The Big BAM

Accelerating IBM's Leadership in the BAM space

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Change History

01/31/2007	First Draft Created
02/11/2007	Second Draft, added deliverables data, updated schedule
02/22/2007	Third Draft, add more details on Industry and Dashboard
02/26/2007	Fourth Draft, more details on Human Task Monitoring, updated schedule
03/16/2007	Update
03/20/2007	Update Schedule
05/08/2007	Update current status

Project Goals

- Extending the reach of Business Activity Monitoring (BAM)

  Providing adapters and support for pulling information from a variety of sources.

- Industry-specific sample Monitor Models and Dashboards
  Improving the lifecycle of developing monitoring models by adding templates to the monitoring model based on Industry

  Sample monitor models and dashboards for a given industry that can be extended and customized easily
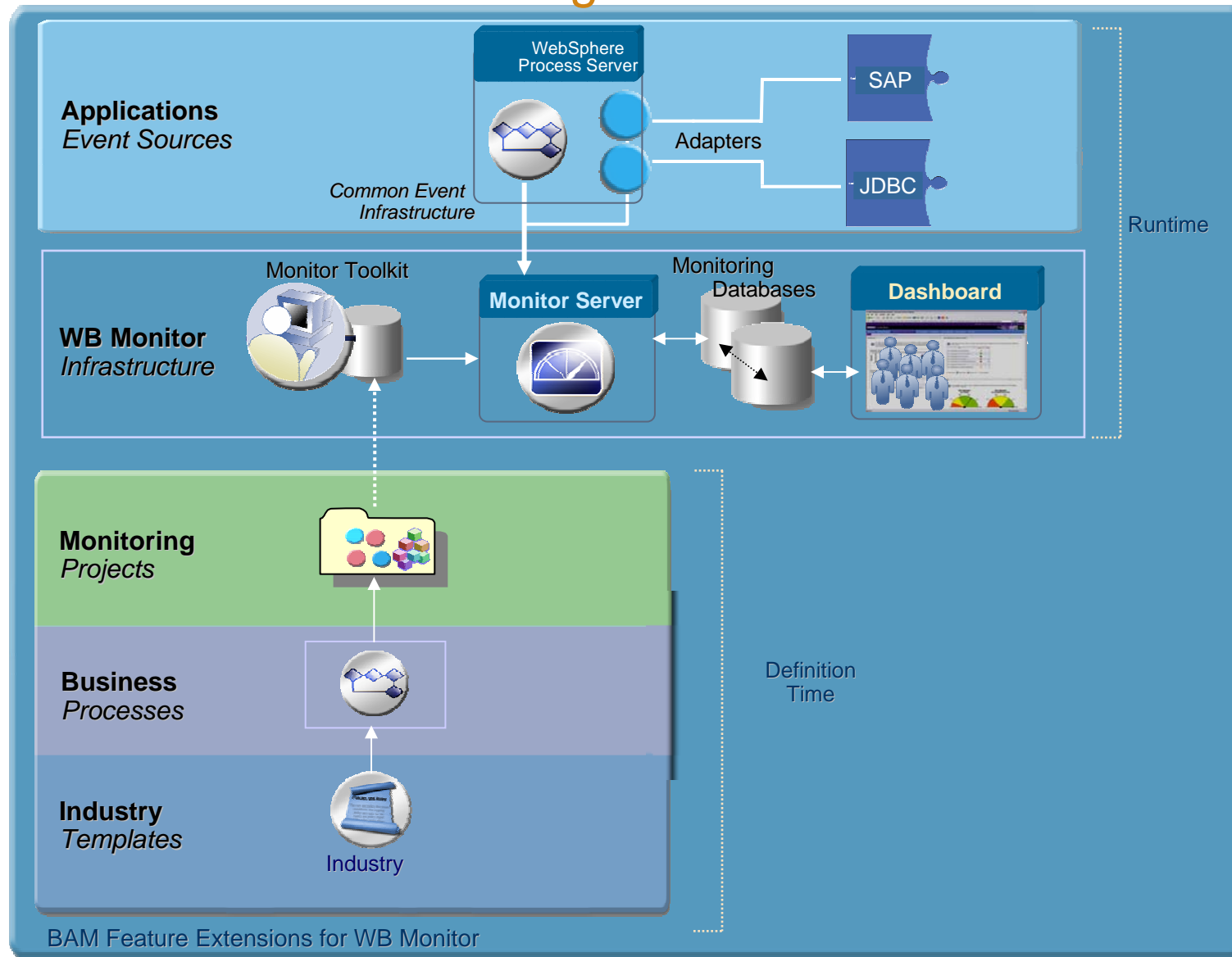
- BAM dashboard for human task monitoring

  Incorporating a sample generic human task monitor model in the current dashboard
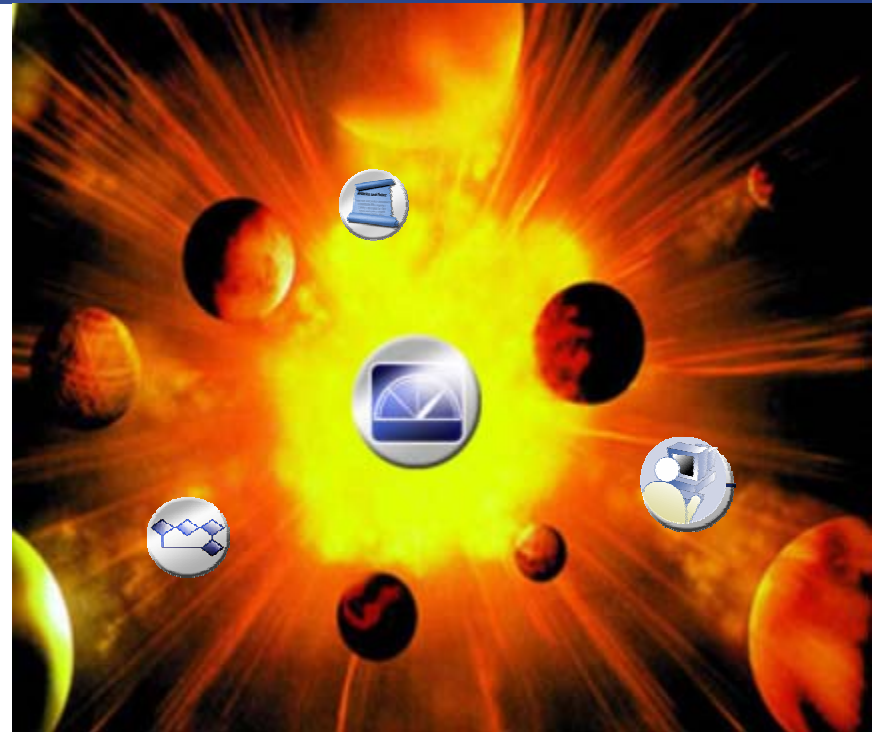
Deliverables

- The results of this project will be delivered as a SupportPac Category 2 for WebSphere Business Monitor V6.0.2.1

- The SupportPac will include the following:

  - 2 sample event adapters, one for JDBC and the other for SAP
  - 1 sample Monitor Model for generic human task monitoring which comes with a sample Human Task Administration portlet
  - 3 Industry-specific Monitor Model and Dashboard samples. Industries covered are:
    - Retail Industry (Call Center business process)
    - Financial Industry (Mortgage Lending application process)
    - Healthcare Industry (Claims processing by health provider)

- All these samples will be available as free downloads by end of 2Q.

The Big Picture

Applications
Event Sources

WebSphere Process Server

SAP

Adapters

JDBC

Common Event Infrastructure

Runtime

WB Monitor
Infrastructure

Monitor Toolkit

Monitor Server

Monitoring Databases

Dashboard

Monitoring
Projects

Business
Processes

Industry
Templates

Industry

Definition Time

BAM Feature Extensions for WB Monitor

Event Adapter Samples

Motivations

- Enablement for different types of applications as being "monitorable" by WebSphere Business Monitor is necessary if we are to extend the reach of BAM

- There are different approaches but one such common and easy to implement approach is the use of adapters

- The sample adapters to be delivered illustrates how one can develop an adapter for different event sources using IBM technology

- Although there are only 2 samples, the intention is to deliver more sample event adapters in the future

Main Contacts

- *Khirallah Birkler and Benjamin Käckenmeister, Boebligen (SAP)*
- *Yi Che, CDL (JDBC)*

Sample JDBC Adapter

The Approach

- Create a sample JDBC adapter inbound interface and a mediation flow into the IBM WebSphere Integration Developer 6.0.2 (WID).

- Use the JDBC adapter inbound interface operation and mediation flow to generate events definitions from within WID.

- Generate a Monitor Model from this operation and mediation flow.

- Augment this Monitor Model to process the generated events and calculate metrics.
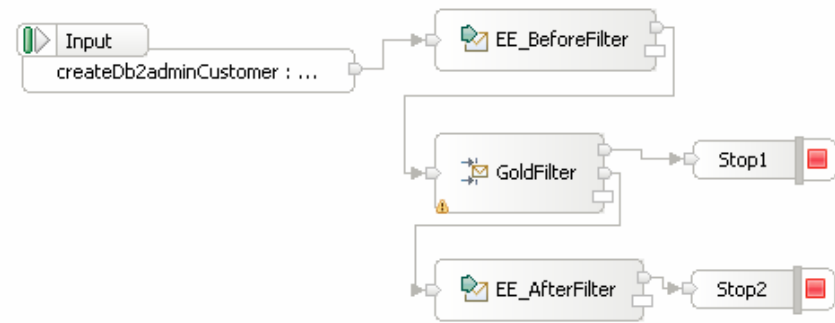
- Deploy the Monitor Model.

