DA-IOT

Case study on Indian Context

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1 Introduction

Introduction The "Internet of Things" (IoT) describes a system where the Internet is connected to the physical world via ubiquitous sensors. Initially coined by Kevin Ashton, a British technology pioneer, IoT for the last 20 years has provided remote insights on the health, status, efficiency, quality, and location of objects, people, and places. Over the years, IoT has evolved from simple computing and short range wireless communications to powerful data processing and the ability to monitor and control objects from long distances with minimal to no human intervention. With the continued evolution of the IoT; businesses, cities, and citizens are now benefiting from the power of living in a connected world where humans and machines live in a symbiotic relationship.

Technology Roadmap: The Internet of Things

Source: SRI Consulting Business Intelligence
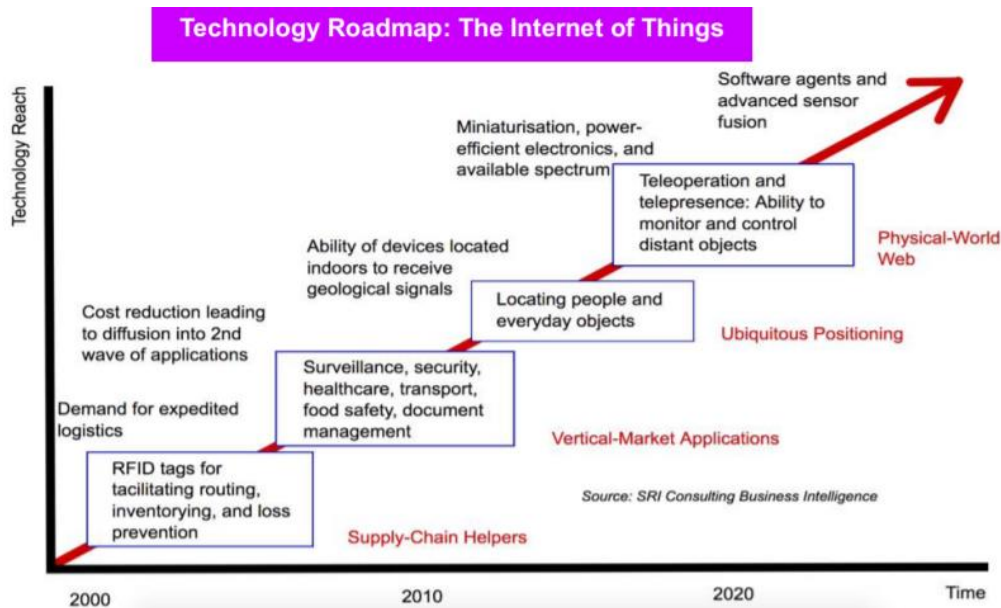
In a recent report by IoT Analytics, 7 billion IoT devices were connected and active in 2018 and is expected to grow to 10 billion connected devices by 2020. GSMA Intelligence in June 2018, projected that over 25 billion IoT devices will be deployed by 2025. As shown in Figure 2, the global active IoT connections is projected to grow at a 17% CAGR by 2025.
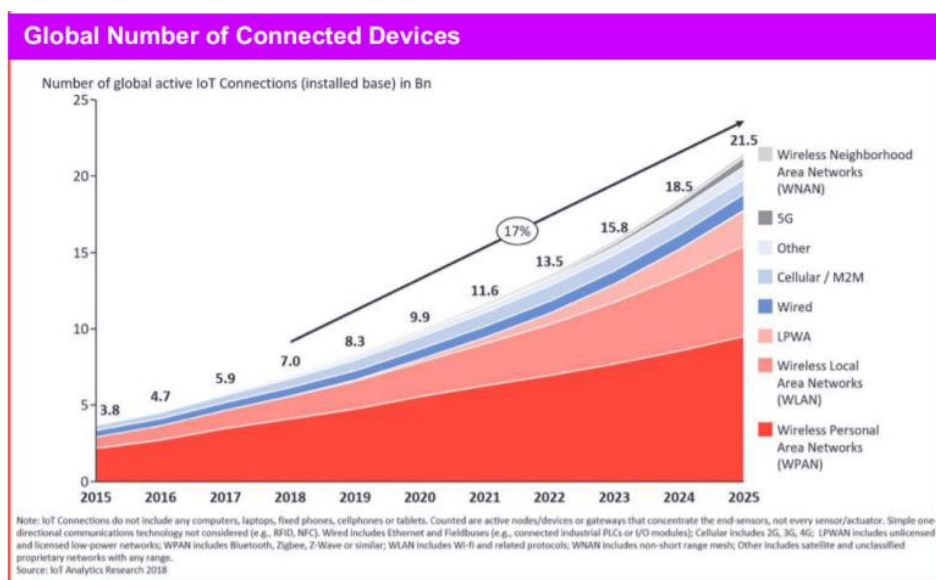

