IOT15577 - Building Your First IoT Project Business Case

Kevin Robinson

Business Development Manager

@KRobADSKPLM

Class summary

Where are you on your connected product journey?

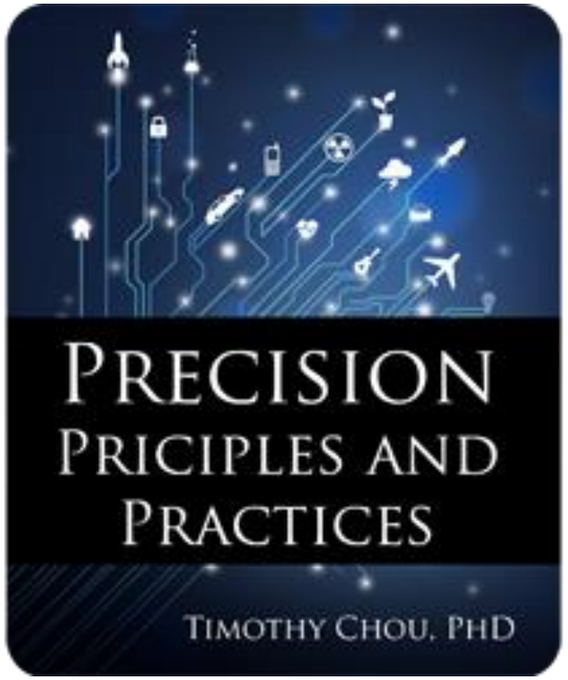
Regardless of where you are in your journey…. this class is designed to provide you with some real-world examples of what a successful connected-product business looks like, and how you can start to develop a business case for your own implementation. From identifying design improvements, post-sales support, and spares management business, through to advanced system monitoring services and products as a service, we look to identify your potential return on investment and phased approaches to your ultimate goal. This session features Autodesk Fusion Connect, formerly SeeControl.

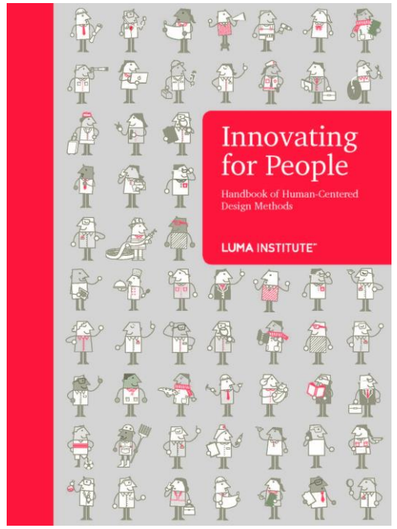
Key learning objectives

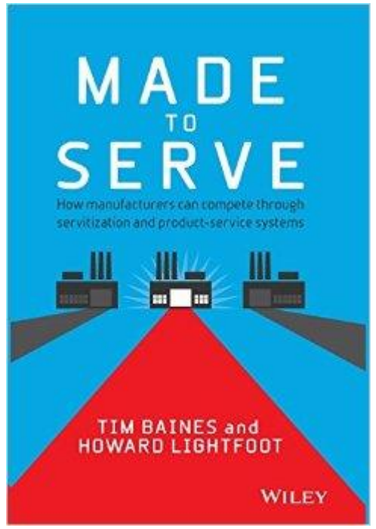
At the end of this class, you will:

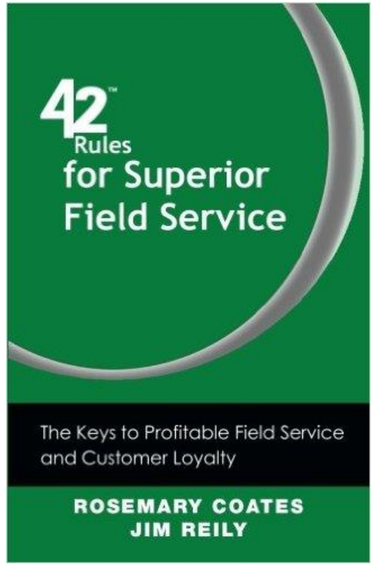
- Identify your own readiness for a connected product business
- Learn how to articulate an internal IoT business plan to your organization
- Learn how to identify ROI opportunities on the way to your connected-product goals
- Understand how other companies have achieved success with IoT solutions

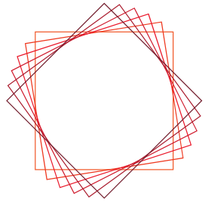
Resources





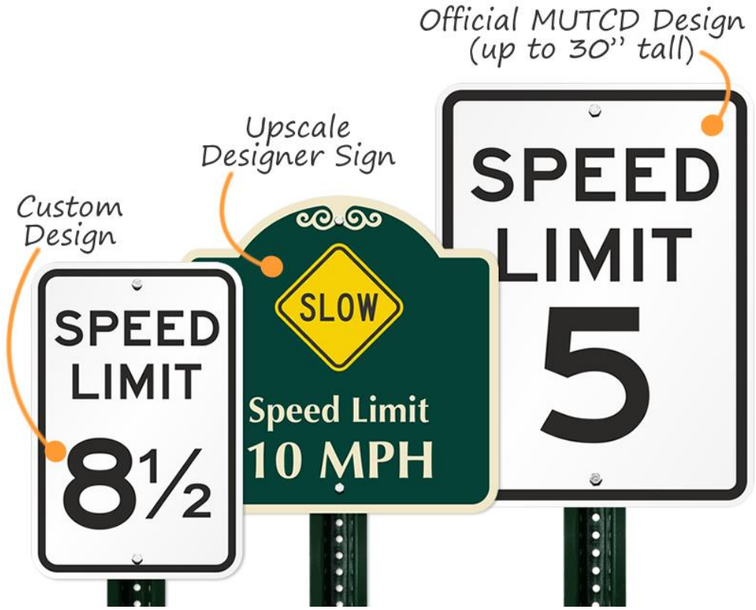






iot INSTITUTE™

Any sign manufacturing companies in the room?



Discussion topic Source : “Customer Success is key” and http://www.alltrafficsolutions.com/

Eagle Crusher - http://www.eaglecrusher.com/ - Disclaimer, This is only being used as an example and does not reflect actual customer intentions or plans

Recycled concrete

- When a structure made of demolished or renovated concrete is called recycled concrete.
- Concrete aggregate collected from demolition sites is put through a crushing machine.
- Crushing facilities accept only uncontaminated concrete, which must be free

