

**The Mercator Group**

**Business Process Management Center of Excellence**

**A Practical Guide to Agile BPM Implementation**

March 2015



# Workbook III: A Practical Guide to BPMS/SOA Implementation

March 2015  
Version 1.2



There are three workbooks/practical guides in The Mercator Group's (TMG) series on process improvement:

- Workbook I: Enterprise Portfolio Process Alignment
- Workbook II: A Practical Guide to Business Process Improvement
- Workbook III: A Practical Guide to Agile BPM (this workbook)

Workbook 1 (under development) provides guidance and instructions on ensuring that an enterprise-wide process improvement effort is properly aligned and supportive of organizational mission, goals and objectives. Workbook II provides guidance and instructions on implementing a major process improvement effort, including detailed instructions for conducting process improvement workshops. Workbook III provides a methodology for quickly implementing process improvements using a combination of low-code environments, such as Business Process Management Suite (BPMS) software and Service Oriented Architecture (SOA) techniques.

The workbooks can be used collectively in a top-down organization-wide process improvement/transformation effort, or independently to address the particular areas for which they are designed.

The workbooks were developed by The Mercator Group ([www.MercatorG.com](http://www.MercatorG.com)) and are freely available for all who would like to use them. We only ask that if used in their entirety that attribution is given to the Mercator Group for material used. The Mercator Group is dedicated to the advancement of enterprise and process improvement methodologies and techniques; especially as they assist government and not-for-profit organizations dedicated to our common welfare. We also are committed to the sharing of knowledge associated with improving enterprise management as a discipline. Collaboration and feedback on material are welcome.



## Prologue

The Practical Guide to Agile BPM, and Business Process Management presents a model based methodology for building business software using a Business Process Management Suite (BPMS) supported by a service oriented architecture (SOA). The methodology is applicable to any fully functioning BPMS and SOA supported environment. It was developed by The Mercator Group and extended in support of the Federal Acquisition Service (FAS) IT modernization effort. The methodology is based on “hands-on” experience with multiple BPMS systems, as well as experience with leading practice rapid development techniques; including Agile Software Development.

The target audience for the workbook is a business or system analyst practitioner familiar with advanced Model Driven Architecture (MDA) concepts and BPMS in general. However, the methodology is accessible to people with general knowledge of system lifecycles seeking to become familiar with BPMS and MDA.

### ***What is BPMS?***

Business Process Management Suites (BPMS) are commercially available software packages that provide a low-code, comprehensive and integrated platform for the collaborative design, build and operation of business software in support of business processes. A BPMS provides a non-technical business analyst with a “workbench” for modeling people-centric applications. Modeled applications can be easily prototyped and integrated in to a SOA environment and deployed on the BPMS vendor provided software platform capable of running mission critical applications. BPMS is relatively new technology that is quickly becoming a core component of enterprises requiring agile IT infrastructures.

### ***What BPMS is not?***

BPMS is a software tool that excels in supporting the human workflow and collaboration aspect of business software applications. It does not eliminate the need for complimentary computation intensive or business rules centric software, or high-transaction volume system-to-system integration needs. In short, BPMS is not appropriate for all automation tasks, and should only be considered for tasks involving a high-level of human interaction, collaboration and workflow.

### ***Other Low-code environments***

Low-code environment is a term for software development environments that support the assembly of functionality without having to resort to coding. In many cases, these environments allow for non-programmers to quickly build out significant functionality in collaboration with business users. BPMS is a low-code environment. There are other low-code environments, such as highly configurable application packages, and more data-centric environments, like Salesforce.com. While we focus on BPMS, Agile BPM is applicable to any low-code environment.

### ***What is its value?***

The primary values of BPMS are as follows:

- Accuracy of functional and system requirements for application services increases by a factor of more than two over other development approaches to an accuracy of 95%.
- Substantial reduction in BPMS based project risk over more traditional extended lifecycle methodologies based on the ability to iteratively develop and deploy new functionality in manageable “chunks.”
- Ability to quickly deploy changes to business requirements and support a continuous process improvement effort.
- Reduction in time and cost of software development of between 25% and 50%, depending on system complexity, organizational impediments, and scope.

