ORACLE®

Business Activity Monitoring

Dag Oscar Olsen
Nordic Business Development Manager SOA & RFID

Agenda

- The Business Problem
- Key Concepts
- Oracle BAM Architecture
- Customer Use Cases
- Customers

"BAM defines the concept of providing real-time access to critical business performance indicators to improve the speed and effectiveness of business operations." ….. Gartner Group.

ORACLE®

The Value of Business Activity Monitoring

- **Business Goal:**

  Iterative Process Improvement
  - Modify Process Flow
  - Exception Handling
  - Dynamic Process Assembly

- **Traditional Challenge:**

  Insight to Action Gap
  - Traditional BI Tools manage only what happened last time, not what is happening now
  - No opportunity to take corrective actions while there is still time to avert a crisis
  - No opportunity to leverage arbitrage opportunities

- **Solution:**

  Business Activity Monitoring
  - **Monitor**, **Analyze** & **Act** in real-time
  - Achieve process agility through in-flight change

ORACLE

Business Activity Monitoring: Why it matters?

- BAM enables business users to define and customize web based dashboards and alerts without IT support

- BAM helps detect business/IT problems proactively, find the root cause, and take corrective action

- BAM provides real-time business dashboards and alerts to monitor KPIs, SLAs and business processes

Correlation BAM, BI and CPM

- BAM is largely *born-of*, and is reshaping, two previously distinct technology markets:
  - Analytics and decision making of Business intelligence market
  - Real-time and business process linkage of Enterprise Application Integration (EAI)
- BAM focuses on what is happening, not what has, or might happen
- BAM sits *in-between* the historical and analytical focus of BI and the forward business planning of Corporate Performance Management
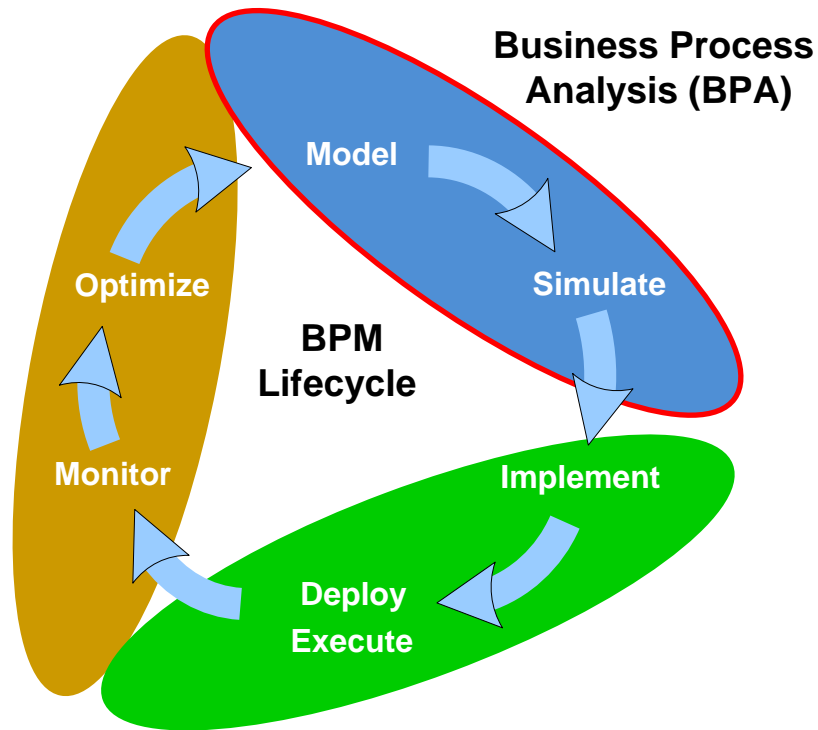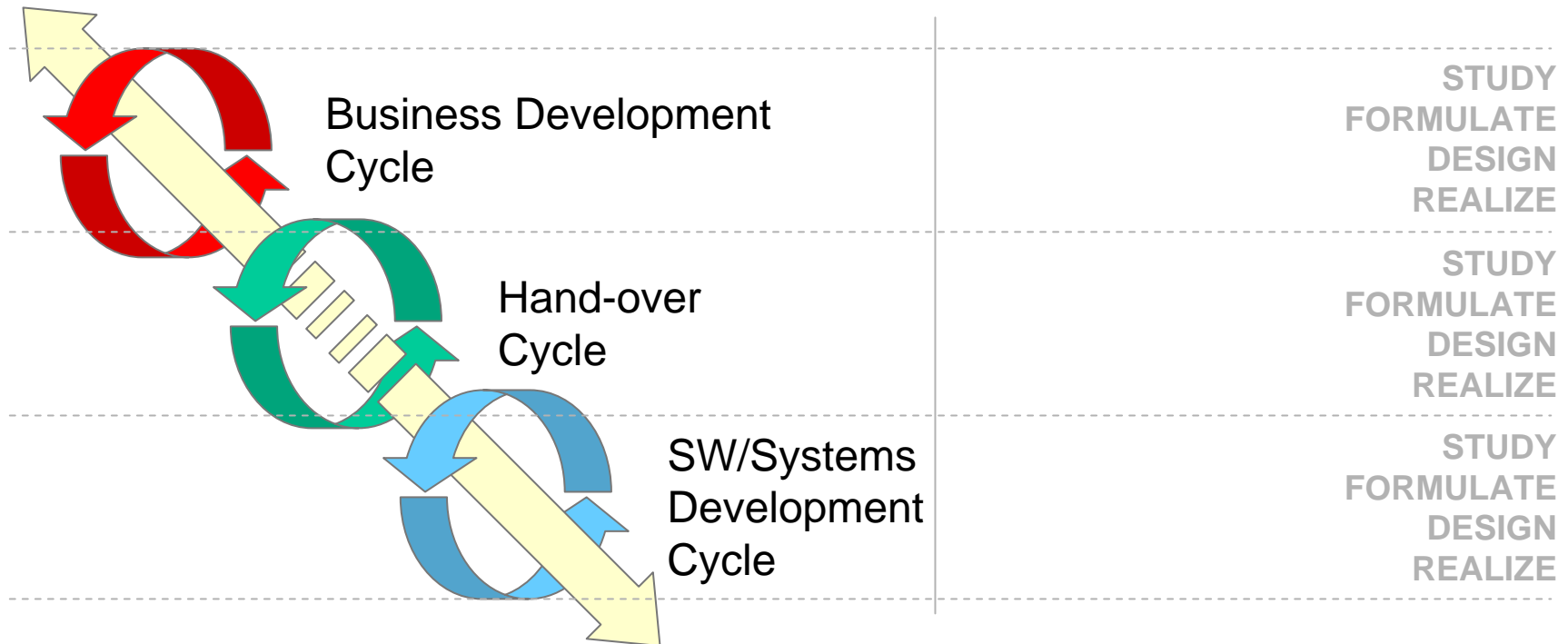
"Has happened"　　　　*"Happening"*　　　　*"Could/Should Happen"*

BI
(analysis and reporting)　　BAM　　CPM
(forecasting and data mining)

ORACLE

The BPM Lifecycle

Business Process Analysis (BPA)

Model

Optimize

Simulate

BPM Lifecycle

Monitor

Implement

Deploy Execute

BPM is about

✓ Process Modeling, Execution and Management

✓ Continuous Process Improvement

✓ Business and IT working together to achieve business objectives

✓ Making IT more responsive to changing business needs and conditions

Three Major Cycles of Enterprise Development

Business Development Cycle

Hand-over Cycle

SW/Systems Development Cycle

STUDY
FORMULATE
DESIGN
REALIZE

STUDY
FORMULATE
DESIGN
REALIZE

STUDY
FORMULATE
DESIGN
REALIZE

STUDY: monitor, analyze, simulate, *understand*
FORMULATE: plan, *specify what* (without specifying how)
DESIGN: (re-)design/refine, simulate/prototype & *specify how* without actually implementing
REALIZE: implement, test, deploy & maintain: *construct* and *put to use*