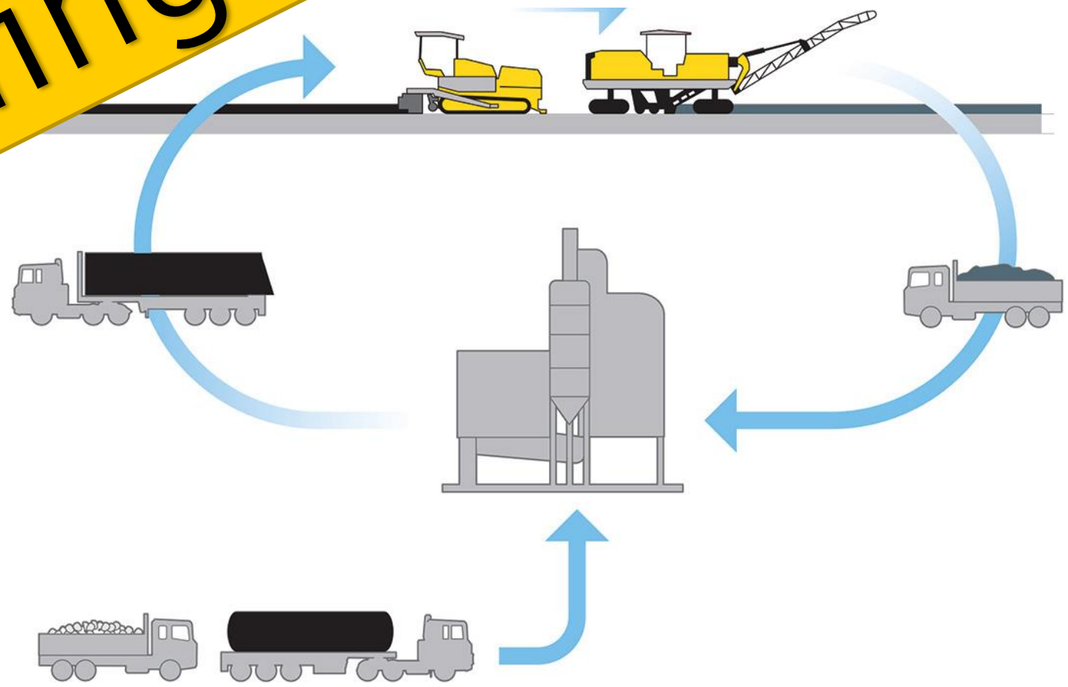
Advantages

- Keeping concrete debris out of landfills saves landfill space.
- Using recycled material as gravel reduces the need for gravel mining.
- Using recycled concrete as the base material for roadways reduces the pollution involved in trucking material.

FACTORS THAT ASSESS THE QUALITY OF RECYCLED AGGREGATE

- Size distribution:- that recycled aggregates either fine or coarse can be obtained by crushing.
- Abs tion :- high in recycled aggregates than l aggrigates
- esistance :- Use of such aggregates in flexible pavements show sults

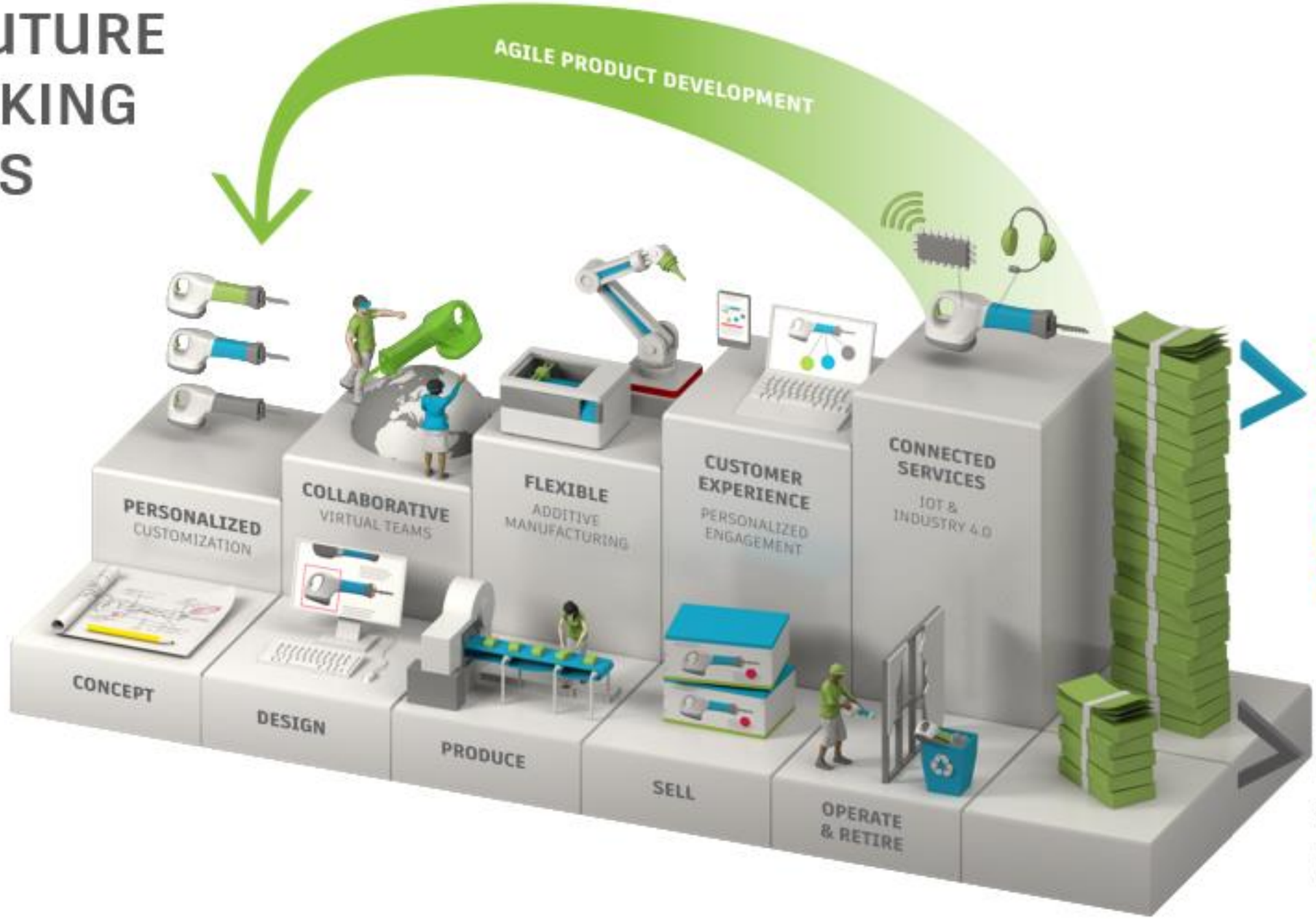
Just Kidding .....



The new frontier of design …. Connected design

- Board Drafting
  - Isometrics
  - Electronic Erasers
- 2d CAD
  - Isometrics
  - Digitizers
- 3d CAD
  - Rendering & Animations
  - Parametric
- Simulation
- What's Next for you?

THE FUTURE OF MAKING THINGS



AUTODESK.

Image Credit : Jaso Industrial Cranes

IoT Journey and Opportunities

REACTIVE

- Limited design feedback
- Break-fix service

CONNECTED

- Usage data enables better product feedback
- Remote updates
- Diagnose before service