### ***How is this value achieved?***

When implemented using modern software development practices BPMS fundamentally changes the software development process from a sequential set of poorly integrated disciplines and steps (business analysis followed by requirements definition followed by software development followed by maintenance) to an integrated and collaborative process that marries the end user, business analyst and IT professionals into a cohesive team that can quickly deliver target capabilities. The BPMS tool provides the capabilities to quickly generate software functionality in a language (BPMN) that allows for easy communication across the enterprise, including the very important end user and consumer of the generated capabilities. An effective approach and methodology that incorporates integrated project team fundamentals allows for the leveraging of the BPMS capability.

### ***How does BPMS relate to Service Oriented Architecture (SOA)?***

They are totally interdependent. The most reliable approach to identifying the services provided by an SOA is through process design validated through BPMS based modeling. Once services are identified they need a mechanism for orchestrating their use in support of a business process. For example, a service that provides for the validation of a credit card purchase requires software to orchestrate access and use of that service in the

context of the business process it is supporting. There needs to be orchestration software that coordinates a sales person's access to the validation service within the context of the transaction. It could be a retail clerk at a store, or a customer service representative on the phone. The use of that service needs to be managed by a layer of software, which is where BPMS excels.

***What is Model Driven Architecture (MDA)?***

MDA is an essential concept behind BPMS and achieving its value. The premise is that by modeling and simulating software supporting a business process one can more accurately and quickly arrive at the appropriate level of automation within a shorter timeframe. Modeling in a BPMS combined with simulating and/or piloting the processes provides a dynamic environment for “trying on new system capabilities before making a purchase.” The concept of MDA is a cross-industry best practice approach that has unquestionable payback.

***Where do BPMS start and Business Process Improvement / Lean Six Sigma leave off?***

BPMS is only concerned with the part of a business process requiring automation. Any implementation of BPMS should be an extension of a business process improvement effort as it extends to collaboration between a human and a system. Additionally, the Mercator Group BPMS methodology includes the establishment of a process performance baseline and post implementation measurements of performance improvements, a cornerstone of any process improvement methodology.

***What is the role of the Business Process Management Center of Excellence (B-COE) in supporting BPMS?***

Gartner, and other advisory groups, highly recommend the establishment of a Center of Excellence when embarking on an enterprise-level business process improvement program. The center can act to implement process improvements, as well as work within the organization to establish continuous process improvement capabilities.

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The Practical Guide to Business Process Management (BPM)/Service oriented Architecture (SOA) Implementation presents a model based methodology for building business software using a Business Process Management Suite (BPMS) supported by a service oriented architecture (SOA). The methodology is applicable to any fully functioning BPMS and SOA supported environment. It was developed by The Mercator Group and extended in support of the Federal Acquisition Service (FAS) IT modernization effort. The methodology is based on “hands-on” experience with multiple BPMS systems, as well as experience with leading practice rapid development techniques; including Agile Software Development.

## BPMS/SOA METHOD

The methodology for developing an enabled business process in a Business Process Management Suite is essentially a modified rapid application development process. A BPMS allows highly iterative application development and immediate deployment to production. The differences in SDLC are due to the Business Analyst becoming the primary developer of the application and an evolving production application hosted by the BPMS. There are 3 stages of development: Inception, Iteration, and Maturation/Evolution. The following describes each phase of the development of an enabled business process.

Stage	Phase	Description
Inception	Scope	The requirements are defined for a discrete business process to be managed including high-level activities, system touch-points, and roles
Iteration	Model	The business process in the BPMS is defined using Business Process Modeling Notation. User interfaces, system interfaces, and basic data flow are implemented as part of the process model in the BPMS.
	Assemble	The development team completes the data flow, external interfaces, and any required customization to make the managed business process production ready.
	Execute	The managed process is live and accessible by business users in a test or production environment.
Maturation/ Evolution	Measure	Defined performance metrics are tracked to determine process efficiency.
	Analyze	Metrics are compared to expectations and performance measures are realigned to business needs.
	Refine	Adjustment to process and business rules along with process innovation yield potential improvement to business performance.

**Table 1 - Development Phase Definitions**

The BPMS/SOA methodology only addresses SOA to the extent that process based design is fundamental to identifying and defining effective SOA services. Further technical elaboration and deployment of SOA services are beyond the scope of this document.

