



# Combining WebSphere BPM and Six Sigma to drive continuous improvement

## Lean Sigma, business process management (BPM) and SOA work together to increase flexibility and innovation

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- Six Sigma, Lean, and Lean Sigma disciplines have delivered measurable financial results to the stakeholders of hundreds of companies
- According to Gartner\*, the spread of Six Sigma and other process improvement methods, along with advances in BPM technology and standards, are driving even greater results
- Services Oriented Architectures (SOA) when used in the context of BPM are allowing companies to move away from rigid applications that are slow and difficult to change
- Firms that have embraced these methodologies and technologies are finding that they are able to deliver additional value through innovation more rapidly than their competitors

\*Gartner's Position on Business Process Management, 2006

“Consistency in operations means you don't spend all your time running down problems. And that means more time for innovation. Especially if you're going to open your company to collaboration, you need to be in decent shape internally.”

Dave Lubowe, Partner, IBM Global Business Services

# **Key takeaway – each step in the Six Sigma improvement and design method is supported by WebSphere BPM**

- WebSphere Business Modeler's advanced simulation and analysis adds new capability, improves decision-making, and reduces risk
- WebSphere Process Server controls and choreographs short- and long-running processes, generating alerts or starting new processes when corrective action is required
- WebSphere Business Monitor captures real-time process data and KPI results, improving visibility and responsiveness
- Seamless handoff from business to IT reduces implementation cycle time and project risk
- Reuse of components (services, processes) results in lower costs, increased flexibility
- Tools are powerful yet easy-to-use, resulting in increased productivity



Six Sigma Improvement Method

# Topics

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- Business process management (BPM) overview
- WebSphere BPM process improvement and design methods
- WebSphere BPM capabilities (including Classifiers)
- Picking the right process – knowing what to look for
  - Where to find improvement
  - Modeling Exceptions
  - Prioritization Matrix
- Next steps

"Various surveys tell us that the typical enterprise is devoting [over 80%](#) of its applications budget to simply supporting normal business because of the [complexity of making change.](#)"

Source: CBDI  
The Business Case for SOA

# Topics

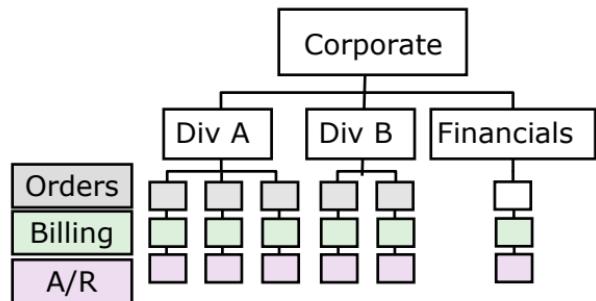
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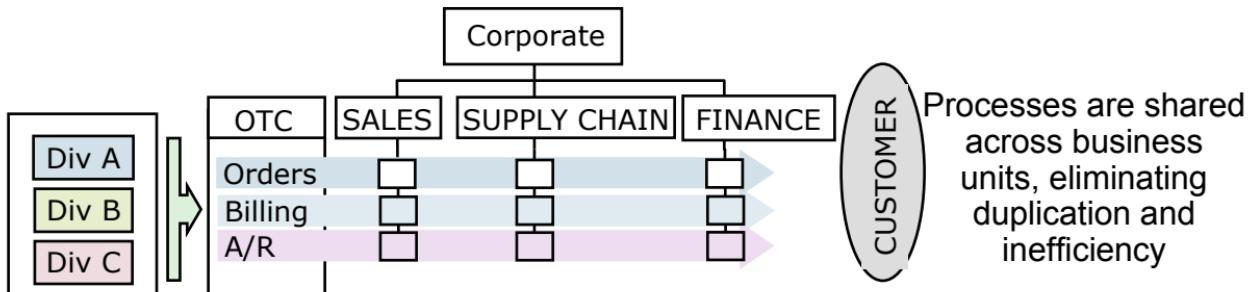
"Over 70% of the IT budget is being spent on overcoming the limitation of current systems, while less than 30% is spent on acquiring new capabilities that can provide a competitive edge to the business."

Source: IBM Research

# Many companies use horizontal realignment in an effort to improve performance



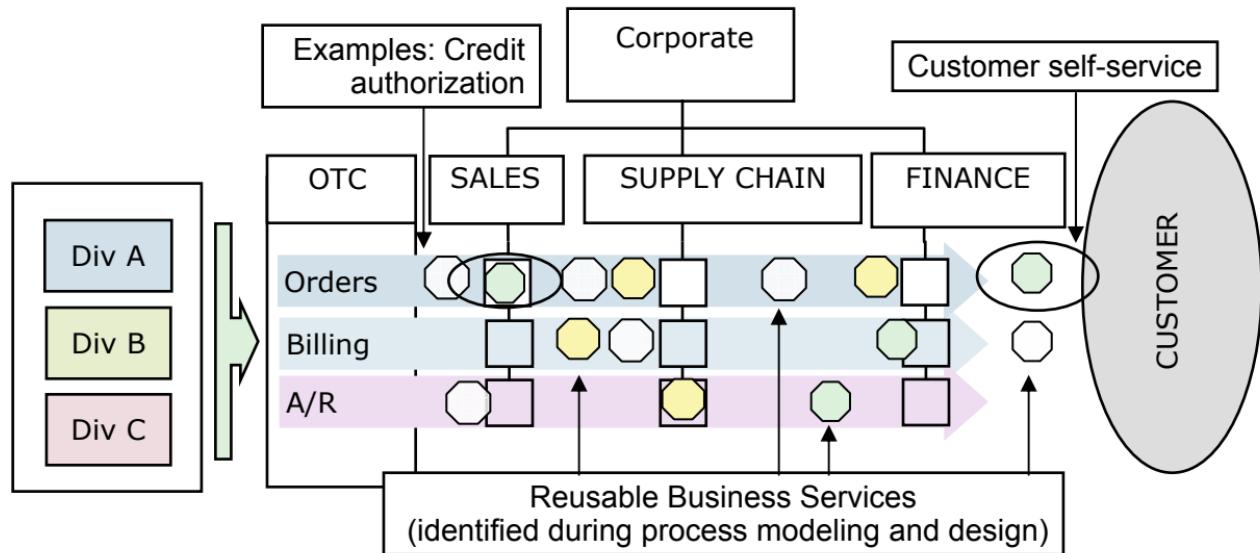
Autonomous Division Model
Redundant functions
Structure, metrics and incentives promote local optimization
Limited ability to reuse best practices, service components



WebSphere Business Modeler is used to identify and build shared processes based upon best practices found in the Divisions

# Service-driven realignment accelerates the return on investment, increases flexibility and responsiveness

Component reuse *within* and *across* processes drives costs down even more and flexibility is achieved by “rewiring” services in new, innovative ways



WebSphere Process Server manages system and human interactions along the process.  
WebSphere Business Monitor gives visibility to Key Performance Indicators and enables rapid response to error conditions as they occur

# Business process monitoring achieves even greater results

"Three-quarters of 160 companies surveyed recently believe they are flying their business processes 'blind and without instruments.' **This lack of visibility, often due to old application software, is inhibiting all levels of management from seeing bottlenecks** in such critical processes as capital risk management, claims tracking, compliance, inventory management, and customer service."

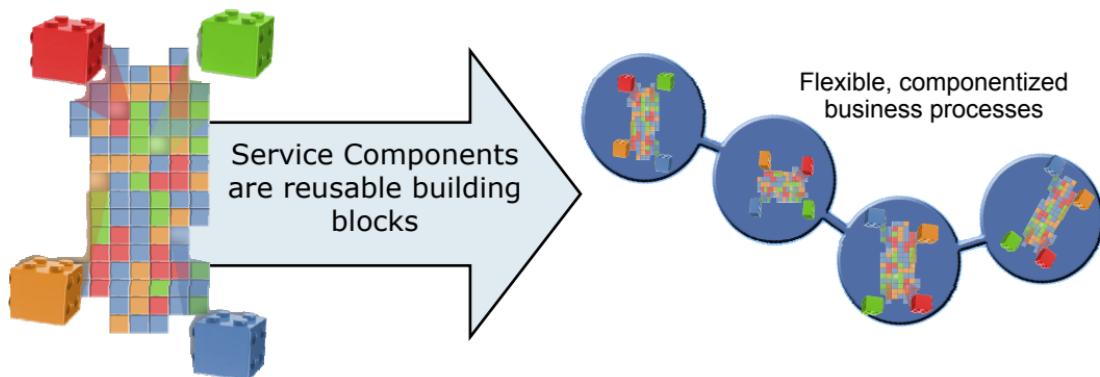
- An average 9% improvement in revenues
- A median 12% decrease in process-related expenses
- A 10% return on assets (ROA)
- An 18% return on investment (ROI)
- 94% are moderately or very pleased with the overall improvement business process monitoring has delivered



Source: AberdeenGroup, The Business Process Management Benchmark Report, October 2006

# Flexibility through Business Services

Business process logic will no longer be deeply embedded in application code, where it is locked away and expensive to change. Instead, process logic will exist in the form of **high value business services that are reusable**. Processes using these services will be much more flexible and cheaper to maintain over time, allowing businesses to achieve dramatic results in responsiveness, cost effectiveness and profitability.



WebSphere Registry and Repository and Business Services Fabric may be used to manage the services environment for maximum benefit and return

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"It's the iterative part that many companies just aren't practicing. They're not 'closing the loop' by using their experience (or, better still, metrics) to tweak services and processes for optimal performance. Rather, too many are redesigning once and declaring victory because they've realized a few gains."

