Workflow and Orchestration Solutions from SAP - Overview and Positioning

Applies to:

SAP NetWeaver Business Process Management, SAP NetWeaver Process Integration, SAP Business Workflow and SAP NetWeaver Process Orchestration. For more information, visit the Business Process Modeling homepage.

Summary

The objective of this document is to outline the different workflow and service orchestration solutions that are available to SAP customers, focusing on the strengths for each and recommendations for usage.

A summarization of the findings is available at the end of the document.

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Created on: 6th December, 2011

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SAP Solutions

Over the past several years, SAP has been evolving their workflow and service orchestration solutions to the point that multiple options currently exist for customers requiring workflow capabilities. Many customers have asked to get a clearer understanding on the intended use cases so that they can better understand when to use each. This section of the document concentrates on outlining the existing solutions and what use cases they support.

SAP Business Workflow

SAP Business Workflow is an ABAP-based workflow engine that is embedded as part of the SAP Business Suite for orchestration amongst SAP applications. It has grown out of the need to define configurable, human centric processes or workflows. In the context of the different solutions within SAP Business Suite (ERP, SRM, PLM, CRM, etc), there is always a need to define human centric interactions that can help manage the information and data contained in it. For example, one of the main use cases is the need for well defined and repeatable approval processes that may depend on really complex rules and policies. Usually these processes require multiple approvals or steps that may take their time to complete (i.e.: Purchase Requisition approval processes within ERP). SAP Business Workflow has a native and good set of capabilities for managing SAP Business Suite data objects contained within the application packages (ERP, SCM, CRM, etc) at a low effort and cost. SAP Business Workflow has proved most effective when the workflow is confined to a single SAP instance.

SAP Business Workflow also has good integration with Business Rules Framework Plus (BRFplus). BRFplus is an ABAP-based business rules solution introduced with SAP NetWeaver 7.0 Enhancement Pack 1. It is provided as part of the technical foundation package SAP Business Suite runs on. As such, it can be leveraged seamlessly within SAP Business Suite as its primary use case (and also used in other business application built-in). This enables the delegation of rule resolution to a framework that does not require any coding. For example, business rules and policies can be defined using decision tables (no programming language is needed) where it is possible to layout the conditions for pricing, discounts, approvals, etc. While business rules can be maintained and administered by non-technical users, the creation and assembly of business processes within SAP Business Workflow requires a developer to help orchestrate these transactions and involve the needed individuals within an organization.

SAP Business Workflow delivers the work to end users through the SAP GUI inbox as well as the Universal Worklist inbox (available as part of the SAP NetWeaver Portal). Email notifications can also be configured to facilitate the reach of individuals through this channel. With Duet® Enterprise software, it is now possible to expose the Universal Worklist into a Microsoft SharePoint Portal enabling yet a broader end user reach for workflow tasks. Duet Enterprise allows to use Microsoft SharePoint together with SAP applications. SAP Business Workflow also offers a functional and Object Oriented API (the latter available in Enhancement Pack 6) that enables extensibility and accessibility by other components.

Although SAP Business Workflow can invoke ABAP and SOAP services, this has never been its primary use case. These capabilities have been added to support the human centric interactions and not intended for implementing complete integration centric business processes (i.e. processes that automate system to system communication – this has been the focus of ccBPM or SAP NetWeaver Process Integration). The ability to help retrieve and update information (the main reason these features were added) before and after user centric interactions help streamline the data management when human interactions are needed without unnecessary additional steps to synchronize data. Tasks can be implemented with Web Dynpro ABAP forms. SAP Business Workflow also offers a public API for connecting to deployed workflow programmatically.

SAP Business Workflow may be most appealing to organizations having an IT organization with ABAP skills as this is a pre-requisite to effectively implement business processes or workflows implemented with this solution. SAP Business Workflow is a 100% ABAP implementation and it runs on the same ABAP Application Server that SAP Business Suite runs on, where it is possible to leverage existing ABAP Administration resources.

Many SAP applications use SAP Business Workflow enabling **preconfigured workflow scenarios** to be reused in various situations. The scenarios can either be implemented without any changes or configured for

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your business processes by making minor adjustments. These workflow scenarios reduce implementation time significantly and have been optimally configured for the respective application functions.

SAP Business Workflow has more than 10 years of maturity and is currently in maintenance mode. No active development is done on SAP Business Workflow with the exception of issue correction and minor improvements. More information on SAP Business Workflow can be found on its Product Availability Matrix on the SAP Service Marketplace (https://service.sap.com/pam).

SAP NetWeaver Business Process Management (SAP NetWeaver BPM) / Composition Environment (SAP NetWeaver CE)

SAP NetWeaver Business Process Management (SAP NetWeaver BPM) enables business and IT professionals to compose processes jointly on the basis of a single, directly executable process model. This makes for fast, flexible process development and deployment - ultimately reducing costs. SAP NetWeaver BPM can help improve the efficiency of business processes, reduce errors in complex repetitive tasks, and lower exception-handling costs.