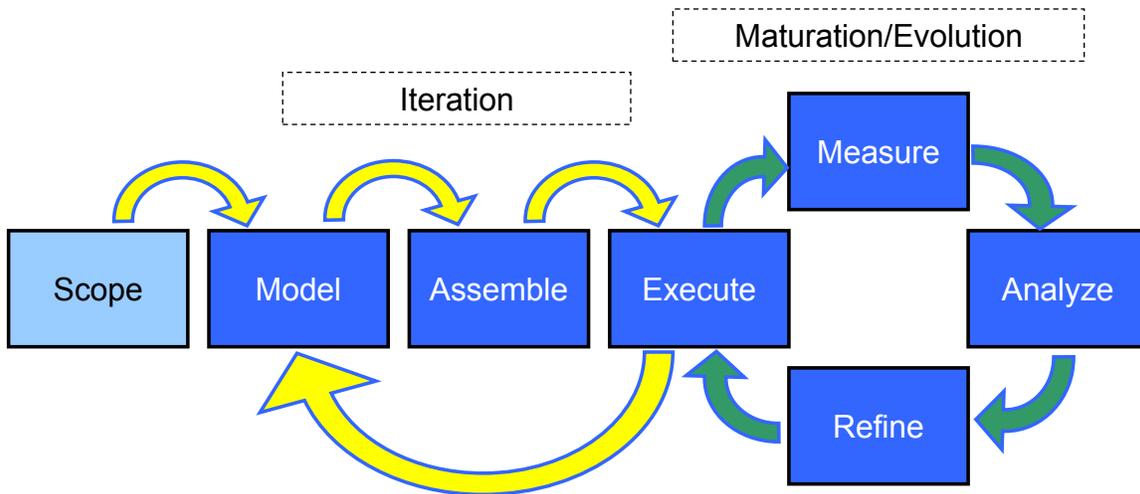
### ***Transitions***

Each stage of the methodology represents an iterative multi-step development process. Iteration involves collaborative process modeling between the Business Analyst, IT Support, and the Process Stakeholders. During this stage, many versions of an enabled process are cycled through the Model, Assemble, and Execute phases. The enabled business process is promoted to production when the Process Stakeholders and the Executive Sponsor have accepted the business process.

Stage	Phase	Status	Next Phase
Inception	Scope	Executive sponsor approval	Model
Iteration	Model	Process model executable	Assemble
	Assemble	System abstractions implemented	Execute
	Execute	Modeling or system integration still required	Model
Maturation/ Evolution		Process stakeholder acceptance, Executive sponsor approval	Measure
	Measure	Business activity data recorded	Analyze
	Analyze	ROI calculated, potential process improvements identified,	Refine
	Refine	Only rule or reporting changes required	Execution
		Process model changes required	Model

**Table 2 - Transitions from Phase to Phase**

Enable business processes in production are in the Maturation/Evolution stage. These processes are constantly measured, analyzed and refined for optimal performance. Business processes requiring significant change to their process model reenter the Iteration stage for collaborative adjustments before promotion back to production. The following diagram represents the stages and phases of the BPMS methodology.

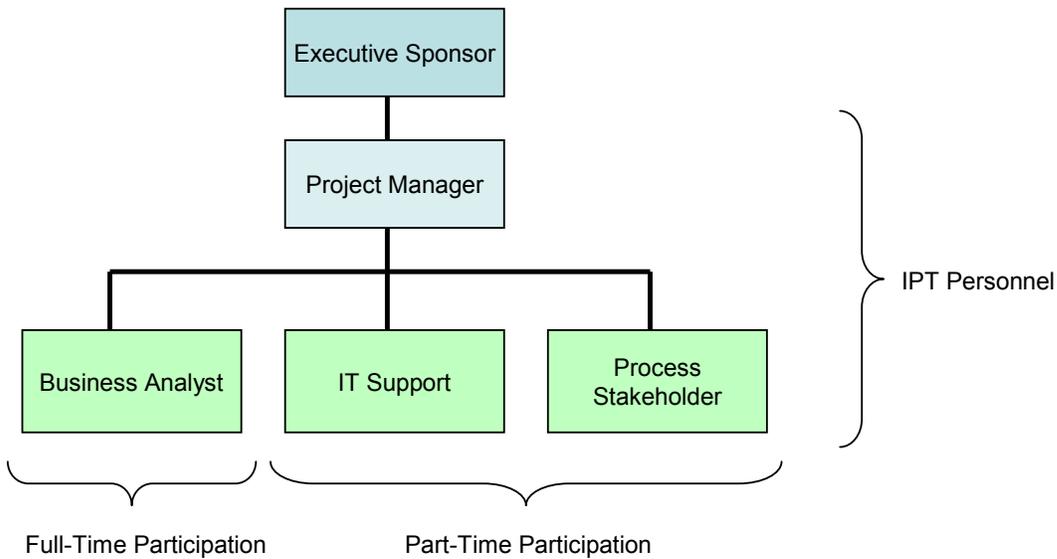


**Figure 1 - BPMS Methodology © The Mercator Group**

The TMG Agile BPM methodology is designed to fit into an overall Agile Development framework, and further enhance Agile by providing the ability to scale Agile development efforts. Agile BPM provides a framework for organizing and architecting a BPM solution to support large scale development of system capabilities.