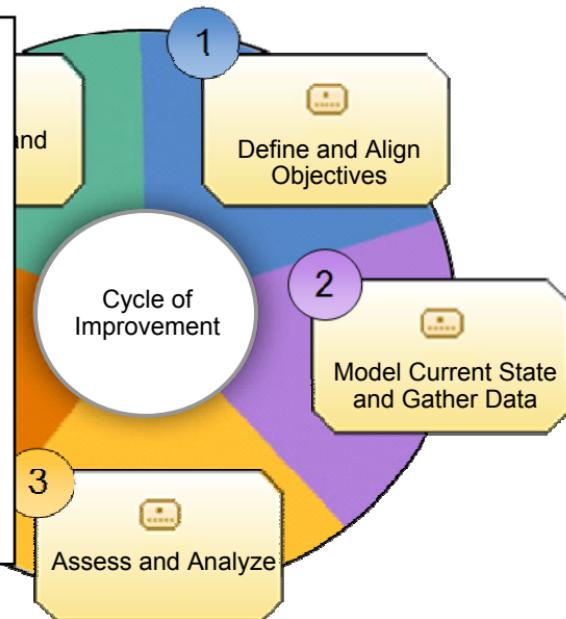
Source: Intelligent Enterprise, Feb. 2006

# WebSphere BPM – Five steps to continuous process improvement

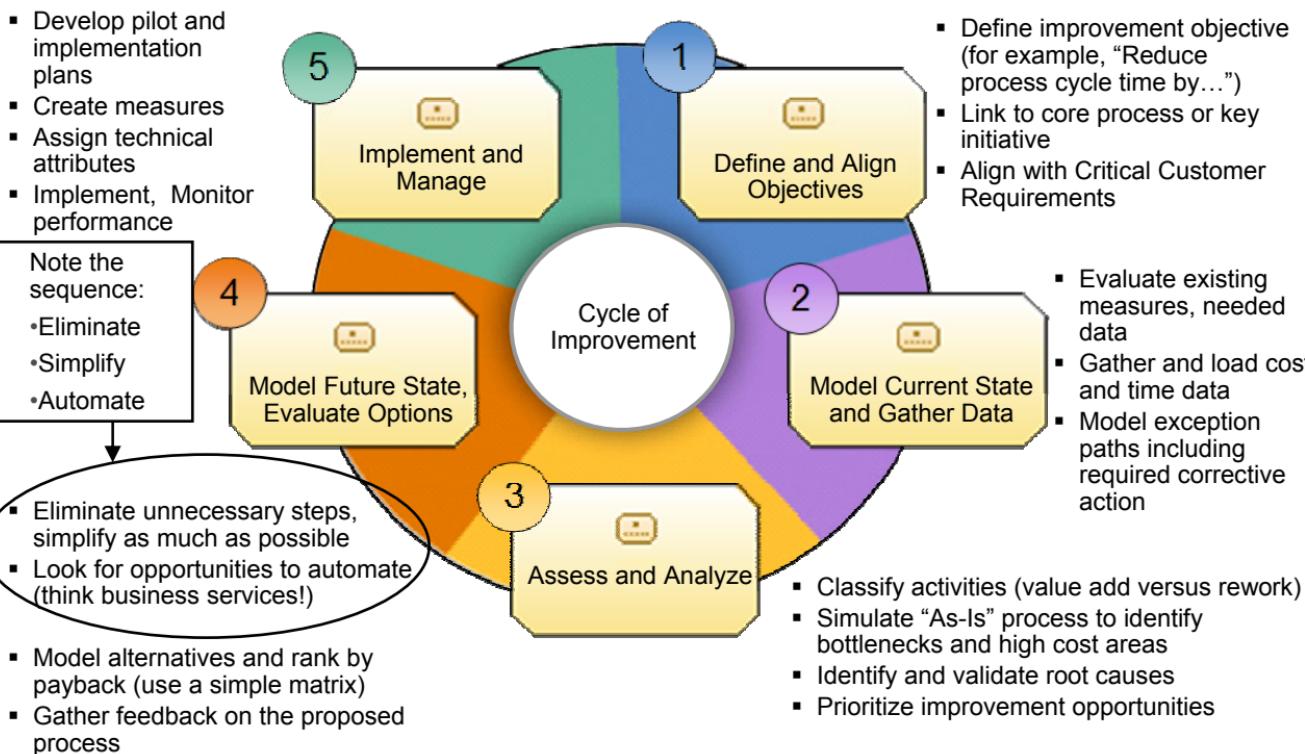
## The WebSphere BPM 5-step Improvement Framework

Goal: Create a **technology-enabled** framework for iterative process improvement and innovative new process design that is:

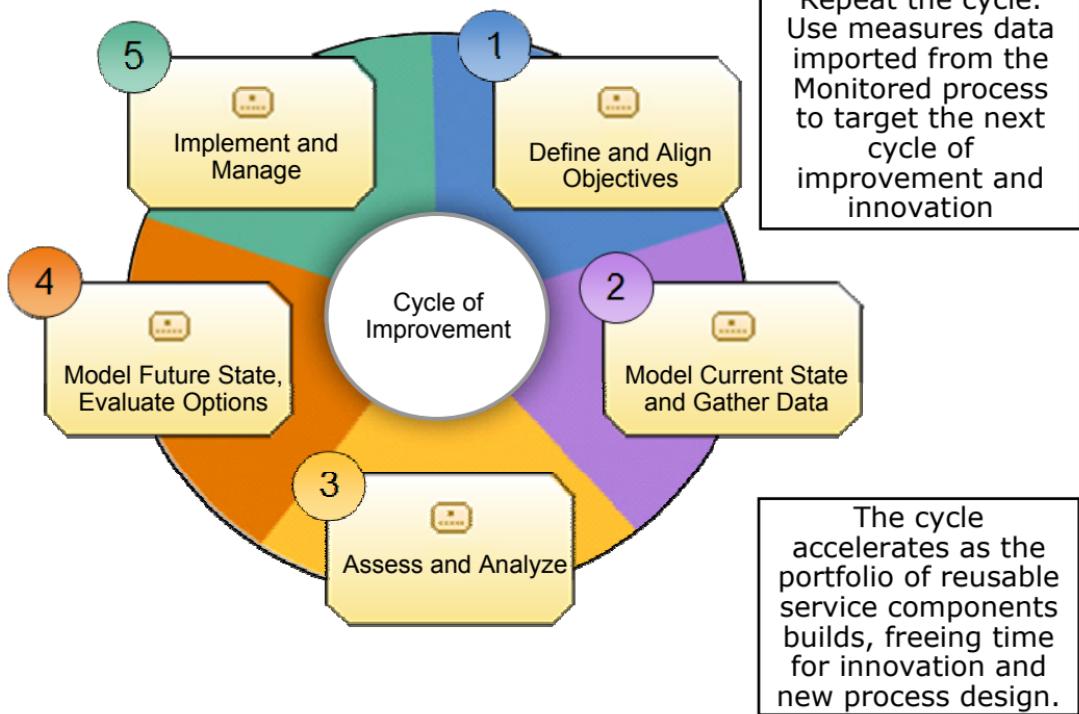
- Systematic and repeatable
- Flexible and responsive
- Results-focused
- Based on proven methods such as Six Sigma's DMAIC and DMADV



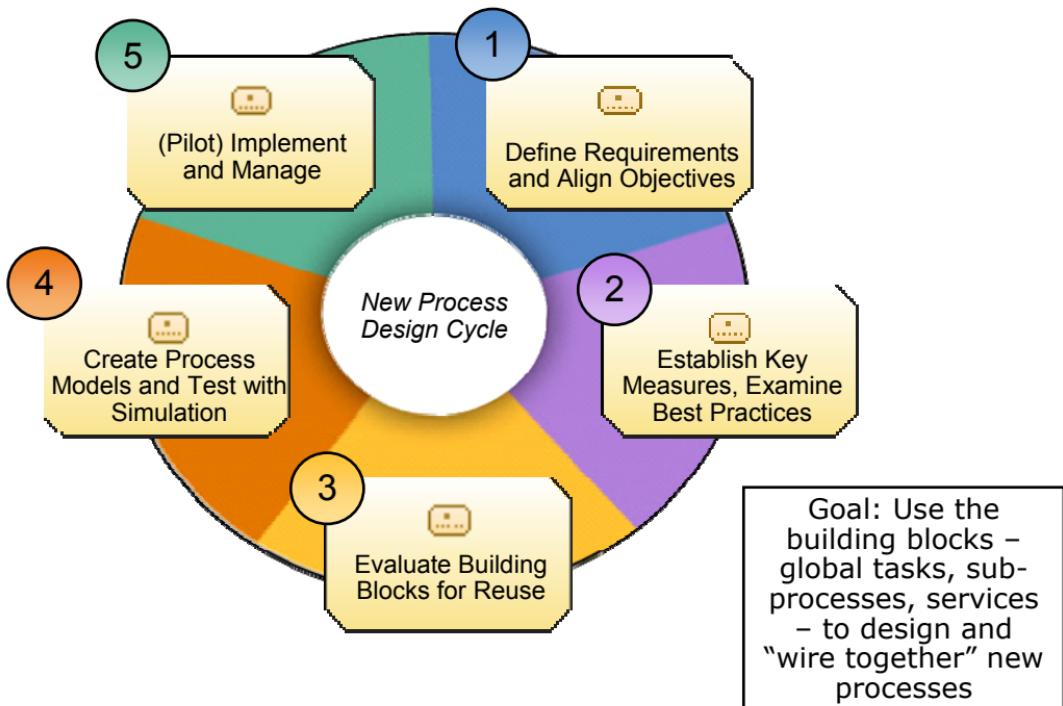
# WebSphere BPM – Five steps to continuous process improvement



