Introduction to Connected Facilities Management 2018

Praveen Rao
Digital Solutions Leader
Global business services
IBM

Thought for the day - Digital technologies are revolutionizing the industry

- What worked for your business yesterday may not work tomorrow.

World's largest transportation company… owns no vehicles	**World's biggest media company… creates no content**	**World's most valuable retailer… has no inventory**	**World's largest accommodation provider… owns no real estate**	**World's largest video conference company… has no telco infrastructure**

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Transformation is focused on value driven outcomes...

Making markets:
Using IoT to create new markets of untapped demand.

Making their competitors irrelevant:
Using IoT to become the company in the market to beat.

Becoming the **keystone of an ecosystem** to provide platforms and services that make a company and it's customers more valuable as their ecosystem grows. The company's competitors may even need to use their data and services to compete.

And on the new competencies to be acquired and nurtured

Experiencing the consumer experience

Fortifying brand equity

Reshaping competitive landscapes

Establishing a dynamic response team

Collaborating & interacting with technology

Assimilating automation

Industry Disruption

New Competencies

New Outcomes

New Perspectives & Approaches

New Discoveries & Advancements

New Ways of Working

Vision for the connected facilities management

Building Optimization with IoT
BUSINESS IMPERATIVES

Through the use of cognitive analytics, sensors, and existing building systems, significantly improve your occupant experience and reduce your total building infrastructure operations.

20%
SAVINGS ON TOTAL BUILDING OPERATIONS COST

Enhance Occupant Workspace Environment and Engagement

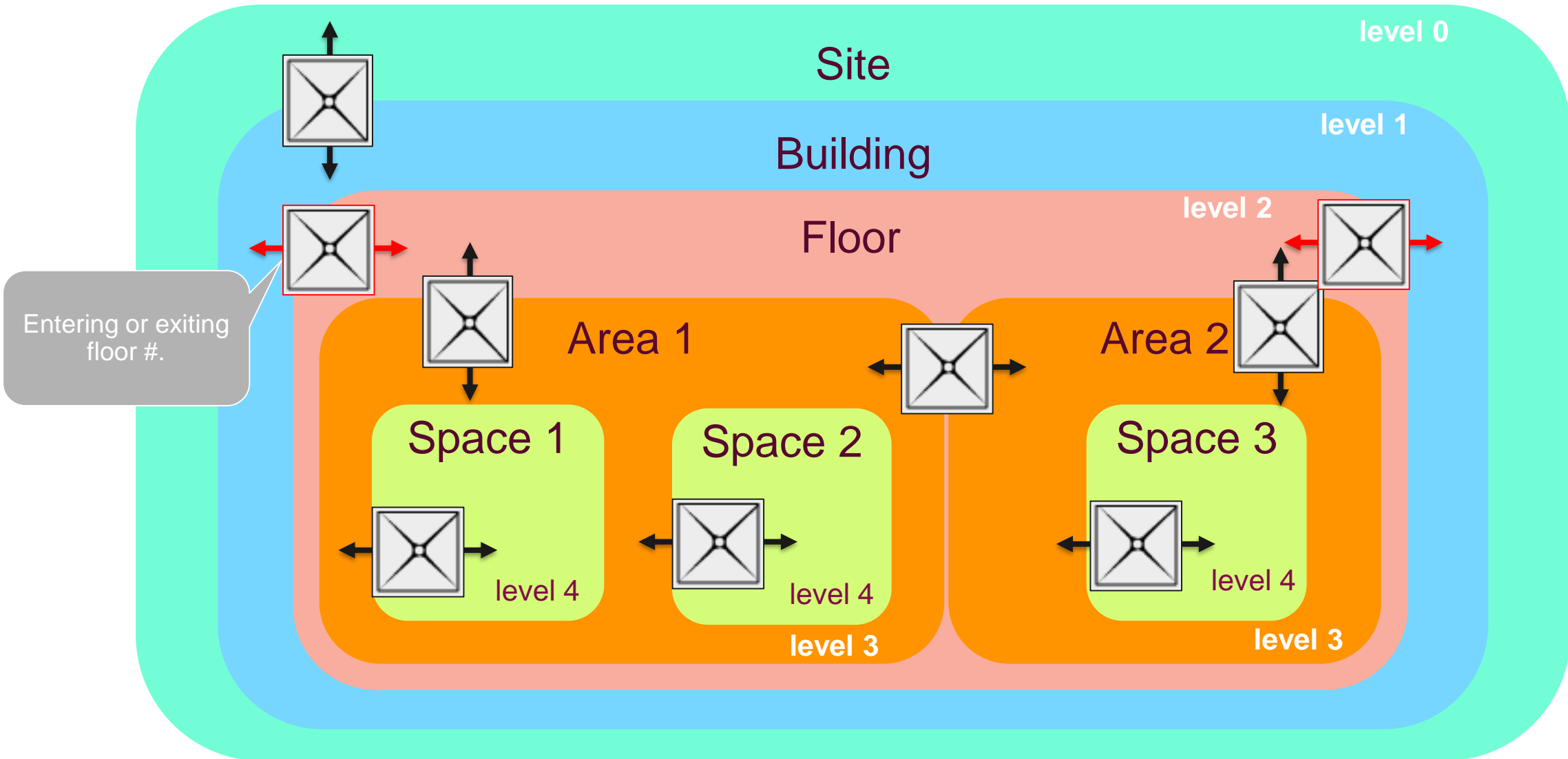Redefining today's workspace environments. Focusing on foresighting occupant needs.

