Manufacturing and Supply Chain in the Cognitive Era

Industry 4.0 Conference

Krish Dharma

Director – Industry Solutions, Automotive and Aerospace and Defense

kdharma@us.ibm.com

IoT is changing the way enterprises engage with people and is driving digital disruption.

Transforming Professions


Field worker safety


Emergency response


Customer service


Smart law enforcement


Manufacturing

Engaging Customers


Payments


Wellness


Banking


Healthcare


Amusement parks

Embedded sensors

Cognitive Analytics

Pervasive Connectivity

Product Lifecycle Management

Cloud Computing

Creating new products and business models

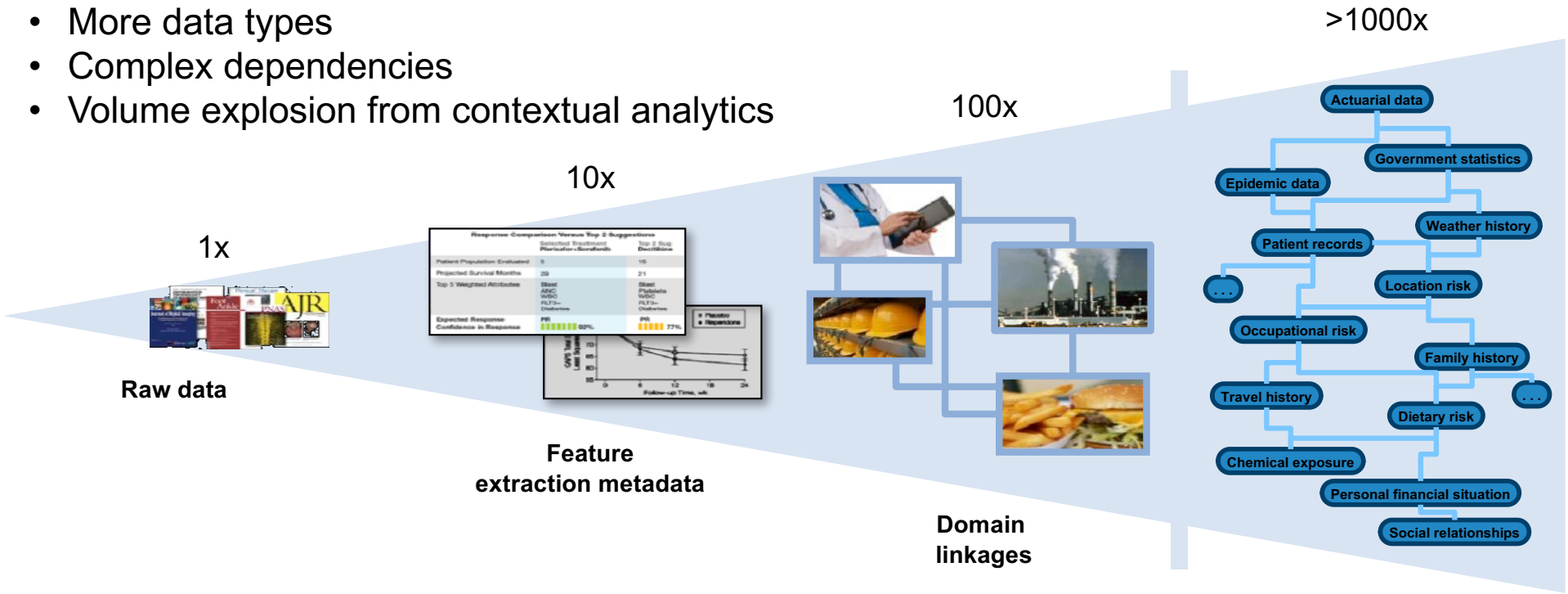
Improving operations and lowering costs

Driving engagement and customer experience

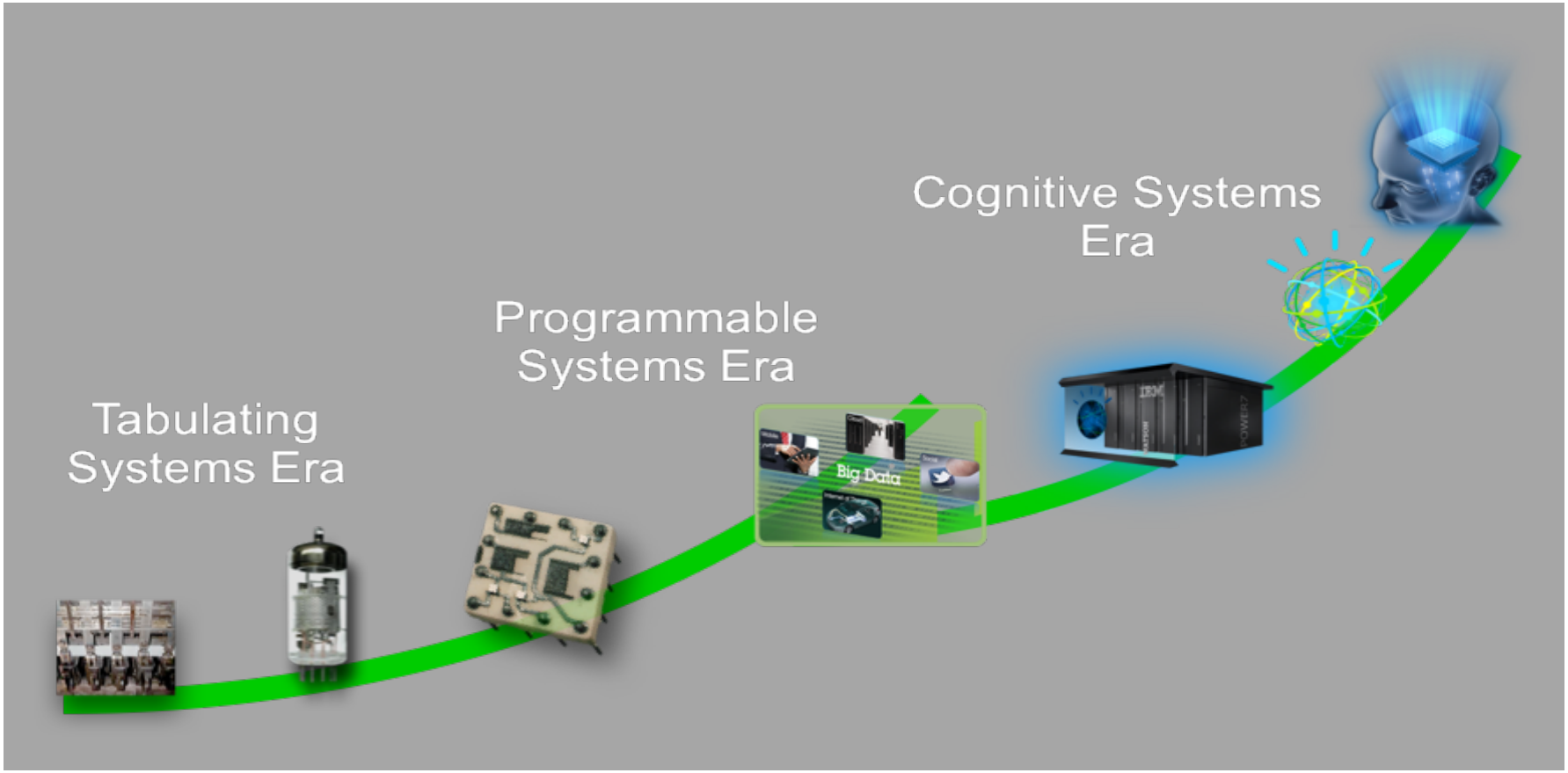
Sharp decreases in infrastructure costs over the last 10 years are driving the IoT revolution.

