



WE DELIVER RESULTS THROUGH DIGITAL TRANSFORMATION

IoT, IIoT, Industry4.0, Predictive Analytics

What's in it for You?

IoTco

250 E. 5TH ST

CINCINNATI, OH 45202

www.IoTco.com

Mo Abuali

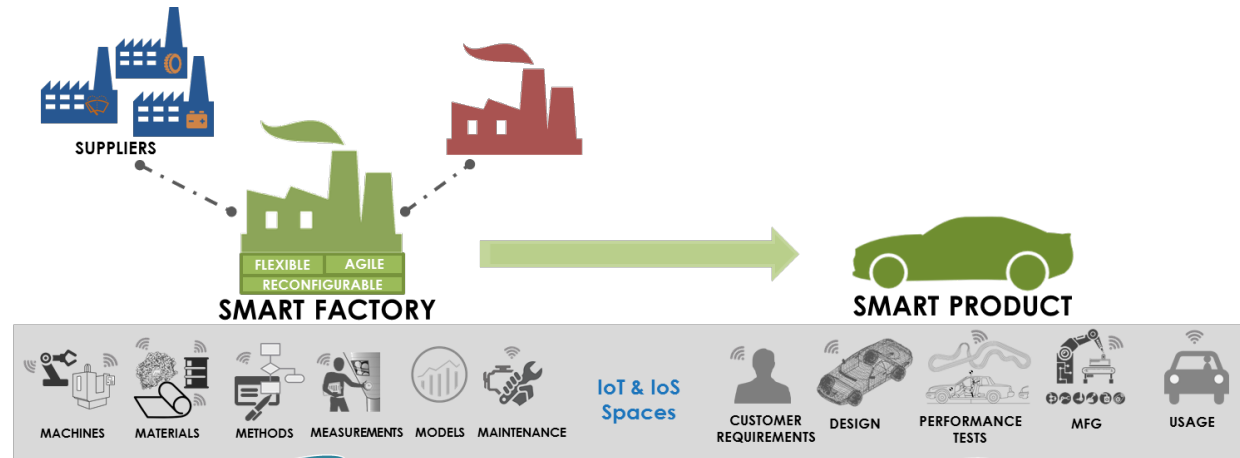
Managing Partner | PhD Industrial Engineer

[Abuali @ IoTco.com](mailto:Abuali@IoTco.com)

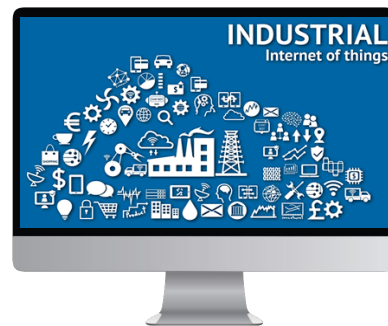
Our Expertise



Domains



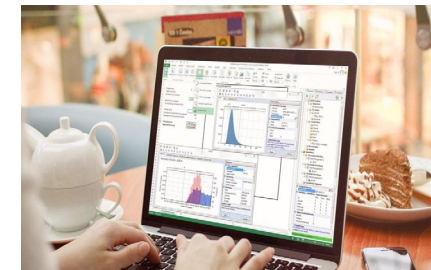
Practices



Industrial IoT
MES / OEE Software
Turnkey & Automation Services



Predictive Analytics
PDX Software
Analytics as a Service



IoT Academy
Digital Transformation
Consulting & Training Services

Our Clients



- Automotive



SHILOH



- Manufacturing



MAKINO



- Heavy Industry



- OTHER





IoT | IIoT | 4IR | Predictive Analytics



Technology and Use Cases



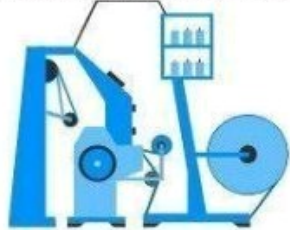
How to Start Your Journey

The 4th Industrial Revolution Is Upon Us.

