



# ***Reliability Centered Asset Management***

## ***Trends and Best Practices***

***Oct 15, 2009***

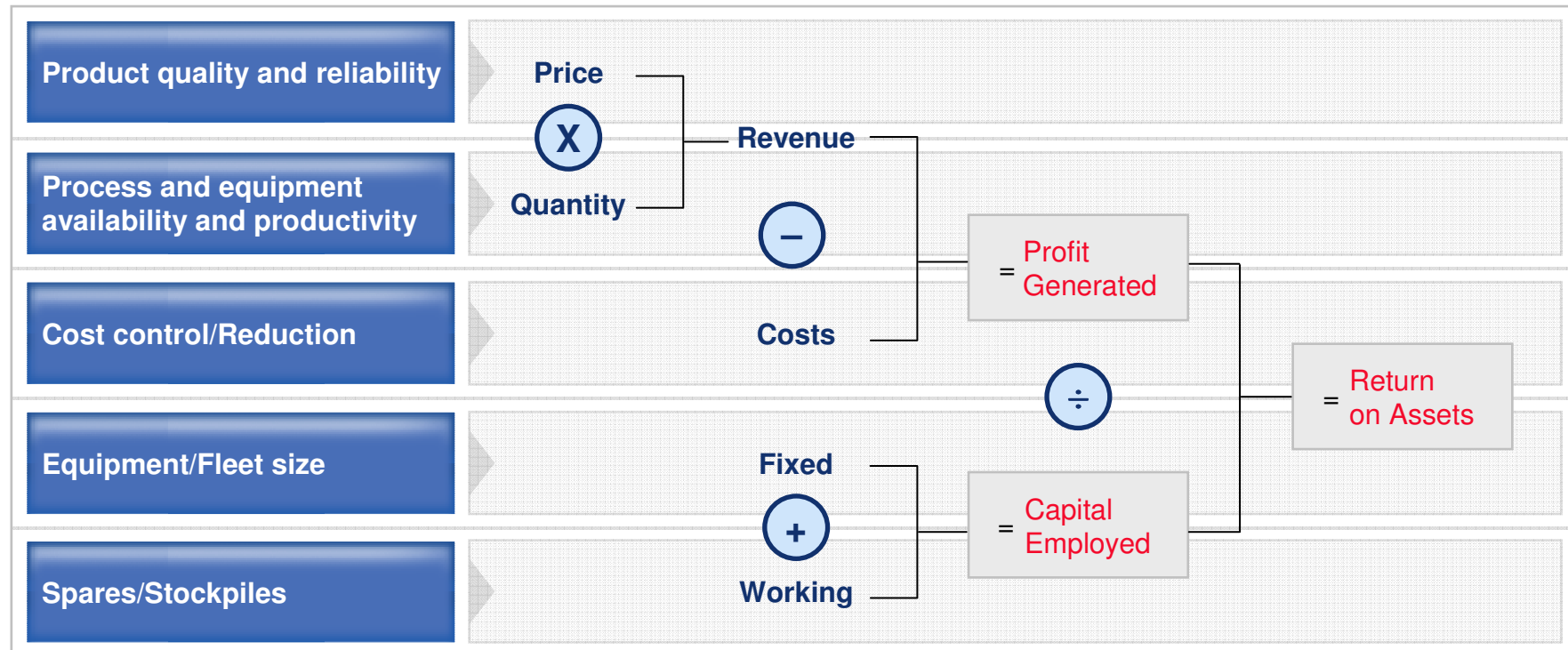
***Mary T. Bunzel***  
***Worldwide Industry Leader***  
***Asset Management in Manufacturing***



## ***Why Reliability Centered Maintenance – Financial Impact***

- Cash-ability: lowest Asset Net Present Cost (NPC)
  - Affects CAPEX & OPEX
- Direct Cost Reductions
  - John Moubrey: “...a reduction of 20 – 70% routine maintenance costs where there is an existing scheduling maintenance”
    - Ineffective Maintenance
    - Inapplicable Maintenance
  - Delayed use of capital
    - Correct timing of Asset Replacement impacts NPV
    - Reductions in cost of capital and investments in assets to “insure availability”
    - Calculated Risk Positions to determine REAL impact of failure
    - Reductions in Inventory Positions

