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Fujitsu North America Technology Forum 2015

Panel Theme: Reducing Complexity and Generating Valuable New Insights from IoT Data

Jorjeta G. Jetcheva, Ph.D.
Fujitsu Laboratories of America

February 11, 2015

Fujitsu North America Technology Forum 2015

Smart Grid IoT & Data Analytics

Jorjeta G. Jetcheva, Ph.D.
Fujitsu Laboratories of America

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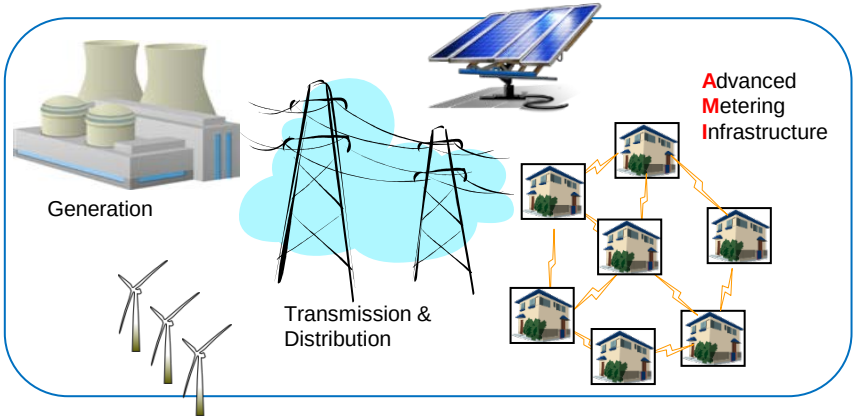
Grid Operation

- **Supply & demand balancing**
  - Load & generation forecasting
- **Fault prevention & management**
  - Analysis of voltage & power quality data
- **Cyber & physical security**
  - Communication & video data analytics



FLA Analytics Research

- C&I site load forecasting
- Traffic analysis for intrusion detection in AMI networks

Best Paper Award

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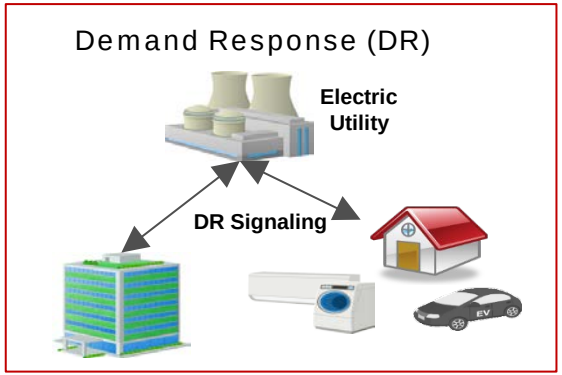
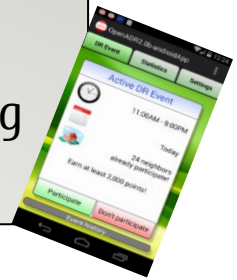
Energy Efficiency & Environmental Impact

- **Detect inefficient/faulty equipment**
  - Smart meter & sensor data analytics, anomaly analysis
- **Get people to be more efficient**
  - Load disaggregation, sensor & DR analytics



FLA Analytics Research

- Load disaggregation
- DR participation forecasting
- Gamification for DR



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Some Challenges to Consider

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- How can we change people's behavior?
- Balance between too much information & insufficient information?
- Best way to keep the user in the loop?
- How to maximize re-use of IoT devices & data across applications?

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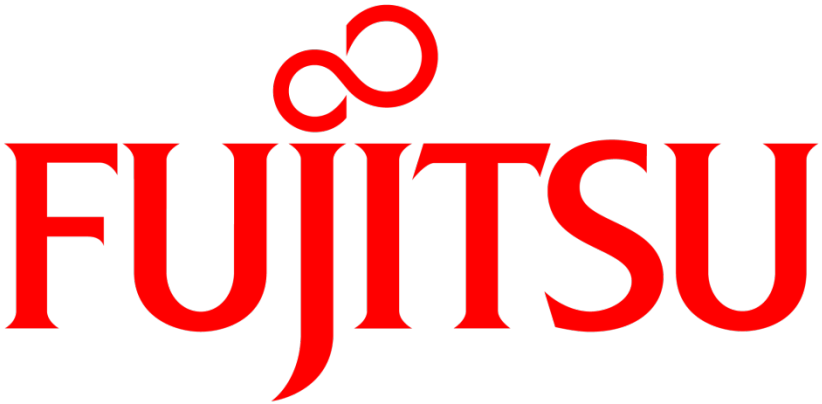

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Innovative ICT Platform in the IoT Era

Naoki Akaboshi
Fujitsu Laboratories Ltd.

