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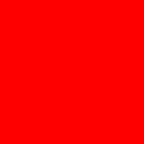
Achieve Greater Return on Assets and Margins with Oracle Manufacturing Operations Center

Aravindan Sankaramurthy
Group Manager, Product Management

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

Agenda

- Product Overview

- Customer Program

- Product Roadmap

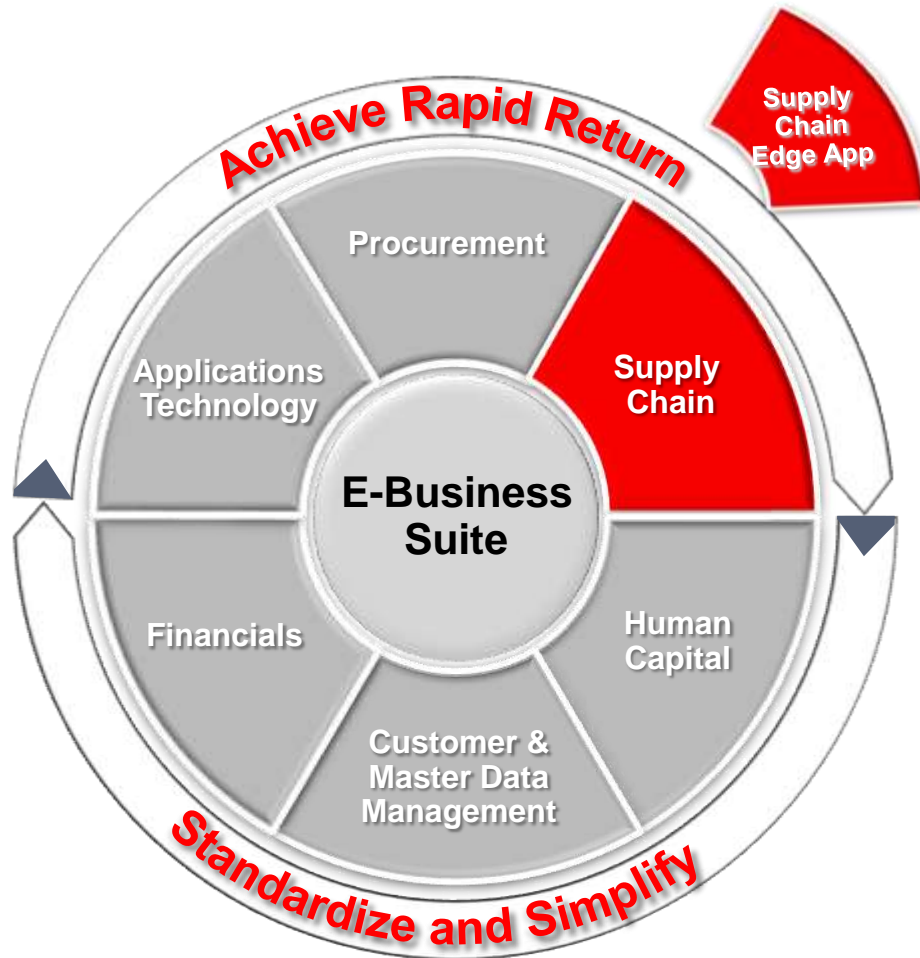- Oracle's New Operations Center for Green (Planned)

Product Overview

ORACLE®

Optimize Value Creation
What's New in Supply Chain Management

Supply Chain Edge App

Manufacturing Operations Center

Procurement

Supply Chain

Applications Technology

E-Business Suite

Financials

Human Capital

Customer & Master Data Management

Achieve Rapid Return

Standardize and Simplify

Results:

✓ **Complete value chain planning - from demand sensing to after market service**

✓ **Optimize manufacturing operations and asset utilization**

✓ **Increase logistics efficiency and track and control costs**

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Oracle Strategy
Provide a solution that…

- Delivers quick value - <u>in weeks not in years</u>
- Fits into your existing shop floor environment – <u>no upgrade, re-write or replacement required</u>
- Works with your existing back end solution – <u>no ERP upgrade required</u>
- Helps <u>accelerate Lean-Six Sigma programs</u>, achieve operational excellence
- Architected for <u>long-term scalability and flexibility</u>

EMI offers highly automated manufacturers a low-risk, high-return way to leverage data that they already have into valuable EPM insights. With an average six-month payback regardless of initial implementation costs, EMI initiatives should be a line item on the upcoming year's Information Technology (IT) budget for any manufacturer committed to improving the performance of its enterprise.

- AMR Research

Manufacturing Operations Center

- **Real-Time Intelligence for Plant Operations**

- **Unified Plant Data Repository**

- **Integration to shop floor systems and equipment**

- **Event Management Framework**

- **Supported by Oracle Analytics Platform & Engine**

The Foundation for Continuous Process Improvement

Manufacturing Operations Center

- **Real-Time Intelligence for Plant Operations**

- **Unified Plant Data Repository**

- **Integration to shop floor systems and equipment**

- **Event Management Framework**
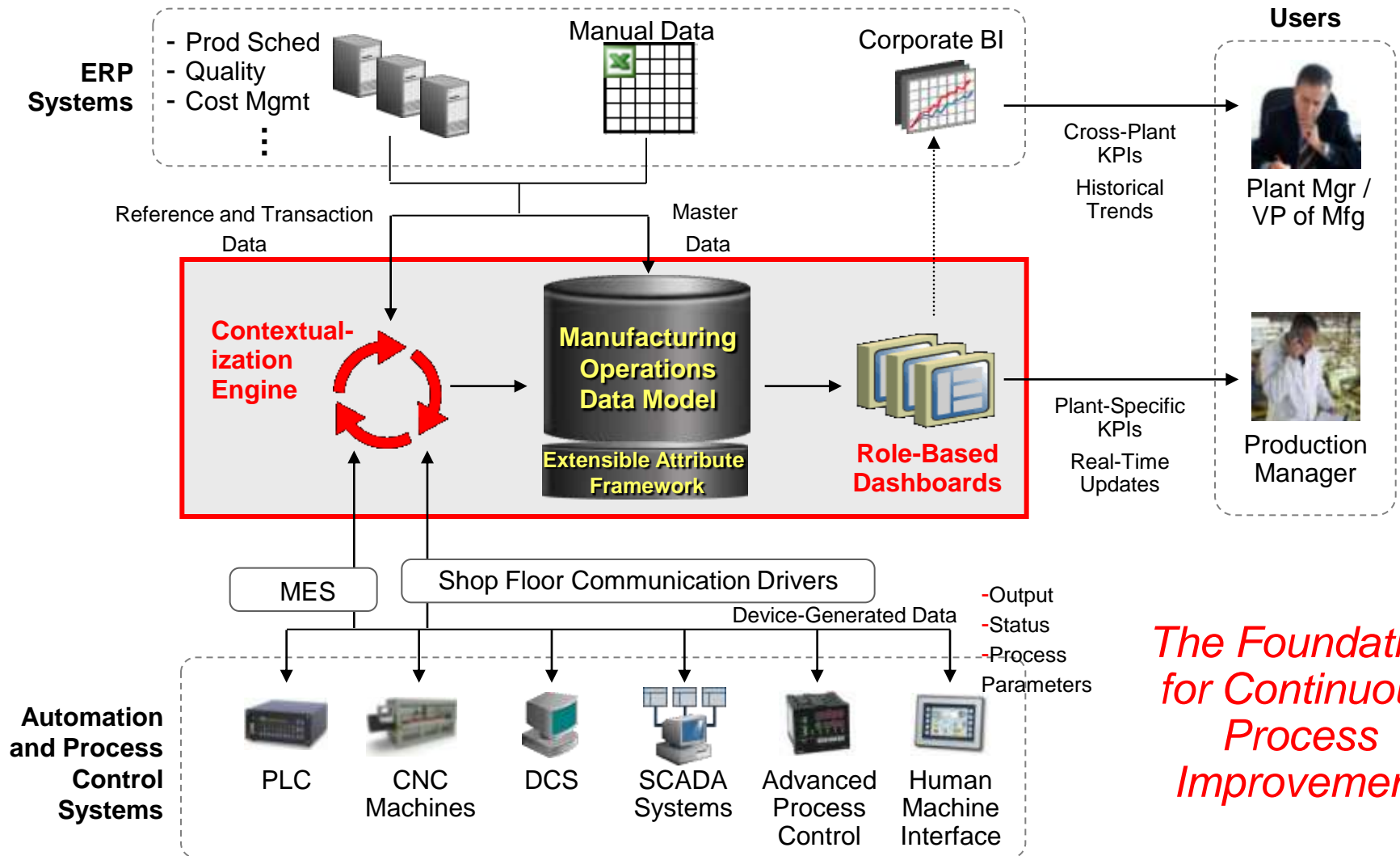
- **Supported by Oracle Analytics Platform & Engine**

The Foundation for Continuous Process Improvement

Manufacturing Operations Center
At-a-Glance

Users

ERP Systems
- Prod Sched
- Quality
- Cost Mgmt
...

Manual Data

Corporate BI

Cross-Plant KPIs

Historical Trends

Plant Mgr / VP of Mfg

Reference and Transaction Data

Master Data

Contextual-ization Engine

Manufacturing Operations Data Model

Extensible Attribute Framework

Role-Based Dashboards

Plant-Specific KPIs

Real-Time Updates

Production Manager

MES

Shop Floor Communication Drivers

Device-Generated Data

- Output
- Status
- Process Parameters

Automation and Process Control Systems

PLC | CNC Machines | DCS | SCADA Systems | Advanced Process Control | Human Machine Interface

