

## CHALLENGES AND ISSUES OF IOT APPLICATIONS IN BANKING & FINANCE

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**Abstract** Businesses are looking at the potential of IoT in finance to harness data and to avoid the risks that are specific to this industry due to the fast digitization and mobilization of the banking and financial services industry. For small firms, the Internet of Things is akin to an industrial revolution, with 83% of companies reporting increased productivity as a result of IoT adoption. This explosion in technology offers the banking and finance sector opportunity to improve their operations and become more efficient, secure, and profitable. It also gives them the ability to increase their digital skills. IoT applications in banking and finance are the main emphasis of this research. These industries provide countless prospects for IoT expansion. It investigates the adjustments made by IoT in banking and finance. It also examines problems and difficulties related to IoT in various businesses.

**Keywords:** IoT, Applications, Banking & Finance

### **Introduction**

The Internet of Things (IoT) is a network of connected electronic and computational objects. The sensors in thermostats and manufacturing equipment, as well as printers, TVs, mobile phones, and even refrigerators, can all be controlled by these gadgets. As people and businesses benefit from the advantages of IoT, as we'll discuss below, adoption has grown dramatically in recent years. This technology is extremely useful to businesses in the manufacturing, logistics, and food and beverage sectors to name a few. There are projected to be 16.44 billion linked IoT devices worldwide by 2025, up from 7.74 billion in 2019. The Internet of Things (IoT) is a network of gadgets, appliances, cars, and other items that

are outfitted with sensors, electronics, connections, software, and actuators. This allows them to communicate with one another and share information. IoT devices, to put it simply, exchange data through wired or wireless networks. IoT innovations have countless potential applications. It has the power to significantly alter the planet. The business world is most affected by IoT since it has altered not just how various corporate operations are conducted but also how the economy is managed. It contributes to the improvement of lives as well as the cost and productivity optimization of operations.

### **Benefits of IoT Applications:**

#### 1. Reduced Costs

Internet of Things technologies are developed with businesses in mind, the more operations can be streamlined and profits raised. IoT devices are already having an effect on businesses' bottom lines, from cybersecurity to workplace productivity. When IoT devices and sensors are used to maintain corporate equipment at peak performance, maintenance expenses can be reduced. Office equipment on-the-fly troubleshooting detects issues before they have an impact on staff and employees, avoiding the inconvenience and expense of significant repairs. One advantage the Internet of Things delivers to your operations and maintenance process is the reduction of expensive extended downtime for repairs. Additionally, there are several ways to employ IoT technology to boost your bottom line through the automation of routine business activities, a top driver of IoT investment for many companies.

#### 2. Higher Efficiency and Productivity

Efficiency serves as the foundation for the kind of increased productivity that increases SMBs' revenue. Utilizing IoT to reduce repetitive or time-consuming processes is one method to use technology to improve business efficiency. An automated PDF creation and conversion tool that removes barriers to PDF editing and archiving, accelerating communication and documentation, would be an example of an IoT function for this strategy. These IoT solutions improve communication both within and outside the office, which boosts output. In fact, a poll by Harvard Business Review found that 58% of businesses are experiencing increased collaboration because to IoT devices. Lastly, big data analytics via IoT can give an overview of staff productivity and assist in determining which jobs should be delegated and are improving the function of business. Big data can also be instrumental in tracking efficiency for manufacturing supply chains. You can follow delivery systems and monitor products and inventory to stay ahead of demand.

### 3. Business opportunities

While many businesses try to make money from their digital services, many don't have a well-rounded plan for doing so. IoT is a game-changer in this regard, as advanced analytics, AI, and smart utility grids make it simple for SMBs to gather the useful data they need to give their consumers the value they want. These analytics offer fresh perspectives that are being used to fundamentally redefine old industries in addition to helping to develop new business models. More firms are providing new or updated products and services to a larger consumer base as a result of IoT's capacity to connect products and services as they relate to customer behaviors. Businesses now have access to more information than ever before on customer preferences and product performance over time thanks to IoT devices. Businesses can use this and predict behavior patterns and needs of consumers better than ever.

### 4. Improved Customer Experience

Due to today's IoT, which is far more prevalent than IoT technology of the past because of how recent it is, omnichannel strategies have radically altered how customers view their connections with enterprises. Organizations are prioritizing front-end consumer interaction as they try to connect with their audiences more effectively, frequently using IoT devices. The modern consumer expects to be able to communicate with businesses via their phone, whether it be through a dependable mobile website, an automated chatbot, or a dedicated app. 40% of customers don't mind if a chatbot or a live person assists them as long as they get the assistance they require. As a result, innovative companies are utilizing new technologies and fusing it with IoT to improve their customer

### 5. Increased Mobility and Agility

Due to the nature of IoT technology, organizations may now allow their staff to work virtually from anywhere. This flexibility can be quite beneficial for SMBs in particular. The IoT revolution has allowed a surge in small and mid-sized businesses to change the way they operate by recruiting more full-time remote workers in "work from anywhere" positions. Office leases are expensive. According to estimates, 43% of companies who incorporate IoT policies into their organizations report better business agility by enhancing the way operational activities are carried out. This demonstrates how agility has improved for SMBs. Using an effective method or safeguarding those endpoints, as well as maximizing the benefits of IoT technology across all of your devices for communication, will be the main issues for projects utilizing the advantages of IoT.

