OMAINTEC CONFERENCE EXHIBITION 2017

15th INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE IN THE ARAB COUNTRIES
UNDER THE THEME: **"SMART MAINTENANCE"** CONICIDE WITH THE 15TH ARAB MAINTENANCE EXHIBITION

Internet of Things 101

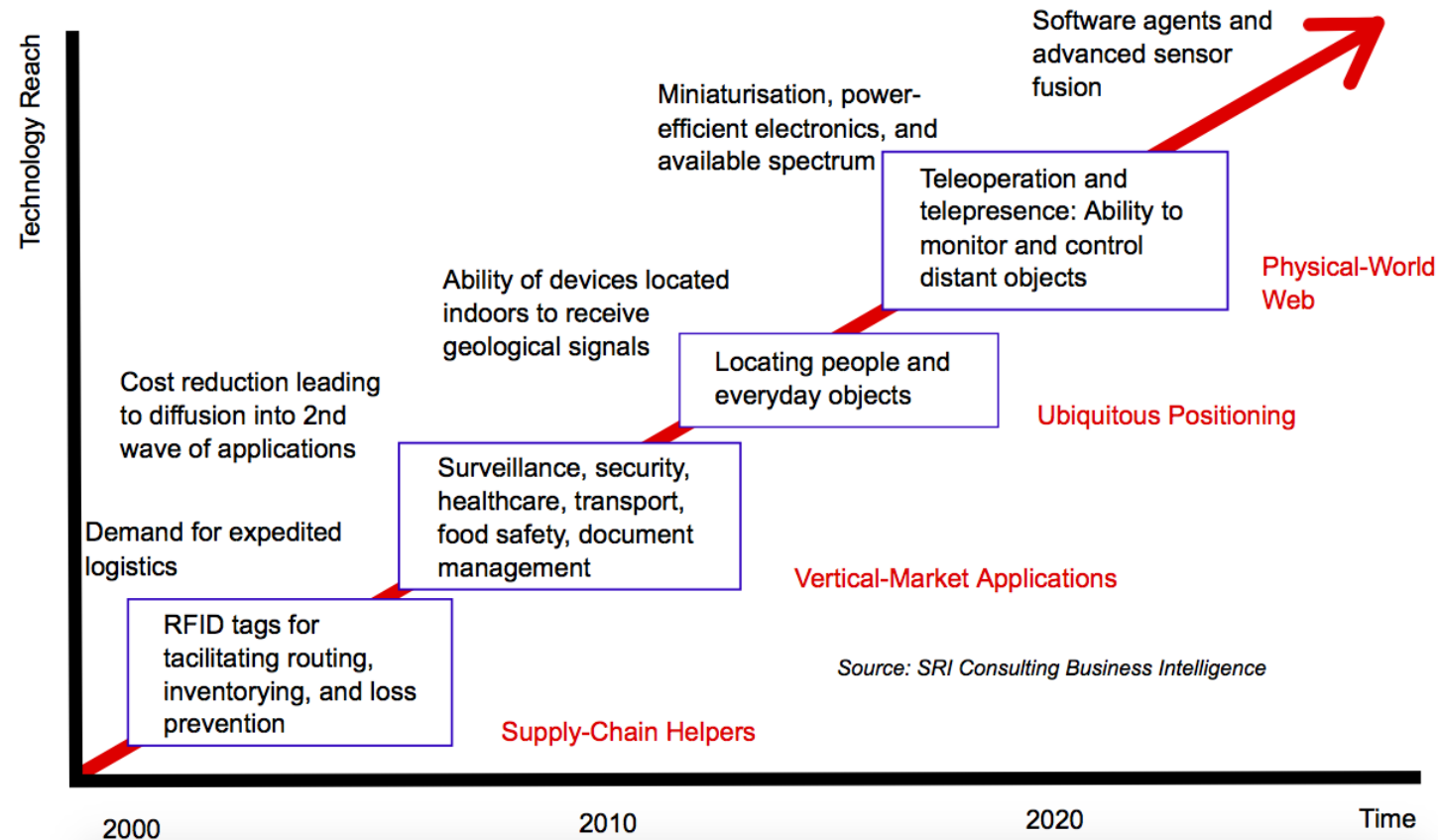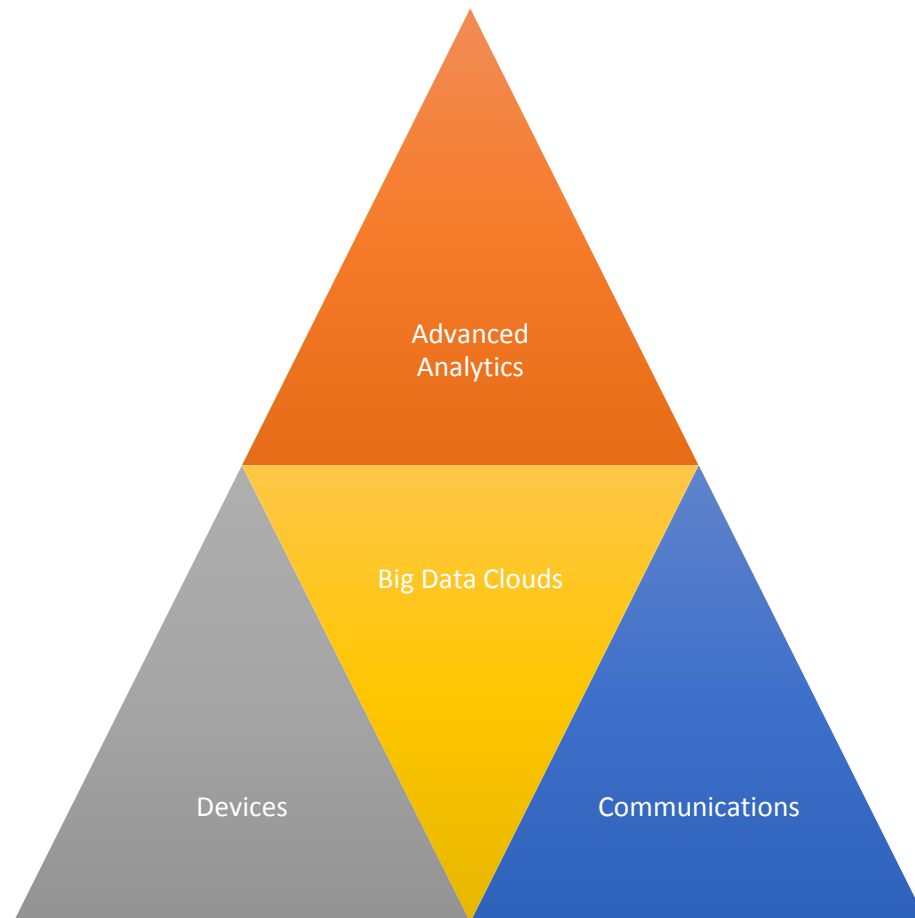## Suleiman Barada, B.Eng., PMP

