who lived in underprivileged rural families or were not in the labor.

In developing nations, the gender disparity in account ownership remained constant between 2011 and 2017, at 9 percentage points, making it difficult for women to successfully manage their finances. Less gender disparity was seen in countries where the use of mobile money was widespread. It remains to be seen how the COVID-19 will affect this gender discrepancy. More than 55 nations have committed to financial inclusion since 2010, and more than 60 have started or are developing national strategies. The nations that have made the greatest strides in financial inclusion are:

a) Scaled-up policies, such as universal digital ID in India and Aadhaar/JDY accounts that cover more than 1.2 billion people.
b) Used government funding as leverage. (For instance, 35% of people in low-income nations who get government assistance established their first bank account for this reason.)
c) Promoted the growth of mobile banking services. (For instance, ownership of mobile money accounts increased from 12% to 21% in Sub-Saharan Africa.)
d) Applauded emerging business models, such as using data from online sales to promote financial inclusion.
e) Developing a national financial inclusion strategy (NFIS) that brings together a variety of stakeholders, such as financial regulators, telecommunications, competition, and education ministries
f) Focusing on financial capacity and consumer protection to promote ethical, sustainable financial services
g) Our research shows that when countries implement a national financial inclusion strategy, they accelerate the pace and impact of reforms. National financial inclusion strategies

should bring together financial regulators, telecommunications, competition, and education ministries.

DISCUSSION

Financial Inclusion: What Is It?

Financial inclusion refers to initiatives to make financial services and products available and reasonably priced to all people and companies, regardless of their personal wealth or the size of their organization. The goal of financial inclusion is to lower the obstacles that prevent individuals from engaging with the financial system and using its products to better their lives. Additionally known as inclusive finance [4]–[6].

The Process of Financial Inclusion

Financial inclusion, according to the World Bank, "facilitates day-to-day living, and helps families and businesses plan for everything from long-term goals to unexpected emergencies." Additionally, it adds, "As accountholders, people are more likely to use other financial services, such as savings, credit, and insurance, start and expand businesses, invest in education or health, manage risk, and weather financial shocks, all of which can improve the overall quality of life."

Although there have always been obstacles to financial inclusion, a variety of factors are currently working to increase access to the types of financial services that many wealthy consumers take for granted. The growing use of financial technology (or fintech), for instance, has provided creative tools to address the issue of inaccessibility to financial services and devised new ways for people and organizations to obtain the services they need at fair prices. The financial industry, on the other hand, is constantly coming up with new ways to provide products and services to the global population, and often turn a profit in the process.

Financial Inclusion Areas

Financial inclusion is a broad term that may apply to many different things, including but not exclusively the following financial, economic, or entrepreneurial principles.

Financial Literacy and Education

Giving people the necessary financial knowledge and skills allows them to make wise decisions, manage their finances well, and recognize the advantages of using formal financial services rather than relying on illegal or potentially exploitative alternatives. In some cases, people simply lacked access to the right educational resources to learn the fundamentals of financial literacy.

Accessible and Reasonably Priced Banking Services

By providing no-frills savings accounts and low-cost transaction accounts, financial inclusion at the grassroots level is enabled, encouraging financial saving and enforcing financial security both conceptually and physically. This ensures that unbanked and underbanked people can participate in the formal financial system.

Gender Inequalities

Focusing on gender-specific financial inclusion initiatives, such as tailored financial products, financial literacy programs, and initiatives to support women's entrepreneurship, can help

empower women economically and close the gender gap in financial services. According to Women's World Banking, 31% of women are more likely than men to have an inactive bank account.

Comprehensible Credit Scoring

Financial inclusion works to investigate alternative credit scoring methodologies that take into account non-traditional data sources can extend credit access to those with limited credit history. Including factors like utility bill payments or rental history in credit assessments allows more people to access credit and other financial services, further promoting financial and social inclusion.

