



# JUMP START YOUR BPM PROGRAM WITH STANDARDS-BASED PROCESS MODELING

## BPM's Tower of Babel

Imagine a company in which each department spoke its own language: engineering, sales, customer service, legal, HR, and so on. I don't mean the technical lingo specific to each function, but a different language for describing the most basic activities they perform: how their business processes work. And even within groups charged specifically with documenting, improving, and managing business processes end-to-end, suppose business analysts used one language, architects another, and developers a third – three different languages to describe the same thing, each following the rules and conventions of a different tool or modeling methodology. Hard to get everyone on the same page? You bet.

Not too long ago, that would have been *your* company. Maybe it still is today. But it doesn't have to be. The era of standards-based BPM is here. That means a common visual language used across the enterprise, shared by business analysts, architects, and developers. That means a language not proprietary to a single tool vendor or consulting organization, but a standard supported by all tools. That visual language, called Business Process Modeling Notation (BPMN), is here today. It standardizes the diagrams that describe how business processes work through shapes and symbols with precise predefined meaning. Even organizations that have implemented their own company-wide modeling conventions will increasingly find that moving to the new universal standard simplifies model interchange across tools, business-IT collaboration, and integration with external process models.

BPMN is a critical enabler of shared understanding, but getting the whole company to speak the same process language, we need three things in addition. One is support for BPMN built into "standard" tools, meaning the tools already installed on business user desktops. For diagramming in business, that standard has traditionally been Microsoft Visio. In Visio Premium 2010, just released, we now have full BPMN support. Second, we need a prescriptive methodology and style guide, so that the meaning of a process model is clear to anyone from the diagram alone, without any accompanying documentation. And to get the maximum benefit from BPM, we need low-cost tools that add process simulation and performance optimization to those Visio BPMN models, and link them with process execution environments. With analystView from Global 360, we now have that as well.

This paper explains the business value of standards-based business process modeling standards, tools, and methodologies, and how to use them effectively to improve operational performance, compliance, innovation, and agility.

### **BPMS Watch**

Bruce Silver

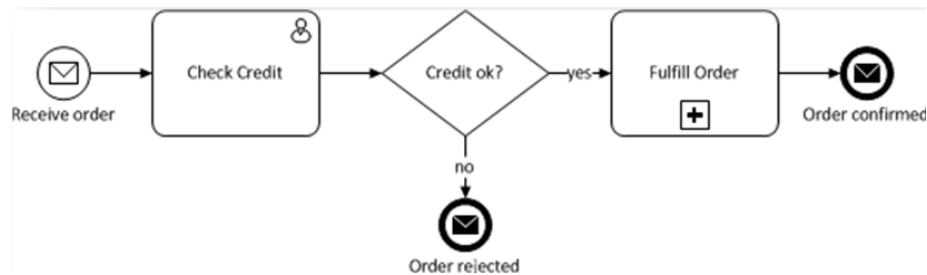
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# BPMN: The Process Modeling Standard

BPMN's path to near-universal adoption as the process modeling standard has been a long one. BPMN actually began in the dotcom era as a graphical front end to executable process design. The idea, originally set forth in a book called *BPM: The Third Wave*, was that business people would be able to create their own automated process solutions simply by drawing a diagram, a process model. Unlike traditional flowcharts, in which the meaning of the various shapes is imprecise and often made up by each modeler, BPMN would have precise predefined diagram semantics, but remain business-friendly. Today, BPMN is used both for business-level documentation and analysis and for executable process design, and that is its great strength.

BPMN's business-friendliness stems from its outward familiarity. It carries forward basic elements of traditional process flowcharting: boxes representing activities, arranged in *swimlanes* representing process roles or organizational units, and interconnected by arrows called *sequence flows*. Conceptually simple, there are only three primary flow elements: *activity* (rounded rectangle), a step that performs work in the process; *gateway* (diamond), conditional routing logic in the flow; and *event* (circle), a signal that something happened, either generated by the process or received by it (Figure 1).



**Figure 1. BPMN uses just three basic flow elements: activity (actions), gateway (routing logic), and event (a signal that something happened).**

Besides standardizing the meaning of these flow elements, BPMN adds five important features missing from traditional flowcharting.