Optimize Building Maintenance and Improve Services

A new breed of smart buildings. Creating better environments from richer data and predictive analytics.
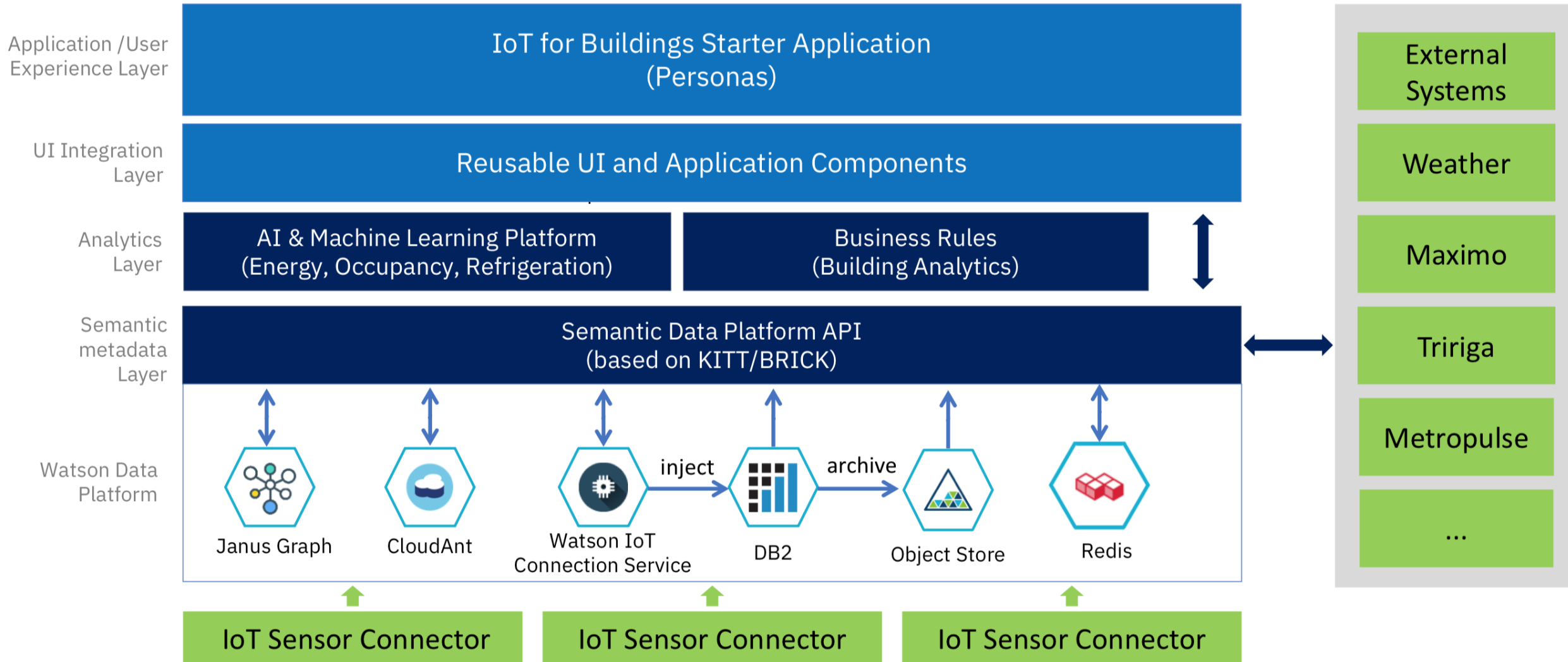
Reduce Costs and Increase Operational Efficiency