February 11, 2015

Data Explosion in IoT Era

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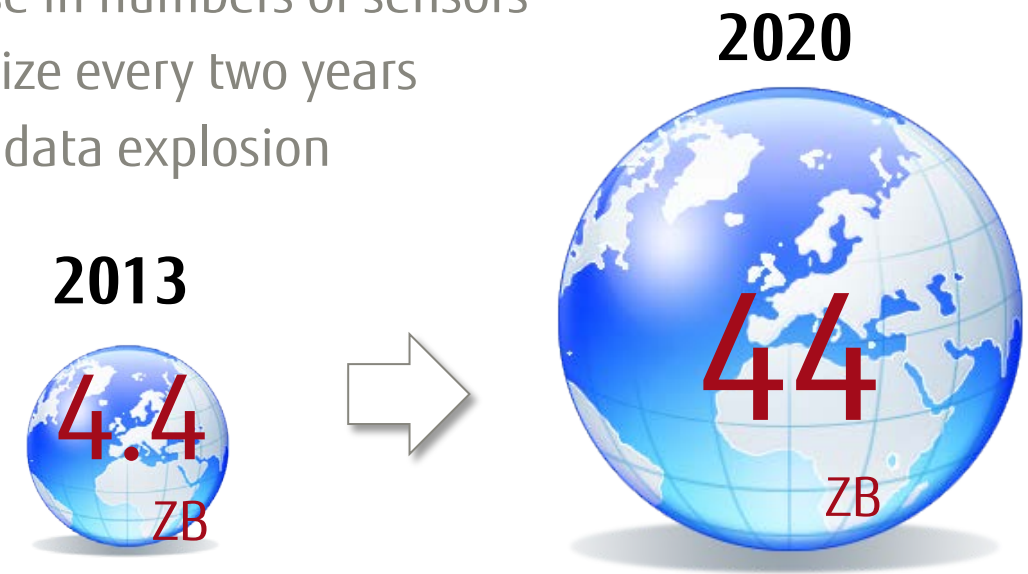
Rapid Growth of Data in Digital Universe

- Rapid increase in numbers of sensors
- Doubling in size every two years
- Unstructured data explosion



Source: EMC Digital Universe with Research & Analysis by IDC 2014
http://www.emc.com/leadership/digital-universe/2014iview/executive-summary.htm

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Examples of Innovation Driven by IoT Data

Fujitsu “Akisai”Cloud Service for Agriculture

- Sensor data is used for cultivation scheduling
- Fujitsu succeeded to harvest low-potassium lettuce which is known to be difficult to watering

Automated Identification Technology

- Airbus selected Fujitsu RFID technology to deliver dependable management and traceability of aircraft parts

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IoT Data for Enterprise

- Enterprises can benefit from IoT Data in many areas
- However, significant challenges exist in using IoT Data to drive value in the enterprise
  - Expanding velocity, volume, and variety of data require new technology solutions
  - Retrieving useful information from unstructured data requires huge computing ability and is challenging
  - The end of *Moore's Law* on the horizon

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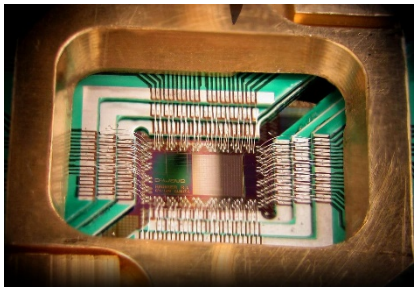
New Architecture to Accelerate IoT Data Computing

- GPGPU/FPGA
  - Microsoft and Baidu find speedier search results through FPGA
- Neural Networks
  - Neuro Chip
- Quantum Computing



