Workbook II: A Practical Guide to Business Process Improvement

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

Workbook I: Enterprise Portfolio Process Alignment (WIP)
Workbook II: A Practical Guide to Business Process Improvement (this workbook)
Workbook III: A Practical Guide to BPMS / SOA Implementation

Workbook I (under development) provides guidance and instructions on how to manage and implement an enterprise-wide process improvement effort, and ensure it 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 by using a combination of Business Process Management Suite (BPMS), or low-code environments, Agile development techniques, and Service Oriented Architecture (SOA).

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) 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.
Table of Contents

A PRACTICAL GUIDE TO BUSINESS PROCESS IMPROVEMENT ......................... 1
EXECUTIVE SUMMARY - WHY BUSINESS PROCESS MODELING AND THIS WORK BOOK ................................................................. 3
PURPOSE OF WORKBOOK ................................................................ 4
BASIS FOR THE BPI WORKBOOK ...................................................... 5
ASSUMPTIONS AND PREREQUISITES .................................................. 7
BPI FRAMEWORK ............................................................................. 9
  METHOD ......................................................................................... 9
    Customer Alignment and Value Chain Analysis ........................................ 9
PROCESS MODELING OUTPUTS .......................................................... 11
BPI AND LEAN SIX SIGMA (LSS) ....................................................... 12
BPI TRANSITION TO BPMS / SOA BASED IT SERVICE DESIGN AND DELIVERY .............................................................. 13
PROJECT ORGANIZATION AND STAFFING ........................................ 13
AGILE PRINCIPLES AND BPI ............................................................ 16
TOUCH-POINT ANALYSIS AND CUSTOMER JOURNEY MAPPING .............. 16
TRAINING ......................................................................................... 17
TOOLS USED .................................................................................... 17
INFORMATION MODELS ................................................................... 18
RULES OF ENGAGEMENT ................................................................ 19
SAMPLE TEMPLATE OF WORKSHOPS TO FACILITATE BPI EXECUTION .... 20
  WORKSHOP 1 – PROJECT KICKOFF .............................................. 23
  WORKSHOP 2 – DOCUMENT AS-IS ENVIRONMENT ......................... 25
  WORKSHOP 2A – CREATE INFORMATION MODEL ............................. 27
  WORKSHOP 3 – DEVELOP GAP/OPPORTUNITY ANALYSIS .................. 28
  WORKSHOP 4 – CONDUCT VISIONING SESSION .............................. 30
  WORKSHOP 5 – DEVELOP TARGET ARCHITECTURE ......................... 31
  WORKSHOP 6 – DEVELOP TRANSITION PLAN ................................... 33
APPENDIX A – BUSINESS PROCESS TUTORIAL ................................... 34
  WHAT IS VALUE CHAIN ANALYSIS ................................................ 35
  WHAT IS A PROCESS ..................................................................... 35
  HOW VALUE CHAINS RELATE TO PROCESSES ............................ 35
  BASIC BPMN MODELING CONCEPTS .......................................... 37
    BPMN Object Definitions .............................................................. 37
    Modeling Principles and Guidelines ................................................. 38
APPENDIX B – OVERVIEW OF INTEGRATED PRODUCT OR PROCESS DEVELOPMENT (IPPD) .......................................................... 43
  IPPD INTRO/BACKGROUND .......................................................... 43
  IPT BACKGROUND ....................................................................... 43
  CHARACTERISTICS AND BENEFITS OF AN IPPD ............................ 44
Some of the key characteristics of an IPPD include: ................................................................. 44

Appendix C - Project Charter Outline ..................................................................................... 46

Appendix D – Information Models ........................................................................................... 47

Information Flow Diagram ....................................................................................................... 47
Data Object List ......................................................................................................................... 48
SUMO Table ............................................................................................................................ 48

Appendix E – Role of Metrics and Targets ............................................................................ 49

Appendix F – Bibliography ....................................................................................................... 51

Bibliography ............................................................................................................................ 51
EXECUTIVE SUMMARY - WHY BUSINESS PROCESS MODELING AND THIS WORK BOOK

The most vital asset to an organization is its people working in concert to achieve the organization’s goals. Today, this extends outside the organization where the most successful enterprises are one’s that manage to maximize cooperation and collaboration among internal staff, industry partners, and customers toward common community aspirations. Unfortunately, most organizations aren’t able to obtain the required level of cooperation and collaboration internally, much less create a well functioning community inclusive of outside stakeholders. While much of the problem in building this cooperation and collaboration is a result of corporate culture and lack of time for management to focus on anything but immediate concerns, a good part of the problem can be attributed to the lack of design in key process areas. In the majority of cases business processes and practices have been developed over time in an ad hoc fashion. In many cases different parts of a key process are developed separately with very little thought or coordination with other activities in the process. This inevitably results in further sub-optimization of an organization’s people assets. A key challenge for any organization to maintain their relevance and usefulness in the fast paced and constantly changing business environment is to ensure they have well functioning and adoptable processes that deliver value to the customer. This is especially important with the “graying” of the workforce that keeps today’s processes running, and the workforce taking their critical business knowledge with them once they retire or leave the organization.

The objective of the business process improvement discipline, and the whole reason for this workbook series, is to provide the basic tools for analyzing cross-functional activities in an organization and optimizing them to support the needs of the organization’s mission, and its customers. Using business process improvement techniques an organization will be able to:

1. Ensure the entity’s business activities support the needs of the customer and the objectives of the organizations mission
2. Vastly improve the efficiency of their processes
3. Effectively define roles and responsibilities of staff
4. Ensure the overall performance of the various functions supporting a process is greater than the individual parts
5. Ensure technology supports the needs of the organization
6. Ensure people’s knowledge is captured in a repository to enable organizational knowledge sharing

The Business Process Improvement workbook provides a roadmap, or “how to” document for implementing a business process improvement effort. It is designed to address the process transformation or improvement needs for a major business area. The workbook is assessable to anyone participating in a business process improvement effort. It can be used to facilitate the activities of an integrated project team to address the comprehensive people, process and technology aspect of the business.
**PURPOSE OF WORKBOOK**

The purpose of the Business Process Improvement (BPI) Workbook is to provide guidance and instruction to a business process design team, and an outline for the facilitation of integrated project team (IPT) workshops. The workbook provides both an overview of process design to the uninitiated participant in a business process improvement effort, and step-by-step instructions for the development of a comprehensive process design taking into account the people, process and technology aspects of a complete business activity. The workbook is designed so each member of the major process improvement team can receive a copy of the workbook at the start of the design effort in the form of a binder. As the process improvement material is developed it will be added to the workbook. At the end of the effort, the workbook will contain the complete process improvement design. The outcome of the effort will be a comprehensive process based solution to a business problem or need. Ultimately, these solutions are designed to provide an operational view of how the department will execute the specific processes from both a business and systematic perspective in order to satisfy both customer needs and organizational performance objectives.

By following and completing the sessions outlined in this workbook, an organization will be able to deliver their products and services on a more timely basis and at a higher quality level, all while keeping every organizational level involved throughout the process and all product deliverables in a consolidated location. Additionally, components of the workbook, such as the tutorial on process design and process design standards, are valid tools for guiding less comprehensive process design efforts.
BASIS FOR THE BPI WORKBOOK

The BPI Workbook is based on a comprehensive enterprise performance improvement framework developed by The Mercator Group (www.MercatorG.com), which in itself is based on an integration of industry best practices, which include:

