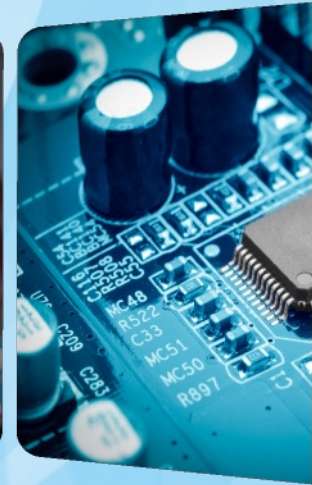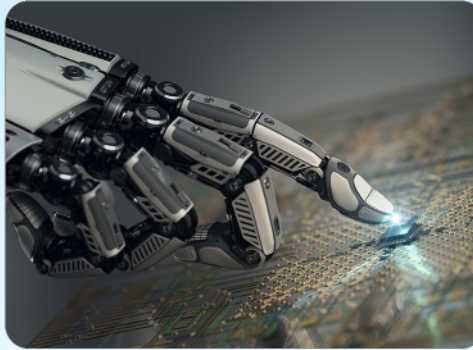# PAR 2510

IEEE-SA IoT Steering Committee

Standard for Establishing Quality of Data Sensor Parameters in the Internet of Things Environment

Sept 2018

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IEEE Team Collaboration – 60px in the WG.

Juan Cazilla
Chair, IEEE P2510 and Sales Engineer, Cisco

Gerard Hayes
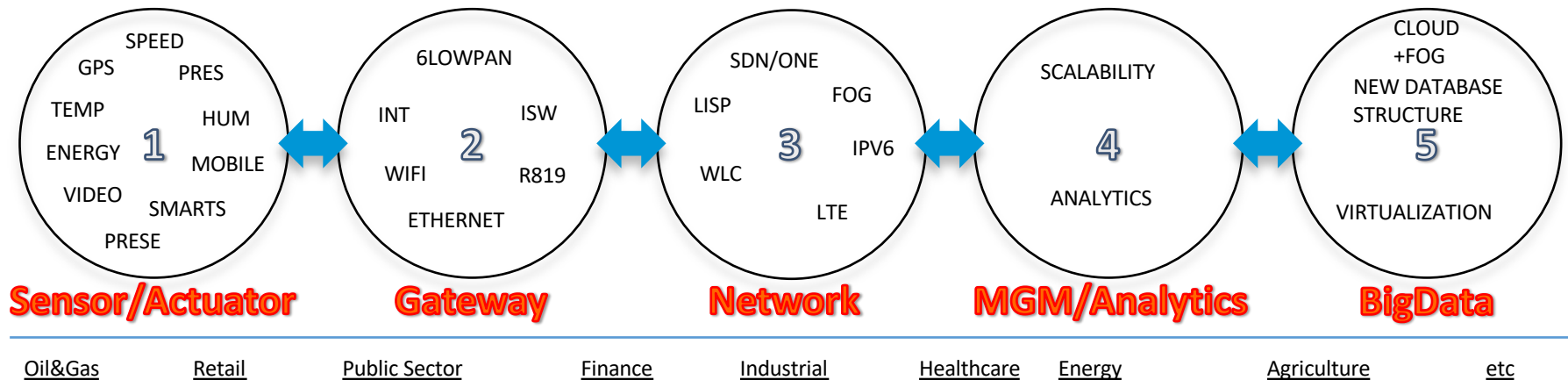President & CEO Wireless Research Center of North
Carolina

Ravi Subramanian
Technical Director, IEEE Conformity Assessment Program

CECA "Innovation Learning Process"

How we can have a technical development that could be adaptive to the unpredictable future?

Managing the Anarchy

| Sensor/Actuator | Gateway | Network | MGM/Analytics | BigData |

| Oil&Gas | Retail | Public Sector | Finance | Industrial | Healthcare | Energy | Agriculture | etc |

Problem to solve in IoT customers

- Multiples Sensor Brands (what brand should they buy?)

- Large Enterprises and SCC+ probably will install 100 of different sensor brands and models in the next 5 to 10 years.

- Several (upgrades/calibration/changes/Security issues) in the next years that will affect his operation environment. Customer will need some help from an independent organism like IEEE.