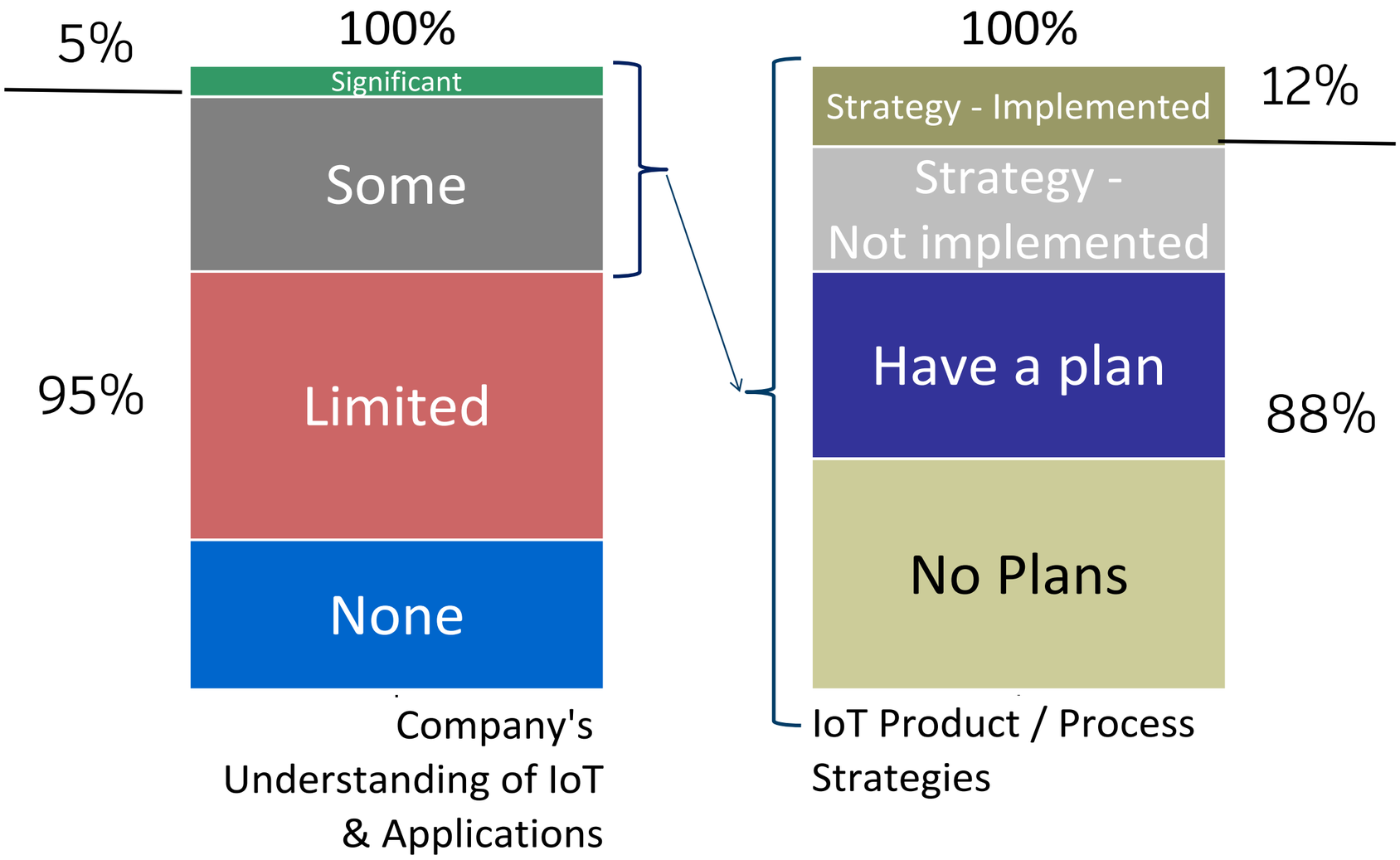
ANALYZED

- Understanding usage to drive upgrades
- Predictive maintenance
- Shift to proactive service

TOTALLY ENGAGED

- Sell subscriptions, leases, managed services
- Tailor to customer need
- Integrated, customer-driven business

You are not alone ….



n=350 US Manufacturers
Study sponsored by Rockwell Automation
QAD
BDO
September 2015

Source: www.mpi-group.com MPI Internet of Things study to evaluate US manufacturers' readiness to incorporate smart devices and embedded intelligence within their plants and processes

Source: Iot Transform Book, Steve Grady of Enviro Controls

Two IoT-Driven Business Transformation Areas

Operational Excellence and/or **Market Differentiation**

Assimilating and extending **best practices**

⇩

Moving to the **productivity methods**

Creating a **unique** competitive position

⇩

Doing things differently to **deliver distinct value**

Source: Iot Transform Book, Steve Grady of Enviro Controls

IoT Benefits - Loaded scores

Draft

- What does IoT/connected allow you to do (n=281, multiple selections allowed)

Precision Framework

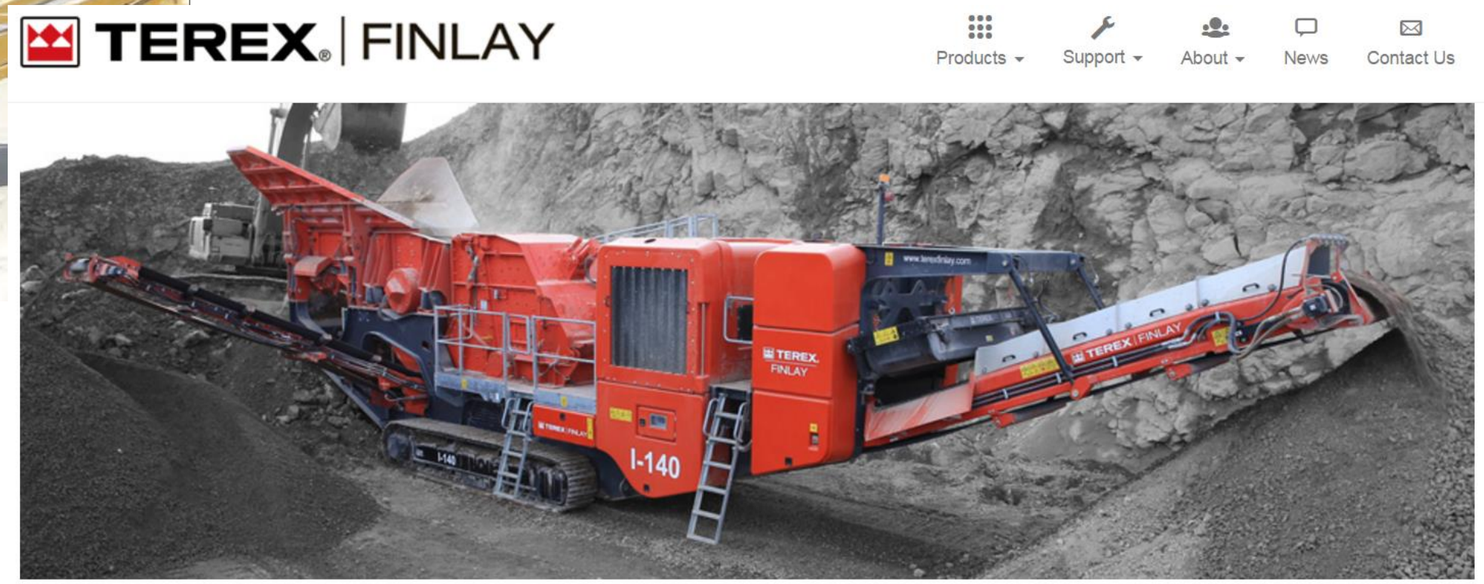
IoT Framework

Amps Phase A (ST_AMPS_A)
Amps Phase B (ST_AMPS_B)
Amps Phase C (ST_AMPS_C)
Apparent Power (ST_KVA)
Cellular Signal % (CELL_SIGNAL)
Check Genset (AL_CHK)
Common Alarm (AL_COMN)
Control Panel - Ignition Switch (ST_IGNIT_SW)
Control Switch (ST_CONTROL)
Device Type (ST_DEVICE)
Emergency Stop (AL_ESTOP)
Engine Coolant Temperature - Coolant Temperature (ST_COTE)
Engine Oil Pressure - Oil Pressure (ST_OIL_PR)
Engine On Time - Run Hours (ST_RUN_HS)
Engine RPM - Engine RPM (Actual) (ST_RPM)
Engine Shutdown Alarm (AL_SD_RUN)
Engine Starts (ST_START_CNT)
Engine Status
Frequency (ST_FREQ)
Fuel Level (FUEL_LEVEL)
Genset Supplying Load (ST_LOAD_GS)
Last Communication (COMM_TIME)
Last Data Collection Time (LAST_DATA)
Low Coolant Temperature (AL_COTE_LOLO)
Modbus Communication Failure (AL_MODBUS_FL)
Percent Amps A (ST_PCT_AMPS_A)
Percent Amps B (ST_PCT_AMPS_B)
Percent Amps C (ST_PCT_AMPS_C)
Power Factor (ST_POWER_FA)
Power in KVAR (ST_KVAR)
Total KW (ST_KW)
Total Percent kW (ST_KW_PCT)
Voltage Phase A-B (ST_VOLT_A)
Voltage Phase B-C (ST_VOLT_B)
Voltage Phase C-A (ST_VOLT_C)
Volts AB - Input Voltage Phase A (ST_VOLTS_A_IN)
Volts BC - Input Voltage Phase B (ST_VOLTS_B_IN)
Volts CA - Input Voltage Phase C (ST_VOLTS_C_IN

