



Improving Process Intelligence With Predictive Analytics

Understanding how processes behave over time is critical to both the active management and optimization of processes. During process modeling and optimization, identifying temporal constraints and dependencies allows for accurate scheduling of the process and its resources. During process execution, visualization of the process timeline and critical path provides a basis for predicting whether a specific process instance will meet its milestones, in advance of when those milestones are scheduled to occur. This type of predictive process analytics yields more intelligence about processes by anticipating when problems will occur before they happen, enabling better human and automated decision-making.

This paper addresses the mandate for more intelligent processes that is emerging in the business process management market, and how time-based views and predictive analytics provide powerful tools for achieving that goal.

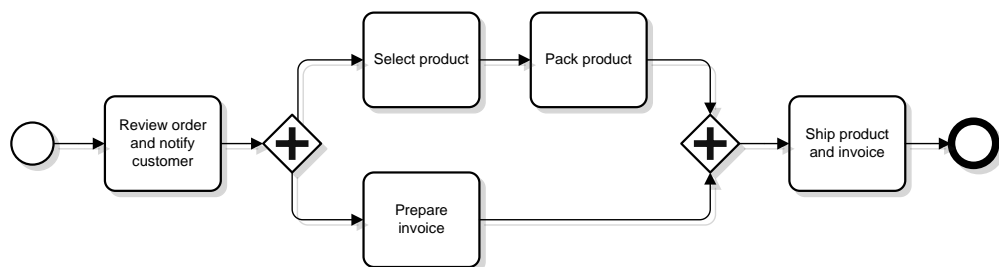
How Time Works In Processes

Time is an inherent characteristic of any process, and is a critical real-time metric for intelligent, agile processes. In



short, the behavior of processes over time can be used to determine the potential for process improvement, either on the fly for a specific process instance, or in ongoing process improvement and redesign efforts.

The concept of a temporal dimension in processes isn't new: the early days of BPM focused primarily on reducing cycle time in processes. Current flowchart-style process models, including the standard Business Process Model and Notation (BPMN) provide only rudimentary modeling of time within processes, typically limited to task deadlines that trigger when a specific time has elapsed; modeling of wait times and task execution times are considered the domain of process simulation rather than features of more general process analysis and design. Although a flowchart representation models dependencies between tasks, lack of full temporal information means that timelines and critical paths cannot be easily visualized during process execution in a BPM system (BPMS). The result is that BPMS's typically only measure temporal metrics in the aggregate after process completion, except when raising exceptions for task-specific deadlines.



BPMN Representation Of A Process

In BPMN, process instances in danger of missing their overall deadlines often cannot be identified, and the impact of a

missed task deadline on the entire process timeline is poorly understood if past performance of the remaining tasks is not used to recalculate the expected completion time.

Some BPMS's allow for an alternative representation of processes as a Gantt chart, in addition to the typical flowchart or other notations, in order to identify temporal constraints. Familiar to project managers, Gantt charts show the relative dependencies of tasks, and plot an overall timeline and critical path to completion. If a task deadline is missed, the impact on the process timeline is immediately visible. Ideally, the process execution dynamically adapts to satisfy the overall temporal constraints, although often simply visualizing the critical path allows a knowledge worker to determine a course of action (allocating additional resources, boosting priority, or removing tasks) that will shorten the time required for the remaining tasks in order to meet the process deadline. This representation also lends itself to processes that are a collection of unordered tasks without temporal interdependencies, as in case management.



Gantt Chart Representation Of A Process



The predictive element that time brings to processes is pivotal to operational efficiency and the ability to make better business decisions. Being able to review historical and current data enables business leaders to deploy alternative tactics to overcome emerging problems, particularly in long-running, customer-facing processes.

What Is An Intelligent Process?

Gartner Research is reshaping its BPMS category into intelligent business process management suites (iBPMS), “targeted at organizations that want to optimize their agility, and to respond to changing conditions intelligently and swiftly.”¹ Driven by organizations’ need to intelligently manage operations in real time, iBPMS includes process mining, event-driven analytics and automated constraint-based optimization, combining the near real-time nature of event-driven active analytics with the power of on-demand predictive analytics.