Figure 2: Global Number of Connected IoT Devices

With focus on the India market, one must wonder how India's IoT progression is doing and where it stands in the overall contribution to the global market

connected devices projections. The Department of Telecommunications (DoT), a department of the Government of India's Ministry of Communications, released a National Digital Communications Policy in 2018 where it set a goal of expanding India's IoT ecosystem to 5 billion connected devices by 2022. This paper will take a deep dive into some of India's leading segments where IoT has already began to make advancements and headway as well as provide insight on the connected reality of IoT in India.

2 IoT in India

2.1 The Evolution

To understand where the IoT boom first started in India, one must travel back in time to 2013. Many experts in the field of IoT believe it all began when Qualcomm Ventures and Cisco invested $43.3 million in a Hyderabad-based system-on-chip design company named Ineda Systems. Ineda had been working on low power SoCs and wearable processor units (WPU) targeting the emerging wearable technology market. At that time, this was the largest investment a company in India had received which had been working on IoT technologies.

With the success of Ineda Systems and the backing of Qualcomm and Cisco, companies across India began to take deeper interest in the advancements of IoT and began to invest more time, money, and resources to understanding and developing solutions which could also create the same fortunes as it did for Ineda.

Aside from the dream of becoming the next tech unicorn, the Government of India saw IoT as a tremendous value add to the development of the country and their digitalisation efforts. The Government of India began to implement programs and policies to help drive the growth of India's digital capabilities, acumen, and presence to keep pace and in stride with other technological thriving countries. Three major programs where implemented to help this effort, the "Make in India Program", the "Smart Cities Mission", and the overall

"Digital India" campaign. With these efforts, India began to see a major digital transformation leveraging cutting edge technologies such as IoT.

2.2 Make in India Program

In order to transform India into the global manufacturing hub, The Government of India started an flagship program called "Make in India" under the leadership of honourable Prime Minister of India in the year 2014. This initiative was implemented to create a new wave of tech start-ups in India which will contribute to the growth of the country's IoT ecosystem. The Make in India campaign is designed to bring the 'fourth Industrial revolution', also known as 'Industry 4.0', to the fore front creating new business opportunities for companies focused in the IoT.

In the first two years of the program, India received investment commitments worth ₹16.40 lakh crore (US$230 billion) launching India to one of the top destinations for foreign direct investments (FDI) surpassing the United States and China. Due to influx of investors entering the India tech market, India has seen an exponential growth of tech startups taking their chances in becoming the next big success story. The Economic Times recently reported that since the launch of the Make in India program, 7,700 tech startups have been created in the country, making it the third largest in the world. As of now, this program has proven to be a success and has had tremendous impact on the overall growth of the IoT market in India.

2.3 Smart Cities Mission

Another line of effort which the Government of India has implemented is called the 'Smart Cities Mission', an urban renewal and retrofitting program, which plans to develop 100 cities across the country making them citizen friendly and sustainable. This effort is made to bring forward much advancement to cities to include smart infrastructure, smart governance, smart utilities, and smart citizens. Figure 3 illustrates how the Smart City Mission has divided their efforts and focus into six different categories to include the type of smart solutions which they are expecting to implement as part of this effort.

Figure 3: Smart City Smart Solutions

With relaxed FDI policies and Government backed funding of $1.2 Billion USD, India's Smart City Mission is positioned very well to create new jobs, improve quality of life, and advance India as one of the tech leaders of the world. 9 IoT in India Advances Business Digitalisation in India August 2019 www.theiet.in/IoTPanel

2.4 Digital India Campaign

With the need of connectivity and access to e-Governance, the Government of India decided to launch the Digital India campaign. This campaign ensures that Government services are made available to citizens electronically by improved online infrastructure and by increasing Internet connectivity or by making the country digitally empowered in the field of technology. This program supports IoT based solutions and believes it offers citizens access and awareness to the best services and technology.