Illustrations

1. Business Level Diagram of the Monitor Adapter

3. Sample Mediation Flow that filters Gold Customers
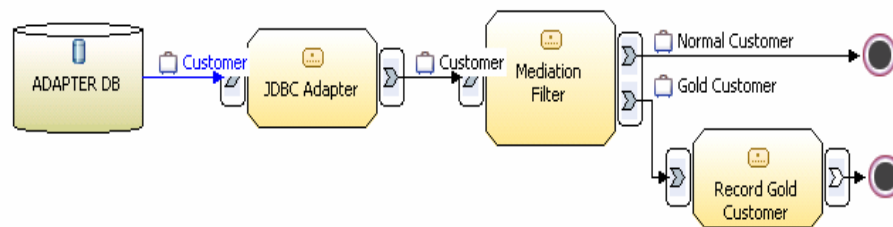
2. Two SCA Components for the Monitor Adapter

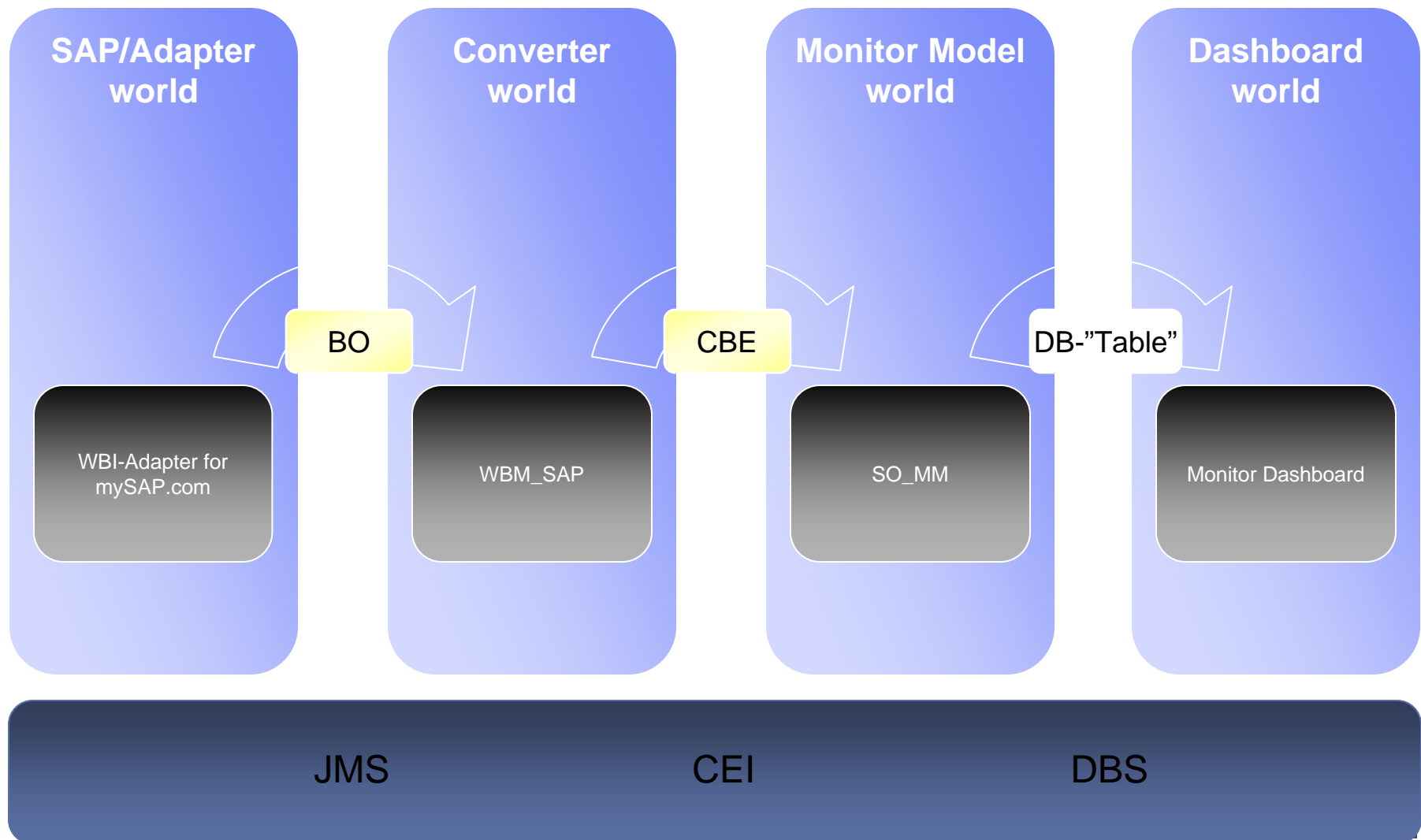**4. Generate Monitor Model from SCA operation and Mediation flow**
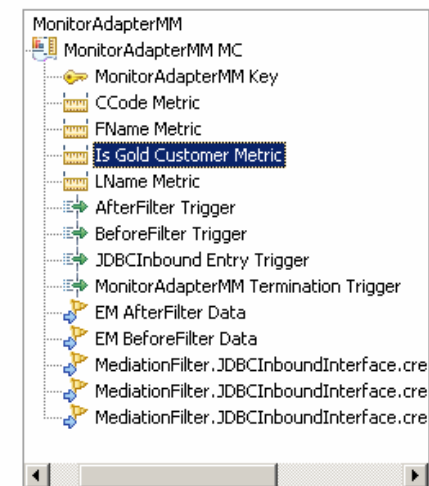
Facts about SAP

- Nearly each customer we want to sell WebSphere Business Monitor has also SAP software in use.

- We have no solution to monitor business processes running on SAP within our monitoring product.

- Customer wants to have a single view even if various process engines are used.

- WebSphere Business Monitor architecture is suitable but this is not sufficient
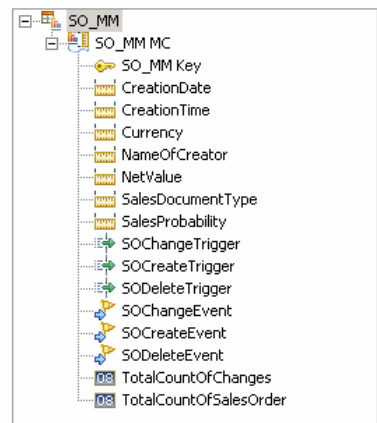
Architecture

Portal Server

Monitor Dashboard

WBM Server

SO_MM

WBM_SAP

2 JMS

WBI Adapter Framework

WBI-Adapter for mySAP.com

CBE

4

5

CBE

3

1

CEI

SAP

Create / Change Sales Order

7

DashboardDB

6 Replication

MonitorDB

Architecture - Worlds

SAP/Adapter world	Converter world	Monitor Model world	Dashboard world

BO

CBE

DB-"Table"

WBI-Adapter for mySAP.com	WBM_SAP	SO_MM	Monitor Dashboard

JMS   CEI   DBS

Module Details

WBM_SAP

WBMConnectorDeliveryHub → InboundDelivery2BOgeneric → FormatAndSend

SalesOrder_CREATED_SAP47
SalesOrder_CHANGED_SAP47

SO_MM

Monitor Details Model

- SO_MM
  - SO_MM MC
    - SO_MM Key
    - CreationDate
    - CreationTime
    - Currency
    - NameOfCreator
    - NetValue
    - SalesDocumentType
    - SalesProbability
    - SOChangeTrigger
    - SOCreateTrigger
    - SODeleteTrigger
    - SOChangeEvent
    - SOCreateEvent
    - SODeleteEvent
    - TotalCountOfChanges
    - TotalCountOfSalesOrder

KPI Model

- SO_MM
  - KPI_CTX
    - AverageNetValue
      - Ranges
      - Target
    - AverageSalesProbability
      - Ranges
      - Target
    - Count
    - MaxNetValue
    - MinNetValue
    - TotalNetValue
    - TotalNetValueCreatedByKAECKEN

Industry-specific Monitor Model and Dashboard Samples

Industries: Business Processes and Main Contacts

- Financial
  - Sample Business Process
    - Mortgage/Lending
  - Main Contacts
    - John Adams
    - Keith Melton
    - Robert Snider
    - Sonny Fulkerson

- Healthcare
  - Sample Business Process
    - Claims processing by the Service Provider
  - Main Contact
    - George Eisenberger
    - Ajay Asthana

- Retail
  - Sample Business Process
    - Call Center Management
  - Main Contact
    - Vish Ganapathy
    - Patrick Gibney

Mortgage Lending High-Level Process (1/2)

