

# The Internet of Things (IOT) and Pharma

Journey of drug and medical equipment starts from its manufacturing to its consumption by the patients and hospitals. Use of IOT in pharmaceutical industry is not only limited to collection of data using fitness wearables, but the sensors are also being used in drug manufacturing plants to monitor the different parameters like temperature and humidity, required to meet the regulatory compliance for drug manufacturing. Sensors are being used in the manufacturing plants to monitor the performance of machineries and predict any failures. Sensors are also going to play a vital role in Logistics and supply chain of these drugs where these sensors can be used to monitor the movement of the drugs from manufacturing units to their desired destinations.



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Gartner, Inc. forecasts that 8.4 billion connected things will be in use worldwide in 2017, up 31 percent from 2016, and will reach 20.4 billion by 2020. The total spending on endpoints and services will reach almost USD 2 trillion in 2017. With growing footprints of digital transformation across different industries and verticals, digitalization is not only limited to becoming paperless, but it has moved a step ahead, where data from different sources are helping organizations in their growth. Q3 feels this is where IOT is going to be one of the key contributors. In fact, McKinsey estimates the potential economic impact of IOT applications to exceed USD 11.1 trillion per annum by 2025.

As we all know, Internet of Things or IOT is about building a network of physical objects. The world has moved from a network of interconnected computers to a network of interconnected everything. Increased usage of linked devices, faster cloud adoption, growth of high-speed networking systems have motivated every industry to embrace IOT solutions to augment their infrastructure. Wi-Fi, Bluetooth, NFC, RFID, and QR codes are the widely used technologies to enable IOT ecosystems.

With IOT, intelligently linked devices embedded with sensors are able to communicate and exchange data. Any device fitted with sensors and actuators gains the ability to produce, transmit and process data. The data generated is not being used to its full potential and serves around 2 per cent of what it is capable of. Right now, the focus of using IOT is mainly on

abnormality detection, control mechanisms or for instructional purposes. IOT data for optimization and predictive analysis is yet to be fully exploited and tapped.

## IOT in Pharma

The journey of drug and medical equipment starts from manufacturing to its consumption by the patients and hospitals. IOT in pharma industry can be used in the following stages of a drug/equipment lifecycle:

**Manufacturing** - Drug manufacturing and production units are using IOT to automate their maintenance processes. Sensors attached to their production units regularly send data against different parameters to assess the performance of machineries and predict any possible failures. Similarly, various assets and raw materials required in these industries are being monitored through sensors which will send notifications before any actual shortage of raw material happens. Industrial Internet of Things (IIOT) could add USD 14.2 trillion to the global economy by 2030. Moreover, investment in IOT is expected to exceed USD 60 billion in the next 15 years.

**Drug Compliance / Quality Control** - Several predefined parameters need to be monitored while manufacturing any drug. These predefined parameters if violated can lead to disqualification of the whole batch of drug leading to a production loss. Sensors can be used to monitor such parameters in real time during manufacturing and raising proper alarms if any of such parameter is expected to go beyond the set values.

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**Supply chain/Logistics** - Drugs and Medical equipment once manufactured, need proper storage and transportation in a controlled environment. IOT sensors can be used to monitor such controlled environment so that one can track the drugs while in transit.

## Implementing IOT

The implementation of an IOT ecosystem in an organization requires a change in the business model. Technical as well as governance obstacles need to be overcome for an organization to set up an effective, value driven IOT ecosystem. Creative business models equip organizations to position their products as services. Small business cases that churn out a quick ROI while addressing minor pain points with IOT devices and networks can be a good start.

Implementing IOT is not just about installing sensors, it involves lot of other activities like receiving data from sensors, processing

this data to draw meaningful insights etc. The ability of IOT systems to function effectively in an organization requires interoperability between these systems. This interoperability is required for 40-60 percent of the implementation.

## Conclusion

The real value-add of IOT depends on the data that these devices generate. Industries can improve operations and plan future roadmaps by analyzing this data. The success of any IOT project primarily depends on the predictive/prescriptive analytics done using the data generated. Data generated from IOT devices, when used for optimization and predictive analysis, creates maximum value for both the stakeholders and consumers of the organization. Use of IOT in pharmaceutical industry is not only limited to collection of data using fitness wearables, but sensors are also being used in drug manufacturing

plants to monitor the different parameters like temperature and humidity, required to meet the regulatory compliance for drug manufacturing. Sensors are being used in the manufacturing plants to monitor the performance of machineries and predict any failures. Sensors are also going to play a vital role in Logistics and supply chain of these drugs where these sensors can be used to monitor the movement of the drugs from manufacturing units to their desired destinations. We believe that implementing IOT would test conventional business models and would generate maximum worth through interoperability, optimization and analytics. ■