# WebSphere BPM – Five steps to continuous process improvement



# WebSphere BPM – Five steps to new process design



# Topics

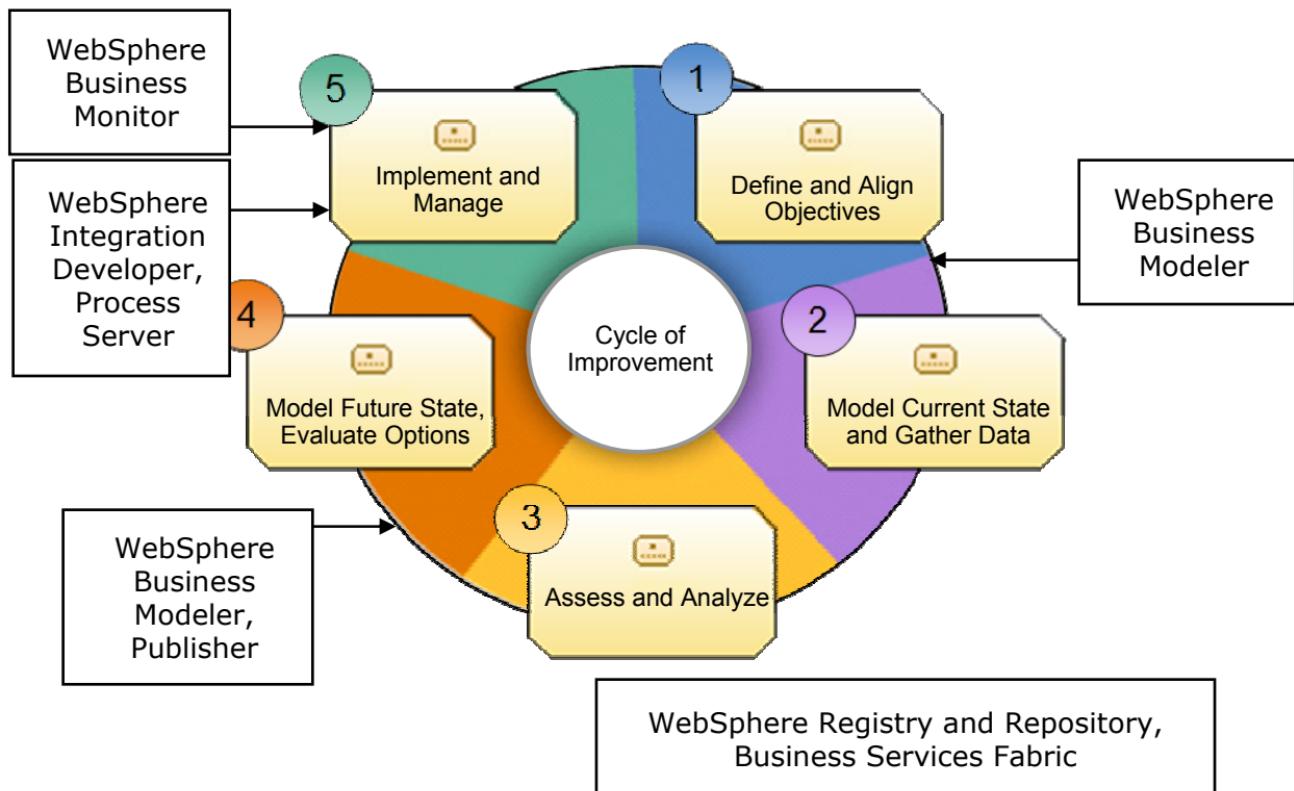
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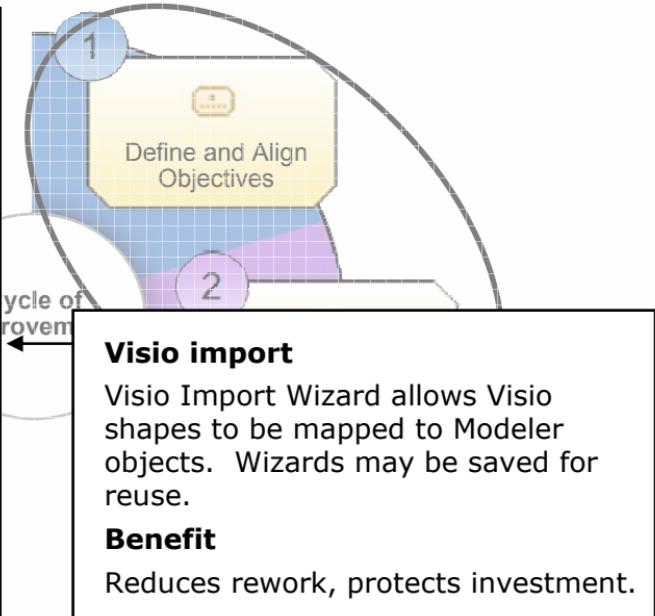
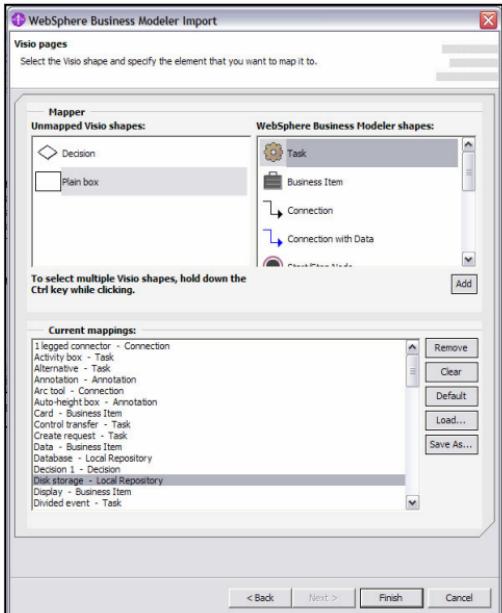
"BPM's top-down model-initiated approach can actually accelerate the SOA rollout by fostering business-IT alignment with concrete performance metrics, and encouraging an iterative approach to the production implementation."

Source: Bruce Silver's blog on business process management

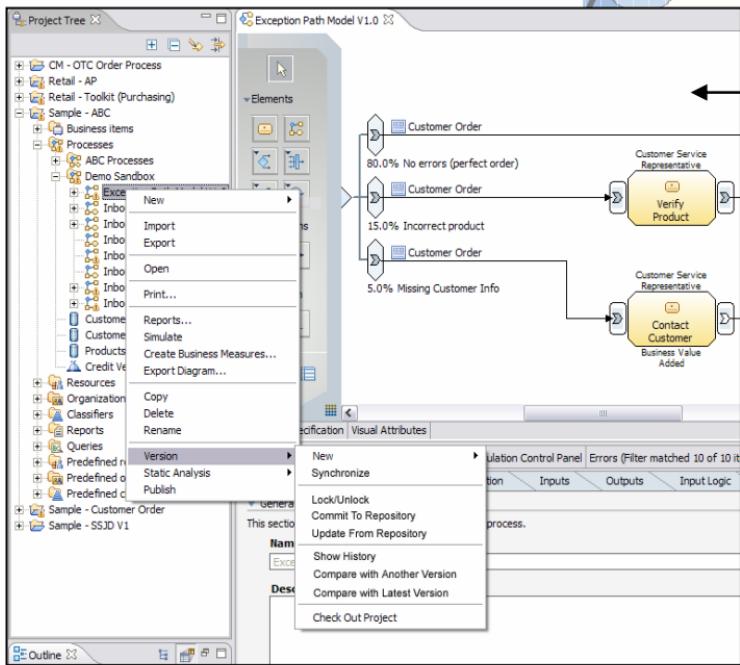
# WebSphere business process management – Five steps to continuous process improvement



# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



## Team sharing

Versions are managed, synchronized and controlled through a shared repository. The repository is continually enriched by *both* IT and business.

## Benefit

Workload may be divided to speed implementation, richer objects simplify implementation.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

## Swimlane editor

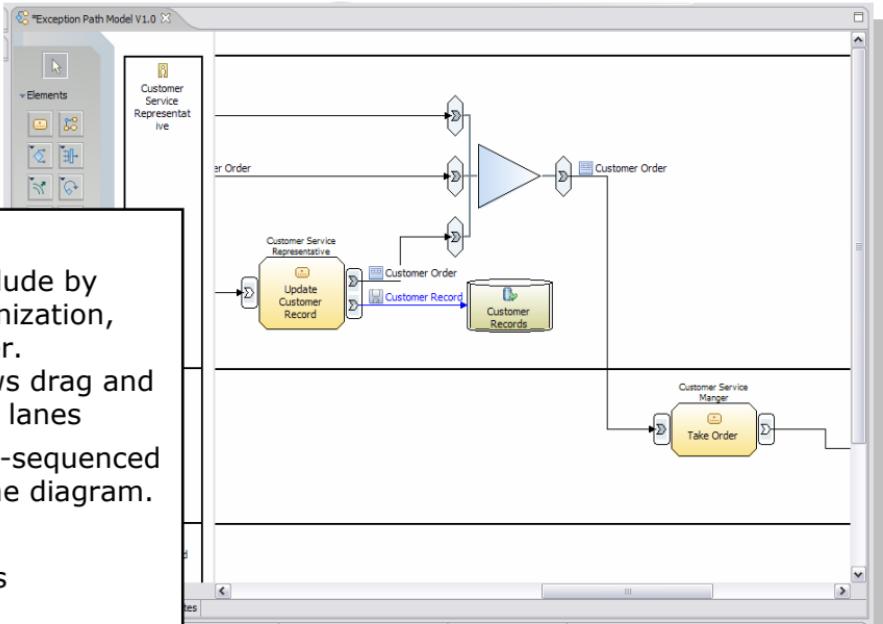
Swimlane options include by Role, Resource, Organization, Location and Classifier.

Swimlane editor allows drag and drop modeling across lanes

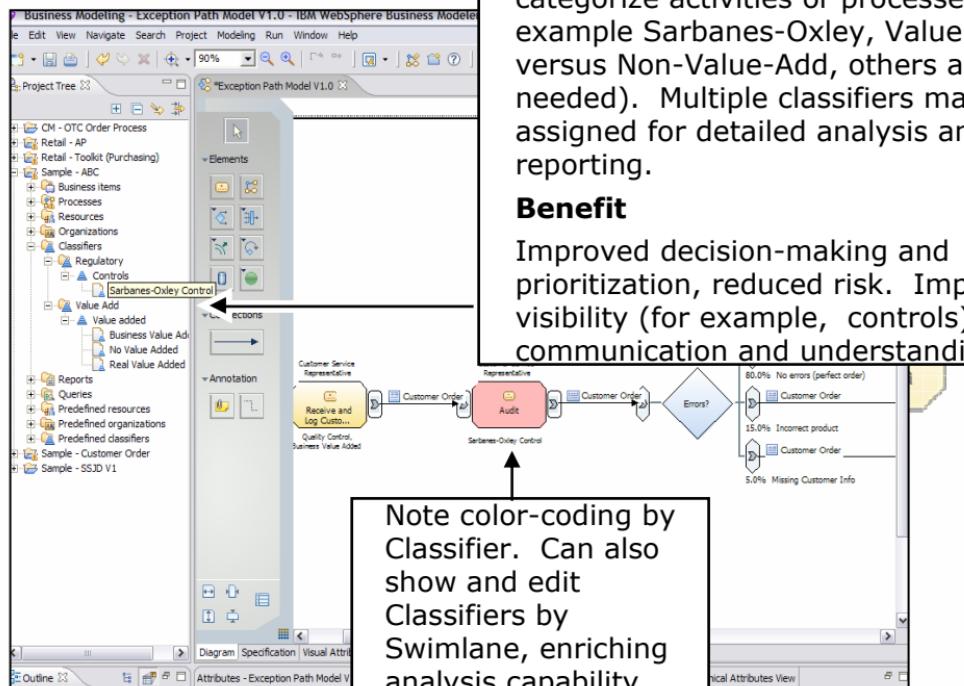
Swimlanes may be re-sequenced by right clicking on the diagram.

## Benefit

Saves time, facilitates communication and understanding.



# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



## Classification Capability

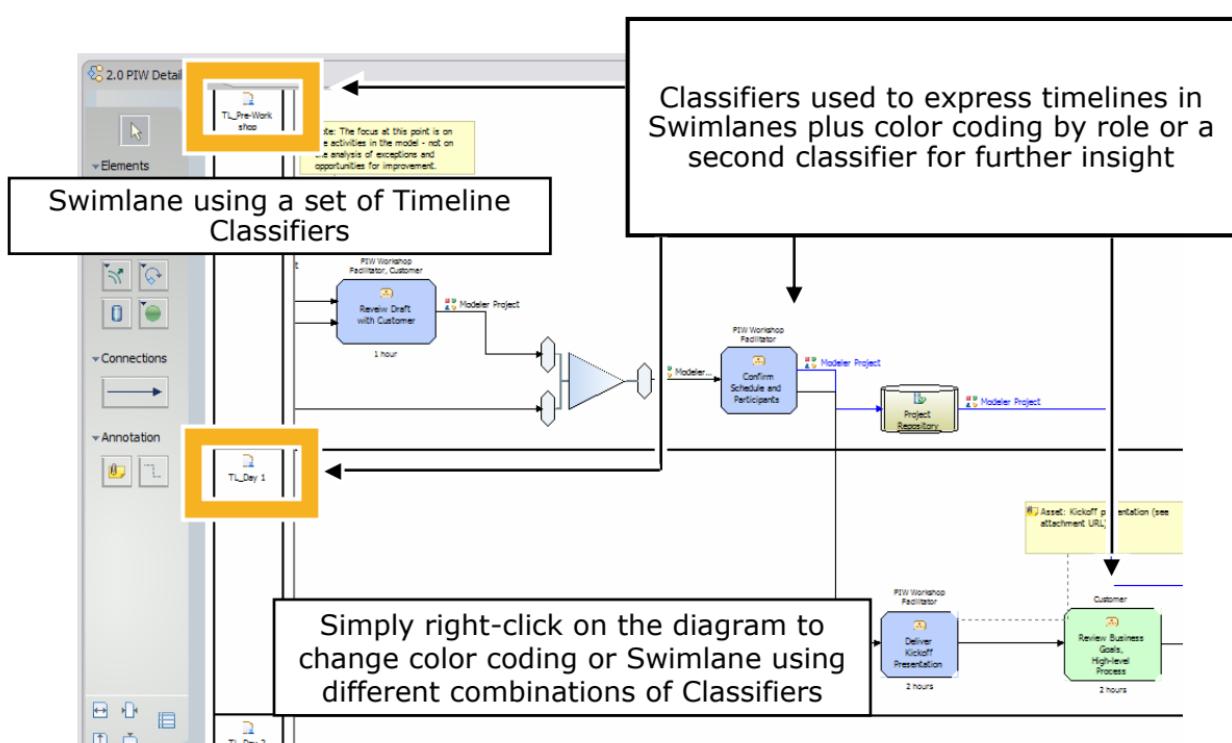
Classifiers are used to group or categorize activities or processes (for example Sarbanes-Oxley, Value-Add versus Non-Value-Add, others as needed). Multiple classifiers may be assigned for detailed analysis and reporting.

## Benefit

Improved decision-making and prioritization, reduced risk. Improved visibility (for example, controls), communication and understanding.

Note color-coding by Classifier. Can also show and edit Classifiers by Swimlane, enriching analysis capability.

# WebSphere Business Modeler Classifiers – facilitate analysis and help communicate process details



# Classifiers – key to analysis and an IBM differentiator

The screenshot shows the 'Defects Works' application interface. On the left, there is a navigation tree with a yellow box highlighting the 'Classifiers' node under 'Master Template'. A callout box points from this area to the text: 'Consider the use of a Classifier template to use as a starting point for a new project.' In the center, the 'Classifier value documentation' section is displayed, with 'Assigned color' selected. Below it, a large text box contains the following text:

These Classifiers are set up for Lean where the goal is to look for and eliminate the sources of waste in a process. Classifiers may be created as needed and on the fly including those which might be useful in understanding variation cause and effect.

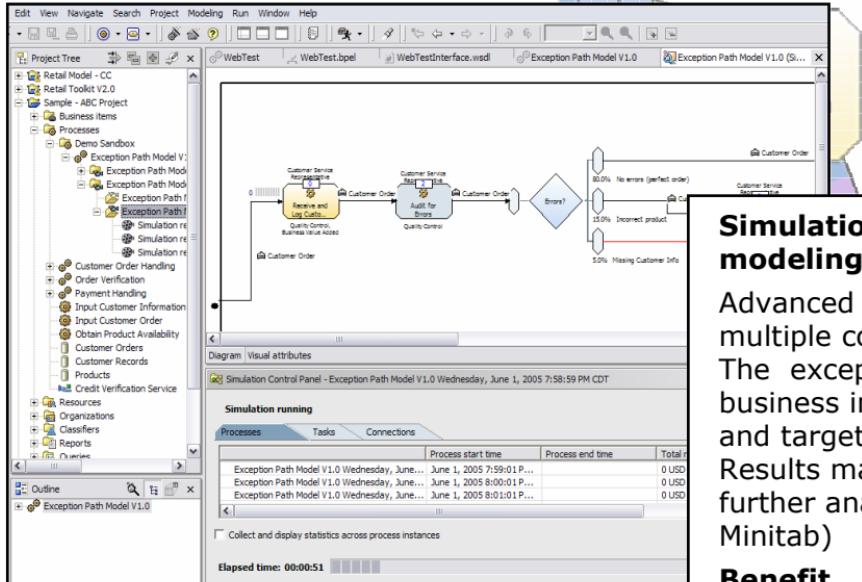
On the right, the 'Attached files' section is shown, listing files like 'Defects including the effort involved in inspecting for and fixing defects' and 'Waste (Muda)'.

# Classifiers – key to analysis and an IBM differentiator

The screenshot shows the 'Classifiers' section of the IBM Rational Quality Manager interface. On the left, there's a tree view of classifier types under '(Master Template) Classifiers'. A yellow box highlights the 'Classifiers' node. Three callout boxes provide additional information:

- Top Callout:** Consider the use of a Classifier template to use as a starting point for a new project.
- Middle Callout:** Classifiers might include those for Value Add, Regulatory/Compliance, Risk, Root Cause, Exceptions, Measures, Rules and Rule Complexity, Services and Timelines...
- Bottom Callout:** These Classifiers are used to flag the type of improvement and to tie to a business case. Classifiers may be associated with sub-processes and individual activities.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



## Simulation and exception path modeling

Advanced simulation allows multiple conditions to be tested. The exceptions with the greatest business impact may be identified and targeted for improvement. Results may be exported for further analysis (for example, Minitab)

## Benefit

Improved decision-making and prioritization, reduced risk.

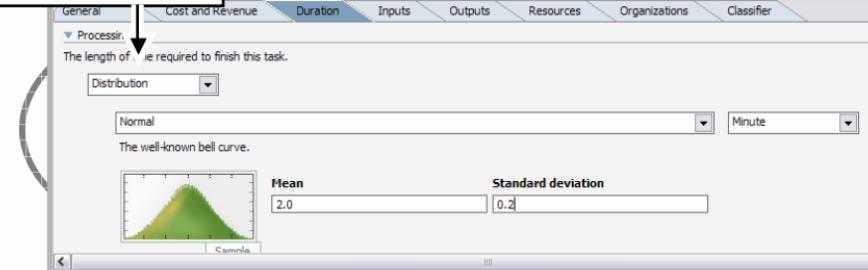
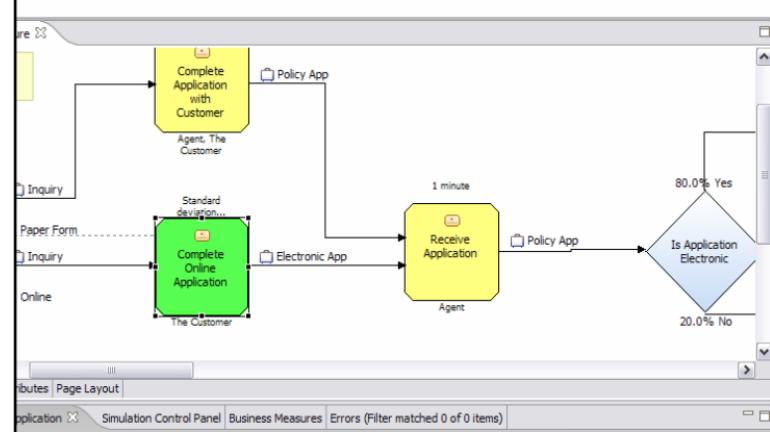
# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

## Simulating Variability

Probability distributions may be applied throughout the model during simulation to test for different conditions. Fourteen distributions are available including Normal, Erlang, Weighted List, Random List.

## Benefit

Improved decision-making, reduced risk through more thorough testing.



# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

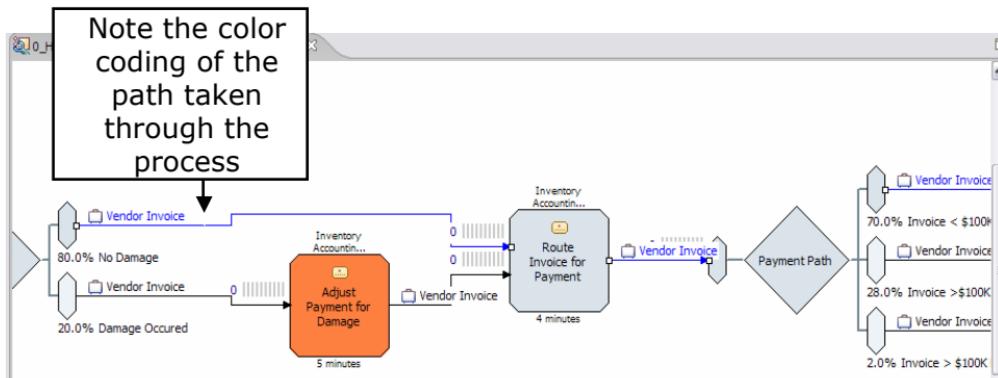


Diagram	Visual Attributes	Simulation Attributes	Page Layout
Attributes	Simulation Control Panel	Business Measures	Errors (Filter matched 0 of 0 items)
Processes Classifier Cost And Duration   Simulation result Monday, July 2, 2007 9:03:01 AM   0_HL.Product.Invoice			
Processes Classifier Cost And Duration   Simulation result Monday, July 2, 2007 9:03:01 AM   0_HL.Product.Invoice			
Case Name	Distribution	Classifier	Average Elapsed Duration
+ Case 1	7.00%		
- Case 2	38.00%		
+ Exception Path			4 minutes 10 seconds
+ Labor Type			4 minutes 10 seconds
- Quality control			4 minutes 10 seconds
		Not quality control	4 minutes
		Quality control	4 minutes 30 seconds
+ Case 3	4.00%		USDO.76
+ Case 4	9.00%		USDO.76
			USDO.70
			USDO.70
			USDO.89

Dynamic Analysis (simulation) results include those by Classifier. This shows the time and money spent on Quality Control steps in a high percentage path of a Mortgage Application process.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