The Foundation for Continuous Process Improvement

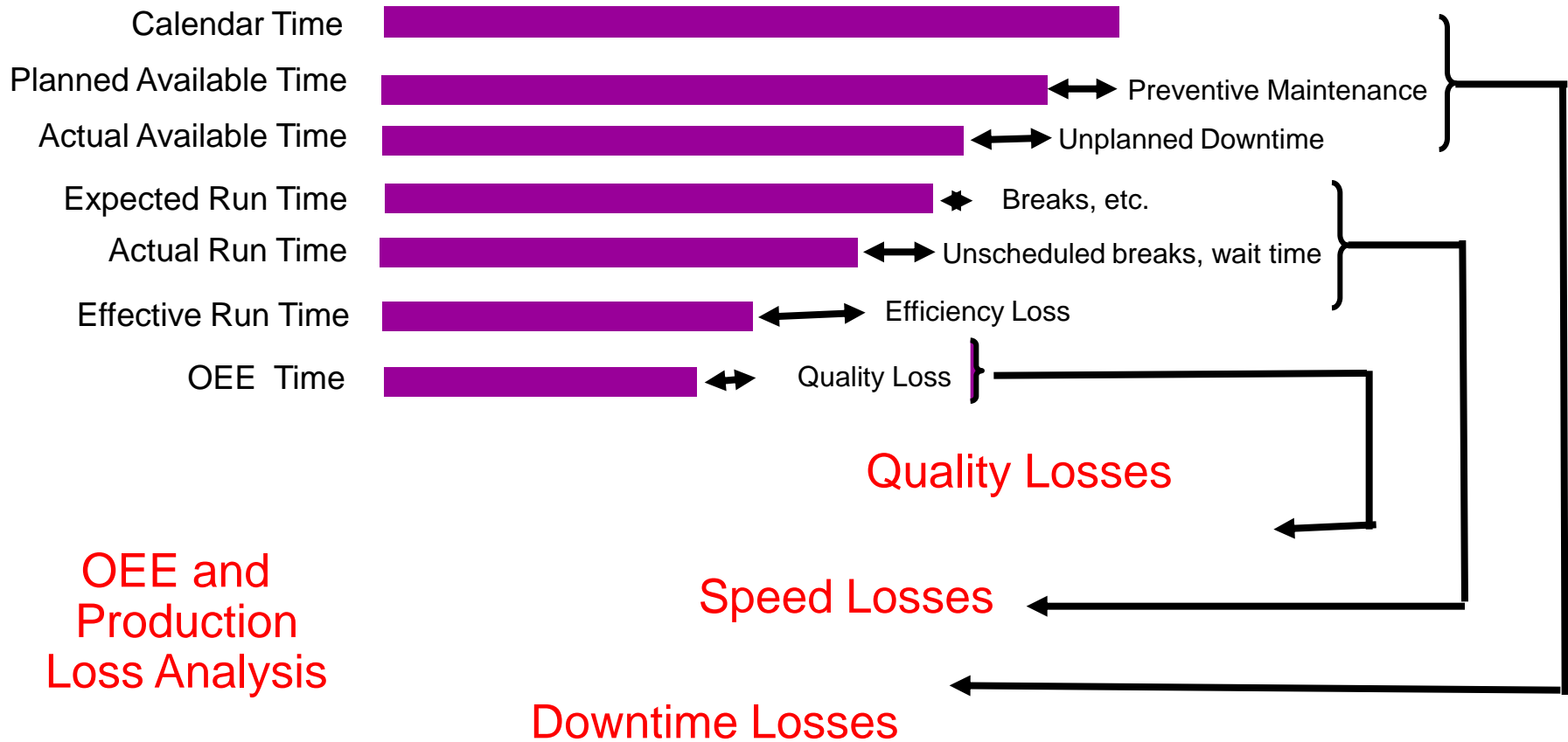**ORACLE**

Role-Based Dashboards and KPIs
Deliver Performance Measures by Responsibility
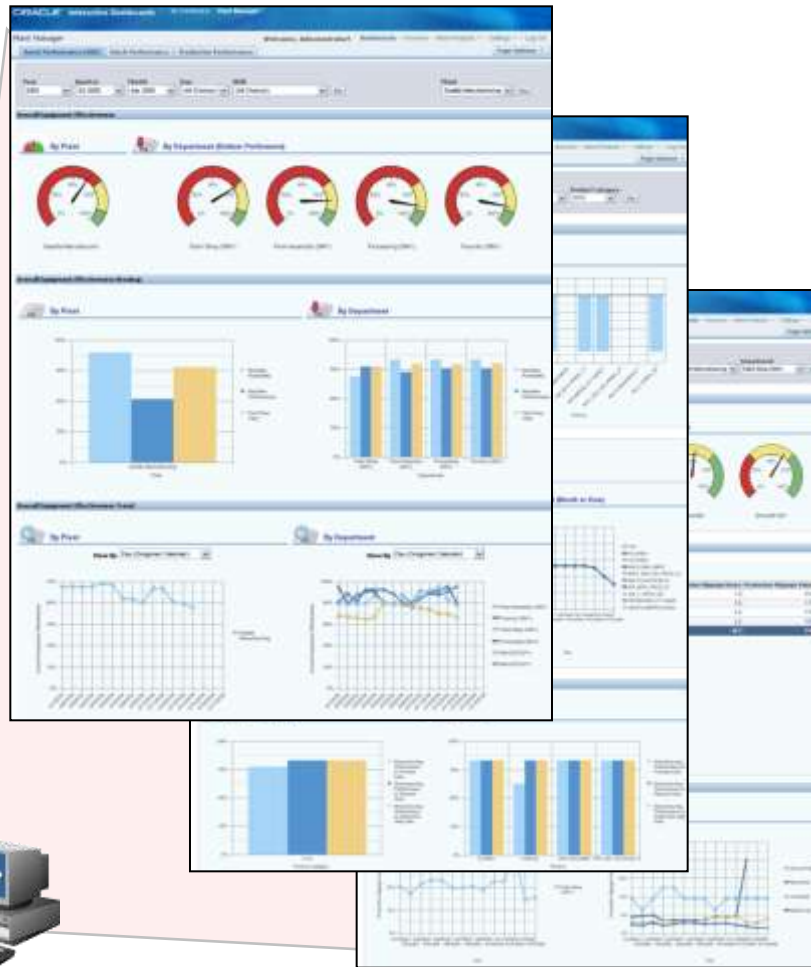
- **Pre-built role-specific dashboards, reports, and alerts**

- **Graphical views**
  - Trend charts
  - Graphs
  - Tables
  - Red-yellow-green indicators

- **Embedded best-practice calculations and KPIs**

- **Analytic workflows to drive actions**

- **Drill-downs into details for root-cause analysis**

- **Leverages OBIEE+**

- **Configurable and customizable**

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Overall Equipment Effectiveness (OEE)

OEE = Availability Ratio X Efficiency Ratio * First Pass Yield

Calendar Time	
Planned Available Time	← → Preventive Maintenance
Actual Available Time	← → Unplanned Downtime
Expected Run Time	← → Breaks, etc.
Actual Run Time	← → Unscheduled breaks, wait time
Effective Run Time	← → Efficiency Loss
OEE Time	← → Quality Loss

Quality Losses

OEE and Production Loss Analysis

Speed Losses

Downtime Losses

Comprehensive Set of Pre-built KPIs and Measures
Build a Decision Support System Unique to Your Environment

Most standard KPIs available out-of-the-box

Easy to use dashboarding tool enables users to identify, select, modify, and format relevant KPIs

- Accelerate deployment and adoption

- Easily adapt dashboards and metrics to different types of production environments & roles

- Provides a comprehensive Operational Intelligence framework

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Manufacturing Operations Center

- Real-Time Intelligence for Plant Operations

- **Unified Plant Data Repository**

- Integration to shop floor systems and equipment

- Event Management Framework

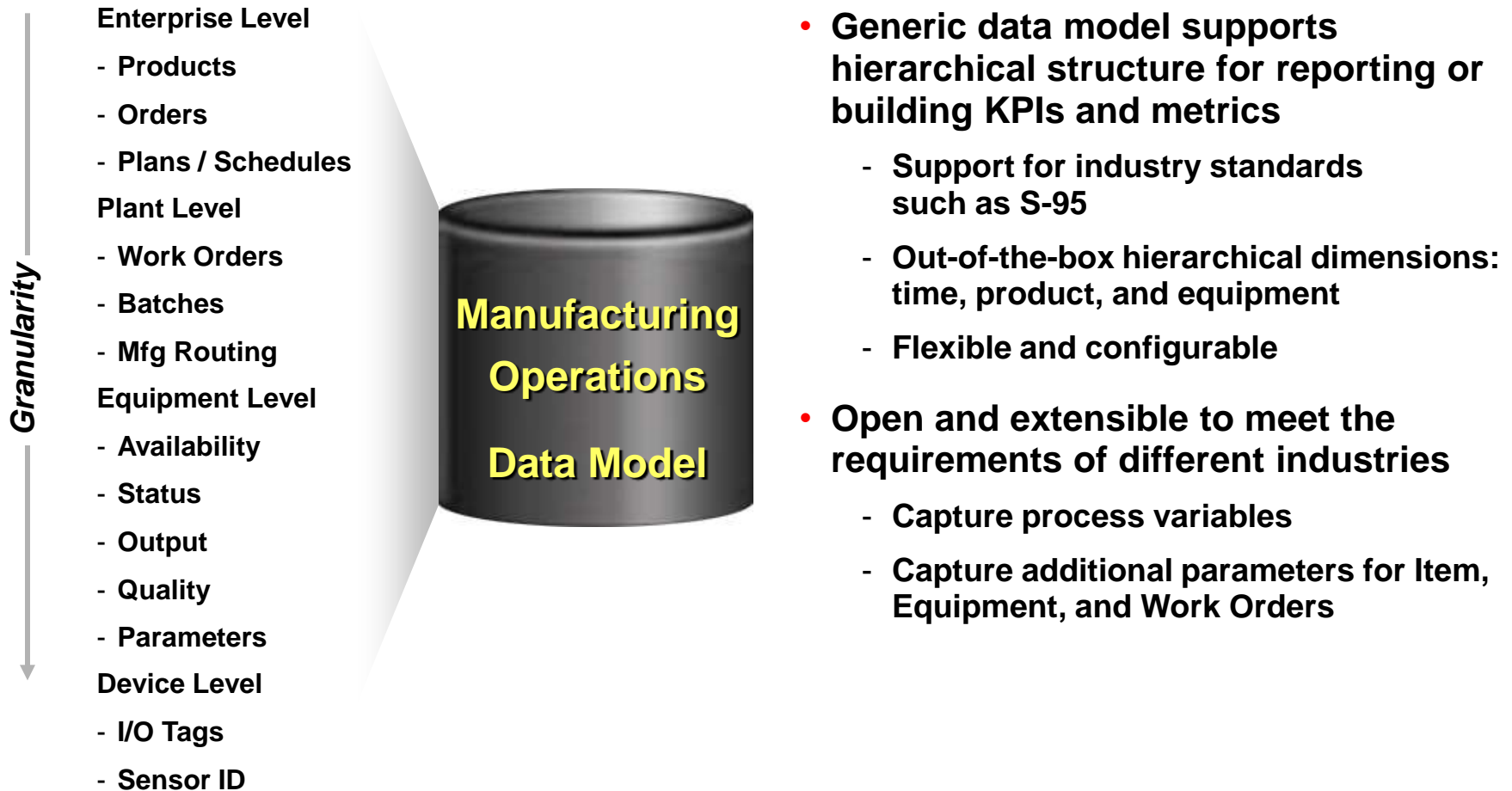- Supported by Oracle Analytics Platform & Engine
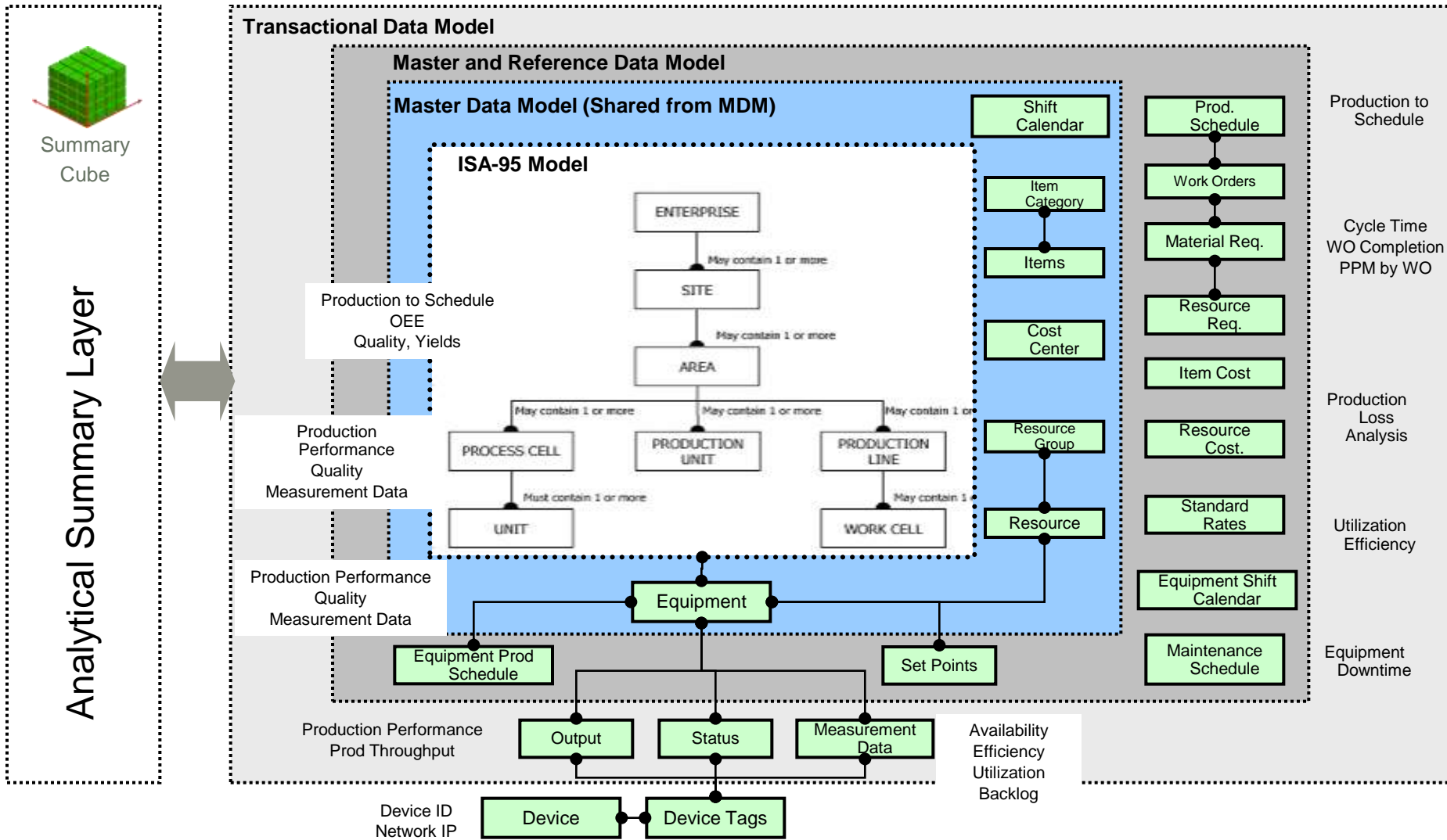
The Foundation for Continuous Process Improvement