Maximizing operational efficiency and quality control to reduce work order inefficiencies.

IBM's POV on Buildings Physical Hierarchy

Site — level 0

Building — level 1

Floor — level 2

Entering or exiting floor #.

Area 1 — level 3

Area 2 — level 3

Space 1 — level 4

Space 2 — level 4

Space 3 — level 4

Logical Architecture for connected FMs

Application /User Experience Layer

IoT for Buildings Starter Application
(Personas)

UI Integration Layer

Reusable UI and Application Components

Analytics Layer

AI & Machine Learning Platform
(Energy, Occupancy, Refrigeration)

Business Rules
(Building Analytics)

Semantic metadata Layer

Semantic Data Platform API
(based on KITT/BRICK)

Watson Data Platform

Janus Graph

CloudAnt

Watson IoT
Connection Service

inject

DB2

archive

Object Store

Redis

IoT Sensor Connector

IoT Sensor Connector

IoT Sensor Connector

External Systems

Weather

Maximo

Tririga

Metropulse

...

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IBM Connected facilities offerings

Occupant Experience

Workstation Availability
Locate available workstations

Wayfinding
Find office assets and colleagues

Cognitive Concierge
Assistant for all building requests

Sentiment Analysis
Track occupant satisfaction

Cognitive Rooms
Voice and display enabled rooms

Intelligent Parking
Find parking spots easily

Operational Efficiency

Energy Analytics
Analytics to prevent energy waste

Weather Optimization
Weather data for heating and cooling

Water Conservation
Identify and reduce water waste

Visitor Management
Modern and secure visitor check-in

Cognitive Security
Automate surveillance and car access

Elevator Optimization
Streamline elevator request management

Maintenance Optimization

Predictive Maintenance
Fix problems before they happen

Intelligent Restroom
Optimize cleaning schedules and service
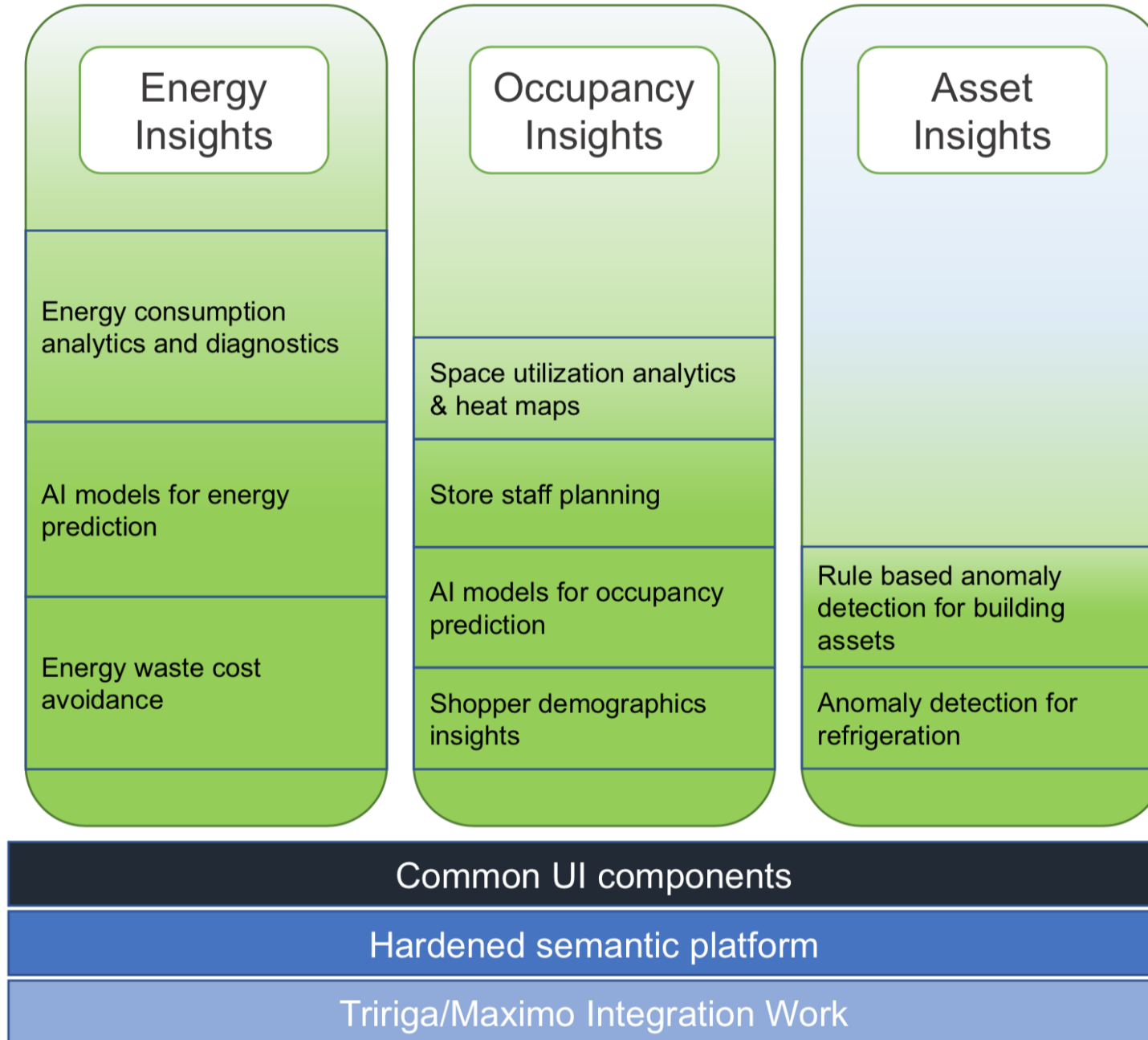
Indoor Air Quality
Maintain optimal air quality

Just in Time Maintenance
Address issues before they worsen

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New offerings in the next release in 2018

Energy Insights
- Energy consumption analytics and diagnostics
- AI models for energy prediction
- Energy waste cost avoidance

Occupancy Insights
- Space utilization analytics & heat maps
- Store staff planning
- AI models for occupancy prediction
- Shopper demographics insights

Asset Insights
- Rule based anomaly detection for building assets
- Anomaly detection for refrigeration