One View of the Business Development Cycle

▶ **Development is moved closer to business**
▶ **Language gap between business and IT is reduced**
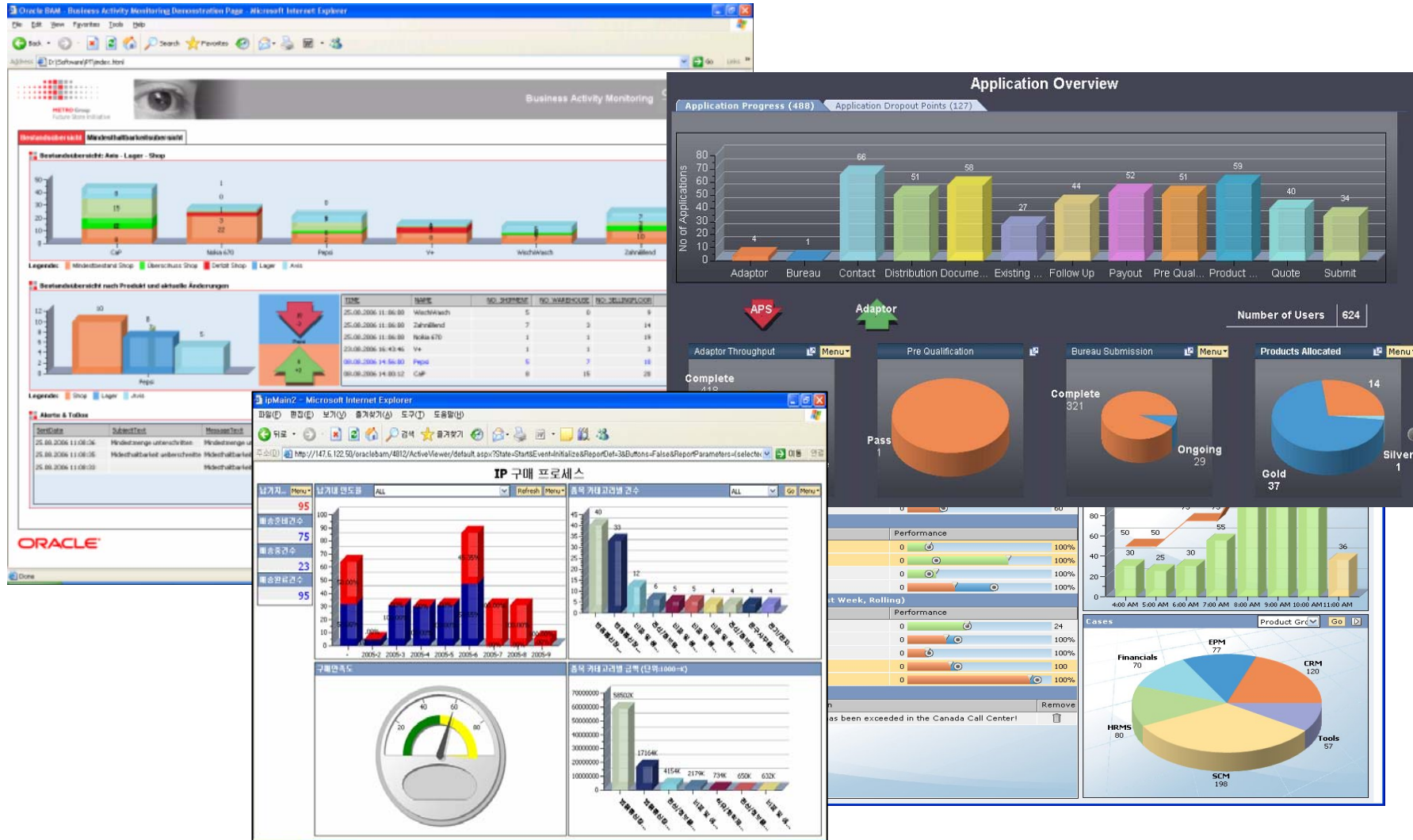▶ **Busines gets analysis (business intelligence) & design tools**

BUSINESS DESIGN

(BPMN, EPC, OD, ...)

SYSTEM DESIGN & DEVELOPMENT

(BPMN, EPC, OD, BPEL, ...)

IMPLEMENTATION, ORCHESTRATION: BPEL+

Invoke (use) S_1.
If result is empty,
    invoke S_3.
If not empty,
    invoke S_5.

LOG

CST

BEN

BUSINESS SIMULATION & RE-DESIGN

(BPMN, EPC, OD, BPEL, ...)

BUSINESS ACTIVITY MONITORING (BAM)

X

(BPMN, EPC, OD, BPEL, ...)