Unified Plant Data Repository
Provide Consistent Information for All Manufacturing Users

Granularity

Enterprise Level

- **Products**

- **Orders**

- **Plans / Schedules**

Plant Level

- **Work Orders**

- **Batches**

- **Mfg Routing**

Equipment Level

- **Availability**

- **Status**

- **Output**

- **Quality**

- **Parameters**

Device Level

- **I/O Tags**

- **Sensor ID**

Manufacturing Operations Data Model

- **Generic data model supports hierarchical structure for reporting or building KPIs and metrics**

  - **Support for industry standards such as S-95**

  - **Out-of-the-box hierarchical dimensions: time, product, and equipment**

  - **Flexible and configurable**

- **Open and extensible to meet the requirements of different industries**

  - **Capture process variables**

  - **Capture additional parameters for Item, Equipment, and Work Orders**

Unified Plant Data Repository

Transactional Data Model

Master and Reference Data Model

Master Data Model (Shared from MDM)

ISA-95 Model

ENTERPRISE

May contain 1 or more

SITE

May contain 1 or more

AREA

May contain 1 or more | May contain 1 or more | May contain 1 or more

PROCESS CELL | PRODUCTION UNIT | PRODUCTION LINE

Must contain 1 or more | May contain 1 or more

UNIT | WORK CELL

Production to Schedule
OEE
Quality, Yields

Production Performance
Quality
Measurement Data

Production Performance
Quality
Measurement Data

Equipment

Equipment Prod Schedule

Set Points

Production Performance
Prod Throughput

Output | Status | Measurement Data

Availability
Efficiency
Utilization
Backlog

Device ID
Network IP

Device | Device Tags

Summary Cube

Analytical Summary Layer

Shift Calendar

Item Category

Items

Cost Center

Resource Group

Resource

Prod. Schedule

Work Orders

Material Req.

Resource Req.

Item Cost

Resource Cost.

Standard Rates

Equipment Shift Calendar

Maintenance Schedule

Production to Schedule

Cycle Time
WO Completion
PPM by WO

Production Loss Analysis

Utilization Efficiency

Equipment Downtime

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Manufacturing Operations Center

- **Real-Time Intelligence for Plant Operations**

- **Unified Plant Data Repository**

- **Integration to shop floor systems and equipment**

- **Event Management Framework**

- **Supported by Oracle Analytics Platform & Engine**

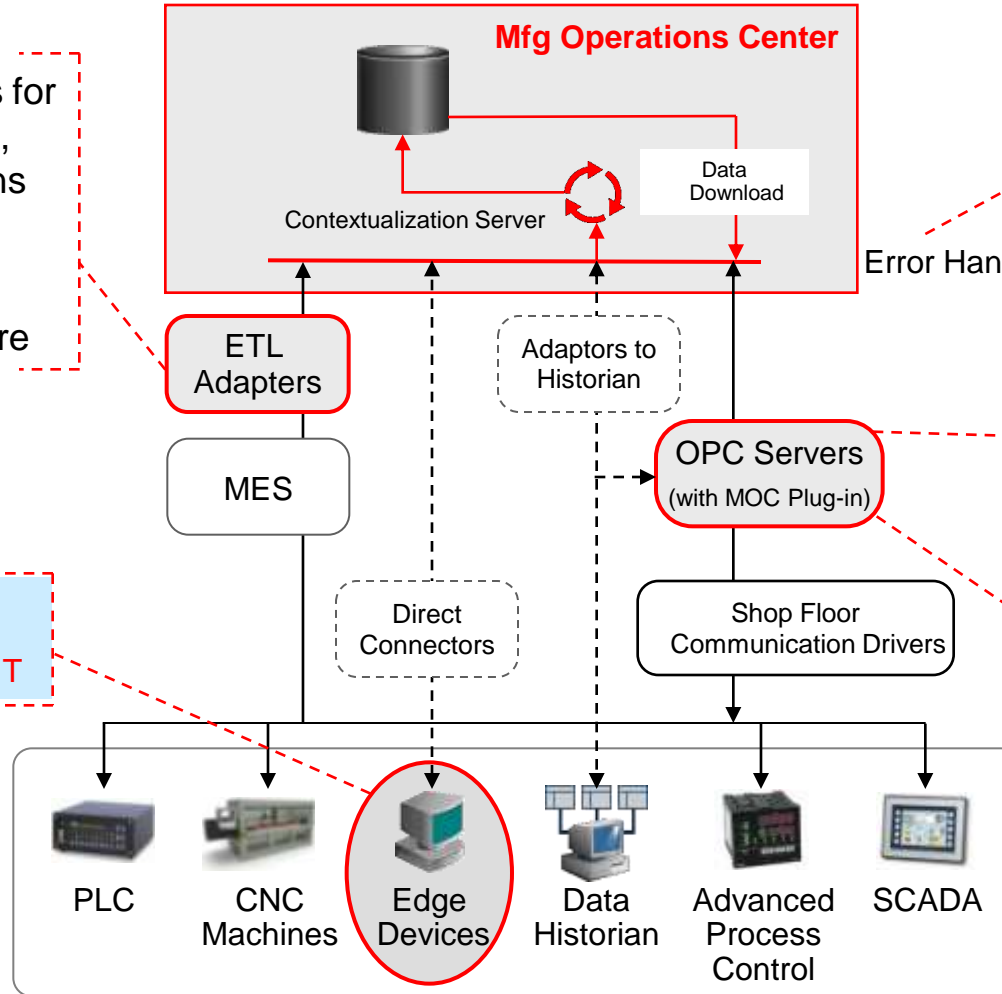
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Bi-directional Integration with Devices and Sensors
Gather High Resolution Data Directly from Source

Mfg Operations Center

- Support adapters for 3rd party systems, like data historians

- Build additional adapters using Fusion Middleware

Contextualization Server

Data Download

Error Handling

Capture and process errors at every stage of data collection

ETL Adapters

Adaptors to Historian

OPC Servers (with MOC Plug-in)

- Tag data mapping

- Data filtering rules engine

MES

Direct Connectors

Shop Floor Communication Drivers

PLC | CNC Machines | Edge Devices | Data Historian | Advanced Process Control | SCADA

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Shop Floor Data Contextualization
Convert Raw Data into Useful Business Information