Intelligent processes allow you to see where you are, and predict where you’re going, by combining data and analytics seamlessly with business processes. Intelligent processes respond to changing business environments, changing the course of a running business process in real time based on internal and external events, and relative to the overall goals and constraints. As more process instances are executed,

¹ “Selection Criteria Details for Intelligent Process Management Suites”, G00219274, Gartner, Inc., 17 November 2011



intelligent processes feed back actual historical information to optimize the process for future instances.

Intelligent processes require analytics to be faster and more directly integrated with executing processes for a near real-time view, often using in-memory analytics and databases. They also require proactive alerts: via in-application guidance, desktop dashboards or mobile devices, so that the right people can be notified and respond to potential problems before they occur; or via service calls or outbound events, so that other systems and processes can respond automatically.

Intelligent processes thrive on events, both creating and consuming events. Events generated by a process may be analyzed by an event-processing platform in order to analyze patterns and potential issues. Events from external sources – including social media channels or device instrumentation – may be received by processes to trigger or guide their execution. It's necessary to monitor and respond to the events generated by a process rather than just the eventual outcomes in order to realize the benefits of predictive analytics; the value of these predictions deteriorates as a process instance proceeds towards its final outcome, hence it's necessary for the analytics to be sufficiently fast to provide guidance before it's too late to correct its path.

Intelligent processes don't just provide visibility, but, more importantly, the agility to act on that information to avoid problems still in flight.

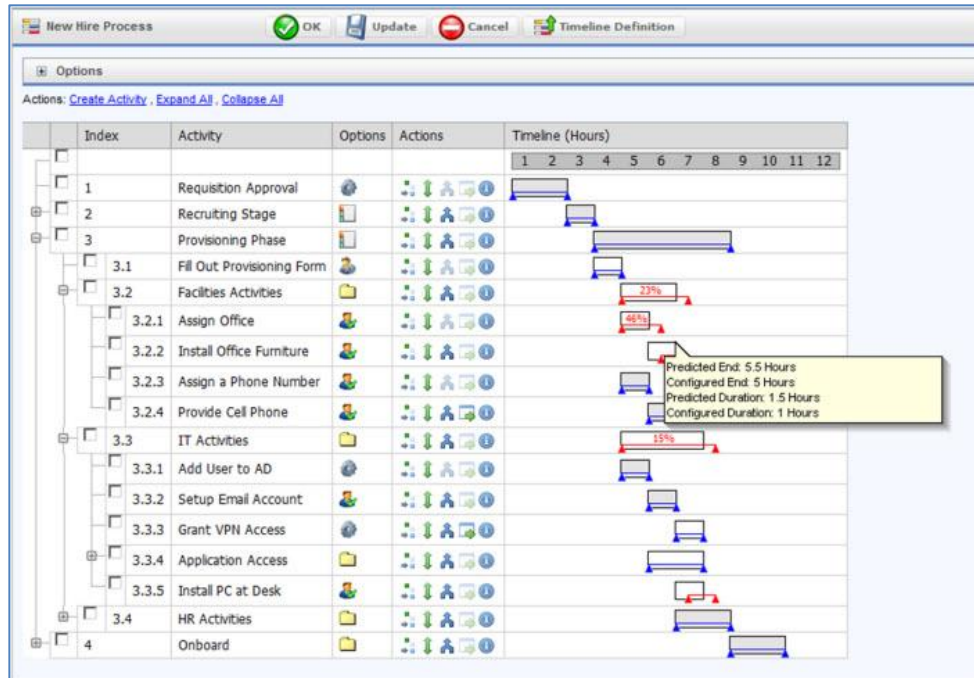


Improving Process Outcomes Via Predictive Analytics

Intelligent processes avoid problems before they occur, and predictive analytics is a cornerstone of that capability.

The time-oriented nature of processes enables forecasting future behavior of processes, and averting problems before they occur based on events to date. This requires analytics not just on the aggregate, but on individual process instances that might be straying outside the boundaries. If process activities can be used to predict potential missed milestones sufficiently far in advance, problems can be avoided before they occur, and before external customers are aware that their processes are off track. If these processes are automated in a sufficiently agile BPMS, information can be fed back to allow the process to self-adjust through automated decisioning, or be adjusted manually upon receipt of an alert.