ORACLE
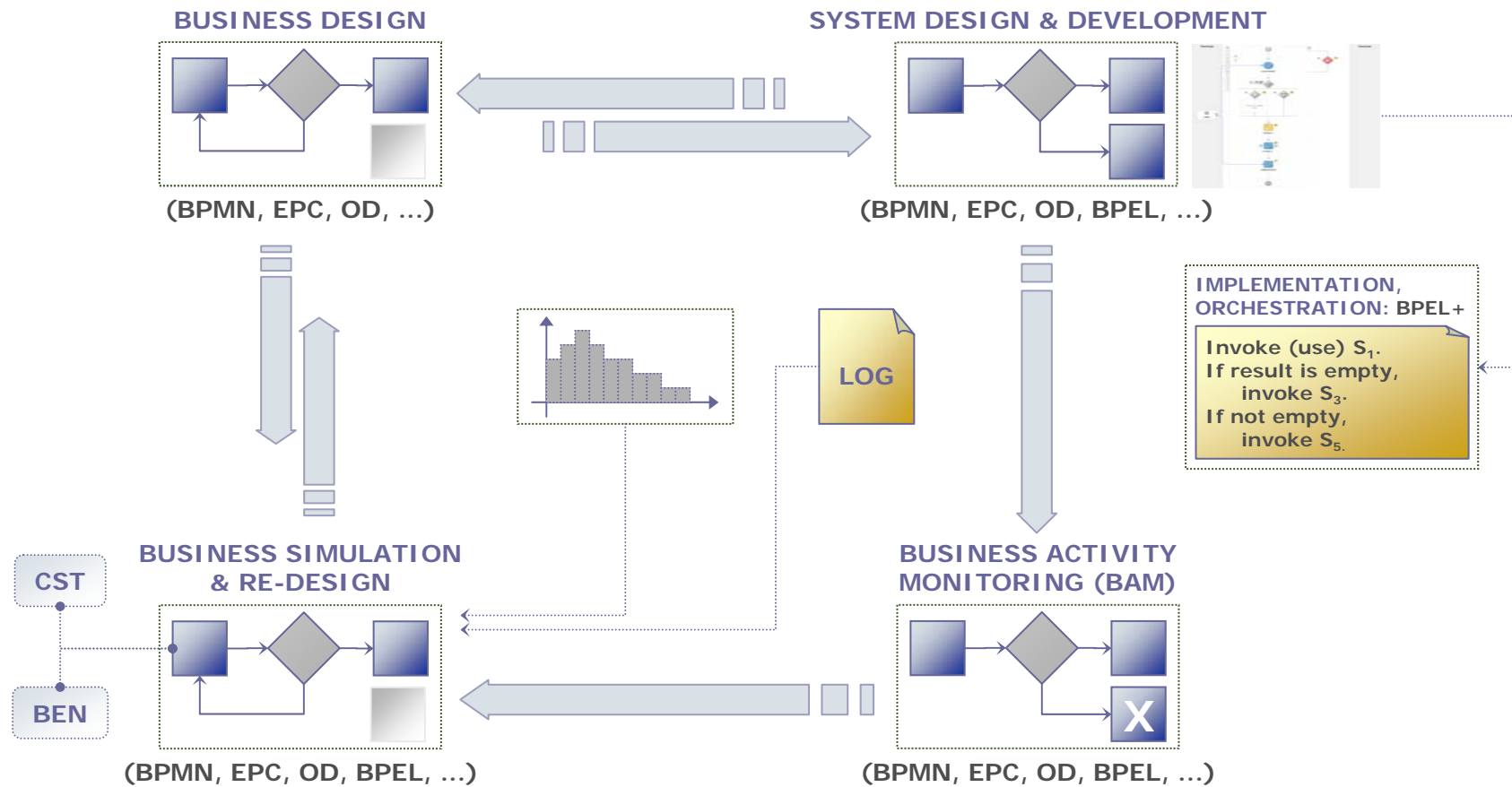
BI + BAM

✓ BAM adds real-time information to Business Intelligence

✓ Business Intelligence adds information context to BAM

Real-Time DW vs. BAM

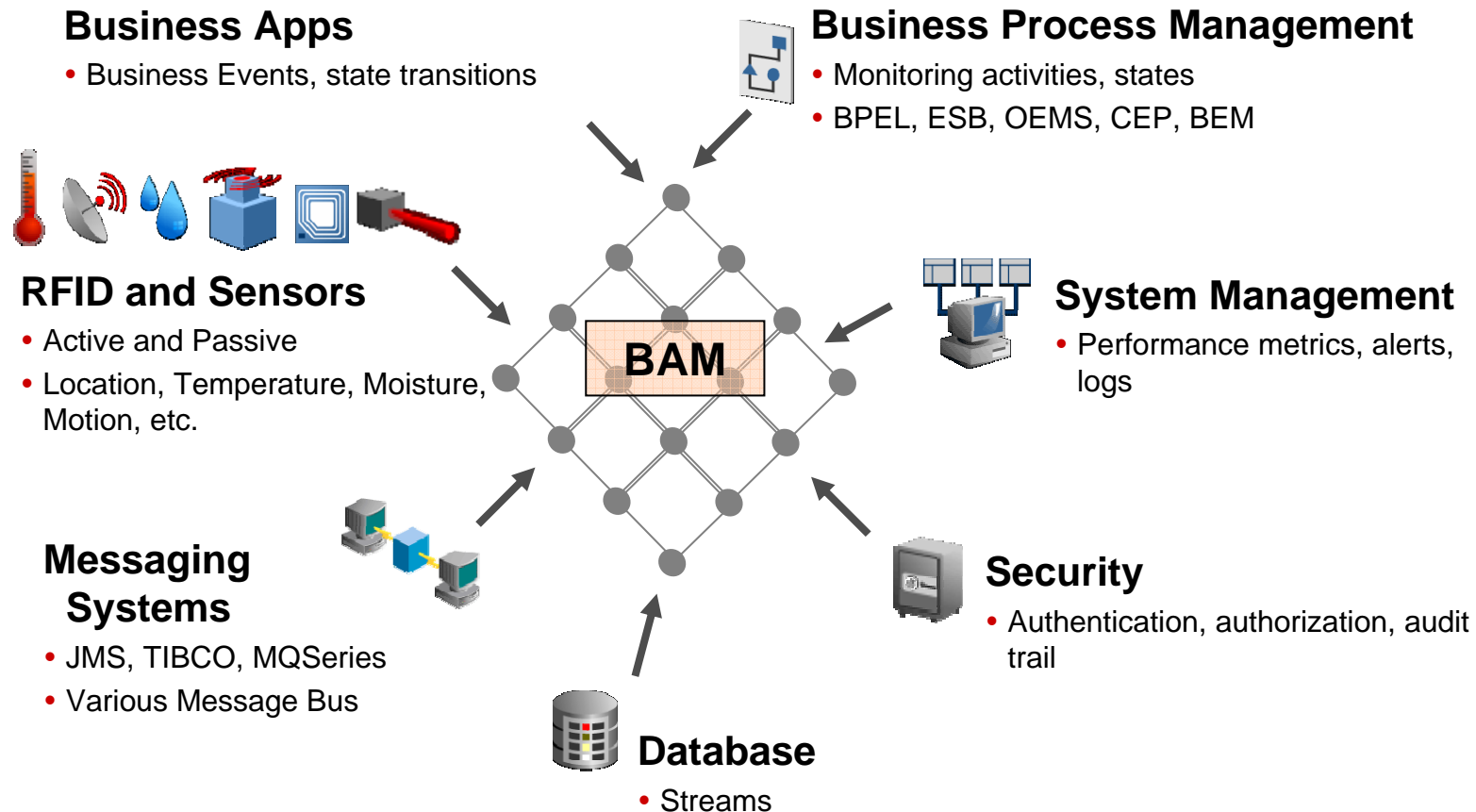| Real-Time Data Warehousing	BAM
The decision-making process is not event-driven. Consider a customer making a large deposit in his/her checking account. Even if the data/event related to the deposit is loaded in the data warehouse in near-real time, no one in the bank will know about the event; therefore, the bank will miss an up-sell opportunity.	**Event-driven decision making** — Rather than depending on batch extraction, loading into a data warehouse/data mart and running reports to check operational status, pure-play BAM systems are automatically triggered and updated by events that are important to the business. Analytics are run on the events as they are generated and actions are taken immediately.
Dynamic modeling and use of business rules to define action are not supported. Data models in the data warehouse cannot be changed easily and may require weeks or months of data reloading and re-indexing to reflect changed models. Business rules cannot be specified to indicate action to be taken when thresholds are crossed.	**Rules-based monitoring and reporting** — BAM products permit dynamic modifications to data models and business rules on the fly, thanks to architectures that can be driven by business rules. The more powerful and flexible the rules-driven capabilities, the better the BAM implementation.
Correlation of events over a time series is not possible. Many business scenarios require continuous monitoring of certain metrics over a period of time in order to differentiate between a spike and a trend. Lack of time series processing may cause an organization to overreact or have false positives.	**Real-time integration of event and context data** — By far the greatest technological challenge comes from dynamically combining event data with contextual information to enable decisions to be made using a combination of operational, historical, plan and forecast data. The best BAM systems will be those that employ architectures that are highly tuned for this purpose.
Tremendous latency is introduced. Loading large volumes of event data into a data warehouse can delay action on events significantly, especially because reports can only be run after data has been loaded. This latency also precludes continuous monitoring of metrics or trends to inform business users about what action to take when exceptions occur.	**No latency; comprehensive exception-alert capabilities** – Events are acted upon as soon as they occur by using an event-driven processing model and streaming architecture that minimizes latency. BAM products are highly optimized for minimizing latency between event and action.

# Oracle BAM Dashboard Examples

Key Concepts

ORACLE®

#1-- Business Events Integration

Business Apps
- Business Events, state transitions

Business Process Management
- Monitoring activities, states
- BPEL, ESB, OEMS, CEP, BEM

RFID and Sensors
- Active and Passive
- Location, Temperature, Moisture, Motion, etc.

BAM

System Management
- Performance metrics, alerts, logs

Messaging Systems
- JMS, TIBCO, MQSeries
- Various Message Bus

Security
- Authentication, authorization, audit trail

Database
- Streams

ORACLE

#2 – Analyze Processes, Trends and Context

Monitor a Single Process
  Track each process step
  Identify failures
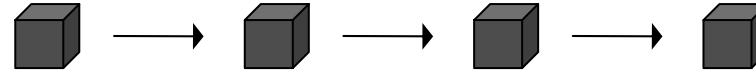
Process Aggregations
  Averages, KPIs, SLAs
  Identify bottlenecks
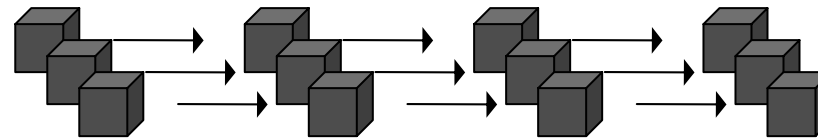
Complex Event Processing
  Correlate independent events
  Identify threats & opportunities
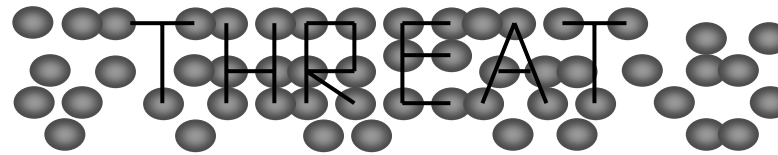
Context
  Historical performance
  Rolling average

Jan '04   Jan '05   Past 4 Hours

#3 – Interface for Business Users

Personalized Dashboards
Role-based access
User defined and built
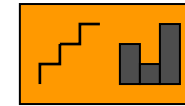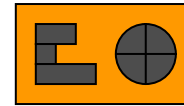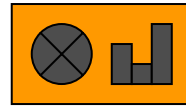
Personalized Alerts
User defined alert rules
Multi-channel delivery
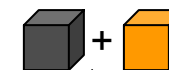
Embedded Actions
One-button response
Initiate response workflow

Events and Services Work Together
Service and Event Network

Service Consumer

Service Provider

Event Generator

E Event Object

Loan Applicant

Web Application

Service: Apply for Loan

Event Generator (BPEL Process Manager)

Event: Loan Request

E

Event Processor (BAM Server)

Event: High-Value Loan

E

Loan Manager

Service: Queue Request

Workflow Service

Service: Expedite Loan

ORACLE
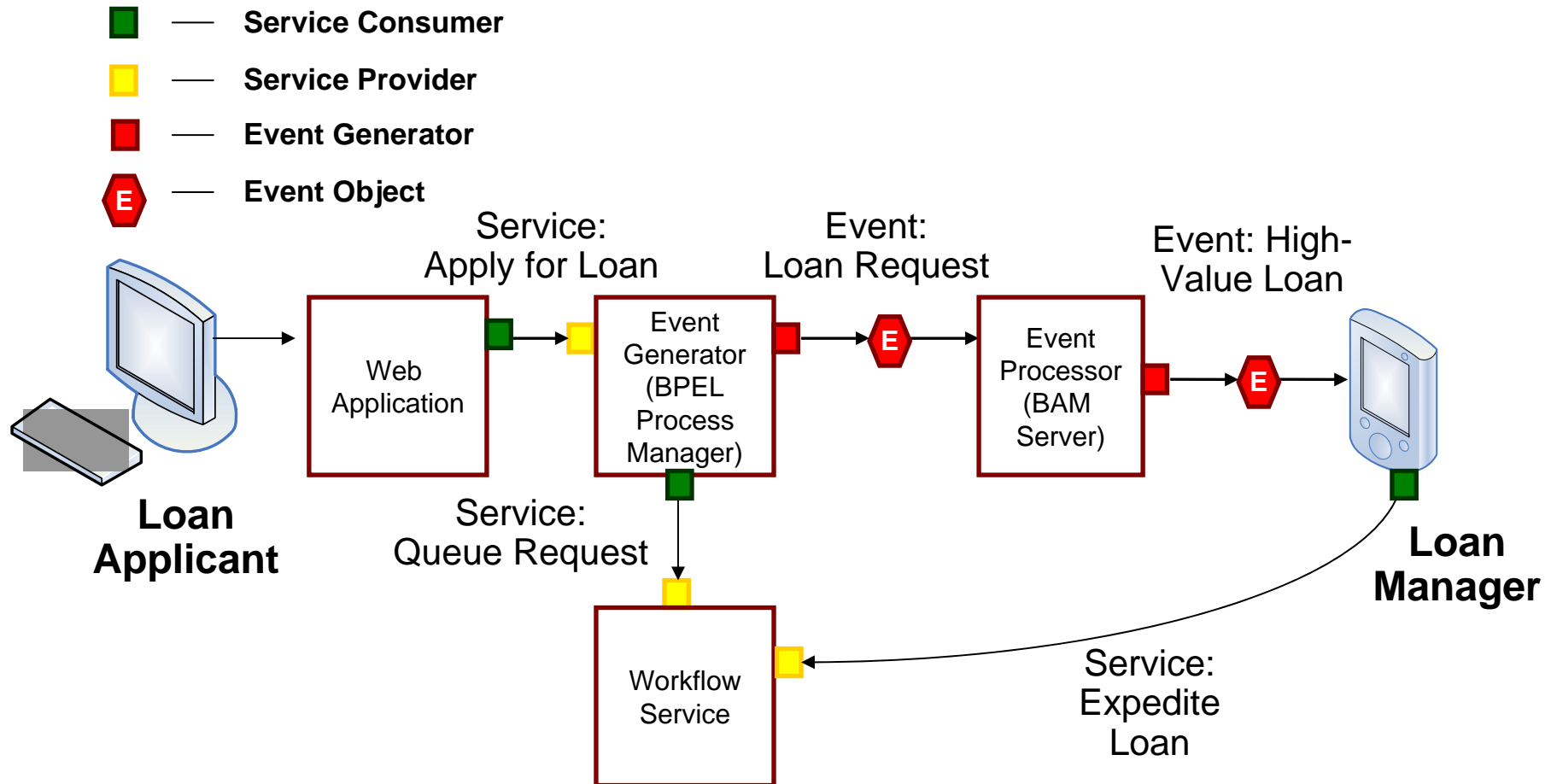
How Events Work
Example Technologies