## Asset Management – The Connection to Shareholder Value

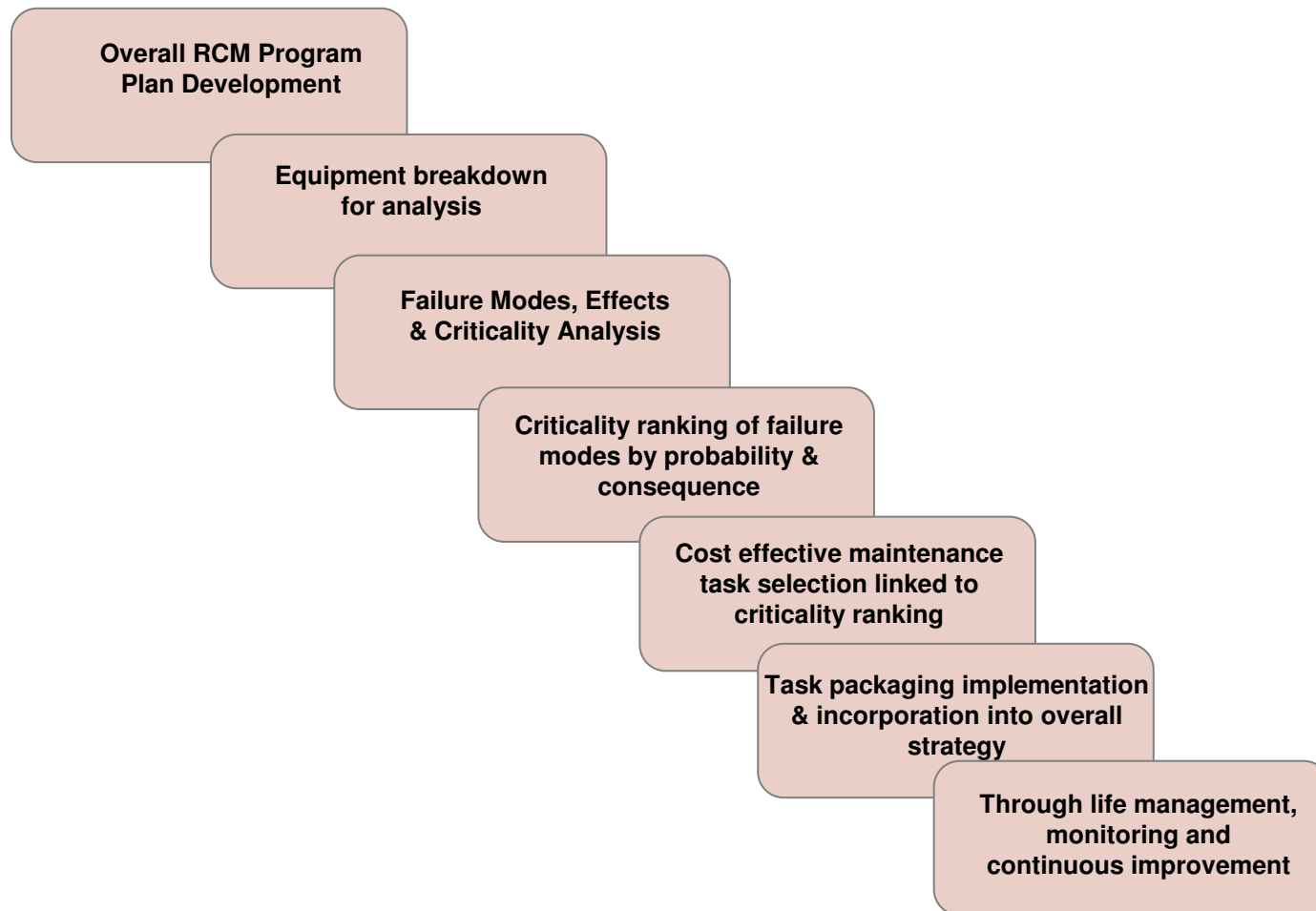


- Asset utilization up 3–5%
- Labor utilization up 10–20%
- Warranty recoveries up 10–50%
- Equipment purchases down 3–5%
- Material costs down 5–10%
- Inventory carrying costs down 5–20%
- Purchasing labor down 10–50%
- Inventory needs down 20–30%