Department of Electronics and Information Technology (DeitY) has come out with a draft IoT Policy document and industry leaders are joining together to contribute to the standards and policies to make India a more connected place. Due to this program, there is a large demand for development of IoT Products specific to India. Development of India's IoT Infrastructure is still in process and the Government believes leveraging proven technologies is key to the success of India's digital campaign.

3 Digitalisation of India's Businesses

With the above mentioned programs and the increased discussion on topics such as IoT, AI, Big Data, and Cloud Computing; businesses have grown more intrigued and have shown more willingness to leverage technology in order to digitally transform their businesses in hopes of more savings and gaining an edge of their competition.

3.1 Driving Factors for Digitalisation

There are several factors driving Businesses to adopt IoT and cutting edge technologies. Some of these reasons are listed below:

• Increase in customer expectations

• Desire to increase revenue and lower operational costs

• Reduce go-to-market timelines

• Obtain better customer insight

• The technology hype cycle

• Desire to improve processes and SOPs.

In addition to the above factors, some businesses in other regions of the world have already started to demonstrate improvements in their business operations, operational costs, and increased revenue with their digital transformation efforts. Businesses in India have started to join the digital transformation movement and per a recent Vanson Bourne study, almost half of the Indian business leaders believe that they'll be able to disrupt their perspective markets using digital technologies to accelerate new product/services development.

3.2 Digitalisation Challenges in India

In order for a business to ensure a successful adoption and implementation of digital transformation, they need to understand and take into account the hurdles slowing digital transformation. In a recent article in Business Today, it was stated that in India, 93% of Indian businesses believe that they are facing major challenges in digital transformation today. The main challenges they are facing are due to the lack of knowledge or uncertainty on things such as data privacy and cybersecurity, in-house skill sets, regulatory instability, and weak digital governance.

With the realization that every business will have their own challenges and issues slowing down their digital transformation, businesses are now more

than ever relying on experts in the field of IoT, AI, cyber security, and data processing to help solve these issues and to assist them in their transformation process.

3.3 Case Study: Kodak's Failure to Digitalise

Up until the turn of the century, Kodak was deemed as the leading photographic firm in the world. In 1996, Kodak generated approximately $16 billion revenue with a profit of $2.5 billion by 1999. Their expertise in film production and digital cameras put them on the top of the industry. In the early 2000s, a new wave of digital photography was introduced in the film industry nearly cutting out the need for traditional film and printed photography. Kodak, being the leader in the industry and having captured the majority of the market selling film, did not feel digital photography would have an impact on their overall business and hence was slow to react to the digital revolution. Because of their slow reaction, their business began to experience massive loss in revenue plummeting from an impressive $15 Billion USD to $9.4 Billion USD by 2009.

Kodak made a critical mistake by being complacent believing that their brand, global distribution network, and variety of product offerings would protect them from the new wave of cutting edge technologies. Having leadership which were reluctant to make a change, provide a clear direction for the way forward, and unable to provide disruptive innovations resulted in Kodak filing for a Chapter 11 protection bankruptcy in mid-January 2012, signifying the downfall of Kodak. 11 IoT in India Advances Business Digitalisation in India August 2019 www.theiet.in/IoTPanel Smart Cities Market in India 2017-2023 ($ Billion)

4 IoT Advancements in India (per Segment)

Over the last few years, India has started to see a shift in IoT deployments moving from pilots and proof of concepts, to real commercial deployments. The digital transformation is now and IoT is being used across many industries. Below you will find real examples and use cases of deployed IoT projects in

India and how leveraging technology improves business operations, save costs, and even generates new found revenue.

4.1 Smart Cities

India's target of reaching 5 billion connected devices by 2022 cannot happen without the efforts taking place in Smart Cities. The majority of connected devices are expected to come from the Smart Cities Mission program and will be mostly due to the smart utilities and smart mobility projects. Infoholic Research recently reported that the Smart Cities market in India will grow to $48 Billion USD by 2023 with a CAGR of 18.5% (see Figure 4). The expected grow rate is impressive and also demonstrates that India is on the right path to achieving their targets.