FROM INDUSTRY 1.0 TO INDUSTRY 4.0

FIRST INDUSTRIAL REVOLUTION

Introduction of mechanical production facilities with the help of water and steam power



1784

First mechanical loom

SECOND INDUSTRIAL REVOLUTION

Introduction of a division of labor and mass production with the help of electrical energy



1870

First assembly line

THIRD INDUSTRIAL REVOLUTION

Use of electronic and IT systems that further automate production



1969

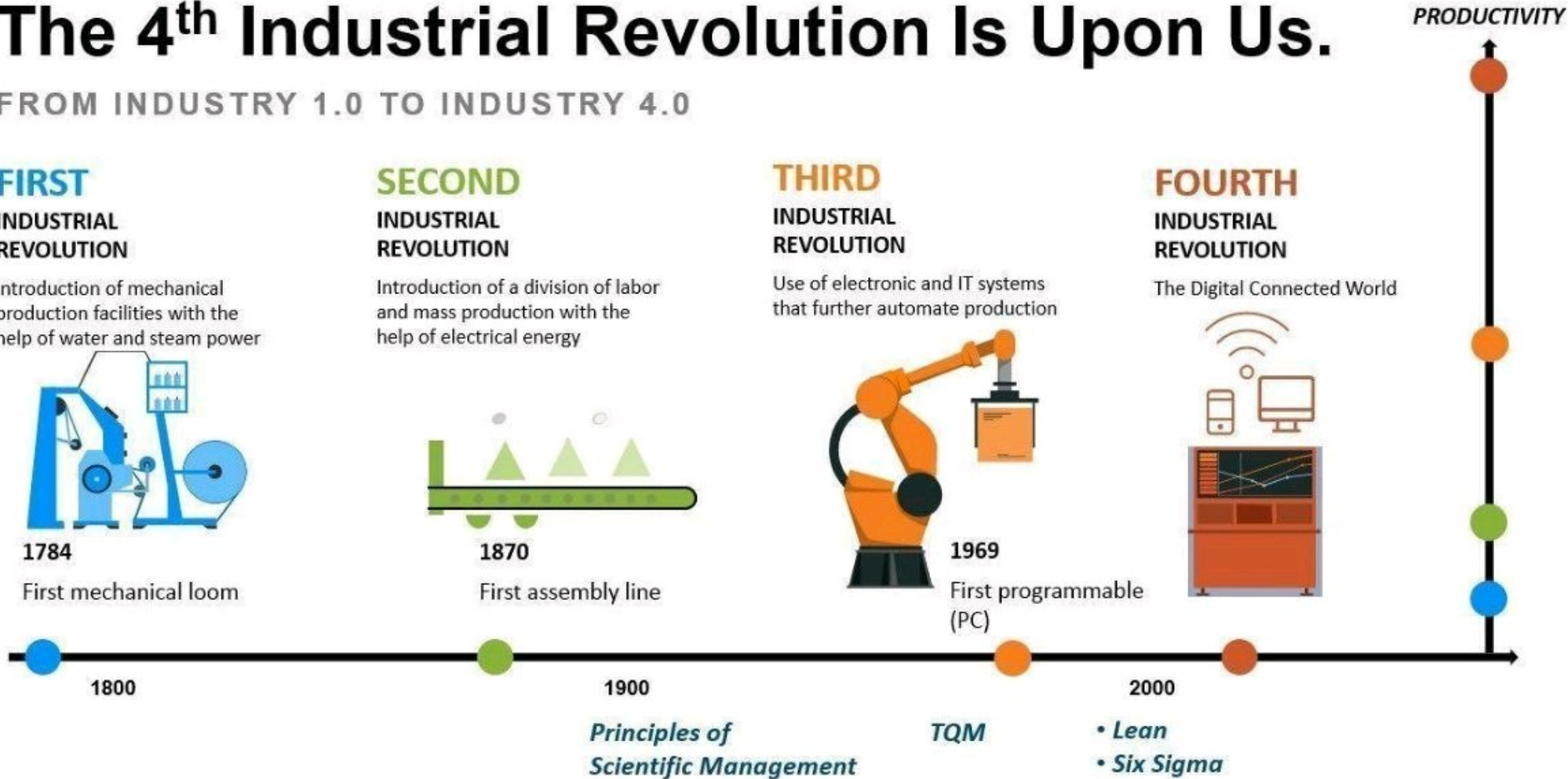
First programmable (PC)