Consumer Defense

Strong consumer protection frameworks ensure fair treatment, transparent pricing, and ethical conduct by financial institutions, fostering trust and confidence in formal financial services. Financial inclusion strives to implement protection regulations safeguards to uphold the interests of financially vulnerable individuals. Financial inclusion aims to ensure those who may be illiterate or uninformed have access to formal financial services.

Financial Inclusion's Importance

The importance of financial inclusion may be attributed to a number of extremely broad and general causes, some of which are as follows:

a) Financial inclusion helps lift people out of poverty and reduces economic disparities by giving them the means to manage their finances and invest in income-generating ventures. Financial inclusion offers marginalized and low-income people the chance to access formal financial services, such as savings, credit, and insurance.
b) Financial inclusion leads to higher levels of savings, investment, and entrepreneurship, fostering economic growth and stability in both local communities and national economies. One general argument is that when more people have access to financial services, they can participate actively in the economy.
c) Small companies often struggle to get credit from conventional banking sources, but financial inclusion via creative lending models and internet platforms may provide entrepreneurs the much-needed financing they need to expand their operations.
d) Financial inclusion initiatives that focus on women can support gender equality and women's economic empowerment by giving them access to financial services. By having more control over their finances, women can improve their chances for educational success, improve their health, and have more influence over household decisions.
e) Financial inclusion fosters innovation. Financial inclusion encourages the creation of new technologies and fintech solutions that address the needs of underserved populations, which can advance financial services and benefit the broader financial ecosystem.
f) As technology plays a big part in financial inclusion, encouraging access to digital financial services also helps to create digital inclusion, ensuring that more individuals can participate in the digital economy.

Tech and Financial Inclusion

Here are some ways we might employ contemporary developments to better serve the globe with financial services. There are innumerable ways technology can and is playing a big role in improving financial inclusion.

Cellular Banking: Mobile banking apps are user-friendly and available around-the-clock, allowing people to conveniently conduct financial transactions from their smartphones without having to go to physical bank branches. These apps offer a wide range of services, including checking account balances, transferring funds, paying bills, and even applying for loans.

Electronic payments: Online payment systems offer a variety of options for making cashless transactions. Mobile wallets allow users to store funds digitally and make payments using their mobile phones. Contactless payment methods like Near Field Communication (NFCs) and QR codes enable quick and secure payments in physical retail settings. Both solutions reduce the risk of theft or loss assuage. In 2020, the FDIC found that 46.4% of all U.S. households used nonbank online payment services.

Broker Banking: Agents act as intermediaries, representing financial institutions in remote locations where brick-and-mortar branches are impractical. They provide services such as account opening, deposits, withdrawals, and fund transfers to people who may not have easy access to traditional banks. Agent banking models use technology to equip banking agents with mobile devices and software.

Lending Platforms Online: Fintech lending platforms connect borrowers and lenders directly through online platforms, allowing borrowers to apply for loans and lenders to evaluate borrowers' creditworthiness using data analytics and alternative credit scoring. This streamlines the lending process and increases credit access for people and businesses that aren't well-served by traditional banks or who would otherwise be barred from obtaining traditional credit.

Blockchain and digital money: Consider developing country implementations of these solutions to promote transaction speed, counter weak national currencies, and promote financial system accessibility. Blockchain technology provides a decentralized and immutable ledger for secure financial transactions. Cryptocurrencies enable people without traditional bank accounts to participate in the digital economy.

Apps for Financial Education: Users can access educational modules, budgeting tools, and investment insights to enhance their understanding of financial concepts and make better financial decisions. For example, Mint by Intuit had been downloaded from the Google Play store more than 10 million times as of July 2020. Financial education apps and online platforms also offer interactive and engaging content to improve financial literacy.