Source: IoT Institute Learning Center - IoT Fundamentals & Examples of Business Transformation and Dr. Tim Chou's book Precison

Eagle Crusher - http://www.eaglecrusher.com/ - Disclaimer, This is only being used as an example and does not reflect actual customer intentions or plans

SCREEN MACHINE INDUSTRIES
AN AMERICAN MANUFACTURER OF PORTABLE CRUSHING AND SCREENING EQUIPMENT
5256T IMPACT CRUSHER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Product Performance

Maintenance Needs

Safety

Upgrades & retrofits

Hours Running

Warranty

Location Tracking

Operation Ease of Use

Dealer Enablement

Eagle Crusher - http://www.eaglecrusher.com/ - Disclaimer, This is only being used as an example and does not reflect actual customer intentions or plans

Maintenance Examples….. What if….

- Check and maintain the engine fluid levels (oil, coolant, etc.). Check, clean or replace the engine air filter as necessary. Monitor and maintain the proper concentration of the Coolant Additive in your cooling system. Testing for normal levels is typically achieved by using a test kit obtained from the parts department at your local engine dealer.
- Check the oil level site glasses of the vibrating feeders and screens, if or where applicable. Drain and refill regularly per the recommendations in your Operator's Manual.
- Inspect the inside of the impactor on a daily basis. Look for worn or damaged blow bars and replace or turn if necessary. Look for worn, damaged or missing curtain and side liners. Replace as necessary. Assure that all blow-bar wedges and spindle pins are in place.

- Inspect V-belt drives for damaged belts or loose belt tension. Replace cracked, glazed, torn or separated belts. Maintain proper belt tension for optimum performance of your plant. Loose or worn belts and sheaves can affect the generator speed and result in low voltage supply to all electric-powered components. Low voltage can cause electric-motor and electric-panel component failures. Consult the manual for belt-tension calculation procedures.
- Check the plant for level. Side to side level is more critical to proper operation than front to back level. Adjust the hydraulic legs as necessary to bring the plant into a level position from side to side at both ends of the plant. Always insert the pins in the leg tubes so that the pins support the plant and not just the hydraulic cylinder itself. Allowing the plant to "lean" to one side causes incorrect oil levels in feeders and screens. This can cause oil to run into the center tubes of the feeders and can cause seal leaks to develop in both the feeders and screens. Allowing a plant to operate out of level also causes uneven wear patterns on the blow bars and curtains inside your impactor.

Value of Pursuing IoT

	LOWER COST	INCREASE REVENUE
***Connect** to smart machines* to improve service & repair operations	▪ Decrease field visits with remote access to operating data. ▪ Reduce software update costs. ▪ Reduce time-to-fix and downtime.	▪ Improve customer satisfaction for increased repeat business. ▪ Enable premium SLA service contracts.
***Analyze** IoT data* to improve product design, reliability, preventive actions	▪ Reduce warranty claims. ▪ Reduce number of service calls. ▪ Increase first-time fix rates. ▪ Reduce inventory, E&O costs.	▪ Increase market share with superior, differentiated designs. ▪ Improve quality; corporate and brand reputation. ▪ Reduce R&D distractions for fewer new product delays.
***Transform** your business* with new innovative products and services	▪ Reduce number and time of support calls. ▪ Enable self-service support. ▪ Improve enterprise productivity through IoT information sharing.	NEW, PROFITABLE REVENUE STREAMS: ▪ Premium custom offering based on customer usage patterns. ▪ New pay-per-usage service revenue models.

Stakeholders Impact

Engineering / R&D

IT

Product Management

Dealers / Dealer Service

Operations

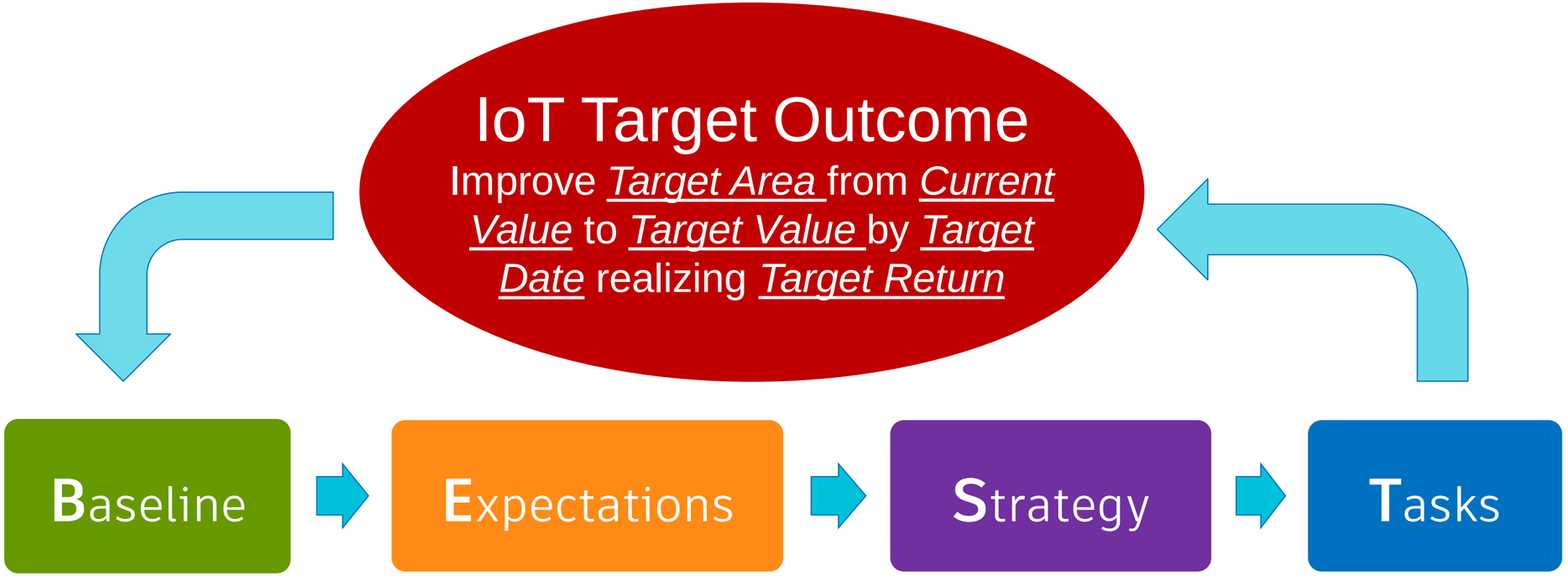
Sales

Customer Service / Field Service

Customer End Users of Product

“DO” Discovery and Internal discussion starters…..