FOURTH INDUSTRIAL REVOLUTION

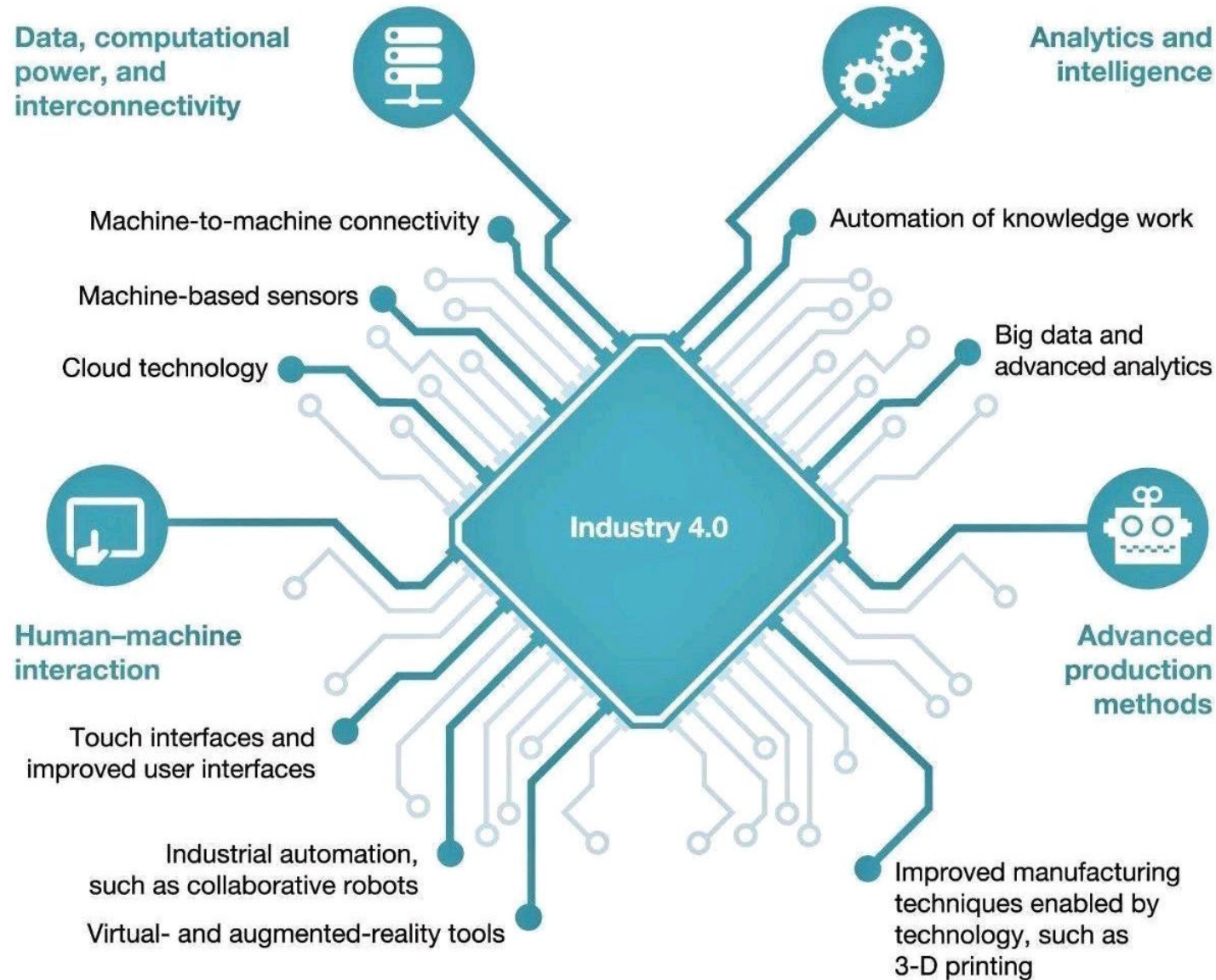
The Digital Connected World

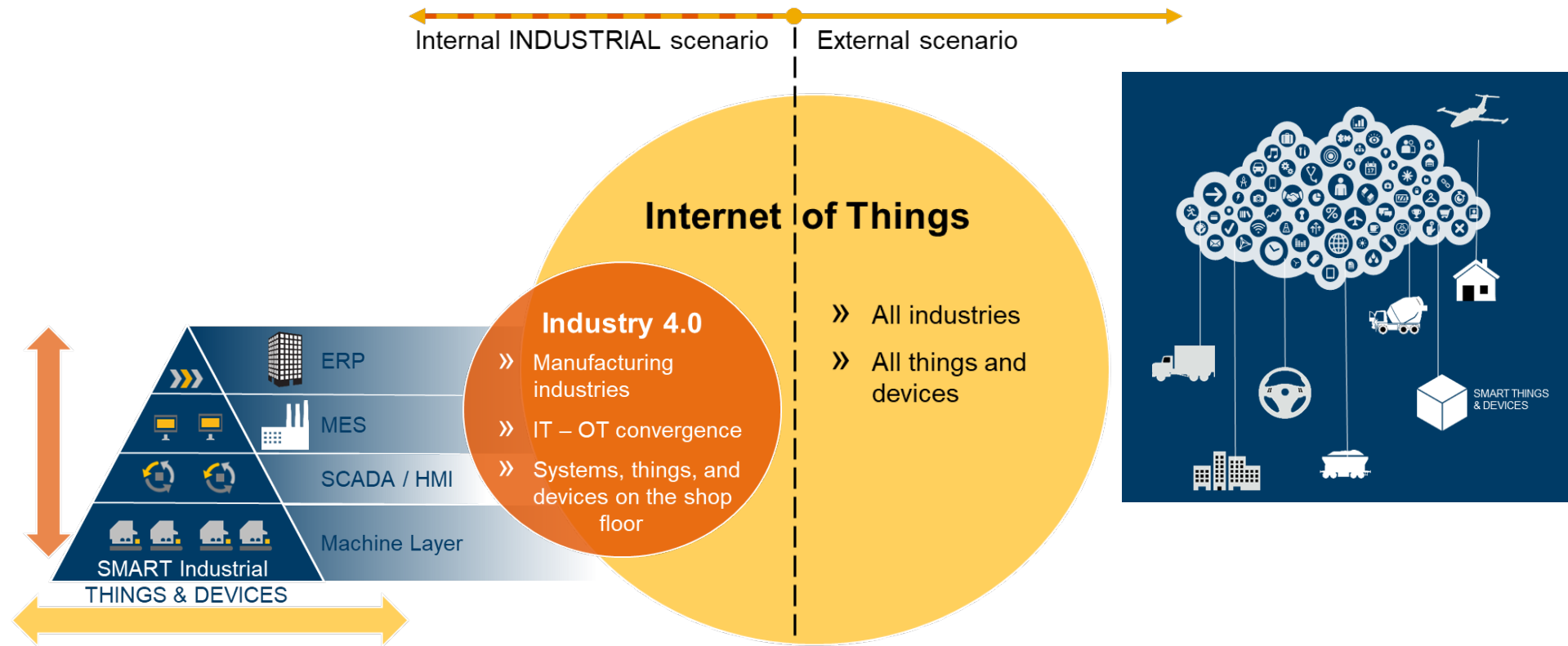


PRODUCTIVITY



Industry 4.0 results from the emergency of 4 disruptive technologies...