IoT Synonyms

- Industrial Internet of Things (IIoT)
- Machine-to-Machine (M2M)
- Industry 4.0
- Internet of Everything
- Industrial Internet

IoT – The History – Sci-Fi to Reality

Technology roadmap: The Internet of Things

Software agents and advanced sensor fusion

Miniaturisation, power-efficient electronics, and available spectrum

Teleoperation and telepresence: Ability to monitor and control distant objects

Physical-World Web

Ability of devices located indoors to receive geological signals

Locating people and everyday objects

Ubiquitous Positioning

Cost reduction leading to diffusion into 2nd wave of applications

Surveillance, security, healthcare, transport, food safety, document management

Demand for expedited logistics

Vertical-Market Applications

RFID tags for tacilitating routing, inventorying, and loss prevention

Source: SRI Consulting Business Intelligence

Supply-Chain Helpers

Technology Reach

2000   2010   2020   Time

IoT Enablers

IoT Solution Building Blocks

Applications – Industrial and Consumer

Cloud Platforms / Big Data Analytics / Machine-learning / Artificial Intelligence

IoT

Low-power Long-range Communication Networks

Sensors, Actuators, Gateways

IoT vs. Conventional

It is time for Operational Technology (OT) to meet Information Technology (IT)

IoT vs. Conventional (e.g. SCADA)

1. Scalability

In SCADA there are assets that give out crucial information like meters that have never been connected due to an overhead expense in undertaking such an exercise. Also, as the number of users increases the bandwidth should also be made large enough to handle the increase which causes security concerns and drop in system performance. Further, it also takes long to setup and difficult to get reports from plants that are in different countries and regions from the central plant.

IIot has the ability to bring in and process large amounts of data from machines and allows you to connect anything of relevance including meters. All the data is sent to the cloud and accessed using login details. Information from plants anywhere in the world can be sent to the cloud and accessed from anywhere by large groups of people. Also, all new resources to set up a new plant can be derived from the Cloud.

IoT vs. Conventional

2. Data Analytics

The main SCADA usage is for day-by-day operation of the plant and storage of a finite amount of data without preservation of historical data for deeper analytics. In most cases, there is no data integration with enterprise applications to aid in business performance. Machine data is available but there are data islands. Data in SCADA systems is of low value because it requires contextual information to be understood and therefore lacks valuable insights.