## PROJECT ORGANIZATION AND STAFFING

It is recommended to use an integrated project team (IPT) to provide structure and leverage the correct expertise in each step of the process enablement. A combination of executive leadership, business analysis, software development support, and end-user buy-in will ensure project success. The diagram below shows the team structure and the following table describes each role and their responsibilities throughout the process.

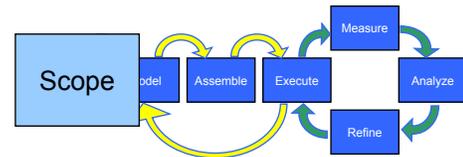


**Figure 2 - Project Team Structure**

Role	Definition / Responsibilities	Phase
Executive Sponsor	The Executive Sponsor is responsible for championing the goals and objectives of the BPM project. This person makes sure the process complies with the strategic and business objectives of the organization and that the scope aligns with overall FAS strategy. The Executive Sponsor also approves change management issues, handles issue escalation, and monitors budgetary concerns regarding the project	Scope, Execute, Refine
Project Manager	The Project Manager monitors the planning and execution of the project schedule, assigning resources, and the budget during the course of the project. The Project Manager will liaise with the Executive Sponsor concerning status and issue escalation with regard to resolution, resource allocation, budget, and/or scope	Scope, Model, Assemble, Execute

	creep.	
Business Analyst	<p>The Business Analyst is a full-time resource for the lifecycle of the enabled process. The Business Analyst is responsible for:</p> <ul style="list-style-type: none"> <li>Defining requirements with the Process Stakeholders and interpreting those requirements into BPMN.</li> <li>Working with the Systems Analyst to implement customization, external interfaces, and a deployment plan</li> <li>Developing reports, dashboards, and performance measures based on the requirements of the enabled process</li> <li>Analyzing performance data and determine potential for process improvement during the Maturation/Evolution stage</li> </ul>	Scope, Model, Assemble, Execute, Measure, Analyze, Refine
Systems Analyst	<p>The Systems Analyst is a part-time resource who supports a variety of technical details required for successful enablement of a business process. The Systems Analyst is responsible for:</p> <ul style="list-style-type: none"> <li>Identifies existing adapters and interfaces during the Model phase to support the enabled process</li> <li>Develops additional system collaboration and a deployment plan during the Assemble phase</li> <li>Performs quality assurance from an IT architecture standpoint</li> <li>Works with service providers to maintain service level agreements with consumed services</li> </ul>	Model, Assemble, Execute
Process Stakeholder	<p>The Process Stakeholder works closely with the Business Analyst to define process requirements and then to iteratively build an enable business process in the BPMS. The Process Stakeholder is mostly likely a manager or end-user of the enabled business process and the first line of user acceptance.</p>	Scope, Model, Execute, Analyze

**Table 3- Project Roles**



## SCOPE

The scoping phase is essential for establishing expectations and a foundation for success in enabling a business process through BPM. There are three crucial elements to scoping a BPMS project: Understanding, Innovation, and Organization.

*Understanding* – The IPT must understand the business process explicitly including core activities, actors, and system interfaces.

*Innovation* – The enabled business process must return value through automation, improvement, transparency, and/or integration.

*Organization* – The IPT must define how the enabled process will fit into the organization and how the organization will adapt and improve using the enabled process.

### *Understanding*

The IPT defines the high-level business process initially to scope the business process from end-to-end. This exercise is a combination of gathering existing process collateral and interviewing subject matter experts. Purely manual processes may have never been addressed from a process modeling perspective and require extensive research by the Business Analyst to define the target process. Conversely, processes identified for Improvement will have well-defined process models nearly ready for implementation. Gathering existing collateral is the most productive step for the IPT. Most processes targeted for enablement have already been modeled in some way. Existing process diagrams do not need to be in Business Process Modeling Notation (BPMN). The execution model in a BPMS is enough of a deviation to offset any advantage of importing process models into the BPMS environment.