<table>
<thead>
<tr>
<th>Best Practice</th>
<th>Source</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Chain Analysis (VCA)</td>
<td>Michael Porter</td>
<td>Provides a proven method for aligning business processes to mission and customer needs. It was originally developed to perform competitive analysis in the private sector, but has been successfully adapted to public sector needs.</td>
</tr>
<tr>
<td>Integrated Project Teams (IPT)/ Integrated Product and Process Development (IPPD)</td>
<td>CM/SEI</td>
<td>Provides a proven method for organizing process improvement teams to best leverage institutional knowledge and overcome organizational resistance to change.</td>
</tr>
<tr>
<td>Six Sigma</td>
<td>Motorola/GE</td>
<td>Demonstrates the importance of basing change on quantifiable metrics and the application of the scientific method.</td>
</tr>
<tr>
<td>Lean Manufacturing</td>
<td>Toyota</td>
<td>Demonstrates a properly implemented efficient process design leads to improvements in quality. Provides a mechanism for implementing continuous process improvements.</td>
</tr>
<tr>
<td>Business Process Modeling Notation (BPMN)</td>
<td>Omg.org</td>
<td>Provides a standard notation for defining business processes. Supports the implementation of business process management suite solutions.</td>
</tr>
<tr>
<td>Rapid Application and Agile Development principals</td>
<td>Multiple sources</td>
<td>Provide a basis for improving the overall system development life cycle, which has traditionally been a barrier to business process improvement.</td>
</tr>
</tbody>
</table>
The BPI Workbook actually supports the second phase in a three-step approach to business process improvement. Each phase represents both a narrowing of scope and a further iteration to comprehensive process based business solutions aligned to the needs of the organization:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Scope</th>
<th>Key Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Portfolio Process Alignment (EPPA)</td>
<td>Complete enterprise or line of business</td>
<td>Alignment of major process areas to the enterprise mission and customer requirements. Identification of baseline and targeted measures for each major process area. Sequencing of portfolio improvement efforts.</td>
</tr>
<tr>
<td>Business Process Improvement (BPI)</td>
<td>A set of business activities which together produce a definable product or service, either internal or external to the organization</td>
<td>Business process descriptions, roles and responsibilities, key data object definitions and flows, general technology requirements, performance targets and sequencing plan/business case(s)</td>
</tr>
<tr>
<td>BPMS/ SOA based IT Service Design and Delivery</td>
<td>Discrete process area</td>
<td>Deployed IT services in support of business processes</td>
</tr>
</tbody>
</table>

The workbooks can either be used collectively in a top-down organization-wide process design (above phased approach), or independently to address the particular areas for which they are designed. If used independently, process improvement efforts will inevitably uncover issues more appropriately addressed in other phases. This requires the project team to be prepared to manage scope and resolve/manage items beyond the charter of the project.
ASSUMPTIONS AND PREREQUISITES

Do you have a target or goal?

To optimize the output from a major process improvement effort it is important to have both a baseline of current performance characteristics (speed, cost, quality), and a target for improvement. Many process design efforts fall short because they more or less result in very “sterile” logical models of what an organization does. These logical models, while of some use in describing an organization’s business practices, are usually not detailed enough to provide value added information. Process models become very useful when they provide insight into what is uniquely valuable to the process or expose performance gaps and opportunities for improvement. These results are best achieved when a process design effort includes management provided performance targets that can be used to drive the design of a process. This has the further benefit of helping to counter the inevitable forces against organizational change by providing a quantifiable business basis for implementing the process improvements.

Have you properly segmented your organization into major process areas?

One of the major difficulties in process design is the proper segmentation of business activities into contiguous processes. It is obviously important that your major process area accurately represents a process. This is problematic in many cases. Processes typically span functional areas of organizational responsibility. Getting key managers to acknowledge the concept of connectivity can be difficult and can result in the segmentation of a process improvement effort in to stove-piped functions; thus, defeating the purpose. Additionally, changes made in one area of a process, such as the implementation of new technology, may not be properly adapted to in others. For example, order-to-payment is a classic business process that is still a well-used model for segmenting a process today. However, in most situations, the order and payment processes for electronic funds transfer and e-commerce are completely separate. As a result, organizations that have not realized this facet are unable to take full advantage of the new technology.

The value chain analysis approach to segmenting an enterprise line of business into its component major processes is a proven technique for effectively segmenting process areas for further elaboration and design (See workbook I). While it is not necessary to use this approach, there needs to be some level of assurance that the identified major process area is in fact a process. Recognizing whether or not major processes have been effectively segmented is further addressed in the process tutorial section of this workbook.

Do you have the right team?

A good process design addresses not only the flow of work, but the people, organizational and technology aspects of the business areas affected. Process designs often uncover issues with business strategies that need to be addressed at the executive level. This obviously affects people’s jobs, roles and responsibilities. Finally, they usually require the re-alignment of technology to support the process change. Addressing all these related aspects to a process requires the design team to include stakeholders from across the enterprise and up and down the management chain. An integrated project team approach that includes the following is recommended:
Do you have the required support at the management level?

Managerial support for a major process improvement initiative is critical to its success. Additionally, clear articulation of scope and expected outcomes is essential. The best way to accomplish this is to ensure executive participation through a mechanism such as a steering committee, and to clearly communicate the governance of the project through a project charter. All major process improvement initiatives should be governed by a project charter that clearly articulates the scope of the project, expected outcomes, team member responsibilities and roles, and processes for escalating change requests and problems. The contents and descriptions of a sample project charter are outlined in Appendix C.

Can you make the necessary changes in a timely manner?

One reason an organization’s business processes are not effectively aligned is their overall enterprise management processes that drive business decisions, budgeting and infrastructure deployment are not effective. This potential shortcoming is critical in a situation where it is anticipated that major organizational changes may be required. Successful organizational change requires quick results to change the “playing field.” Long software development lifecycles or drawn-out acquisitions will put the whole effort at risk. If the organization is not adaptable to making changes quickly, including supporting compressed system implementation life cycles, a phased program needs to be implemented to redesign the enterprise performance management process. Additionally an acquisition strategy for supporting the change is needed, along with the acceptance on the part of IT to adapt modern software implementation techniques to collapse overall IT implementation timelines. Workbook III, BPMS/ SOA based IT Service Design and Delivery, provides a methodology and approach, that if augmented by the required IT tools, is a proven way for seamlessly integrating a process improvement effort with IT support capabilities, and quickly deploying technology to enable required process changes.
BPI FRAMEWORK

The BPI Framework describes the steps, or the “Method,” required for completing an BPI project, its expected outputs, organization and staffing, approach, training and tool requirements.

Method

Customer Alignment and Value Chain Analysis

The BPI method outlined below assumes initial work has been done to ensure the BPI effort is properly aligned to the industry value chain or internal value stream, depending on the process being addressed, and that there has been an effort to understand the customer view, through customer journey mapping, or some other type of effort to capture customer sentiment and needs. If this has not been done, the effort should proceed to perform this alignment and analysis before proceeding to the BPI effort. The value chain or value stream analysis will correctly identify the processes at a high level, with flow down to the lower level mappings in a way that ensures the processes can be positioned to support customer requirements. Customer journey mapping will provide a mechanism to analyze process touch points with customers and help to ensure the processes are providing an engaging experience that meets their needs. Both the current state and future state will be aligned to the value chain or value stream, creating a way to walk back the processes from the proposed future state to the current.

The BPI Method includes a well-defined sequence of steps for improving a business process area. The improvement process consists of five distinct steps:

- Step 1: Define the Current, or “As-Is,” State – the existing processes are laid out, along with the current roles/applications to carry out the process steps, the products produced from the execution of the process steps, and the services provided by each of the processes. Requirements and current performance and resource usage measures are also mapped to the processes.

  It is important when developing the current state to carefully monitor the level of detail defined, and to keep a watchful eye out for overanalyzing and defining something that is going to change anyway. This is especially true if business processes are expected to undergo significant revisions or transformations to achieve the desired target state (To-Be). The objective of the current state analysis is to define the current state to the extent necessary to identify performance deficiency and provide a baseline for designing to the future state. Spending too much time on the current state runs a risk of getting bogged down in minutiae.

  A critical, yet often overlooked, piece within this step is to address existing pain points, problem areas, and high risk factors affecting the outcome of the processes, which need to be accurately captured when defining the As-Is state. This is so these pain points or risk factors can be accurately addressed and eliminated or mitigated when performing the subsequent steps during the BPI.
Step 2: Identify and Document Gaps and Opportunities – By analyzing the current state and the deficiencies or pain points noted in the current state, the IPT team will be able to specifically pinpoint any redundancies, gaps, and opportunities for transitioning from the As-Is to the To-Be. The Gap and Opportunity Analysis should include:

1. **Gap**: Identification of a potential problem area or a specific pain point with associated performance issues. The gaps identified could be process, people, technology, organization or logistic related.
3. **Cost/Risk**: Qualified or quantified cost and risk associated with implementing or not implementing the identified opportunities.