The Event

- XML message
- Binary encoding

- Web service
- Application code
- Automatically or Manually Invoked

Event Generator → **Event Object** → **Event Processor** → **Response Service**

- Application code
- Process engine
- RFID tag reader

- BAM
- CEP engine
- Application code

ORACLE
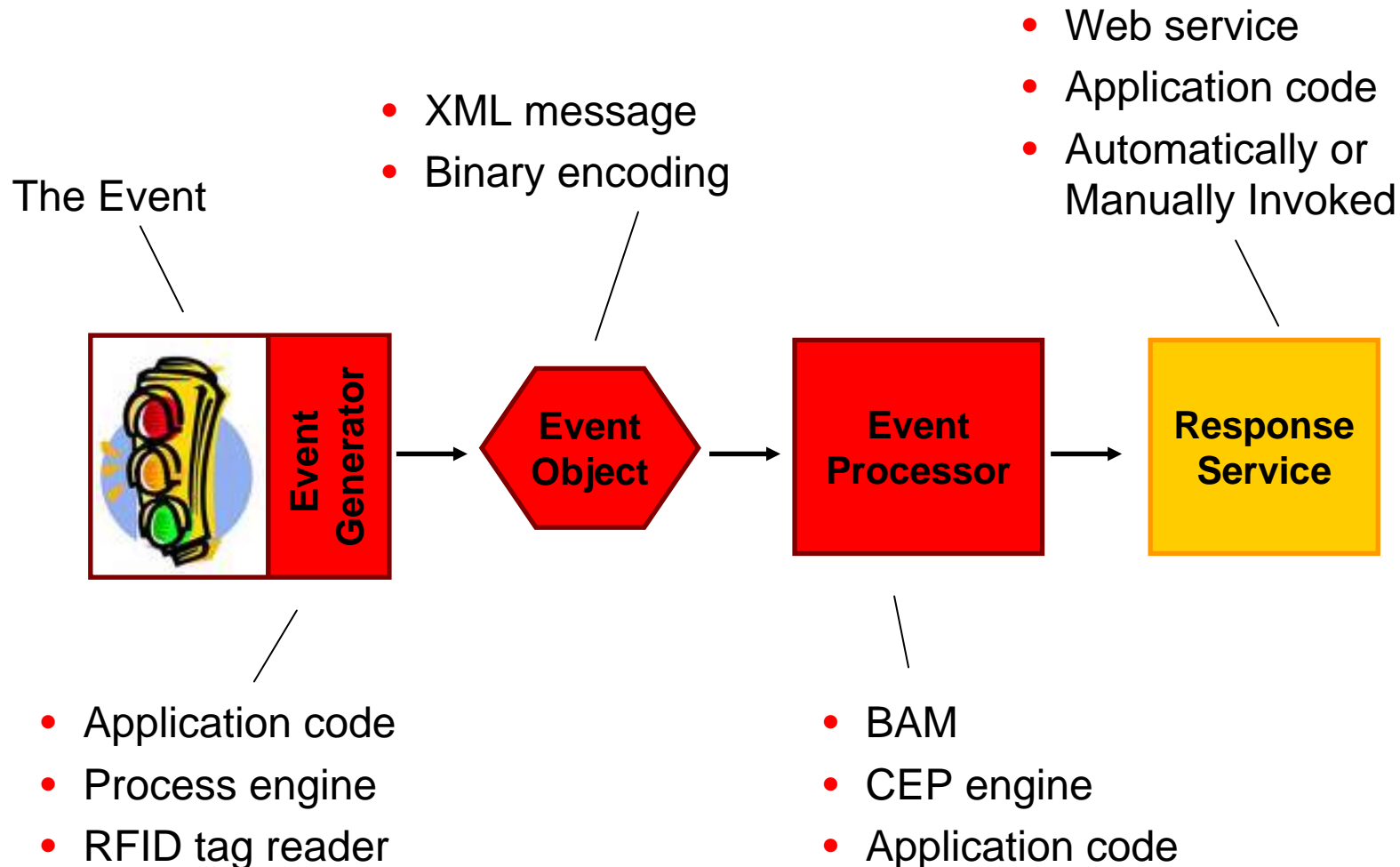
BAM Methodology & Key Concepts

1 Sensors

2 Composite Events

3 Metrics and KPIs

4 Dashboards/ Alerts

5 Response
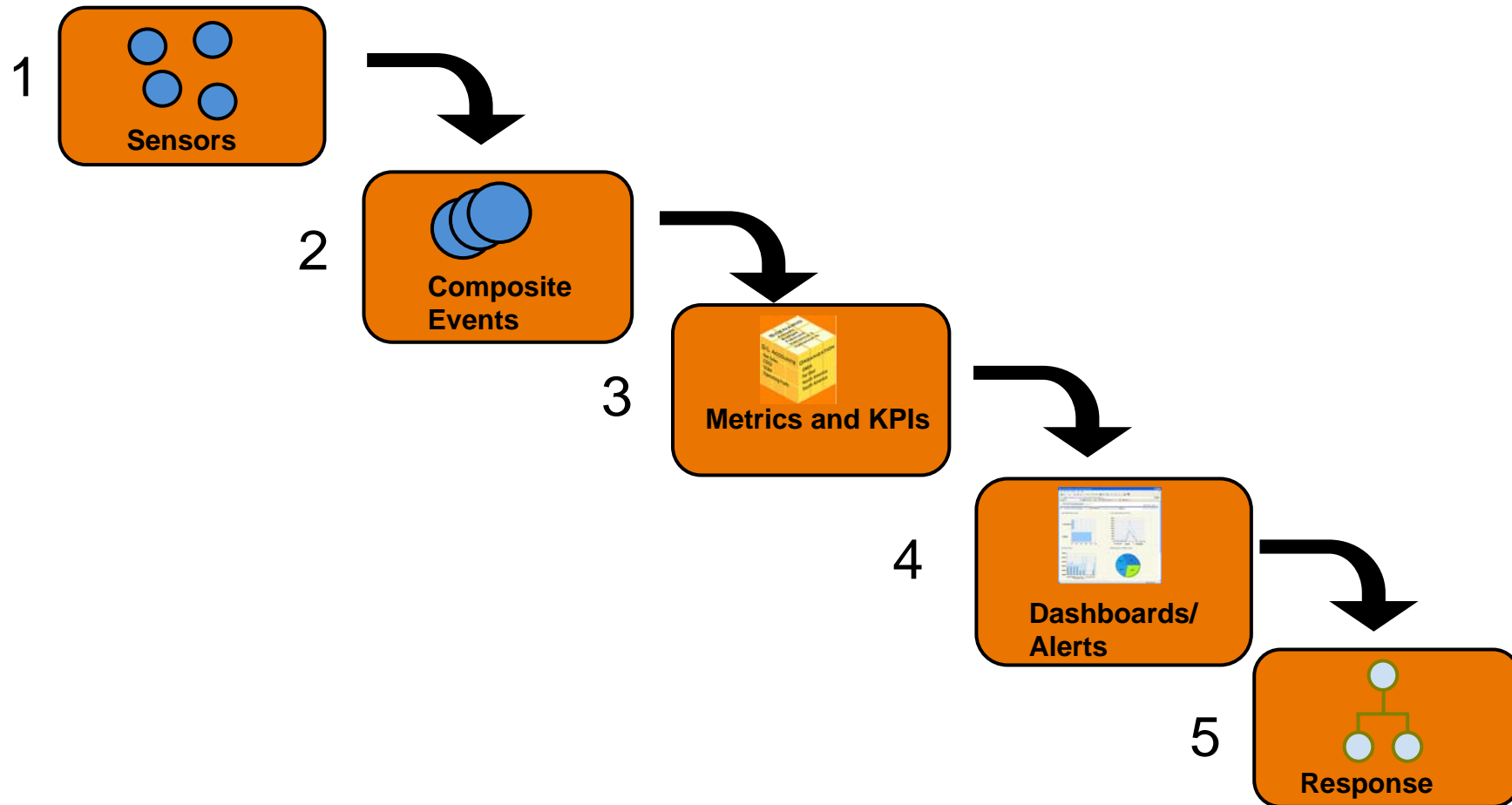
BAM Methodology: Sensors

Sensors

Composite
Events

KPIs

Alerts/
Dashboards

Response

PORTAL

Sensors
receiveInput
invokeRD
InvokeSM
receivedRD
receivedSM
userReviewStart
userReviewComplete
InstanceCompletion