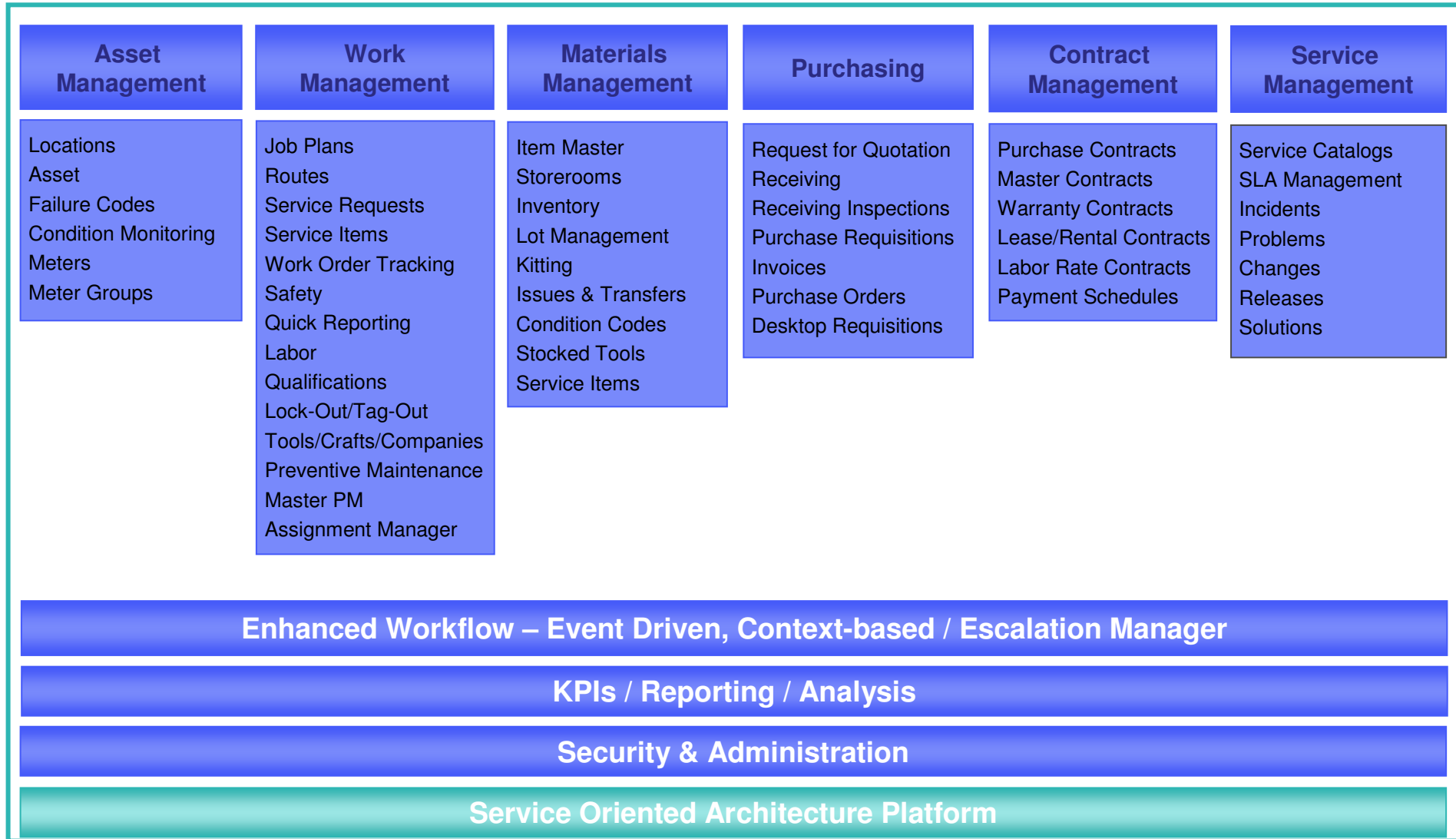
## ***Non Cashable Impacts of RCM***

- Reductions in Health & Safety Risks
- Increased knowledge of Assets, their functions and failures
- Increased ability to troubleshoot failures
- Improved Product Design
- Improved operational procedures, training, work practices
- Tangible increase in quality and integrity of asset data

# Basic Tenets of RCM



# Maximo Supports Reliability Centered Maintenance



# Basic Tenets of RCM

Overall RCM Program  
Plan Development

Drilldown

Select to show children. Select to hide children. Select to return location / asset.

Locations Assets

Location  Needham Site  Status  Site

Asset in Location   No assets found at this location.