Exhibit 1 displays a sample graphical representation for analyzing a gap, or pain point, pertaining to applying for a license. In summary, an application is initially qualified at a central review facility and mailed to another facility for final evaluation. While the whole application process takes an average of 20 days, an analysis of the current state shows that an average of 4 full days, or 20% of the total application process, is spent mailing the application between the customer and the various qualifying/evaluation departments.

**Exhibit 1: Graphical Representation of a Gap Analysis**

Step 3: Conduct Visioning Session – This step uses the Gap and Opportunity Analysis as the basis for the target state design. Once the gap analysis is completed, executive level input MUST be obtained and incorporated into the overall BPI process. The project team shall organize a session where the options for improvement are presented to the executive group in order to collect their feedback. Their input is critical to ensuring the target state developed as
part of this project is aligned with the strategic direction of the organization, satisfies the present needs of the customers, and is within the parameters the organization will accept in terms of the amount of risk and cost it is willing to take to accommodate change.

The output of the visioning session is the initial prioritization of improvement initiatives to drive the target state and transition plan.

- **Step 4: Define the Target or “To-Be” State (Blueprint)** – Taking the prioritized initiatives laid out in Step 3, the IPT team will begin developing the target state for the project. The process modeling revisions to the existing process steps, roles/applications and products/deliverables produced will inherently lead to new services the organization will provide to its customers. These new services will also be based on the updated requirements gathered during this step and incorporated in the To-Be state.

An additional factor helping to construct the To-Be state will be incorporating leading practices from the commercial and public sector for performing similar or identical activity to ensure the process stakeholders are maximizing efficiency and quality.

Finally, the existing performance measures should be reassessed and refined during this step of the phase to align with the new processes developed in the target state. New performance measures should also be developed to support any new processes, services, or deliverables being made available based on the final To-Be state.

- **Step 5: Develop a Transition Plan (Roadmap)** – Using the Gap and Opportunity Analysis, target state process model, and supporting deliverables, a plan for migrating from the current to target state is formulated, taking into consideration timeframes, cost, level of effort, and end products/deliverables needed to make the target state a reality. This usually requires a careful trade-off between achieving quick results against the cost and risk associated with making the changes. Moving too slowly can result in the typical organization inertia and resistance to change derailing the program; a move too quickly can result in an implementation failure.

**Process Modeling Outputs**
The outputs from a BPI project include:

- **Current and Target State Process Models/Architectures** – all processes, artifacts, roles, services, requirements, leading practices, performance measures, and technology aspects should be captured and defined within these models:
  - Customer Journey Map / Voice of the customer
  - Value chain or value stream analysis
  - Process models
  - Role descriptions and responsibilities
  - Performance measures (baseline and target)
  - Technology service requirements and collaboration models
  - Key business object descriptions
\* Gap-Opportunity Analysis – identifies the gaps, redundancies, and inefficiencies needing to be addressed and resolved while migrating from the current to the target states. Maps the gaps to improvement opportunities and initializes the assessment of risk, cost and benefit.

\* Transition Plan – overall approach for migrating from the current state to the target state. The Transition Plan will provide the sequencing of target state initiatives, and will include:
  ➢ Rationalization for sequencing and dependencies
  ➢ Initiative descriptions
  ➢ High level cost and benefits
  ➢ Risk and risk mitigation strategy

The Transition Plan will focus on the duration of the overall project, and will identify initiatives that can provide a short-term payback. As part of the transition plan a Technology Enablement Strategy should be developed to focus on technology that can improve alignment of application and information infrastructure. The strategy should also categorize the application resources into distinct components and reduce overall risk.

**BPI and Lean Six Sigma (LSS)**

Lean Six Sigma has meaning on multiple levels that lead to wide variations in how, and to what extent, it is implemented. Lean Six Sigma as an overall framework for transforming an organizational has a fairly regimental training and certification aspect to it that includes designating organizational personnel into process change expertise ranking from white belt (generally aware) to master black belt (highest level of expertise). The BPI as a methodology for designing processes is fully compatible with this interpretation of Lean Six Sigma, and should be able to easily coexist with a Lean Six Sigma program from this perspective. In fact, it encompasses the core LSS activities of improving processes.

At a more granular level, Lean Six Sigma prescribes a methodology (DMAIC) and a set of tools for achieving focused process improvements. This more granular level of Lean Six Sigma breaks out the steps in a process improvement slightly differently than the BPI. However, there is a direct mapping:

<table>
<thead>
<tr>
<th><strong>BPI</strong></th>
<th><strong>Lean Six Sigma (DMAIC)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Define the Current or As-Is State</td>
<td>Define</td>
</tr>
<tr>
<td>Gap – Opportunity Analysis/ Visioning</td>
<td>Measure - Analyze</td>
</tr>
<tr>
<td>Define Target (To-Be)/Develop Transition Plan</td>
<td>Improve</td>
</tr>
<tr>
<td>Continuous Process Improvement</td>
<td>Control</td>
</tr>
</tbody>
</table>

Additionally, Lean Six Sigma is more prescriptive to what products are produced as part of a Lean Six Sigma project, which is in keeping with its focused use to address specific quality, efficiency or effectiveness aspects of a targeted process area. BPI is meant to address a much broader set of process improvements, and, thus, is less prescriptive in keeping with its wider applicability.
Both programs (BPI and LSS) can be implemented in conjunction or independently; though an independent implementation can become confusing to an organization. At the very least BPI works well as an overall process framework for identifying and aligning individual Lean Six Sigma focused improvements with enterprise goals and objectives. Without this BPI framework, LSS efforts can become scatter-shot and difficult to align to overall enterprise requirements. Additionally, the strong focus of BPI on process definition and improvement make BPI a powerful tool for use within LSS projects, which can sometimes lose that perspective.

**BPI Transition to BPMS / SOA based IT Service Design and Delivery**

The Mercator Group workbooks / practical guides represent a comprehensive end-to-end roadmap for enterprise-wide process change that includes the implementation of a modern software development lifecycle that ensures quick and accurate implementation of process improvements. The BPMS / SOA lifecycle implementation methodology is presented in Workbook III, and presumes an implementation of a Business Process Management Suite / Service Oriented Architecture, or some other Low-Code environment. The workbook provides a methodology for implementing process improvements on top of that infrastructure.

The transition from the BPI phase to the BPMS /SOA implementation requires the following:

1. Identification and segmentation of individual focused process areas for improved IT enablement.
2. Elaboration of the identified process model to the point in which each discrete collaboration between a person and a system service is identified and described.

At this point the individual collaborations can be modeled in the BPMS system and new functionality implemented as prescribed in the Workbook III manual. Either way, BPI is the most effective way to identify and expose service requirements and needed capabilities. Other methods may times lead to SOA structures that do not expose functionality at the correct granularity, or in alignment with end-user needs. BPI needs to be a core component of any SOA environment.