1. **Expressiveness.** It defines a wide variety of subtypes of activities, gateways, and events, distinguished by border style, icon or marker inside, and placement in the diagram, each with precisely defined semantics and rules. This precision and expressiveness is what allows BPMN to go beyond process description to create executable process models. For example, you can express in the diagram what happens if a task takes too long, if an error occurs, or if the customer cancels an order in flight.
2. **Subprocesses.** Unlike traditional flowcharting, BPMN allows the process to be viewed at different levels of detail within the confines of a single semantic model. The key is the *subprocess*, which can be displayed either collapsed as a single activity (rounded rectangle) or expanded as a process. Both views reference the same process definition, and the expanded subprocess can contain other subprocesses, leading to a hierarchical structure in which a top-level diagram represents a high-level end-to-end view, and nested child-level diagrams provide

detail of each step. There is one process model end to end, but you can zoom in to any part of it to see arbitrary levels of detail.

3. **Message flow.** BPMN lets you show the connections between a process and the external environment: the customer that requested the process, service providers to the process, and other internal processes that interact with the process. Those connections, called *message flows*, define each process's place within the overall business architecture, essential for achieving a process-centric view of the business.
4. **Exception handling.** BPMN provides an expressive language to describe *exception handling*, particularly using events. If the customer changes or cancels the order in-flight, how is this handled? If a request is denied, or a task takes too long, or an expected response takes too long to arrive, what should happen? Answers to these questions should be defined by the business, but traditionally they have been tossed over the wall to IT, or else buried deep in documentation accompanying the process model, not in the model itself. BPMN puts the answer in the diagram itself, and gives business a language to describe it.
5. **Shared understanding.** The biggest difference between BPMN and traditional flowcharting is in the universality of the notation. The notation is not private to a particular modeling tool or consulting methodology. The meaning of a diagram is the same regardless of the tool it was created in. Moreover, unlike typical flowcharts in Visio or PowerPoint, modelers cannot make up their own meaning for the shapes and symbols. They are all defined by the standard, with rules about what can connect to what, and what that connection means. Tools can *validate* BPMN models and report inconsistencies with those rules. All of these factors mean you can – in principle – share process models across the enterprise, even across an industry, without ambiguity. You have, at last, a common process language.

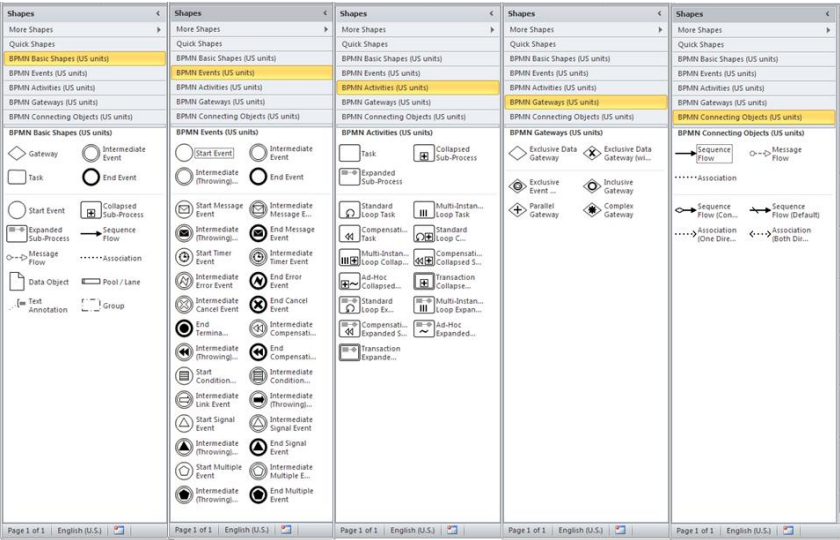
As BPMN has emerged as the process modeling standard, it has been widely adopted by BPM specialist tools, both BPM Suites – that is, process automation offerings – and Business Process Analysis (BPA) Suites used for process analysis and governance. Still, the majority of process diagrams created in most organizations are still authored in “standard” drawing tools, namely Microsoft Visio and PowerPoint. Unfortunately, most of these lack the rigor and consistency enforced by a true BPMN tool.

## Visio: The Diagramming Tool of Choice

The diagramming tool most widely used in business is clearly Microsoft Visio. According to Forrester, over 75% of business analyst use Microsoft Visio for business process modeling. Part of the Microsoft Office suite, Visio provides drag-and-drop editing based on extensive palettes of shapes and symbols called *stencils*. Microsoft provides a wide variety of stencils and diagram types, and third parties or end users can create them as well – including, for example, BPMN. Until now, BPMN diagrams created with those stencils could be characterized as “drawings,” rather than “models,” because the BPMN semantics and rules were not understood by the tool. A few third party add-in tools could validate a BPMN diagram against the standard, but not Visio itself.