1. “What types of connected experiences do you think your customers would value?”
2. “How do you think a connected offering would impact our competitiveness or market position?”
3. “How do we collect and act on product feedback from customers?”
4. How do you obtain actual product performance data from the field?
5. “Can we diagnosis our machines remotely?”
6. “What are the conditions that create failure within our equipment?”
7. “What is the impact of equipment failure and downtime?” To our dealers? Our end customers contractors?
8. “How do our customers / dealers track or manage the suggested maintenance and operating procedures we provide?”
9. “How do our field services team know what to expected for a service call?”
10. “How are our First Fix rates for service calls?”



The Target Outcome is the vision for the IoT Project or the "Do Details"

- Specific and can be understood by the Team
- Focused on solving a key Business Problem
- Have a Story board showing the end state

Source: Iot Transform Book, Steve Grady of Enviro Controls

Target Outcome Example 1

Operational Excellence and/or Market Differentiation

- Improve Field Service First Fix rates
  - Currently at 75% >>>> 90%
  - By January 2018
  - Target Return Value areas:
    - Travel Costs
    - Total Service Hours for labor costs
    - Lost billable hours as opportunity costs
    - Projected Internal Costs Savings of $10k per month
    - Revenue Opportunity Growth per month of $50k per month

Operations

Customer Service / Field Service

Target Outcome Example 2

Operational Excellence and/or Market Differentiation

- Reduce Inventory Costs of replacement parts
  - Move to demand based vs. historical averages
  - Average monthly Inventory on hand value $250k
  - Inventory monthly creation costs $50k (raw, hours labor, equipment operation, etc)
  - By January 2018
  - Target Return Value areas:
    - Overtime Labor
    - Equipment Maintenance Frequency
    - Inventory costs

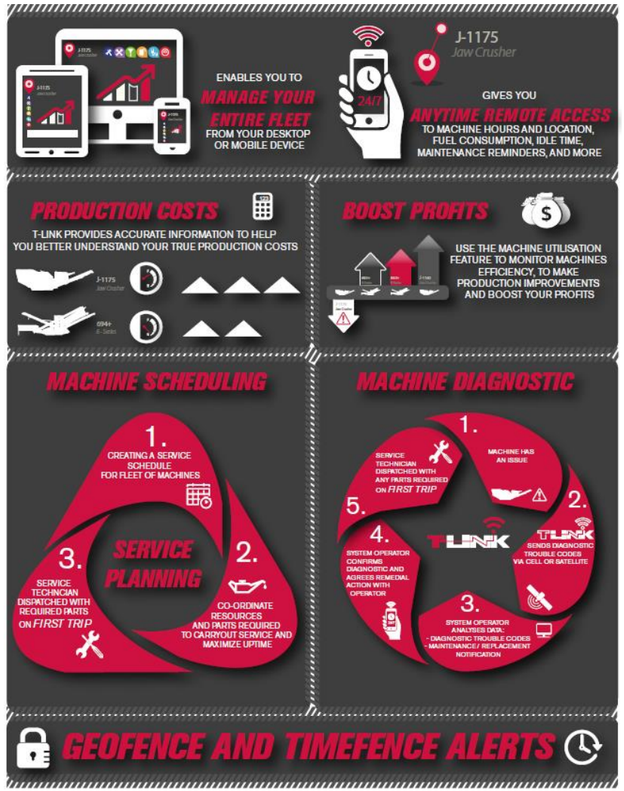
Operations

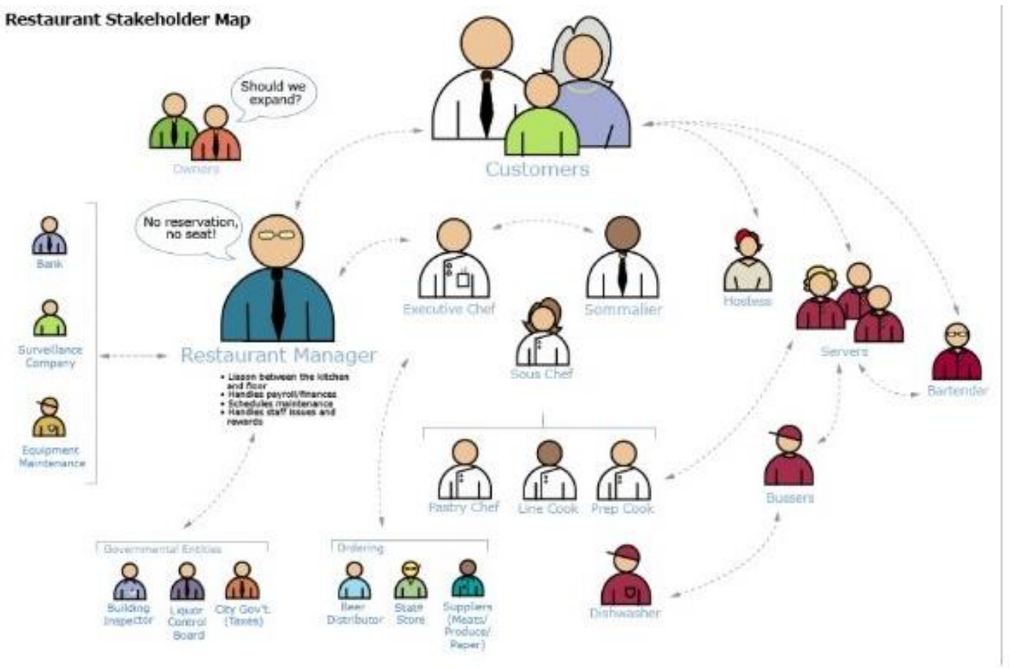
MFG talent

Vision and Storyboard Examples

Operational Excellence and/or Market Differentiation

PLAN, RUN AND MANAGE YOUR FLEET TO GROW YOUR BUSINESS





Example: Illustrative Relationship-based stakeholder Map. Graphic credit LUMA Institute