**Project Organization and Staffing**

Industry-best practices recommend an Integrated Project Team (IPT) approach be used in organizing and staffing the effort. Exhibit 2 displays the typical makeup of an IPT for a BPI project. Roles and supporting responsibilities are defined for each type of personnel listed in the organization chart after the graphic.
IPT roles and responsibilities are defined as follows:

<table>
<thead>
<tr>
<th>Role</th>
<th>Definition and Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Steering Committee</td>
<td>Council of senior organizational leaders that verify the project results are consistently mapping to and satisfying the organizational objectives. They are also responsible for approving change management issues, handling problem escalations, and monitoring and approving all budgetary issues regarding the project.</td>
</tr>
<tr>
<td>Executive Sponsor</td>
<td>The spokesman for the Executive Steering Committee. The Sponsor is responsible for chairing the Executive Steering Committee and championing the goals and objectives of the project. The Executive Sponsor approves project deliverables, making sure the deliverables comply with the strategic and business objectives of the organization and accomplish the project scope objectives as well.</td>
</tr>
<tr>
<td>Role</td>
<td>Definition and Responsibilities</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Oversees the daily activities of the project. The project manager monitors the planning and execution of the project schedule, resource allocation for individual project tasks, and budget expenditures during the course of the project. The project manager will relay the overall status of the project to the executive management on a periodic basis (i.e. weekly or bi-weekly). The project manager will liaise with the Executive Sponsor should project problems need escalation for resolution, additional resources or budget requirements are needed, or if changes in project scope need to be approved.</td>
</tr>
<tr>
<td>Business Stakeholders</td>
<td>Business stakeholders are responsible for developing the content of all process improvement products. They will ensure that the project scope and deliverables will adequately satisfy the needs of the business users or customers. Business stakeholders will act as representatives of the business/customer community during all project-related tasks and meetings to develop the current/target process model states, gap analyses, and transition plan.</td>
</tr>
<tr>
<td>IT Stakeholders</td>
<td>Ensures that the target state and other supporting products adequately leverage technology functionalities and capabilities with an acceptable risk. IT stakeholders will act as representatives of the IT community during all project-related tasks and meetings to develop the current/target process model states, gap analyses, and transition plan.</td>
</tr>
</tbody>
</table>

An ideal IPT has all personnel participating in the project on a full-time basis. However, daily work constraints and other external responsibilities may prevent certain team members from taking part in all project-related activities throughout the course of the project. As a result, business and IT stakeholders may need to be broken out between full and part-time IPT members.

The participation of part time members will be accommodated through facilitated workshop sessions (described in greater detail later in this document). All IPT members should be required to attend all project meetings and workshop sessions. The full time members will also be required to complete all intermediary tasks and responsibilities in between the workshop sessions to ensure the products are completed in adherence to the project plan. This means the full time Business and IT stakeholders will be contributing and working on behalf of the part time stakeholder as well when producing all products. Conversely, the part time stakeholders must consistently verify throughout the project their view-points and contributions are taken into consideration within the products.
Agile Principles and BPI

The BPI effort can be implemented as an overall framework for implementing Agile processes and supporting system capabilities. TMG’s Agile BPM describes a lower level process implementation effort that is based on Agile. At the process mapping level, presented in this workbook, a process framework is implemented that can be used to scale up Agile efforts, and make Agile more effective at supporting large scale implementation. The process framework provides a way to properly define and segment smaller scale Agile efforts that can be implemented independently from each other. It provides a way for defining the flow of activities and information across a process, and coordinate individual Agile teams based on an understanding of that flow and its eventual modular implementation.

From a methods standpoint, there can be two scenarios:

Limited coupling:

1. A higher level of iteration, and packaging of improvement efforts in shorter implementation steps.
2. Coordination with Product Owners and Agile teams to iteratively release improvement initiatives.
3. Utilization of a product backlog nomenclature for organizing and sequencing process improvement and system capability implementation efforts.

Full Integration:

1. Moving the lower level process modeling normally performed as part of the BPI into the individual Agile BPM efforts for quicker and more collaborative implementation.

In all other aspects, the IPT should be consistent with a more traditional effort. The key difference is the BPI team would coordinate with the Agile teams to release iterations of the process improvements for implementation, and Product Owner would essentially take the role as Executive Sponsor. Full Integration is the preferred approach for organizations that have embraced Agile development.

Touch-point Analysis and Customer Journey Mapping

In most BPI efforts the stakeholder most represented are typically internal users, with end-state customers seldom a major part of the process design effort. If not managed, this could lead to processes that are difficult to use by the more casual external user, and, ironically, even make it more difficult to internal users due to errors introduced into the process by the casual user being forced to interact with a difficult to use process. To combat this, a BPI effort should do what it can to obtain the view of the customer, and do so at a fairly granular level. This goes beyond getting a sense of their sentiment, and understanding the journey they go through in performing the activity associated with the process you are implementing.
Touch-point Analysis and Customer Journey Mapping analyze the client experience at every point in their activities associated with the process being implemented. This could start with the discovery phase, when they are for example being introduced to the need for the product you are trying to sell, and go all the way to service delivery and usage, and maybe even disposal. The Customer Journey Map provides a depiction of the experience from both a practical level and emotional one. It looks at the customer in the context of their interaction, and tries to make the interaction with the process engaging, useful, and easy to use. Additionally, there could be multiple models of customer experience based on profiles of various types of customers (early adopters, value buyers, etc.)

Customer Journey Map typically take the form of an Infographic which describe the steps the customer goes through, and their touch-points with the actors in the process. It could also be built around a profile of the customer, describing aspects of that customer intrinsic to the experience. At each state the emotional experience is analyzed, and potential process improvement steps for addressing that state are explored.

**Training**

Prior to constructing the current and target states of the project, the IPT members should familiarize themselves with the core process modeling concepts that will be incorporated throughout the development of this phase’s core deliverables. Appendix A contains a more in-depth overview that can be used as a tutorial. Participation as a stakeholder in an BPI effort does not require previous experience or knowledge of process modeling.

**Tools Used**

As stated previously, the tools for completing the necessary steps within the BPI Phase should be uniform and accessible across all levels of the organization in order to promote consistency and limit version control or data redundancy issues. For this phase, the following tools should be incorporated into the overall process:

- A process modeling tool to adequately capture core and sub process levels, process requirements, technology aspects and needs, and roles and responsibilities for executing the processes. The tool should also have the capability to perform simulations of the target process state and should have the ability to serve as a repository for maintaining the entire requirement data needed to implement the product/service for the respective project.

- A project management tool that allows IPT project leaders to relate and track overall planning needs, resource allocation for executing various steps throughout the Phase, budget-related tasks for the project, requirement identification and definition, and task execution over the course of this phase.

- A web conferencing tool should be used to facilitate work sessions when team members are geographically dispersed. While face-to-face communications is the best alternative for conducting work sessions, consideration must be given to scheduling and traveling constraints of team members. Web conferencing has proven to be an adequate alternative where lack of proximity is an issue.
INFORMATION MODELS

An optional activity for the BPI is the further elaboration on information requirements outside the normal flows depicted in the process diagrams. In many cases information sharing is a huge issue, which needs special attention. The BPI Framework can accommodate this with the addition of work sessions dedicated to information modeling. These sessions would deal primarily with data sharing and management issues, not with more technically oriented structural models better left to data architects working at a much more granular level. The models are further described in the work session overviews and in Appendix D.
RULES OF ENGAGEMENT

Participants shall:

- Be authorized to speak for the stakeholders being represented
- Have access to senior management staff for quick resolution of issues requiring escalation
- Have expert knowledge of organization being represented and access to required documentation
- Commit to make every effort to attend all workshops and all sessions
- Be available for feedback consultations
- Be a team player and respect the opinion of others
- Provide candid input with a focus on the scope of the project
- Agree to act as an organization change agent for the proposed process improvements
- Agree to abide by applicable Robert’s Rules of Order when working as a group
- Disable cell phones and pagers for the duration of sessions

The IPT as a whole shall:

- Respect the time constraints of project participants
- Conduct the sessions in alignment with the project charter
- Explain clearly the activities and objectives of each session prior to their commencement
- Schedule meetings and sessions well in advance
- Be prepared to facilitate sessions in a way that makes the best use of everyone’s time
- Be available to answer team member questions individually and respect their confidence
SAMPLE TEMPLATE OF WORKSHOPS TO FACILITATE BPI EXECUTION

To complete a BPI for a major process, the IPT must participate in a series of facilitated workshops. The workshops will be the primary venue for obtaining team consensus on the content of the products. This section presents a sample set of templates for a BPI effort. While not a requirement, the more you can describe to participants what will be required of them, and how the BPI effort will proceed, the better things will go. The sample workshops are as follows:

- **Workshop 1: Project Kickoff** – the IPT team will familiarize themselves with all of the participating team members, project scope and overall approach

- **Workshop 2: Document As-Is Environment** – the current state business process will be modeled, and all objects within the model will be defined and mapped to the performance metric framework

- **Workshop 2A: Create Information Model (optional)** – this session will elaborate on the information flows included in the current state process models. Workshop 2A should be included when it is determined that there are issues associated with data ownership, origin and usage.

- **Workshop 3: Conduct Gap/Opportunity Analysis** – the IPT will identify all pain points with the current state, and will outline and construct opportunities and recommendations for improvements that can be implemented into the target state.