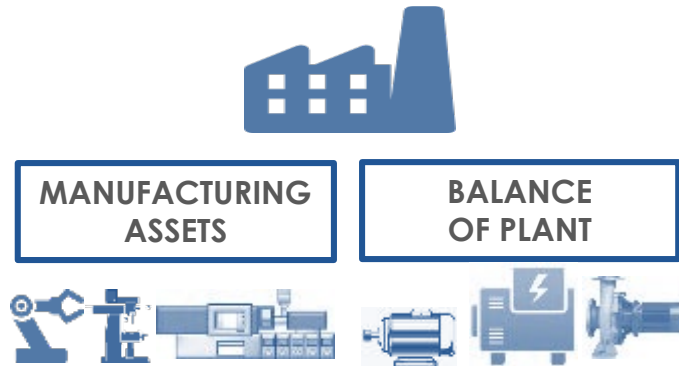
Digital Transformation Strategy



Start with the BUSINESS CASE



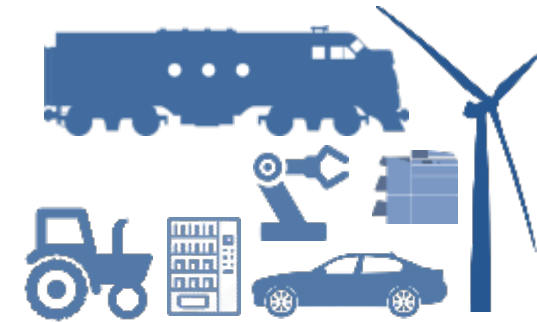
SMART FACTORY



- Improve Uptime (OEE)
- Optimize Spare Part Management
- Predictive Quality
- Process Optimization