## Profile analysis

Profile Analysis reveal high cost, long duration paths without running simulation. Results may be readily exported for further analysis (for example, Minitab)

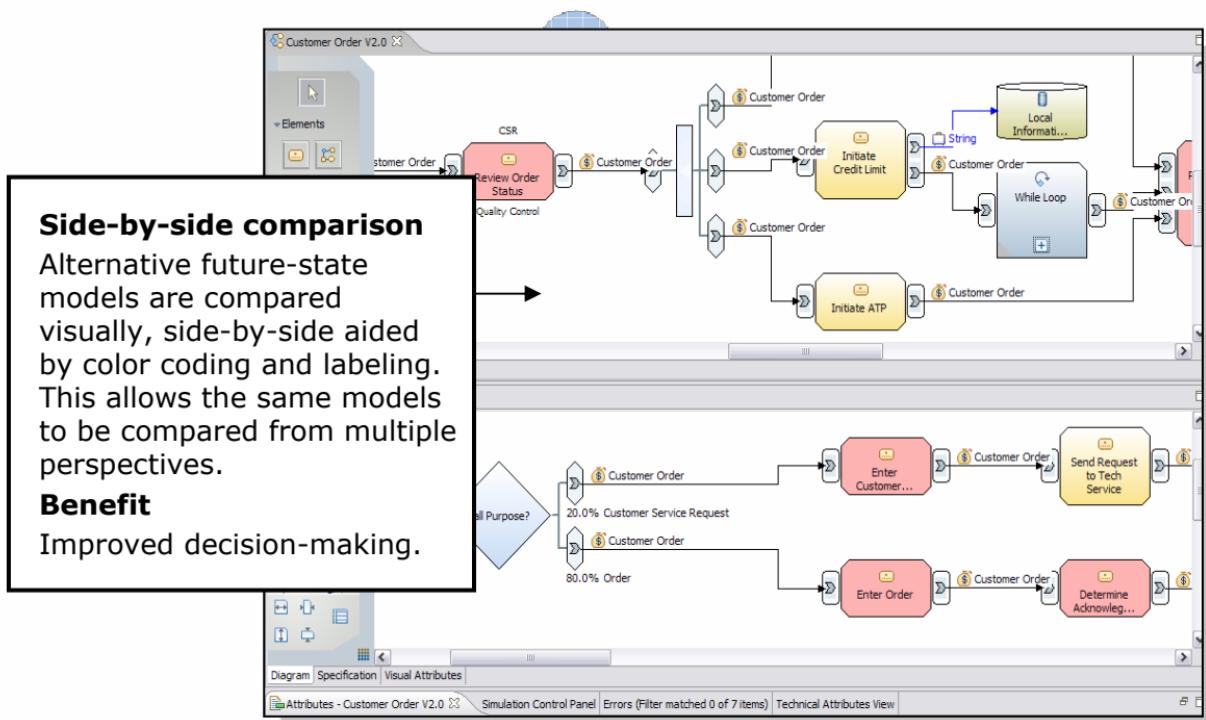
## Benefit

Improved decision-making and prioritization, reduced risk.

The screenshot shows the WebSphere BPM Studio interface. On the left is the Project Tree with various BPMN models. In the center is the process flow diagram for '0\_HL - New Business Life (Simulate)'. The diagram includes nodes like 'Delete cation with timer', 'Method to Send App' (a decision diamond), 'Mail Application to Carrier', 'Process Mail', 'Fax Application to Carrier', 'Process Faxed Application', and 'Policy App' components. Arrows indicate the flow of the process, with time estimates like '3 minutes' and '2 minutes' for certain steps. On the right is a 'Static Process Cases Summary' table. The table lists 12 cases with their names, probabilities, and various performance metrics. A bracket on the left groups cases 1 through 6, and another bracket on the right groups cases 7 through 12, both labeled with 'Look for best case patterns – low cost, high probability, shorter duration. Aids targeting exceptions for improvement'.

Case Name	Probability	Activity...	Task Total...	Task Elapsed D...	Task Working ...	Task Resource D...	Process Total Cost	Process Elapsed Du...
Case 1	38.40%						\$16.91	4 hours 44 minutes
Case 2	25.60%						\$9.49	2 hours 39 minutes
Case 3	9.60%						\$17.01	4 hours 48 minutes
Case 4	8.64%						\$25.44	5 hours 44 minutes
Case 5	6.40%						\$9.59	2 hours 43 minutes
Case 6	5.76%						\$18.63	3 hours 39 minutes
Case 7	2.16%						\$24.93	5 hours 48 minutes
Case 8	1.44%						\$18.72	3 hours 43 minutes
Case 9	0.96%						\$25.44	5 hours 44 minutes
Case 10	0.64%						\$18.63	3 hours 39 minutes
Case 11	0.24%						\$24.93	5 hours 48 minutes
Case 12	0.16%						\$18.72	3 hours 43 minutes

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



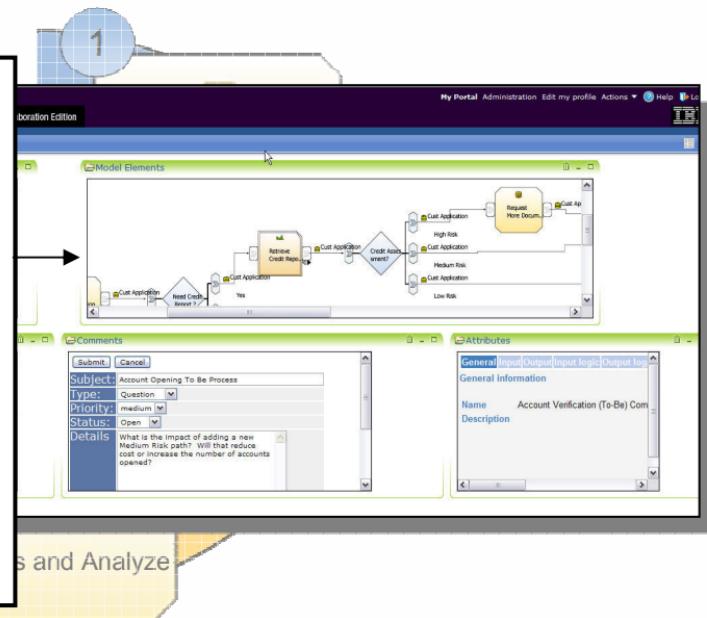
# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

## Web publishing

WebSphere Publisher is used to gather feedback on alternatives prior to implementation or during design. Publisher may also be used to share improved process documentation.

## Benefit

Multiple including improved access to documentation (reduced cost through consistency) to pre-implementation evaluation.



# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

The screenshot illustrates the integration of WebSphere BPM and Six Sigma for process improvement. At the top, a process flow diagram shows a sequence starting with an 'Inquiry' step, followed by a decision diamond 'Application Origin' branching into '20.0% Paper Form' and '80.0% Online'. The 'Online' path leads to 'Complete Online Application' (duration 20 minutes) and then 'Receive Application' (duration 1 minute). Resource icons for 'Mail' (3 minutes), 'Policy App' (0), 'Process Mail' (5 minutes), and another 'Policy App' are shown above the flow. Below the process is a 'Simulation Result Name' table:

	Simulation Result Name	Average Elapsed Duration	Average Throughput
	Future State (1000 transactions)	11 hours 9 minutes 31.879 seconds	0.09 work item / hour
Difference	Current State (1000 transactions)	14 hours 30 minutes 22.188 seconds	0.07 work item / hour
Percentage Change		-3 hours 20 minutes 50.309 seconds	0.02 work item / hour
			-30.00%
			23.08%

Below this is another table for resource costs:

	Simulation Result Name	Average Resource Cost	Average Cost	Average Profit
	Future State (1000 transactions)	USD 12.16	USD 12.16	(USD 12.16)
Change	Current State (1000 transactions)	USD 23.03	USD 23.03	(USD 23.03)
		(USD 10.87)	(USD 10.87)	USD 10.87
			-89.38%	-89.38%
			-89.38%	-89.38%

**Comparative Reporting**  
Allows two processes to be compared from multiple perspectives including cost, time, and breakeven.

**Benefit**  
Improved decision-making, reduced risk.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

The screenshot shows the WebSphere BPM Studio interface. On the left is the Project Tree with various projects and components selected. The main workspace displays a process model titled "Product Inspection (2 July)". A callout box highlights an annotation in the process flow: "Error reporting is mode sensitive. In the technical mode, implementation errors are flagged". Another callout box points to a decision diamond: "No if PO # > 2000 ind non-owned Brand. In this decision may be triggered by a Vendor ID or some fielded value." The bottom right contains a section titled "Assigning technical attributes" with a descriptive text about how technical attributes can be set prior to export to generate starter skeletons for bridging business and technical design gaps.

## Assigning technical attributes

Technical attributes may be set prior to export to generate starter “skeletons” to bridge the gap between business and technical design. Errors affecting implementation are highlighted before export.

### Benefit

The net effect is reduced overall implementation cycle time through improved LOB -> IT handoff.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement

Simple checkboxes are used to identify where time, cost, revenue and decision percentages are captured and Monitored

The screenshot shows the IBM WebSphere Business Modeler interface. At the top, there's a process flow diagram with a green circle containing a '5'. Below it, a callout box points to a 'Business Measure Details - Measure 1' dialog window. The dialog has fields for Name (Measure 1), Type (KPI selected), Description, and Dashboard views. A note says 'One or more ranges must be specified.' In the main workspace, there's a table titled 'Monitored values' with columns for Process Element, Processing Time, Processing Cost, Startup Cost, Revenue, and % Per E. Several checkboxes in this table are circled in red. To the right, a 'Sales KPI' chart is visible.