The diagram below depicts an actual overall mortgage lending process. Automated Loan Setup is highlighted to indicate that this task will be modeled as nested Monitoring Context (MC). The overall process will be an abstraction of the flow demonstrated in the diagram. Most of the remaining tasks will be modeled as Human Tasks and tracking and performance metrics will be materialized via the high-level MC.
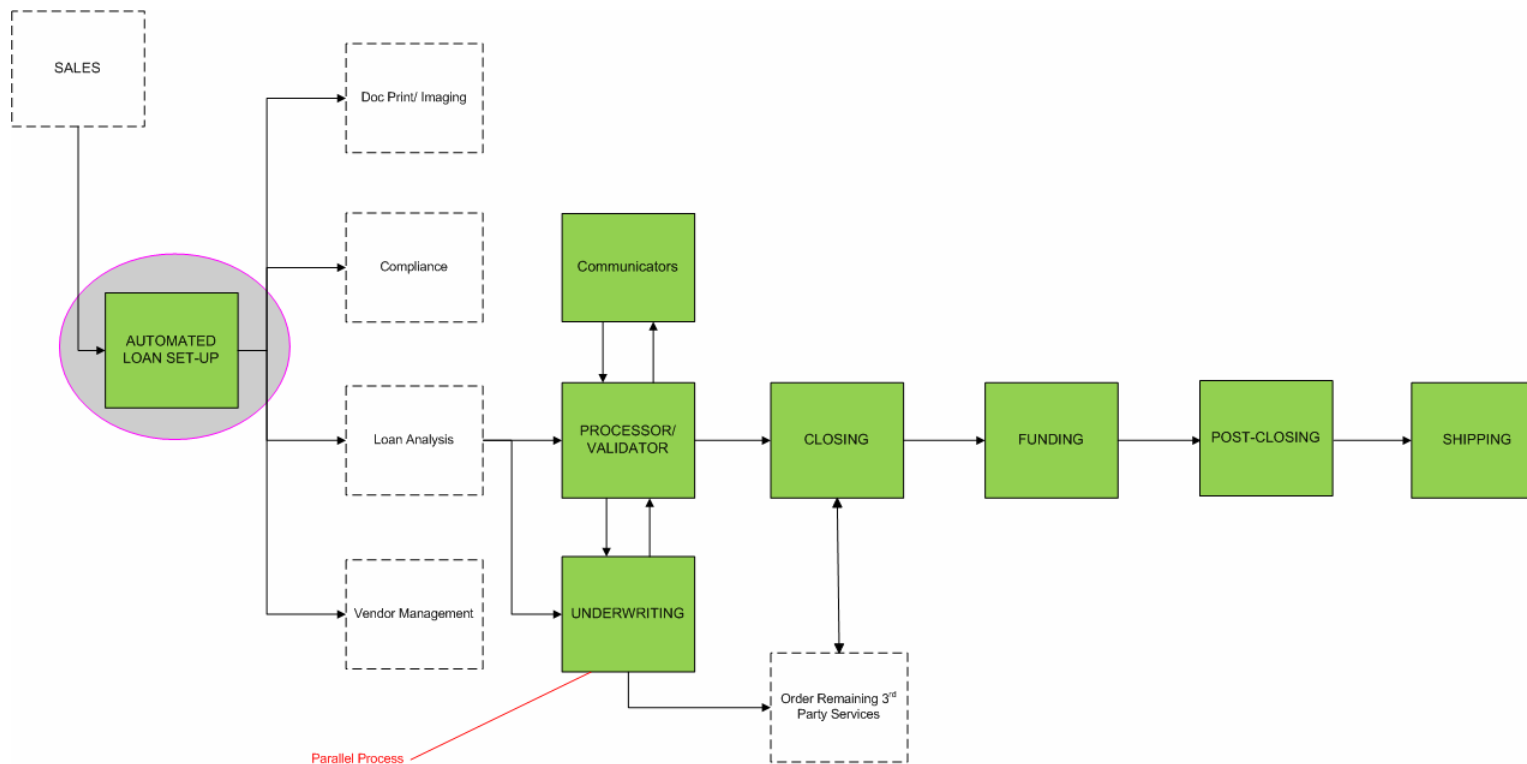
Mortgage Lending High-Level Process (2/2)

The diagram below depicts the event flow between the Mortgage Lending MC and the Human Task MC. Inbound events to the Mortgage Lending MC will result in calculation of metrics. The event payloads include among other data, the stop and start times of the external human tasks that are used in calculating the measures and Key Performance Indicators (KPIs) externalized in the Mortgage dashboards.
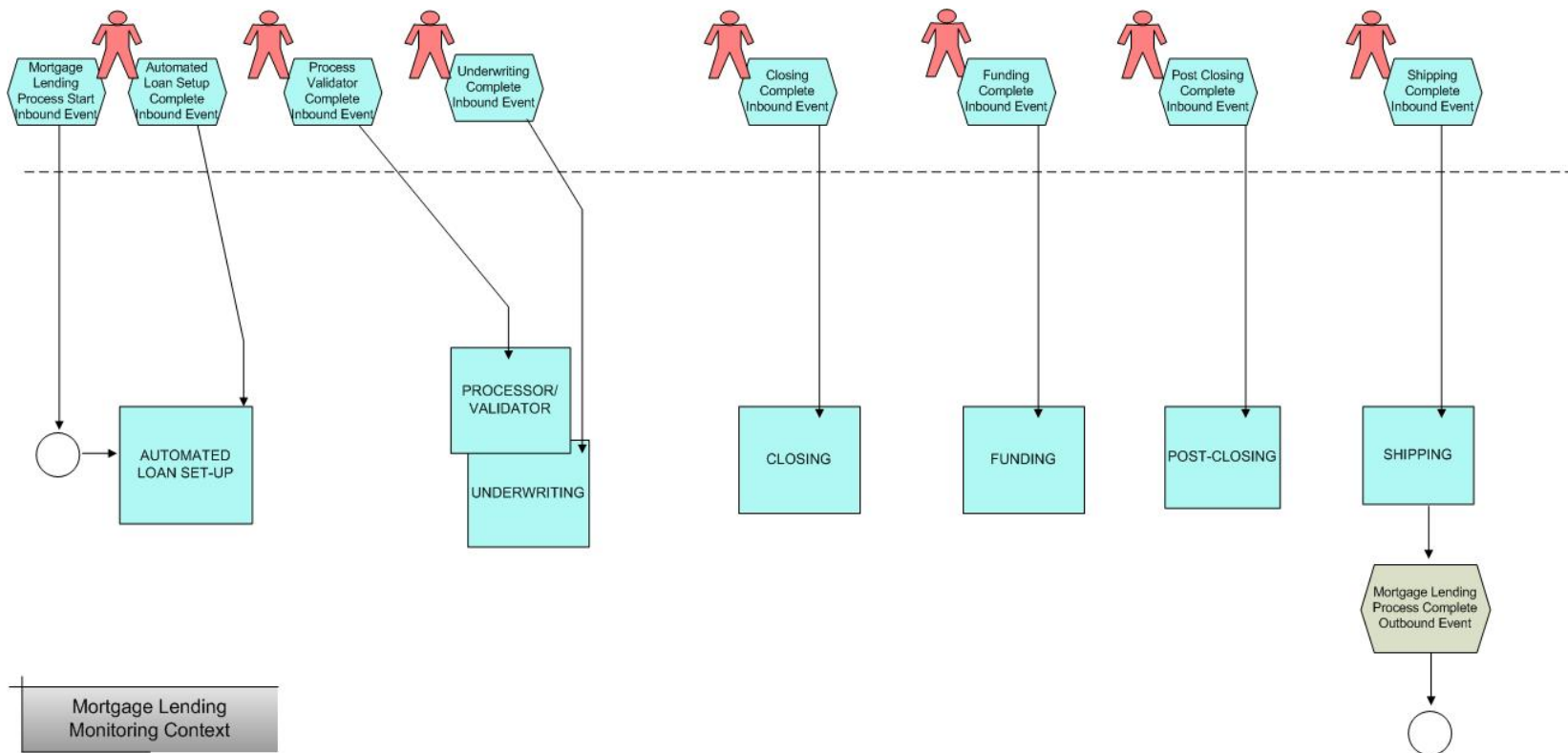
Mortgage Lending Process KPIs

Mortgage Lending Process KPIs
- Monthly Maximum Application to Funded Days
- Monthly Maximum Application to Ready to Close Days
- Monthly Maximum Application to Upload Hours
- Monthly Maximum Completed Loan Amount
- Monthly Maximum In Process to Ready to Close Days
- Monthly Maximum Loan Dollars per Processing Day
- Monthly Maximum Manual Underwriting to Ready to Close Days
- Monthly Maximum Ready to Close to Closed Duration Days
- Monthly Maximum Upload to Funded Days
- Monthly Maximum Upload to In Process Hours
- Monthly Maximum Upload to Manual Underwriting Hours
- Monthly Maximum Upload to Ready to Close Days
- Monthly Minimum Completed Loan Amount
- Monthly Number of Completed Loans
- Monthly Total Completed Loan Dollars
- Monthly Total of Application Loan Amount
- Yearly Maximum Application to Funded Days
- Yearly Maximum Application to Ready to Close Days
- Yearly Maximum Application to Upload Hours
- Yearly Maximum Completed Loan Amount
- Yearly Maximum In Process to Ready to Close Days
- Yearly Maximum Loan Dollars per Processing Day
- Yearly Maximum Manual Underwriting to Ready to Close Days
- Yearly Maximum Ready to Close to Closed Duration Days
- Yearly Maximum Upload to Funded Days
- Yearly Maximum Upload to In Process Hours
- Yearly Maximum Upload to Manual Underwriting Hours
- Yearly Maximum Upload to Ready to Close Days
- Yearly Minimum Completed Loan Amount
- Yearly Number of Completed Loans
- Yearly Total Completed Loan Dollars
- Yearly Total of Application Loan Amount

Mortgage Automated Loan Setup Process (1/2)

The Automated Loan Setup task is implemented as a nested Monitoring Context (MC) under the Mortgage Lending MC. The diagram below depicts an actual Automated Loan Setup task. It is annotated to indicate failure metrics that will be maintained.