- One CRITICAL OPERATIONAL decision and ONE Analytics Engine -> Multiples IoT Implementations

- Multiples method to acquire the data / Multiples Vendors, Models & Prices

- Operational Decision (Close the O&G pipe or Stop the card) -> multiples sub-systems involved. Multiples sources family's with different level of accuracy.

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Data and IT Capability by Stage of Analytical Champion

▸ Stage 1: The Organization is plagued by missing or poor-quality data, multiple definitions of its data, and poorly integrated systems.

▸ Stage 2: The Organization collets transactions data efficiently but often lacks the right data for better decision making.

▸ Stage 3: The Organization has a proliferation of business intelligence tools and data marts, but most data remains unintegrated, no standardized, and inaccessible

▸ **Stage 4: The Organization has high-quality data, an enterprise-wide analytical plan, IT process and governance principles, and some embedded or automated analytics.**

▸ Stage 5: The Organization has a full-fledged analytic architecture that is enterprise-wide, fully automated and integrated into processes, and highly sophisticated

Thomas Davenport

IEEE PAR 2510 – Welcome and Presentations

▶ IoT Innovation Process

   – **Helping Customers** today and tomorrow

      • Massive Sensor Deployments

      • Heterogeneous sensor environments

      • Market motivation (Customers open to buy new brand sensors)

      • How we can Help CIOs/CEOs/**Actuators/Analytics to take more effective decisions in Critical Operations (Airports, O&G, Mining, SCC+, Logistics, etc)**

▶ Passive Standard (Documents) Vs **Active Standards (Along the Time).**

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IEEE PAR 2510 – Why does the market need something like this..?

▶ Reduce possible mistakes, when customers take critical decisions in OT environments.

  – Industrial safety, today we don´t know the reliability level of the information

  – We have no idea related with the quality degradation or corruption over the time, and we do not have tools to enforce the quality levels.

  – The idea is to understand the accuracy level before the actuator runs/actuate.

▶ Customers need a single source standard organization solution because the market is so big, complex and without much control.

▶ More efficient decisions reduce industrial risk, save lives, reduce the Operational costs and also improve customers productivity.

IEEE P2510 Vision

▸ Heterogeneous Vendor Sensors environment will be natural in next years.

▸ We will try to Provide Standard Solution to…..

  – Understand the quality of the data considering the sensor (**brand, model, OS, battery life, battery degradation, calibration cycles, security, etc)**

  – **New competitive and complex situ**ation in large customers (New sensor manufactures, and also traditional manufactures like Honeywell, ABB, GE, Emerson, Siemens, etc)

  – Take decisions considering the sensor AD (**Administrative Distance**).

  – Optimize **OT decisions close the 100% accuracy level** in the samples.

  – **Mitigate false positive** samples in multi-AS IoT Environments.