Crowdfunding: Crowdfunding platforms enable individuals, startups, and social impact projects to raise funds from a diverse pool of investors. This democratized fundraising approach expands access to capital for underserved entrepreneurs and impactful initiatives. As of July 2020, GoFundMe has assisted in raising over $. As of July 2020, GoFundMe has allowed individuals, startups, and social impact projects to raise funds from a diverse pool of investors.

Issues with Financial Inclusion

When attempting to achieve financial inclusion, there are persistent and significant barriers to overcome. First, there is a significant barrier regarding a lack of awareness and knowledge about formal financial services. Rural and marginalized areas may simply be unaware of the concepts or services that are available, while some communities may have mistrust for formal financial systems. Additionally, cultural and social norms and traditions may have an impact on financial behaviors and decisions [7]–[9].

Socioeconomic disparities and gender inequalities can hinder financial inclusion, with women and marginalized groups potentially facing greater barriers to access and control over financial resources. Policy and regulatory barriers can discourage financial institutions from serving low-income customers and entering underserved markets.

Geopolitical and conflict-related challenges can disrupt financial infrastructure and stability, further limiting access to financial services in particular geographic areas, and inadequate data and market information on unbanked and underbanked populations can make it difficult to develop targeted and effective financial inclusion strategies.

Last but not least, worries about data privacy and security may prevent people from using digital financial services, particularly in places with insufficient data protection frameworks. In some cases, customers may knowingly or unknowingly choose to financially exclude themselves based on the decisions they make. For instance, those who choose to forgo using digital services financially exclude themselves from many opportunities in exchange for more control and comfort over their personal information

What Economic Benefits Does Financial Inclusion Bring?

Financial inclusion boosts consumer spending and business development, which results in job creation and improved productivity. It also attracts more foreign investment and aids in the achievement of sustainable development goals. Financial inclusion contributes to economic growth by encouraging entrepreneurship, increasing savings, and expanding investment opportunities.

What Function Does Government Play in Financial Inclusion Promotion?

Governments may enact steps to lower obstacles, encourage financial institutions to serve marginalized groups, and invest in financial literacy programs and digital infrastructure. Governments play a crucial role in fostering financial inclusion via policy and regulatory frameworks.

What Threats Does Financial Inclusion Pose?

Over-indebtedness, possible exploitation by dishonest lenders, and data privacy issues with the usage of digital financial services are a few problems connected to financial inclusion.

What Are the New Financial Inclusion Trends and Innovations?

Fintech developments, including artificial intelligence, blockchain, and digital currencies, as well as a greater focus on data privacy and security, as well as regulatory changes, are likely to have a significant impact on the direction that financial inclusion initiatives take globally. Financial inclusion is the process of ensuring that all people, particularly those who are underserved and

marginalized, have access to affordable and suitable financial services. It aims to equip people with tools like savings accounts, credit, insurance, and digital payment options, enabling them to participate in the formal financial system, manage their finances, and develop economic resilience [10], [11].

CONCLUSION

The landscape of financial inclusion and banking the unbanked is primed for significant revolution as technology develops. The potential of linking the unbanked and the formal financial system is held by mobile banking, digital payment networks, and cutting-edge financial goods. Additionally, collaborations among financial institutions, technology providers, governments, and NGOs are crucial for building an ecosystem that supports efforts for scalable and long-lasting financial inclusion. In an age marked by economic inequalities, financial inclusion is a ray of hope. The financial sector contributes to good development by making financial services more accessible to those who are not banked. The financial services sector's continued commitment to the goal of financial inclusion lays the way for a society in which everyone has access to economic opportunity, where everyone is empowered, and where development is shared by people, communities, and societies everywhere.