System

Show All Systems

Show Path to Top

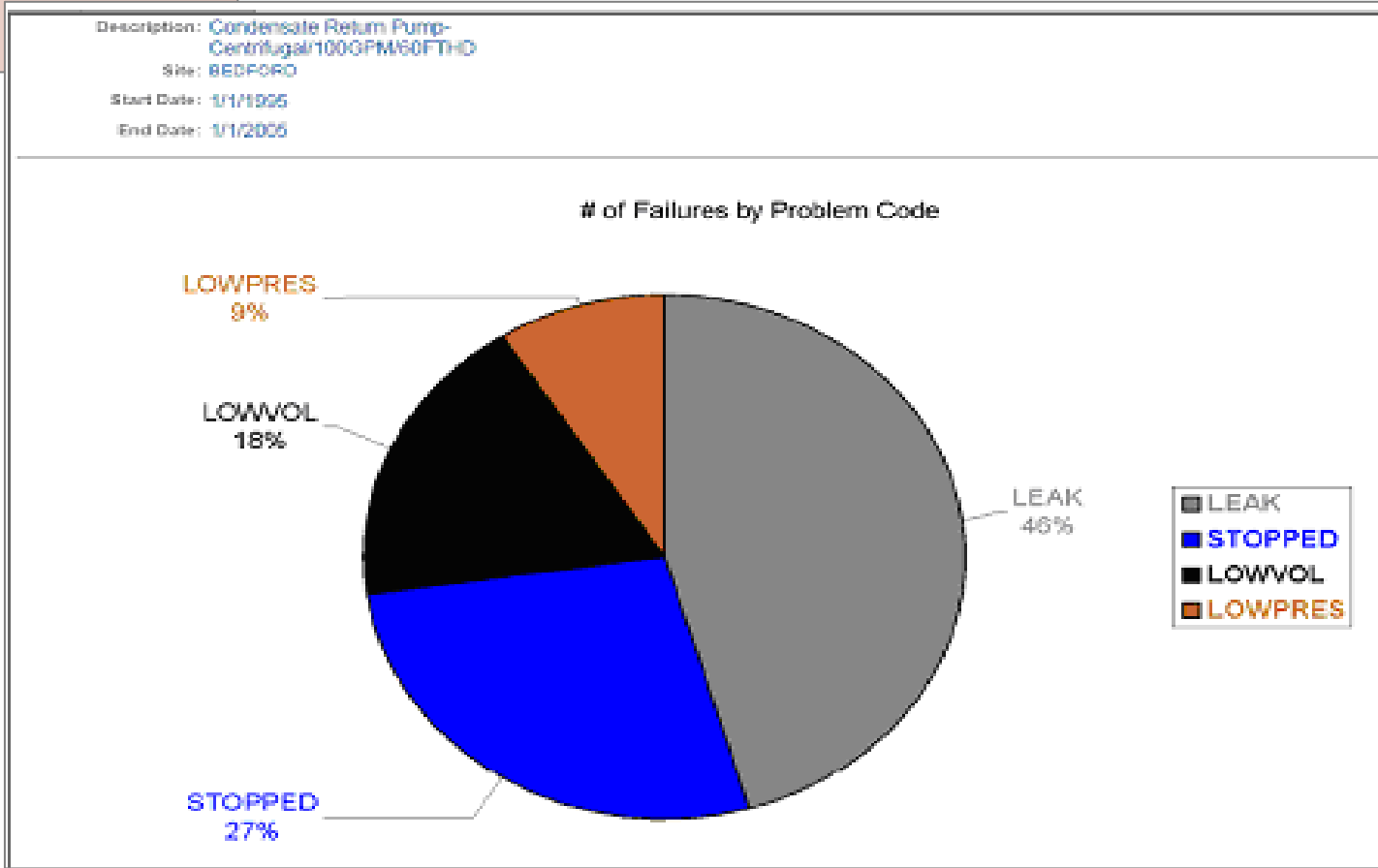
View Work Orders & PMs

- NEEDHAM: Needham Site
  - BOILER: Boiler Room
    - BR200: HVAC System- Main Office
    - BR230: Boiler Room Emergency Generator
    - BR300: Boiler Room Reciprocating Compressor
    - BR400: Main Boiler- 50,000 Lb/Hr
      - BR430: Condensate Return Pump- Centrifugal/100GPM/60FTHD
        - BR431: Motor- 10hp/1750rpm/TEFC/254T Frame/440v/3ph/60hz
      - BR450: Feed Water Pump- Centrifugal/100GPM/60FTHD
      - BR460: Burner, Gas Fired- For Boiler
      - BR480: External Supply Pump

Cancel

# Failure Analysis

Overall RCM Program  
Plan Development





## Sample Prioritization Matrix

	Reason for Work							
	RFW6		RFW5		RFW4		RFW3	
	Imminent Danger		Safety		Environment		Routine	
Asset/Loc Priority	Matrix Index	Matrix Priority	Matrix Index	Matrix Priority	Matrix Index	Matrix Priority	Matrix Index	Matrix Priority
5	78	5	65	4	58	4	50	3
4	77	5	59	4	51	3	45	2
3	76	5	52	3	41	3	38	2
2	75	5	45	3	39	2	36	1
1	74	5	40	3	37	2	35	1



## *Maximo's Connection to The Smart Planet*



## ***Asset Management and A Smarter Planet***



We've thought about IT as the world of data centers, software, PCs, routers, bandwidth.

We've thought about infrastructure as the world of buildings, factories, airports, roads, pipeline.

These worlds are converging.

In a smaller, flatter, faster and "smarter planet we face...

More ***complexity in assets and processes***

More ***capabilities required***

More ***reliance on management systems***

But, we also have the opportunity to achieve...