IoT creates data and computing overload…

- More data from more sources
- More data types
- Complex dependencies
- Volume explosion from contextual analytics



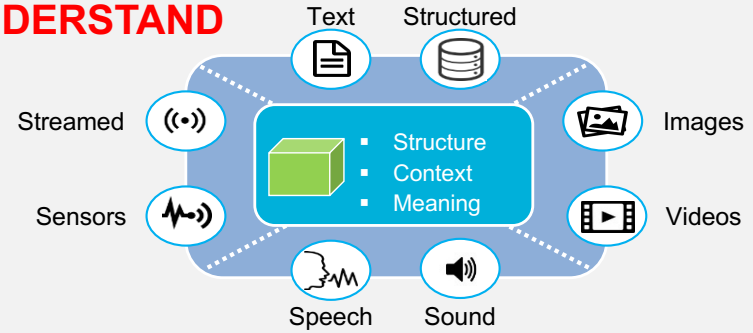
… driving the need for a new era of cognitive computing.



What does Cognitive Computing do?

1. Understands Big Data

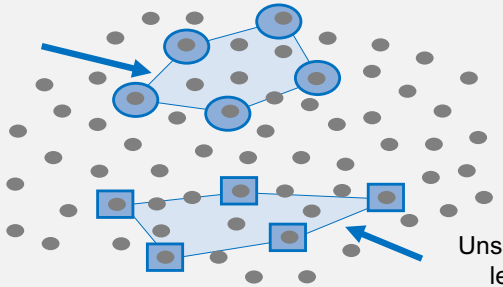
UNDERSTAND



2. Mines and finds patterns

ANALYZE

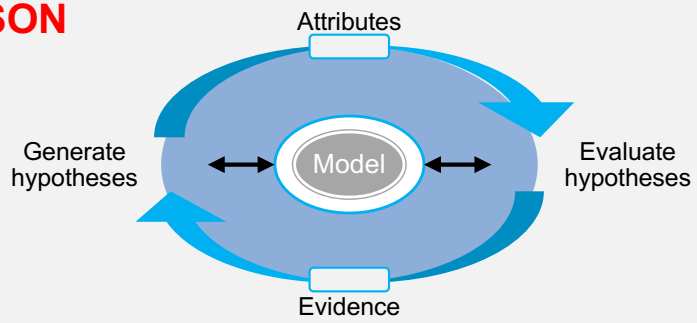
Supervised learning (DETECT)



Unsupervised learning (DISCOVER)