An enabled process in a BPMS is more than just the process itself. The monitoring and management of the process is just as important. Within the scoping phase, the IPT will also define the requirements for measuring, monitoring, and reporting process activity to the relevant actors. This is achieved through Business Activity Monitoring (BAM), which is made up of a combination of performance metrics, reports, and dashboards. The enabled business process can also be important to enterprise business intelligence and the IPT will identify potential process data for inclusion in an enterprise data warehouse.

Automation of customer facing processes should include capturing the view and experience of the customer, and creating an environment of engagement. Various tools, such as **Voice of the Customer** and **Customer Journey Mapping** should be used to ensure proper alignment to customer needs.

As a result of this effort, the IPT should know the basic high-level elements to begin implementing the process in a BPMS:

- Start and end points of the process
- Anticipated human actor roles
- Known system interfaces
- Core business activities
- Inputs and outputs

- Performance requirements

### ***Innovation***

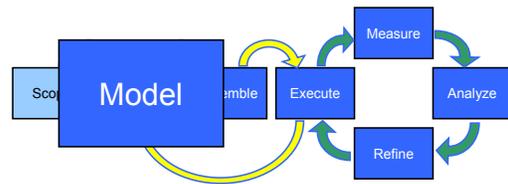
The IPT will also define baseline performance measures for the process enablement. Implementing the process in a BPMS should provide a measurable return on investment. This return may include greater level of service from FAS, a reduction in cost/time on the part of FAS, and/or a reduction in cost of IT overhead in support of the process. To properly measure the benefit realized from process enablement, the IPT needs a baseline for the current cost and action time of the process (especially if presently manual) and the current cost of supporting systems (especially if being replaced by process enablement).

### ***Organization***

Success of the project to enable a business process is dependent on the value it provides to the enterprise. Iterative development of the process provides the highest probability of success, but the project still requires optimal initial conditions. Executive sponsorship and process stakeholder buy-in are crucial. The initial scoping exercise must include all parties.

### ***Outcome***

The work product resulting from the Scope phase is a scoping document. The scoping document includes high-level business activities, roles, system touch-points, triggers and terminals, and baseline cost and performance metrics. The business process enablement project moves to the Model phase when the Executive Sponsor accepts the scoping document.



## MODEL

This phase is the main building block of an enabled business process and the first phase of the iterative development stage. The Model phase acts as the primary development phase and requirements gathering phase simultaneously, thus collapsing typical development cycle. The business analyst works with the process stakeholders to define a model in the BPMS, using Business Process Management Notation (BPMN), which fulfills the high-level requirements developed in the Scope phase. For additional information pertaining to BPMN and its use refer to Workbook II: A Practical Guide to Business Process Improvement. The resulting model represents both the requirements and the executable application within the BPMS platform.

### *Prerequisites*

A successful modeling effort should begin with certain elements already in hand. A process model starting from scratch still needs concrete boundaries as established in the Scope phase. The following artifacts should be obtained in the previous phase before modeling begins:

- High-level requirements
- Roles
- Inputs
- Outputs
- External system touch-points
- High-level data model
- Existing managed sub-processes.

### *Activities*

A business process enabled by a BPMS employs several elements beyond just a process model. A truly mature process is developed to be measured and optimized. Also, the process does not exist on an island. It is part of a greater whole with pre-conditions, expected outputs, and integration with external systems. During the development of the enabled process in the Model phase, the business analyst is responsible for the following activities:

- Process model – Execution model in BPMN with all human and system activities, decision points, and terminals.
- User interfaces – Each human activity has a corresponding user interface rendered by the BPMS.
- System interface stubs – Each system activity should be defined with inputs, outputs, and a default expected result. If a test version of an existing service exists, it can be used in place of a stub for more accurate representation of production for testing and simulation.
- Basic data model and dataflow – All business related variables are defined by the business analyst, including complex data types. All interactions with business variables are also defined in both human and system activities.

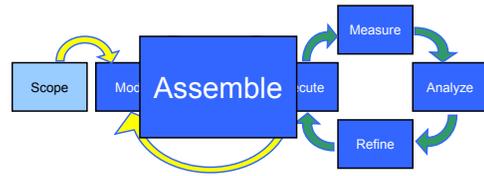
- Customization requirements – There may be identified customization to the BPMS required to meet process stakeholder acceptance.
- Basic reporting and dashboards – Simple reports and dashboards are designed by the business analyst to meet IPT requirements. More complex requirements need customization performed by IT support.
- Performance metrics – Process improvement requires intelligent measure of the enabled business process. The business analyst defines performance metrics in the process model to measure what is important to the business.
- Simulation – The business analyst will simulate the execution model to identify obvious inefficiencies before moving from the Model phase.

