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Create Superior Customer Experience and Enable Business Growth, with IoT in Manufacturing Operations

This paper explores the key trends, implementation use cases and challenges that manufacturing industry faces in the adoption of Internet of Things (IoT) technology to improve their operational processes.

Introduction

It is essential for business leaders to be able to convert different business events into successful business opportunities. In this regard, adopting newer technologies plays a crucial role. Companies can improve customer experience and enhance growth opportunities by leveraging more modern technologies to respond to changing market dynamics in a timely and appropriate manner. Internet of Things (IoT) has emerged as a new disruptive technology that helps businesses to create superior customer experience and enable business growth, improve processes and optimize cost.

Some of the key challenges faced by businesses that IoT promises to solve include -

- Inability to provide intuitive and differentiated customer experience
- Keep growth engine always firing
- Low availability and under-utilization of assets and resources
- Longer time to market new products
- Soaring costs, regardless of implementing cost reduction initiatives

Businesses (irrespective of the industry or domain) now consider IoT to be one of their key strategic technology initiative that can help them in a range of scenarios including improving customer experience, physical asset tracking, optimizing processes, and providing better visibility into operations, among others.

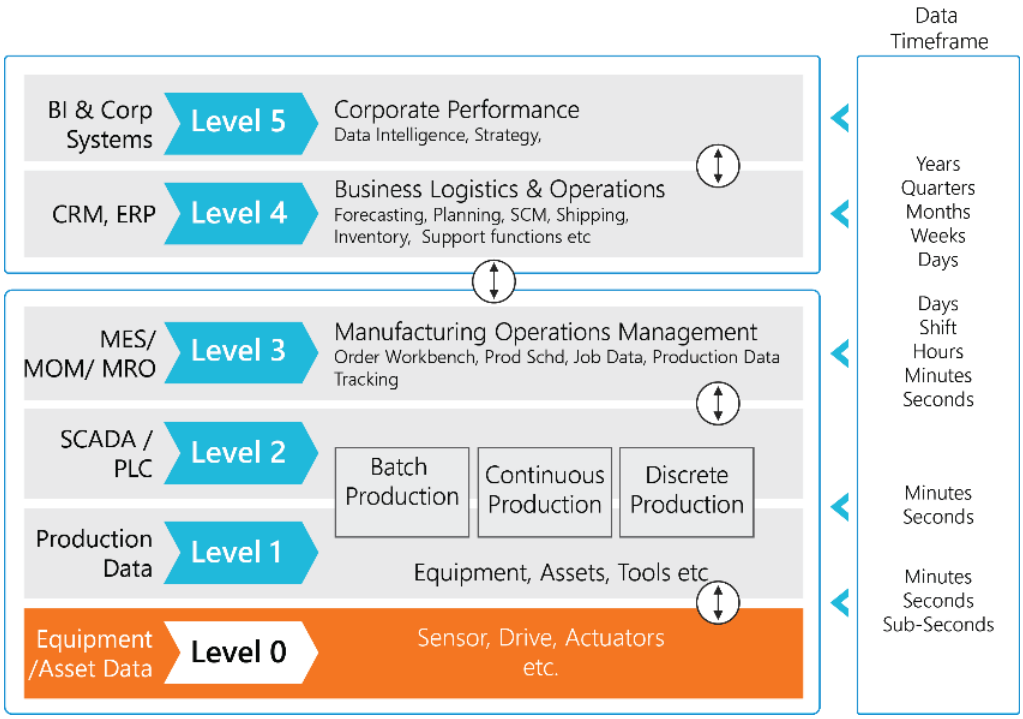
The growth potential of IoT-related products and services is immense in today's market scenario and future as well. IoT product and service providers are expected to generate an estimated incremental revenue of $300+ billion by 20201 and that the worldwide market for IoT solutions will grow from $1.9 trillion in 2013 to $7.1 trillion by 20202. Furthermore, the installed base of IoT devices will grow at a CAGR of 17.5% to 28.1 billion during the same period.

IoT in Manufacturing

IoT is transforming the way organizations in different industries are doing business including the manufacturing companies. Till now technology has been used primarily for running the business and managing manufacturing operations, for automating processes and for collecting data related to assembly jobs. However, IoT goes well beyond this to next level for data collection.

IoT aids in the collection of data from different 'Things' - about operations, production, quality, utilization, consumption, etc. and uses it to streamline and refine the business processes.