More ***insight and collaboration***

More ***efficiency, growth and profit***

More ***innovation***

# Managing Assets in a Smarter Planet



Facility Assets with smart energy, security & emergency systems that alert before failures occur



Transportation Assets with sensors and diagnostics that report the asset's health



Linear Infrastructure Assets with sensors that report early conditions



Production Assets with computer chips to report issues before the assembly line goes down



Technology Assets in a Green Data center reporting heat and energy issues

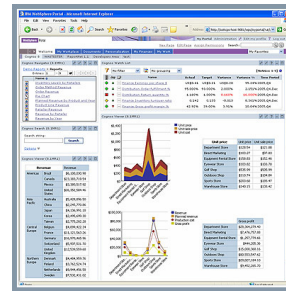
# IBM has invested to acquire key MRO solutions and create MRO specific intellectual property assets to benefit clients

## Maximo to support Aviation MRO



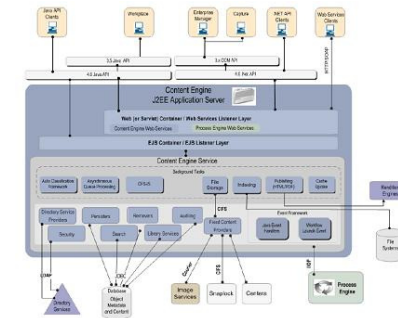
MRO Software acquired in 2006

## Business Intelligence Reporting



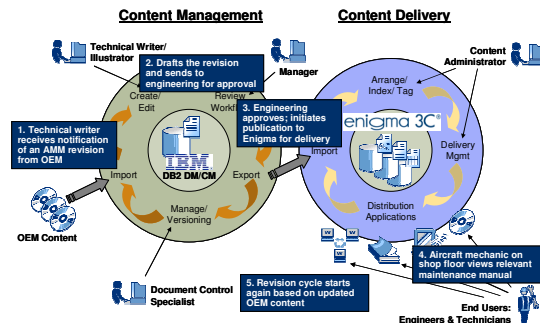
Cognos acquired in 2008

## Content Management



FileNet acquired in 2006

## Technical Documentation Management & Delivery Solution



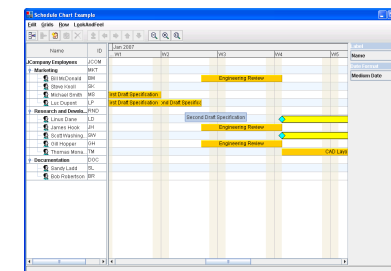
Leading edge solution combining IBM & Enigma products to enable major productivity gains

## Dynamic Inventory Optimisation



DIOS has been developed to solve inventory demand planning challenges and meet inventory management goals.

## Planning & Scheduling



ILOG acquired in 2008. iLog tools are being integrated in Maximo for planning & scheduling capabilities

# Managing the Smarter Planet



Our infrastructure consists of both Operating and IT assets, but they are becoming less differentiated

- Intelligent sensors, RFID tags, etc. are proliferating, resulting in assets becoming more intelligent and widely interconnected
- Operating assets are becoming more co-mingled with, and dependent, on IT assets