  – Have a tool to help customers to improve the level of accuracy required by **Internal or external policies**.
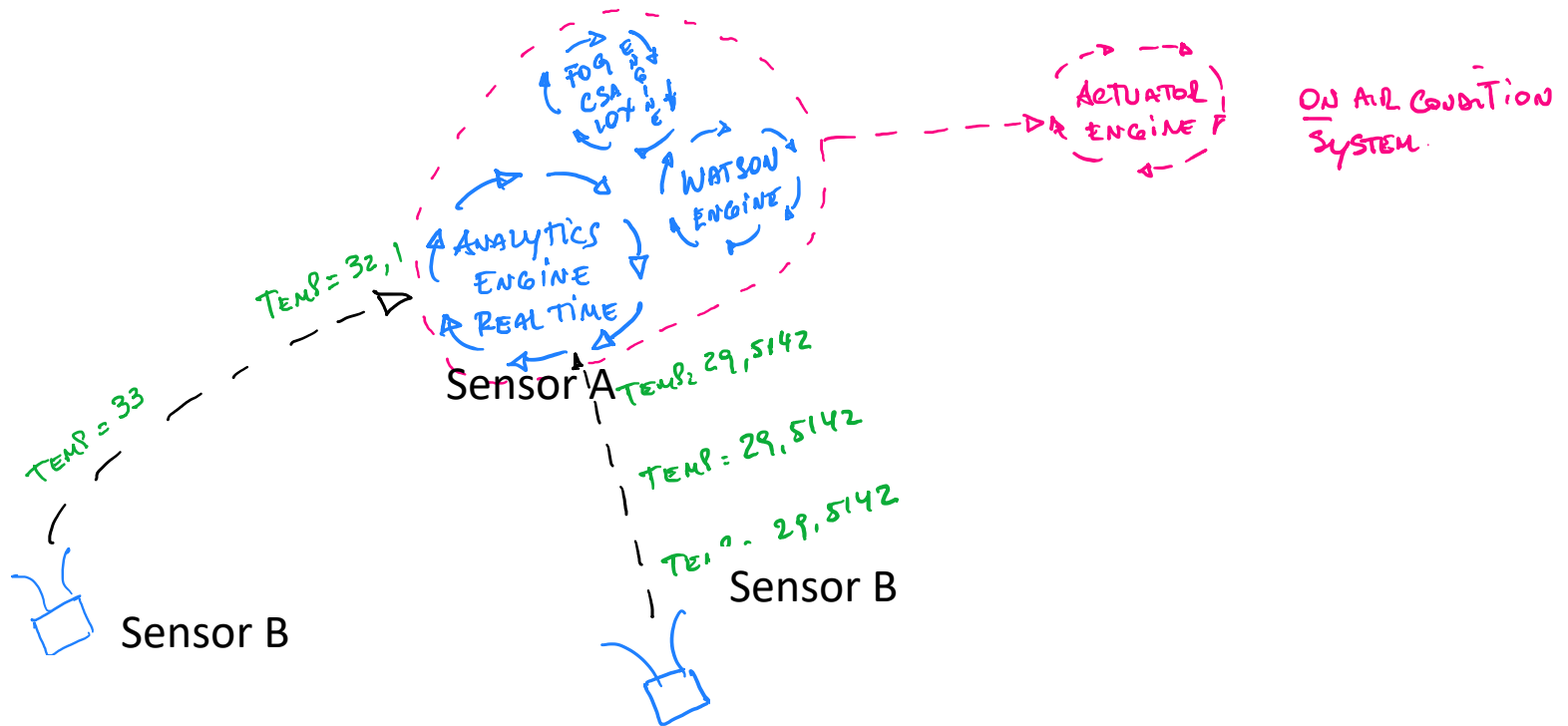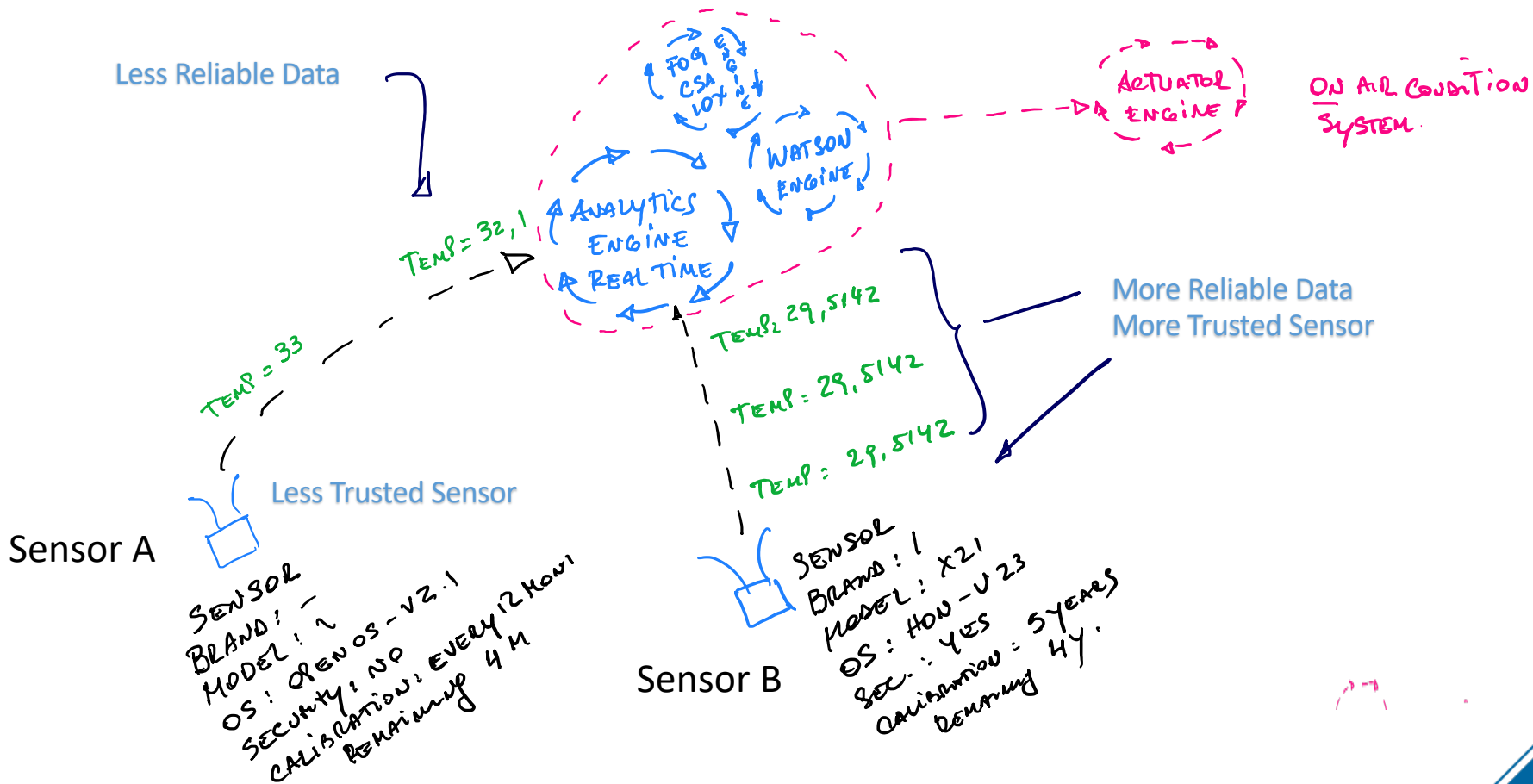
IEEE P2510 – Vision Cont.

