Research Article

INTERNET OF THINGS---CHALLENGES AHEAD

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ABSTRACT

The Internet of Things (IoT) has become an area of debate in terms of its applications and implications on the Indian economy, both at workplace and households. It has impacted both our life and work style. It's a gigantic network of connected things and human, which collects and share data about the way it used and about the surrounding around them. It has its diverse impact in terms of the productivity as well as on the growth of the service sector. As per Gartner & HIS forecasts, there will 25 to 30 billion IoT devices by 2020, and the total IoT market size will be US$3.7 billion (McKinsey). There has been increase in the innovations and the inventions because of the increasing market of Innovations. This has also mandated huge responsibility not only on the consumers of Io, but also on the producers of objects and gadgets compatible to the needs of the different industries. The banking industry has seen tobe greatly affected by the trend of IoT in India. The paper looks at the scope of the internet of things (IoT) on banking and financial services and the impact of IoT on Banking &Fintech industry.

INTRODUCTION

The Internet of Things is the way of connecting devices to communicate, share information, anticipate needs, solve problems and improve efficiency. It's basically inter-networking of physical devices, vehicles, buildings and other objects, embedded with electronics, software, sensors, actuators, and network connectivity that enables these "smart objects" to collect and exchange data.

Say for another example, the smart refrigerator in your kitchen (at home) can send you an alert (or notification) on your smartphone (while you are leaving office) when you're out of milk or gas. Your wearable or smartwatch can warn you if there is something wrong with your pulse or heart-rate. Additionally, all these information gets recorded. Later, the software after looking at the data can provide you information like: you are likely to run of milk on Wednesday, run out of gas in two weeks, or likely to get a heart attack in three months (so, time for a check-up and take precautions). Below is a nice infographic on IoT applications in various industries – Fintech, CPG, Auto Tech, Healthcare etc.

Evolution of IoT

IoT has become an important feature today and has been affecting the competitiveness of the business and its growth. It has ushered a new era of revolution in the digital technology involving the absence of human interface. But this invention had its long journey.
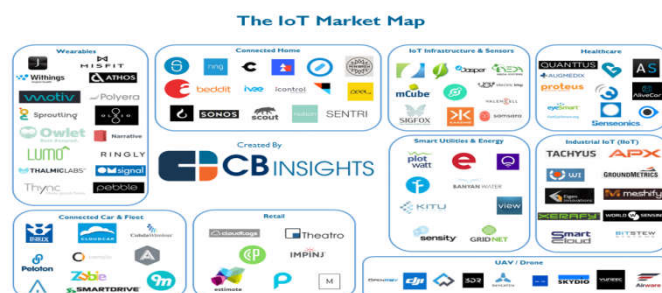
The idea of connecting 'things' to the internet extends much further back than the use of the term 'Internet of Things'. In the early 1980s students at Carnegie Melon University fitted internet-connected photosensors to a soft drinks vending machine, which allowed them to count the number of cans that were being dispensed. This enabled anyone with access to the internet to determine how many drinks had been dispensed, and thus how many were remaining (Vetter 1995).

Even before the first webpage was created, John Romkey and Simon Hackett introduced a toaster that was connected to the internet in 1990. The toaster was connected using TCP/IP and

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hada Simple Networking Management Protocol Management Information Base (SNMP MIB) controller; it's one function was to turn the power on or off. The first use of the term 'Internet of Things' came much later, and is widely attributed to Ashton (Ashton 2009), when he used it as the title of a presentation at Procter and Gamble in 1999.Ashton's vision was to create a system "where computers would be capable of gathering data without human help and render it into useful information, which would be possible with technologies like sensors and Radio Frequency Identification (RFID) that enable computers to observe, identify and understand the world." Today the Internet of Things has spread its wings across the industries and a newer term "Enterprise IoT (EIoT) "has been established that includes devices used in business and corporate setups. As per the market experts, there would be about 50 billion connected devices by 2020.

Although, the definition of IoT has changed from what Kevin Ashton had envisioned it to be with numerous technology inventions, the founding principle of having a network of interconnected devices that are interacting with each other and the surroundings to collect and analyze information using internet has remained the same.

IoTand Data

The underlying value in IoT is the transfer of data in terms of its various objects and gadgets., The banking and financial sector relies heavily on gathering and analyzing data., thereby increasing the dependency on IoT. The IoT is generates a huge amount of data, which is currently retained in vertical silos. However, a true IoT is dependent on the availability and confluence of rich data sets from multiple devices, organisations and verticals which will usher in the next generation of IoT technology. It is recognised as an enabler that will increase efficiency in a number of areas, including transport and logistics, health, and manufacturing(Maple).