- **Workshop 4: Conduct Visioning Session** – the Gap Analysis findings are reviewed by the Executive Steering committee, and the overall project vision and scope is reassessed and modified as needed.

- **Workshop 5: Develop Target Architecture** – the target state business process is mapped in conjunction with the new project vision and opportunities and recommendations noted in the Gap/Opportunity Analysis report.

- **Workshop 6: Develop Transition Plan** – the IPT will develop an approach for moving the organization from the current state to the target state.

While the outline specifies a project can be completed within the six workshops, some of the workshops may require multiple, iterative sessions to complete all of the required tasks and products. The need for multiple sessions per workshop may be due to projects with larger scopes, or projects with a high degree of complexity.

The sequential flow and desired outputs from each session are depicted in the following diagram (Exhibit 3).
Exhibit 3: Sequential Flow & Outputs of Workshops

A detailed guide to the tasks occurring within each of these workshops follows on the proceeding pages. MPI in Exhibit 3 stands for Major Process Improvement. The number of BPIs and their complexity will drive the number of required workshops.
Workshop 1 – Project Kickoff
Suggested Number of Workshop Sessions: 1

Workshop Objectives
1. Understand the nature and scope of this project
   a. Familiarize IPT members with their individual roles/responsibilities
   b. Communicate management expectations for the project
2. Familiarize the team with the overarching value chain and organizational business objectives
3. Identify critical risks or other stakeholder concerns pertaining to the scope of the project
4. Further refine project plan and schedule

Prerequisites
The core IPT members must develop at least a draft version of the project charter and project plan prior to conducting this workshop. Additionally, the team should collect any relevant material that may be used to guide the direction of the project.
1. Draft project charter
2. Draft project plan
3. Project scope and delineation
4. Organizational Value Chain
5. Target performance metrics (from Value Chain)

Workshop Materials
1. Documented stakeholder concerns
2. SWOT Analysis
3. Organizational performance metrics
4. Project planning tool/application
5. Web conferencing facility (as needed)

Workshop Agenda
1. Team Introductions
2. Project/Workshop Overview
3. Familiarize IPT with Organizational Value Chain and business objectives
4. Identify and discuss key stakeholder feedback and concerns
5. BPI planning and resource allocation
6. Expected outcomes

Workshop Products
The following will be produced at the conclusion of this workshop:
1. Finalized project plan, with critical milestones and resources assigned/committed to major project tasks
   a. List of critical deliverables for each milestone identified
2. List of risks and stakeholder points of concern
3. Finalized project charter
Workshop 2 – Document As-Is Environment

Suggested Number of Workshop Sessions: 2

Workshop Objectives
The objectives for this workshop are as follows:
1. Identify and model the current business process structure associated with the project scope
2. Define all roles (people and technology), events, activities, data objects, business rules, and performance metrics associated with the As-Is business process structure

Prerequisites
1. Finalized project charter
2. Finalized project plan
3. Process scope and delineation
4. Target performance objectives
5. SWOT Analysis (recommended)

Workshop Materials
The materials needed for this workshop are:
1. Existing process flows and other material made available by Workshop Stakeholder participants
2. Documentation pertaining to current performance characteristics of the process
3. Process modeling tool/application
4. Web conferencing facility (as needed)

Workshop Agenda
The agenda for this workshop will be:
1. Conduct overview of BPMN process modeling
2. Iterate current state process model
   a. Define roles, activities, data objects, and business rules
   b. Map all definitions to processes within the model
3. Map existing performance metrics to processes within the model

Workshop Products
The following will be produced at the conclusion of this workshop:
1. Core and Sub business process models for the current state
2. Data repository that includes
   a. Definitions for all processes, roles, business rules, data objects, and performance metrics
   b. Costs/resources allocated to each process
c. Duration times for critical process areas

3. List of process weaknesses/pain points for subsequent Gap Analysis
   a. Pain points that are high priorities or can be resolved quickly (i.e. “Fast Lane” improvements)
Workshop 2A – Create Information Model

Suggested Number of Workshop Sessions: 2

Workshop 2A is an optional workshop to elaborate on the information flows included in the current state process models. Workshop 2A should be included when it is determined there are issues associated with data ownership, origin and usage. The information flow models provide a mechanism for analyzing information stewardship for the purpose of developing a high-level architecture that improves information sharing across the organization value chain.

Workshop Objectives
The objectives for this workshop are as follows:
1. Identify problems with information stewardship, such as duel data entry and redundant data.
2. Develop a rational information stewardship architecture to improve the quality of information and ensure timely access to accurate and up-to-date information.

Prerequisites
1. Current-state process models with key data objects identified and defined
2. Available logical data models and mappings of data to systems

Workshop Materials
1. Current-state process models
2. Process modeling tool/application
3. Web conferencing facility (if needed)

Workshop Agenda
1. Extract information flows from process models for key data objects
2. Map data objects to sources, users, modifiers and owners (stewards)
3. Perform a SUMO analysis on identified data objects
4. Develop future-state information flows
5. Define key data management policies
6. Identify data related gaps

Workshop Products
1. Current-state information flows
2. SUMO Analysis
3. Future-state information flows
4. Data policy updates
5. Data related performance gaps
Workshop 3 – Develop Gap/Opportunity Analysis
Suggested Number of Workshop Sessions: 2

Workshop Objectives
1. Identify and finalize all known pain points and performance related deficiencies in the current state
2. Map the pain points to the business and IT needs within the organization and prioritize based on need and alignment to the strategic direction and value chain
3. Identify opportunities and recommendations for improvement

Prerequisites
Prior to conducting Workshop 3, the core IPT should collect industry leading practices and have the Executive Steering committee review and approve the Workshop 2 results.
   1. Target performance objectives
   2. Completed current state design

Workshop Materials
1. Preliminary list of process weaknesses/pain points for subsequent Gap Analysis
2. Current state models
3. Documentation pertaining to current state performance characteristics
4. Industry leading practices
5. Web conferencing facility

Workshop Agenda
1. Identify present pain points within the current state process model
2. Apply leading practices to pain point areas
3. Identify processes or process areas where performance metric results are not adequate
4. Map and prioritize the pain points and the performance deficiencies with the organizational needs based on new or anticipated business requirements, services, and performance measures
   a. Quantify impact of problems when prioritizing in terms of cost or risk
5. Identify opportunities for improvement based on pain points identified
   a. Incorporate technology enablers to enhance the effectiveness of the opportunities
   b. Identify resource needs and cost/benefit analysis for each opportunity identified

Workshop Products
1. Finalized Gap and Opportunity Analysis report includes:
   a. Comprehensive list of prioritized pain points
   b. Quantified impact on the organization from a cost and risk perspective for each pain point
   c. Organizational constraints that might hinder the resolution of the pain points
   d. Opportunities for improvement in the target state
e. Technology enablers that may be incorporated into each opportunity
f. Cost/benefit analysis for each opportunity identified
Workshop 4 – Conduct Visioning Session

Suggested Number of Workshop Sessions: 1

Workshop Objectives
1. Present Gap/Opportunity Analysis results to Executive management
2. Reassess the project direction from a scope perspective
3. Confirm the new/revised target state vision will adequately map to the customer need and the organizational value chain

Prerequisites
Prior to Workshop 4, the core IPT should prepare facilitation material (i.e. executive presentations) for review.
1. Current state process model
2. Organizational value chain
3. Performance metric framework (target)
4. Finalized Gap/Opportunity Analysis report

Workshop Materials
1. Documented stakeholder concerns
2. Finalized Gap/Opportunity Analysis report and presentation material
3. Project planning tool/application
4. Web conferencing facility

Workshop Agenda
1. Review initial project scope and organizational Value Chain
2. Assess final results of the Gap/Opportunity Analysis
3. Develop target state vision and objectives
4. Define and prioritize improvement initiatives based on target vision and opportunities in the Gap/Opportunity Analysis report
5. Identify new services/requirements as needed
6. Revise project scope and plan as needed
   a. Identify critical paths within new project plan