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CHAPTER 25

IMPACT OF COVID-19 ON BANKING PRACTICES

Manjula Jain, Professor
Teerthanker Mahaveer Institute of Management and Technology, Teerthanker Mahaveer University
Moradabad, Uttar Pradesh, India
Email Id- jainmanjula76@gmail.com

ABSTRACT:

The COVID-19 pandemic epidemic has sparked rapid transformations in the banking industry, altering procedures, business operations, and client contacts. The numerous effects of COVID-19 on banking practices are examined in this abstract, which also highlights the obstacles, adjustments, and changing landscape that these effects have had on contemporary finance. Banks quickly adjusted to the new circumstances as the globe struggled to deal with the pandemic's effects. The closure of actual branches and distant working practices hastened the use of digital technology. Online banking, smartphone applications, and contactless payments have developed as lifelines that provide continuous access to financial services while putting an emphasis on cleanliness and safety. The pandemic's attraction rested in its capacity as a catalyst for the financial sector's long-overdue digital transformation. As banks adopted online client onboarding, virtual meetings, and remote customer assistance, conventional procedures were redesigned. Through individualized and easily available services, the change to digital interactions not only improved productivity but also enriched client experiences.

KEYWORDS:

Bad Debts, Banking, Covid-19, Digital currency, GDP, Pandemic.

INTRODUCTION

The global economy experienced a severe and coordinated crisis. According to projections for 2020, the global GDP will have decreased by 6%, with a record number of nations experiencing negative growth (OECD 2020). GDP will decline by a scale not seen since the Great Depression in advanced nations. Banks will undoubtedly experience difficulty as a result of widespread corporate insolvencies and potential household bankruptcies. The scale of the crisis will also likely put banks under greater stress than was anticipated in many of the stress tests that have been undertaken so far, despite the fact that they began the crisis with higher capitalization and liquidity (ECB 2020).

The crisis came on top of the convergence of various developments during the previous ten years, which intensified the strain of competition on banks and, particularly in certain areas, decreased their profitability. In the second paper in the CEPR/IESE series on The Future of Banking (Claessens et al. 2020), we make the case that many of these developments, including digitalization in particular, are likely to be prolonged, if not accelerated, by the worldwide pandemic. Even if the economic crisis has prompted policy changes to encourage lending to the real economy while ensuring the soundness of the banking sector, which gives breathing room in the short term, major banking system transformation will be required in the medium term [1]–[3].

Regulation, low interest rates, and the bank business model

We have now been in a low interest rate and slow growth environment for more than ten years. In especially for those institutions more dependent on maturity transformation and net interest revenue, these consistently low rates have had a detrimental impact on bank profitability via decreased net interest margins, diminished monitoring incentives, and laxer lending rules. As discussed in the first study in this series (Bolton et al. 2019), we also saw a rise in prudential requirements, regulatory scrutiny, and compliance costs during the 2007–2009 financial crisis. These legislative changes have helped the banking industry become more robust, which is particularly advantageous in the present environment. However, the stricter regulations have also reduced banks' competitiveness in comparison to shadow banks and hastened the shift of various commercial activity from the banking sector to shadow banks. In addition, banks' profitability has been under pressure from greater regulation.

Interest rates will most certainly stay low for a much longer as a result of the Covid-19 issue. Although being the conduit for liquidity assistance and having access to central bank support would undoubtedly aid banks in the near term, the deep crisis affecting the real economy is likely to cause a fresh increase in non-performing loans and may once again put banks' viability in jeopardy.

Banks, BigTech, FinTech, and digital currency

The widespread use of digital technology and the advent of new rivals during the pre-Covid era were other developments. While they have promoted the entrance of new businesses and increased competition with established bank business models, they have also enabled the introduction of several new goods and services and assisted in enhancing the efficiency of existing banks.

Technology has had a significant influence on bank business models (Vives 2019). Technology advancements have an impact on deposit collecting, credit extension, and capital market activity. In the paper, we examine in depth the topic of digital money and payments, a sector with a lot of activity. Through legal protection of deposits, exclusive access to the central bank settlement system, and tight collaborations with credit card firms, banks have dominated digital forms of money and payments for decades. The problem now stems from a range of digital assets, such as cryptocurrencies, electronic wallets, stablecoins, and balances with a telecom provider, which do not appear on the balance sheets of banks. The payment technology connected to the asset—rather than the item itself is what gives the new entrants a competitive edge. The key to success has been the ease of payments and links to other aspects of the expanding digital lives of consumers and businesses alike, which have been hastened by the Covid problem. Examples of the degree of the disruption include mobile phone carriers in certain regions of Africa or digital firms' domination in payments in China.