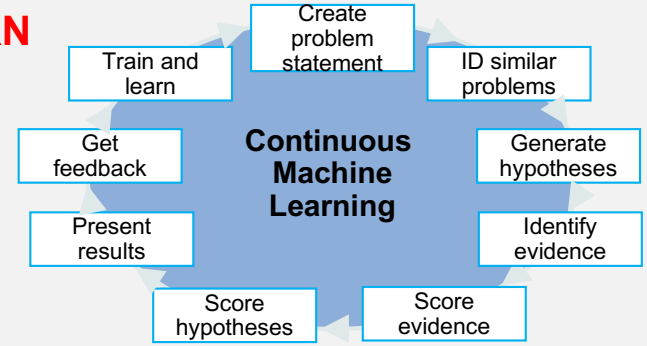
3. Evaluates possible options

REASON

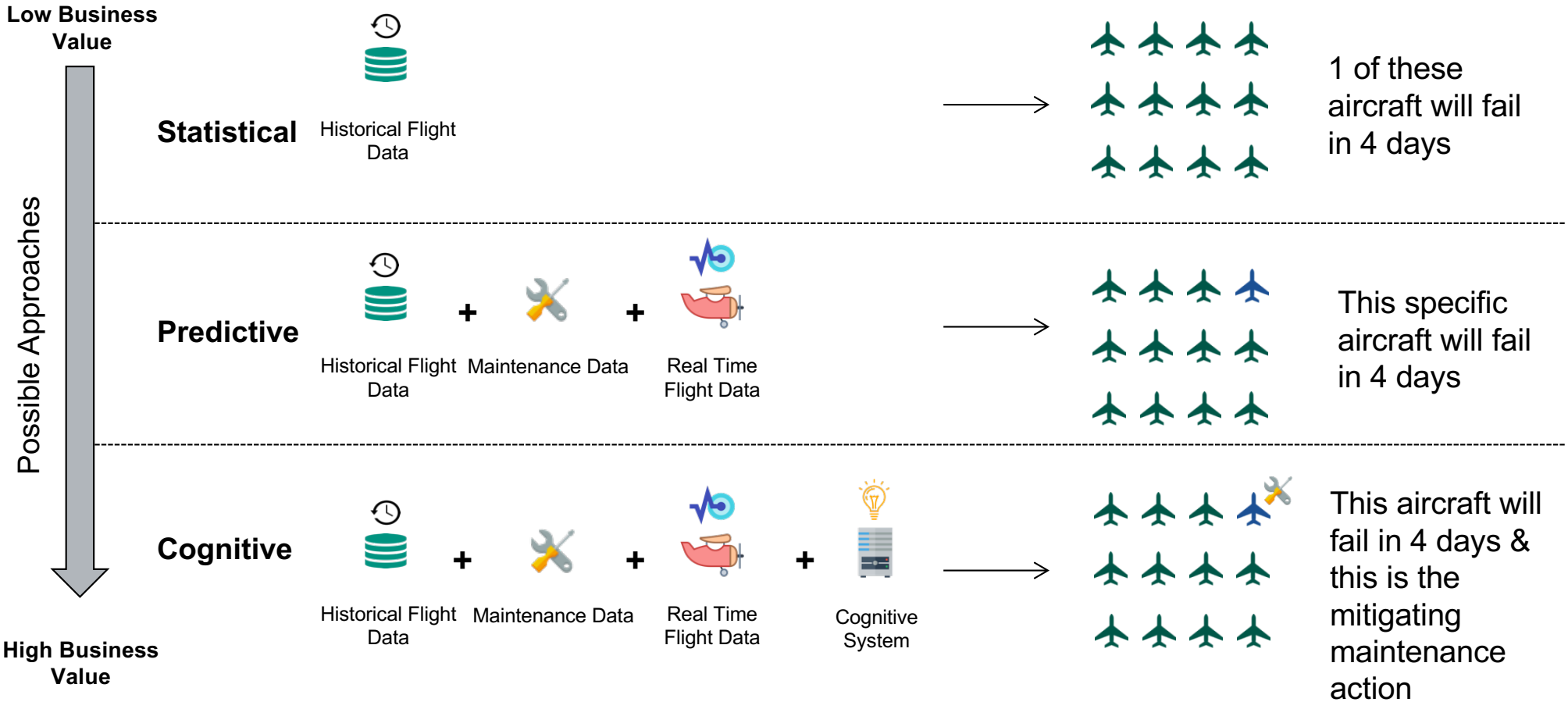


4. Learns and improves

LEARN



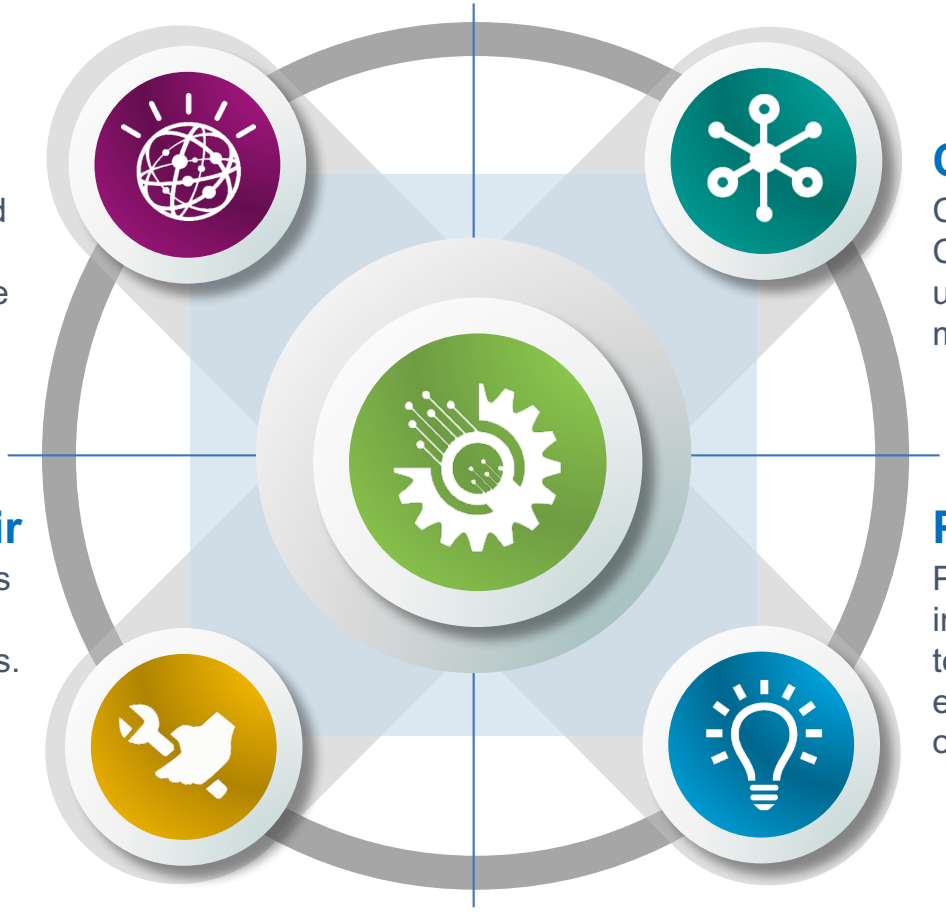
IoT and analytics technologies identify and predict problems; Cognitive systems learn and prescribe solutions.



Simplified Capabilities Framework for Cognitive Manufacturing & Supply Chain

Learn and Advise
Transform your process and operational performance through continuous machine and human learning.

Optimize and Repair
Plan and optimize resources and repair machines, parts, and tools based on analytics.



Connect and Collect
Connect systems and sensors. Collect and curate structured and unstructured data to understand, monitor and improve operations.

Predict and Act
Predict operational issues, impending failure/breakage, time to failure and probable cause to enhance and automate operations and decision-making.

Cognitive Manufacturing & Supply Chain solutions drive cost savings and operational efficiency across the factory value chain