The D-Wave processor
Source: http://en.wikipedia.org/wiki/Quantum_computing

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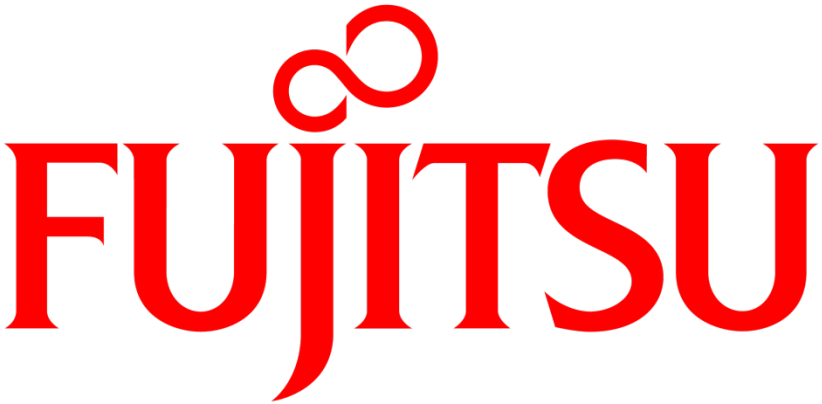

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Human-Centric IoT
Healthcare & Beyond

Ajay Chander

February 11, 2015

IoT makes the Analog World Digitally Readable

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Human

Behavioral

Environmenta

IoT Enables Digitization of Analog Services

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Health

Care

How am I?

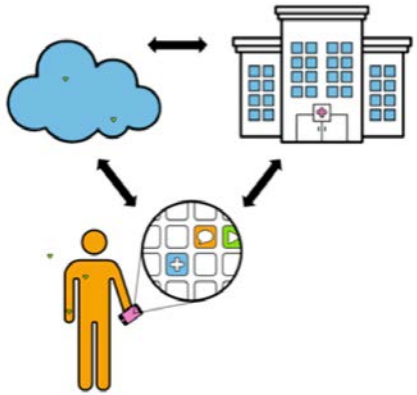
How can I get better?

Manual

Episodic

Digitized

Continuous



Fujitsu Sprout = Mobile Platform for Realtime IoT Data

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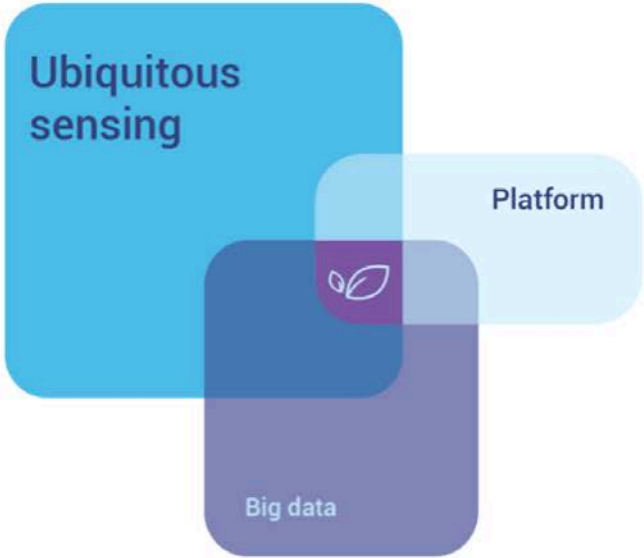
Real-Time	Mobile	Extensible	Platform

Sprout enables real-time mobile personalized data driven services

- Handles real-time data streams
- Is mobile
- Any sensor can be integrated
- Is a service development platform: has an open API for real-time mobile access to multiple data streams
- Can be deployed on any Android device