Technology has disrupted many other industries than payments. 'FinTech' and 'BigTech' providers, two new sorts of players, have entered the various financial service categories. FinTech credit providers are more prevalent in nations with greater levels of overall development and less competitive banking systems, but less so in those with stronger regulatory frameworks. Demand deposit-like taking operations have not seen a significant non-bank entrance yet, perhaps owing to worries about regulatory requirements. BigTech platforms might make significant strides but haven't done so yet due to their cutting-edge technology and, in particular, their (related) increased access to (big) data.

Banks are significantly impacted by the arrival of new competitors via lower pressure on fees and pricing as well as more constrained profits. Banks have reacted, although many contend that they themselves are far from successfully implementing technology. Their profitability is then more jeopardized.

New entrants and technology advancements call for regulatory responses. As the evidence on the danger of discrimination connected with increased use of technology and big data illustrates, the tools utilized by the new entrants might generate new hazards, including new consumer and investor protection problems. It is also essential to preserve a fair playing field since more organizations now provide financial services, and they do so in novel ways. Given that the entire industrial organization of the different financial services industries is evolving, another pertinent and crucial topic is where to draw the regulatory "perimeter." In response to the changes brought on by technology, competition and data rules should also be reviewed [4]–[6].

DISCUSSION

The world after COVID

In the near term, banks could see a revitalization if they continue to provide credit to their clients throughout the crisis. This is especially true given that soft information is now often more important than hard information. Additionally, they benefit from the safety net's protection and have access to deposit funding.

Nevertheless, Covid-19 is anticipated to hasten the digitalization and the transition of activity away from the industry over the medium future. Since realizing cost savings from significant IT investments, which are essential in a consistently low rate environment, would be out of reach, medium-sized banks will likely suffer the most. The banking industry will thus need extensive reform; closing down banks and integrating the existing ones would be favoured. A significant policy concern is whether political barriers to cross-border mergers will exist in the post-Covid-19 era as governments increase the protection of their national banking champions.

Many of the components needed to succeed in the post-Covid era are present in BigTech firms. They are digital natives with the necessary technology, clientele, and brand awareness, as well as access to a wealth of information and substantial financial resources. Thus, banking may transition from a system of a few dominant platforms controlling access to a dispersed client base to one in which a few BigTech companies, together with certain incumbents who have converted their platforms, monopolize the consumer interface. To maintain low switching costs for consumers and a sufficiently competitive market in this situation, it will be essential to ensure customer data ownership and portability for people as well as data interoperability across platforms.

Regulators must adjust by balancing encouraging competition, allowing the advantages of innovation to permeate the system, and maintaining financial stability. Digital disruption presents a tremendous challenge to regulators. So that compliance does not become an entry barrier while also preventing entry from becoming destabilizing, regulators must combine prudential regulation with competition policy. Light regulation of new competitors may encourage competition, but this has the potential to reduce incumbents' profitability and raise their incentives to take risks. Furthermore, this might lead to the development of systemic concerns for non-bank organizations.

The regions where COVID-19 is most likely to have an effect are: profitability, risk management, and cost of credit

The profitability of core banking in developed economies is declining as a result of the low interest rate situation and the COVID-19's considerable effect. As a result, financial institutions are turning to commission-based revenue from industries like payments and technology.

The heightened credit risk of the banks' corporate and retail customers is one of the direct repercussions of the health catastrophe on the actual world economy. Banks are required to make a distinction between short-lived affects that will quickly be absorbed by the actual economy and those that will remain for a longer period of time that will need management and reclassification.