**Transportation Assets**



**Facilities**



**Production Equipment**



**IT Hardware & Software**



**Infrastructure: Telco, Utilities**

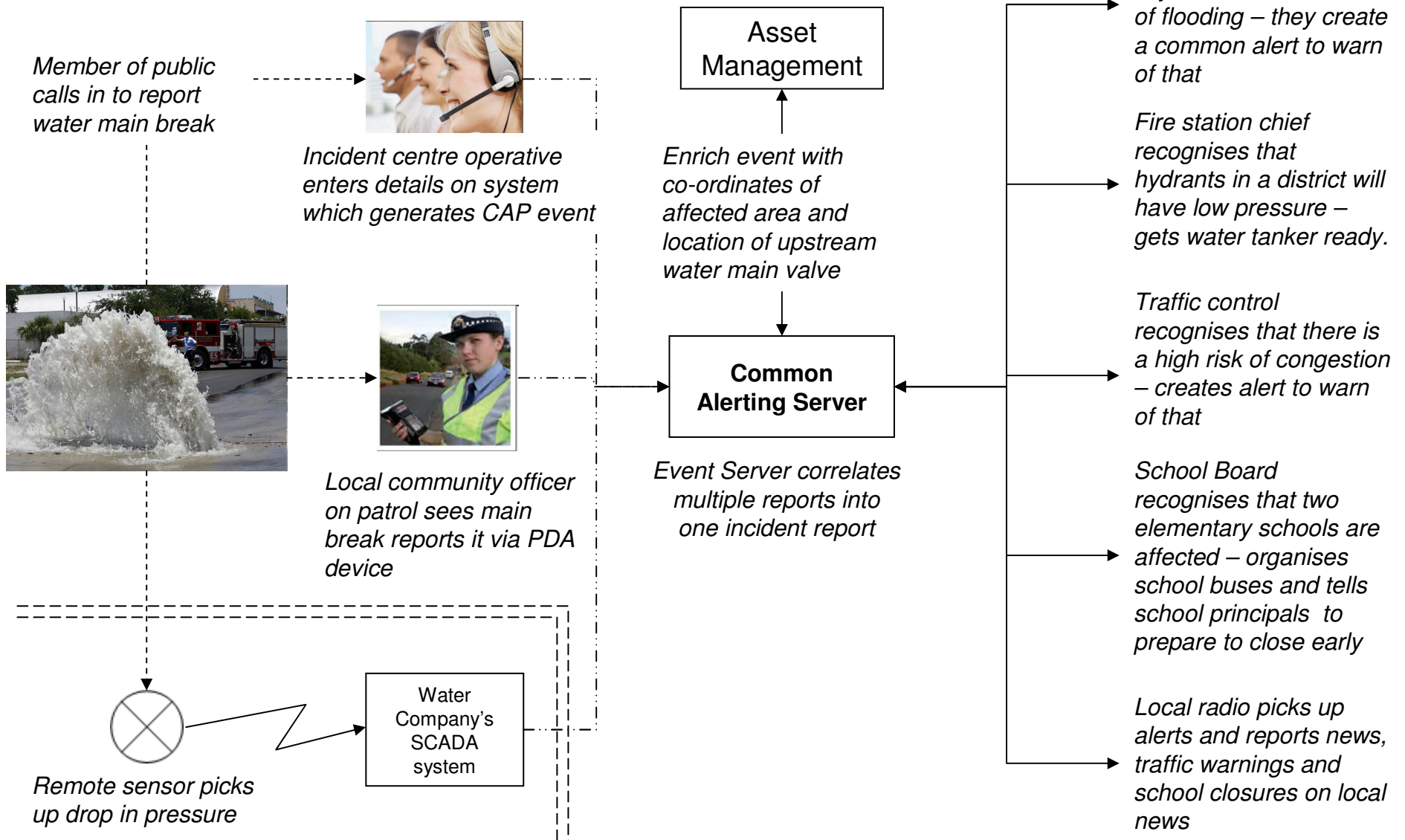


## **Maximo's role within the IBM Smarter Planet strategy:**

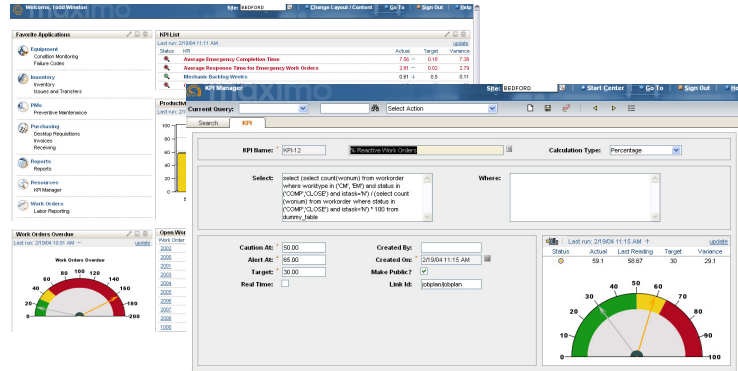
- *Maximo is the IBM system to manage the intelligent assets*
- *Leverage data generated by smart assets to drive greater asset management effectiveness; Condition Based Maintenance, RCM, Telematics, etc.*
- *Intelligent operating assets (software enabled, micro-processor driven, IP addressable) utilize Maximo's IT Asset capabilities to more effectively manage these assets*



# Common Alerting Scenario



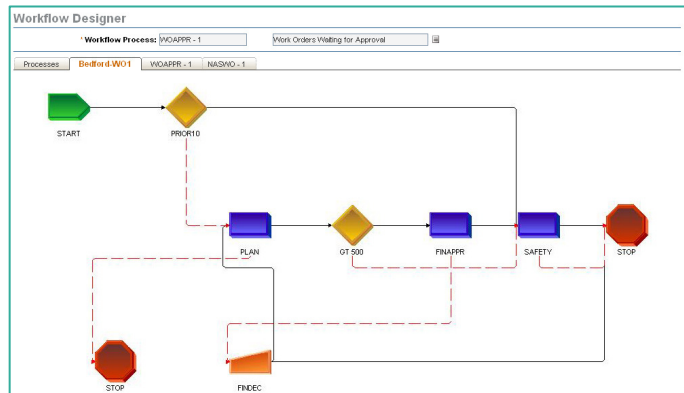
# What is so compelling about Maximo?