ORACLE
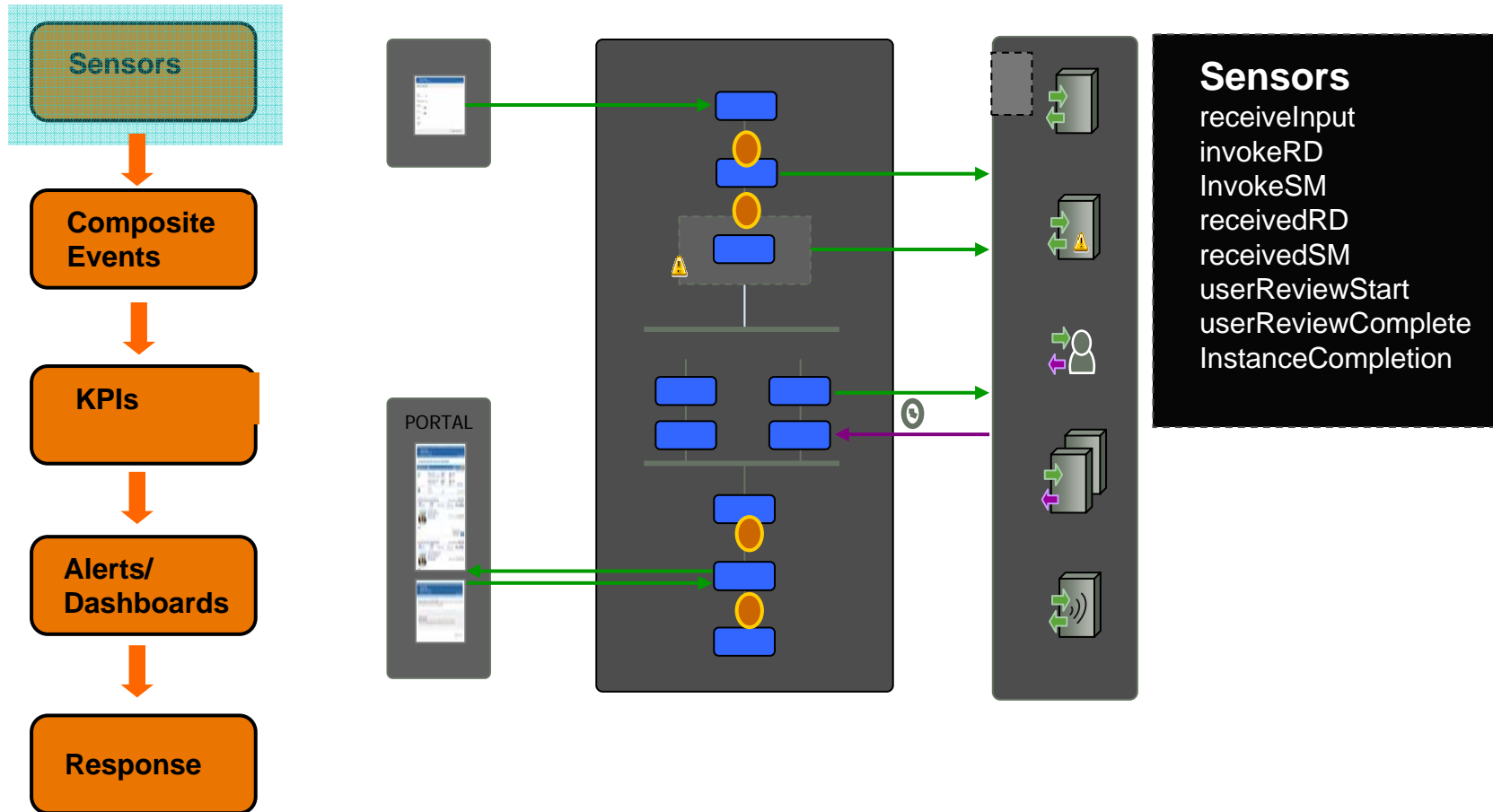
BAM Methodology: Composite Events

Sensors

Composite Events

KPIs

Alerts/ Dashboards

Response

Orderbooking Process

CreditCheck Process

PC▯AL
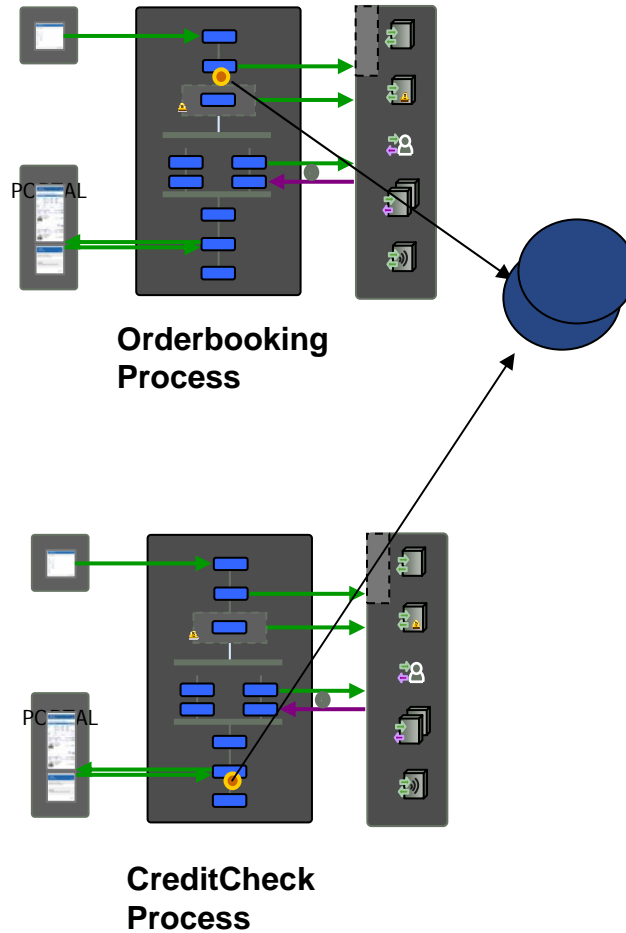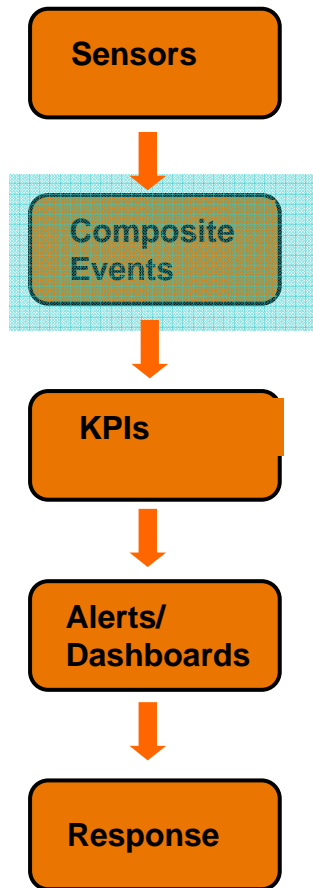
```
Composite Event: Orderbooking

<correlationSet>

  <correlation>

    <event name="LoanRequest"
            attribute="CustId"/>

    <event name="CreditCheck"
            attribute="CustId"/>

  </correlation>

  <correlation>

</correlationSet>
```

ORACLE

BAM Methodology: Metrics

Sensors

Composite Events

KPIs

Alerts/ Dashboards

Response
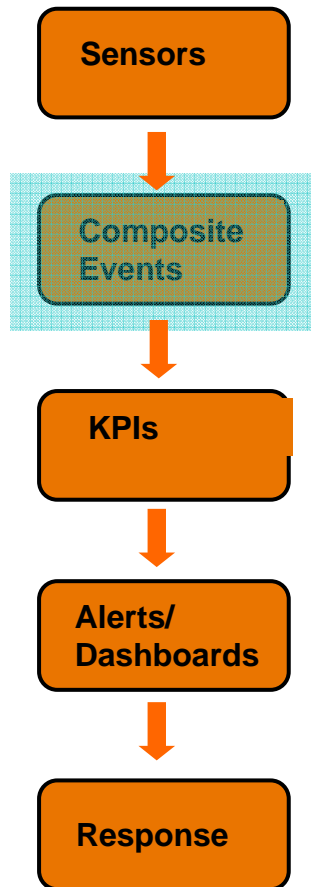
- Metrics are definitions of values of composite event properties or computed from other metrics and constants. For e.g
  - OrderProcessingTime
  - OrderAmount
- Metrics are a key component of monitoring the activities within an enterprise.
- Functions operate on a single instance of the composite event to derive the metric value

BAM Methodology: KPIs

Sensors

↓

Composite
Events

↓

KPIs

↓

Alerts/
Dashboards

↓

Response

Actual Target Variance Forecast

ProcessingTime

CountOffers

CountReqRejects

CountRequests

Time

Vendor
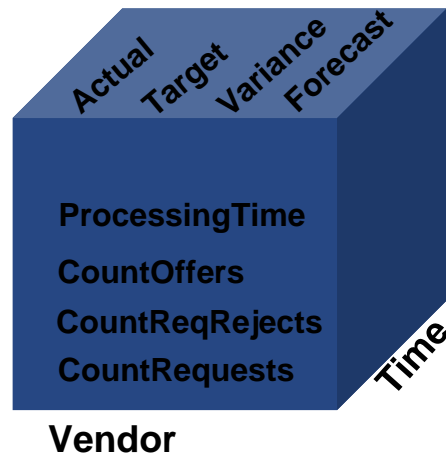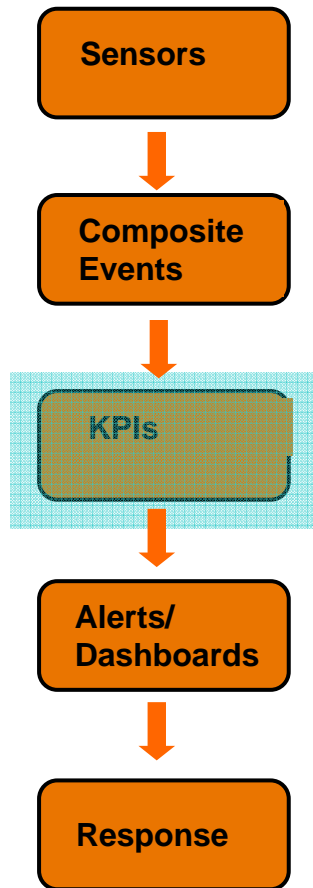
ORACLE

BAM Methodology: KPIs (cause&effect)