Workshop Products
The following will be produced at the conclusion of this workshop:
1. Revised project plan
   a. Critical paths identified
2. Defined target state vision (Executive Direction) and project scope
   a. Revised project benchmarks
3. Defined and prioritized improvement initiatives
Workshop 5 – Develop Target Architecture
Suggested Number of Workshop Sessions: 3

Workshop Objectives
1. Understand requirement and performance measure changes that must be incorporated from current to target state
2. Define and prioritize new requirements, performance measures and services
3. Identify all technology enablers that must be incorporated into the target state process model
4. Construct target state process model based on target state definition and new services to be included
5. Map requirements, performance measures, and industry best practices into target state process model

Prerequisites
Prior to conducting Workshop 5, the core IPT must elaborate on initiative descriptions coming out of Workshop 4, and the Executive Sponsor must review/approve the descriptions to ensure alignment with target vision.
1. Target Vision and prioritized improvement initiatives completed
2. Revised Project Scope/Plan from Visioning Session completed
3. List of new services, requirements, technology enablers

Workshop Materials
1. As-Is process models
2. target vision and prioritized improvement initiatives
3. Process modeling tool/application
4. Web conferencing facility

Workshop Agenda
1. Compare target vision and objectives to the current state process models
2. Determine whether iteration of current state models OR complete process model transformation is needed
3. For process model iteration:
4. Iterate target state process model
   a. Revise/update definitions for roles, activities, data objects, and business rules
   b. Incorporate new services, target state requirements
   c. Update performance metrics and map to process activities
5. For complete process model transformation:
6. Define new core and sub processes
   a. Define roles, activities, data objects, and business rules
   b. Map all definitions to processes within the process model
7. Map existing performance metrics to processes within the model
8. Ensure new target state processes adequately support primary/supporting value chains and target vision

**Workshop Products**

1. Defined target state process models with
2. Mapped business requirements
3. Mapped performance metrics
4. Mapped services
5. Mapped industry leading practices
6. Comprehensive repository with definitions for processes, roles, requirements, services, business rules, data objects, performance metrics, and technology enablers
7. Documentation depicting the target state process models’ ability to support the organizational value chains
Workshop 6 – Develop Transition Plan
Suggested Number of Workshop Sessions: 1

Workshop Objectives
1. Identify and prioritize the steps needed to transition the organization from the current to target state

Prerequisites
Prior to conducting Workshop 6, the core IPT must develop alternative transition steps to include risk and potential benefits for review.
1. Finalized Target-State Process Model
2. Project Scope/Plan from Visioning Session

Workshop Materials
1. Current and target state process models
2. Target state process model repository
3. Short and long term Resource plans for organization
4. Web conferencing facility (if needed)

Workshop Agenda
1. Review target state process model overview and definitions
2. Map organizational needs to the target process models
   a. Prioritize order of how/when each need will be met in the target state
3. Outline transition path from current to target state for each need once the prioritized order is finalized
   a. Identify logical dependencies among potential transition steps
   b. Assign resources and estimated cost/risk for each step defined in the transition plan
   c. Estimate benefits gained from completing each transition plan step
4. Finalize recommended sequencing of transition plan steps

Workshop Products
1. Prioritized Transition Plan
   a. Defined roadmap for achieving target state vision
   b. Business case for executing the transition plan
   c. Risk mitigation plan
APPENDIX A – BUSINESS PROCESS TUTORIAL

This appendix depicts an overview of the Business Process Modeling Notation (BPMN) background and core concepts, which will be used when creating the current and target state models throughout the phase. Users will gain an understanding of what each of the elements and model diagram notations mean, how certain models are constructed based on the intent of the process being diagrammed, and, most importantly, how the models will relate to the overarching strategic and business objectives of the organization and support the underlying sub or component-level processes.

This appendix also provides guidance for modeling with BPMN where the standard itself does not sufficiently address the modeling options presented during the modeling of various processes. It also addresses the use of Value Chains as the mechanism for organizing business process models.
What is Value Chain Analysis

- Value Chain Analysis is a long-recognized best practice for organizing business processes.
- Value Chain based analysis was developed by Michael Porter in the mid 1980’s and is still considered a best practice for decomposing business processes to achieve a customer focus.
- Value Chain Analysis in Government is based more on the alignment of business activities with the citizen contingency being served by the organization.
- Value chains exist for each line of business or service in the organization, although businesses and services may share value chain activities.
- In all cases value chain analysis seeks to optimize those activities (processes) that provide direct value to the customer (primary activities).
- There are two types of value chain activities:
  - **Primary Value Chain Activity**: Directly contributes measurable value to the development of the agency’s products or services. An example is “Collect Department Data.”
  - **Support Value Chain Activity**: A value chain activity or process that, although may be critical to the success of the organization, is not a direct contributor to the development of agency’s product or service, but whose value is derived based on its support of a core, or directly contributing, activities or processes. An example of this is “Deploy Staff.”

What is a Process

- Processes are distinct units of work with definitive start and end points that produce measurable units of value.
- Process Flows are sequentially aligned processes.
- All processes are assigned to a single responsible party, called a role.
  - Roles may represent the process work being done by a person, system, organization, or department.

How Value Chains Relate to Processes

- Each Value Chain, Primary or Support, will be decomposed into one or more Major Business Processes.
- A Major Business Process Area will still be fairly high-level, but will:
  - Focus on the sequence of activities/processes required to achieve the output of the value chain activity being decomposed, and
  - Limit the exposure of detailed business logic.
All processes from the Value Chain down need to have at least one parent process from the previous level (A business process decomposes from a Major Process)

- A process can have more than one parent, which would make it a reusable process

Decomposition from value chain to business process solutions (and subsequently to information and technology requirements) does not ensure complete alignment from the overall department Mission Needs (as value chain activities theoretically align to mission goals and objectives) all the way through the major and sub processes throughout each division within an organization. (Exhibit 4).
## Basic BPMN Modeling Concepts

### BPMN Object Definitions

<table>
<thead>
<tr>
<th>BPMN Object</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>A unit of work that produces a measurable unit of value. Processes may also be referred to as activities.</td>
</tr>
<tr>
<td>Event</td>
<td>A specific occurrence that starts or ends a process. All process flows contain only one start event, but may contain multiple end events.</td>
</tr>
<tr>
<td>Gateway</td>
<td>A decision point in the process in which the subsequent sequences of processes that will occur are based on the decision made in the gateway.</td>
</tr>
<tr>
<td>Pool</td>
<td>Represents a participant in a process flow. It also acts as a graphical container for partitioning a set of activities from other pools. Pools are used when the diagram involves two separate business entities or participants and are physically separated in the diagram. The activities within separate pools are considered self-contained processes. Thus, sequence flows may not cross the boundary of a pool.</td>
</tr>
<tr>
<td>Swim Lane</td>
<td>Sub-partitions within a pool representing a specific role or participant in the process (system, organization or person). The processes within a swim lane are performed by the role identified by the lane, (e.g., the process “get work assignment” in the lane “Data Entry Clerk” would be performed by the Data Entry Clerk role). Pools may contain one or multiple swim lanes.</td>
</tr>
<tr>
<td>Sequence Flow</td>
<td>Connect one process to another, illustrating order of occurrence. Sequence Flows can carry messages or data payloads, or simply illustrate order.</td>
</tr>
<tr>
<td>Message Flow</td>
<td>Illustrate the communication of processes between two pools (BPMN assumes all information in a pool is shared and does not allow the use of message flows within the same pool). A message flow should only be used when the message obtained in the receiving pool causes a subsequent flow of sequential processes.</td>
</tr>
<tr>
<td>Data Object</td>
<td>Specific artifacts that are tied to sequences or processes using the Association symbol (dotted line).</td>
</tr>
</tbody>
</table>
An example of a simple process flow is as follows in Exhibit 5:

Exhibit 5: Purchase Sale of Goods in a Store
Modeling Principles and Guidelines

Pool/Swim Lane Rules are as follows:

- There are guidelines for determining whether one or multiple pools should be used in a business process diagram (BPD)
  - A set of processes sequenced together contribute to the production of the same output should be modeled in the same pool. (Exhibit 6)
  - A set of processes diverging towards the production of separate outputs and sequences should be organized into multiple pools based on their divergence and linked through a message flow (Exhibit 6)

- External entities should always be represented in their own pools and their interactions represented as message, e.g., in Exhibit 5, the credit card company is a separate pool that interacts with the store to approve all credit card numbers.