Automation & Process Control Systems

- PLC
- DCS
- SCADA
- ⋮

ERP Systems

CRM   SCM   ERP

Business Context Data

Transform

High Resolution Tag Data → Business Events

Build Context

Analyzable Business Data →

Intelligence Systems

- Corporate BI
- Hub Dashboards
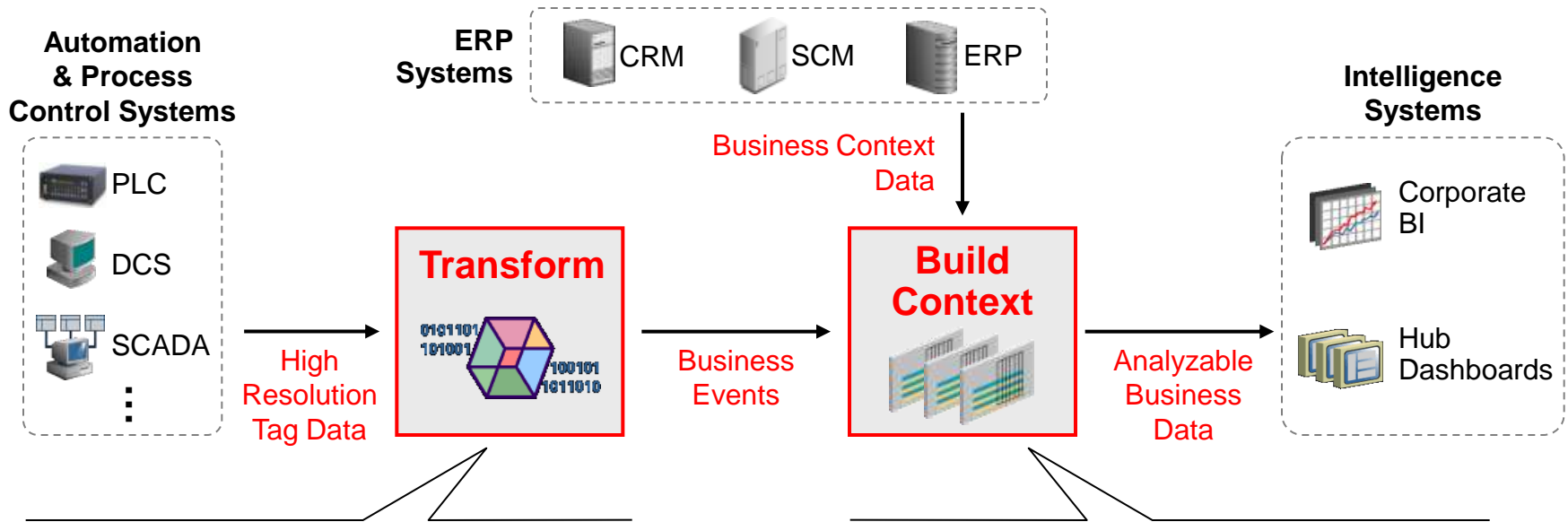
- **Define data transformation rules**
  - Rules by tag type
  - Business-oriented aliases for tags
  - Additional tag attributes like rollover values
- **Use pre-built rules or create new rules**

- **Apply context to time series data**
  - Work Order
  - WO Segment
  - Product
  - Shift
- **Apply out-of-the-box rules or define new rules**

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Manufacturing Operations Center

- Real-Time Intelligence for Plant Operations

- Unified Plant Data Repository

- Integration to shop floor systems and equipment

- **Event Management Framework**

- Supported by Oracle Analytics Platform & Engine

The Foundation for Continuous Process Improvement

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Event Management Framework

- Online monitoring of shop floor and equipment events
- Automated events processing
- Seeded Events in MOC
  - Equipment Events – Downtime, Idle, Fault, Unstable
  - Equipment Recalibration Events
  - Process Parameters Out of Control
  - Scrap & Rework Events
  - Item Rejections
- Seeded Actions
  - Create a maintenance request in EAM
  - Send e-mail alerts and text messages

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Manufacturing Operations Center

- **Real-Time Intelligence for Plant Operations**

- **Unified Plant Data Repository**

- **Integration to shop floor systems and equipment**

- **Event Management Framework (Planned)**

- **Supported by Oracle Analytics Platform & Engine**
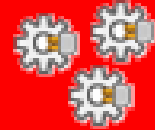
The Foundation for Continuous Process Improvement

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Oracle BI Applications
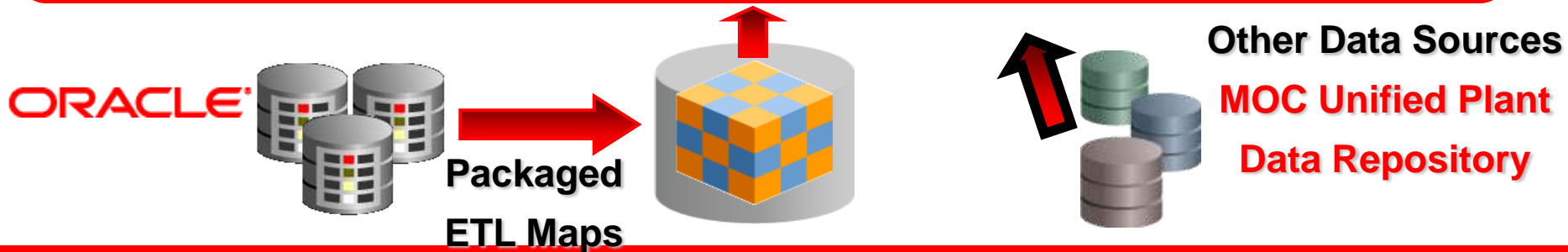## Multi-source Analytic Apps Built on BI Suite EE

Interactive Dashboards	Reporting & Publishing	Ad-hoc Analysis	Proactive Detection and Alerts	Disconnected Analytics	MS Office Plug-in	Web Services

Sales	Service & Contact Center	Marketing	Order Management & Fulfillment	Supply Chain	MOC	Human Resources

Oracle BI Applications

Oracle BI Apps built on
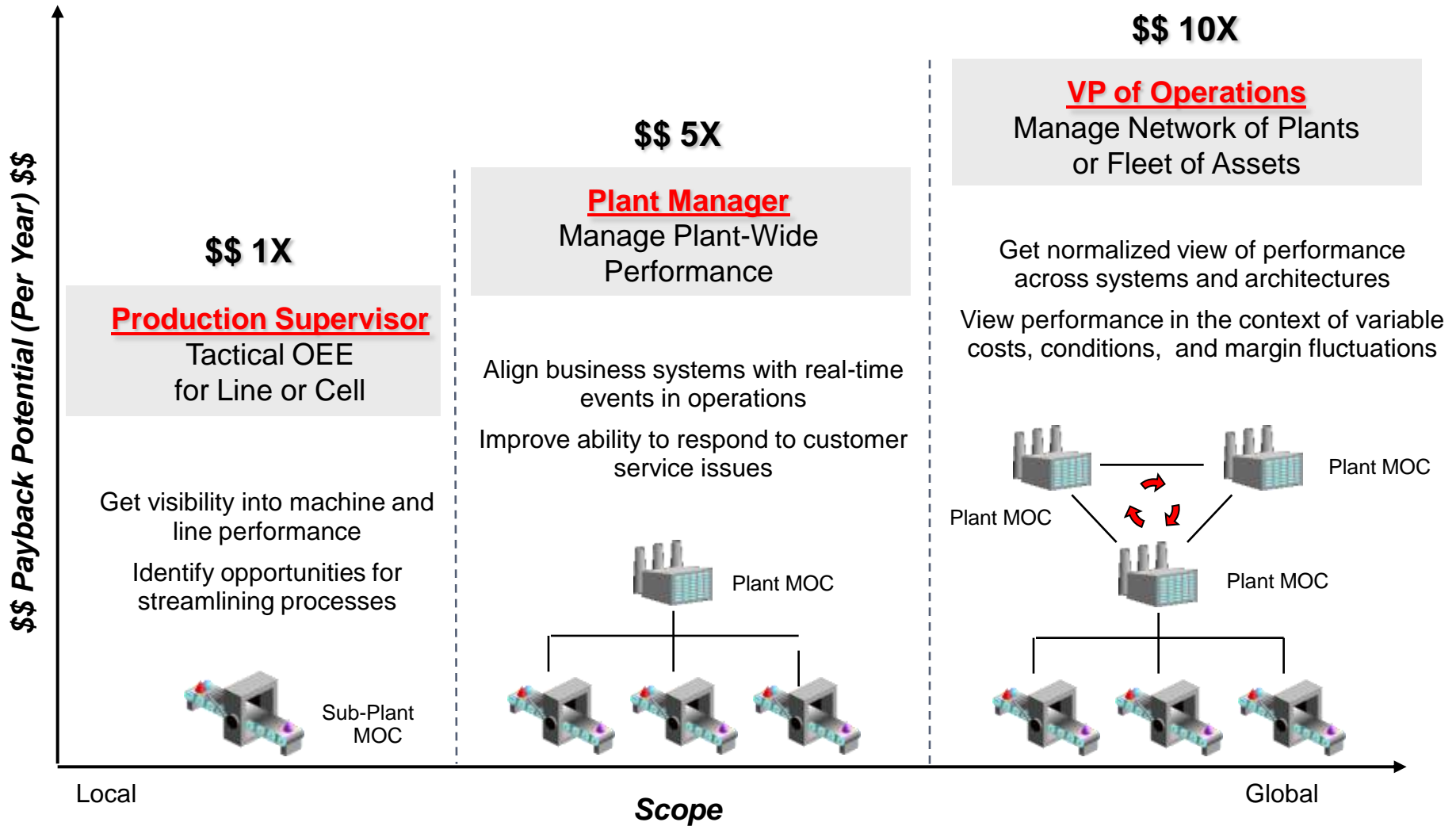
Oracle BI EE Suite

- **Common Enterprise Information Model**
- **Prebuilt Hierarchies, Drill Paths, Security, dashboards, reports**
- **Based on industry and analytic best practices**

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Packaged ETL Maps

Other Data Sources

MOC Unified Plant Data Repository

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Business Benefits & ROI
Generate Value Regardless of Implementation Scope

$$ Payback Potential (Per Year) $$

$$ 1X

Production Supervisor
Tactical OEE
for Line or Cell

Get visibility into machine and line performance

Identify opportunities for streamlining processes

Sub-Plant MOC

$$ 5X

Plant Manager
Manage Plant-Wide Performance

Align business systems with real-time events in operations

Improve ability to respond to customer service issues

Plant MOC

$$ 10X

VP of Operations
Manage Network of Plants or Fleet of Assets

Get normalized view of performance across systems and architectures

View performance in the context of variable costs, conditions, and margin fluctuations

Plant MOC

Plant MOC

Plant MOC

Plant MOC

Local

Scope

Global

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Source: AMR Research

Customer Program

G James Goes Live on MOC in 13 weeks

- **Australia's leading integrated glass and aluminum window manufacturer**
  - **Implemented EBS R12, currently live on Financials**
  - **Implemented MOC, without waiting for EBS roll-out to complete**

- **Plans to deploy entire suite of Oracle EBS**
  - **Other products include Configurator, Flow Mfg, Financials, Procurement, Order Mgmt, Mobile Supply Chain Applications….**

- **Decided to implement MOC right away without waiting for ERP rollout to complete**

G.James
glass & aluminium

- **Time to value – 13 weeks**

- **The deployment contains all 32 equipment from the Tool Room department that manufactures dies for Aluminum extrusion.**

- **On the go-live day, the MOC instance contained 2,000+ items and 80,000+ transactions**

- **Rolling out MOC to 4 other plants**

SIP and RapidValue Program

- Strategic Implementation Partner (SIP) Program
  - Oracle Development would commit to provide close supervision and ensure a successful implementation
  - Weekly calls with customer, Oracle support and consulting partner
  - Executive sponsorship on both sides
  - Complete focus on results and ROI

- RapidValue Program from Geometric, Oracle Partner
  - No risk, low cost, fixed scope implementation program
  - Clear, well defined functional scope and project plan
  - Using pre-defined templates for application modeling, acceptance testing and user training
  - Get to value in 10-12 weeks

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Product Roadmap

Roadmap

CY2010 (Planned)

New Solution for Green Operations

- **Modeling mfg and facilities hierarchies**
- **Top down & bottom up approaches for electricity consumption**
- **Identify opportunities for energy and CO_2 emissions reduction**

Future Candidates

- **Integration with JD Edwards, Production Scheduling**
- **Lean KPIs**

12.1.2 - Dec 2009

- **Event Management Framework**
- **Automated actions based on shop floor events**

12.1.1.01 – May 2009

- **EBS Adaptor for Process Mfg**
- **Extensible attribute framework enhancement to monitor process quality**
- **Item category enhancement**
- **Enhancement to equipment production performance**

First Release 12.1.1 – May 2008

- **Hierarchical dimensions for Time, Product and Equipment**
- **Data integration with other systems**
- **Device Connectivity**
- **Data management & contextualization**

First Release 12.1.1 – May 2008

- **Open/Flexible ISA-95 based data model**
- **Role based dashboards**
- **MOC Catalog – KPIs and Metrics**
- **ERP Adaptor for EBS Discrete Mfg**

Oracle's "New" Operations Center for Green (Planned)

Sustainability Leads to Better Performance

During the current economic slowdown, companies that show a "true" commitment to sustainability appear to outperform their industry peers.

