The Internet of Things
Transforming the Automotive Industry
IoT – Transforming the Automotive Industry

Introduction

The Internet of Things (IoT) is dramatically changing the way technology is used in businesses. Consisting of a network of physical objects with the ability to interact with each other and their external environment, IoT presents an enormous opportunity across industries and processes. According to research agency IDC, the global IoT market will hit $7.1 trillion in 2020.

To implement IoT, companies need to utilize sensor technology, make communication possible between multiple devices, and use advanced analytics to deliver valuable insights. Market leaders, especially in logistics and in the automotive space, are investing in IoT to facilitate automated and seamless business transactions.

Vehicles, machines, parts, and even suppliers and customers are at the center of interactions that result in the flow of information within production lines, supply chains, and sales. This flow of information needs to be streamlined and analyzed to enable real-time decisions and improve automotive experiences. This is where IoT plays a remarkable role.

This white paper discusses how IoT can be utilized efficiently to generate superior business value from the entire value chain in the automotive industry. This paper emphasizes on the functions and processes which need to be targeted and optimized to transform automotive operations.
Let's Discuss...

THE INTERNET OF THINGS

WHAT IS IT?
The Internet of Things, or IoT, represents a growing network of physical objects that interact not only each other, but also with their external environment.

WHY SHOULD WE CARE?
In essence, understanding the development and application of IoT is important to understand new growth areas in a wide array of industries - from IT to financials to the automotive industry.

IoT in Numbers

25 Billion

Estimated number of connected devices by 2020

Worldwide market of IoT solutions by 2020

$7.1 Trillion

82%

Companies that will have implemented IoT solutions by 2017

Overview

IoT has given way to an exciting business transformation within the automotive industry. It provides a rich opportunity for processes to function like never before, creating a more automated and intelligent flow of operations touching every area of the automotive industry – from the shop floor to supply chains to customer engagement channels.

- **Logistic**
  - RFID Sensors on products & vehicles
  - Real time requirement fulfillment
  - Quality management & supply chain visibility

- **Manufacturing**
  - Predictive asset maintenance & optimization
  - Automated performance monitoring
  - Minimal human intervention & reduced costs

- **Interconnected Vehicle**
  - Location base service
  - Automated failure reporting
  - Optimized traffic routing & congestion avoidance
To achieve this transformation, however, we need to consider the following key elements to build a successful IoT strategy within an automotive set up:

**Manufacturing - Shop Floor Control Automation**

The IoT data network ensures automation of the shop floor processes by connecting specific processes (through machine, parts, etc.) and minimizing human intervention to address deviations. Advanced sensors monitor various vitals, such as pressure, temperature and alignment through different steps of the manufacturing process, which in turn transmit these data points to a remote controller.

If there is any deviation, the remote controller can automatically direct the machine to make necessary adjustments in terms of process modification or material addition. Data inputs received at every step of the process can also be used by suppliers and vendors to detect material consumption. With this increased visibility, they can save time and reduce costs. According to a report by Morgan Stanley, IoT driven automation could save $500 billion for the manufacturing industry².
Connected Logistics

IoT can help improve logistics by providing real time insights into orders, location, and transit conditions. This ensures that product and resource requirements can be fulfilled on time and transport costs can be reduced. In addition, time sensitive materials can be delivered on time. Cisco systems research in 2013 suggested that usage of IoT in manufacturing, supply chains and logistics could transform into savings of the tune of $2.7 trillion².

Proactive Maintenance
IoT can be used to improve machine maintenance and usage. Sensors are being used with machines and parts to monitor any malfunction and range of parameters, such as temperature and vibrations. Information and alerts received from sensors can be combined with historical data points to ensure preventative maintenance and predict machine health correctly.

**Connected Vehicles**

This is the future of the automotive experience that vehicle manufacturers are trying to build. Industry experts predict that within two years, the market for connected vehicles will reach over $50 billion. There is a tremendous opportunity for innovation in the automotive industry.

New cars and trucks now have the capability to communicate with other vehicles (V2V) or even infrastructure (V2I), transmitting data regarding location, speed, safety, and performance. Other provisions are being made wherein drivers can receive notifications from nearby stores or car garages with tailored offerings based on their location.
IoT – Overcoming Challenges

Reflecting on the points above, IoT clearly brings a big opportunity for the automotive industry across processes. However to realize the full potential of IoT a number of challenges need to be addressed:

Security & Privacy

As IoT continues to evolve, security challenges will become increasingly tougher to manage. With increased connectivity between devices, data will be generated at a much higher velocity and in different formats (structured, un-structured or semi-structured). Security becomes a critical issue in such a dynamic environment. The entire network must be secured and flow of data must be controlled to prevent data breach. Disruptive cyber-attacks, like a denial-of-service attack, could have profound consequences for a business.

Big Data & Analytics

IoT has an enormous impact on data – from the sheer volume of data to managing and using it. Many businesses are struggling to keep up with the rapid increases in data volume, which in turn puts a strain on their infrastructure. Given the colossal size of data that would be generated through hyper connected devices, businesses need to learn the science of converting raw data into actionable insights.

Infrastructure

The deployment of IoT requires a complex infrastructure involving hardware components like sensors and software that could interact with these sensors. IoT obviously would have a large impact on the technology infrastructure that the business maintains. Apart from the obvious storage requirement for colossal data that would be generated, businesses would have to fulfill the need to manage different sets of data efficiently. The data produced would involve images, videos and a huge number of files created by sensors. Hence the data centers created as part of the technology infrastructure must have the ability to effectively retrieve sets of varied data swiftly.
Conclusion

Implementing IoT can vastly improve productivity and efficiency but it has its own set of challenges. These challenges can be overwhelming but are not insurmountable.

Deployment of IoT requires a number of networks and an equally varied set of sensors to interact and allow flow of information based on a set of standards. For this to happen, governments, academia and business organizations need to work together to build IoT based technology solutions which add value to human lives and businesses.

Considered as an extension of the Internet, IoT could bring along the next information revolution. Utilizing IoT rightly can help us value data and use it correctly to derive information and insights which in turn can improve human lives, business transactions and make the world a better place. How soon we make that possible is

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End Notes