Intelligent assets and equipment

Intelligent assets and equipment utilizes IoT and cognitive capabilities to sense, communicate and self-diagnose issues to optimize their performance and reduce unnecessary downtime.

34%
Decrease in equipment downtime at major global auto manufacturer

Cognitive processes and operations

Cognitive operations and processes bring more certainty to business by analyzing information from workflows, context and environment to drive quality, enhance operations and decision-making.

25%
Increase in overall productivity at major European automaker

Cognitive Supply Chain optimization

Utilize analytics and cognitive insight to build and optimize a dynamic value chain by connecting the extended ecosystem to accelerate innovation.

30%
Reduction in WIP and finished good inventory and reducing cycle time

Cognitive Manufacturing Example - Watson IoT Equipment Advisor

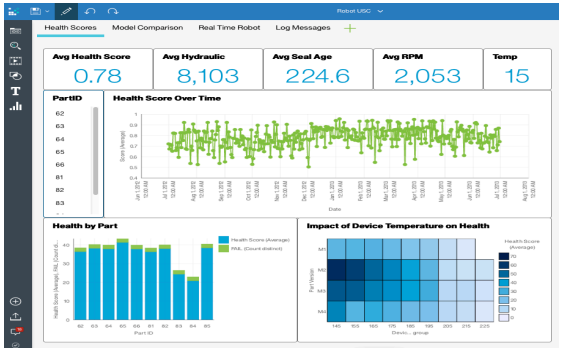
Connect, Predict, Repair and Optimize your equipment with IoT and the power of Watson

