What is the Internet of Things?

Internet of Things (IoT)

The Internet of Things (IoT) refers to the intelligent networking of physical objects through the use of embedded sensors, and other devices that can collect or transmit information not only about the objects but also their environment.

The data amassed from these devices can then be analysed to optimize products, services, and operations. This can be done in real time for applications such as autonomous vehicle or drone operation.

Companies across all industries have IoT on their radar. The worldwide IoT market spend is expected to grow to US$1.3T by 2019 *[Source: Verizon, 2017]*, and the installed base of IoT-enabled devices to reach 50 billion by 2020 *[Source: Yole, 2017]*.

With the deployment of network connected devices experiencing exponential growth, one of the key drivers is availability of innovative sensors at lowering costs and enhanced performance. Sensera is operating in the forefront of the new market growth.

How does IoT work?

Though IoT is often viewed as the physical sensor capturing the new data, IoT for a value creation and strategic perspective incorporates three core elements: the things themselves, the networks that transmit the information, and the data that is captured and how it is used. Companies looking to enter the IoT market have to be mindful about the interplay of their application between these three components.

IoT Value Chain

Technologies (Things)	Networks	Data
Currently, there are a multitude of 'things' that are being deployed to bring the offline world online. Creating, implementing and managing these IoT applications is highly complex with a large range of sensors and mobile devices that are able to monitor a range of inputs. Depending on the inputs required, the technologies incorporated by these 'things' varies widely. Though some building block technologies exist there is high demand for creating custom technologies to provide a market advantage over the competition.	IoT networks enable the cost-efficient connection of millions of devices. This can happen globally through connectivity to a cloud network, or a bridge to a local IoT network to capture 'things' from remote locations. Historically, the cost, power and range to connect these devices to a wide-area network has been a major barrier to widespread IoT deployment. However, low power, high frequency, high volume sensors can begin to be deployed on a massive scale to feasibly connect the world in a way that was previously impossible.	The number of 'things' in use is growing rapidly which is growing the available datasets to business. Data can be used to either drive operational efficiencies through improved insights and automation. In recent times, data has been used to create new services and monetisation opportunities from previously hidden or data that was locked away. IoT services will one of the major value drivers in the coming years. Across all industries, Gartner predicts that US$1.9T of cost savings, improved productivity and new revenues can be realised by 2020.

IoT Applications

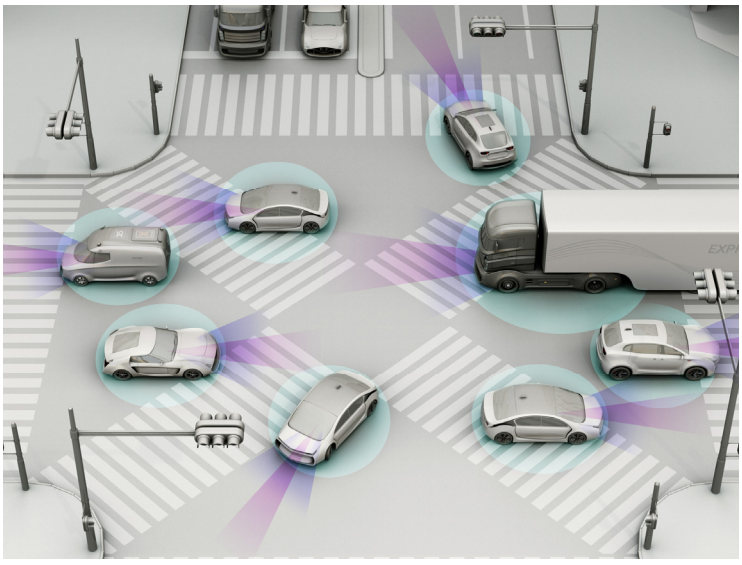
With computing brought into the physical world, this has opened up further possibilities to increase automation and insights through Machine-to-Machine interaction (M2M), Artificial Intelligence (AI), Machine Learning (ML) and Augmented Reality (AR). M2M communication ensures that assets can be monitored in a more efficient manner. Over time the machines can become 'smarter' through ML and AI systems that can identify issues, outliers and red flags. This will especially find widespread application such as monitoring human and livestock health.

Global, remote health monitoring determining high-risk users

Sensors can be deployed in industrial equipment to determine performance and operational reliability. This rapid market and deployment expansion will include sensors for remote location detection that will allow real time position determination even of fast moving objects. This will allow for collision avoidance not only for automobiles, but in high-value industrial vehicles for mining, rail transportation, and drone fleets. The combination of precision location determination with activity and environmental sensors is also poised to transform livestock and other agri-business.

Connected cars for automated navigation and collision avoidance

- Real time positioning
- Risk assessment & response
- Collision avoidance
- Efficient route management
- Telemetry & fuel management



In terms in each of these applications, the presence, knowledge and experience of a human worker to interpret information and act is not necessary as it is completely automated.

Creating Solutions

The use of sensors which can be MEMS based together with IoT capabilities to create big datasets can augment and/or open human expertise with a level of insight and precision not previously possible. This enables:

Identification of new information streams:	• New information that was previously hidden creates new product opportunities
Networking of 'intelligent' sensors:	• IoT can help sensors interoperate and network with other devices to create network information opportunities
Revenue generation opportunities:	• Capturing information from the physical world can create new products and services which in turn generate new sources of revenue
Productivity and cost savings:	• Businesses embracing sensors to improve productivity and save costs, such as capex, labour, and energy are rewarded with unlocked operational efficiencies
Automated decision making and information transfer:	• The use of sensors in-field can facilitate automated decision making to ensure consistent optimized activity

These advantages can dramatically change business models and use cases that were previously uneconomical. Where the combining of sensors has been on the cusp of reality for many decades, the key technologies are in place to usher in a revolutionary, fully interconnected "smart" world. IoT is in the position to become the glue to deliver the integrated, easy to use and sustainable products and services demanded by an increasingly mobile world.

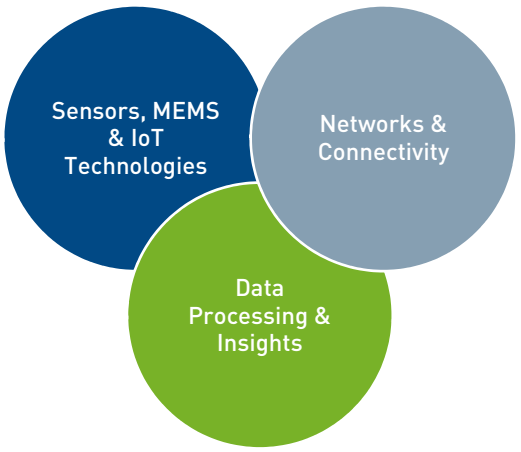
Sensera as Solutions Provider

Sensera aims to assist companies as a solutions provider as well as a device maker. It is planned for Sensera to assist across the value chain by providing:

- The custom technologies required to enable IoT applications
- The networking and interoperability required to ensure that IoT are the 'smartest' they can be
- The data processing horsepower needed to enable high-end solutions to derive next level insights and automation capabilities.

Sensera has the in-house capability to assist companies in design, research, development and production, and in the future will be positioned to capture value in this emerging IoT economy as a producer and service provider for clients and also as a product owner for its own intellectual property.

Sensera can deliver the next generation of applications, technologies and solutions for the IoT world.



Sensera planned capabilities to deliver in the emerging IoT world

Sensera™