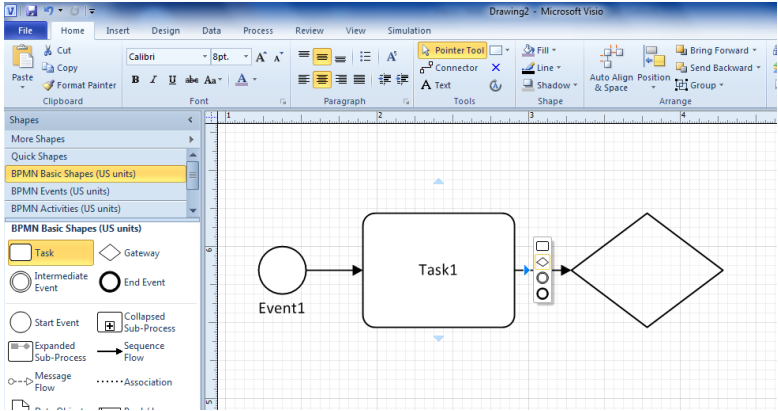
Now, however, that's all changed. Just like the dedicated BPM tools, Visio Premium 2010 provides full BPMN functionality, but built into native Visio. Support for the complete BPMN palette, including diagram validation, is a native feature. The tool supports all of the shapes and symbols defined in BPMN 1.2, the current official release from OMG, along with all of the attributes defined for each shape. The BPMN Basic Shapes stencil contains

default representations of the flow elements, connectors, and other shapes, from which the specialized subtypes can be obtained by selecting right-mouse properties. Alternatively, you can access the subtypes directly from other BPMN stencils (Figure 2).



**Figure 2. Visio 2010 Premium supports the entire BPMN 1.2 palette of activity, gateway, and event types. Source: Microsoft.**

Drawing BPMN diagrams in Visio 2010 is quick and easy. Most of the time you don't even have to drag shapes out of the palette. Just hover your cursor over one of the blue triangles next to an activity and Visio will tentatively draw another one, or let you select a gateway or event instead (Figure 3). A number of browser-based BPMN tools work similar to this, drawing connections for you automatically. Often this is easier than dragging all shapes out of the palette. Not only does Visio 2010 provide this, but it offers fine manual control over placement of all the shapes and connectors as well. With simple diagrams, auto-layout is a big advantage, but in the real world of modeling complex business processes, the ability to make your diagrams neat, with precise control over line and label placement, is in my experience more important. Remember, most of the time your models are going to be shared not as native Visio but as PDF or paper printouts. Other ease of use features include auto-alignment of shapes in the diagram and reflowing the model when switching between vertical and horizontal swimlanes.



**Figure 3. Visio 2010 combines auto-layout and drawing accelerators with precise control over line and shape placement. Source: Global 360**

Visio 2010 Premium lets you model either bottom-up or top-down. With bottom-up modeling, you can select a group of nodes from the page and turn them into a subprocess in one click. Top-down hierarchical modeling works better in Visio than in most dedicated BPM tools. With top-down modeling, you begin with the end in mind, showing the end-to-end process all on one page. That requires subprocesses in the top-level diagram, each of which is expanded in a hyperlinked child level diagram, which may in turn contain nested child level diagrams of its own. Starting from a collapsed subprocess, just click Process/Create New to create a blank Visio page, automatically hyperlinked to the parent, to define the expansion. Or you can click Process/Link to Existing, to attach an existing model as the subprocess expansion, either from another tab of the same Visio file, or from another file entirely.

Finally, Visio 2010 can publish models to Microsoft SharePoint for storage, access and collaboration. BPM is a team effort and requires continuous collaboration among team members. Like Visio, SharePoint has the advantage that in many organizations it is already installed as a document sharing and team collaboration environment. With SharePoint 2010, Visio BPMN models can be published as Web Drawing files. This allows viewing and annotation by users without Visio through a Microsoft web part. Even in this form, the published model is more than just a drawing. Hyperlinks between subprocesses and their expansions still work, and you can click to see all the attributes of any diagram element.

Over the past several years I've used a lot of BPMN tools, but Visio 2010's set of features really stand out for convenience!