Automated Loan Setup
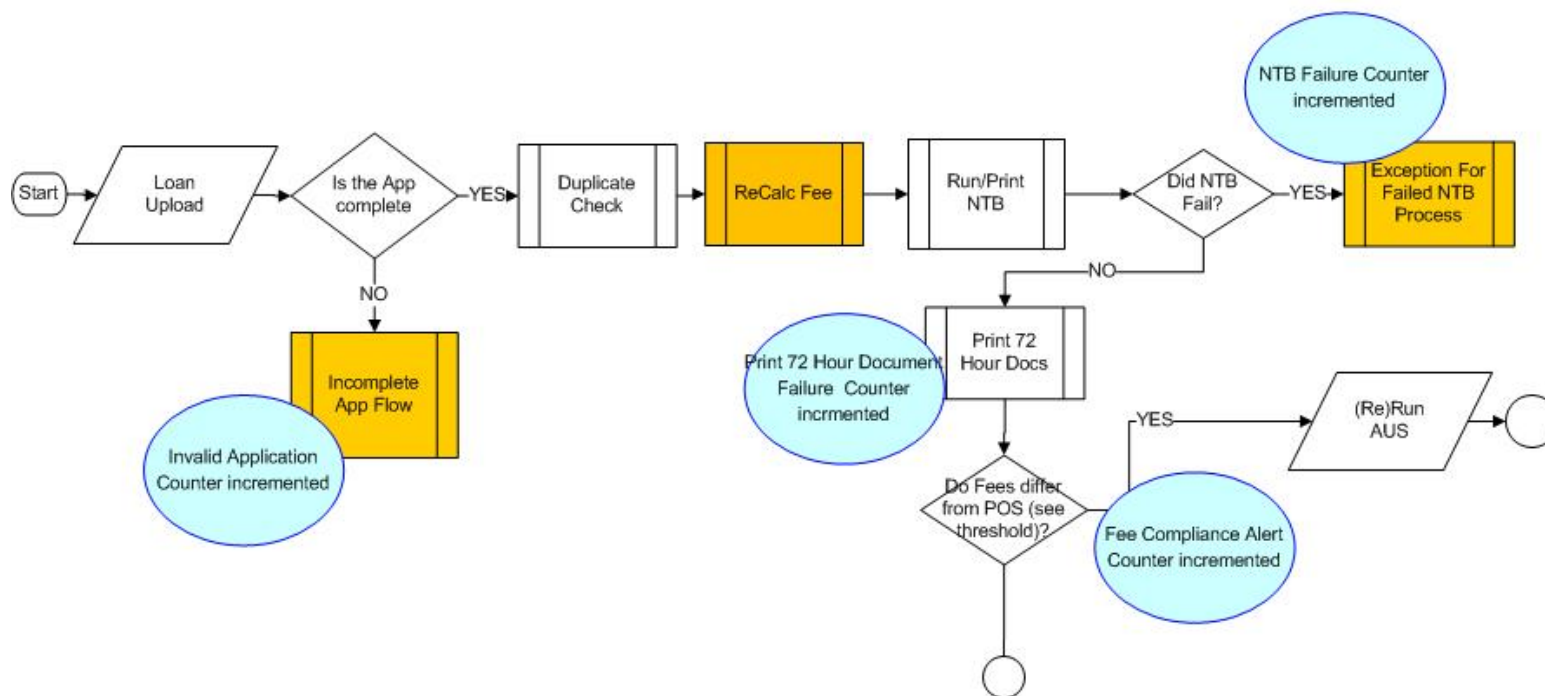
Mortgage Automated Loan Setup Process (2/2)

The diagram below depicts the event flow to and from the Automated Loan Setup MC. Outbound events provide the ability to later register the event with the Action Manger. The inbound events are used to trigger validation of important situations that occur during loan application processing. When a situation condition is considered an error an metric is updated ant an outbound event is issued.

Automated Loan Setup
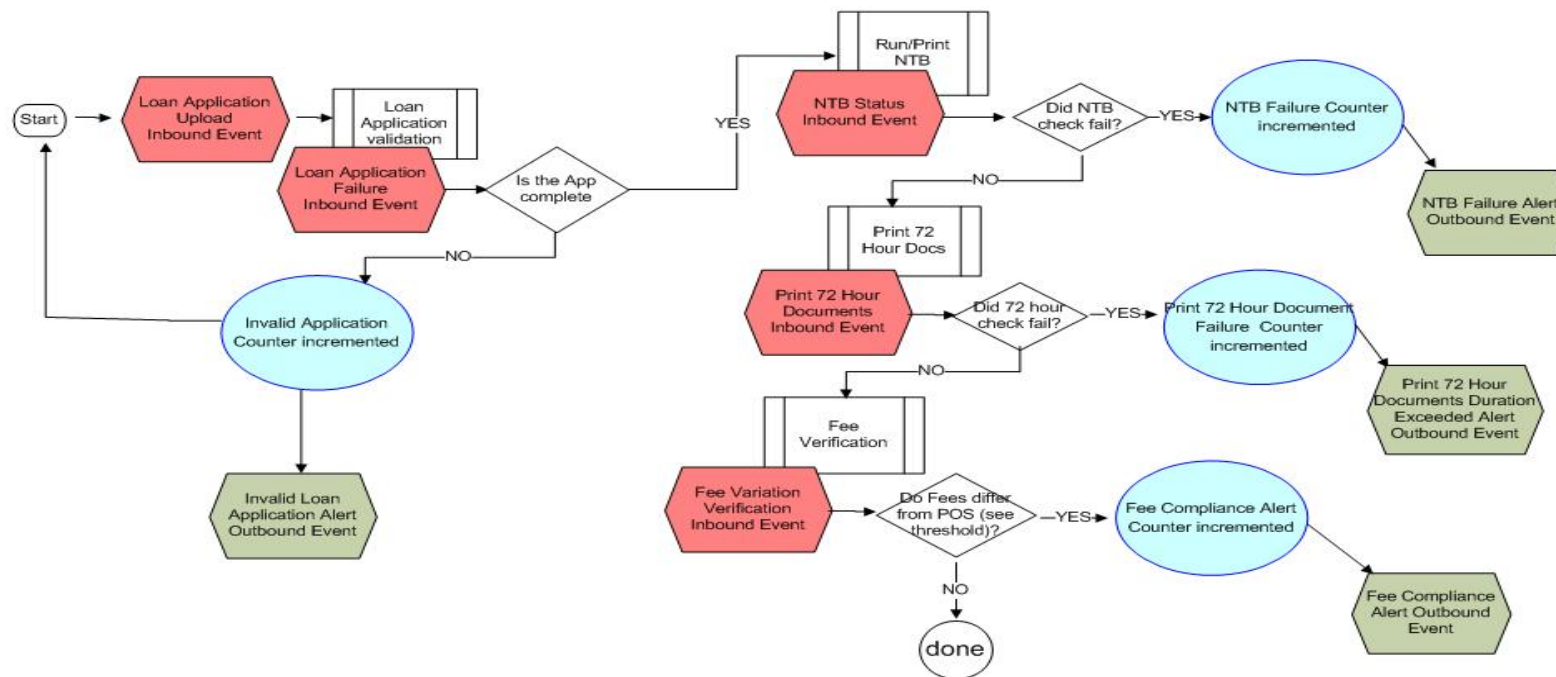
Automated Loan Setup Dimensions and KPIs

Automated Loan Setup MC Cube   Automated Loan Setup MC

Date

start date   Automated Loan Process Date

Automated Loan Setup KPIs
- Monthly Fee Compliance Failures
- Monthly Invalid Applications
- Monthly Maximum Application to Print 72 Hour Documents Comp
- Monthly Maximum Application Upload to Print 72 Hour Document
- Monthly NTB Failures
- Monthly Print 72 Hour Documents Failures
- Yearly Fee Compliance Failures
- Yearly Invalid Applications
- Yearly Maximum Application to Print 72 Hour Documents Comple
- Yearly Maximum Application Upload to Print 72 Hour Documents
- Yearly NTB Failures
- Yearly Print 72 Hour Documents Failures