- External entities can and should be represented as “black boxes” where their processes are unknown or of no interest to the model

- The name of the pool can be either the entity performing the process, the role performing the process, or the process name itself

Business Process Rules are as follows:

- Each business process should only be defined once
- Represented on a business process diagram (BPD)
- Processes exist in a single pool on the diagram, thus assigning ownership to one role
- Processes should typically consist of a “Verb Noun” Agreement (i.e. Perform Check, Prepare Package)
- All process definitions should clearly articulate:
What causes the process to begin
What is produced by the process
Describe significant business rules
Possibly contain process characteristic information and performance metrics
Potential for reuse

A series of business processes that can be used within multiple BPD’s are called “reusable processes”
Reusable processes should be shown on all of the BPDs that use them
The reusable processes should be attached as children to the name of the parent process
The name of the process that the reusable process is attached to could have a different name if the different name provides useful contextual information
Reusable processes may be in their own Pool, or could be a sub process in the same pool as other processes.

Message Flow Rules are as follows:
Messages between the main process being diagrammed and other collaborative processes or external entities need to have descriptive names and comprehensive definitions to account for the lack of detail accompanying the collaborative process or external entity.
Messages should appear between the collaborative processes/external entity in the order in which they generally occur.
The message names across diagrams should be consistent:
  If a message on one BPD is called “Credit Check Notification,” the message on the BPD of the collaborative diagram should be the same.
  If on the collaborative diagram, more detail, or specificity is sought in the name, it should be done through extensions: “Credit Check Notification – Request”
Message flows may be attached to the edge of the pools or directly to a process
Gateway Rules are as follows:
The following table (Exhibit 7) depicts the different types of gateways that can be used within a BPMN process model.

<table>
<thead>
<tr>
<th>Gateway Name</th>
<th>Definition</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive (XOR)</td>
<td>Locations within a business process where the Sequence Flow can take two or more alternative paths. This is basically the “fork in the road” for a process. Only one of the possible outgoing paths can be taken when the Process is performed.</td>
<td><img src="image" alt="Data XOR" /> <img src="image" alt="Event XOR" /></td>
</tr>
<tr>
<td></td>
<td>There are two types decision mechanism:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <strong>Data (e.g., condition expressions)</strong> - Shown with or without an internal “X” marker. Without is the most common use. The Gateway (Decision) creates alternative paths based on defined conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <strong>Events (e.g., the receipt of alternative messages)</strong> - This type of Decision represents a branching point in the process where the alternatives are based on Intermediate events that occurs at that point in the Process. The Event that follows the Gateway Diamond determine the chosen path</td>
<td></td>
</tr>
<tr>
<td></td>
<td>They are also used to merge Sequence Flow</td>
<td></td>
</tr>
<tr>
<td>Inclusive (OR)</td>
<td>Inclusive Gateways are Decisions where there is more than one possible outcome</td>
<td><img src="image" alt="O" /></td>
</tr>
<tr>
<td></td>
<td>The “O” marker is used to identify this Gateway</td>
<td></td>
</tr>
<tr>
<td></td>
<td>They are usually followed by a corresponding merging Inclusive Gateway</td>
<td></td>
</tr>
<tr>
<td>Parallel (AND)</td>
<td>Parallel Gateways are places in the Process where multiple parallel paths are defined</td>
<td><img src="image" alt="+" /></td>
</tr>
<tr>
<td></td>
<td>- They are not required for forking in most situations.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- They can be used for methodological purposes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The “+” marker is used to identify this Gateway</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The Gateway is also used to synchronize (wait for) parallel paths</td>
<td></td>
</tr>
<tr>
<td>Complex</td>
<td>Complex Gateways are Decisions where there is more advanced definitions of behavior can be defined</td>
<td><img src="image" alt="*" /></td>
</tr>
</tbody>
</table>

Exhibit 7: Gateway Definitions and Symbols
Other Naming Convention Rules

- All data objects and messages should take the modifier-noun format, e.g., “Approved Timesheet”
- All events should be noun-modifiers in present or past tense, e.g., “Enumeration Completed”

Perspective Business Modeling

A particular business activity can be process modeled from multiple perspectives, each potentially resulting in a different outcome. Specifically, models can be constructed from the following:
- Customer perspective
- Work product being produced
- Internal operation perspective
- Collaboration perspective

While all these perspectives will work their way into most process designs, it is critical to understand the perspective which is the primary driver behind the success of the process. For example:
- A customer perspective should drive up customer satisfaction, but could result in increased internal costs
- An internal operation perspective should improve efficiencies, but may decrease customer satisfaction

The following table is a guide to help determine from what perspective certain processes should be modeled:

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Definition</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Process design characteristics are driven by customer needs.</td>
<td>This should always be used at the value chain layer of the model and at lower levels where customer service is the primary driver</td>
</tr>
<tr>
<td>Work Product</td>
<td>Process design characteristics are driven by the specifications of the work product being produced.</td>
<td>This should be used at lower levels (below the value chain) when the customer needs are embodied in the work product, and the focus is on maximizing its production, e.g., time to produce</td>
</tr>
<tr>
<td>Internal Operational</td>
<td>Process design characteristics are driven by the need to improve eternal efficiencies and effectiveness.</td>
<td>This should be used at lower levels (below the value chain) when cost effectiveness is the primary driver.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Process design characteristics are driven by the interactions among collaborators and their effective integration.</td>
<td>Collaboration considerations should be part of all modeling exercises, but should be primary when the success of the collaboration is a critical success factor, e.g., e-commerce designs</td>
</tr>
</tbody>
</table>
APPENDIX B – OVERVIEW OF INTEGRATED PRODUCT OR PROCESS DEVELOPMENT (IPPD)

IPPD Intro/Background

As defined by Carnegie Mellon’s Software Engineering Institute, Integrated Product and Process Development (IPPD) provides a systematic approach to product development that achieves a timely collaboration of relevant stakeholders throughout the product or service lifecycle to better satisfy customer needs. IPPD is based on integrating the design of products with the development and support processes throughout the lifecycle of the product. It is not a matter of assessing the quality of the product after it has been designed, nor of focusing on related data item deliverables, nor of extensive testing to improve quality or reliability. Unlike IPPD, which addresses all aspects of a process area, these approaches can extend cycle time, increase costs, and may not result in the most optimum way to produce and support the product. IPPD provides a mechanism for considering all of the competitive factors from planning through delivery of the product or service. The design of the product and the process must be integrated across all facets of the organization to assure a more optimum approach to develop and support the product.

All organizations apply integrated product development concepts to some degree. The question becomes how to go about improving the development process and further implement IPPD concepts. IPPD represents a critical opportunity to re-organize product development on a sounder basis. Development and product costs can be reduced, product quality and performance improved, and time-to-market reduced with an aggressive, purposeful approach to IPPD. This requires a formal, structured approach to implementing IPPD; without an aggressive, structured program, the rate of improvement in developing new products will be much slower.

IPT Background

IPPD efforts are executed through the use of an Integrated Process Team (IPT). The purpose of an IPT is to bring together all the functions having a stake in the performance of a product/process and concurrently make integrated decisions affecting that product or process. The teams can be created, formed, and their talents applied at all levels of the organization ranging from the overall structure of the organization to ad hoc teams that address specific problems.

IPT’s are comprised of personnel spanning various disciplines across the organization. All personnel members should be uniquely skilled in their respective area, and should bring their expertise to the table in order to accomplish a specific goal or product at the end of the project. IPT members should be empowered to represent their set of stakeholders within the organization, and should be fully committed to the completion and delivery of the final product through timely collaboration with the rest of the team members.