1. Gartner Says the Internet of Things Will Transform the Data Center - http://www.gartner.com/newsroom/id/2684616
2. http://www.forbes.com/sites/gilpress/2014/08/22/internet-of-things-by-the-numbers-market-estimates-and-forecasts



In any typical manufacturing process, other important data about different assets and resources also gets generated as part of production lines, which generally goes unnoticed or is not captured. This data is related to the manufacturing assets and resources, which may include – operational data, asset health, performance, usage, maintenance, logistics, resource utilization (Water, coolant, electricity), along with information on some key external factors viz. temperature, humidity, input material, transporter, etc.

IoT solution platforms can be used to capture such data easily and analyze it to surface hidden insights related to different aspects of a manufacturing process and improving operational efficiency. Manufacturing companies have started realizing that they can gain better visibility into their operations and significantly improve them by providing a digital identity to their physical assets with IoT-based solutions.

51% manufacturing CEOs are well informed about IoT and 58% are considering this as a strategic initiative to their business growth

Impact of IoT solutions on operational efficiency in manufacturing industry: Scenarios

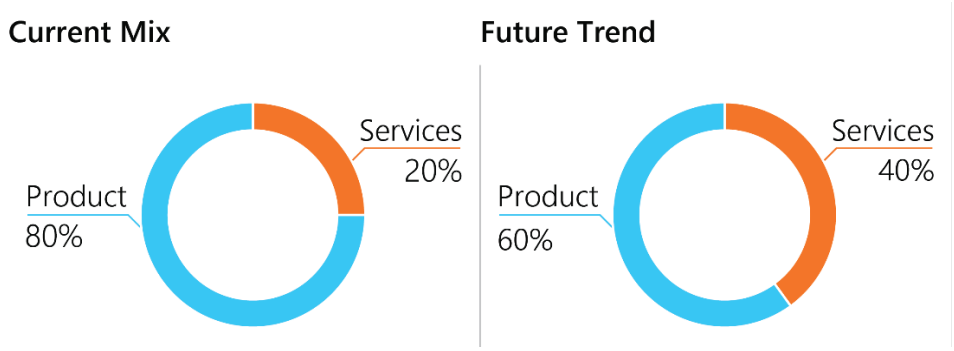
The manufacturing industry has traditionally been driven by innovation and is undergoing the fourth industrial revolution or **'Industry 4.0'**. Technology advancement in manufacturing, promoted by modern sensors, drives, actuators, and robotics, has enabled a revolution in areas such as supply chain, transportation, communication, housing, energy, and production.
Let us look at a few use cases where IoT solutions help in improving manufacturing operations.

Scenario 1: Improving Overall Equipment Effectiveness (OEE)

Overall Equipment Effectiveness (OEE) is the most common measurement of plant's efficiency and is a part of every plant manager's KPI. Equipment availability (key component) gets impacted due to failure and scheduled or breakdown maintenance. Therefore, plant maintenance function is now a strategic component for ensuring highest availability and nearzero downtime of manufacturing plants. Instead of preventive or scheduled maintenance, maintenance requirements can now be predicted by directly collecting data from the equipment, historical maintenance data and inputs from OEMs. As a result, predictive maintenance can bring down maintenance cost of manufacturing equipment by almost 30% - 35%, in addition to increased availability of that equipment.

Scenario 2: New business model for service business

IoT in manufacturing will change the product and services revenue mix from the current ~80% : 20% to 60% : 40%.



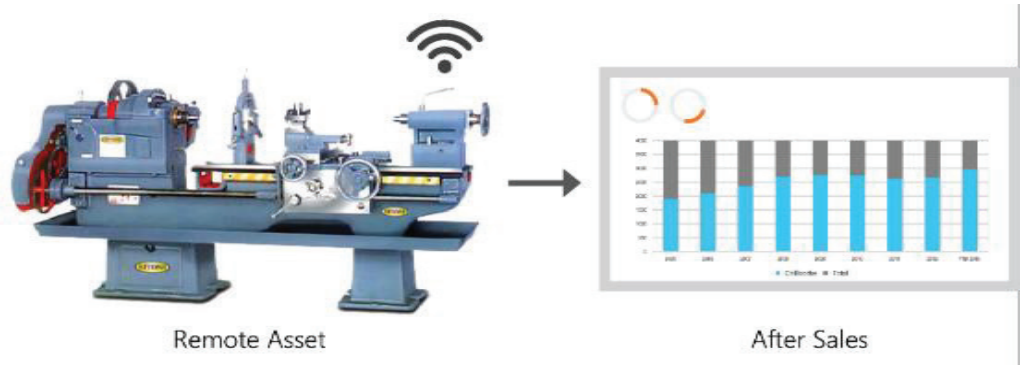
After-sales services and remote diagnostic of equipment failure will support decision-making and help deploy right resources and required spares promptly. These changes will lead to shorter downtime and cost reduction in areas of warranty, support & travel.