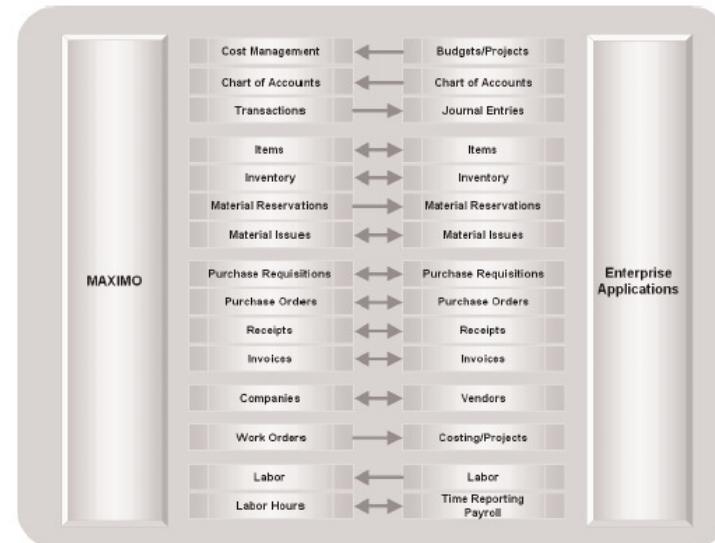
Role-based User Interface



Mobile Architecture



Business Process Configuration



Standards-based Integration






## *Why do customers choose Maximo?*



# Asset Management Solution Map for Rail



Department		Assets	IBM Maximo Solutions
Rail Rolling Stock		Locomotives, Passenger Cars, Freight Cars	<b>maximo for transportation</b> , Maximo Asset Configuration Manager Maximo for Service Providers
Railway Infrastructure		Track, Signals and Structures	<b>Maximo Linear Asset Manager</b> , Maximo Spatial, Maximo Mobile
Support Fleet		Non revenue vehicles: trucks, railway maintenance equipment	<b>Maximo for Transportation</b>
Stations & Facilities		Buildings, depots, stations	Maximo Asset Management, Maximo Mobile
Technology		Control systems, servers, work stations, laptops, mobile devices, telephony	Tivoli Asset Management for IT, Tivoli Service Desk, Maximo Mobile

## Tube Lines

*Tube Lines takes stock of its assets with IBM Maximo asset management*



*“Creating a single source of all asset information has provided unprecedented visibility of asset performance across the three lines managed by Tube Lines.”*

*Martyn Capes, Asset Systems  
Technical Manager, Tube Lines*



### **Business Challenges**

- An up-to-date solution to proactively maintain 200 miles of track, 255 trains, 100 stations, 2,395 bridges and structures, 71 lifts and 227 escalators
- Deploy a single asset management solution across the enterprise
- Provide engineers with mobile access to asset information
- Streamline processes and improve resource effectiveness

### **IBM Solution**

- IBM Maximo to manage rolling stock, linear assets and facilities
- Integration to corporate ERP and HR systems

### **Business Benefits**

- Maximo has enabled Tube Lines to provide a consistent approach to maintenance management across 15 asset classes
- Real time access to up to date asset information, enabling efficient job scheduling to minimize passenger impact
- Reduced duplication, improved information accuracy and with trend analysis for more proactive maintenance strategies