Furthermore, predictive process analytics can be used to dynamically optimize the process model relative to the process goals. This takes the concept of continuous process improvement to a new level, where the process is continuously improving through self-adjusting mechanisms.



Example Of Process Timeline² With Predicted Timelines

The result of process intelligence and predictive analytics is a better understanding of the current state of processes relative to their goals, and the information required to make better decisions sooner, before potential problems grow into real problems.

Summary

We've moved a long way from having to decide between simple BAM dashboards for real-time process monitoring, and complex but historical analytics in an external business intelligence platform, since many BPMS's now provide enhanced real-time analytics directly or via real-time connections to external analytics systems. Visualizations in a

² "Process Timeline" is a trademark of BP Logix, Inc.



dashboard are still necessary for aggregate process monitoring. The real benefit, however, is the ability to analyze and predict problems before they occur, not just display what's happening right now.

The result is much greater visibility into processes, particularly during execution, so that people involved in those processes can use that information to make changes to the process on the fly. Although historical statistics are important, a near real-time view on work in progress is the key to visibility and agility.

Process intelligence and predictive analytics can help you to make fundamentally better business decisions, and make them early enough to head off potential problems.

About the Author

Sandy Kemsley is an independent analyst and process architect specializing in business process management. She performs engagements for both end-user organizations and BPM vendors across North America, writes the popular "Column 2" blog at www.column2.com and is a featured conference speaker on BPM.



BP Logix Addendum

The following case study is provided by BP Logix, Inc., the sponsor of this white paper, and is not written or edited by Kemsley Design Ltd.

Starwood Hotels & Resorts and Process Timeline

Starwood Hotels & Resorts Worldwide, Inc. is one of the leading hotel and leisure companies in the world with 1,051 properties in 100 countries and territories, and 145,000 employees at its owned and managed properties. Starwood Hotels is a fully-integrated owner, operator and franchisor of the internationally renowned brands that include St. Regis®, The Luxury Collection®, W®, Westin®, Le Méridien®, Sheraton®, Four Points® by Sheraton, the recently launched Aloft®, and ElementSM.

Matthew Guglielmetti is the Sr. Manager of Revenue Management Systems within Starwood Hotel's Operations Group. His team is responsible for Starwood's automated revenue management system. That system involves a lengthy installation process, conducted across properties globally, with multiple users per property being trained or working on the process. The automated revenue management system also includes constituents from across many departments, as well as multiple 'pass-offs' from business users to the IT organization.

In addition to the pass-offs, the process itself changes frequently. Recognizing that Starwood wanted to streamline and automate its process, and that management did not want to have to engage IT or an outside company every time an adjustment was needed, Guglielmetti's group was tasked with finding a software solution that could accommodate a process with many tasks and dependencies.

“Tracking installations manually was not sufficient as things could be missed and there were an increasing number of properties and users requiring the system. We knew we needed to automate our processes to have a better customer experience – and it had to be one that could be used by business users (and not require the assistance of IT) would be cost effective and could be quickly implemented.”



Recognizing that his group needed an automated way to collect the files and documents associated with workflows, as well as between team members, Guglielmetti's team identified criteria for the system they wanted to implement. The team recognized that it had a number of completely different processes whose workflow, activities and routing needed to take different paths based on pre-defined criteria.

In addition they needed to:

- Route documents without user intervention
- Accommodate end user decisions as to next steps
- Manage parallel, non-linear processes running at the same time (that was critical)
- Interact with hotel users outside of its own group
- Provide security based on system on roles and responsibilities
- Find a system that was simple to implement and control
- Use a tool that did not require the business users to be technical (no programming!)

Guglielmetti believed a cloud-based product could address his requirements. After evaluating competitive offerings, his team recommended Process Director/Cloud Edition and became one of the first companies to take advantage of the Process Timeline™ technology.

“As a business group, we needed a solution that didn't require us to write code in order to implement workflows and provide the automation we required. BP Logix Process Timeline was a huge benefit to us. There are currently 33 steps in our Timeline. At any point in time, we have properties that are at different points in our process – and we now know, and can identify, what is happening at any step within that process. The Cloud Edition represents an ideal solution for organizations that want quick results with a lower capital investment,” ” said Guglielmetti.