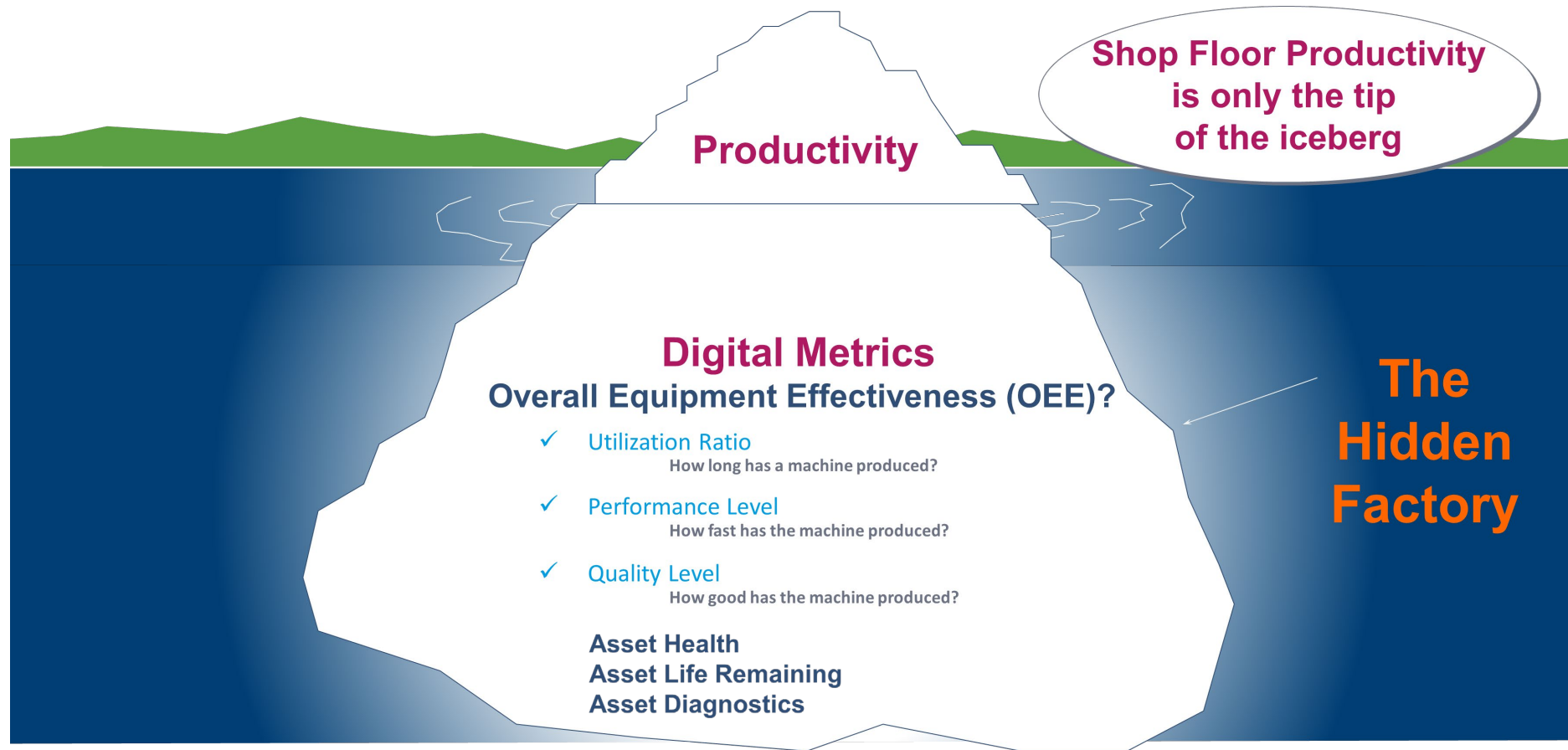


SMART PRODUCT

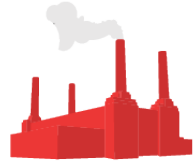


- Remote Monitoring and Diagnostics for Warranties
- Analytics as a Service
- Closed-Loop Design

Smart Connected FACTORY is about... “Real time METRICS”



Smart Connected FACTORY



500

Robots in a Factory



\$10,000

Average Cost of 1-Minute
of Downtime



30

Number of Robot Failures
During Production in 1 Year



30 minutes

Average Unplanned Downtime
for Each Robot Failure

\$300,000

Cost of a Single Robot Failure

50%

Assumed Numbers of
Failures FS Predicts

\$4,500,000

Estimated Annual Savings per Factory

Smart Connected FACTORY REALIZATION



Smart Connected PRODUCT

KOMATSU

*“Predictrionics **exceled over other competitors** in terms of data processing and detection accuracy as well as feasibility, but we were mostly **impressed by their distinguished amount of experience.**”*