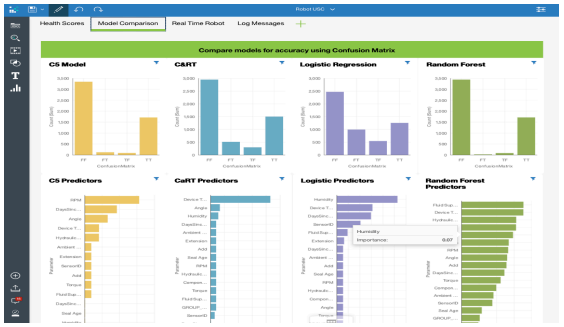
4 Machine Learning models continually sweep for non-obvious patterns

3 Predictive Analytics evaluates equipment status and operations provides early warning

5 Watson Explorer harvests insights from documents, manuals and correspondence

6 Visualizations are immediately updated displaying asset early warning





IBM **Watson IoT**

Predictive

Cognitive

Bluemix

7 Watson IoT Equipment Advisor assists with interactive diagnostics and manual data mining

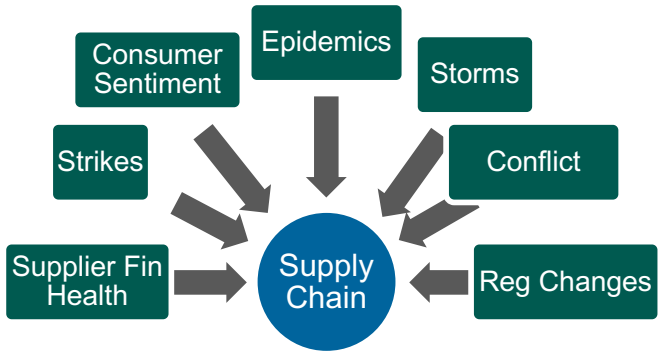
2 Data comes in through Watson IoT Platform Connect

-Robots
-Process Equipment
-Transformers
-Turbines
-Engines

1 Sensors and PLCs provide information about the device

8 Watson IoT Equipment Advisor collects response effectiveness to enhance corpus & machine learning models

Cognitive Supply Chain Example - Supply Chain Risk Insights



Cognitive Supply Chain Risk Insights with Watson – high-level solution design

Social Media Analytics

IBM | The Weather Company

IBM

Social Listening Tool

US Navy Weather forecasts

Big Data

Text Analytics

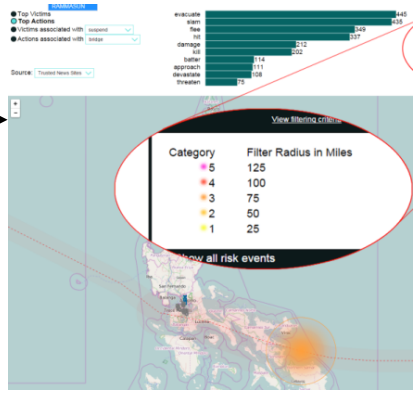
Identify, Predict Assess Events that impact IBM

Watson Content Analytics

Event

Visualization

Geo Spatial Mapping of event to IBM Supply Chain



API Alerts

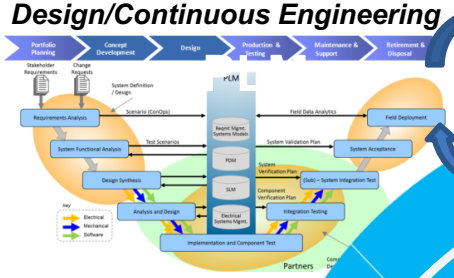
API Alerts

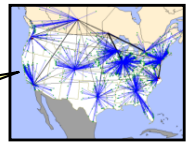
Solution(s)

Transparent Supply Chain

Other Analytics Platform

Cognitive Manufacturing & Supply Chain : A Complex Cyber Physical System





Transaction Systems of Record

Predictive Analytics Systems

IOT Data at the Edge Systems

Dynamic Scheduling System

Monitoring/ Visualization

Cognitive Systems

Horizontal + Vertical Integration