#### **Benefits of IoT: Takeaways**

- Advanced IoT analytics can benefit businesses in ways like increased productivity, cost savings, and efficiency.
- By innovating and rethinking conventional company operation paradigms, IoT generates

new business prospects.

□ Increased income is mostly dependent on improved customer experience, and IoT offers ways to track client habits for optimal effect.

□ To ensure maximum security and prevent service interruptions, businesses should protect data that is transferred to and from IoT devices.

### **Data Sources in IoT:**

Banks employ mobile apps and digital sensors as their two main data sources to power their IoT initiatives.

#### 1. Mobile Apps

The most fundamental and important IoT application is a smartphone app. Mobile is the most innovative market because of the vast number of users it has. While the majority of banks already have mobile banking apps, relatively few of them are also equipped with an analytics platform that can deliver data on a big scale. Information about behavior, user interactions, and reviews can all produce data. It is the simplest and most trustworthy data source that banks may use to gain market insights.

#### 2. Digital Sensors

To track consumer activity, digital sensors can be installed in physical objects like bank branches and ATMs. These digital sensors have the ability to detect unanticipated consumer concerns, service problems, and the simplicity of use of ATMs and other automated machines. IoT can have a significant impact on banking and finance, as we have witnessed. With time, a lot more data points will be added, and marketing and customer support will both become more

personalized. IoT has a significant impact on how banks and other financial institutions make decisions and how we are served.

#### 3. IoT Applications in Finance

The following are the IoT applications in Finance.

1. Debt Recovery - For lending financial institutions, collecting debt from individual and business borrowers requires a lot of work and overhead expenses. Using IoT sensors and networks, FSIs may monitor the operations and supply chain activities of debtor enterprises to

assess their preparedness to pay without incurring the high overhead costs associated with check failures. Similar to this, a network of IoT ATMs, card readers, and other point-of-sale devices can be used to evaluate a borrower's spending and income to determine their ability and intent to repay. If a borrower is in default, further spending can be restricted until payback is made.

2. Fraud Prevention - Financial institutions regularly invest in and look for new ways to stop people from abusing their services, and fraud prevention is one of their top priorities. Major financial institutions like HSBC have already used AI-based anti-fraud solutions with success. Given the importance placed on preventing fraud, IoT will undoubtedly change the game in this sector.

#### 4. Use of IoT in Banking

The IoT applications in banking are listed below.

1. Individualized Offers and Rewards - Banks offer reward points that can be used in particular ways to encourage customers to use credit/debit cards or other forms of payment. Because not all consumers will find these benefits enticing, most reward systems are worthless. By offering

clients relevant redemption options based on their purchase history and demographics, IoT-based intelligence can be utilized to attract customers. For instance, a customer who is known to spend the most of her money on clothing should be given reward points that will enable her to receive discounts on clothing, as opposed to a customer who spends more on food who

should be given points that can be redeemed at restaurants. Such customized rewards will increase client loyalty and engagement.

2. Fraud Prevention - By installing IoT-enabled security systems at points of usage, such as ATMs, which have more private and secure means of authorization, debit/credit card fraud can be avoided. ATMs that validate transactions using eye-scanning technology are being tested by Citigroup.
3. Capacity Management- Banks continuously strive to increase the number of their locations

and ATMs while also managing the current ones as effectively as possible. The average wait time can be measured using IoT-enabled monitoring to track the daily number of customer units, and the ideal staffing and counter configuration at each branch can be identified. The geographic distribution data of clients can also be used to facilitate decisions regarding new branches. The same can be done to optimize the number and location of cash dispensing machines based on usage.

5. IoT-related changes in the finance sector
  1. Product Management & Planning - Banks can introduce better and more specialized service offers by utilising the data gathered from sources like mobile apps. What services and goods should be introduced? Who are the primary targets? When should the products be introduced? Data on prior service offerings and customers' responses to those services can be used to provide answers to all of these queries.
  2. Customized Advertising - Customers want tailored solutions for their unique demands across industries, and the BFSI sector is no exception. Information regarding a client's current financial situation, purchasing habits, and specific demands are required in order to customize a banking solution for him or her. With the use of IoT, banks are now able to monitor all customer activity and offer a service tailored to their wants and needs.
  3. Proactive service - In the banking and financial industries, IoT makes it much easier to resolve service errors and impending product changes. If there is an underlying worry about a product, it will be seen very quickly, and action can be made to address the problem before it gets out of hand. Additionally, having a record of the client's prior behaviors might aid customer support staff in offering more effective solutions.