## *A Few Rail Customers*

**BOMBARDIER**  
TRANSPORTATION



*Arlanda  
Express*



*Connex*



*Lyons Express*



**Long Island Rail Road**



*Gardemoen  
(Norway)*



*Bay Area Transit*

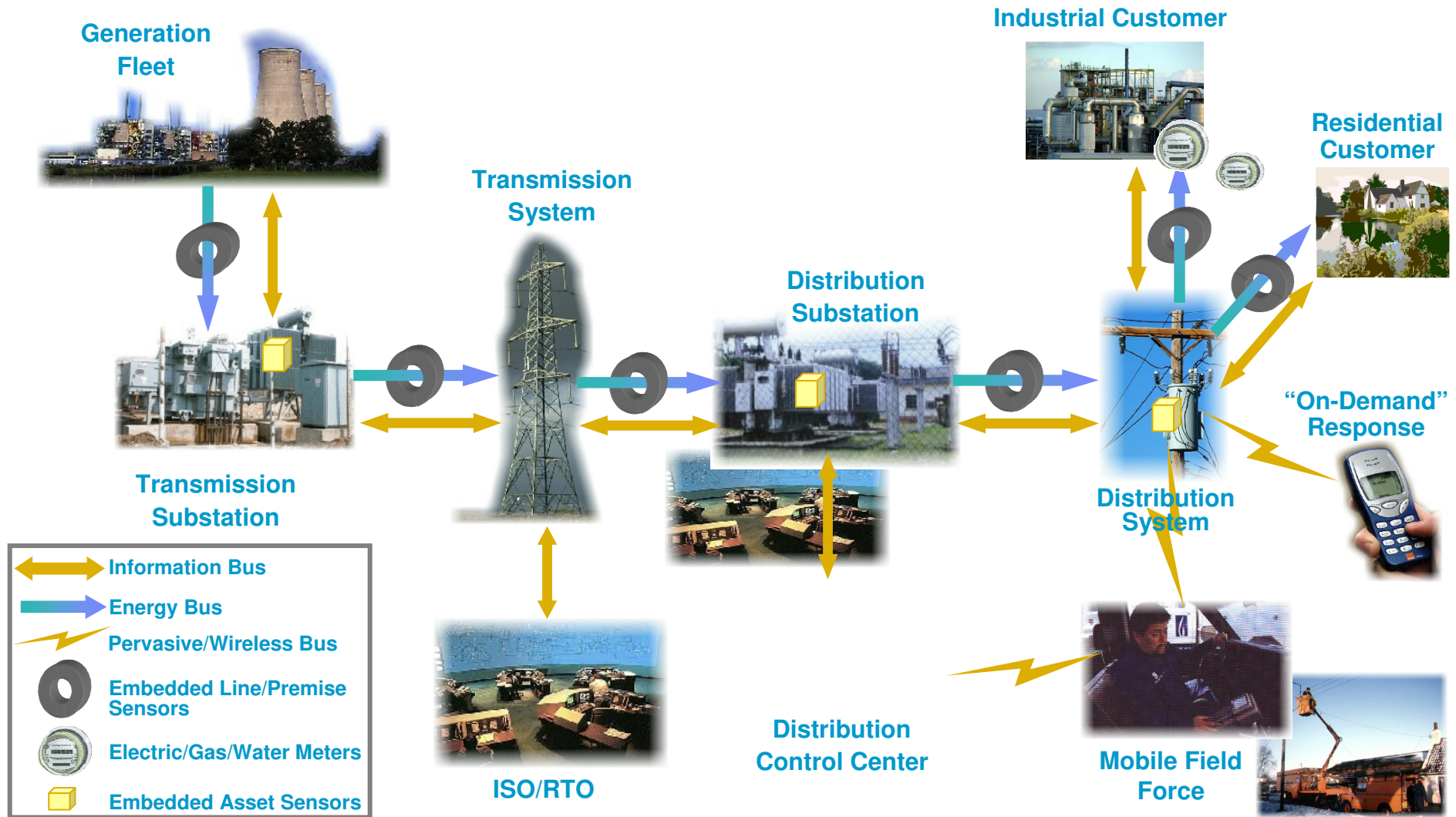


*Danish  
Rail*



*Danish National Railway*

# The Energy & Utilities Value Chain: The Connected Enterprise



# Cinergy

***“Transformation Now” with IBM Maximo asset management***



“MAXIMO was the system with the scalability and flexibility we needed to meet our business requirements,” , In addition, MAXIMO’s inventory information allows accounting to easily report data and meet GASB requirements.”

*Dave Smith, Asset Systems  
Technical Manager*



## ***Business Challenges***

- a top 10 Investor Owned Utility with:
  - 33000 Distribution Miles
  - 7000 Transmission Miles
  - 85+ Substations
- At the Plant: Bring two regulated utilities together, and select a common EAM solution to replacing in-house mainframe systems
- In the Field: Improved regulatory inspections

## ***IBM Solution***

- Maximo Asset Management implemented at largest coal plant in 6 months – 11 more stations in the following 6 months
- Maximo Mobile Suite for line, pole and substation inspections

## ***Business Benefits***

- Rapid Implementation – ROI early in the 2nd year
- Improved paperless operation, plant workers interact directly with data
- Field data accuracy and consistency improve
- Uniform metric and basis of system improvements

## Maximo in Manufacturing Industries



7 of the 10 largest **AUTOMOTIVE** companies worldwide are using Maximo Asset Management

8 of the 10 largest **OIL & GAS** companies worldwide are using Maximo Asset Management

12 of the 13 largest **AEROSPACE & DEFENSE** companies worldwide are using Maximo

6 of the 9 largest **HIGH-TECH/ELECTRONICS** companies worldwide are using Maximo

14 of the 15 largest **LIFE SCIENCES** companies worldwide are using Maximo Asset Management

**Thank You!**



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***Thank you!***