Process Element	Processing Time	Processing Cost	Startup Cost	Revenue	% Per E
Q_HL Product Invoice Payment (Future)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adjust Payment for Damage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Approve Payment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compare Corrected Invoice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compare Invoice Quantity to PO Quantity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Damage Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Deny Payment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Direct PO Quantity Match Invoice?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

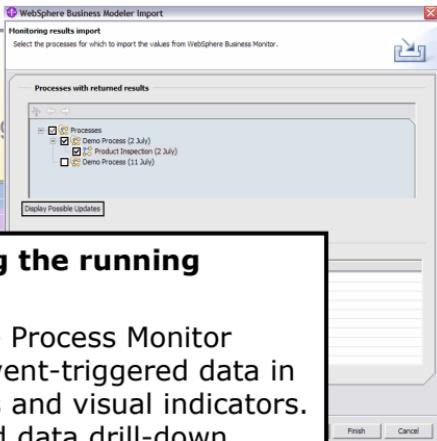
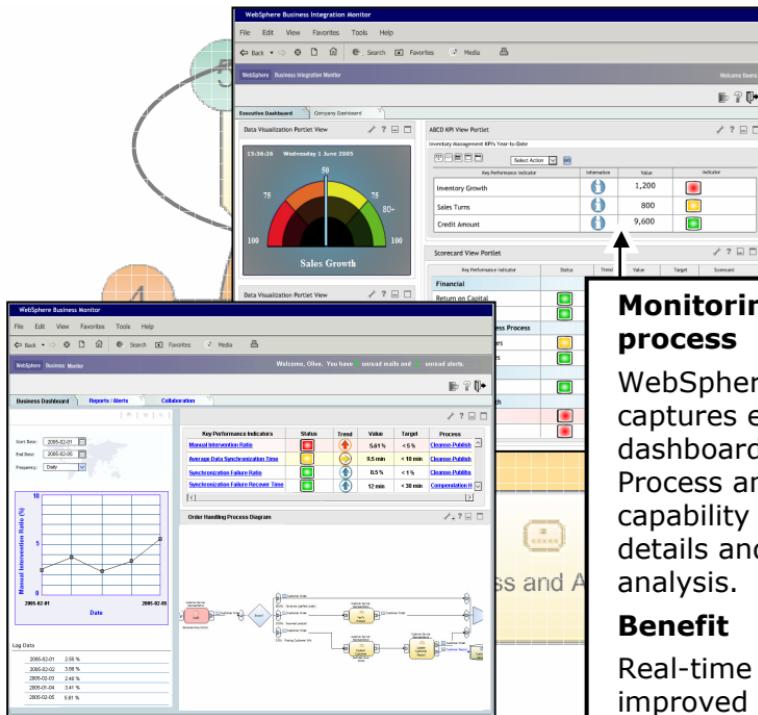
## Implementing Business Measures

Business users define Metrics and KPIs with an easy-to-use graphical Measures Editor. Measures are passed to IT for use in the runtime Monitor dashboard.

## Benefit

Measures may be defined prior to process implementation facilitating the Manage (Control) phase of the improvement cycle.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



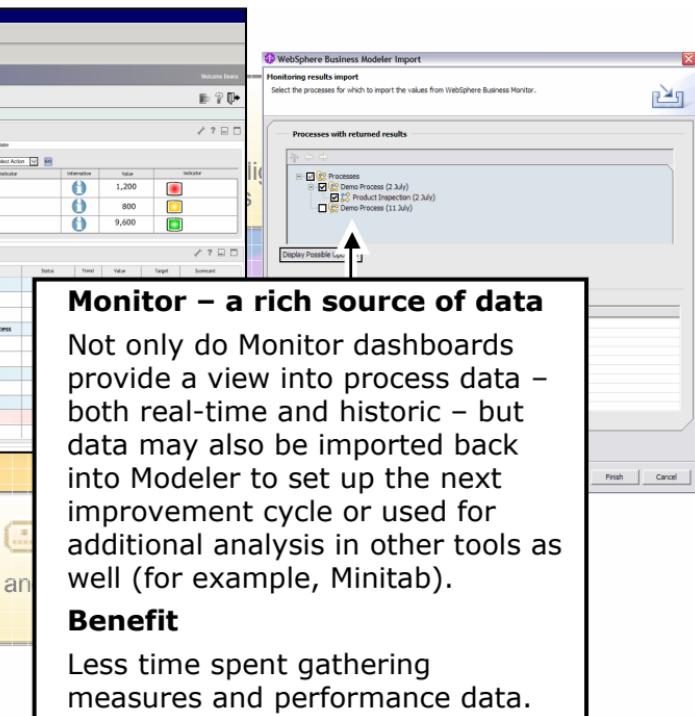
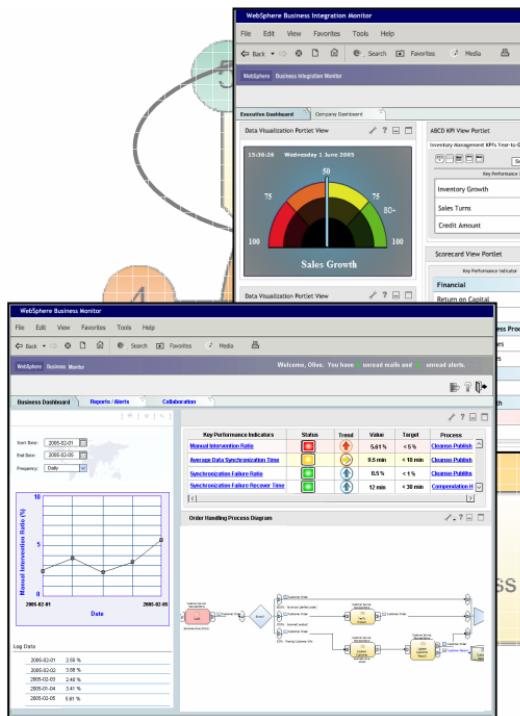
## Monitoring the running process

WebSphere Process Monitor captures event-triggered data in dashboards and visual indicators. Process and data drill-down capability gives visibility to details and facilitates real-time analysis.

## Benefit

Real-time corrective action, improved visibility and responsiveness.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



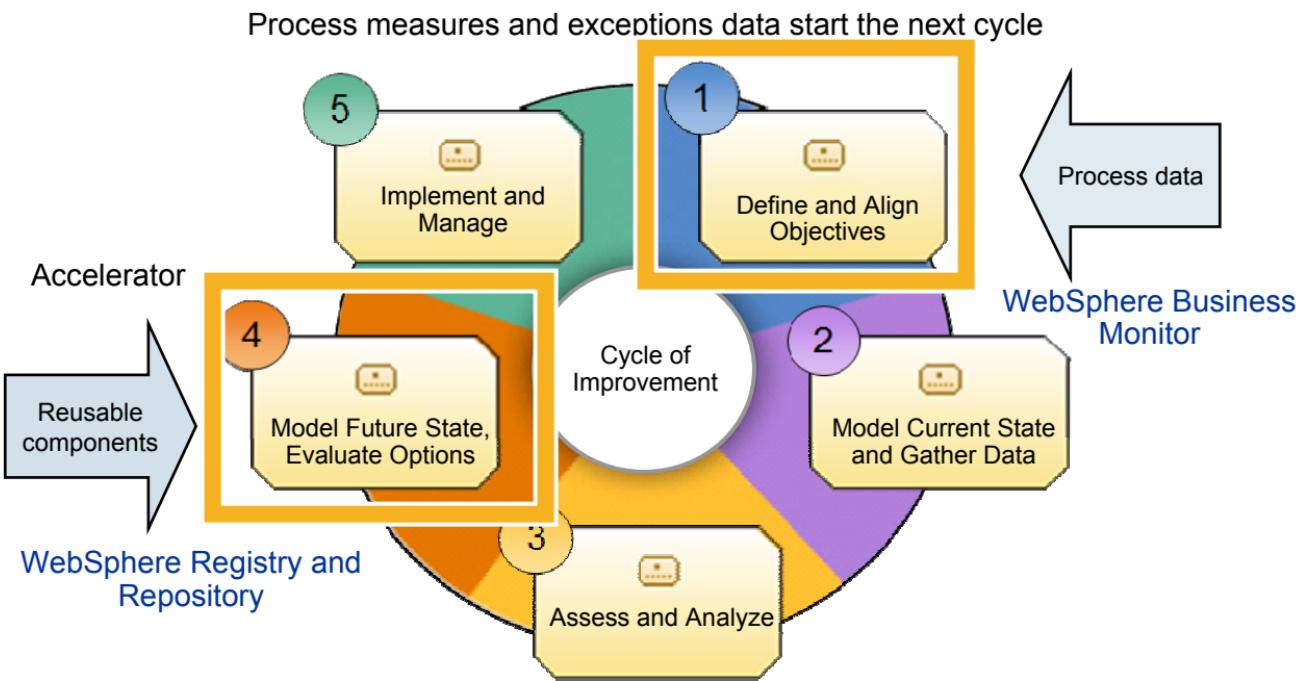
**Monitor – a rich source of data**

Not only do Monitor dashboards provide a view into process data – both real-time and historic – but data may also be imported back into Modeler to set up the next improvement cycle or used for additional analysis in other tools as well (for example, Minitab).

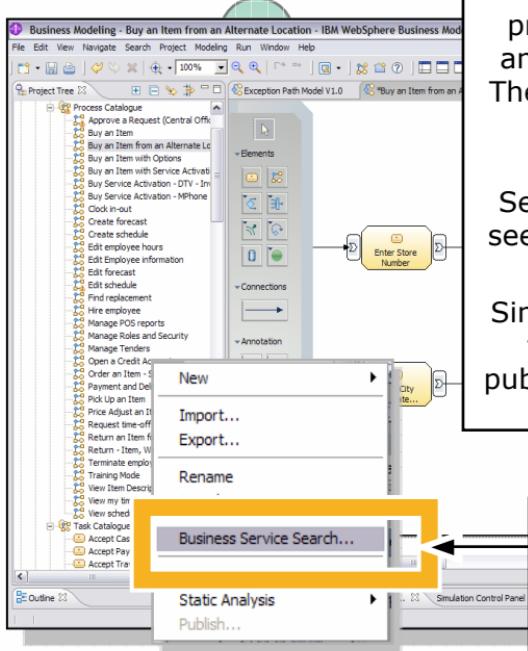
**Benefit**

Less time spent gathering measures and performance data. Data are more accurate and timely.

# Linking WebSphere BPM and Six Sigma to drive continuous process improvement



# WebSphere Business Modeler – Linking capability to New process design



## New Process Design

Reusable building blocks and best practices are stored in the repository and reused to create **new** processes. These include sub-processes, activities, services, and other modeling components.

Search allows models to be queried to see where activities, sub-processes and services are reused

Simulation is used to minimize risk and test alternatives in advance. Web publishing is used to share designs prior to coding.

It is also possible to search the Repository of Services and reuse those as well. The WebSphere Registry and Repository also facilitates governance and runtime use.