FLA's realtime mobile stress analytics are best-in-class



Sprout at F1 RACING Athletics IoT Service

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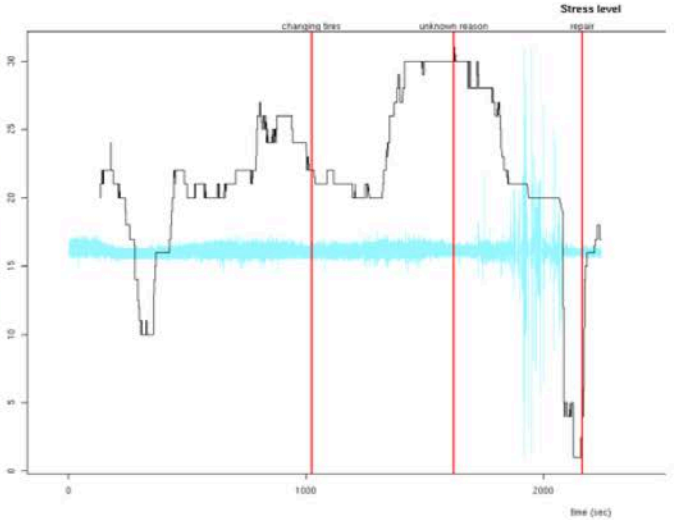

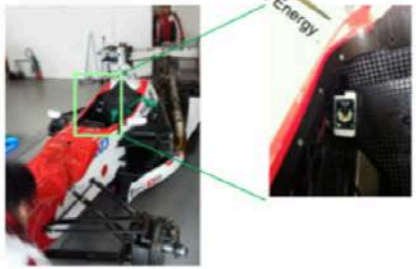

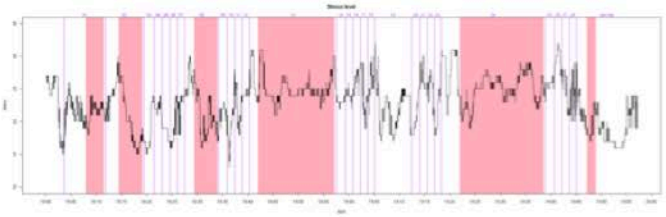

Sprout at VA Hospital: Rehab IoT Service

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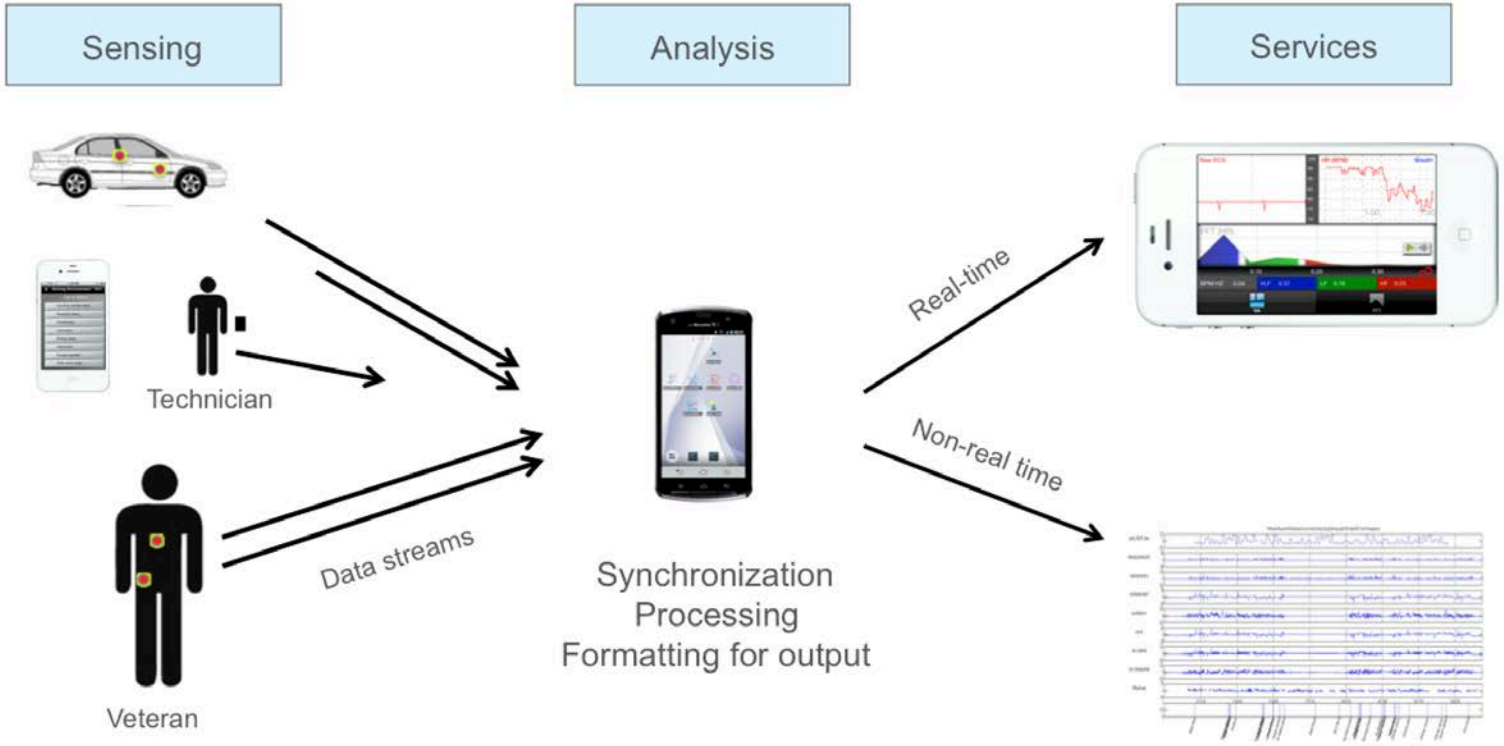
Many soldiers have post-war PTSD and 25% higher accident rates. The VA is researching interventions.