As per Kirk Borne, Principal Data Scientist and Executive Advisor at Booz Allen Hamilton, IoT will play a massive role in shaping the future of data analytics. The IoT promises improved efficiency, accuracy and economic benefits in a number of industries including banking and insurance. According to Bernard Marr, leading technology, KPI & Big Data expert and Forbes contributor, among the top 9 technology megatrends, IoT is very much poised to disrupt the world in 2018.According to Tata Consultancy Services (TCS), financial institutions have reported an average IoT budget of US$117.4 million which is 0.4% of total revenue. Its study revealed that they are planning to spend US$153.5 million by 2018 and further increase their IOT budget by 34% by 2020.

The IoT opportunity lies in the insurance vertical, specifically within risk management. For instance, with the emergence of telematics (in-vehicle telecommunication devices), cars are now able to transmit drivers' behavior data back to the car insurance companies so that they can assess drivers' risks and premiums accordingly. So, this not only benefits the insurers but also the drivers as their reduced premiums are better representations of their safe driving behaviors. In a very short period of time, we all will get surrounded by connected devices like smartphones, censored devices and wearable tech in our home, work and public places. Apart from consumers benefiting, industries like Banking, Insurance and Finance have has already realised the benefits of IoT innovations. Infact the value chain of IoT has been expanding in terms of not only its components, connectivity, system integration's, smart gadgets, but also in terms of its applications.

Applications of IOT in banking

Management and Product Planning – The IoT technology will help the banks to launch and plan the product as per the customers' requirements.

Cyber Security – With the growing internet banking the security is a major challenge for any banking industry. The IoT technology ensures that the customer personal data to financial data potentially kept secure on the moving network.

Customer Relationship Management – IoT can help the banks to understand their present economic condition and offer services to the customer as per requires from time to time. This will ensure maintaining a healthy relationship with their customer and better customer experience.

Proactive Services – IoT technology made it possible for the banking and financial industry to detect any service fault and bring it to the notice of bank to handle the issue before it becomes too serious.

Data Analysis –through mobile apps and digital sensor which helps the banking and financial industry to analyze customer behavior and requirement and helps in the decision-making process of business.

Wearables in Banking- Wearable technologies are now getting popular day by day. Due to wide adoption, enabling banking in wearables has become a primary target for banks across the world. Right now most of the watches are connected with the phone but there have been plenty of innovations to allow for independent wearables. This has made wearables a hot seat for banking innovation as well.

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. Further for organizations in retail banking, faster payments, improved operability (to support the move to open banking) and more responsive mobile services are the main points of focus for innovations.

For car manufacturers, the opportunity to offer services in and around connected cars not only has the potential to improve customer relationships, but also boost revenues. But smarter vehicles represent an opportunity for banks, too: for example, Idea Bank runs a fleet of cars, each customized with an integrated security deposit box and an ATM, which can visit the customer, rather than vice versa. The bank's data suggests that the average deposit at one of its mobile, car-based ATMs is three times higher than at the branch. Meanwhile, in Canada, credit union Blueshore is exploring the possibility of wealth management apps, displayed on car windscreens, for passengers to review their portfolios while being driven to their destinations.

Blockchain-based smart contracts

Blockchain's potential to keep a secure record of authenticated transactions has been much discussed, in financial services and

beyond. Commonwealth Bank of Australia, Wells Fargo and trading firm Brighann Cotton claim to have completed the first global trade transaction between two banks using blockchain, smart contracts and the IoT. The transaction involved a shipment of cotton from Texas to Qingdao in China.

Examples of IoT in the Banking and Financial Services

Visa Mobile Location Confirmation – It is an optional service for consumers which offered through mobile banking apps. The service uses customer mobile geographical location in real time as an additional input into visas predictive fraud analysis. For example, if the cardholder mobile location is same as the payment transaction location, the issuing bank confidently approve the transaction.

Alfa Bank Sense – It is an advanced mobile bank application which predicts the real-time customer financial behavior and offers the product or services the customer might need at that time. This IOT application is more personalized than any other mobile banking app and communicates like the Facebook Messenger does.

Groceries by Master Card – It is an IoT application that allows effortless purchasing of Groceries. The purchase is served by fresh direct and Shop rite e-commerce platforms.