SAP NetWeaver BPM is an extension to the SAP NetWeaver Composition Environment (SAP NetWeaver CE) offering available with SAP NetWeaver®. SAP NetWeaver BPM adds a process centric perspective to all the existing, well integrated capabilities for creating composite applications, including user interface frameworks (Web Dynpro for Java, Web Dynpro for ABAP CHIP, SAP NetWeaver Visual Composer and SAP Interactive Forms software by Adobe), as well as a SOA component based on Web Services (it can leverage the more than 4000 out of the box Enterprise Service Web Services connecting to SAP Business Suite) and the native SAP RFC protocol. For connectivity with non-SAP systems it can leverage the SOAP protocol (supporting synchronous and asynchronous styles) or Java (with the ability to leverage the large Java ecosystem).

SAP NetWeaver BPM is intended to support composite business processes of SAP systems with heterogeneous (non-SAP) systems. This means supporting the implementation and execution of business processes spanning SAP and non-SAP backend applications, by orchestration of human and automated activities. The nature of these orchestrations is stateful, supporting long running processes. For stateless service orchestrations, you should consider leveraging the A2A capabilities of SAP NetWeaver PI.

SAP NetWeaver BPM is tailored to better align Business with IT relying on the usage of the BPMN standard (Business Process Model and Notation) that is also becoming the de facto standard in the market. Ease of modeling business processes is a highlight of this solution available both on a web browser, as well as a desktop tool. BPMN models created with SAP NetWeaver BPM can be exported and leveraged by other solutions, as well as being able to import BPMN 2.0 Level 1 compliant business processes.

In the same way SAP Business Workflow has a native integration with a business rules component (SAP NetWeaver Business Rules Management for ABAP – aka: BRFplus); SAP NetWeaver BPM leverages the SAP NetWeaver Business Rules Management (SAP NetWeaver BRM) component. It is fully integrated with SAP NetWeaver BPM and allows delegation and empowerment for managing rules and policies to process owners, providing timely agility to manipulate business processes. For rules or policies that are heavily relying on SAP Business Suite data structures, it is possible to leverage BRFplus in this context too.

End users can leverage the out of the box Universal Worklist inbox to receiving and processing tasks (it can use a single Universal Worklist instance shared with SAP Business Workflow having a single inbox for hybrid scenarios where SAP NetWeaver BPM and SAP Business Workflow are used). SAP NetWeaver BPM also offers a powerful open standard generic business process API that opens the spectrum to external applications (most remarkably mobile apps) to connect to business processes.

SAP NetWeaver BPM may be most appealing to organizations that need to connect SAP and non-SAP systems within the same business processes. It may also be used to connect business processes spanning more than one SAP instance providing orchestration capabilities across these instances (for example, merger and acquisitions use case where consistent processes need to be enforced across different silo SAP instances for different divisions). We recommend taking a look at the existing best practices for orchestrating multiple systems and creating a sustainable architecture as described in the “Process Orchestration and SOA Guidelines for Best-Built Applications” section of the “Best-Built Applications” booklet accessible online through the following SDN link: http://www.sdn.sap.com/irj/sdn/bestbuiltapps.

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SAP NetWeaver BPM is a 100% Java orchestration engine implementation and as such, Java expertise will be needed to implement and execute business processes end to end.

SAP NetWeaver BPM is SAP's current and active mainstream solution for the composition of business processes and will continue to evolve. Incepted almost 4 years ago, it has gone through 4 iterations and revisions. More information on SAP NetWeaver BPM can be found on its SAP Product Availability Matrix on the SAP Service Marketplace (https://service.sap.com/pam).

Guided Procedures

Guided Procedures was the solution preceding SAP NetWeaver BPM. This code line is currently on maintenance mode with no further active development on it. SAP recommends that all new business processes implemented with Guided Procedures or fitting the SAP NetWeaver BPM use cases, are implemented with the SAP NetWeaver BPM component.

SAP NetWeaver Process Integration

SAP NetWeaver Process Integration (SAP NetWeaver PI) includes an integration centric orchestration solution known as ccBPM (cross-component Business Process Management). This is an ABAB-based, BPEL orchestration engine tailored to manage integration centric only use cases. It extends SAP NetWeaver PI in the sense that it can use and leverage the extensive adapter framework and its broad integration spectrum. This complements the existing Service Bus capabilities offered by SAP NetWeaver PI for mediation and point to point connectivity.

SAP NetWeaver PI's ccBPM orchestration engine is a 100% ABAP implementation. However, SAP NetWeaver PI is evolving to become a single stack, java-based solution. As such, SAP NetWeaver PI and SAP NetWeaver BPM are converging towards a common process engine. This evolved integrated solution is now available to our customers as SAP NetWeaver Process Orchestration.

SAP NetWeaver Process Orchestration is the future process engine supporting both human-centric and integration-centric orchestrations. With this evolution, there are no further enhancements planned to the ccBPM component moving forward. Each incremental delivery package for SAP NetWeaver Process Orchestration (delivery packages enable a more flexible release cycle than formal Service Packs or Enhancement Packs) will support additional patterns currently supported on ccBPM and over time, SAP NetWeaver Process Orchestration will fully replace ccBPM. This will enable running stateful and stateless service orchestrations on the same container allowing a lower administration and management TCO for these two solutions (SAP NetWeaver BPM and SAP NetWeaver PI) that in the majority of the cases are deployed together.