Common UI components

Hardened semantic platform

Tririga/Maximo Integration Work

Energy Management solution

1) Monitor & Model

Solution captures baseline consumption of a building using an adaptive machine-learning model that explains the consumption by the individual influences such as day of week, weather, occupancy, etc.
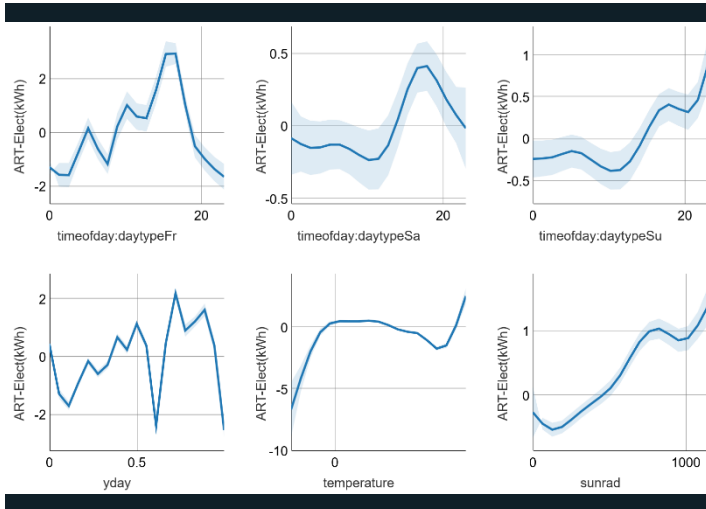
2) Predict & Detect

Solution computes a forecast of the expected energy consumption using the model. It then compares the real consumption with the prediction and any observation falling outside the forecast is considered as an anomaly.
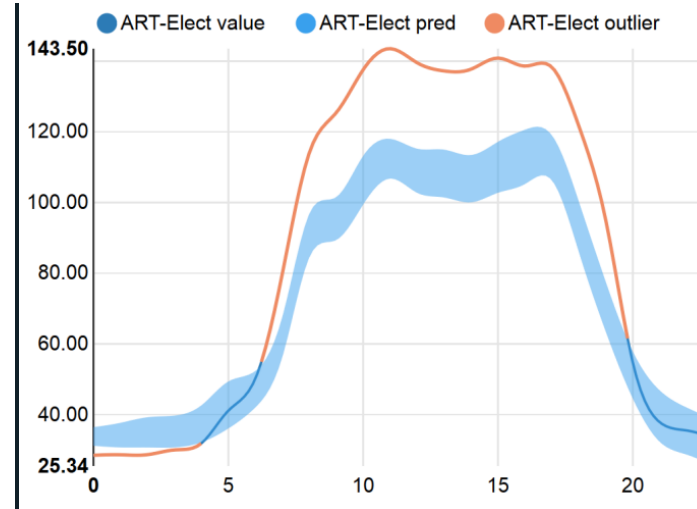
3) Diagnose & Explain

If anomalies are detected, e²-diagnoser will track the anomalous behavior down to the submeters that caused the anomaly using the meter hierarchy. The models then can help to explain the cause of the anomaly.
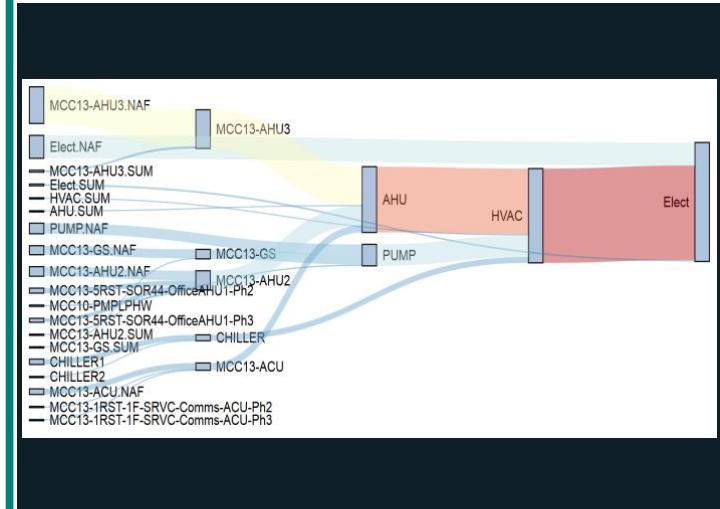
Occupancy Insights:

An IoT enabled solution-as-a-service that integrates and analyzes data from video feeds inside of a building to provide insights on people such as count, demographics, preference etc.

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Unutilized and unsynchronized IoT data is leading to a lack of potentially derivable insight

Problem
IoT devices in the buildings environment are not being utilized to their full capabilities because the data they produce is not harmoniously deriving insight through one platform.