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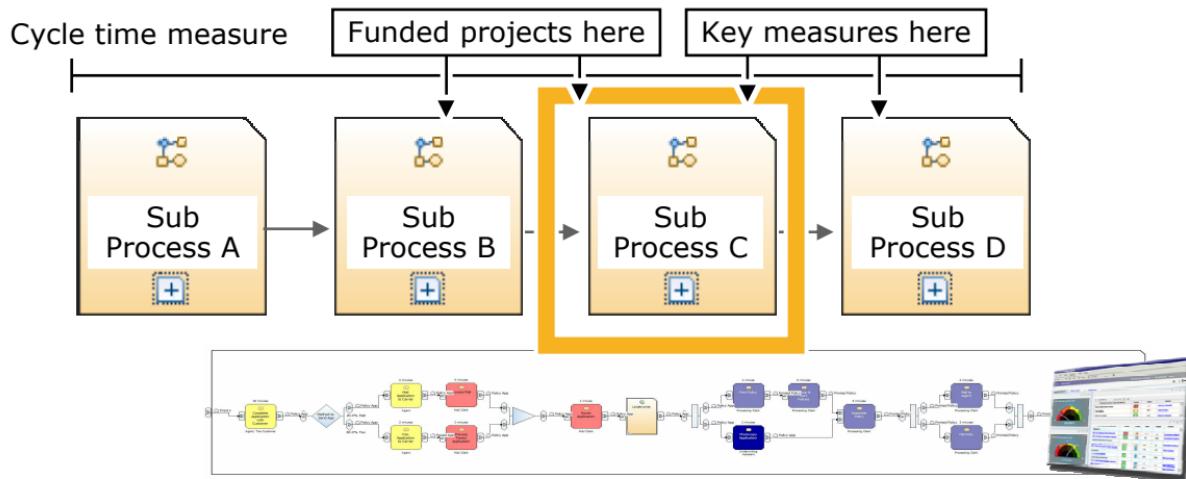
"If you're looking for a place to start, ask mid-level managers in business units. Too often, they react to crises that might have been anticipated. If your management team is largely dealing with tactical problems, a business process monitoring system can identify conditions that are building toward a bottleneck, and remove routine human decision-making from the business process."

Aberdeen, The Business Process Management Benchmark Report, 2006

# Seeing the big picture – finding the best target in a complex – but meaningful – process

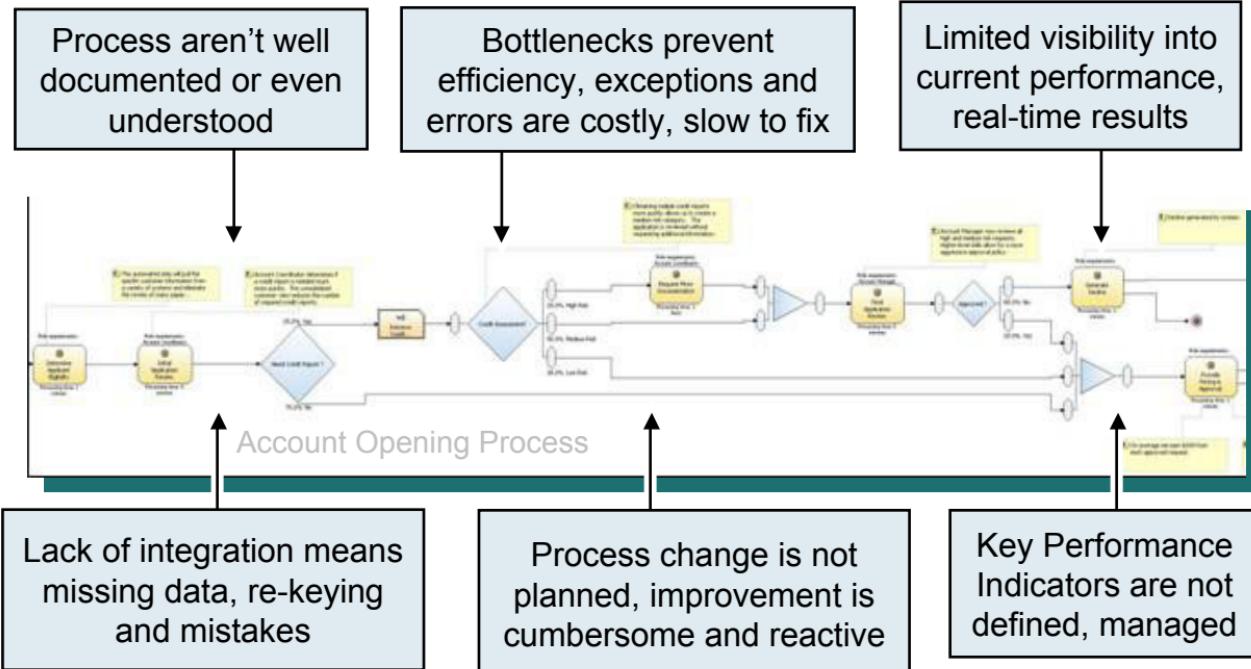
Think big, start small – look for processes that:

- Impact a key business goal or measure
- Have a cross-business impact
- Address a source of customer dissatisfaction
- Require analysis to uncover root cause
- Impact competitiveness (too slow, too costly)
- Drive differentiation or innovation



To find processes that also benefit from BPM and Monitoring

# Business process management eliminates waste, errors and exceptions, gaps, limitations, and missing measures



# Focus on exceptions and measures

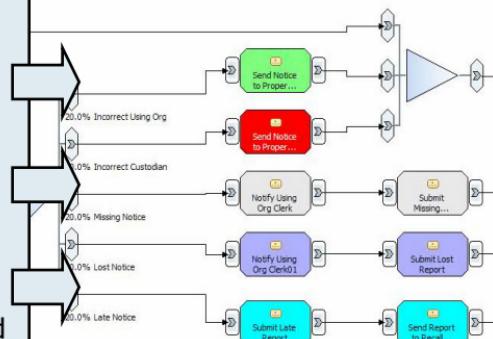
- When the process breaks, where does it break and what happens? What corrective steps are taken?
- How is the process measured? What measures are used by process owners to keep it in control?

Find

- Errors and exception paths that allow you to demonstrate the value of simulation and analysis
- Possible measures to drive improvement (new, simplified Measures Editor coming with 6.0.2)

Exceptions are your friend (they represent opportunity)

- Exception 1 is fixed by automating a manual decision with a rule
- Exception 3 – missing information – is eliminated through integration
- Exception 6 is improved through a managed workflow, etc.



Simulation and Dynamic Analysis (Process Case Analysis) allows the costs of these exception paths to be estimated.

# What to look for in the current and future states

## Current state process

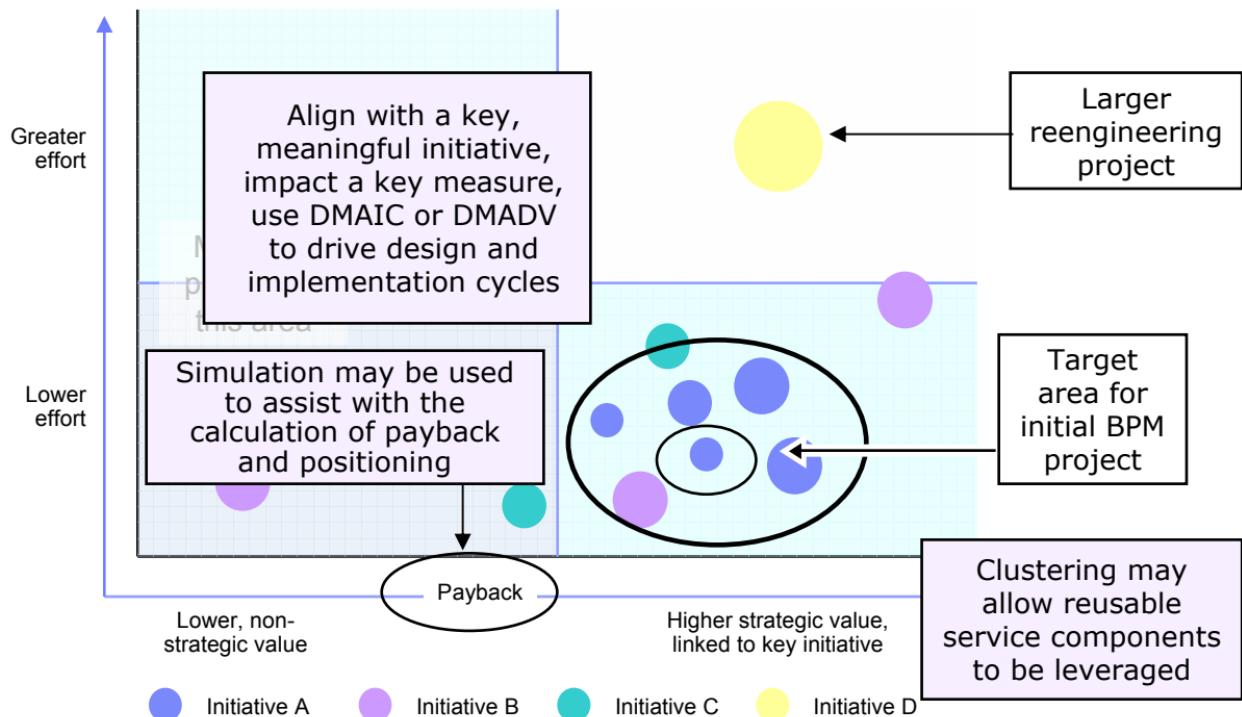
- Bottlenecks and constraints
- Rework, errors and exceptions
- Missing, incomplete information
- Fragmented processes held together through spreadsheets, rekeying, informal workarounds
- Numerous approvals and audits
- Sequential activities creating delays
- Paper-based processes
- Lack of measures, performance indicators (decisions based on feelings versus facts)
- Lack of documentation
- Processes that are too slow, too costly to be competitive

## Future state process

- Streamlined with automated workflow
- Exception-based including alerts and escalation (out of bounds conditions and time triggered)
- Improved access to accurate information through integration
- Rules-driven approvals and routing
- Use of managed parallel activities
- Dashboard monitoring and decision-making based on real-time Key Performance Indicators, results
- Improved ability to respond to and implement required regulatory controls
- Reusable business services