– Hisashi Asada



MINING SITE



LAST RECORDED DATA
10-17-2016 07:08 AM

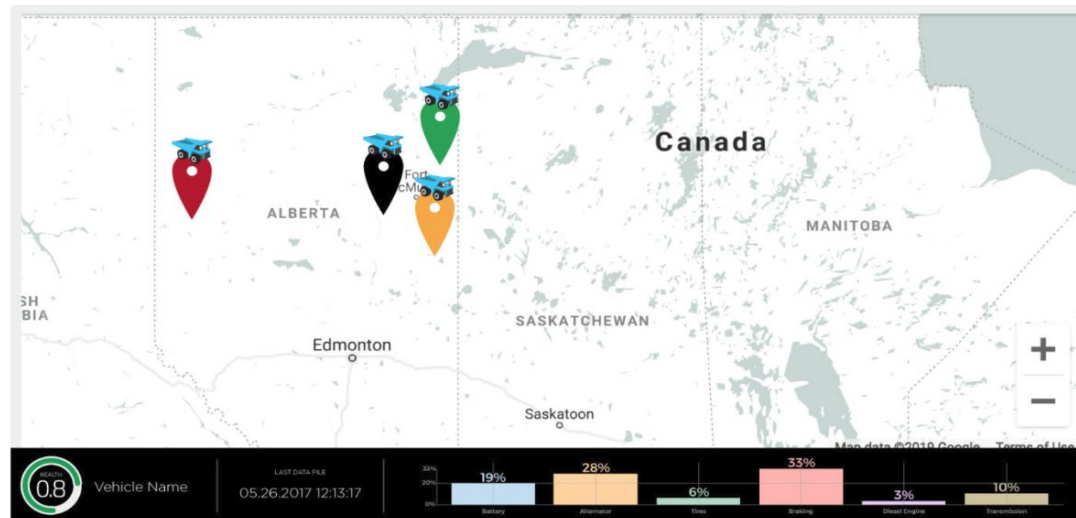
SUB-LEVELS
2

DATA FILES
NA



FLOOR PLAN

SUB-LEVEL HEALTH OVERVIEW



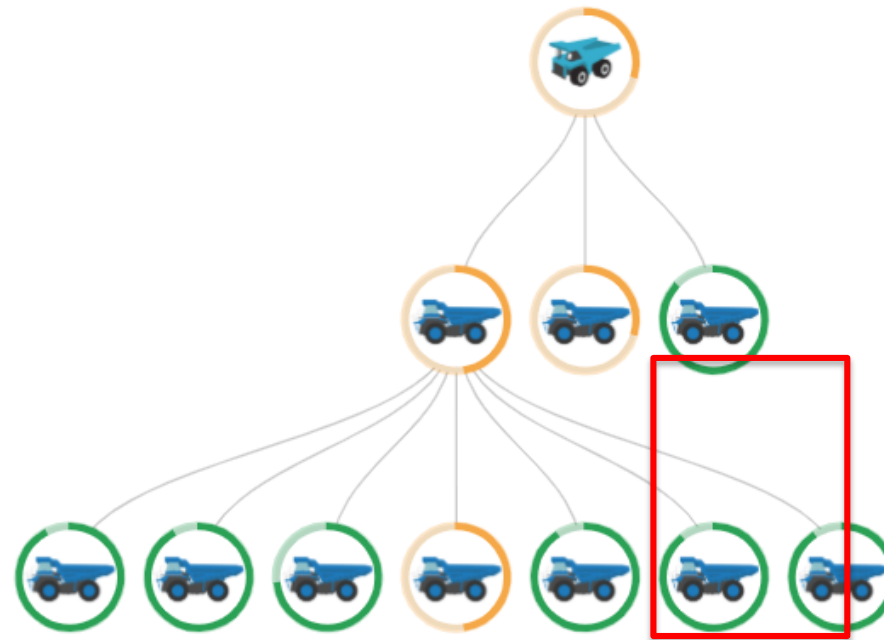
KOMATSU

MINING SITE



Health Indicator

TREE GRAPH ▼





IoT | IIoT | 4IR | Predictive Analytics



Technology and Use Cases



How to Start Your Journey

***One minute of unplanned downtime
can cost tens of thousands of dollars.***

Predictive Analytics takes the guesswork out of production and maintenance planning, replacing it with accurate **predictions** that allow for a **worry-free process**.