The following are the main factors to think about:

1. Given the unique characteristics of COVID-19, the forward-looking information update, and in particular, the manner in which new information must be integrated into risk parameters, has to be thoroughly examined. This may not persist as long as cyclical downturns brought on by economic or financial factors;
2. The updating of "default rates," which must account for any authorities' waivers relating to only transient phenomena of creditworthiness expiration;
3. The determination of the most appropriate timeframes for updating the "recovery rates" in order to account for the beneficial effects, even if they are unavoidably felt in the medium term, resulting from credit recovery policies that might introduce agreements with longer maturities or forms of deferred payments (restructuring debt, etc.);

Due to banks' increased use of loan loss provisions, the decline in economic activity has a negative impact on credit quality. In order to prepare for a probable rise in bad loans, a few European banks have reported sizable losses in Q1'20 (Jan-Mar).

Securitization environment

a) Government remedial measures attempt to reduce risk profiles by providing more incentives for disposals.
b) Given recent developments and potential significant economic effects, it is conceivable that the market for synthetic securitizations will need to be revitalized in the future.
c) Several European banks have completed large impaired loan disposal operations over the previous several years, which has significantly lowered the NPL ratio. The strong interest in unlikely-to-pay (UTP) loans, the emergence of a fervent secondary market for bad debts, and the combination of homogeneous large-ticket asset classes in the creation of portfolios intended for the market, or so-called single names, are among the market's prominent evolutionary trends.

Business models and customer relationships

a) Although COVID-19 may cause a crisis in the actual economy, the effects on the financial system and on the relationship between banks and their customers may also be seen as a "positive discontinuity" for the sector's digitalization and capacity to provide top-notch customer service.
b) Banks are compelled to promote the use of channels that have never been a top strategic priority, even those that are very territorial and branch-centric. The complexity of this phase would be quite high, so banks would need to show that they are really close to their clients.
c) Banking operators may be even more motivated to quicken the road of digital transformation via partnerships and collaborations within the fintech sector given their

clear grasp of their deficit in the supply of services, which is becoming more evident than ever before with COVID-19.

Continuity of operations and business management

a) The availability of technological innovation can play a significant role in ensuring the business continuity of the banks. For example, the activation and improvement of robotics solutions or artificial intelligence (e.g., Advanced BOTs that support the adoption of the technologies displayed on the channels direct) and mobility (e.g., platforms for the management of promoters and system authorizations), if applied to critical processes, would allow for an easier protection of the banks' business operations.
b) The financial industry has a clear chance to assess the advantages of suitable Cloud technologies given the need for a variable availability of infrastructure resources.

Low value of banks was caused by high stock market volatility...

Global stock markets have seen severe instability and excessive volatility as a result of COVID-19. One of the most severely impacted industries has been finance, with bank values falling in all nations worldwide (P/NAV multiple witnessed a dramatic decline from 1.00x on 31 December 2019 to 0.69x on 30 April 2020). With the exception of the Nordics, Asian and European banks are presently trading at considerable discount levels (with average P/NAV of 0.56x and 0.52x, respectively), while North American banks are still trading at P/NAV equal to an average 1.15x.

During COVID-19, banking stocks were hit. From December 1, 2019, to April 30, 2020, most banks saw a pricing decline in mid-March. The STOXX banks index for Europe had a significant drop of 40.18 percent, followed by the banks index for North America (31.23 percent) and Asia/Pacific (26.09 percent) over the same time period.

...yet maintaining a close connection to profitability

The regression analysis predicts a substantial link between bank value and profitability. Due to their relatively higher profitability, which is primarily the result of their business activity diversification (such as offering investment banking services), North American banks in particular are seeing their valuations rise. Their RONAV is on average 11.4 percent, as opposed to 10.9 percent and 7.5 percent for Asian and European banks, respectively. Assuming a RONAV of 10%, the implicit P/RONAV for each area is 1.0x, 0.8x, and 0.5x for North America, Europe, and Asia, respectively [7]–[9].