IIoT is all about long term data storage for analysis. Big data processing and modern machine learning algorithms can be applied to predict outcomes. This gives more power to the system by being able to predict maintenance schedules, reducing overall downtime and extending equipment life. Integrating machine and sensor data with enterprise applications is at the core of IIoT and data can be understood quickly.

IoT vs. Conventional

3. Standardisation

SCADA systems mostly use OPC for data gathering. It is a standard that has stood the test of time but its major disadvantage is that it relies on DCOM technology. This means it can only run on the windows platform. In SCADA, system devices cannot collect/exchange data with each other regardless of footprint. Due to the lack of open communication standards there remains a gap between Operational Technology and Information Technology.

The primary goal of industrial IoT is to standardise sensor networks, data gathering and aggregation. IoT standards such as OPC UA are already being used to define real-time communication within a plant having different control devices and sensors from different vendors. Security is baked into IoT standards with support for HTTPS and SSL. On the cloud front, most service providers have rules engines in place that can be modified according to specific conditions. Cloud based Industrial IoT systems are able to collect and manage data using open communication standards as the data is exposed through standard APIs and webs services.

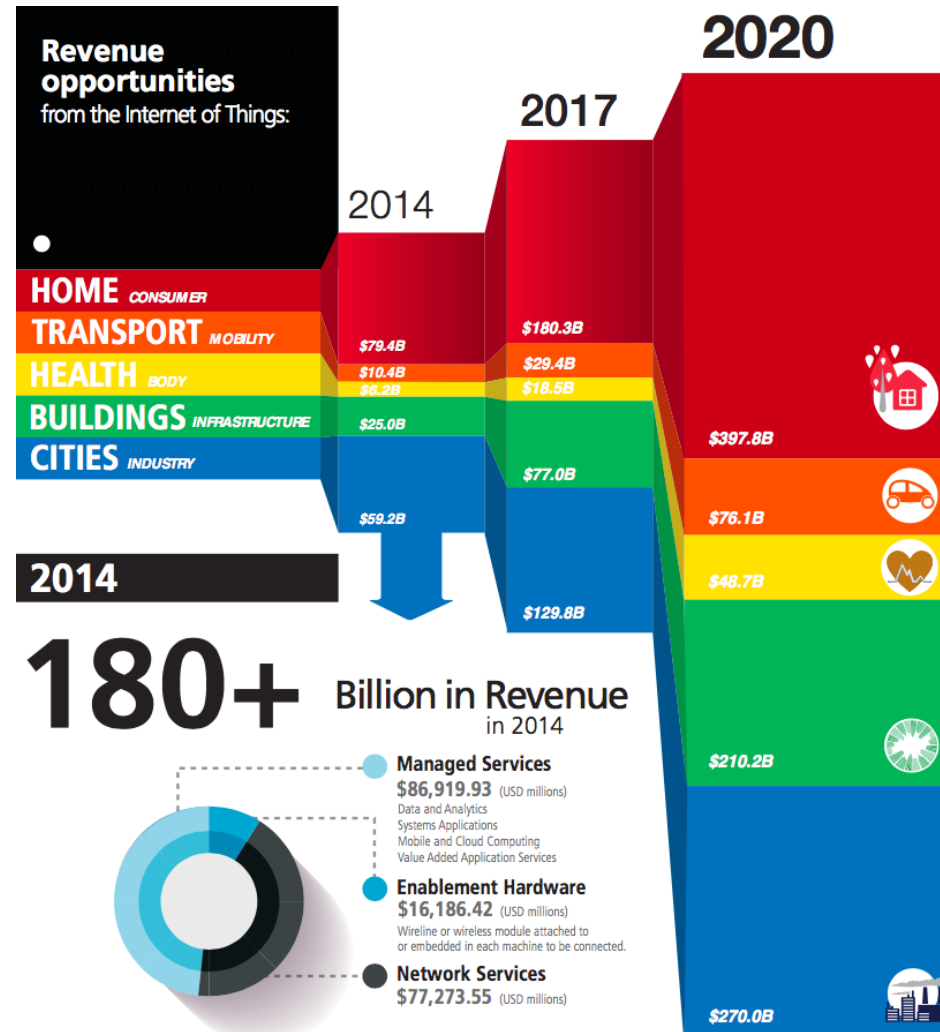# IoT vs. Conventional

4. Interoperability

In SCADA systems devices not made by the same manufacturer cannot easily integrate. At times, even different versions from the same manufacturer present a challenge in making them work interchangably. SCADA systems lack the required interoperability to create seamless programmability of devices or sensors. There is no presence of horizontal platforms that are operable across devices regardless of make or model.