Industrial Robots

Servo-Motor
Torque Monitoring

Fleet-based
Peer-to-Peer
Analytics



Machine Tools

Non-intrusive
Performance
Monitoring

Tool Condition
Monitoring

Spindle / Bearing
Performance
Monitoring

Feed-Axis
(Ball Screw) Health
and Life Prediction

Coolant Analysis
and Diagnosis

Alarm & Fault
Mining



Stamping Machines

Vibration-based
Fault Detection

Acoustic-based
Analytics



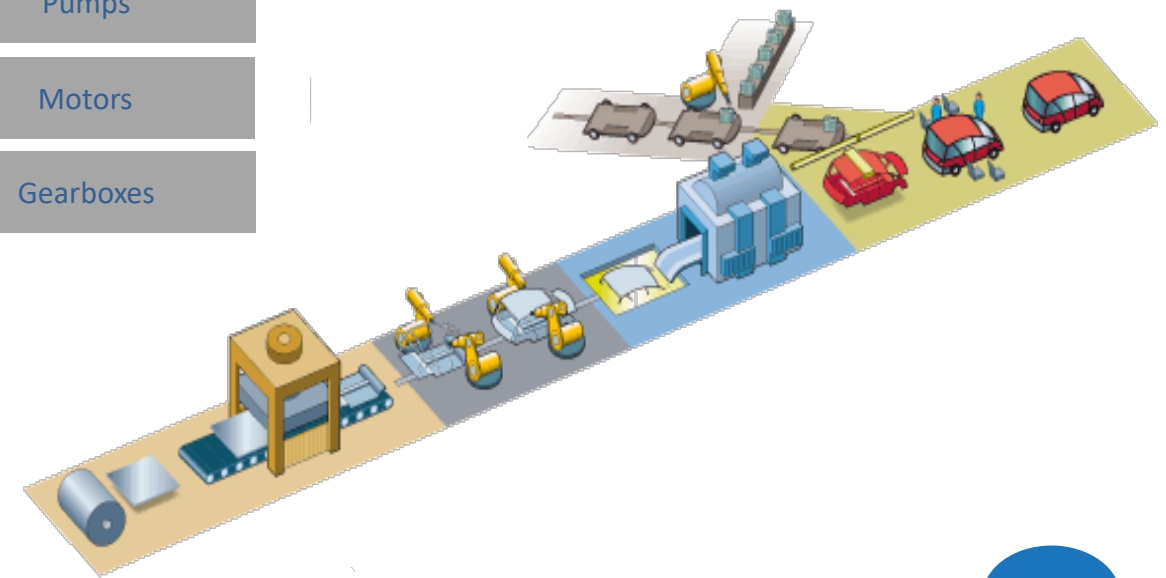
Ancillary Equipment

Compressors / Chiller
Surge Map Modelling

Pumps

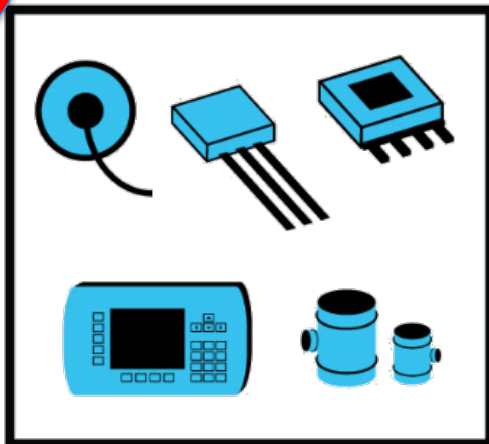
Motors

Gearboxes



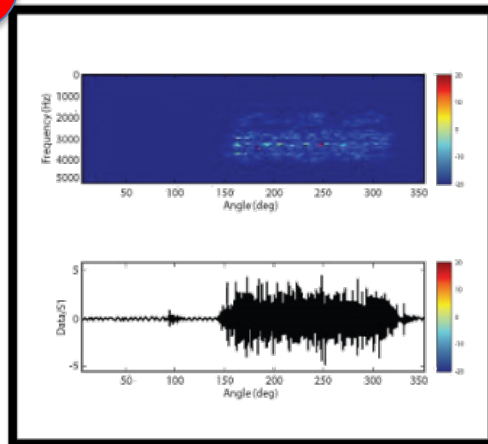
1

Data Collection



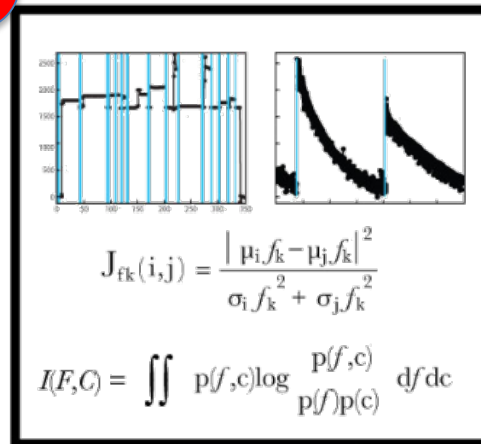
2

Signal Processing

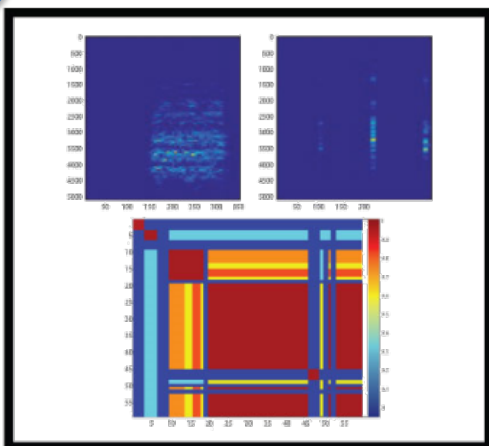


3

Feature Extraction

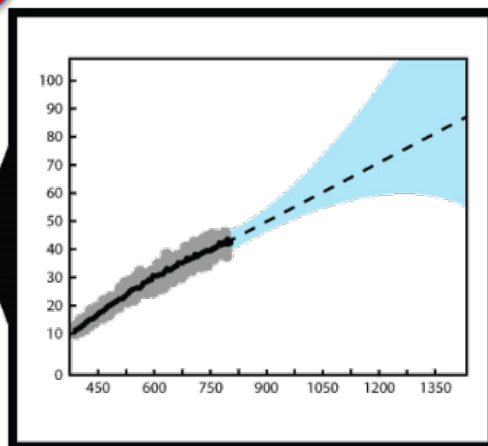


6



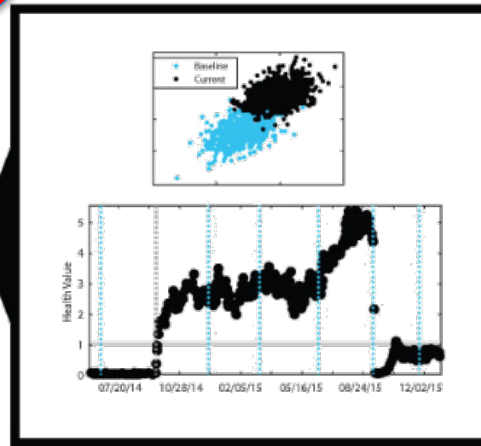
Fault Diagnosis

5



Trending / Prediction

4



Health Assessment



IoT | IIoT | 4IR | Predictive Analytics



Technology and Use Cases



How to Start Your Journey

Find Your “Proof of Value”



Think Big → Start Small → Prove Value → Scale Fast

Discovery

- Assemble Team
- Identify Plant
- Secure reference material, regarding infrastructure, data and processes

Conduct Workshop (Site Visit)