COVID-19's Effect on Banking Practices

The COVID-19 epidemic has posed hitherto unheard-of difficulties in a number of industries, including banking. Banking procedures have been considerably influenced by the epidemic and the accompanying control measures, compelling institutions to make quick adjustments in order to maintain business continuity and satisfy changing consumer demands. This debate explores the COVID-19's several effects on banking procedures.

Transformation to Digitalization

The epidemic hastened the financial industry's continuing shift to digitization. Customers switched to internet banking, smartphone applications, and digital payment systems for their financial requirements when traditional branches closed or operated at reduced capacity. In order to preserve

client satisfaction and provide continuous access to financial services, banks had to quickly improve their digital infrastructure, provide powerful online services, and enable remote account management.

Remote employment and teamwork:

Banks started allowing its staff to work remotely as a result of social distancing policies. This change called for the use of digital collaboration tools, secure remote access to private systems, and a reconsideration of conventional office procedures. This change enabled continuity while highlighting the importance of cybersecurity to protect private financial information.

Customer Support and Engagement:

To handle the spike in enquiries about relief programs, debt forbearance, and financial planning, banks had to adapt their customer service operations. Many organizations put a strong emphasis on empathic communication and offered clients digital means to acquire information and support. For discussing complicated financial issues, virtual consultations and video conferencing have taken the role of in-person encounters.

Credit and Loan Management:

The pandemic's economic effects resulted in a rise in credit demand and loan delinquencies. To meet the shifting financial environment, banks had to quickly modify their credit evaluation and risk management procedures. In order to help borrowers in need of financial assistance, loan deferrals, payment extensions, and government-backed relief programs became crucial instruments.

Payments and Cash Management:

The epidemic sparked worries about the virus's ability to spread via actual money. Contactless payments, mobile wallets, and online transactions all increased in popularity as a consequence. The promotion of electronic payments by banks led to a decline in the usage of cash and an increase in the number of cashless transactions.

Financial Institutions Under Stress

Bank profitability was impacted by the recession because of lower interest rates, less demand for loans, and larger reserves for probable loan defaults. Financial institutions were required to improve their liquidity situations, review their investment holdings, and adopt more responsible credit risk management practices.

Responses to Regulations and Compliance

In response, regulatory agencies took action to assist the financial industry during the crisis. Certain compliance rules were relaxed in an effort to reduce the load on banks and promote lending. Institutions, meanwhile, needed to be compliant while navigating quickly shifting regulatory environments.

Enhanced Innovation

Banks have accelerated the implementation of cutting-edge technology like blockchain, artificial intelligence, and chatbots as a result of the problems provided by the epidemic. These technologies

helped to improve risk management, expedite internal procedures, and provide better client experiences.

CONCLUSION

Banking processes have undergone an irreversible change as a result of the worldwide pandemic COVID-19, which has compelled the sector to quickly innovate, adapt, and redefine its operating principles. This summary highlights the pandemic's transformational character, problems, adaptations, and the shifting environment it has formed within the world of contemporary finance. It also summarizes the path of the pandemic's influence on banking practices. Beyond the immediate disruptions, the pandemic's influence on banking operations is significant since it has sped up a long overdue digital transformation. For the sake of maintaining corporate operations and preserving public health, banks quickly adopted remote employment, internet services, and contactless transactions. Financial institutions adopted technology-driven approaches that improved client experiences and operational resilience as a result of the crisis, which served as a catalyst. The pandemic's position as a stress test that exposed the financial industry's strengths and weaknesses is what makes its effects so alluring. Traditional business processes will inevitably be disrupted, but the industry's capacity to change course and continue offering services demonstrated its flexibility and resilience. As continuity enablers, digital technologies have helped banks service clients, manage risks, and maintain financial stability.

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