### ***Iteration***

The BPMS methodology is an iterative process meant to shorten the development lifecycle as well as increase its accuracy in meeting the stakeholder requirements. The initial development of the enabled business process will go through much iteration through the Iteration stage (Model, Assemble, Execute) before passing to production after stakeholder acceptance. Process stakeholders are involved in the development of the process through each iteration and are responsible for sign-off before the process moves from the Iteration stage to the Maturation/Evolution stage. Some processes will require process model changes as a result of the Refine phase. These processes will revert back to the Iteration stage starting with the Model phase. The methodology for mature processes in this stage is no different than those in initial development.

### ***Outcome***

The work products resulting from the Model phase are the executable process model, system integration definitions, business activity monitoring artifacts, and supporting data model. The process model does not need to be complete, only executable to solicit requirements feedback from the Process Stakeholders. The system integration definitions are delivered to the Systems Analyst for implementation during the Assemble phase. Early iterations of the Model phase may have very incomplete process models and undefined system integrations. The business process enablement project moves to the Assemble phase when the Business Analyst needs requirements accuracy evaluation from the Process Stakeholder.



## ASSEMBLE

IT Support is primarily responsible for the Assemble phase. Technical details and customization are implemented by java developers and infrastructure experts to support the interfaces and requirements identified by the business process analyst in the Model phase. Implementation details are abstracted through means of reusable drag-and-drop components in the BPMS. The business process analyst can now fully implement the enabled process.

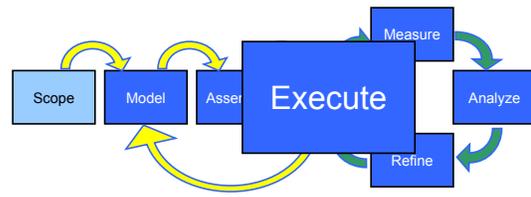
### *Activities*

There are five elements of implementation that fall under the IT Support purview. The project manager is responsible for maintaining a development schedule with IT Support to keep the entire enabled business process project on track. The business analyst remains aware of the development schedule and is responsible for incorporating technical details into the enabled business process but does not need to know the underlying implementation details. The following elements are necessary for successful enablement of a business process:

- Complete dataflow – IT Support validates existing variable against the Enterprise Information Model. IT Support also creates any additional variables and interactions to facilitate complete end-to-end execution of the enabled business process.
- Dynamic process components – System activities requiring heavy interaction with business rules or data manipulation are built through a cooperative effort between the business analyst and IT Support. Development of such components may require programming or scripting on the part of IT Support
- System interfaces – System interfaces are completed by IT Support through process components utilizing messaging, database queries, or web service calls.
- Customization (tool and/or UI) - Custom components may need to be created to support process functionality not immediately found in the BPMS. IT Support can extend the BPMS with extended java classes, script, and/or system integration.
- Complex reporting and dashboards – Some reports and dashboards may require access to underlying data-structures, integration with external systems, or behavior/presentation not immediately supported by the BPMS.

### *Outcome*

The work products resulting from the Assemble phase are work system services providing capability to BPMS components. The business process enablement project moves to the Execute phase when the process model is executable and requirements feedback is solicited from the Process Stakeholder by the Business Analyst.



## EXECUTE

Business processes enabled by a BPMS are by definition executable. Their location in the BPMS infrastructure determines their status as Production, Test, or Development. It is best practice to have two separate environments for enabling business processes: A production environment where fully tested processes are imported to and a development/test environment where processes are iteratively developed and tested.

### *Environments*

In production, process models are not altered directly by the business analysts nor are underlying integration or activities altered. A BPMS is designed to support in-flight changes to production processes. There are three types of changes that take place during production:

- minor changes to individual process instances by business managers
- minor changes to business rules, reports, and dashboards by business managers or a business analyst
- major update to a process by the business analyst after iterations through Model, Assemble, and Execute(Test)

In development/test, process models existence in a BPMS environment nearly identical to the production environment, except potential system integration components point to test versions of those components. In the Execute phase, the business analyst solicits feedback from the process stakeholders to further refine the detailed requirements for the enabled business process. Process stakeholders are able to use the application as if it were the final product, therefore reducing risk through increased transparency into the development process. System integration components built in the Assemble phase are also tested as part of the ongoing business process development. A mature center of excellence will eventually have a portfolio of enterprise-wide system integration components supported by the service oriented architecture of FAS.

