

# Internet of Things

INTERNET OF THINGS (IOT) HAS EMERGED AS THE KEY TECHNOLOGY ENABLER FOR DIGITAL TRANSFORMATION AND PROVED TO BE GROWTH DRIVERS FOR BUSINESS ACROSS INDUSTRIES. HENCE, YOU CAN SEE A RISE IN THE IOT SOLUTION PROVIDERS IN INDIA.

Machines, Game Consoles, Kitchen appliances—many of the devices we use for work or pleasure already communicate with each other via the Internet. Things have evolved rapidly with the help of IoT solution providers in India in recent years and continue to change how we interact with our surroundings.

The steady fall in prices of sensors and communications technologies, combined with a parallel rise in understanding of how they can be applied, have raised the application of IoT technologies and also the IoT development services in India. IoT solution providers in India have moved to the operational phase and already started delivering values in industries ranging from Healthcare to manufacturing. Thus, today you will come across several IoT development services in India.

We at CBT Infotech, provide the best IoT development services in India. We feel that some focused conversations between a tech expert (like us) and industry experts like you will help a lot in driving the solutions that can meet real-world needs, the outcomes you are looking for.

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# The Six Applications and Benefits of IoT in Manufacturing

*By connecting products, processes, infrastructure and people, the IoT is building a new era of smart and informed manufacturing. All components of the manufacturing value chain can significantly benefit from the penetration of digital sensors that allow high visibility and better control of production processes while also enabling the automation of tasks.*

The Internet of Things (IoT) is a key component of global industrial transformation, and the manufacturing sector leads in leveraging this technology. As per IDC Data, the sector had invested \$178 billion in IoT in 2016<sup>1</sup>. Operations accounted for the main spending user case, followed by production asset management, maintenance and field service.

Analysts expect manufacturing to retain that leading position until at least 2020 for multiple reasons. IoT has the potential to bring another industrial revolution – Industry 4.0 – with applications that bring rapid returns while enabling manufacturers to adopt digital transformation in various perspectives: automation, visibility, customer-centricity and reduced time to market.

Let us look at a list of the top six uses, applications and advantages of IoT in the manufacturing domain.

## 1- Quality Control

In a standard reactive quality control process, manufacturers produce an item, their quality control unit tests it, and they hope to catch and rectify the flaws before the product reaches the market.

IoT makes this process proactive with thermal and video sensors collecting complete product data through different stages of a product cycle. The products can also be tested at each manufacturing step to check if their attributes are within specifications. In addition, instrumentation and monitoring of manufacturing equipment help quality control personnel to check if and where equipment calibration diverges from standard settings – such inaccuracies must be thwarted in time to avoid misalignment of products. IoT's support in monitoring both equipment settings and the outcomes of each production step gives manufacturers a stronger assurance of detecting quality problems at the source. Measures for improvement can, therefore, be taken in time.

RJ Corp, the largest bottler of Pepsi in India<sup>2</sup>, uses IoT sensors to capture different data parameters required to gauge quality on a real-time basis. As the material gets prepared, deviations indicate at a quality concern, and the machine can be stopped for immediate corrective action.

## 2- Inventory Management

Together with radio frequency identification (RFID), IoT makes inventory management an efficient and seamless process. Every item in the inventory gets an RFID tag, and each tag has a unique identification number (UID) comprising encoded digital information about the item. RFID readers can scan the tags, and the data extracted gets transmitted to the cloud for processing.

The role of industrial IoT here involves transforming the data acquired by RFID readers into useful business insights. It creates a record of the location of inventory items, their statuses and their movements in the supply chain and gives users comparable results. For instance, as per the data on inventory quantity and location, IoT-based inventory management architecture can help calculate the volume of raw materials required for an impending manufacturing cycle. The outputs of IoT-based inventory management can be used in diverse ways. The system can send an alert to the users if any individual inventory item is missing and can notify them when they must replenish the materials.

IoT gives cross-channel visibility to supply chain managers with a realistic estimate of available materials, the arrival of new materials and work-in-progress, optimizing shared costs in the value chain. By tracking the speed of movement and traffic flow of raw materials, manufacturers can be better prepared to receive them. This improves handling times and enables more efficient processing of those materials for production.

### **3- Predictive Maintenance**

Traditionally, manufacturers have employed a time-based approach for planning the maintenance schedules of their machinery and equipment. However, according to the ARC group study<sup>3</sup>, only 18% of equipment fail on account of age, whereas 82% of failures occur randomly. This proves that a time-based approach is not efficient and may prove costly in the long run.

Manufacturers can avoid such ineffective maintenance routines by leveraging industrial IoT and data science for predictive maintenance. By using IoT sensors (on the equipment), they can monitor its operating environment and perform analytics using related data in the cloud to evaluate the actual wear and tear. Prompt service and repair enable more efficiency in the maintenance process, better allocation of work to field technicians and avoidance of downtime along with more significant cost savings.

As an example, steel plants have several furnaces using water cooling panels for temperature control. Any leakages in the panels can result in safety issues and production loss. With IoT-based predictive maintenance, plant managers can strategically identify anomalies and conduct a root cause analysis to prevent machine failures and delays in production.

### **4- More Safety in Operations**

In combination with big data analytics, IoT also optimizes the safety of workers, equipment and operations in a manufacturing plant. It can be used to track KPIs like worker absences, vehicle mishaps, machinery damage and any other mishaps that affect normal activities.

IoT wearables are critical solutions in this case. Employees using these devices can also be monitored continuously for their health metrics while working in factories and fields. It helps to understand their exposure to fumes produced in a process, stress levels, heart rate, fatigue and general movement. The information gathered can help business owners improve their compliance structure and reduce insurance costs.

If there are disparate suppliers and security protocols and no standardization, IoT can cause security concerns. To prevent their assets from getting targeted by malicious attackers, manufacturers leveraging IoT must link their operations technologies and IT infrastructure. They should also strategize their BYOD policies to regulate the interaction of personal devices with manufacturing operations. Support from the cloud and IoT services vendor is critical in this regard.

### **5- Smart Metering**

IoT has also introduced the manufacturing sector, utilities and other industries to the world of smart meters that can monitor the consumption of water, electric power and other fuels. IoT sensors allow organizations to gauge the specific use and deploy practices for more effective usage of resources.

With customizable end-user dashboards deployed by IoT services vendors, manufacturers can comprehensively analyze the results of smart meter monitoring. They can also compare costs, efficiencies and the carbon footprint of alternative resources to incorporate better options in their manufacturing processes.

## **6- Smart Packaging**

Smart packaging that directly uses materials with embedded interconnectedness provides advanced benefits of IoT for manufacturers. A prime aspect of smart packaging is that it enables consumers to engage with it, as well as generates data to handle a product more effectively. Smart packaging may manifest itself in the form of recipe videos, beauty tutorials and other demonstrations to explain the product usage.

IoT and packaging work together in different ways, including sensors, QR codes and augmented reality/virtual reality/mixed reality options. The idea is to add value for consumers and also collect data – through smart tracking – to further optimize operations and boost efficiency.

At Tata Tele Business Services, we design IoT solutions for a host of industrial operations. Our team works seamlessly to deploy bespoke tools, connected devices and connected processes to help clients leverage evolving technology for maximized ROI.