Banking on Wearable – Wearable devices have been the easiest win for the banks. Many banks started providing an application for popular wearable devices like apple watch and fit pay. Few banks have also launched their own wearable device like pay with Bpay by Barclays which allows contactless wearable payment solutions. As per experts, Wearable are the next wave of revolution in Fintech.

Challenges Ahead

Financial services companies like banks and insurers have existed for ages. But, all of a sudden, the banking and financial services are being challenged by the GAFAs (Google, Apple, Facebook, and Amazon) and the Fintechstartups. According to Capgemini's World Fintech Report of 2017, 50.2% of customers say that they have already opted for at least one non-traditional financial firm. So, the banks and financial institutions need to be more customer-centric and develop digital skills in-house in order to survive.
Some of the Challenges are asfollows:

Security

Security is an essential pillar of the Internet and is perceived as one of the most significant challenge for the IoT. Increasing the number of connected devices increases the opportunity to exploit security vulnerabilities, as do poorly designed devices, which can expose user data to theft by leaving data streams inadequately protected and in some cases people's health and safety (implanted, Internet-enabled medical devices and hackable cars) can be put at risk. Infact as per the survey done by Amsterdam, Netherlands-based Gemalto, a cybersecurity firm researched the impact of security on the development of the IoT. It was found that 90 percent of consumers lack confidence in the security of Internet of Things devices. This comes as more than two-thirds of consumers and almost 80% of organizations support governments getting involved in setting IoT security. It's clear that both consumers and businesses have serious concerns around IoT security and little

confidence that IoT service providers and device manufacturers will be able to protect IoT devices and more importantly the integrity of the data created, stored and transmitted by these devicesTo deal with these and many other unique challenges, a collaborative approach to security will be the need of the hour

Privacy

The IoT creates unique challenges to privacy, many that go beyond the data privacy issues that currently exist. Much of this stems from integrating devices into our environments without us consciously using them. This is becoming more prevalent in consumer devices, such as tracking devices for phones and cars as well as smart televisions. In terms of the latter, voice recognition or vision features are being integrated that can continuously listen to conversations or watch for activity and selectively transmit that data to a cloud service for processing, which sometimes includes a third party. The collection of this information exposes legal and regulatory challenges facing data protection and privacy law.

In addition, many IoT scenarios involve device deployments and data collection activities with multinational or global scope that cross social and cultural boundaries.

Compatibility and Longevity

IoT is growing in many different directions, with many different technologies competing to become the standard. This will cause difficulties and require the deployment of extra hardware and software when connecting devices.

Other compatibility issues stem from non-unified cloud services, lack of standardized M2M protocols and diversities in firmware and operating systems among IoT devices.

Some of these technologies will eventually become obsolete in the next few years, effectively rendering the devices implementing them useless. This is especially important, since in contrast to generic computing devices which have a lifespan of a few years, IoT appliances (such as smart fridges or TVs) tend to remain in service for much longer, and should be able to function even if their manufacturer goes out of service.

Standards

Lack of standards and documented best practices have a greater impact than just limiting the potential of IoT devices. Without standards to guide manufacturers, developers sometimes design products that operate in disruptive ways on the Internet without much regard to their impact. If poorly designed and configured, such devices can have negative consequences for the networking resources they connect to and the broader Internet.

Regulation

Like privacy, there are a wide range of regulatory and legal questions surrounding the IoT, which need thoughtful consideration. Legal issues with IoT devices include crossborder data flow; conflict between law enforcement surveillance and civil rights; data retention and destruction policies; and legal liability for unintended uses, security breaches or privacy lapses. Further, technology is advancing much more rapidly than the associated policy and regulatory environments.

Development

The broad scope of IoT challenges will not be unique to industrialized countries. In fact, the IoT holds significant promise for delivering social and economic benefits to emerging and developing economies. By 2025, McKinsey Global Institute projects that as much as 38% of annual economic impact of the IoT applications will derive from less developed regions.

Like current challenges in this area, less-developed regions will need to address policy requirements, market readiness and technical skill requirements to take advantage of the IoT potential.

CONCLUSION

Despite the challenges and bottlenecks of the IoT in its current state, it still has many benefits in today's business world. It's useful enough that some are willing to throw caution to the wind and make the transition to the IoT-despite all the challenges it provides-to get a jumpstart on their competition before it becomes the next big thing.

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