- Source: Bloomberg: A.T. Kearney Analysis

FIGURE: Sustainability-focused companies outperform peers

Industry average better   Sustainability-focused companies better

Industry	~6 months	~3 months (positive)	~3 months (negative)

Utilities: 5% | 7%
Telecommunications: 7% | 9%
Technology: 5% | 13%
Oil and gas: 12% | 15%
Industrial goods and services: 11% | 23%
Construction and materials: -8% | -2%
Healthcare: 12% | 13%
Insurance: 15% | 21%
Financial services: 17% | 25%
Banks: 4% | 11%
Travel and leisure: 5% | 10%
Retail: 10% | 17%
Media: 28% | 33%
Personal and household goods: -6% | -4%
Food and beverage: 8% | 16%
Automobiles and parts: 20% | 33%
Chemicals: 18% | 30%
Basic resources: 5% | 10%

Indexed stock price performance percentage differential to market

Note: Indexed stock prices at ~ 3 months = September 8, 2008 and ~ 6 months = May 19, 2008 to current date, November 24, 2008. Percentage performance differential calculated by taking the percentage point difference of averaged sustainability companies' indexed performance to the market indexed performance over the market indexed perofrmance. Sustainability companies include DJSI World 80 2008/2009 + DJSI 2008 Supersector Leaders + Goldman Sachs SUSTAIN focus list for mature industries.

n=99 sustainability companies

Sources: Bloomberg; A.T. Kearney analysis

… sustainability is a mother lode of organizational and technological innovations that yield both bottom-line and top-line returns. Becoming environment friendly lowers costs …...smart companies now treat sustainability as innovation's new frontier.

- Harvard Business Review, Sept 2009

Energy Consumption – Key Focus Area for Sustainability

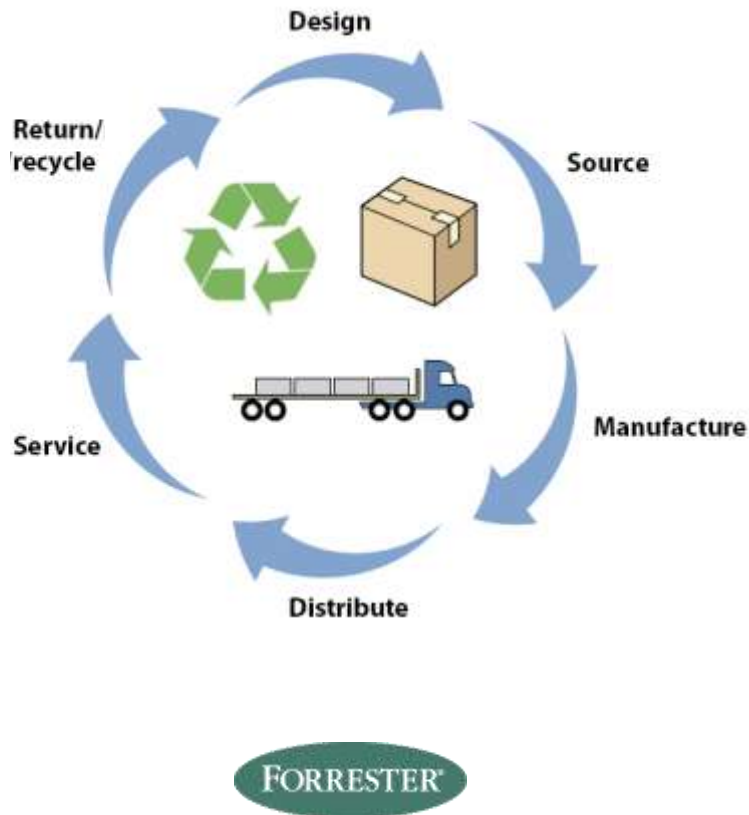Source: AMR Research, "Sustainability Strategies: The New Age of Carbon", Stephen Stokes and Kevin O'Marah, June 2009

Industries can achieve 20% energy reduction resulting in $19 billion of savings by implementing energy savings initiatives….

- US Department of Energy Study

Sustainable Supply Chain Operations
Green and Sustainability in Every Aspect of Business

Life-cycle phase	Examples of SCM sustainability efforts
Design	Initiating design for the environment (DfE) and recycling (DfR) programs, implementing environmental cost accounting
Source	Implementing vendor scorecards to audit and certify sustainability levels, sourcing locally where possible, controlling supplier transportation mode decisions
Manufacture	Optimizing asset utilization through predictive maintenance, moving from "end of pipe" to holistic life-cycle analysis, reducing facility energy usage, implementing environmental management systems (EMS)
Distribute	Reducing and recycling packaging, measuring the carbon footprint and incorporating offsets in logistics decisions, increasing consolidated loads, participating in the EPA SmartWay Transport Partnership program
Service	Optimizing field service routing and trunk stock to minimize drive times, incenting repair versus replace, implementing continuous improvement feedback programs with product design teams
Return/recycle	Remanufacturing and recycling programs to sell products into secondary markets, rolling out no-charge take-back programs

Source: Forrester Research, "Supply Chain Leaders : Your CEO Wants To Know Your "Green" Strategy – Do You Have One?",
Patrick M. Connaughton, December 17, 2007

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"New" Oracle Solution for Green Operations

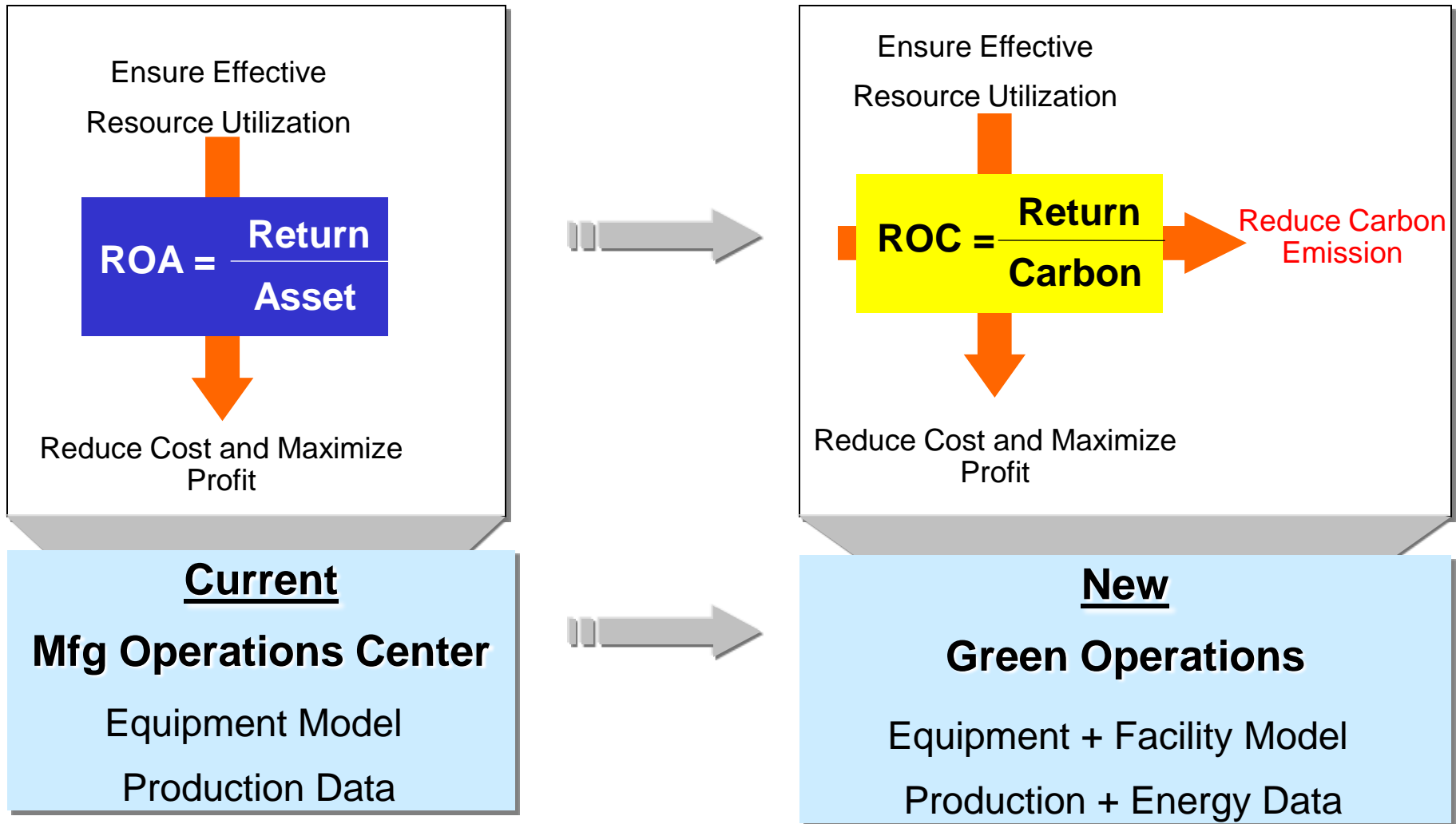- **Top-Down and Bottom-Up approach to Energy Management**

- **Track Energy Use and CO_2 emissions in *manufacturing and non-manufacturing facilities***

- **Normalize and correlate energy consumption to operating conditions and production output**