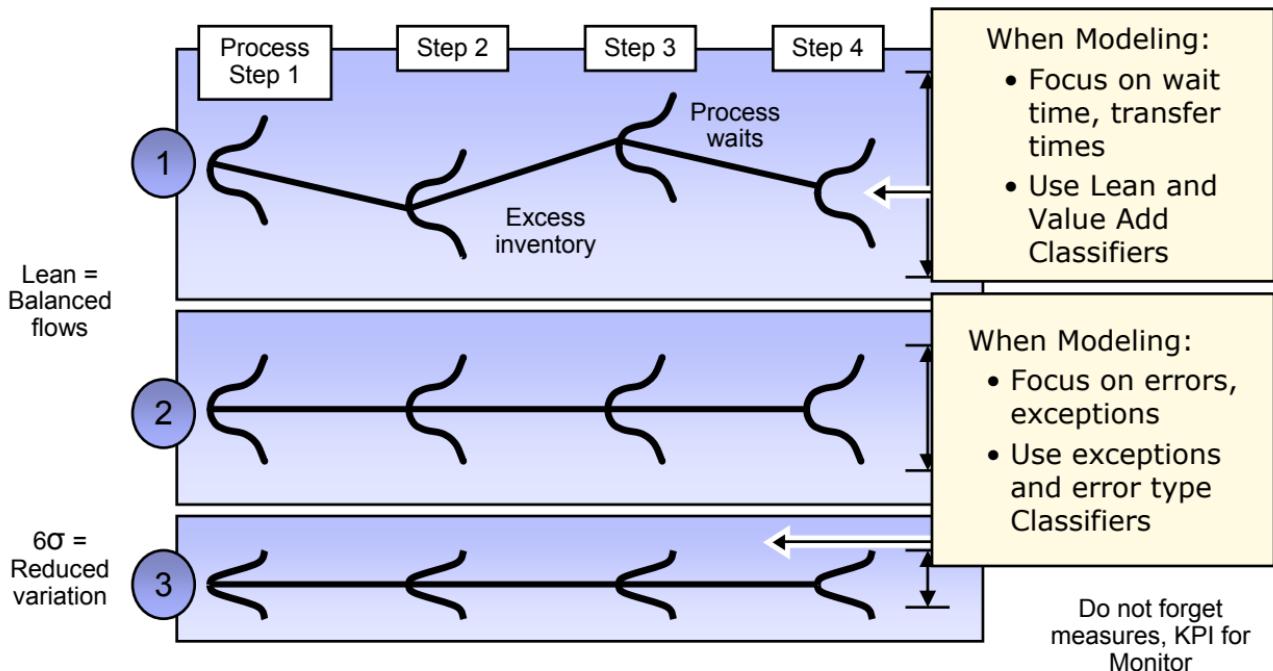
Improved process

# BPM and SOA – use a simple prioritization and evaluation matrix to target improvement cycles



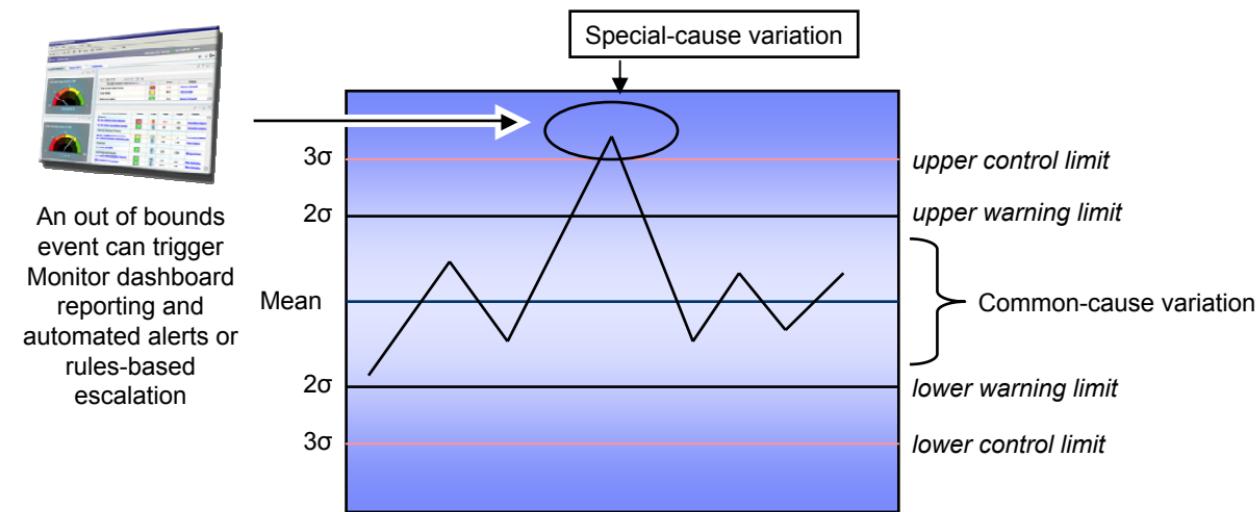
# Using Classifiers when combining Lean and Six Sigma

DMAIC and DMADV adopted as methodology



# Monitor KPI upper and lower limits are tied to events that trigger corrective action and escalation

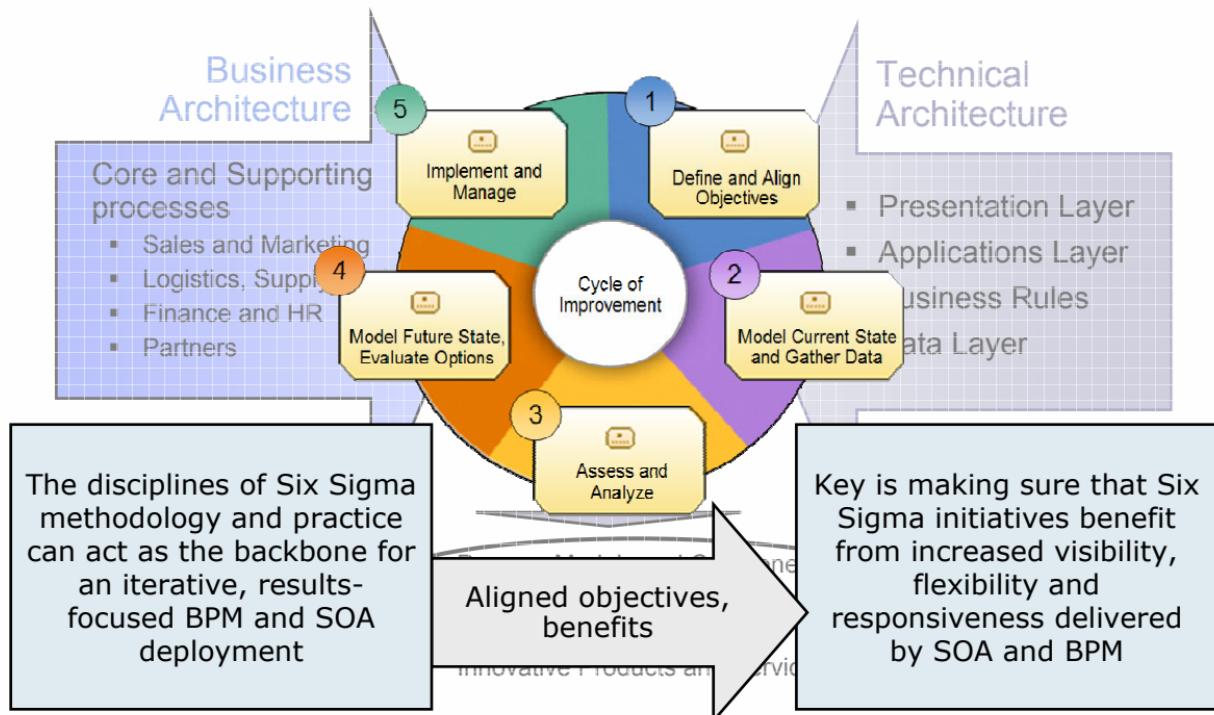
- Used to monitor process performance and initiate corrective action in Control step



- WebSphere Monitor allows Upper and Lower Control Limits to appear in gauges with exceptions triggers

Also known as the 'Shewhart chart' or 'process-behavior chart'

# Success with BPM requires a foundation partnership between Line of Business (LOB) and IT



# Key takeaway – each step in the Six Sigma improvement and design method is supported by WebSphere BPM

- WebSphere Business Modeler's advanced simulation and analysis adds new capability, improves decision-making and reduces risk
- WebSphere Process Server controls and choreographs short- and long-running processes, generating alerts or starting new processes when corrective action is required
- WebSphere Business Monitor captures real-time process data and KPI results, improving visibility and responsiveness
- Seamless handoff from business to IT reduces implementation cycle time and project risk
- Reuse of components (services, processes) results in lower costs, increased flexibility
- Tools are powerful yet easy-to-use, resulting in increased productivity



Six Sigma Improvement Method

# Topics

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- Business process management (BPM) overview
- WebSphere BPM process improvement and design methods
- WebSphere BPM capabilities (including Classifiers)
- Picking the right process – knowing what to look for
  - Where to find improvement
  - Modeling Exceptions
  - Prioritization Matrix
- Next steps

"I detect a growing interest in merging methodologies, tools and techniques from multiple approaches to process change."

Source: Paul Harmon, Business Process Trends, May 30, 2006

# WebSphere Process Improvement Workshop

A three day educational and problem-solving work session during which you document a current business process, define a high level technology-enabled alternative process, and compare the two using WebSphere Modeler's advanced simulation capability

## Activities

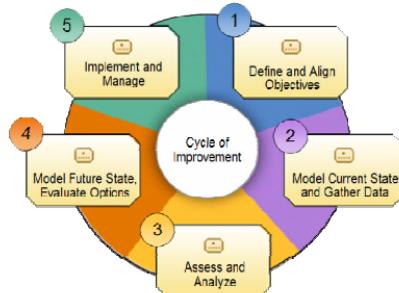
- Establish process boundaries and link to business goals, key initiatives and benefits
- Model the current-state process including decisions, failure points and exceptions
- Analyze the current process and identify required or needed business measures
- Identify changes to the process that would result in an improved, workflow-and/or services-enabled alternative and model the future-state process
- Develop simulation test cases and perform static and dynamic simulation analysis

## Deliverables

- Current- and future-state process models, simulation results and comparative reports

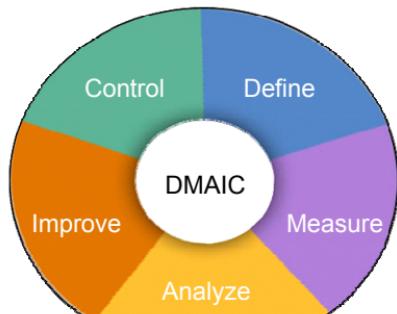
## Participants

- Customer: LOB executive sponsor, business process experts, IT architects
- IBM: WebSphere Integration Solution Architects, Process Improvement experts

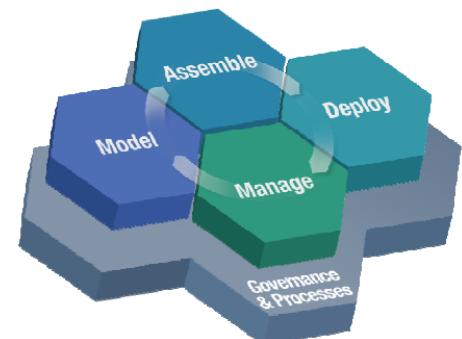


# The common threads of continuous process improvement

- Closed loop with embedded feedback methodology
- Emphasis on defect reduction (Six Sigma) and time and waste reduction (Lean)
- Measures, data-driven
- Multiple proven tools and techniques used when needed
- Controls to ensure results



Six Sigma Improvement Method



IBM SOA life cycle