In order to garner the most benefit industrial iot devices rely on their ability to connect with each other. Even though industrial IoT ecosystems still remain fragmanted there are protocols such as MQTT that enables platforms that are communicable and programmable across devices regardless of vendor The use of publish and subscribe cloud communication architectures makes in Industrial IoT systems interoperable as the participating clients don't have to know each other to communicate .

IoT Footprint
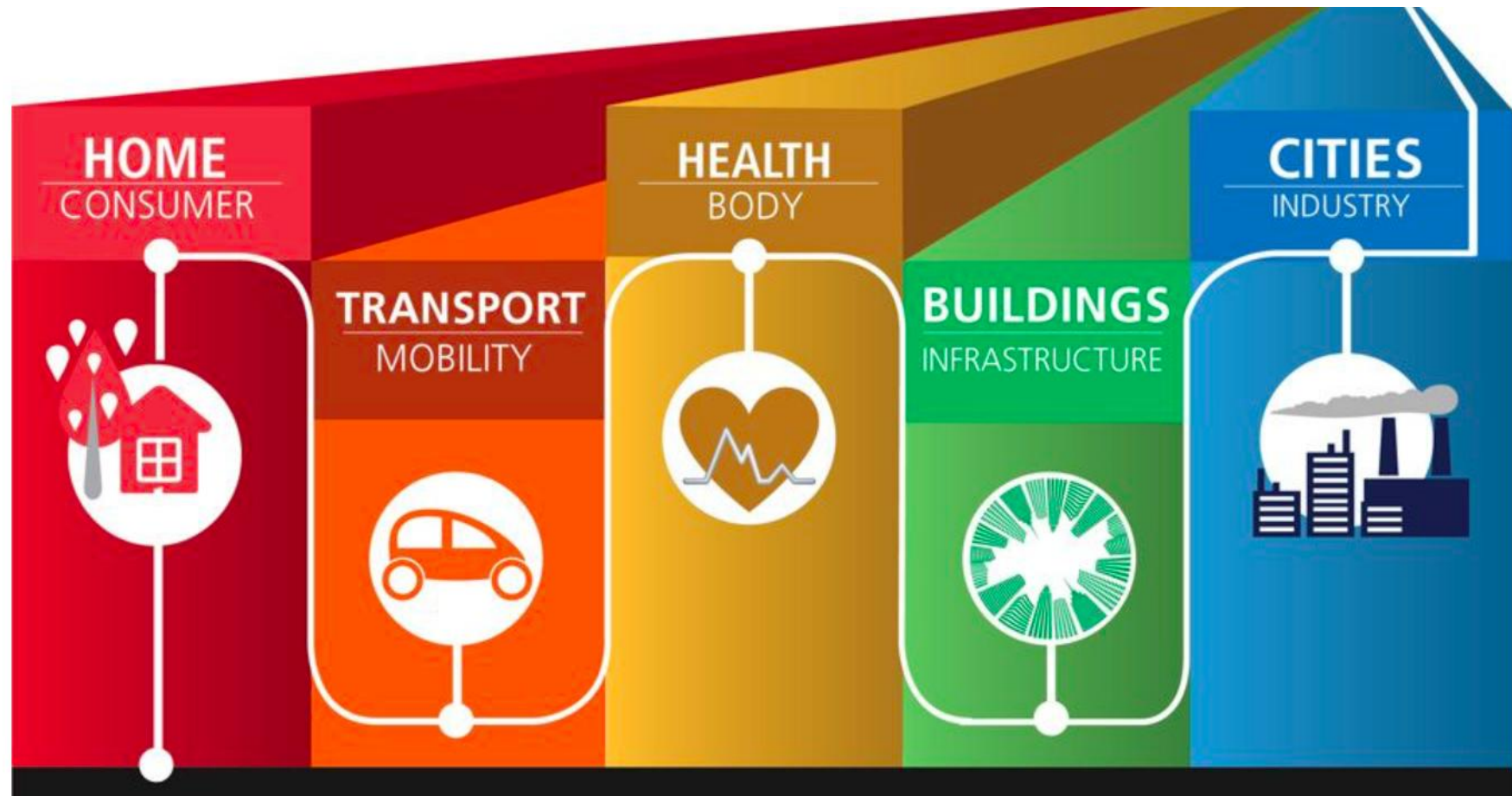
IoT Commercial Outlook

Panelists

Jawad Fakih
- Workers Safety

Moufid Sharafeddin
- Networks

Charbel Aoun
- Smart Cities

Raj Singh
- Predictive Maintenance

Ghada Aldahim
- Secutiry

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