- **Identify specific opportunities for energy efficiency and reduction in CO_2 emissions**

- **Leverage as a certifiable data repository for energy usage reporting based on GRI framework and GHG protocol**

- **A solution that integrates directly to automation systems, meters and sensors**

- **Built in collaboration with OMRON Corporation, a leader in environmental sustainability**

Solution for Energy Efficiency and Reduction in CO2 Emissions

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Enabling Return on Carbon (ROC)

Ensure Effective
Resource Utilization

$$ROA = \frac{Return}{Asset}$$

Reduce Cost and Maximize Profit

Current

Mfg Operations Center

Equipment Model

Production Data

* ROA＝Return on Asset

Ensure Effective
Resource Utilization

$$ROC = \frac{Return}{Carbon}$$

Reduce Carbon Emission

Reduce Cost and Maximize Profit

New

Green Operations

Equipment + Facility Model

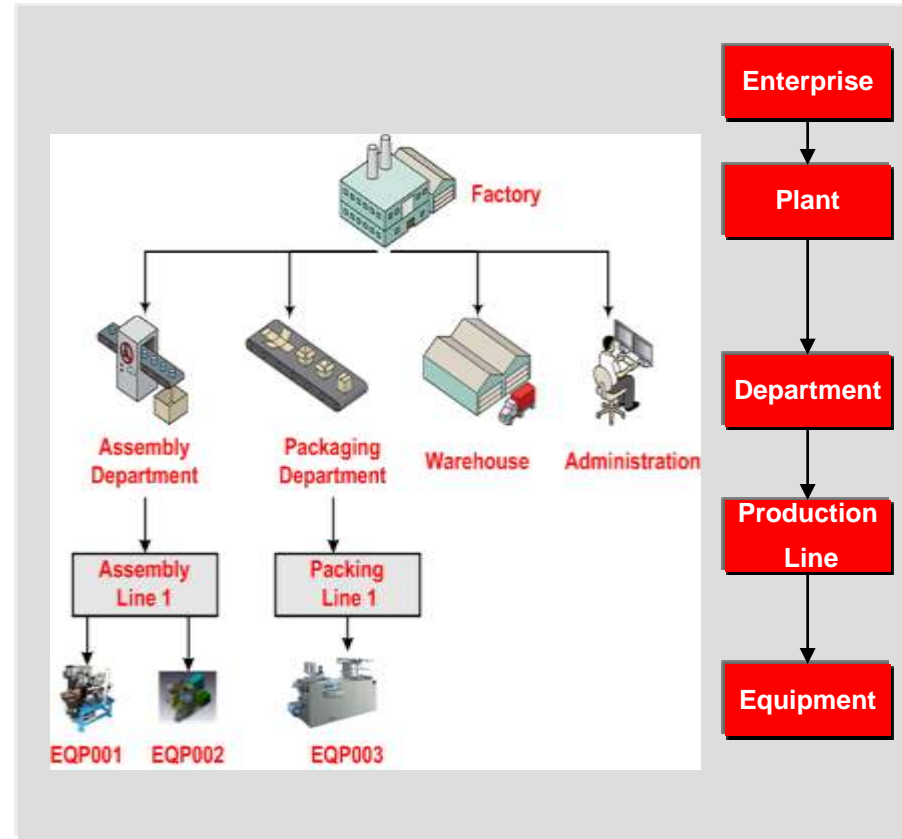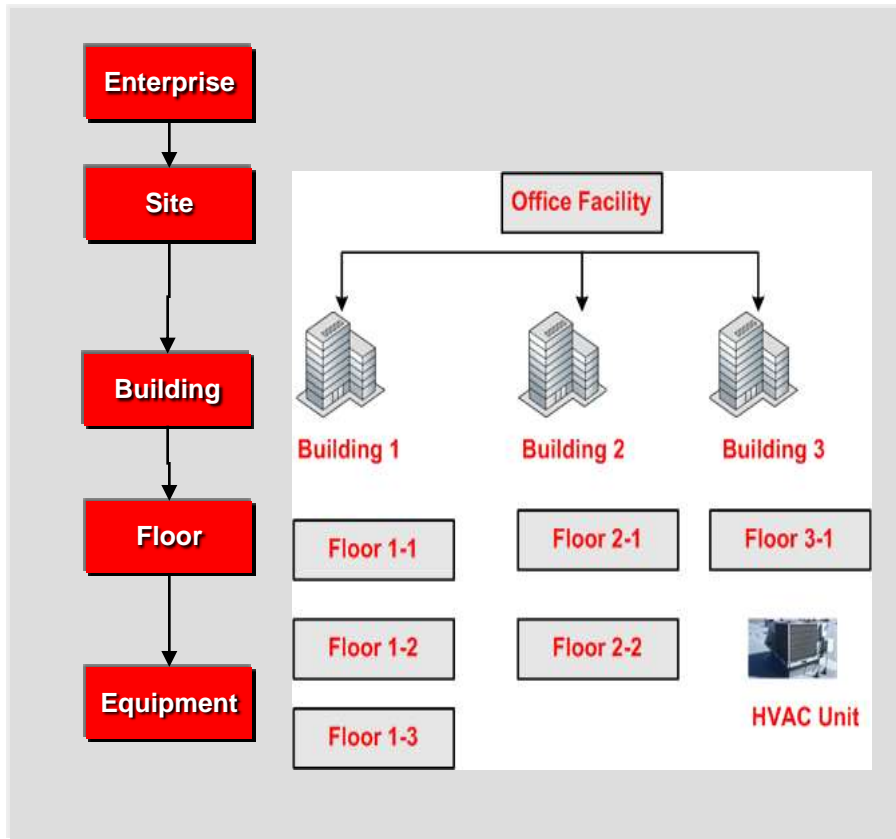Production + Energy Data

* ROC＝Return on Carbon

"New" Oracle Solution for Green Operations
Solution for Energy Efficiency and Reduction in CO$_2$ Emissions
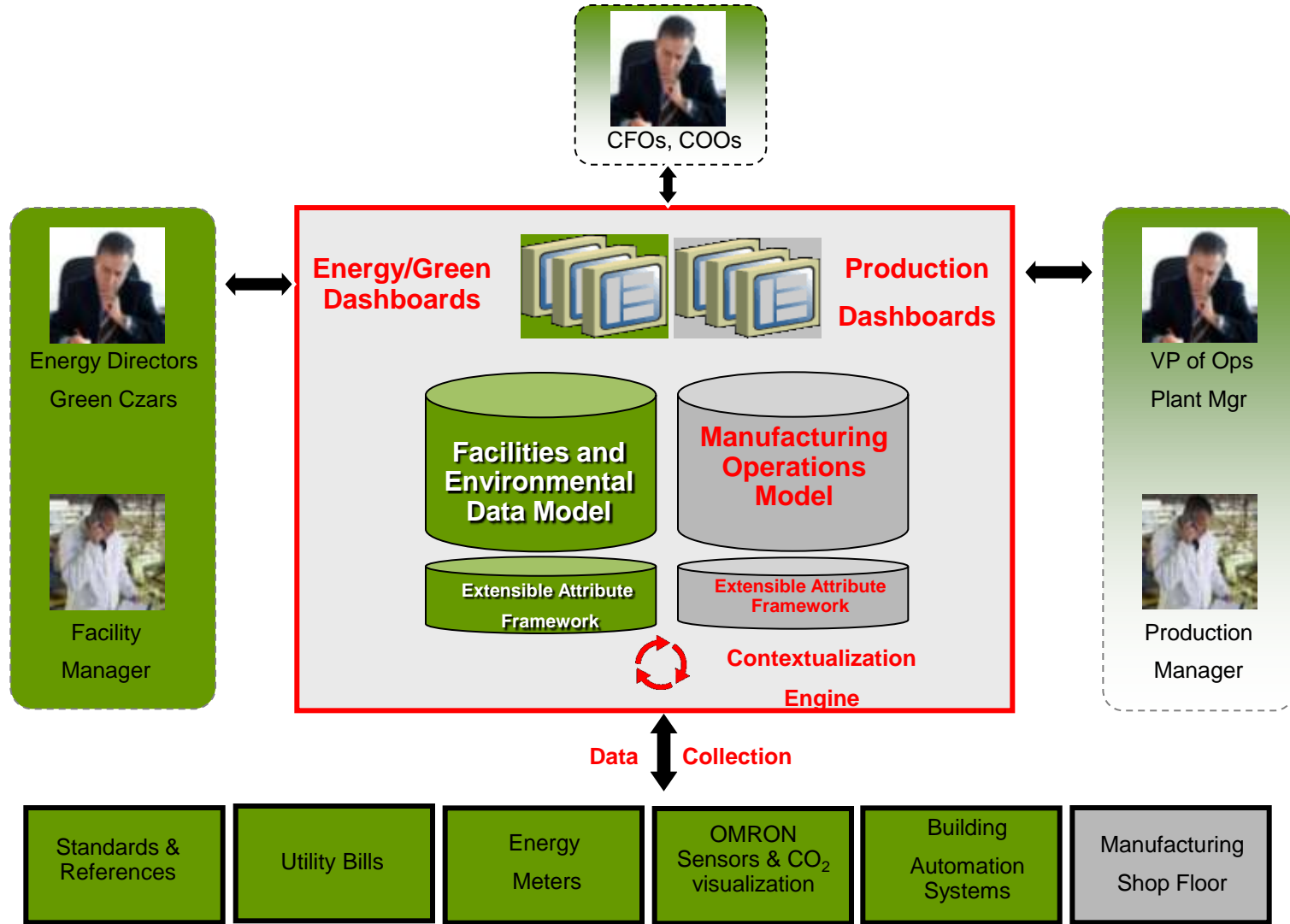
Solution Capabilities
Flexible Entity Modeling and Hierarchies

- Model *Production and Non-Production Facilities/Site*
- Flexible Hierarchy & Entities Definition – Sites, Buildings, Floors, Departments, Equipments, etc.
- Model utilities as energy sources, energy costs & other key attributes

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Solution Capabilities
Flexible Entity Modeling and Hierarchies

Sustainability Aspect Setup

Define Sustainability Aspect

Update Aspect

Select Sustainability Aspect
- Electricity

Usage Category: Electricity

| Add Category | Inactivate | Activate |

Select	*Usage Category
●	Air-conditioning
○	Compressor
○	Laptop
○	Production (for Equipment)
○	Lighting
○	Other Energy

Emission: Electricity

| Add Emission | Inactivate | Activate |

Select	*Emission	Emission UOM
○	CO2	KG
○	CO	GM

View Site Sustainability Aspect Details

	Site PLANT2	Sustainability Aspect Electricity
	From Date 01-Jan-2010	To Date
	Number of Sources 1	

Cost and Emission Factor Details

Select Source	Type	Planned Usage(%)	Cost	Currency
● Cairn Energy	Utility	100	3	USD