6. IoT-related changes to banking

IoT might transform banking with a creative rethink. The first IoT banking platform, Interact IoT, enables consumers to save money by tying their bank accounts to IoT-enabled products. Combining blockchain technology and IoT connectivity for a dependable and secure

network can also be advantageous. The second major change in banking brought about by IoT is wearable technology. Wearables have been a top target for banks worldwide due to their popularity and reach. The majority of watches currently on the market are phone-connected, however numerous developments now make standalone wearables possible. As a result, wearable technology has become a hotbed for banking innovation. Along with wearables, remote devices like Amazon Alexa are also a focus area where innovation banking is necessary. Basic banking like balance check and transaction history are some must haves in every wearable and remote assistant device.

### **Issues and Challenges in IoT Implementation**

The following problems and difficulties with IoT implementation are listed:

Providing Value to the Client - The success of an IoT implementation is closely correlated with how precisely the problem statement is defined. But most IoT service providers overlook this.

They ought to be aware of the potential long-term effects these solutions may have on productivity, customer happiness, and efficiency. The necessity for thorough reflection throughout the cycle indicates that the inability to fully comprehend the customer issue statement is the greatest obstacle to IoT deployment. IoT experts must therefore identify the important performance indicators to monitor and enhance with an IoT solution.

**Hardware Compatibility Problems** - Many different sensors, PLCs, and other devices that are connected to IoT gateways to gather & transmit data to the cloud are used to capture data. Based on their objectives and expected business results, enterprises must carefully identify the machinery, hardware, and old machines that are already in use. The difficulty of implementing the Internet of Things (IoT) increases when there are legacy equipment present that do not use the aforementioned PLCs and sensors. One simple solution is to add external sensors to the legacy equipment, but this is not a fool proof solution, making it a very difficult operation.

**Issues with Data Connectivity**- Since data connectivity has greatly improved, this issue may be the one that has received the greatest disregard. However, there are still some places where data connectivity presents a problem for IoT adoption. It involves the data format that IoT devices produce and how they communicate with the gateway and the cloud. The majority of IoT gateways on the market are GPRS and Wi-Fi/LAN compliant, however legacy devices rely on PLCs, telemetry systems, and RTUs to produce data. In order to deliver data to the IoT platform, a proper edge layer that converts transport and data format protocols is required. Prior to starting an IoT deployment, defining the ideal mix of these protocols would be quite beneficial.

**Difficulties with Accurate Data Capture**- Although the system may be reliable and leak-proof, there may still be problems with improper data gathering. Inaccurate data is recorded due to an unfortunate event or the software's incapacity to address specific anomalies in run time. As a result, the analytics produced are insufficient and may not aid in making wiser judgments. The difficulty of implementing IoT may have a significant impact on both customers' and industrial users' purchasing decisions.

**Analytics Difficulties** - Actionable insights gained from the gathered IoT data represent the true value of an IoT solution. This necessitates the use of a high-performance analytics platform that can manage the enormous quantity of data that will eventually be contributed to the system. When designing the IoT implementation architecture that includes data processing, purification, and representation, data analytics partners need to bear this in mind. So, allowing for enough extensibility to integrate real-time or predictive analytics into an IoT solution can assist in resolving this crucial IoT deployment difficulty.

**Data security problems** - In light of recent events like ransomware attacks, businesses are

concerned about data security. There were violations and intellectual property thefts. IoT service providers must therefore provide data security.

### **IoT in Banking and Finance in the Future**

IoT will assist the banking and finance sector in the coming days with compliance challenges, customer behavior analysis, and modifying it. Both at the manager and customer levels, it will change technology. As a result, it might result in lower total costs and improved performance. It is anticipated that switching costs and IoT implementation costs will decline given the advantages and market potential.

### **Conclusion**

The Internet of Things (IoT) is a cutting-edge technology that enables networks of linked devices to gather real-time data, send it to the cloud for processing and analysis, and respond to events instantly. Examples of connected devices include sensors, cameras, and smart devices. IoT is crucial to banking and finance because it promotes digital automation of

crucial activities and ensures effective data collecting and processing. BFSI organizations may improve the security of transactions, optimize services and operations, and provide a cutting-edge client experience with IoT-enabled solutions.

The banking and finance sector is susceptible to security breaches; therefore, before going live, IoT should address these issues. IoT adoption in finance is now moving slowly, but as financial services are mobilized more and new use cases are developed, IoT adoption will eventually spread to the entire industry. IoT implementation should be delayed until problems with physical devices and their associated compatibility have been overcome because switching from an older system and adapting to IoT are difficult. Using a comprehensive governance mode, which offers protected access to sensitive reports and data, can address data security challenges.

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