Sprout at SONY PICTURES: Wellness at Work IoT Service

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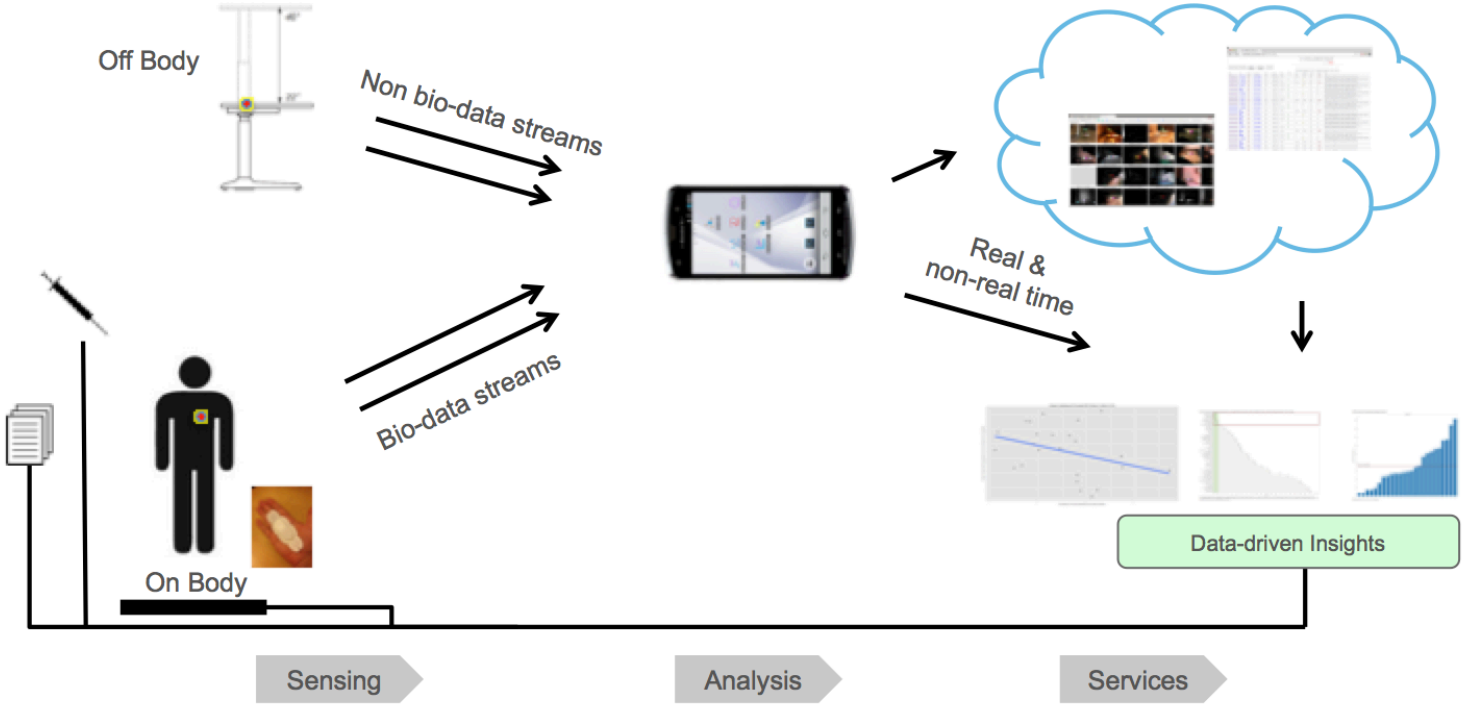
Sony's business problem: ROI of sit-to-stand desks?
Sprout solution: quantify people, desks; analyze big data