Sample Dashboards (1/2)
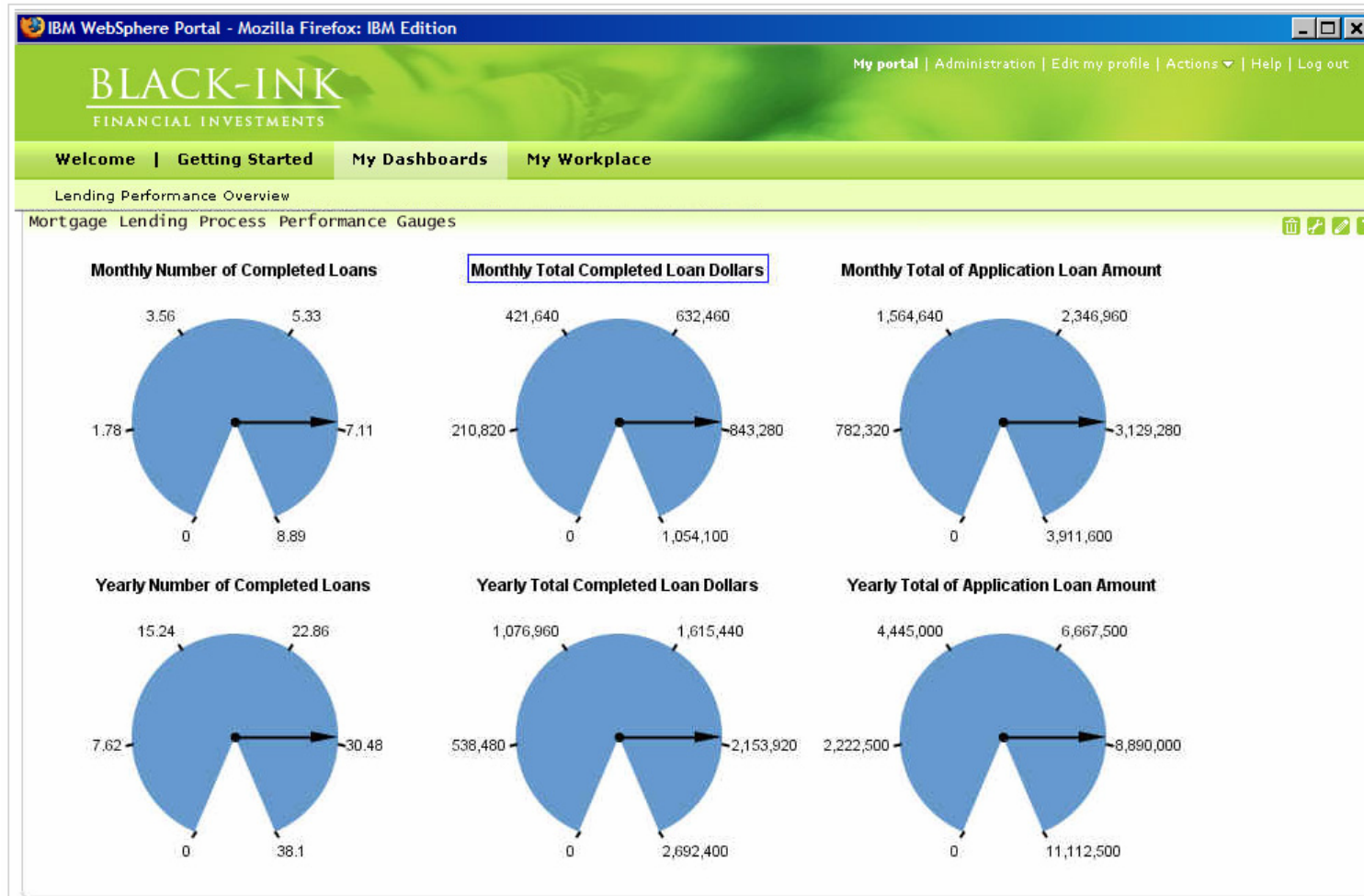
Sample Dashboard (2/2)

Healthcare Revenue Cycle High-Level Process (1/2)

The process centers on the revenue cycle involved with outpatient care claims in a hospital. The main steps of the process are:

1. A patient visiting a hospital,
2. Practitioner care and patient discharge,
3. Charge capture and coding
4. Patient's account is closed
5. Bills are generated for the services
6. Claims are issued and disputes and discrepancies are resolved
7. Payments are collected or amounts are written off

Healthcare Revenue Cycle High-Level Process (2/2)
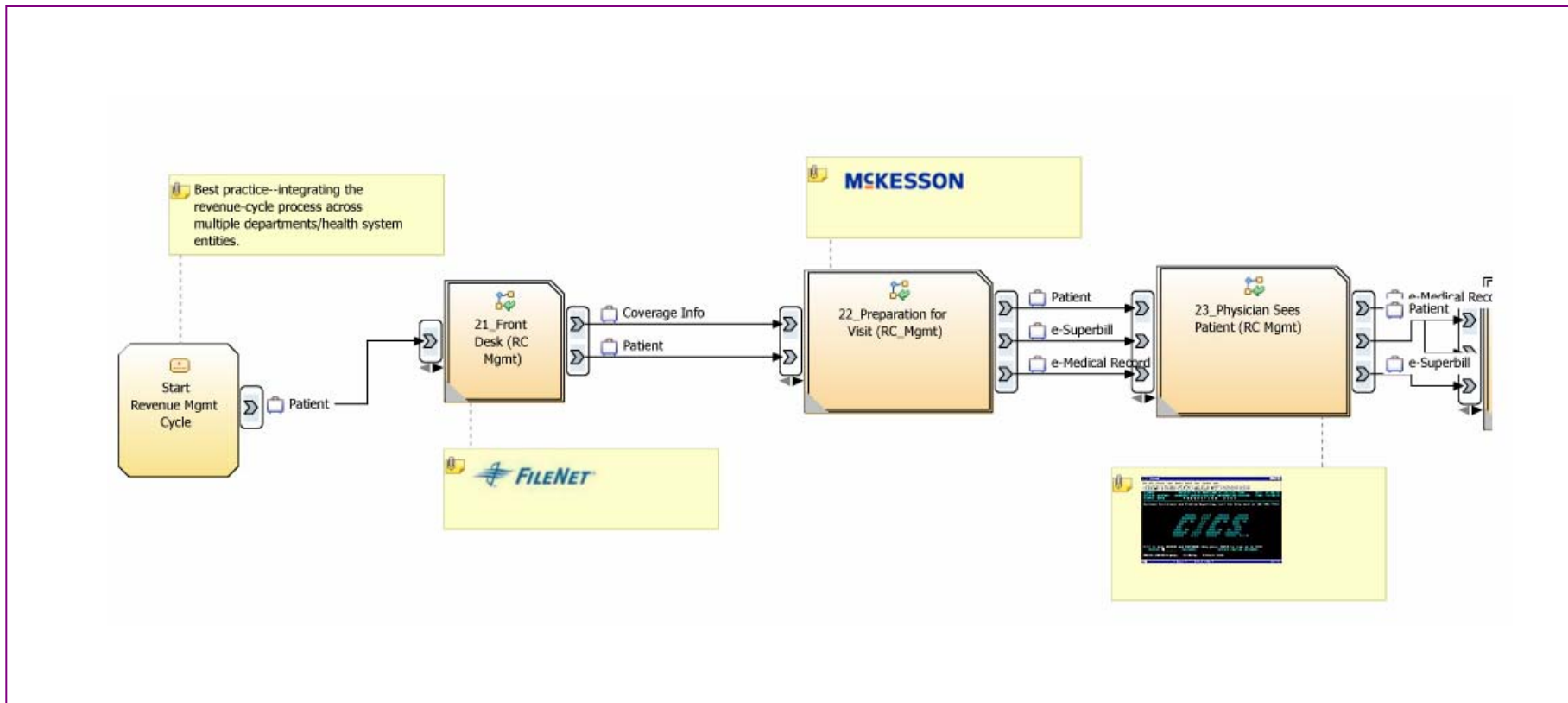
Healthcare Revenue Cycle Dimensions

▼ Dimensions

Add dimensions and their hierarchical attributes. Each attribute level enables you to aggregate the levels that are underneath it.

Cube / Dimension	Dimension Attribute	Source	Is Key
⊟ HealthcareRevenueCycle MC Cube		HealthcareRevenueCycle MC	
⊞ Claim Submission Type Dimension			
⊞ Claim Denial Type Dimension			
⊞ Claim Class Dimension			
⊞ Claim Payer Dimension			
⊞ Claim Amount Range			
⊞ Claim Date			

Sample Dashboard (1/3)

Sample Dashboard (2/3)

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Sample Dashboard (3/3)