## How to Use Process Modeling

Armed with a standard diagramming notation, a built-in editor in Microsoft Visio 2010, and an off-the-shelf model repository and collaboration environment in SharePoint, you have everything you need to begin modeling your business processes. Here are some practical tips for getting started.

### *1. Understand the objective*

Before you start to document your current-state processes, you need to understand the intent of the effort. What are you trying to accomplish? Are you trying to improve an existing process? Make it faster, cheaper, more flexible, less error-prone? Are you trying to increase volume without adding headcount? Do you need to modify an existing process to adapt to a new product or service offering? Or are you simply trying to document the process for compliance and auditability? There is no one right answer, but you need clarity on your objectives before you get started modeling. Ideally the objectives are handed down from senior management, including specific measures of success. The reason you need this up front is to avoid wasting time modeling details irrelevant to your business purpose. You want your process models to drill down to the level of detail needed to meet those objectives, but no further. The objectives and measurable goals should be written down in a document in the BPM team's SharePoint repository, and continually referenced by the process models as you develop them.

### *2. Document the as-is process*

Modeling the current state, or as-is, process is a team exercise, most effectively done using facilitated meetings with subject matter experts – people responsible for the process tasks

today – and other stakeholders, including business analysts, architects, and IT. The role of the *facilitator* is to gather facts from the stakeholders through interviews and observing process workers, to move the meeting along, and keep the focus on describing how the process works, the sequence of steps, rather than a recitation of complaints. It is important to keep in mind the overall project intent. If the improvement target centers on making the process faster, make sure your process model drills down deep enough to show important sources of delay. Similarly, if the improvement centers on cost or quality, problems should be traceable to specific nodes in the as-is model.

An important role in these sessions is the *scribe*. It should be someone well versed in the proper use of BPMN. Whether the process capture is done “live” in Visio or with stickies on the wall, the scribe should quickly translate the model into proper BPMN in Visio, and publish it to SharePoint for review and possible iteration. The objective here is to gain consensus from all stakeholders that yes, we all agree this is the way the current process works.

### 3. Analyze the as-is process

Once you have consensus on the as-is model, it’s time to analyze it. That means uncovering connections between the process model and current performance problems. By directing complaints at the process diagram rather than at individuals or groups, it is easier to move forward. Common problems traceable to the as-is process diagram include:

- Too many performers or “touches,” especially when there are excessive handoffs across organizational boundaries. Swimlanes make this behavior easily visible from the process diagram.
- Excessively sequential behavior. Could some of the activities be performed in parallel?
- Excessive approve, inform, check, or review steps. Are all of these steps necessary?
- Duplicate steps. Hasn’t this action been performed already?
- Excessive rework. A frequent cause is absence of validation at the error source.
- Insufficient automation. Can a manual task be easily automated?
- Mismatches between task value and performer, either high-value performers doing low-value work or vice versa.
- Lack of standardization or reuse. Is the same task performed differently in different parts of the organization?

### 4. Propose to-be process improvements

Each of the problem bullets above suggests its potential improvement: parallel instead of sequential, automated instead of manual, elimination of redundant and low-value-add steps, etc. Those improvements can be captured in new to-be process models. You may also want to consider multiple to-be alternatives. It’s easy at this point, as the changes are just proposals captured in Visio. To-be process models in BPMN should be annotated to identify specific sources of expected improvement, and ideally should reference the overall project goals and performance targets maintained in SharePoint.

You may come up with several alternative candidates for the to-be process. In order to select the best one, you may need to provide additional details to your model, such as

defining the resources that perform each task, their cost and availability, daily processing volumes, and the mix of work types. This analysis helps you validate the process logic in your model and estimate to-be performance improvement quantitatively.

## 5. Analyze and validate against goals

Any proposed change to the as-is process, even without automation, implies some cost and risk. Before giving the go-ahead, management is going to want to know, *How much faster? How much cheaper? How much better?*

You sometimes hear the advice not to spend much time modeling the as-is process if your goal is to develop an improved to-be process. I don't agree with that. A detailed, verified as-is model is necessary for reliable projection of to-be performance improvement. *Simulating* the as-is model and comparing the result with known actual values of time and cost metrics are necessary to provide confidence that both the activity flow model and estimated parameters are correct. You may need to iterate both the diagram and the simulation parameters until the results match known actuals. This greatly adds to the credibility of the projected performance improvement in the to-be model simulation.