Emission Factor Details

Emission	Emission Factor	Status
CO2	1	Active

Entity Hierarchy

⊕	⊟ Plant1	01-Jan-1900	Unassigned
⊕	⊟ PAN-CRT(P3)	05-Nov-2009	Plant1
⊕	⊟ KETTLE-1	05-Nov-2009	PAN-CRT(P3)
	MIXER1	05-Nov-2009	KETTLE-1
	MIXER2	05-Nov-2009	KETTLE-1

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Solution Capabilities
Automatic Data Collection from Meters and Sensors
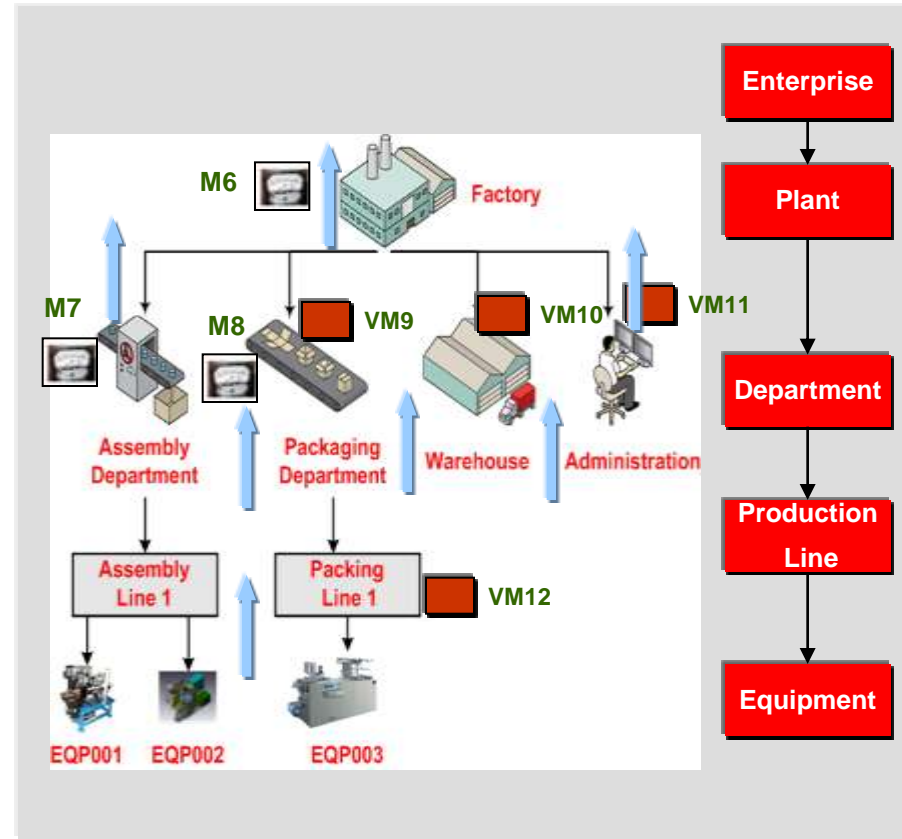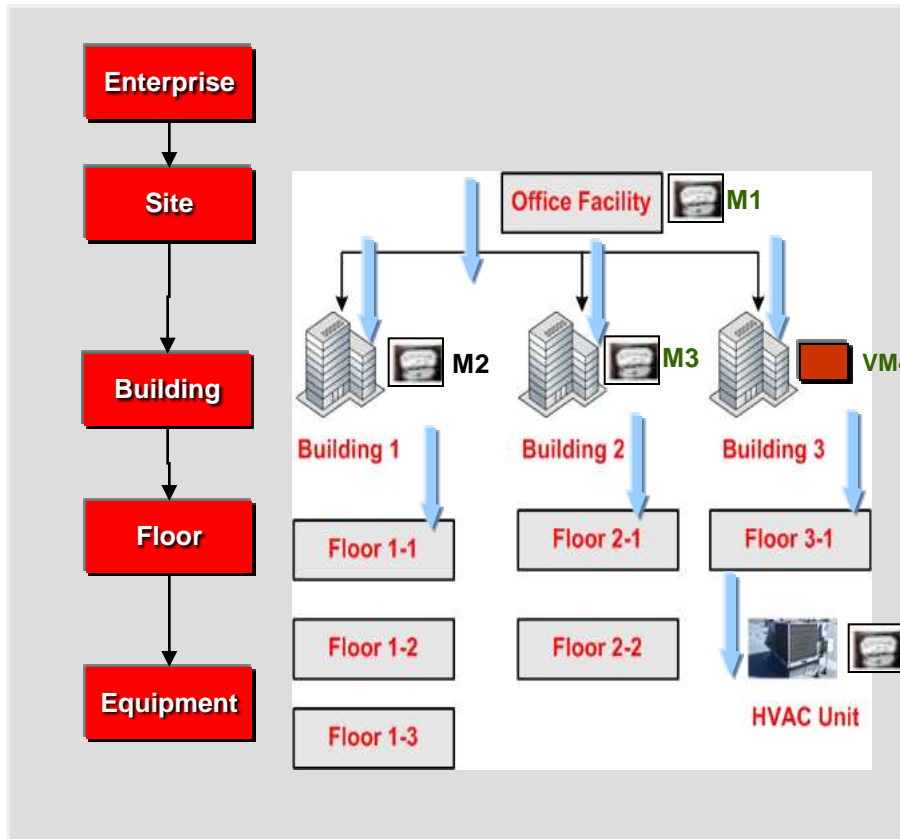
- Model Meters and tie them to sensor tags for data collection
- Model multiple Virtual Meters for Calculations, Simulation and Scenario Comparison
- Use Virtual Meters for Aggregation and Allocation
- Support for 'Top Down' allocation and 'Bottom Up' aggregation

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Solution Capabilities
Meters & Meter Readings

Meter Entity Association

* Entity Hierarchy	Department Hierarchy
* Entity Name	Mixer11
Usage Category	

* Entity EQUIPMENT

Sustainability Aspect Electricity

Go Clear

Search Results

Assign Meters | Update Assignment | Inactivate | Activate

Select	*Meter Code	Meter	Meter Type	Usage Category	Meter Category	Simulation Name	Status
○	M0001	METER 0001	Actual	Compressor	Simulation	Allocated	ACTIVE

Meter History Reading

Sustainability Apsect **Electricity**
Entity Hierarchy **Equipment Hierarchy 01**
Entity Name **Mixer11**
Meter **METER 0001**

Meter Type **Actual**
Entity Type **Equipment**
Meter Code **M0001**

*From Time	*To Time	*Usage Value	Usage UOM	Process	Action
04-Jan-2010 22:00:00	04-Jan-2010 22:59:59	15	KWH	N	✏️ 🗑️
04-Jan-2010 21:00:00	04-Jan-2010 21:59:59	13	KWH	N	✏️ 🗑️
04-Jan-2010 20:00:00	04-Jan-2010 20:59:59	10	KWH	N	✏️ 🗑️

- Define and associate meters to entities in the hierarchy

- Model Actual and Virtual Meters

- Collect meter readings through tags

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Solution Capabilities
Green Dashboards and KPIs

- Planned vs. actual electricity usage and CO_2 emissions
- Normalized Electricity Usage, Emissions and Cost by Production Output, Sq. Ft and Headcount
- Electricity consumption by usage category
- Drilldown to identify causes of anomalies or outliers
- Pre-built role-specific dashboards, reports, and alerts
  - Graphical views
  - Trend charts
  - Graphs
  - Tables

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Solution Capabilities
Powerful Analytics – Always with Context

Which sites are meeting established targets ?

Contextual Information

Normalized Consumption information

| Summary | Site | Building | Floor | Floor Section | | | | | | Page Options ▼ |

Year 2009 | Quarter (All Choices) | Month Oct-09 | Date (All Choices) | Go

Electricity Consumption

Site	Plan Vs Actual - Period to Date	Business Function	Area	Headcount	Actual Consumption - Period to Date	Plan Consumption - Period to Date	Last Year Consumption - Period to Date	% Change (Plan) ▼	% Change (Last Year)	Actual Consumption per Unit Area	Actual Consumption per Person
Ayabe	🔴	Manufacturing	190,000	14,000	22,247	22,100	22,247	0.67 🚩	-0.50	0.12	1.59
Yasu	🟢	Manufacturing	40,000	850	11,009	11,120	11,009	-1.00	-2.92	0.28	12.95
Kusatsu	🟢	Manufacturing	200,000	14,090	20,512	20,720	20,512	-1.00	-0.99	0.10	1.46
Osaka	🟢	Sales	100,090	20,900	8,275	8,360	8,275	-1.02	-9.11	0.08	0.40
Kyoto	🟢	HQ	6,000	2,080	7,453	7,530	7,453	-1.02	-2.93	1.24	3.58
Komaki	🟢	R&D	25,000	190	4,789	4,840	4,789	-1.05		0.19	25.21
Grand Total			561,090		74,285	74,670	74,285	-0.52	-2.39	0.13	1.43

Electricity Consumption UOM: **KWH**, Area UOM: **Sq Ft**

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Solution Capabilities
Site Level Energy Consumption and CO_2 Emissions

Key Site Characteristics

Summary | Site | Building | Floor | Floor Section

Page Options ▼

Site Characteristics

Site: Ayabe
Business Function: Manufacturing
Headcount: 14000
Area: 190000
Area UOM: Sq Ft

| Year | Quarter | Month | Date |
| 2009 ▾ | (All Choices) ▾ | Oct-09 ▾ | (All Choices) ▾ |

| Site | Building | |
| Ayabe ▾ | (All Choices) ▾ | Go |

Electricity Consumption

| Building	Business Function	Area	Headcount	Actual Consumption - Period to Date	Plan Consumption - Period to Date	Last Year Consumption - Period to Date	% Change (Plan) ▾	% Change (Last Year)	Actual Consumption per Unit Area	Actual Consumption per Person
Building 200	Manufacturing	77,551	6,359	7,612	7440	7,612	2.31 ⚑	0.95 ⚑	0.10	1.20
Building 100	Manufacturing	15,510	984	4,154	4150	4,154	0.11 ⚑	-1.09	0.27	4.22
Building 400	Manufacturing	29,469	2,528	3,083	3090	3,083	-0.22	-0.54	0.10	1.22
Building 300	Manufacturing	44,204	3,791	4,618	4630	4,618	-0.26	-1.74	0.10	1.22
Common Area	Water System	6,286	0	1,953	1960	1,953	-0.36	-1.37	0.31	
Admin Building	Administration	16,980	338	826	830	826	-0.45	-1.63	0.05	2.44
Grand Total		**190,000**	**14,000**	**22,247**	**22100**	**22,247**	**0.67**	**-0.51**	**0.12**	**1.59**