Using IoT and operational data input, manufacturers now can offer outcome-based service models and ensure higher availability of equipment. Many manufacturers now offer rental models instead of selling the products to the customers.

In addition, product engineering groups use the feedback from the after-sales team for taking corrective measures in the subsequent product releases, thereby reducing the time to develop the prototype and testing it.

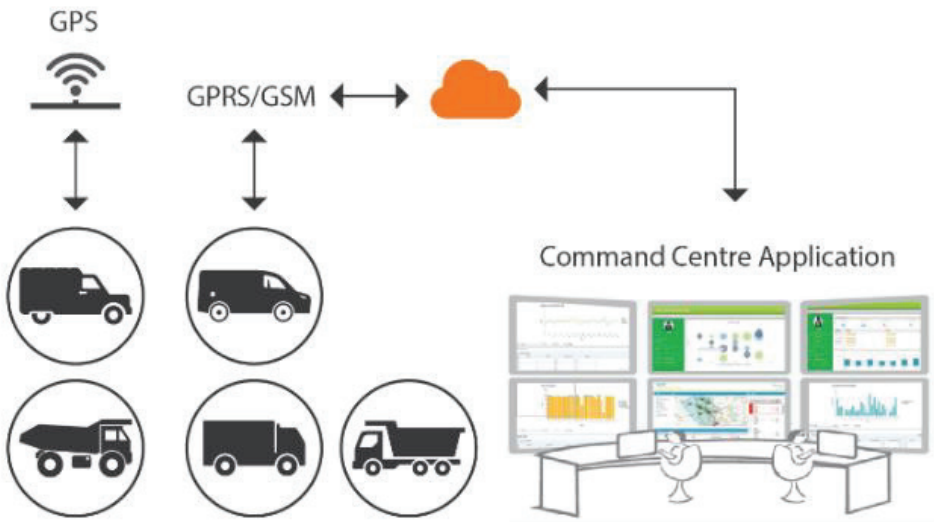
Scenario 3: Asset Performance Management of remote or mobile assets

As the asset availability, uptime and utilization of an asset improve, the operational cost reduces. IoT makes this achievable. IoT provides an effective solution for asset tracing and tracking and collects input around operational and health parameters of different sub-systems operating inside or around the asset. With additional data available, one can aim for higher utilization of asset, higher uptime through predictive maintenance and improved usage. Additionally, external parameters will assist in-depth analysis of usage patterns that will drive strategic decisions like buying (Capex) or renting (Opex) of such assets. This could emerge as a different business model and opportunity for the equipment vendors.



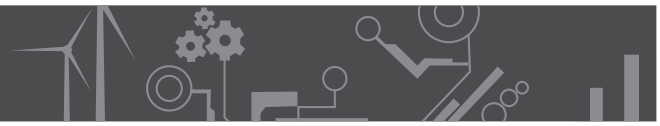
Scenario 4: Optimize Supply Chain logistics & warehouse operations

A major expense for consumer goods industry is the logistics and warehouse operations where any cost-saving or productivity gain directly reflects on the bottom-line.



IoT solutions integrated with Transport Management System provide vehicle visibility and improve planning & utilization that optimizes vehicle usage. Early maintenance prediction improves uptime and availability of the vehicles, leading to early movement of goods, timely delivery to the customer site and penalty avoidance, amongst others. As part of the distribution process, wearable devices are helping to improve the productivity of resources working in a warehouse, thereby improving on-time delivery, customer experience, and data accuracy.

Conclusion



IoT promises to have a profound impact on manufacturing businesses allowing them to plan, control, integrate, analyze and optimize processes in a better manner by creating a network of connected machines, systems, devices and humans. This connectedness and the data generated from this connected network will provide manufacturing companies with many potential opportunities such as to improve operations, enhance customer experience, and strengthen supply chain, among others. However, implementing an IoT solutions in your organization can be challenging as it requires effective planning related to - defining the IoT architecture, data acquisition strategy, right IoT platform to integrate with existing technologies, security, data, etc. Having a right IoT partner can ensure effective planning and implementation of IoT solutions in the context of your business and faster realization of business value.

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