Solution
By accessing near real time equipment data at the stores through a single platform, retailers can focus on improving store operations while providing superior customer experience in the stores.

Benefits
- Increase asset reliability and uptime
- Improve store sales and operational efficiency
- Maintain food freshness
- Reduce maintenance cost
- Reduce energy consumption

Solution Components

Member Behavior
Associate Behavior
Refrigeration
Food Equipment
POS & IT Equip.
Lighting
HVAC

Watson

Predictive Analytics & Insights

The Weather Company
An IBM Business

IBM Metro Pulse
Powered by Watson

External Data

What the Solution Does:
In partnership with a vast ecosystem of partners, our **Connected Store** solution delivers real time insights for winning and keeping Members through superior shopper experience, better management of ques at the counter and right inventory levels

Use cases/Reference

Floor Level Utilization
- Deliver Insights to Corporate Real Estate to make portfolio decisions matching business demand for space
- Sensors installed on Floor access points

Space Level Utilization
- Deliver Insights to Space Planners to make space design decisions matching business demand for space
- Sensors installed in key spaces on the floor

Employee/Visitor Engagement
- Empower Employees and Visitors with a Workplace Services App to enhance their building experience.

Clients

eir

AMERICAN EXPRESS

WPP

Give Us A Store Program

Perform a Workshop
- Validate benefits case
- Confirm use cases
- Establish Pilot KPIs

Facilitate a Pilot
- Refine solution
- Develop business case
- Monitor performance against Pilot KPIs

Evaluate Pilot Success
- Confirm solution
- Confirm performance against KPIs
- Confirm business case and high level production roadmap

Deploy
- Roll out and Scale up production

IBM's combined expertise in Connected Store delivers high-impact results

We are Different
IBM can be a strategic partner, as we provide end-to-end services:
- Insights to improve store operations based on Watson Analytics
- Connectivity of devices to the cloud
- Integration of that data with work order management systems
- Wide array of ecosystem partners bringing their unique strengths

Insight at your fingertips
- Prioritized Store Insights delivered to the store and regional managers
- Automated work management, vendor tracking and SLA monitoring
- Provides Store Manager with interactive 360 view of store via SAM app
- Mobile enabled dashboard developed with Apple partnership

Ecosystem of World Renowned Partners
Honeywell   SIEMENS   CISCO
PHILIPS   ARROW ELECTRONICS, INC.   beco   IBM
ZEBRA

Asset insights offering as part of connected facilities

Connected Facilities:
An IoT enabled solution-as-a-service that integrates and analyzes data from many retail IoT components into a single platform that store-personnel can use to be proactive instead of reactive.

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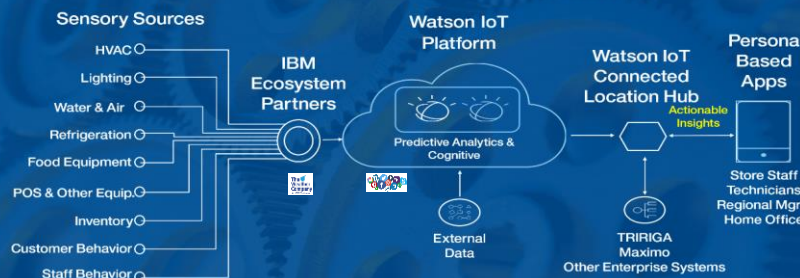
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Solution Components

Watson IOT Connected Store solution components

Sensory Sources
- HVAC
- Lighting
- Water & Air
- Refrigeration
- Food Equipment
- POS & Other Equip.
- Inventory
- Customer Behavior
- Staff Behavior

IBM Ecosystem Partners

Watson IoT Platform — Predictive Analytics & Cognitive — External Data — TRIRIGA Maximo Other Enterprise Systems

Watson IoT Connected Location Hub — Actionable Insights

Persona Based Apps — Store Staff Technicians Regional Mgrs. Home Office

What the Solution Does:
In partnership with a vast ecosystem of partners, our **Connected Store** solution delivers real time monitoring of refrigeration, HVAC and Electric in the store, provides on-edge analytics, advanced prediction models on Watson IOT, and Automated Insights to TRIRIGA and SAM