- Reconfirm process documentation with current shop floor activities.
- Detailed infrastructure review
- Confirm critical work centers and data collection points.
- Discuss reporting requirements.

GAP Analysis

People

Process

Tools

Identify the ideal end state, but focus on those areas which will achieve a ROI.

Statement of Work

Hardware

Software

Services

Assemble proposal, highlighting required components, such as infrastructure, sensors, software and services..

Proof of Value

Review findings with business leaders, project sponsor etc. and determine path forward.

Preparation

Workshop

Execution

Call to Action



- ✓ Start your **Digital Transformation** Journey Today. **Think Big, Start Small.**
- ✓ Make it **Operational** and obtain a **Proof of Value.**
- ✓ Achieve a **Smart Connected Factory with Zero-Downtime / Zero-Defect Vision.**
- ✓ Leverage **Smart Connected Products** to provide your end users further value.
- ✓ Find your weak link: **People, Process or Technology.**
Benefits only accrue as far as the weakest link.

Where are you in YOUR journey?



IoTco, LLC
250 E. Fifth Street ▪ Suite 1500
Cincinnati ▪ OH 45202, USA



+1 (513) 813-8777



info@IoTco.com



www.IoTco.com

Mo Abuali

CEO | PhD Industrial Engineer

[Abuali @ IoTco.com](mailto:Abuali@IoTco.com)