### *Deployment*

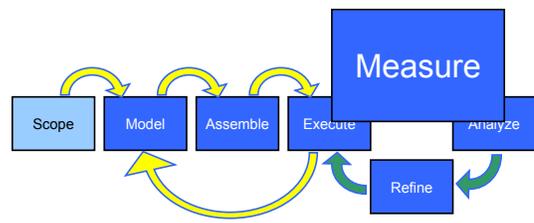
In a BPMS environment, deployment is simply moving an enabled process from development/test to production. However, this typically is not a simple procedure. The process model itself can be exported from development/test and then imported into production which takes care of the majority of the functionality. The real work involves moving reports, dashboards, external system references, and potential customization. All of the supporting elements should be moved first so the process model is functionally complete once imported. After which, the reporting elements are transferred as they are dependent on the process model and its data structure. The high level procedure for deployment is as follows:

- Transfer supporting elements (system integration, platform customization, etc.)
- Deploy process models (Sub-processes first then main model)
- Transfer reporting elements

Each enabled business process should have a defined deployment procedure specific to all of its components for use during iterative updates and refinements. IT support is responsible for and maintains this procedure.

### ***Outcome***

The work product resulting from the Execute phase is either Process Stakeholder requirements feedback during iterative development or the enabled business process in production. A production-ready enabled business requires a deployment plan for the move to production. The business process enablement project remains in the Iteration stage cycling through Model, Assemble, and Execute, until the Process Stakeholder has accepted the process as fulfilling all the requirements and the Executive Sponsor has signed off on the developed business process. An accepted business process moves to the production environment of Execute in the Maturation/Evolution stage.



## MEASURE

A process in BPMS is automatically measured for performance both explicitly and implicitly. Key indicators can include time, cost, and quality. Time is a basic indicator recorded automatically task by task. Cost can be derived from defined resource cost and activity time. Quality must be tracked explicitly as part of the process based on a defined accuracy assessment or human evaluation.

Time is the category of measure most important to business process management. The duration of activities within a process often determine the value and efficiency of a process. Performance metrics based on time can identify bottlenecks, points of inefficiency, unbalanced workload, and opportunity for additional automation.

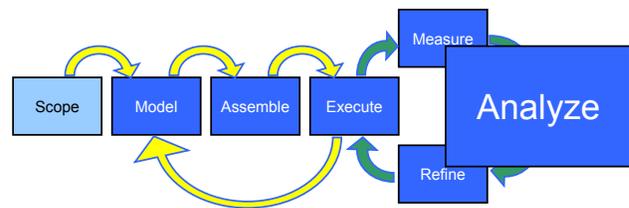
The BPMS audits each process completely, tracking basic performance metrics for each work task. Other performance metrics relevant to the business can be modeled into the process. These metrics can be stored in the BPMS as archived process data or exported explicitly for consumption by external analytic tools during the Analyze phase. These performance metrics are simply data and must still be interpreted by an analyst. Usually, non-traditional performance metrics are identified during later iterations of a mature enabled business process as part of the Maturation/Evolution stage.

### *User Feedback*

Beyond just performance metrics, end user perception and acceptance of the enabled business process is of crucial importance. Rapid and effective changes to the workflow and user interfaces increase the end-user comfort and efficiency with the enabled process. Pain-points can be addressed beyond those identified by just quantitative measures. Process stakeholders can also request additional functionality as part of the Evolution/Maturation stage. These new requirements are documented in changes to the next version of the process model.

### *Outcome*

The work products resulting from the Measure phase are business activity data and user feedback. The business process enablement project moves to the Analyze phase when enough process data has been collected the warrant analysis and possible process improvement.



## **ANALYZE**

An enabled business process can have massive amounts of historical data related to its performance. During the Analyze phase, the business analyst must assess the data for issues and potential for process improvement. The BPMS provides analytics and simulation to facilitate this analysis, but external analytics are also possible. Process performance metrics could be a large part of a business intelligence function in the enterprise. There are three basic categories of analysis to take place: Expectations, Process Improvement, and Return on Investment.