Call Center for Retail – Call Queue High Level Process
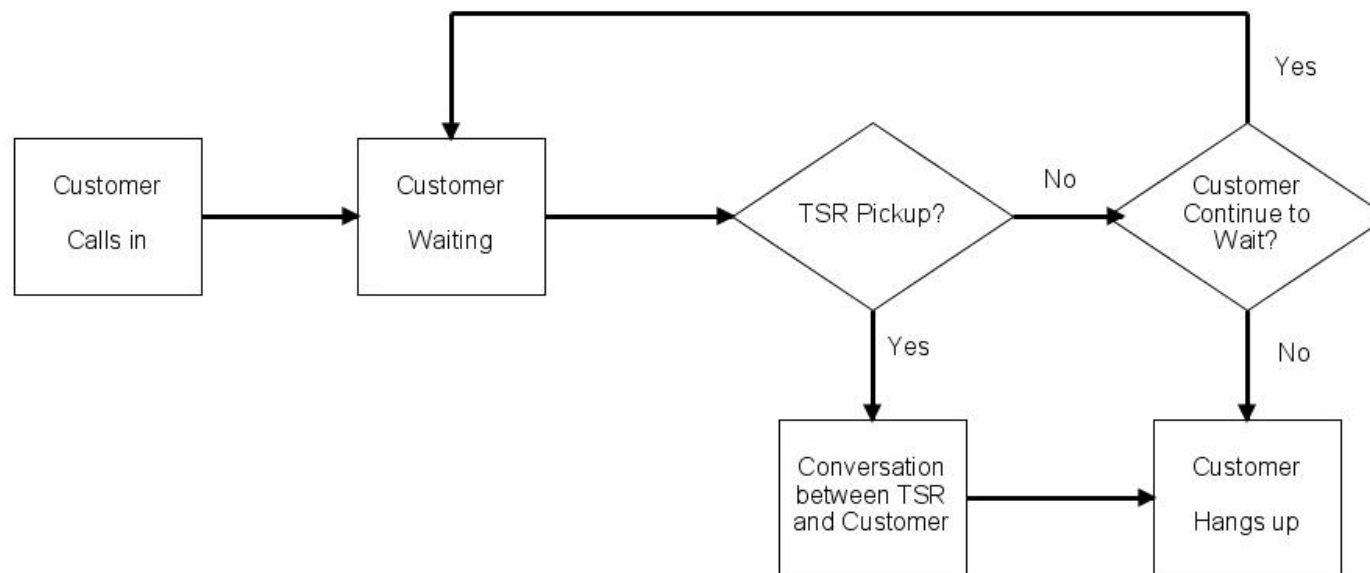
Call Center for Retail – TSR Performance High Level Process
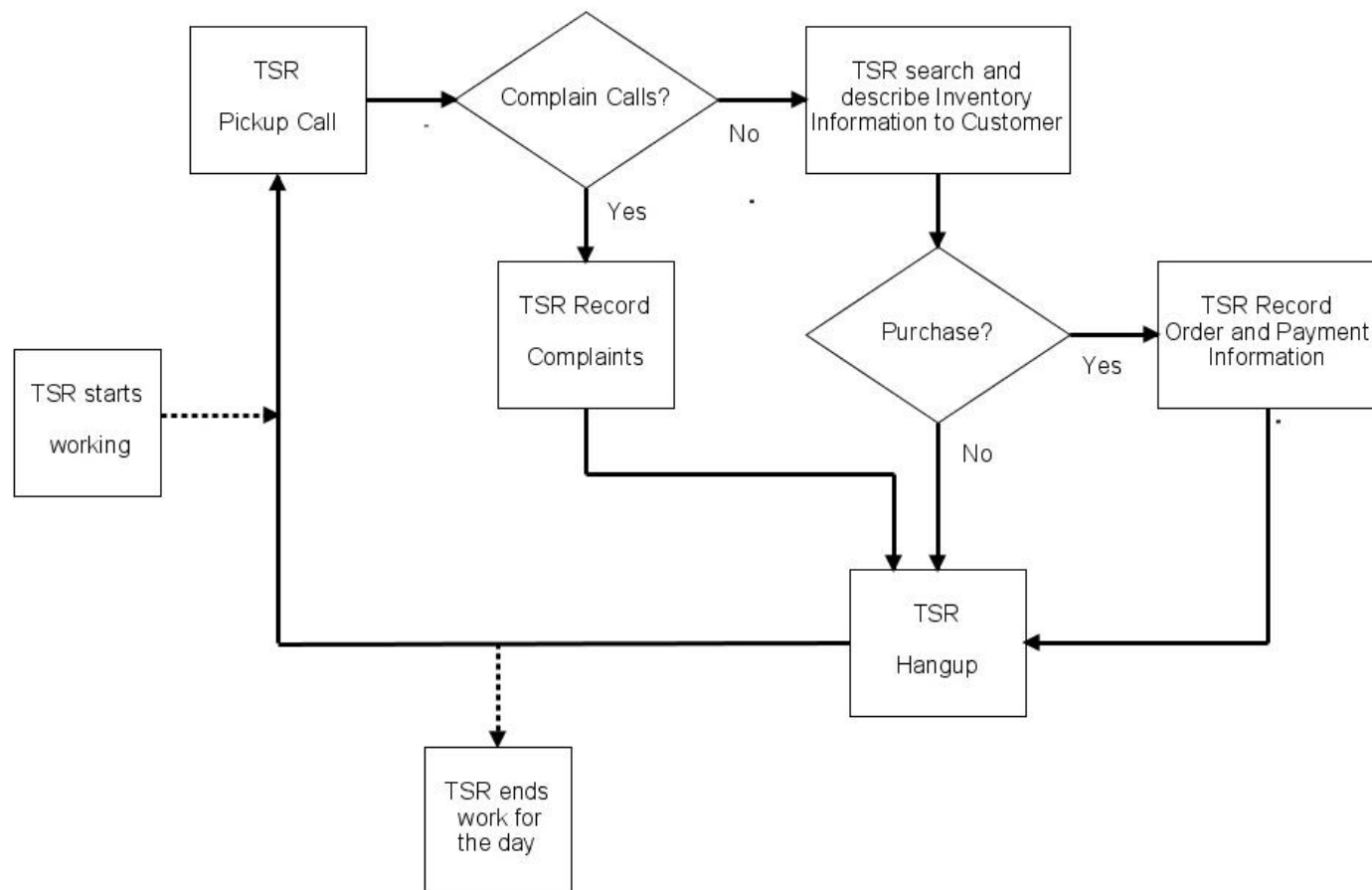
Call Center for Retail - Event/Trigger Definitions

For the Call Queue MC, the following inbound events and triggers are introduced.

- Call in Trigger
- Hangup Trigger
- Miss Call Trigger
- Pickup Trigger
- Call in Event
- Hangup Event
- Pickup Event
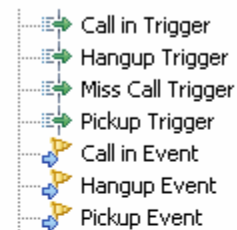
For the TSR Performance MC, the following inbound events and triggers are introduced.

- Complaint Trigger
- Hangup Trigger
- Non Purchase Trigger
- Order Completion Trigger
- Pickup Trigger
- Complaint Event
- Hangup Event
- Order Completion Event
- Pickup Event
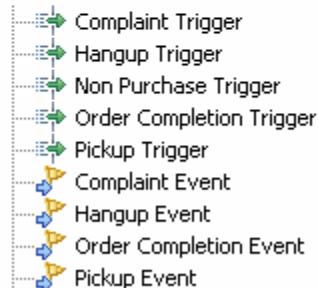
All inbound events inherit properties from activity event CBE and call event CBE. Call Event CBE:

Call Center for Retail - Dimensions

Dimension for Call Queue MC:

Cube / Dimension	Dimension Attribute	Source
− Call Queue MC Cube		Call Queue MC
+ Date		

Dimension for TSR Performance MC:

Cube / Dimension	Dimension Attribute	Source
− TSR Performance MC Cube		TSR Performance MC
+ Date		
+ Call Status		
+ Product Category		
+ Complaint Reason		
+ TSR Member		

Call Center for Retail - KPIs

Call Queue KPI context
- Daily Average Per Order Amount
- Daily Average Profit per Call
- Daily Average Wait Time
- Daily Total Customer Calls
- Daily Total Missed Calls
- Monthly Average Per Order Amount
- Monthly Average Profit per Call
- Monthly Average Wait Time
- Monthly Total Customer Calls
- Monthly Total Missed Calls

TSR Performance KPI context
- Daily Average Call Duration
- Daily Average Order Percentage (%)
- Daily Average Per Order Amount
- Daily Average Profit Per Order
- Daily Total Commission
- Daily Total Complaint Calls
- Daily Total Non Purchase Calls
- Daily Total Order Amount
- Daily Total Order Completion Calls
- Daily Total Profit
- Daily TSR Adjustment Rate (%)
- Monthly Average Call Duration
- Monthly Average Order Percentage (%)
- Monthly Average Per Order Amount
- Monthly Average Profit Per Order
- Monthly Total Commission
- Monthly Total Complaint Calls
- Monthly Total Non Purchase Calls
- Monthly Total Order Amount
- Monthly Total Order Completion Calls
- Monthly Total Profit
- Monthly TSR Adjustment Rate (%)
- Yearly Average Per Order Amount
- Yearly Average Profit Per Order
- Yearly Total Commission
- Yearly Total Order Amount
- Yearly Total Profit
- Yearly TSR Adjustment Rate (%)

Sample Dashboard for Call Queue

Sample TSR Performance Dashboard
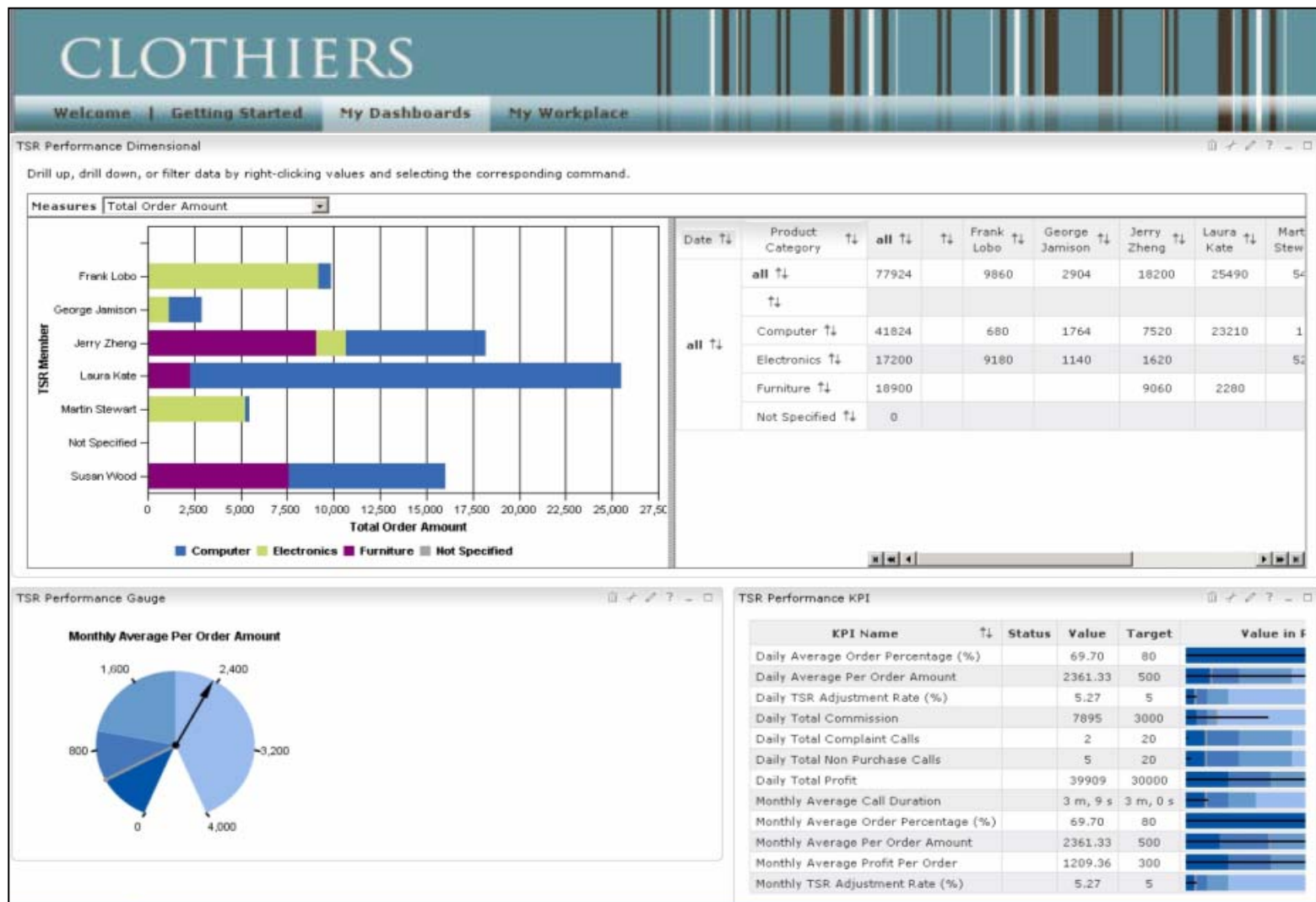
Human Task Monitoring Sample