Results/Reference

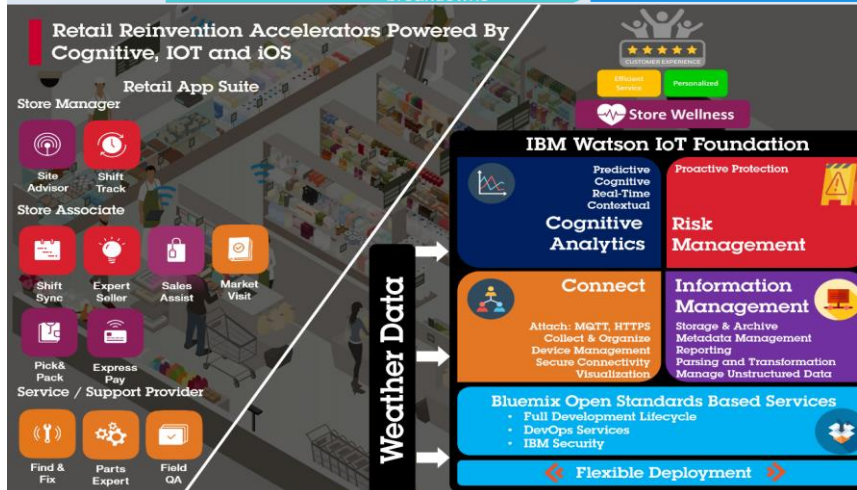Based on a leading multinational retail chain…

- 10 -15% Operations Cost
- 100% Automated Work Order Generation
- 90% Reduction in Alarm Volume
- Energy Cost
- 15 -20 % Equipment breakdowns
- Cost associated with Food Loss

Retail Reinvention Accelerators Powered By Cognitive, IOT and iOS

Retail App Suite

Store Manager: Site Advisor, Shift Track
Store Associate: Shift Sync, Expert Seller, Sales Assist, Market Visit
Pick & Pack, Express Pay
Service / Support Provider: Find & Fix, Parts Expert, Field QA

Store Wellness

IBM Watson IoT Foundation
- Predictive Cognitive Real-Time Contextual — Cognitive Analytics
- Proactive Protection — Risk Management
- Connect — Attach: MQTT, HTTPS; Collect & Organize; Device Management; Secure Connectivity; Visualization
- Information Management — Storage & Archive; Metadata Management; Reporting; Parsing and Transformation; Manage Unstructured Data
- Bluemix Open Standards Based Services — Full Development Lifecycle; DevOps Services; IBM Security
- Flexible Deployment