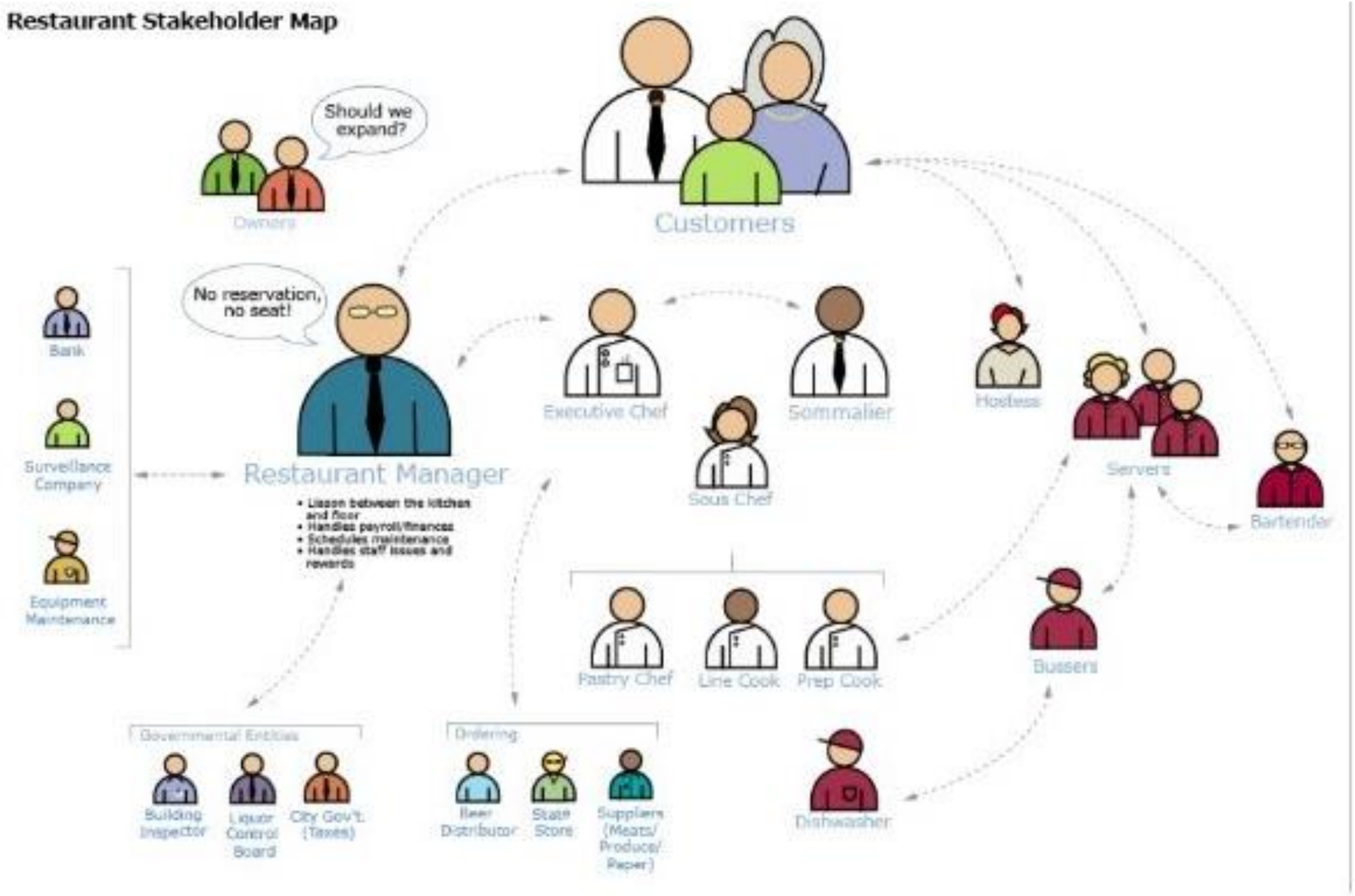
Sales

Product Management

Dealers / Dealer Service

Customer End Users of Product

Source: Terex Powerscreen T-link brochure and Luma Institute Class / Book – Innovating for People



Example: Illustrative Relationship-based stakeholder Map. Graphic credit LUMA Institute

Next Steps

Getting Started…..Project Approach Options

- Awareness, Research and Learning
- Brainstorm and socialized target outcome concepts and storyboard
- Project Approach Options
    1. PowerPoint Prototype
    2. Proof of Concept
        1. Emulated – Software only
        2. Live Data – Plus Hardware
    3. Full Funded – *Build out the B.E.S.T plan for your target outcomes*

The Stack

7 **Optimize Performance**
(Purpose, People and Process)

6 **Business Applications**
(Analytics, Reporting, Control)

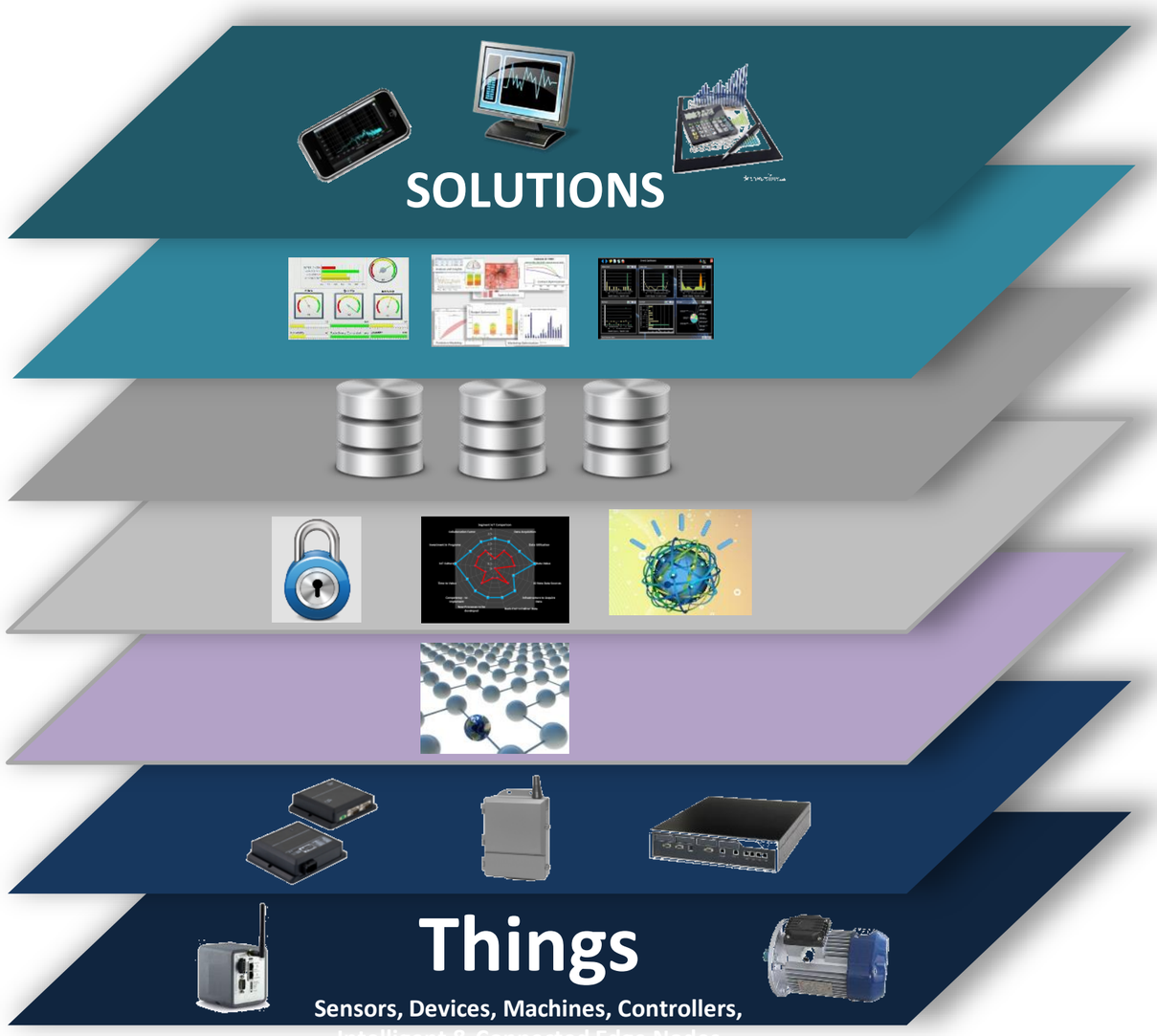
5 **Cloud Servers**
(Storage, Software, Redundancy)

4 **Software Platform Services**
(Security, Aggregation & Logic)

3 **Network Connectivity**
(Internet Access, M2M Wireless)

2 **Gateways & Edge Computing**
(Data Filtering/Analysis, Demarcation, Interface Protocols and Security)

1 **Physical Sensors & Controllers**
(The "Things" in IoT)