Motivations

- There is no out-of-the-box support for generic human task monitoring in WB Monitor V6.0.2.

- The motivation of this work is to provide a sample framework that illustrates how generic human task monitoring can be implemented in WebSphere Business Monitor V6.0.2

- By *generic*, it means that business performance measurements can be taken for human tasks regardless of the actual business applications. Thus, customers can readily use this capability when desired.

- For specialized human tasks monitoring, i.e., those that require business application context, developers need to incorporate the monitoring logic into their own monitor models.

- The result of this work will hopefully bootstrap the development of a full-fledged human task monitoring line item into the main development code stream for future releases.

Components of the Human Task Monitoring Sample Package (1/2)

- ## Human Task Monitoring Model (HTMM)

  - HTMM is a monitor model that process events spanning across different business processes.

  - HTMM is generic and therefore it implies that business payload cannot be part of the monitor model.

  - Currently, the event definitions were based on the events emitted by the Human Task Container for WebSphere Process Server.

  - HTMM includes a datamart model for dimensional analysis

  - Only inline human tasks (and participating) are included in the first version of the HTMM

Notes:
1. *The chosen approach is to write an HTMM for each supported Process Engine, e.g. WPS.*
2. *While the original intention was to create HTMM for WPS and FileNet, the FileNet implementation was withheld due to scheduling issues with WBM/FileNet integration.*
3. *In the future, the approach is to factor out code that are common among all process engine. A Java Interface is then developed requiring each process engine to implement the interface.*

Components of the Human Task Monitoring Sample Package (2/2)

- **Human Task Administration Portlet**
  - A sample portlet that was written to allow an administrator to take actions on a given task using the Dashboard
  - It contains a subset of the functionalities available in BPC Explorer for human tasks
  - It is designed to interact with the Instances View using Click-to-Action.
  - At the very least, the portlet shows the current status of a task. Optionally, the user can terminate, suspend, resume or transfer ownership of the task.
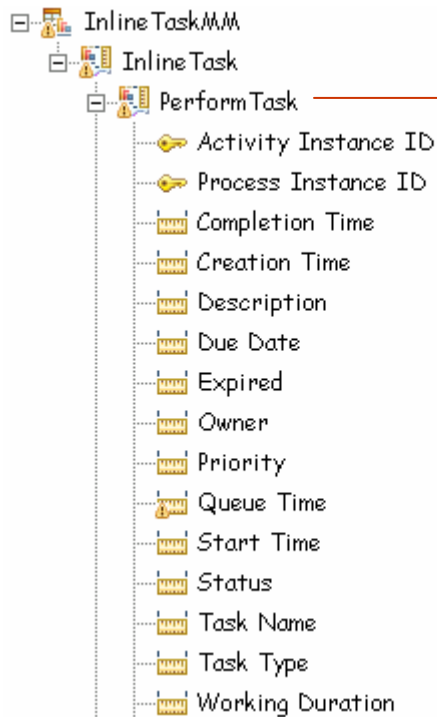
Human Task Monitor Model (Event Definitions)

Event Definitions
- BPC.BFM.ACTIVITY.BASE
- BPC.BFM.ACTIVITY.CLAIM
- BPC.BFM.ACTIVITY.ESCALATED
- BPC.BFM.ACTIVITY.FAILURE
- BPC.BFM.ACTIVITY.MESSAGE
- BPC.BFM.ACTIVITY.MESSAGE_HTM_test_bpel_HTInlineTask_b_7_Perform Human Task
- BPC.BFM.ACTIVITY.MESSAGE_HTM_test_bpel_HTMProcess_b_7_Invoke Human Task
- BPC.BFM.ACTIVITY.MESSAGE_HTM_test_bpel_InlineTask_b_7_Perform Task
- BPC.BFM.ACTIVITY.STATUS
- BPC.BFM.ACTIVITY.WISTATUS
- BPC.BFM.ACTIVITY.WITRANSFER
- BPC.BFM.BASE
- BPC.BFM.PROCESS.BASE
- BPC.BFM.PROCESS.CORREL
- BPC.BFM.PROCESS.ESCALATED
- BPC.BFM.PROCESS.FAILURE
- BPC.BFM.PROCESS.START
- BPC.BFM.PROCESS.STATUS
- BPC.BFM.PROCESS.WISTATUS
- BPC.BFM.PROCESS.WITRANSFER
- BPC.HTM.BASE
- BPC.HTM.TASK.BASE
- BPC.HTM.TASK.FAILURE
- BPC.HTM.TASK.FOLLOW
- BPC.HTM.TASK.INTERACT
- BPC.HTM.TASK.MESSAGE
- BPC.HTM.TASK.MESSAGE_HTM_test_ht_MyHumanTask_t_MyHumanTask
- BPC.HTM.TASK.STATUS
- BPC.HTM.TASK.WISTATUS
- BPC.HTM.TASK.WITRANSFER
- WBI.MonitoringEvent

Event Definitions are taken from a BPEL with inline Human Task.

These messages are irrelevant and therefore not used at all in this HTMM.
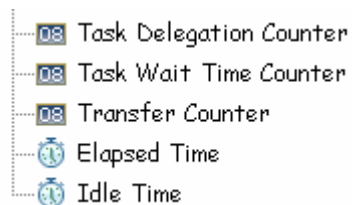
HTMM Monitor Details Model (1/4)

InlineTaskMM
 InlineTask
  PerformTask
   Activity Instance ID
   Process Instance ID
   Completion Time
   Creation Time
   Description
   Due Date
   Expired
   Owner
   Priority
   Queue Time
   Start Time
   Status
   Task Name
   Task Type
   Working Duration

Task Delegation Counter
Task Wait Time Counter
Transfer Counter
Elapsed Time
Idle Time

The model only captures human tasks that are inline
- *PerformTask* is the generic name, but the metric Task Name should give the actual name of the task
- This inline human task is correlated with the parent process that executed the task
- To see the actual usage of these metrics, consult the actual Business Monitoring project.

Since we are monitoring an inline human task, a child MC is created.

The Parent MC belongs to the process that executes the inline human task.

Here are some interesting Stop Watches and Counters.

HTMM Monitor Details Model (2/4)

The following are the Inbound Events processed by this model

PerformTask ASSIGNED
PerformTask CREATED
PerformTask DEASSIGNED
PerformTask ESCALATED
PerformTask EXIT
PerformTask EXPIRED
PerformTask FAILED
PerformTask FAULTSET
PerformTask FCOMPLETED
PerformTask FRETRIED
PerformTask OUTPUTSET
PerformTask SKIPPED
PerformTask STOPPED
PerformTask TERMINATED
PerformTask WI_CREATED
PerformTask WI_DELETED
PerformTask WI_REFRESHED
PerformTask WI_TRANSFERRED

PerformTask Termination Trigger
Task Assign Trigger
Task Completion Trigger
Task Creation Trigger
Task Deassigned Trigger
Task Transfer Trigger
Task Wait Time Trigger

Triggers used by this model

HTMM Monitor Details Model (3/3)

Sample Filter and Correlation Expression for an inbound event

Type: BPC.BFM.ACTIVITY.STATUS   Browse...

shows that this event is a type declared by BPC

Filter Condition
Define a condition based on the event attributes to identify whether to accept an event of this type.

PerformTask_CREATED/extendedData/EventNature = 'CREATED' and PerformTask_CREATED/extendedData/bpelId = '7'

Notice that this filter condition does not include a test on a specific process template.

Correlation Expression
Define an expression to identify the monitoring context instance or instances that receive the event at runtime.

PerformTask_CREATED/propertyData/ECSCurrentID = ActivityInstanceID and PerformTask_CREATED/propertyData/ECSParentID = ProcessInstanceID and PerformTask_CREATED/propertyData/ECSParentID = ../ProcessInstanceID

Correlation ensures that this inbound event is associated with the right parent process.