Implementation of IPPD represents a transition from a functional stovepipe focus to a customer product focus. Teamwork within the framework of IPPD drives the functional and product disciplines into a mutually reinforcing relationship which helps remove barriers to the IPT success.
Characteristics and Benefits of an IPPD

Some of the key characteristics of an IPPD include:

- **Customer Focus** - Primary IPPD objective is to identify and satisfy the customer’s needs better, faster and cheaper. Customer needs should determine the nature of the product and its associated processes.
- **Concurrent Development of Processes** – the processes that are jointly developed during this phase of the overall project will help facilitate the subsequent product design, development and support phases that occur later in the IPPD methodology. This, in turn, will help lower overall project costs through fewer changes/less rework later in the development process.
- **Robust Design and Improved Process Capability** – Promote the use of advanced software design and development techniques that will result in software that (1) achieves quality through design and is robust for all domains and environments, (2) focuses on software process capability, and (3) promotes continuous process improvement.
- **Event-Driven Scheduling** - Establish a scheduling framework that relates program events/milestones to the attainment of stated goals and accomplishments. Attainment of goals/milestones signals the completion and acceptability of each event/milestone.
- **Multidisciplinary Teamwork** - Team decisions, based on risk assessments, should include the combined input from technical, cost, support, and management functions and organizations, as well as customers and suppliers. Team members must fully understand their roles, support the roles of all other team members, and understand the constraints under which the team operates.
- **Seamless Management Tools** - a framework should be established that relates products/processes at all levels to demonstrate dependencies and interrelationships. This framework should relate requirements, planning, resource allocation, and task execution and tracking over the course of this phase, and should provide the capability to share technical, programmatic and business information by using shared information systems and software tools (including models) to access, exchange, validate and view data and information.
- **Proactive Identification and Management of Risk** - Technical/business performance measurement plans, using relevant metrics, should be developed and benchmarked against “best-in-class” government and industry programs and organizations to continually verify effectiveness and anticipated vs. actual achievement of all technical and business objectives.

Assuming that these characteristics are effectively incorporated into the project approach and executed in a successful manner, the Department should realize some, or all, of the following benefits:

- **Reduced Cycle Time to Deliver a Product** – decisions that were initially made in sequential fashion can now be made concurrently from an integrated perspective, with all stakeholders accounted for. A subsequent reduction in extended and expensive rework cycles has a positive impact on schedules and overall software life cycle costs.
Reduced System and Product Costs - Proper emphasis on IPPD at the beginning of the process helps to optimize the product and process funding profile. Early software project phases may require additional investment, but unit costs, and overall life cycle costs, typically incurred downstream in the overall process may be reduced due to fewer design or engineering changes, better capability to meet schedule objectives, and extensive use of trade-off analyses to reach cost-effective solutions.

Reduced Risk - Team planning at the earliest stages of software development promotes better understanding of available technologies and processes. This, in turn, yields a better understanding of risk and its impacts on cost, schedule and performance. Effective risk assessment can result in methods or processes for reducing or mitigating potential risks and establishing more realistic cost, performance and schedule objectives.

Improved Quality - Teamwork that is coupled with team desire and management support for continuous software product and process improvement results in improved product and process quality for the end-user.
APPENDIX C - PROJECT CHARTER OUTLINE

The following list depicts a sample outline of what information should be included in a project charter:

*Project Background and Understanding* – This section shall explain the overall purpose of the organization and all underlying information leading to the development of the project in question.

*Project Objectives* – This section outlines what the project hopes to accomplish upon completion. Objectives shall be broken out between one or two primary objectives and several underlying, supporting objectives.

*Project Task Plan Overview* – This section shall identify the overall timeframe of the project, and shall pinpoint critical path(s), key milestone dates, and core deliverables to be presented throughout the duration of the project.

*Project Sponsorship and Organization* – This section shall identify the executive sponsor(s) that are championing this project, and shall also identify the steering committee team members as well as the project management members.

*Roles and Responsibilities* – This section shall list all of the members, positions, and tasks they will be performing throughout the duration of the project.

*Communications* – This section shall address the need for internal status meetings, logistical and resource needs for each of the meetings, and any technical needs to facilitate both project-related dialogue and information. Furthermore, this section shall address how the key deliverables will be made available to the key stakeholders of the project.

*Key Assumptions* – This section shall outline all the situational events that project management is taking into consideration while planning and executing the scope of the project.

*Project Risks* – This section shall depict characteristics, circumstances, or features of the project environment that may have an adverse effect on the project or the quality of its deliverables. This section will also address how each risk identified will be either mitigated or eliminated during the course of the project.

*Project Approvals* – This section will allow for executive and project management to formally accept the course of action to be taken on this project and all deliverables created during this project.
APPENDIX D – INFORMATION MODELS

Information Flow Diagram

The purpose of the Information Flow Diagram work product is to model the information flows at the organization level in order to ensure the effective and timely sharing of information across the organizational elements being modeled. The Organization Information Flow Diagram is a graphical representation of information flows between organizational elements. Each information flow diagram identifies the organizational elements acting on the information, the roles they play, and the information exchanged among them in support of the process area being modeled. The roles are logical functions that each organizational element plays in support of the information flow represented. Any organization can play multiple roles within the process area information model, and any role may be played by multiple organizational entities.

Exhibit 8 demonstrates a sample Information Flow Diagram for an Inventory Management department at a Manufacturing Facility.
Data Object List

The data object list will include a list and definition of each of the data objects included in the information models.

SUMO Table

The purpose of the SUMO (Sources, Users, Modifiers, and Owners) Table is to analyze the current management and usage of data objects and to rationalize that usage and management in the target architecture. The SUMO Table is first used to analyze the current Sources, Users, Modifiers, and Owners of data objects from either a functional or component perspective. This is followed by a rationalization of usage and management so that there is only a single source for each object, a single owner, and modification outside of the source or ownership is controlled. The SUMO Table work product is used on an as-needed basis to sort-out data problems that may affect a particular business area. As demonstrated in Exhibit 9, the SUMO Table maps Data Objects to Components or Business Functions. An “O” at the intersection of the Component-Data Object Axis indicates that that Component Owns/manages/stewards that Data Object. Each Data Object should have only one Manager/Steward. A “U” indicates that that Component uses the Data Object. “S” means that that Data Object originates from that Component. A blank indicates that there is no relationship.

Exhibit 9: Sample SUMO Table
APPENDIX E – ROLE OF METRICS AND TARGETS

Business or operational process models by themselves offer limited insight in determining the direction an organization wishes to progress from its current state to its target state. Specifically, processes modeling loses its impact if one is unable to evaluate how effective a process is, regardless of whether the process reflects the “as-is” or the “to-be” state. Therefore, a critical aspect for constructing the current and target state models is to incorporate performance measures across the processes to pinpoint what operational areas need to be incorporated in the target state (i.e. “strong” process performers) and which areas need to be redesigned or streamlined (i.e. “weak” process performers) in order to improve on the target state. Performance measures are quantifiable means for assessing the impact and effectiveness of an operational process, and may be used not only to measure process output within a process area, but may also be used for measuring against industry standards and best practices as well analyzing performance trends over an extended period of time. Performance measures help identify critical process and efficiency gaps that must be corrected in order to achieve an optimum target state.

An example of the effectiveness of incorporating performance measures is demonstrated in the following graph (Exhibit 10) from an actual project. The target for this process was to reduce the average time to process a request from 120 days to 30 days. The As-Is state of the reflected process identifies the length of time it takes to perform “direct added value work” to develop the product in question. Furthermore, it also reflects all of the additional bottlenecks and unintended steps that are performed to execute the service. By incorporating these work steps and “length of time” measures for all the roles involved in this process, and mapping them to the actual process steps, we are able to identify the areas needing improvement. For example, it was found the average amount of time spent waiting for responses to requests for clarifications was 52 days. Using this information we were able to focus on changes to the process that would reduce these delays. As the “To-Be” process state has been developed, the “direct added value work” has slightly been reduced, but more importantly the collaboration delays and bottlenecks have all but been removed from the process, reducing the overall production time/product from 120 days to 30 days.
Exhibit 10: Impact of Incorporating Performance Measures

**120 Days Average**
- Direct Value Added Work
- Ancillary Support Tasks
- Coordination Delays
- Bottlenecks
- Rework

**As-Is**
- Bid Coordinator
- Buyer
- Support Staff

**30 Days Average**
- Direct Value Added Work

**Target**
- BC
- Buyer
APPENDIX F – BIBLIOGRAPHY

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