Electricity Consumption UOM: **KWH**, Area UOM: **Sq Ft**

Cross-Building Comparison

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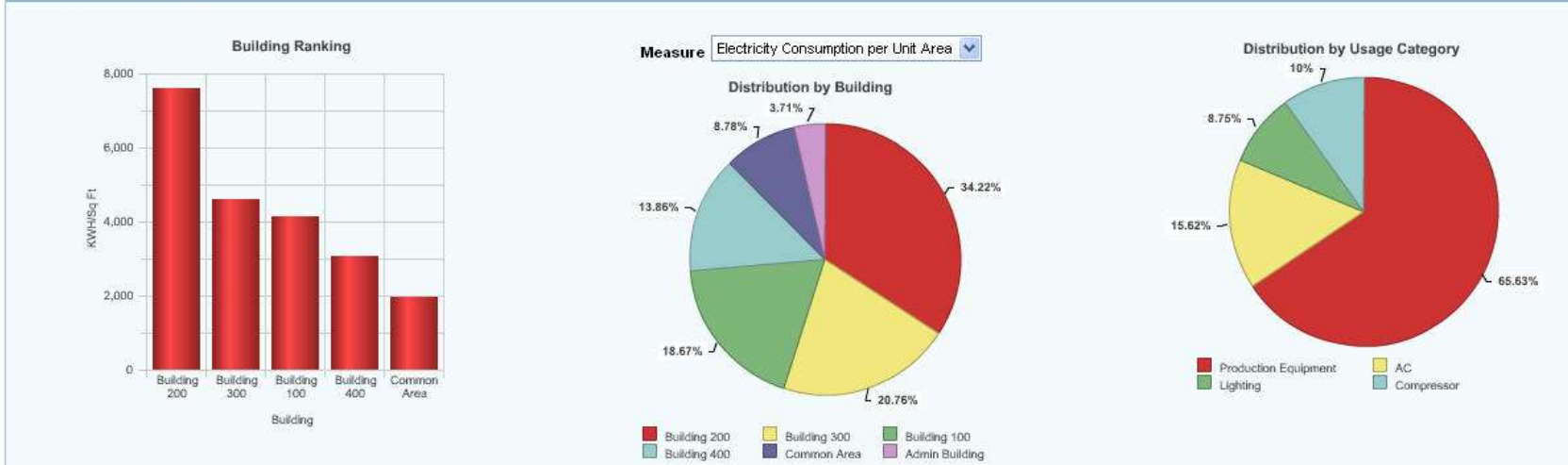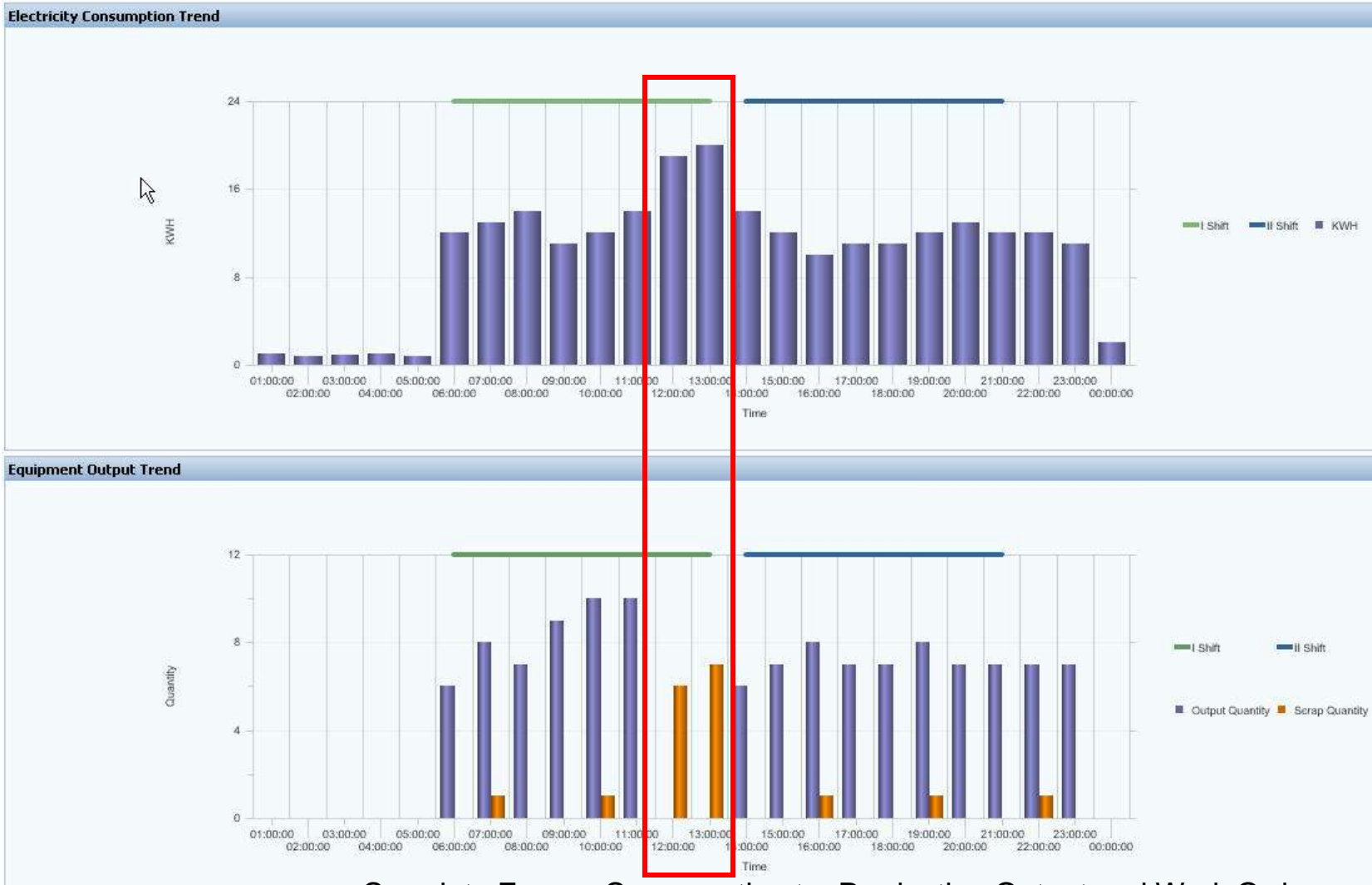
Solution Capabilities
Trend Charts & Graphs for analysis
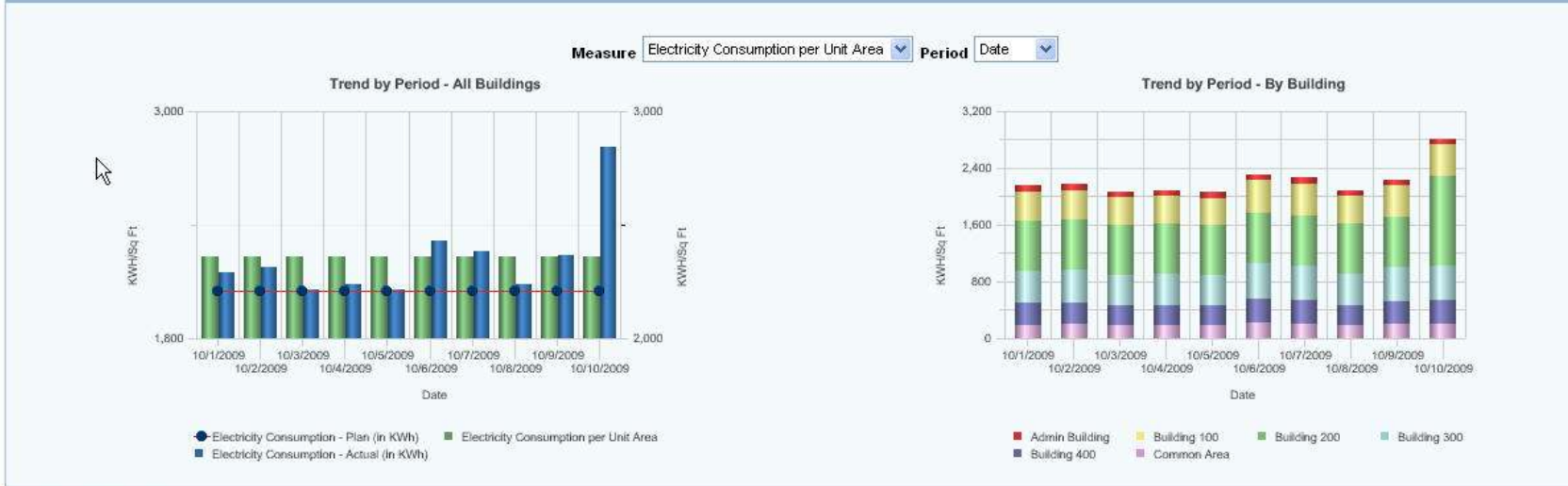
Solution Capabilities
Contextualize Energy Usage to Production

Correlate Energy Consumption to Production Output and Work Orders
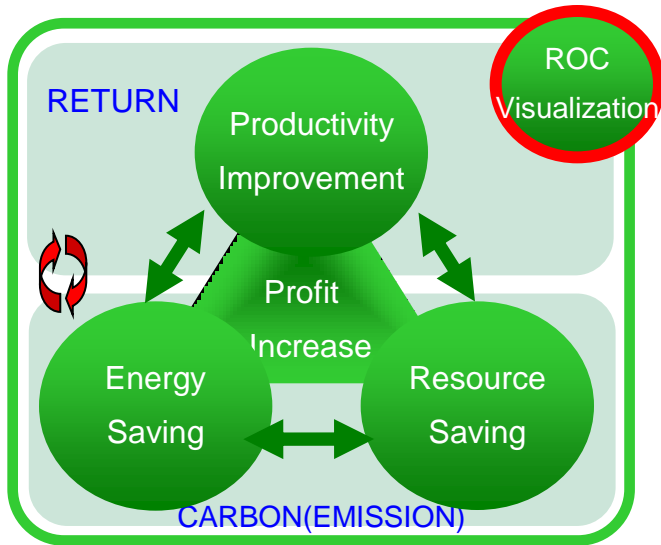
Solution Capabilities
Contextualize Energy Usage to Production

Correlate Equipment Status to Operating Parameters

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Summary And Key Takeaways

ROC Visualization;

New paradigm to increase productivity and profit under low-carbon-emission control.

- Sustainability is an "opportunity", not just an obligation

- Energy efficiency should be top priority out of all sustainability initiatives

- Oracle is announcing a "New" solution for energy efficiency and reduction in CO_2 emissions

- "New" solution delivers value to all operations and facilities – manufacturing and general commercial

- "New" solution combines best in class software from Oracle and technology and expertise from OMRON

- Planned availability of solution - CY 2010

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Questions?

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For Additional Information

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