Weather Data

Give Us A Store Program

Perform a Workshop
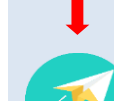- Validate benefits case
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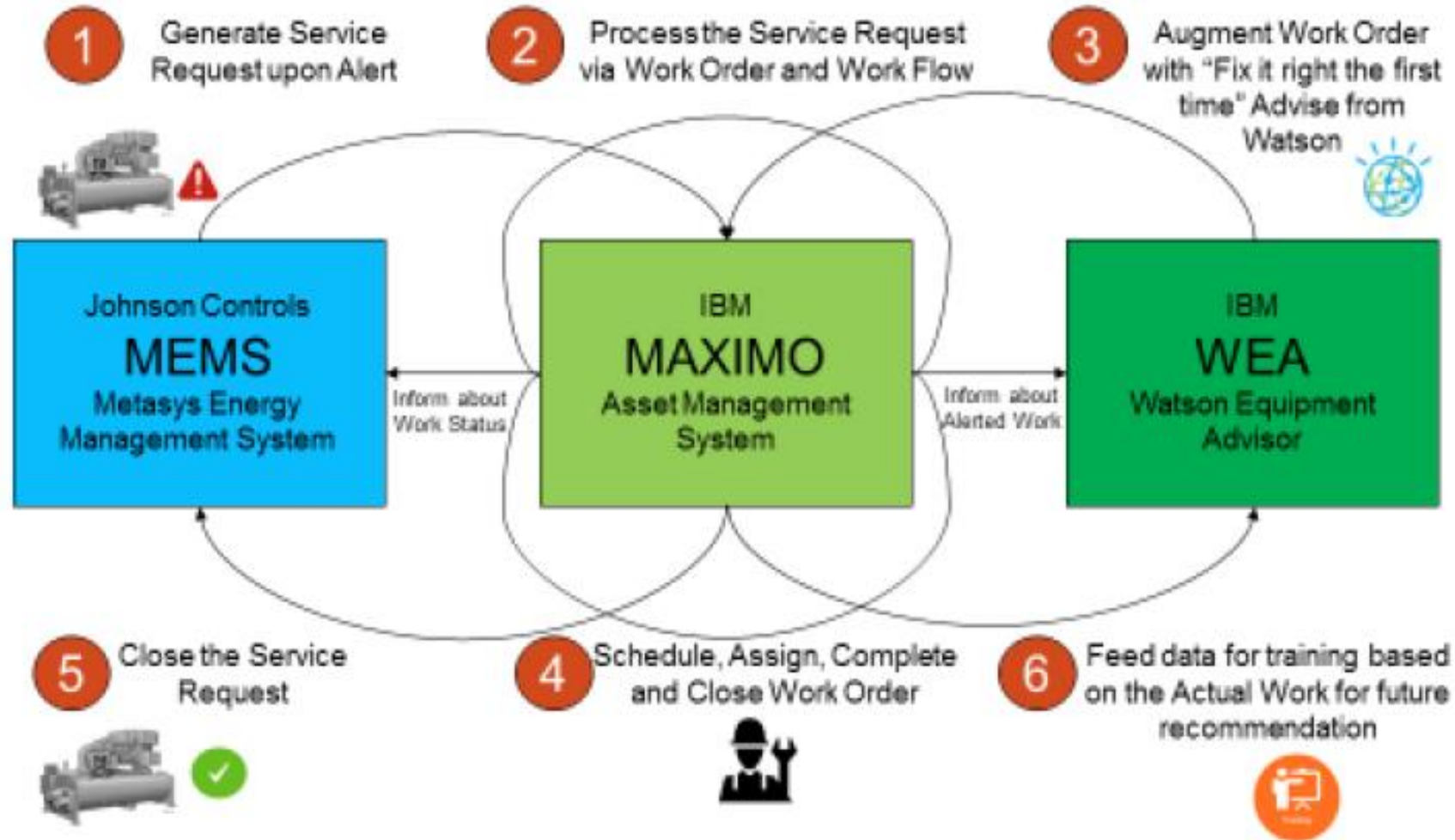
Ecosystem of World Renowned Partners

MOD.CAM INTELLIGENT VISION — ZEBRA — CISCO — SIEMENS — IBM

JCI Asset Advisor powered by IBM

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Other areas of partnership between JCI and IBM

IBM – IT *Service, Operation, Planning & Business Intelligence*	JCI -- OT *Comfort, Security, Real-time Optimization, real-time condition modeling*
▪ Property & lease (portfolio) management ▪ Space planning ▪ Project Management ▪ Capital and expense budgeting ▪ Condition based asset maintenance ▪ Asset tracking and work order management ▪ Emergence response ▪ Green building (GHG), ▪ Environment and Sustainability Planning and Reporting ▪ Cabling and Telecommunication management ▪ Move management ▪ Space usage and charge back management ▪ Compliance and Risk management ▪ Fleet Management ▪ Maintenance and repair operation	▪ HVAC system and control ▪ Building Automation ▪ Elevator control ▪ Air quality controls ▪ Fire alarm ▪ Lighting controls ▪ Audio/Visual communication ▪ Security (Access and Video surveillance) ▪ Energy/Utility Metering and Management ▪ HVAC and energy related service ▪ Real-time asset tracking and tagging ▪ Renewable energy ▪ Energy storage

Today, these two systems do not share data & information processing flows

Q/A