Simulation analysis requires defining resources that perform each process task, and the time it takes to complete the task. At branch points in the flow, it also requires either a probability of taking one path or the other, or specified branching conditions based on data.

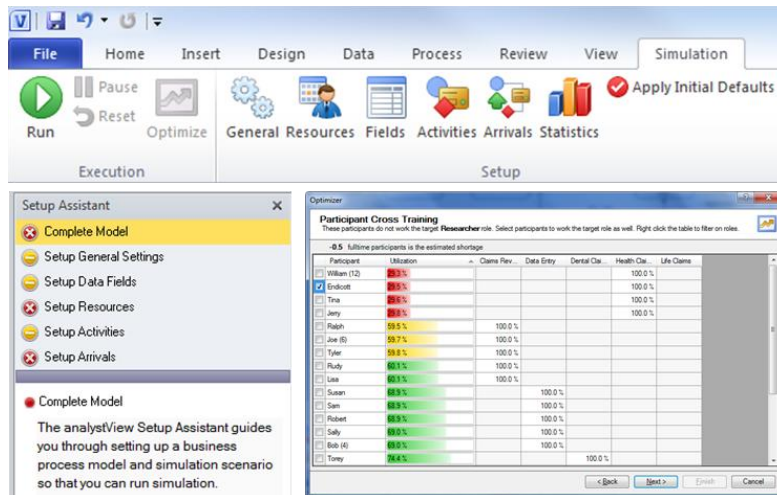
A major factor in process performance is often allocation of resources, particularly if simulation reveals bottlenecks and excessive wait times for certain tasks. You can reduce waiting by reallocating resources to different tasks in the process, a procedure called *optimization*. Simulation lets you try out a variety of alternatives “on paper” and compare them in terms of time and cost to complete. Because of the tradeoffs involved, it is best to share and discuss simulation results among stakeholders.

## Global 360 analystView

Simulation is not a native Visio 2010 function, but Global 360 provides a low-cost add-in called analystView that picks up where Visio stops in the process improvement effort. analystView makes as-is and to-be simulation more accessible to business analysts with novice or expert simulation experience.

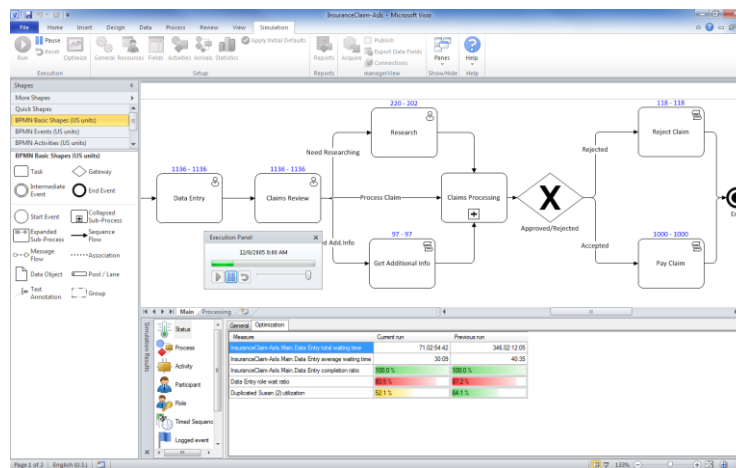
analystView adds a set of *Process Discovery* icons to the Visio ribbon bar, and a *Setup Assistant* checklist in the right pane (Figure 4). These guide the user through the configuration of information required for simulation. The Process Discovery icons guide the modeler in providing information required by the process model to simulate end-to-end performance, including role costs and calendars, which roles perform each activity, data required, and task durations and costs. As users refine the process model, the Setup Assistant verifies that processes attributes have been defined sufficiently for proper simulation analysis.

analystView also provides advanced optimization support, making adjustments to resource allocation that decrease wait time. analystView's “Optimize” wizard helps you to locate problem areas and indicate where the process needs to be improved.



**Figure 4. analystView’s Process Discovery icons (top), Setup Assistant (bottom left), and Optimizer wizard (bottom right). Source: Global 360.**

analystView provides several important features missing in most other simulation tools. One is the incorporation of instance data, mentioned earlier. You don’t have to create a full process data model just to do simulation, but without instance data it is difficult to get accurate simulation results. You can use instance data (e.g., the *OrderAmount* value) to determine the duration of a process task or the path taken at a gateway for each simulated process instance. Without instance data, those durations and paths are just uncorrelated probabilities.