Sensors

Composite Events

KPIs

Alerts/ Dashboards

Response
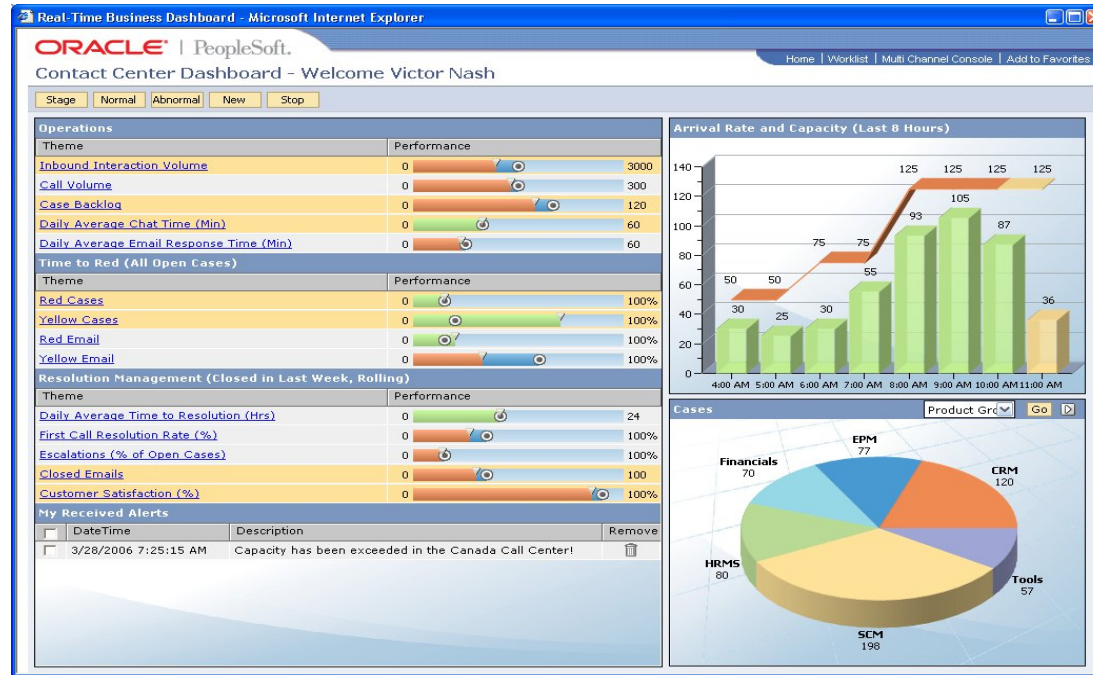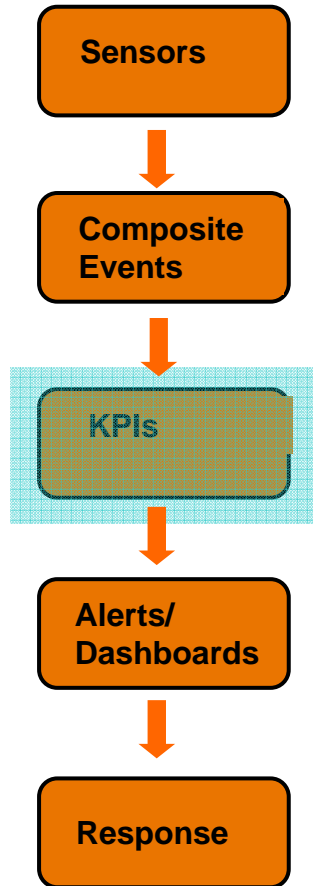
ORACLE

BAM Methodology: Dashboards

BAM Methodology: Alerts

The BPM Lifecycle
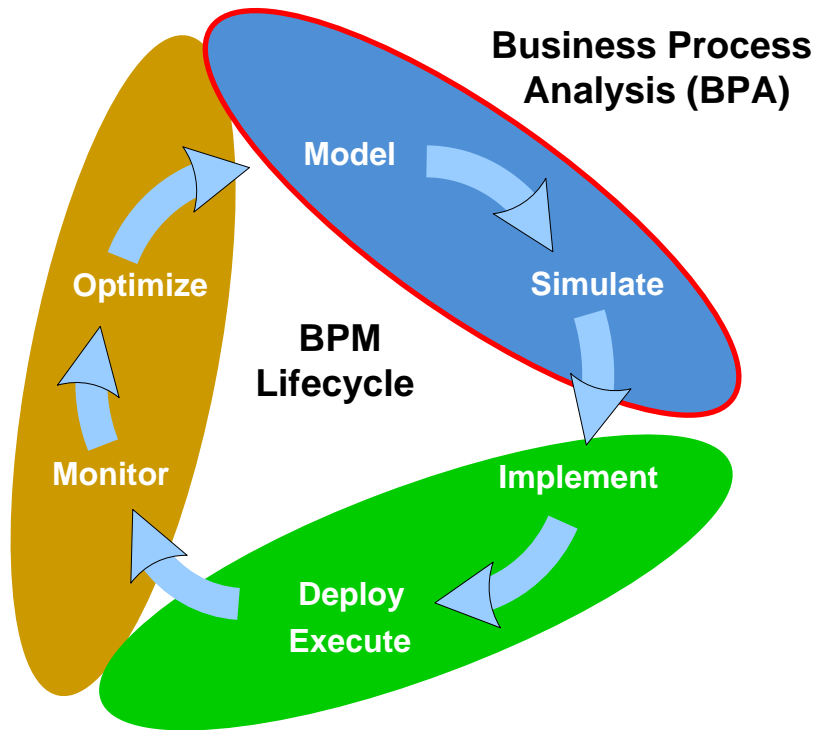
Business Process Analysis (BPA)

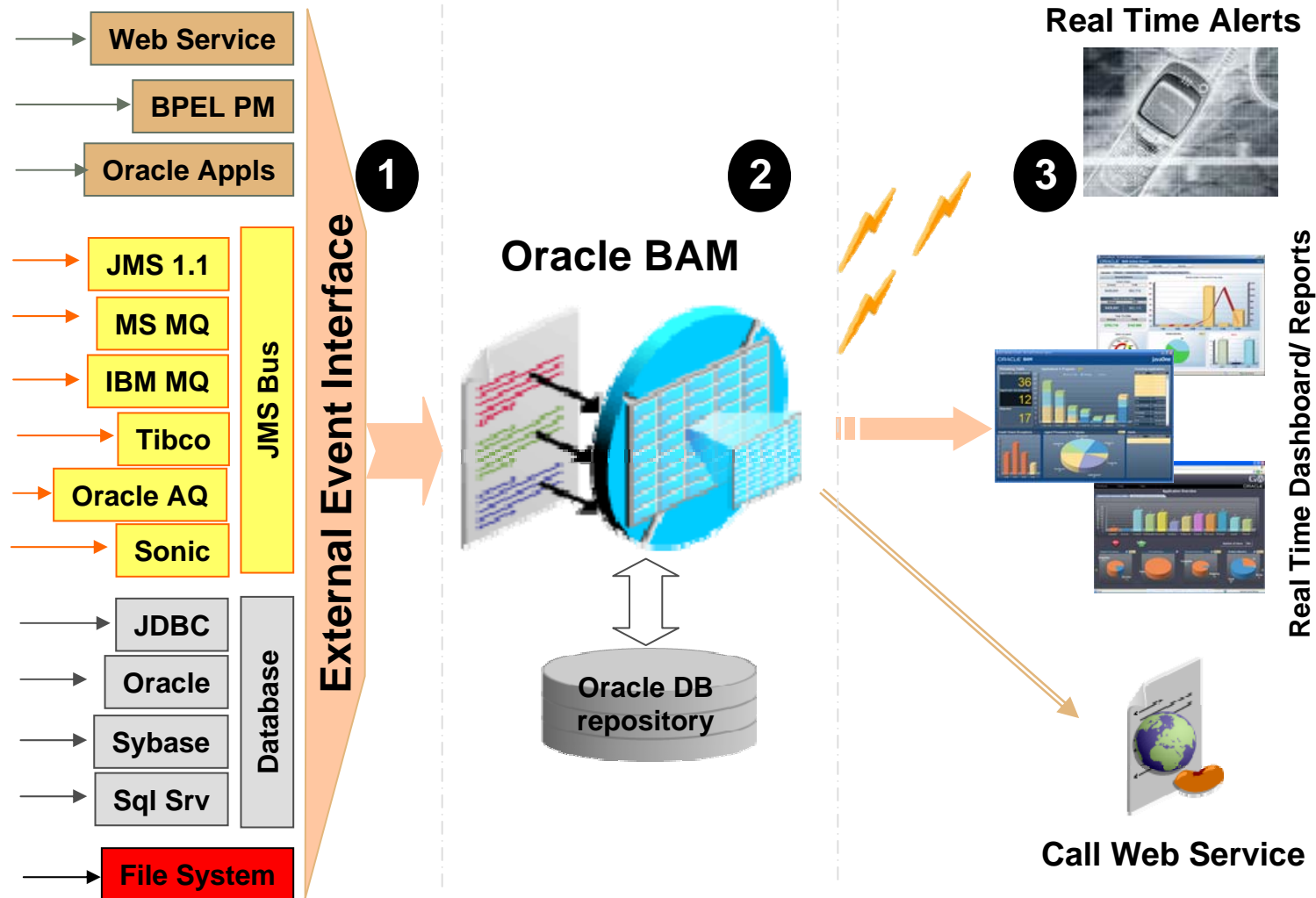Model → Simulate → Implement → Deploy Execute → Monitor → Optimize
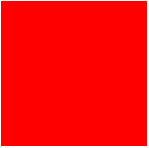
BPM Lifecycle

BPM is about

✓ Process Modeling, Execution and Management

✓ Continuous Process Improvement

✓ Business and IT working together to achieve business objectives

✓ Making IT more responsive to changing business needs and conditions

ORACLE

Oracle BAM Architecture

Oracle BAM: Open Architecture

Web Service

BPEL PM

Oracle Appls

JMS 1.1

MS MQ

IBM MQ

Tibco

Oracle AQ

Sonic

JMS Bus

JDBC

Oracle

Sybase

Sql Srv

Database

File System

External Event Interface

①

②

③

Oracle BAM

Oracle DB repository

Real Time Alerts

Real Time Dashboard/ Reports

Call Web Service

ORACLE

Customer Use Cases

In Flight Process Modification Patterns

Challenge: Modify Process Flow

"How do I get this months sales back on target" → **Modify Process Flow** — *"195% improvement in turn-over"*