### ***Expectations***

Each performance metric should have an expected result as the process is based on existing real business. This initial step of the Analyze phase involves the Business Analyst simply checking to see if performance metrics are in expected ranges. Unanticipated deviations are early indicators of business environment changes, process deficiency, misaligned requirements, and/or poorly allocated resources. Quickly identifying issues out of the norm allows the IPT to remedy the enabled business process thereby increasing adoption of BPM in the organization

### ***Process Improvement Opportunities***

The business analyst should be able to tie performance metrics of the process to business goals. When doing so, the business analyst can assess the value of the enabled business process as it pertains to those goals. If it is determined from evaluating expected results and alignment to the business goals that the process is deficient, then the business analyst needs to identify opportunities for process improvement. The typical causes of process inefficiency are unbalance workload, bottlenecks, and unnecessary rework. Basic performance metrics make these opportunities readily identifiable and can then be targeted for improvement with simple changes to the process model or business rules.

Some processes, especially those with high transaction rates, are ripe for process improvement using Lean Six Sigma. Processes identified for LSS treatment are handed off to an LSS team for Analyze and Refine. These processes can continue to be enabled in the BPMS, but the Evolution/Maturation stage is controlled by the LSS team. Additional performance measures may be added for statistical analysis. Once the LSS process improvement is complete the enabled business process follows the same BPMS methodology as before.

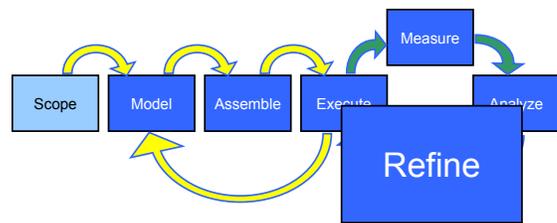
### ***Return on Investment***

As part of the Analyze phase, the business analyst should determine the return on investment for automating the business process in the BPMS for a newly enabled process or for changes made to an existing enabled process. For new processes a baseline for process performance was created in the Scope phase. Process improvement can then be compared to the time and cost of process enablement to determine the value of enabling the business process in the BPMS. For existing enabled process, the baseline is

determined in each measurement phase, so return on investment can be assessed pre and post changes to the process.

### ***Outcome***

The work products resulting from the Analyze phase are process performance document. The process performance document outlines analysis of current performance metrics, potential for improvement, and the return on investment. The enabled business process moves to the Refine phase when the Executive Sponsor decides to act on one or more opportunities for process improvement.



## REFINE

The final phase of the Evolution/Maturation stage is Refine. Refinements are made to the enabled business process to incorporate identified process improvement. There are two levels of refinement: minor changes which lead back to the Execute phase and major changes which lead back to the Model phase.

### *Minor Refinement*

Process improvement which does not require changes to the executable process model are considered minor and do not need one or more runs through the Iteration stage to validate. These refinements include:

Adjustment to business rules – Business rules are designed to facilitate process improvement or adaptation to changing requirements without change to the executable model. In most cases, adjustments are made by the business analyst as part of the Refine phase, but some rules are exposed to the end users and can be modified by a supervisory role during the Execute phase.

Adjustment to reporting/dashboards – Reporting and dashboards exist outside of the executable process model but can continuously be tailored within the BPMS. The business analyst or IT support can adjust process reporting to benefit further measurement and analysis.

Resource balancing – Often performance metrics indicate a resource inefficiency rather than a process deficiency. Simple workload balancing or adjust to rules responsible for work assignments can provide improvement without adjustment to the process model.

### *Major Refinement*

Some changes to the enabled business process will require altering the executable process model and supporting system interfaces. These refinements require the process re-entering the Iteration stage for proper development and testing before bringing a new version to production. Even though the changes may be very small and require only a single Model, Assemble, and Execute cycle, steps must be taken to ensure no disruption to the automated process in production. For major refinements, the business analyst defines the required changes with the process stakeholders. Once process stakeholders have accepted the potential process improvements, the project manager and executive sponsor evaluate whether an additional development cycle is acceptable. If the IPT choose to begin a new version of the enabled business process, the process is further developed iteratively beginning with the Model phase before eventually moving to production as part of the Execute phase. The iterative nature of the BPMS allows the IPT to make small changes to the process and evaluate their effectiveness with each cycle. This reduces the need to make wholesale changes to the process. Pain-points for the end user and clear efficiency issues with the process can quickly be remedied.

### *Outcome*

The work product resulting from the Refine phase is an improved enabled business process. Minor refinement results in rule or reporting changes and the business process is moved to the Execute phase. Major refinement results in the business process being

moved to the Iteration stage starting with the Model phase for any process changes identified during the Refine phase.