**Figure 5. Global 360 analystView provides simulation modeling and reporting features to novices and experts alike. Source: Global 360**

Another is the ability to adjust simulation parameters dynamically based on specifics of each instance, task performer, and other factors. This requires a bit more technical skill but allows simulation to provide much more accurate results. You can also track conditions and log them as events in a simulation run. This allows simulation to deal with quality and customer satisfaction metrics, not just time-based performance measures.

Using the new Visio Services feature available in SharePoint 2010, business analysts can publish BPMN models and their simulation data to SharePoint for team collaboration before deciding on the optimum to-be process.



Finally, analystView can pass simulation data to Global 360 managerView, the performance analysis component of its Process360 BPMS; it can also import actual statistics from managerView as simulation parameters.

## Achieving a Consistent Method and Style

BPMN is a crucial standard, but in order to maximize shared understanding you also need a consistent methodology and approach for using it in modeling and simulation tools. While tools like Visio 2010, SharePoint 2010, and Global 360 analystView let you deploy modeling and simulation across the business, they do not enforce a particular diagramming methodology or style. It is best when the logic of even complex end-to-end processes is clear from the diagram itself. With hierarchical modeling, for example, that means tracing the process logic from the top-level diagram down must be straightforward and unambiguous, even from a PDF, paper printout, or SharePoint-based Visio diagram.

Also, you should be able to visualize the interactions between a process and the global environment: the customer or other process requester, service providers to the process, and interactions with other internal processes. And you should be able to see not just the “happy path” to the process’s “success” end state, but paths to significant exception end states as well. BPMN provides a rich language for describing what happens when an exception occurs: an approval is denied, an item is out of stock, an activity takes too long to complete, or the customer changes the order in flight. If an exception such as these is significant to the overall performance metrics, it should be included in the process model.

All of this information, while valuable, can make the models confusing if they are not done in a consistent way. Thus a consistent structure and look for all BPMN models within the organization aids shared understanding. The BPMN specification allows the modeler latitude to model a particular bit of process behavior in a number of different ways. A consistent method and style means that given the same set of facts, all modelers should produce more or less the same diagram. It also allows process models to be understood in detail across the business, without the need for accompanying documentation.

Consistent method and style only occurs through a broad program of user education and training.<sup>1</sup> It works best if assisted by a central authority within the organization – for example, a BPM Center of Excellence – that maintains the internal guidelines and provides model review and mentoring, at least in the early stages of BPM maturity.

## Executable Modeling and Continuous Improvement

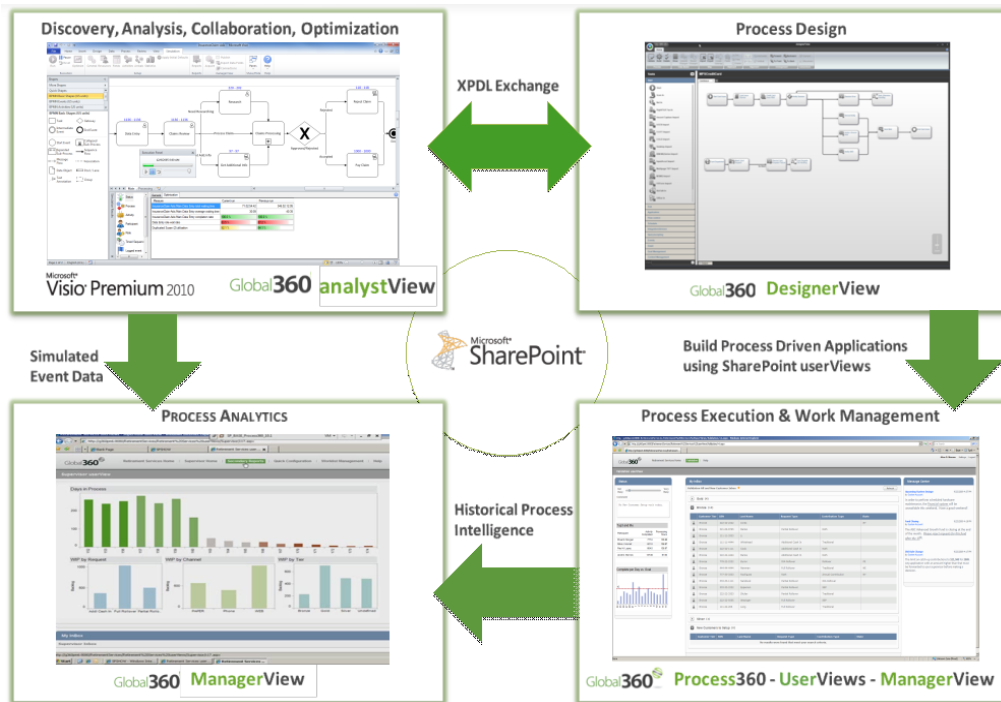
Process improvement does not always require automation in a BPM Suite. Many processes can be made to perform faster, at less cost, and with greater control and consistency simply by reordering tasks, automating certain manual tasks, and making the procedural logic explicit in a shared diagram. But to get the maximum benefit out of BPM, it is often best to turn your improved to-be process model into an automated BPMS solution.