Challenge: Exception Management

"Business Process has too many manual steps!" → **Exception Management** — *"Able to minimize stop-points and human touches"*
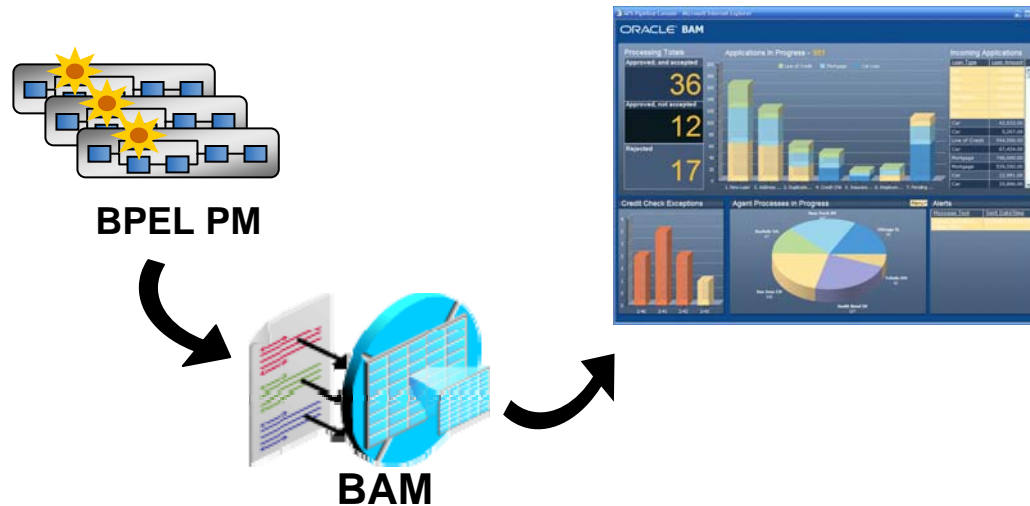
Challenge: Dynamic Process Assembly

"How do I ensure I have the right items in stock" → **Dynamic Process Assembly** — *"Able to control whole supply chain"*

Modify Process Flow

BPEL PM

BAM

Business Users

Rules

- **Rules de-couple decisions from process flow**
- **BAM allows users to modify Rules based on what's happening now**
- **Best practice for BPM / SOA applications**
  - **Dynamically change rules without redeploying process**
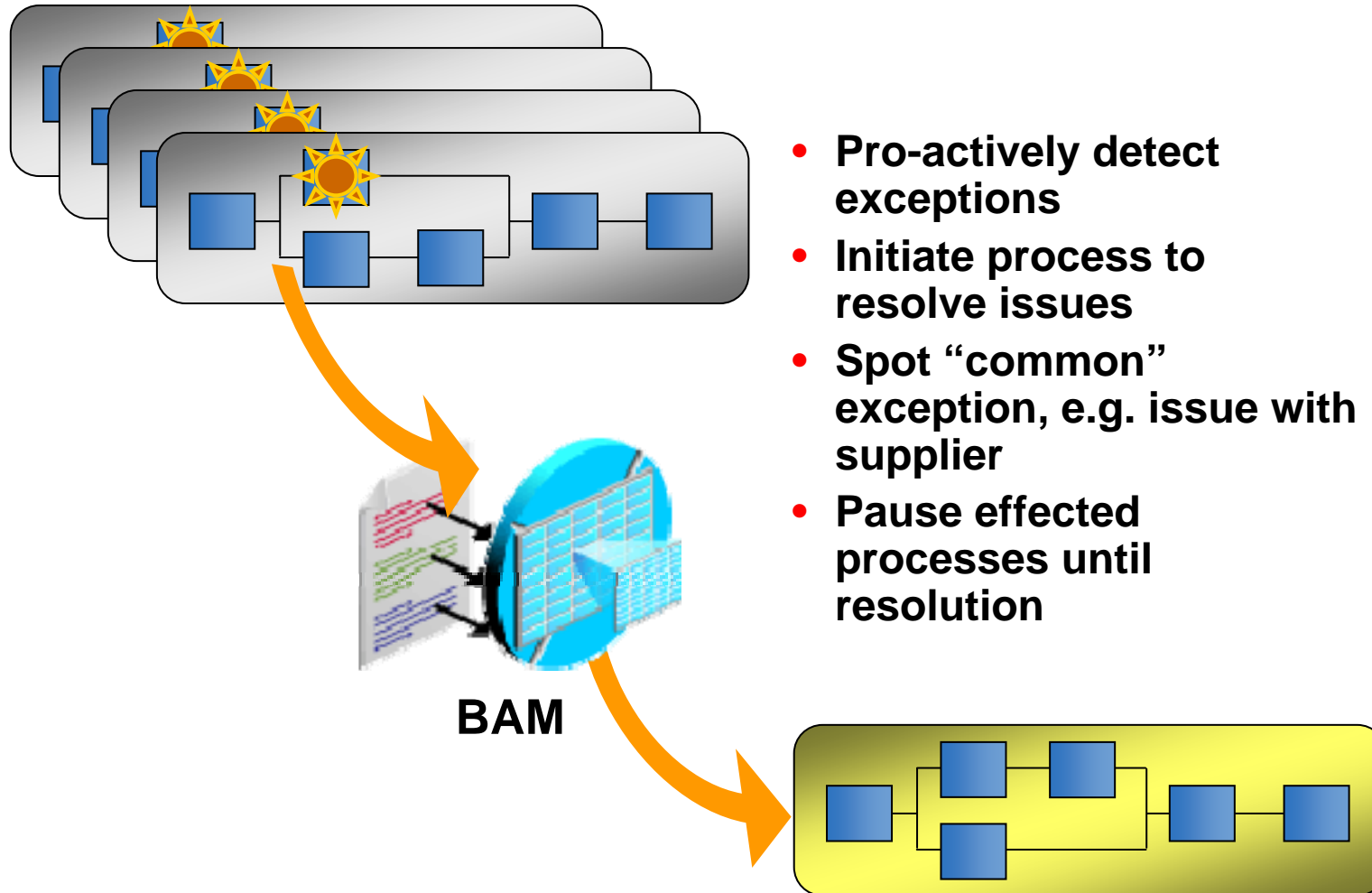 - **Provide Agility & Transparency**
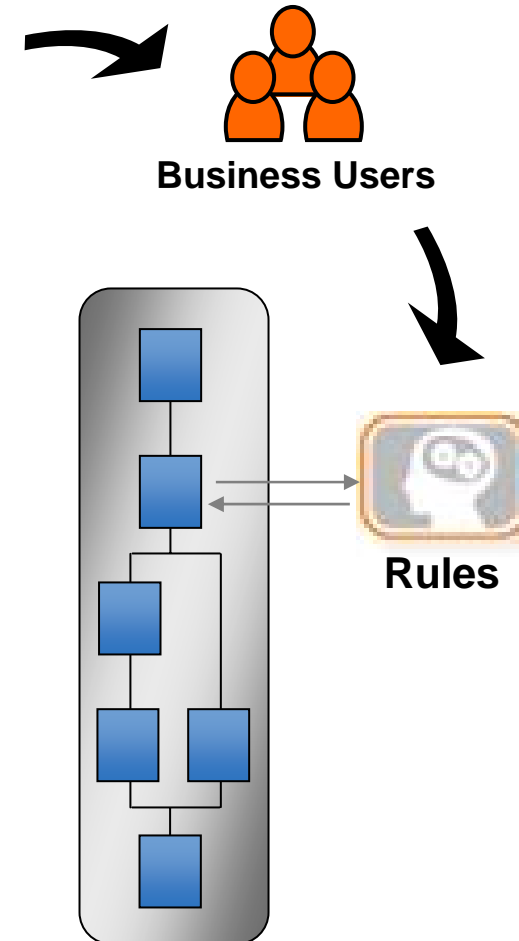
ORACLE

- **UK provider of high-risk loans**

- **Loan Application Approval Process uses BPEL, Rules and BAM processing 25,000 applications/day**

- **BAM monitors loan volume levels and adjusts approval criteria to trade-off partner SLA against bad debt**

- **Now "sense & respond" system via BAM, BPEL and Rules Engine**

- **Loan volume events adjust approval policies and trigger alternate process flows**

- **195% improvement in turn-over**

ORACLE

Exception Management

BAM

- **Pro-actively detect exceptions**
- **Initiate process to resolve issues**
- **Spot "common" exception, e.g. issue with supplier**
- **Pause effected processes until resolution**