Figure 4: Smart Cities Market in India

IoT Analytics reported that Smart City IoT projects in 2018 was the leading IoT segment in which commercial deployments were taking place (see Figure 5). In 2019, we are seeing the same trend 12 IoT in India Advances Business

Digitalisation in India August 2019 www.theiet.in/IoTPanel 2018 in India and expect it to continue for years to come.
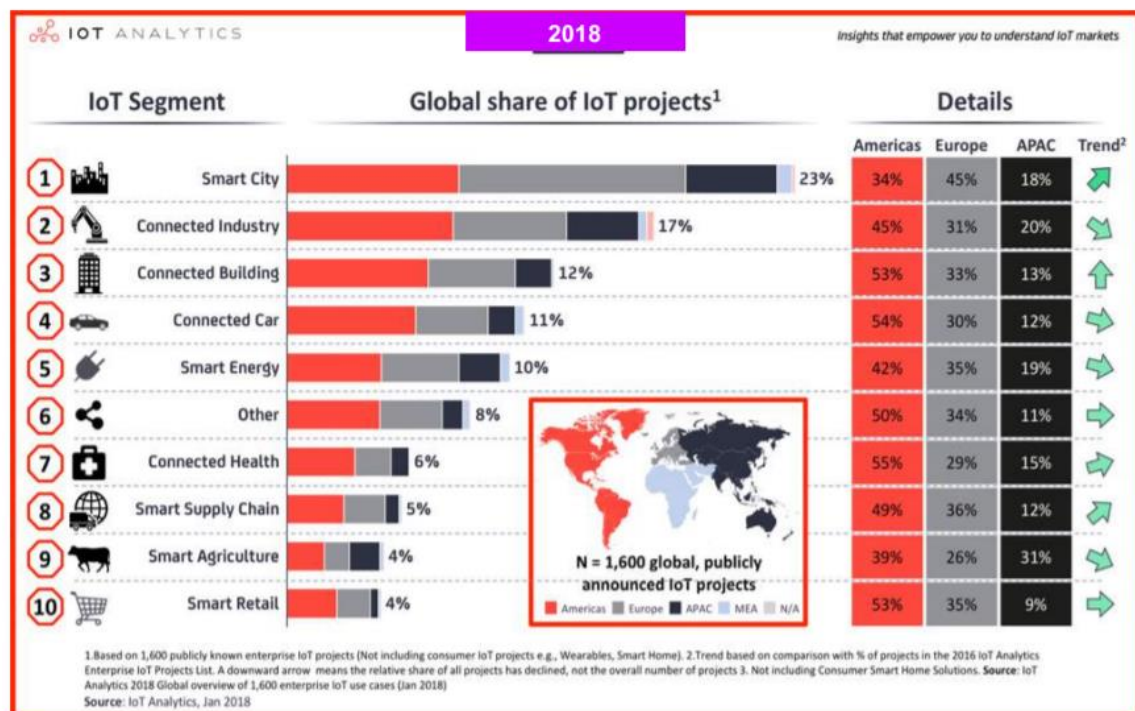

Figure 5: Global Share of IoT Projects

Conclusion

In conclusion, many technological advancements have been made to date to provide businesses and city decisions makers with the right tools to properly plan, manage, maintain their businesses and cities. Customer satisfaction, operational efficiency, quality of life for citizens are some factors driving the digital transformation movement in India and as of today, India has demonstrated its ability to stay current with technology and to successfully execute smart solutions across the country. With improvements of processing power, cloud services, sensing, communication protocols, predictive analytics, and AI, the world is witnessing a new era of technological achievements. Businesses cannot deny the benefits technology adds to their day-to-day operations neither can they afford to sit back and be complacent. The shift

from pilots and POCs to commercials is happening now and in the next 5 years, the deployment of commercial projects leveraging the IoT will exponentially increase. The Government of India has implemented programs to support the digital transformation and India is positioned well to become one of the top 5 global leaders in tech and innovation. What we are seeing in India can simply be stated as a technological phenomenon.