▸ We will provide **quality certification process to guaranty minimum level of accuracy** that will be considered by customers when they want buy new sensors.

▸ Real Time Analytics will need to know, **not only the "data", but also the "level of accuracy of the information"** before proceeding to "close O&G pipes, stop Cars, send alerts, etc"

▸ **Improve the Data Correlation between multiple AS of IoT (Geo-location/temperature/pressure, etc).**

▸ Have a parameter to understand the quality of the data is critical to improve the productivity in the business operation and enforce the industrial safety.
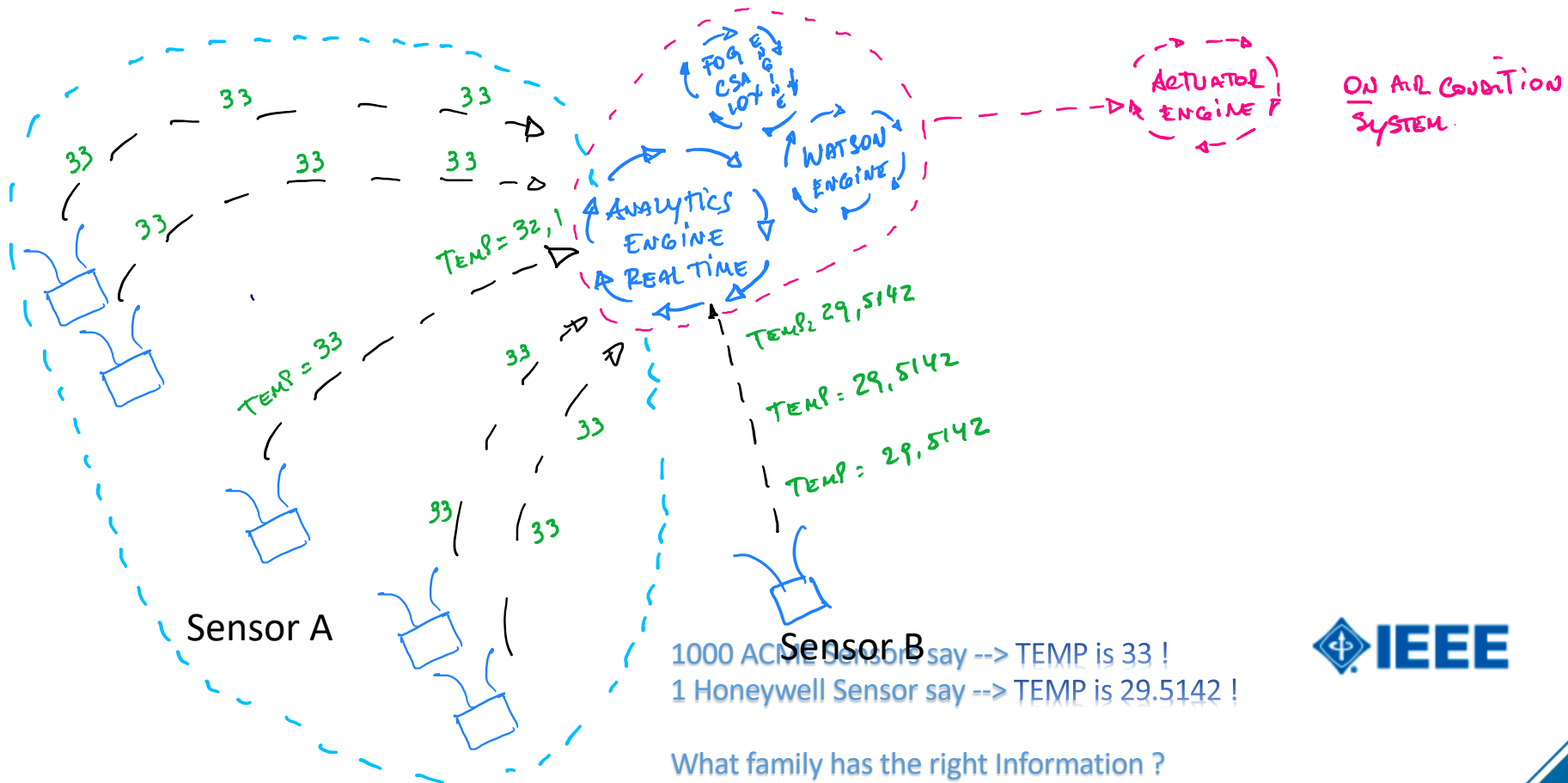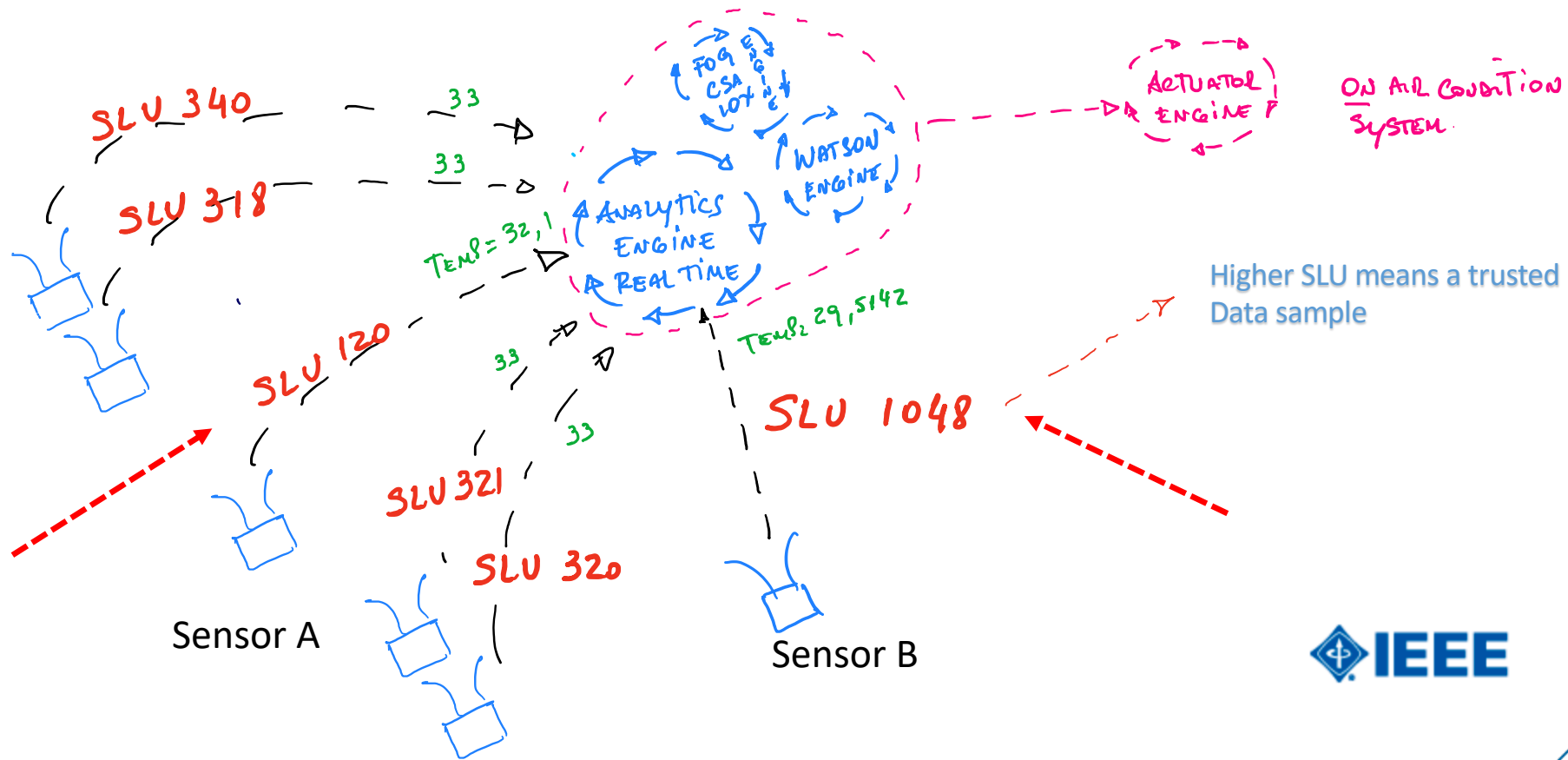
EPS Technical aspects