ORACLE
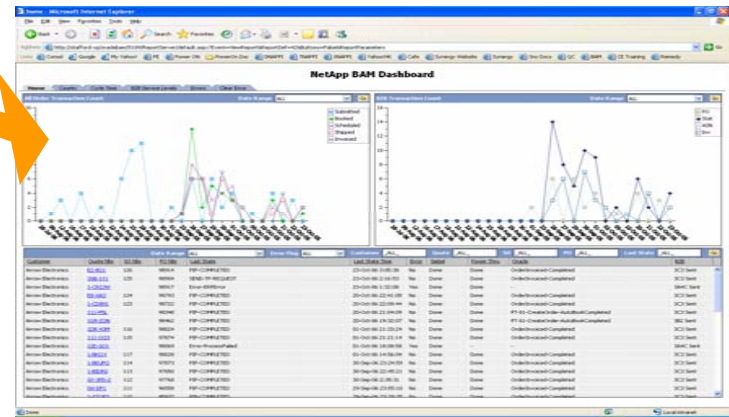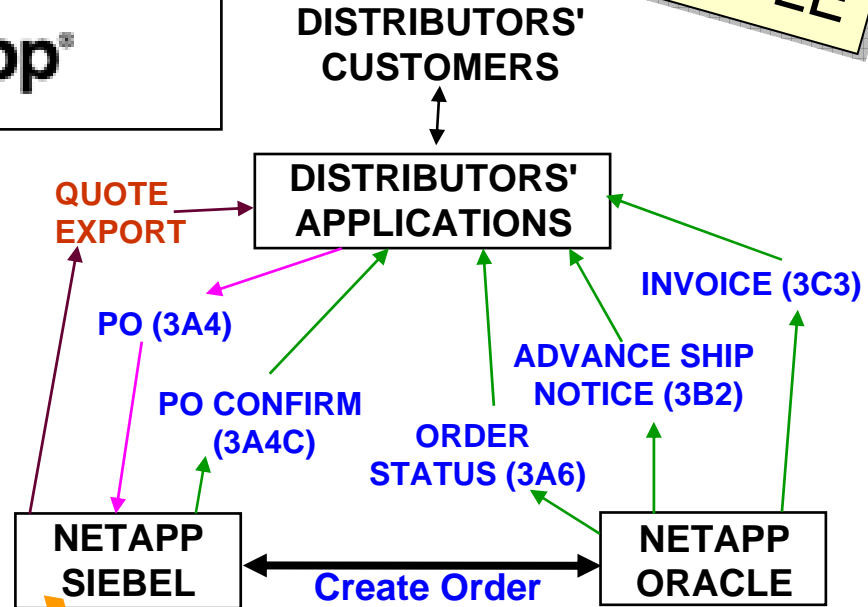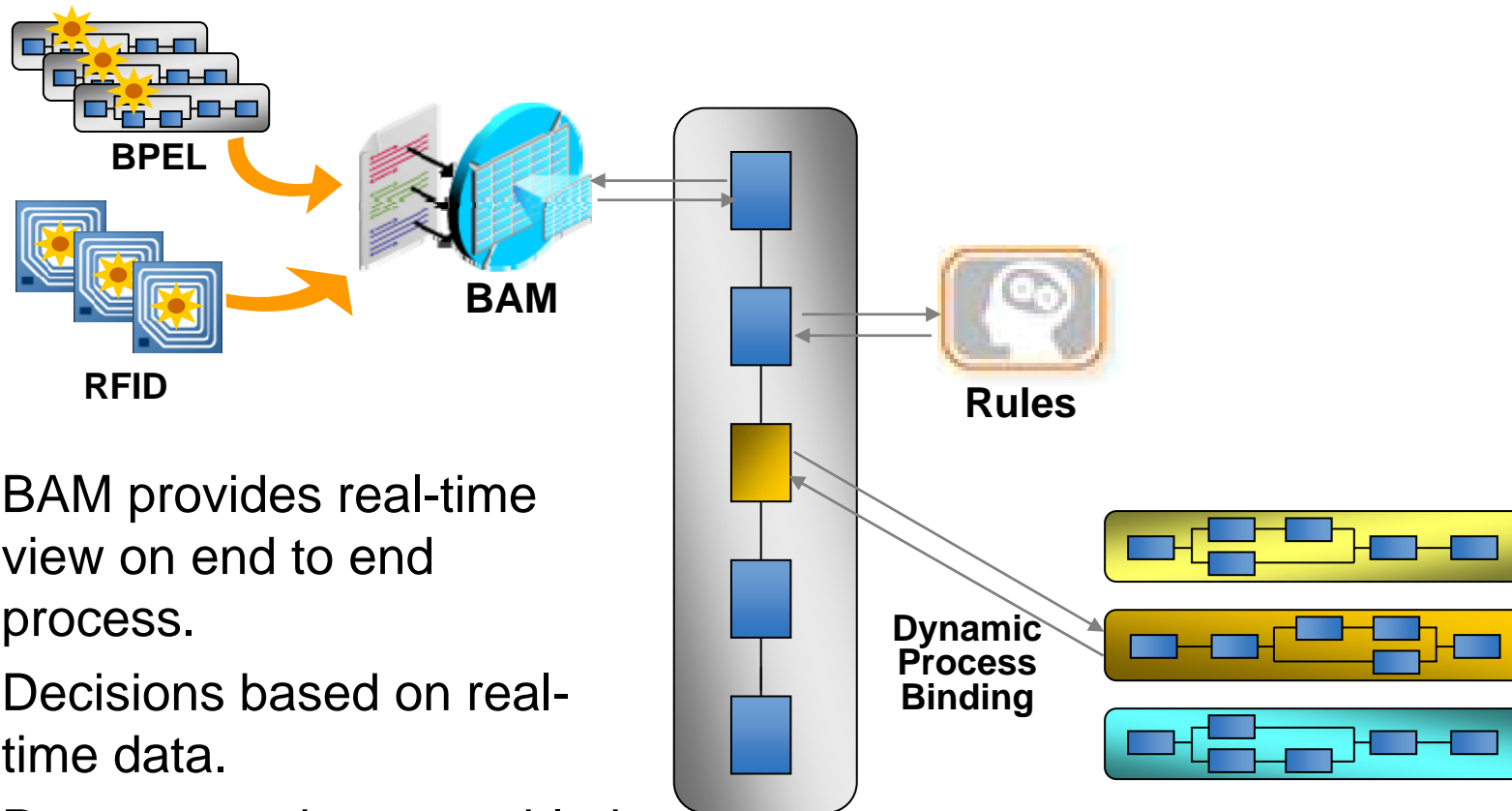
NetApp®

- **Unmatched simplicity to complex world of enterprise data center management**

- **Radically Transform Quote-to-Invoicing**

- **Simplification of Submit-to-Book Processes to Minimize / Eliminate, Stop-Points and Human Touches.**

- **Automated PO, Confirmation, Order Status, Adv. Shipment Notice & Invoice**

- **BAM monitors conformance to SLA's by Distributors - Enabling management by Exception**

- **Dramatic Reduction in Order to Invoice Cycle Time**

DISTRIBUTORS' CUSTOMERS

QUOTE EXPORT

DISTRIBUTORS' APPLICATIONS

INVOICE (3C3)

PO (3A4)

ADVANCE SHIP NOTICE (3B2)

PO CONFIRM (3A4C)

ORDER STATUS (3A6)

NETAPP SIEBEL — **Create Order** — **NETAPP ORACLE**

NetApp BAM Dashboard

ORACLE

Dynamic Process Assembly

BPEL

RFID

**BAM**

Rules

Dynamic Process Binding

- BAM provides real-time view on end to end process.
- Decisions based on real-time data.
- Process can be assembled from process fragments at run time.

ORACLE

EXAMPLE

- Third largest retailer worldwide.

- Loss through Out of Stock estimated at 1 Billion € for German retailing.

- Reality is "Not-on-shelf-but-on-stock"

- RFID used for accurate stock management.

- BAM monitors actual and expected inventory levels

- BAM used to warn if inventory levels are below certain thresholds

- Ideal is not to monitor just in-store logistics, but whole supply chain
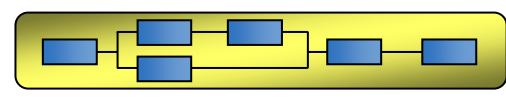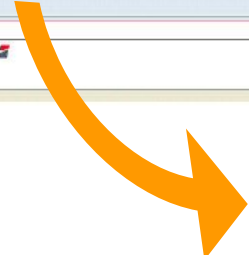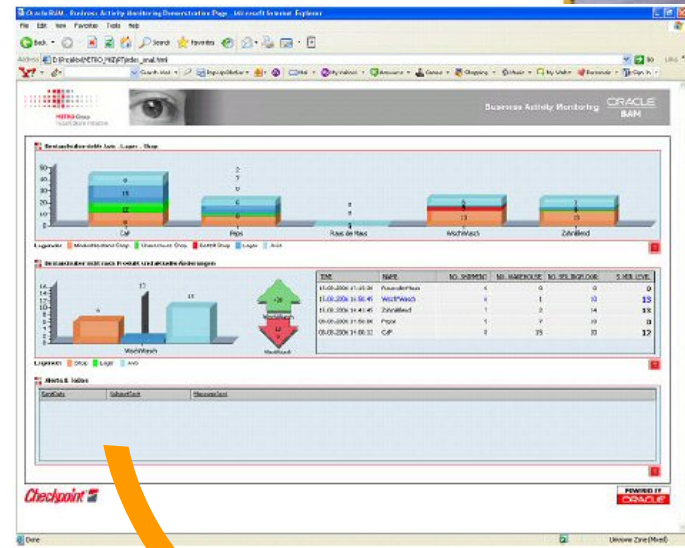
ORACLE

Oracle BAM Customers

Cattles Bank:
Business Drivers

- Improved customer and partner service
- Entry into new markets and territories
- Expansion into related business sectors
- Increased cross-selling and up-selling
- Strategic alliances
- Innovative product development
- Growth in business volume
- Smarter business practices
- Increased customer orientation
- Integrated and scaleable systems
- Efficiency improvements in IT delivery
- Reliable and accurate up-to-date management information

METIS
Rule Engine

MIDA
Customer
Database

EXPERIAN
Credit Bureau

METIS
Rule Engine

Credit Score
&
Bureau

Address
Targeting

Product
Allocation

Data
Capture

Decision

Manual Processing

ORACLE