IoT Services = Novel Business Solutions

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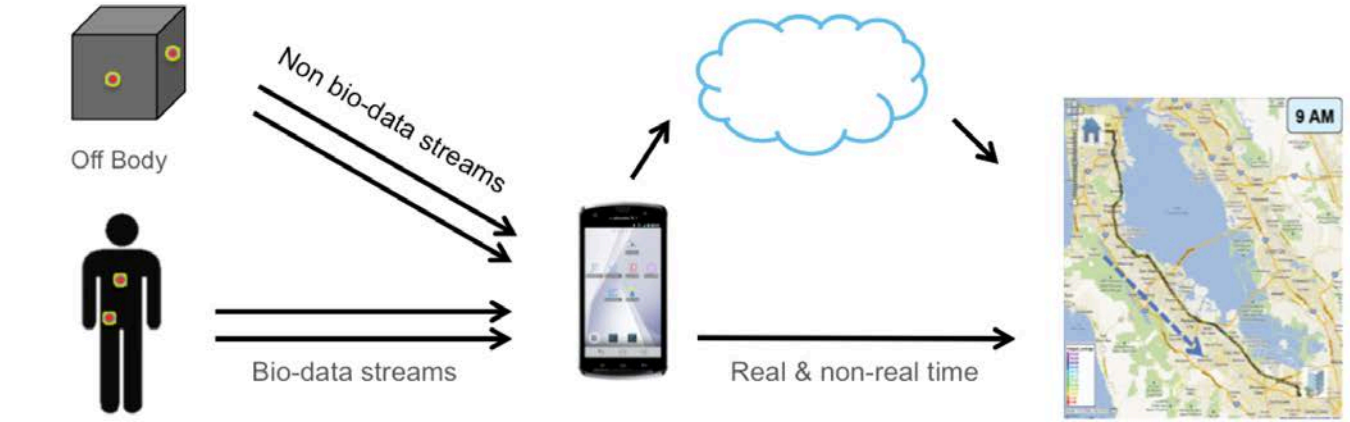
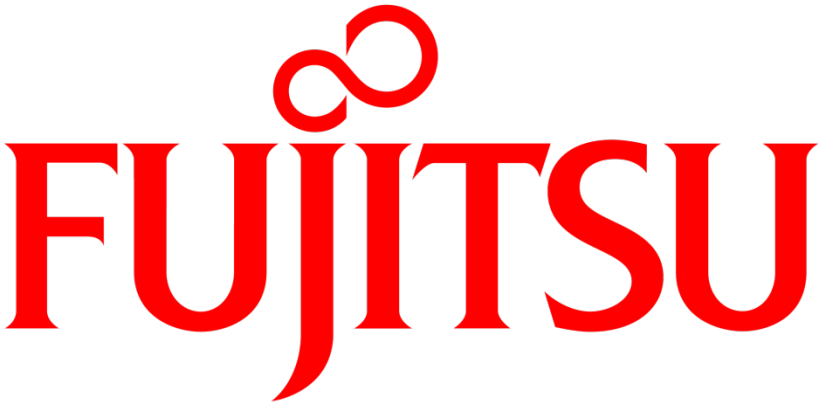
Business problems are often data problems. Sprout enables data-driven solutions to such problems.

Chose your sensor(s)	Choose/develop analysis modules	Develop UI/UX and deploy





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