If no instances are found   Create new instance
If one instance is found   Deliver to the instance
If multiple instances are found   Treat as error

HTMM Monitor Details Model (4/4)

Assignment of metric values based on Triggers
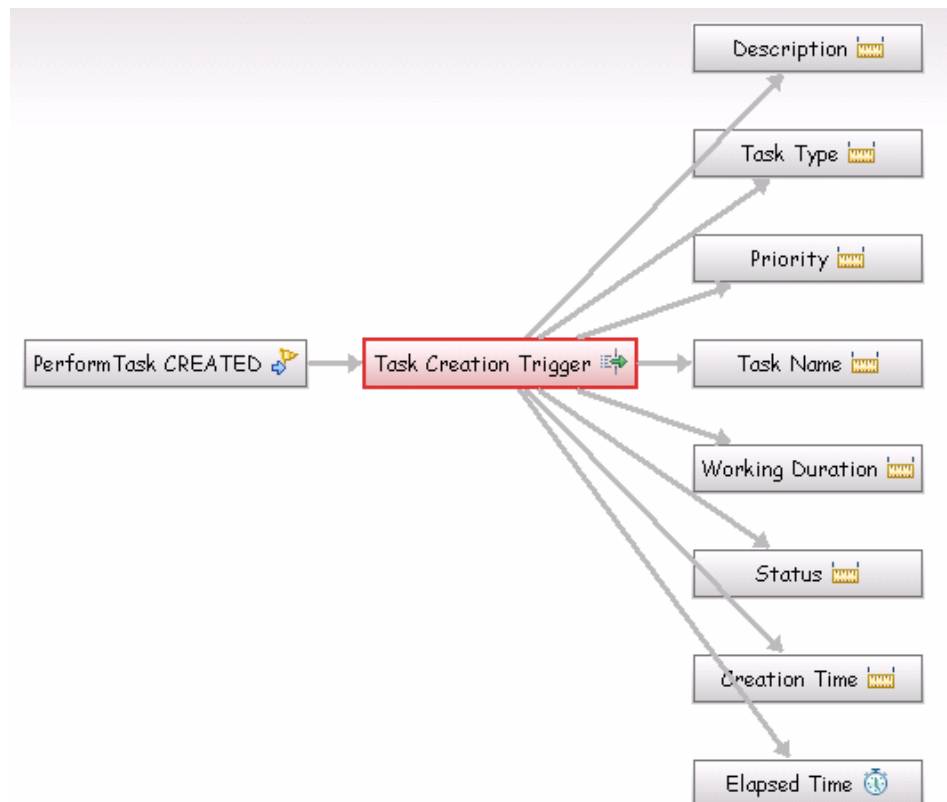
This figures shows which metrics are assigned their values when a *PerformTask CREATED* event comes in.

Datamart Model

PerformTask Cube
Dimensions
- Task Name
- Task Owner
- Task Status
- Task Duration
- Task Kind
- Task Priority
- Task Deadline
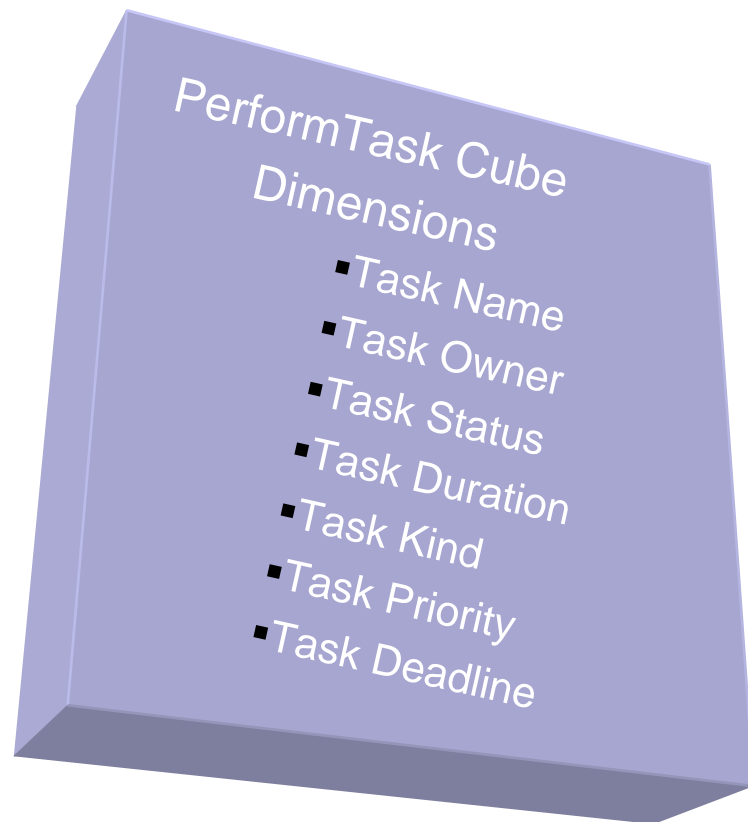
This cube is used for
Dimensional Analysis View

IBM WebSphere Business Monitor Feature Extensions

Human Task Dimensional View

Instances Count (of task instances) is an example of a Generic Measure
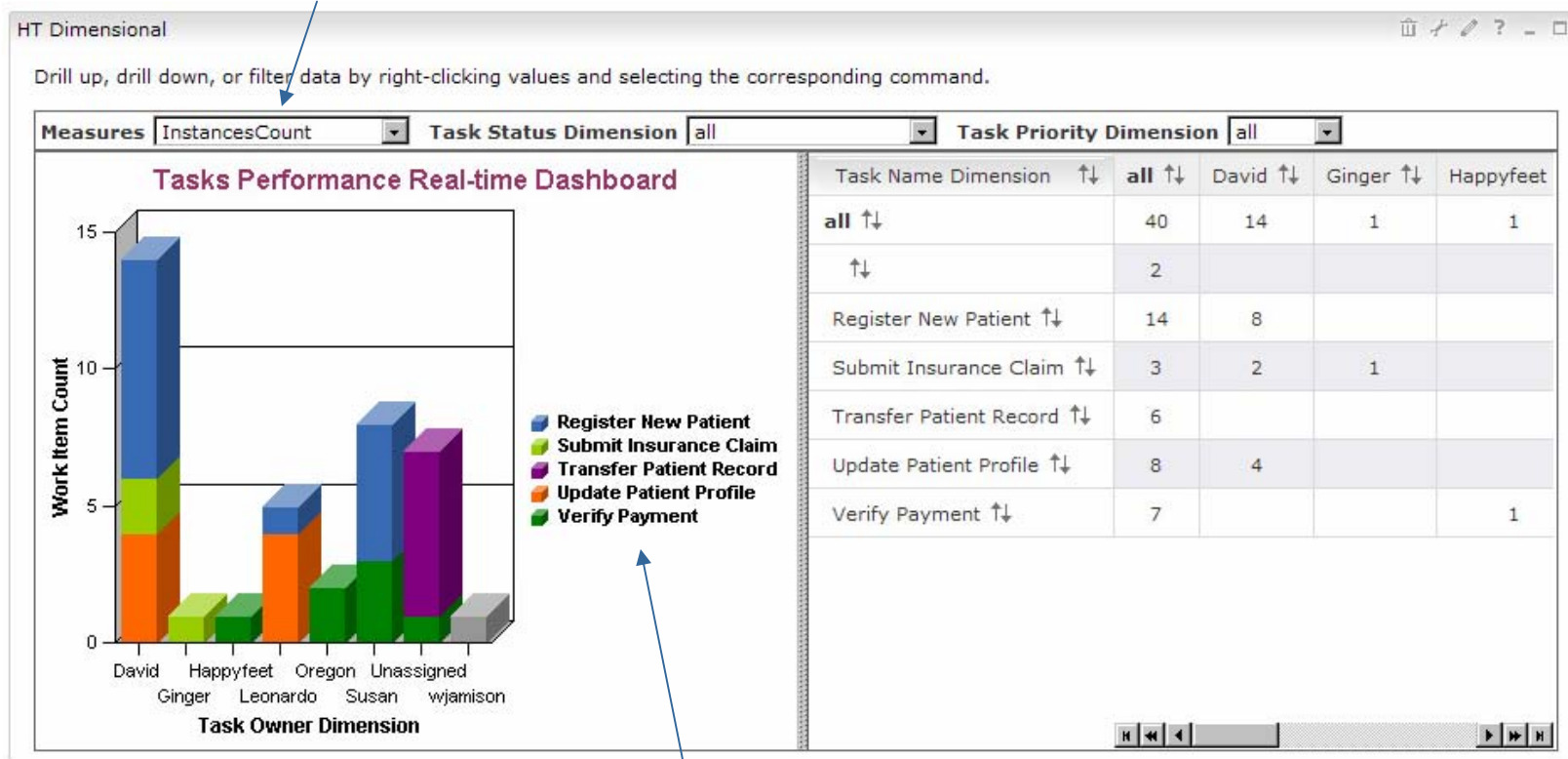
Notice that our generic model reads the actual task names of each task.

How to use the HTMM

- If you are interested in monitoring your human tasks, install the generated code for the HTMM in your Monitor Server.

- Security must be enabled in both the Monitor Server/Dashboard and WPS where the monitored application is running.

- The HTMM should be able to co-exist with any other monitor models that you want to deploy on your monitor server

- Run your monitored BPEL application. Ensure that you enable event monitoring in your human tasks when developing your BPEL application. The next slide shows how it is done using WID 6.0.2. By doing this, your BPEL application will automatically throw events that are processed by the HTMM.

Enabling Event Monitoring in your BPEL application

(1) Click on your human task.

(2) Make sure to choose this tab and then click on **CEI** for destination, and the **All** radio button. Also, choose Full for the Event Content.

IBM WebSphere Business Monitor Feature Extensions

Human Task Administration Portlet

End of Document