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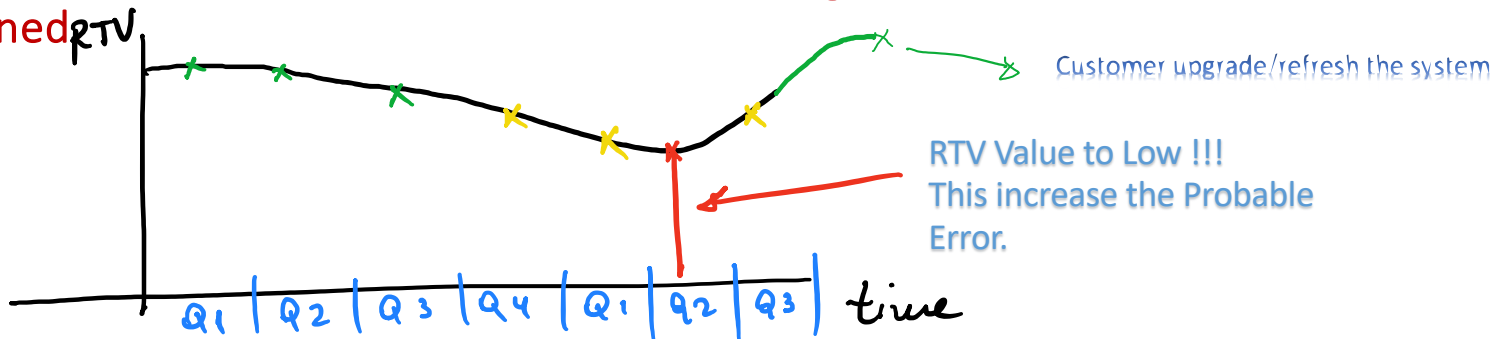
EPS Technical aspects

Sensor A

Sensor B

33 (repeated multiple times)

TEMP = 32,1
TEMP = 33
TEMP: 29,5142
TEMP = 29,5142
TEMP = 29,5142

FOG ENGINE
CSA
IOT

WATSON ENGINE

ANALYTICS ENGINE REAL TIME

ACTUATOR ENGINE

ON AIR CONDITION SYSTEM

1000 ACME Sensors say --> TEMP is 33 !
1 Honeywell Sensor say --> TEMP is 29.5142 !

What family has the right Information ?

EPS Engineering aspects

EPS Engineering aspects

We will need an Algorithm to do it !!

▸ EPS-Algorithm will use the **SLU value to calculate to OPTSV (optimum possible Total Sample value) vs the RTV (Resultant Total Value)** and will inform to the analytic engine this value.

