IOT – A MYRIAD OF POSSIBILITIES

Billions of devices

Internet of Things (IoT) conceptualizes the vision of a future internet, where the physical objects, living as well as non-living, are all connected to the internet and are capable of exchanging information among themselves and with their surroundings

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WHITEPAPER

Introduction

The Internet of Things (IoT) is the next wave of technology evolution that promises to connect every object on earth -- living as well as non-living. IoT conceptualizes the vision of a future internet, where the physical objects from a car to a dish-washer, a chair to light bulb, are all connected and would take an active part in the internet, exchanging information about themselves, as well as about their surroundings. This will give immediate access to information about the physical world and the objects, leading to innovative services and solutions and leading to an increase in efficiency and productivity. The opportunities offered are huge and a few scenarios, and usecases, that we can foresee in such an interconnected world, are noted in this whitepaper.

Smart Home

Home Automation is one area which has seen a very frequent association with IoT. Technologists

romanticized the idea of a man waking up from his bed, dutifully woken up by his alarm which has

already calculated the wake-up time based on the man's schedule for the day. The alarm in turn

would have adjusted the house temperature, set-up the coffee machine and the toaster, so that

the man wakes up to the sweet smell of coffee and the toast. The door is automatically locked on

his exit and there is a signal to the car so that it is adequately warm by the time the man enters

and the destination is already preset in the car's navigation system based on the person's calendar

for that day.

For the idea of Smart-home to succeed, the possibility of interoperability among devices needs to tackled. Devices from different makers, being able to talk to each other pushes forward the realization of smart use-cases

Makers of home appliances have been getting attracted to this idea of connectivity and also are getting aware of the future market potential that beckons. Products like the Smart bulbs are an example. These Smartphone controlled LED light bulbs talks over Zigbee with a bridge which in turn converts the signals for access from Wi-Fi enabled devices. There are also, seen in the market, products like the Wi-Fi enabled doorbot and the zigbee/Wi-Fi accessible thermostats from Nest & Honeywell. These trends represent pilot adaptations and the evolution of proprietary islands of connected devices. These devices are all connected but are not truly IoT.

> **Considering the wide variety of devices and an array of device makers, there is an inherent fragmentation in the overall system**
>
> **The software platform vendors should start providing Open APIs if the Smart-home adaptation has to grow.**

This is a nascent period and the potential marketable usecases are still being studied. Hence in the current scenario, interoperability is an issue and the standardization across vendor offerings is the bottleneck. Popular vendors are coming out with the gateway devices which are essentially to understand the semantics from different protocols and bridge them to a universal path which is the connection to the cloud. Such devices eliminate the complexity of handling multiple hubs for

different kinds of devices through a single wireless hub that can be controlled by a centralized

mobile app. This is a promising trend and are definitely the need of the hour. There is a huge

potential market out there for the early players to conquer and a certain study projects a CAGR of

35.91 percent over the period 2012-2016 for the Global Smart Home Network Equipment market.

Industrial Automation

Augmentation by human intelligence for decision making is minimal and this leads to easy and quick adaptability to changing requirements and optimizing processes.

With the prevalence of connected devices and IoT, we may witness the next of Industrial

revolution. With the connectivity established between the machines, the parts and the control

system, the modern production facilities will be fully automated with very minimal human

interventions. With regular data collection, feedback and analytics possibilities between the

connected parts, the control systems will have all the information to take informed decisions.

With the production facilities being well connected, there is a huge scope for optimizing and

revolutionizing the entire supply chain mechanism. With the demand being well predicted and

known in advance, the production of volumes can be monitored. The monitoring and control of

supply of raw materials and the production facilities will lead to lowering the inventory costs and

lesser wastage.

Smart & Connected City

In the recent times, there is an increasing trend of urbanization seen wherein, an increasing

number of populations are moving to cities.

> **More than half of the world population lives in cities. Cities are**
>
> **becoming more complex and unmanageable.**

The concept of Smart-city provides for the spread of millions of sensors all over the city providing

real-time data and information for analysis, and thus, paves way for better and informed decision

making and also facilitates the provision of the right and accurate information to all the inhabitants.

With millions of sensors and with interconnectivity established, the possible usecases are huge and

hence the opportunities are enormous.

Contextual and Specific data, derived from strategically placed sensors, help in deriving a consensus and aid in decision making

Pollution level and noise level monitoring at city locations ensures that real time data is available to

the general public as well as policy makers. Specific data help derive consensus and aid decision

making. Waste management & collection is optimized by having the bin talking to a central server

and registering for the collection of waste.

Water supply and distribution can be monitored to ensure sufficient access to all. Monitoring will

also serve the purpose of quality check and control as well as ensuring that the supply matches the

demand. Leakage detection and preventive maintenance can be automated as well.

Real-time monitoring of parking systems enable drivers to find free parking spaces quickly and

efficiently and hence reduces fuel consumption and CO_2 emissions. This may also mean minimal

traffic jams.

IoT enabled Smart-city will have economical, societal as well as political implications. IoT, will

provide an amazing opportunity for the political class and decision makers to increase the quality of

life of the citizens. Planning and streamlining of the investments in the ICT sector, with the future

in mind, is the need of the hour.

BLR LABS possesses the expertise in the areas of real-time embedded systems, which is critical for engineering low power, low footprint IoT edge devices

We also do possess the expert knowhow in connectivity protocols – BT, Wi-Fi, NFC etc which are critical for realizing the IoT usecases and for engineering end-to-end IoT scenarios

We have experienced professionals to address the custom needs in Cloud connectivity and Analytics

With the experience and expertise is possesses, BLR LABS aims to be the preferred partner in Architecting, Designing and Developing End-to-End Connectivity based Systems and Solutions to Consumer electronics, Telecom and IoT device makers & Software Providers