In a BPMS, an executable process model is deployed to a process engine, which routes each instance of the process through the steps described in the model. It creates workflow tasks for the human steps, executes the defined flow logic and business rules, and queries and

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<sup>1</sup> A modeling methodology and style guide that achieves this is elaborated in my book *BPMN Method and Style* ([www.bpmnstyle.com](http://www.bpmnstyle.com)) and in the BPMN training I provide.

updates backend business systems on command from the process engine. As it completes each step in the process, the BPMS logs timestamps and business data, aggregates the information in an analytical database, and monitors key performance indicators in real time through management dashboards.



**Figure 6. Process360 turns BPMN from Visio and analystView into an executable process solution. Source: Global 360**

Figure 6 illustrates the components of Global 360’s BPMS, called Process360. Process modeling for discovery and analysis using Microsoft Visio and analystView feeds executable process design in designerView. When the design is deployed for execution, users interact with their workflow tasks through a variety of customizable role-based userViews and can monitor business performance in managerView. Microsoft SharePoint serves as a repository of process models, simulation reports, and historical process intelligence.

Executable process design in a BPMS requires more technical detail than is provided by the analytical BPMN created in Visio, but direct interchange between those models is achieved using XPDL, a standard from the Workflow Management Coalition. The technical modeling environment enables developers to integrate the process with existing systems and manage any changes to the organization’s technical infrastructure. Global 360 analystView adds XPDL export/import of BPMN to the Visio 2010 ribbon bar, facilitating integration of Visio BPMN models with executable design in designerView.

The important thing is that all the work you put into carefully modeling your to-be process in Visio is directly transferable to the executable solution. This is a big improvement from generating a requirements document tossed over the wall to IT. Done right, executable process implementation involves direct collaboration between business and IT, supported by the BPMS toolset and model repository.

# The Bottom Line

The era of haphazard flowcharting is over. While easy to draw, those diagrams cannot be effectively shared across the business nor between business and IT. Detailed process description buried in voluminous accompanying documentation is too often shelfware, soon forgotten. The key is putting process understanding into the diagram itself, so it stands on its own. That requires a more rigorous diagramming language, understood by multiple tools, suitable for both business and IT. We now have that in BPMN.

Second, that language must be supported by the common tools already installed, because many users are not going to acquire special purpose tools for BPM. We now have that, too, in Microsoft Visio 2010 and SharePoint.

Third, those BPMN models should serve as more than just business requirements for process improvement. You should be able to integrate them directly into the process improvement effort, projecting expected performance improvement through simulation analysis and driving executable design in a BPMS. With Global 360's analystView add-in to Visio, we have that as well.

An effective program of business process documentation, analysis, and improvement can no longer rest on haphazard flowcharting or proprietary modeling tools and languages. In today's business environment, you need to think customer-facing, end-to-end. That means shared understanding, across departments and systems, spanning business and IT. That means enlarging the group of BPM stakeholders, lowering the bar by leveraging standard tools, and getting them all on the same page with a consistent method and style.

The pieces you need to get going in BPM are all in place. What are you waiting for?

*Bruce Silver*

*May 2010*

To learn more about BPMN modeling capabilities within Microsoft Visio Premium 2010 and Global 360's analystView, you can visit each vendor's site where 60-day free trials of the tools are available for download.

You can find Microsoft Visio Premium 2010 at:

<http://visiotoolbox.com/2010/Trials.aspx>

You can find Global 360's analystView add-in for Visio Premium 2010 at:

<http://www.global360.com/analystView>