▸ **The Analytic Engine will use the** RTV also to understand if the QoV (Quality of the Value) is decreasing along the time

▸ The Analytic Engine will store the RTV or EPS in the database

▸ The **Analytic Engine also will understand and detect in real time the** "wrong samples" and in collaboration with the SLU-Engine the SLU will be re-assigned.

RTV

Customer upgrade/refresh the system

RTV Value to Low !!!
This increase the Probable Error.

Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3   time

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Solution Overview

Sensor
Manufacturer

- New Sensor manufacture want to capture part of the new IoT market.
- Old and well known Sensor manufactures want to keep the differentiation in quality and price
- Customers want to implement the best cost-effective IoT solution…..
- CIOs want to implement some technical controls along the time
- CEOs want to have more data from different sources to take the best business decisions as possible

WW Customers SP/Enterprise/Public Sector

Solution Overview
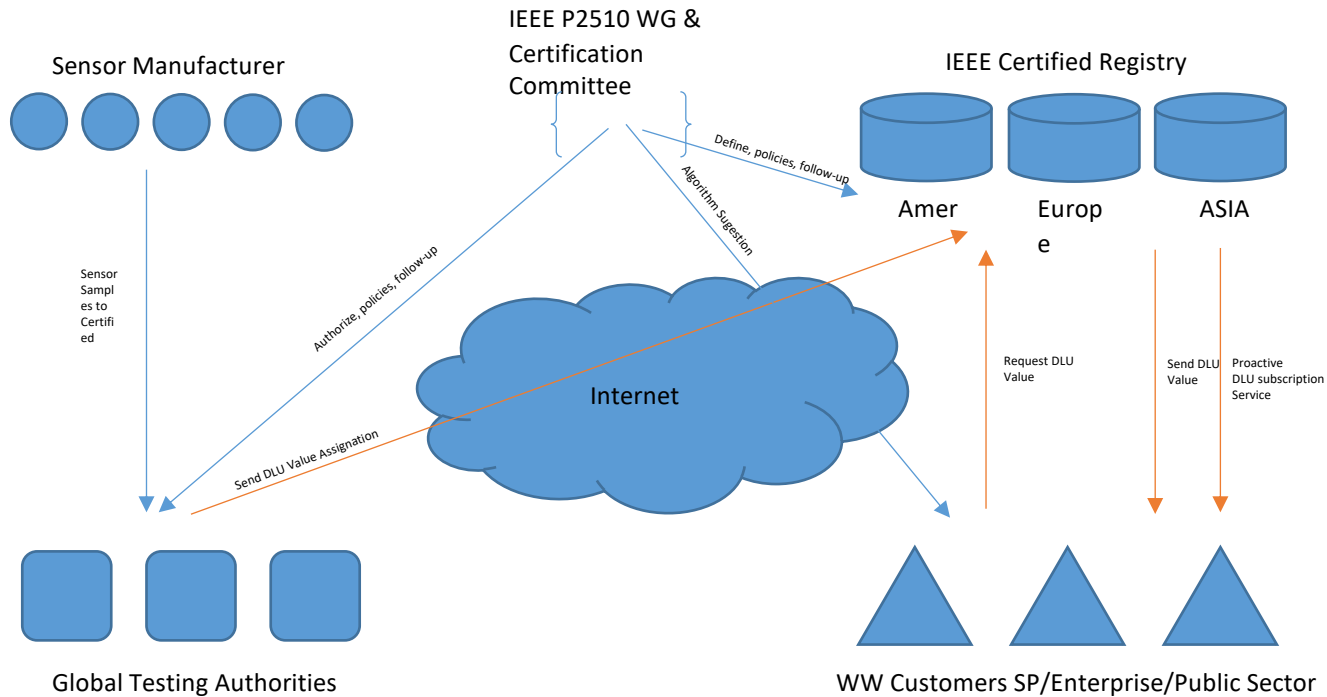
Benefits of Implementing a Conformity Assessment Program

▶ Benefits of conformance test before deployment implementation
- Early identification of non-conformances
- Exact functionality of the protocol is identified
- Multi-vendor solutions will have interoperability issues – helps identify such issues
- New offerings will have bugs – helps to catch them

▶ Reduces the vendor's cost / need for re-tests for different end-users

▶ Establishes a baseline for performance expectation, at initiation and over time

▶ Eases interoperability

▶ Transparency based on common implementation / Test Authority

▶ https://standards.ieee.org/products-services/icap/sensors-certification-committee/index.html

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