Source: Iot Transform Book, Steve Grady of Enviro Controls

Start Here

S D N A C (k+p+p)

verizon

AUTODESK FUSION CONNECT

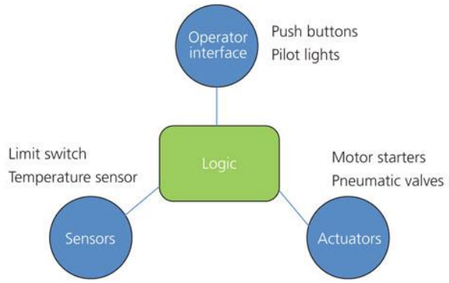


Figure 1. The basic components of a control system

Source: Kevin's normally bad white boarding skills replaced in a slide

Customer Examples

Premier Deicers

Sluggish winter de-icing operations impacted departure times and profitability

- De-ice cycle accelerated **40%**
- More on-time departures
- Less fuel consumption
- New revenue streams/services
- Created competitive advantage

SOLUTION TIME
30 Days

AUTODESK® **FUSION CONNECT**

Top Plastics Processing Equipment Maker

Highly reliable, long-last products limited sales growth and market opportunities

- Enhanced remote diagnostic service
- Power and speed of IoT solution caused strategy rethink
- Transitioning to Product-as-a-Service

SOLUTION TIME
30 Days

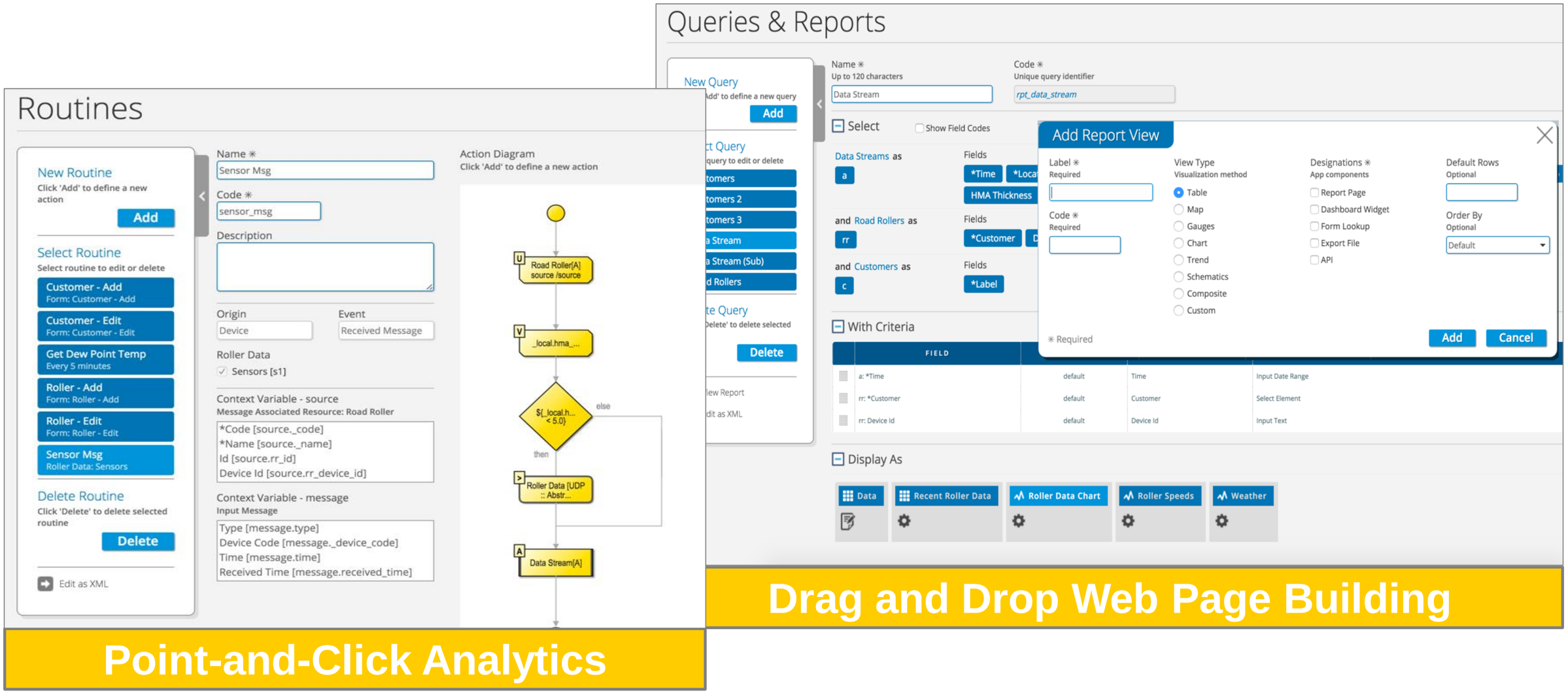
AUTODESK® **FUSION CONNECT**

Our Approach

How Fusion Connect Works

"Connected Products Prototyping" = Explore the Do and Things further

IoT Simplified



Call to Action

IoT for Manufacturing Track classes

Tuesday

- 3:00 pm – 4:00 pm - IOT15577 - **Building Your First IoT Project Business Case – industry talk**

Wednesday

- 8:00 am – 9:00 am - IOT15617 - **Planning Your Connected Product Offering - demo**
- 1:00 pm – 2:00 pm -IOT15597-L - **Pimping Your IoT Ride - Lab**

Wednesday cont.

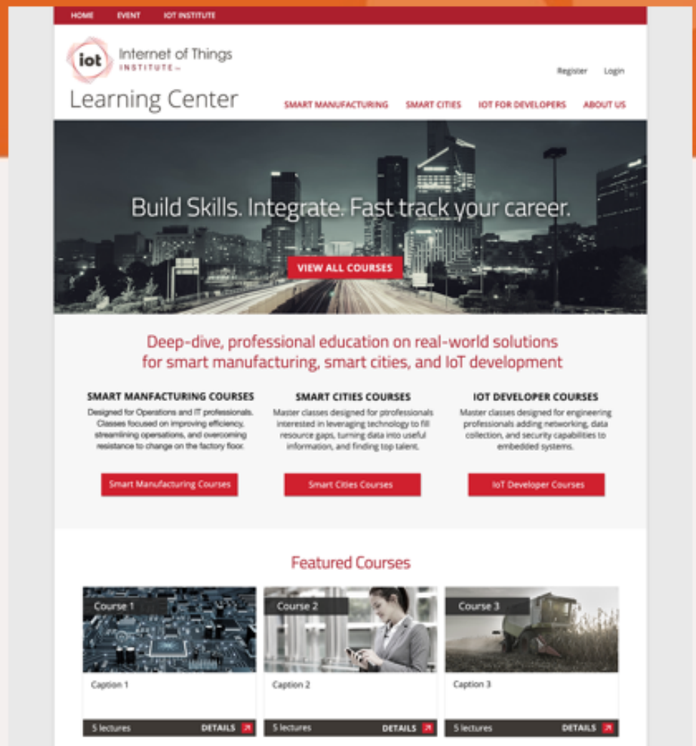
- 4:45 pm – 5:45 pm - IOT15657 - **What Connected Products Are Doing for Us – industry talk**

Thursday

- 8:30 am – 9:30 am - IOT15637 - **Getting on the Fast Track to IoT - Panel**
- 1:00 pm – 2:30 pm - IOT15559 - **An Introduction to Fusion Connect - demo**

Learning Center

Education.IoTi.com is an e-learning platform with free courses focused on Smart Manufacturing, Smart Cities and IoT Engineering



FEATURED COURSE:

IoT Fundamentals & Examples of Business Transformation

Instructor: Dr. Timothy Chou

-Stanford Lecturer & Author of *Precision: Principles, Practices and Solutions for the Internet of Things*

Sponsored by:

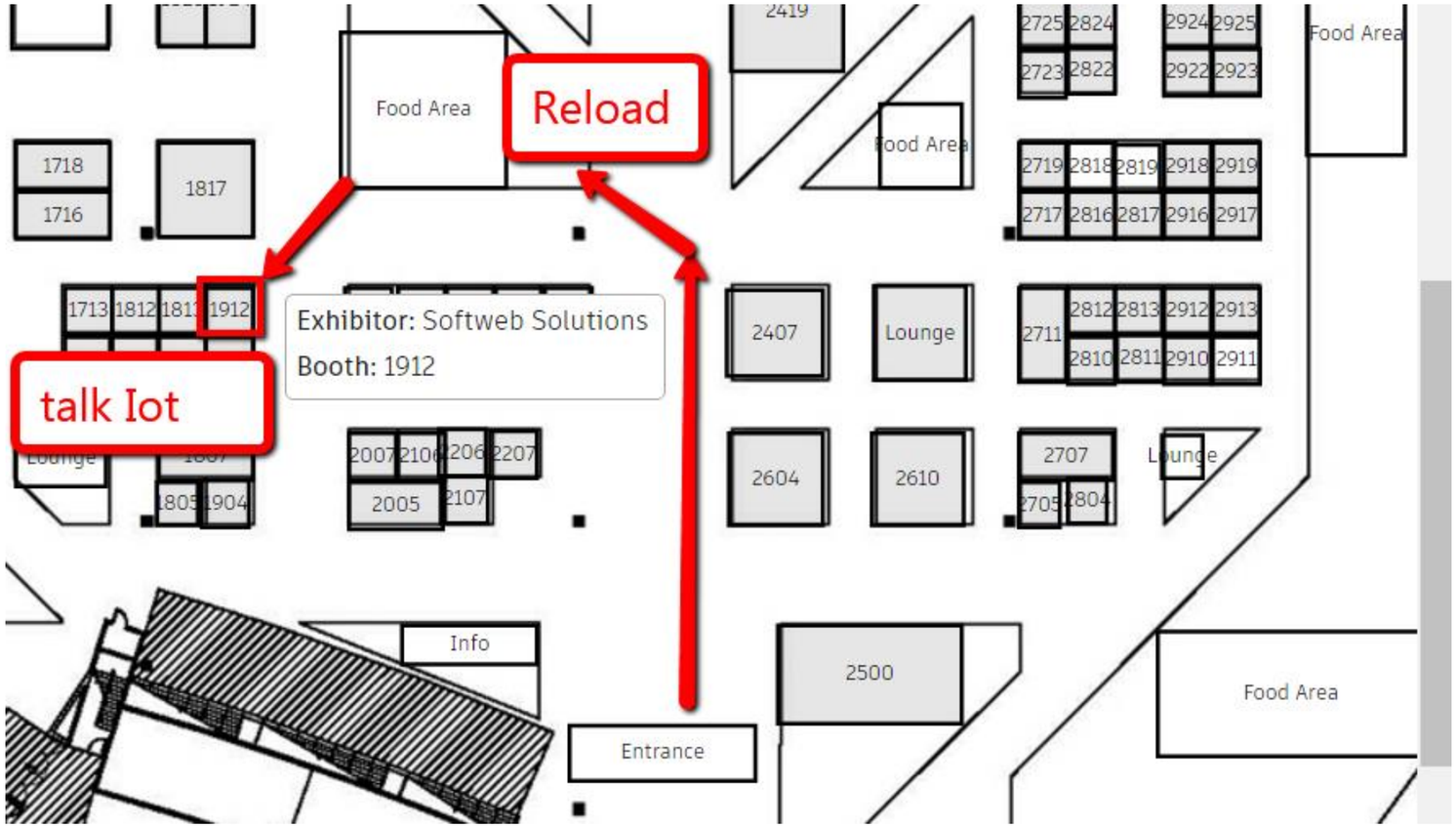
Autodesk Fusion Connect

Internet of Things INSTITUTE™

Softweb Solutions

Stop by Softweb booth to talk about “Proof of Value Workshop”

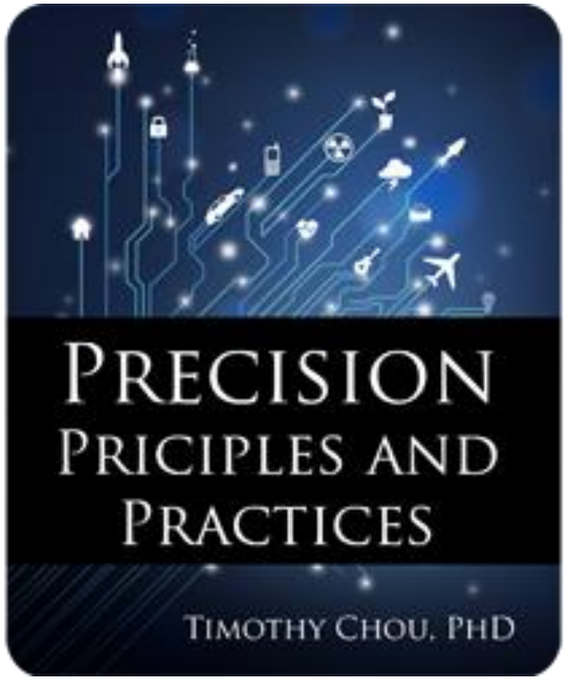
Booth Number # 1912

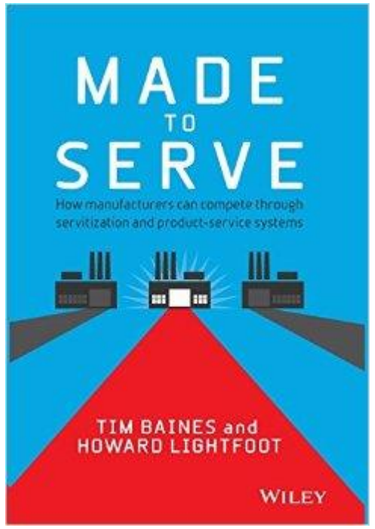


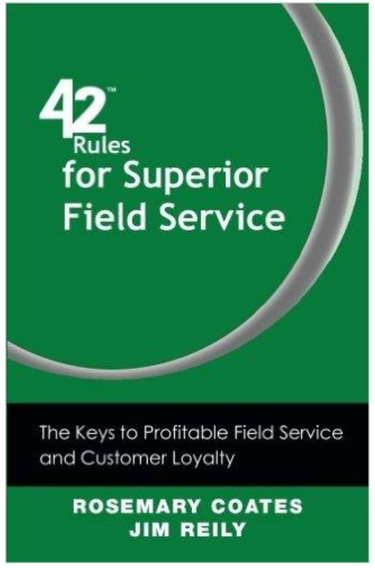
Check out the Global Workshop Dashboard

Autodesk Product
Design & Mfg Zone
Booth Number # 1031

Resource Reminder







Follow up Book Offer

- Email me at Kevin.Robinson@Autodesk.com your first pass ***Target Outcome*** and a **Vision Pitch or Stakeholder Flow**
- **Qualifying items:**
  - **Deadline – 1/15/16**
  - **Not a ADSK employee or reseller**
  - **Attended the class**
  - **Complete a survey**

How did I do?

- Your class feedback is critical. Fill out a **class survey** now.
- Use the AU mobile app or fill out a class survey online.
- Give feedback after each session.
- AU speakers will get feedback in real-time.
- **Your feedback results in better classes and a better AU experience.**

Thank you and have a great AU 2016!

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