Interoperability

Despite the general advice provided in the previous sections, the reality is that organizations are tied to specific IT landscapes, constraints and restrictions. It is good to have strong and bold policies as to what solutions to use under different use cases and conditions, but it is also important to remark that in some cases, it is not possible to completely re-implement existing business processes. Some cases call for connecting existing pieces together and for this, it is imperative that the existing orchestration solutions can interoperate at runtime together to create a much larger end to end value chain.

The recommended interoperability should be based out of Web Services. SAP Business Workflow and SAP NetWeaver BPM (as well as ccBPM) allow exposing process functionality through a Web Service interface. Not only can these solutions expose functionality from the SOAP framework, but they can also invoke Web Services. As such, this communication framework should be leveraged as a standard, loosely coupled mechanism for stitching together different workflow and orchestration solutions.

Let's assume for example, an organization is defining its new consolidated purchase requisition approval process across different divisions. In this situation, it is possible to define the umbrella business process within SAP NetWeaver BPM and delegate the actual approval of the purchase requisition within different

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SAP instances to a multi-process approval workflow implemented within SAP Business Workflow and managing other approvals outside SAP Business Suite with SAP NetWeaver BPM. This would be a practical example on how the two solutions would be combined to get more value in a heterogeneous use case. The approval steps are still confined and managed within the environment the end users utilize, but the end to end process is managed with a solution that can span multiple systems within the IT landscape for coordination purposes. The way the SAP NetWeaver BPM based process can trigger a SAP Business Workflow process would be through its Web Service interface (also available as a reusable way for creating approval workflows externally).

Implementing and embracing organization specific business processes should be an organic and non-disruptive exercise. Wise judgment should be used in what can be reused and what needs to be moved to new solutions analyzing future value and TCO. With SAP NetWeaver BPM 7.3 release is introduced the ability to link to ABAP Web Dynpro as the user interface for BPM user tasks. This allows leveraging know-how and expertise on this UI framework as well as broader user centric orchestration capabilities in SAP NetWeaver BPM.

Additionally, it is possible to leverage the existing public APIs for connecting the selected orchestration solution with other applications in the ecosystem.

Comparative Summary

This section is intended to provide a summarized perspective on the topics discussed in this document. The first comparative chart depicts solution coverage on a feature based analysis. Take a look at the chart below for specifics:

Functionality	SAP Business Workflow	SAP NetWeaver BPM	ccBPM	SAP NetWeaver Process Orchestration
User-centric capabilities				
Integration-centric capabilities		(1)		
Heterogeneous integration				
End User experience (task inbox)				
External consumption and extensibility (API)				
Java-based integration	(2)			
ABAP-based Integration		(3)		

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Implementation of task form				
Process modeling				
Collaborative process modeling				
Leverage SAP Business Suite processes through SAP Solution Manager (4)				
Business Rules				
Process Monitoring and Analytics				

(1) If used in support of user-centric scenario or low volume, low data integration processes (according to sizing recommendations)
(2) This refers to the capabilities of invoking Java based components through SOAP wrappers.
(3) This refers to the capabilities of invoking ABAP based components through RFC, as well as SOAP. There are also new capabilities of re-using ABAP Web DynPro in BPM user centric steps and visualize BWF models as BPMN in NW BPM.
(4) This refers to the BPL (Business Process Program) and its new modeler BPB (Business Process Blueprint) which can generate BPMN for the process definitions stored in BPR (Business Process Repository).

This second chart depicts solution recommendations on a use case basis. Depending on what is the context of usage, this second table may help make a better solution selection.

Use Case	Recommended solution
Single SAP instance and user-centric	SAP Business Workflow. For example: Manual purchase order approval on a regional division (which has an SAP instance allocated to it and is independent).
Multiple SAP instances and user-centric	SAP NetWeaver BPM. For example: Master data synchronization, order forwarding, availability checks.
Single SAP Instance and integration-centric	SAP NetWeaver BPM & ccBPM. Refer to comments on ccBPM as SAP NetWeaver BPM is SAP's future orchestration engine. Consider ccBPM if only ABAP background. For example: Management of purchase

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	orders with suppliers and partners using B2B.
Multiple SAP instances and integration-centric	SAP NetWeaver BPM & ccBPM. Refer to comments on ccBPM as SAP NetWeaver BPM is SAP's future engine. Consider ccBPM if only ABAP background. For example: Master data synchronization, order forwarding, availability checks.
SAP only orchestrations	SAP NetWeaver BPM. Consider SAP Business Workflow/ccBPM if only ABAP background.
SAP and non-SAP orchestrations	SAP NetWeaver BPM
ABAP skill sets	A combination of SAP Business Workflow and ccBPM
Heterogeneous IT skill sets	SAP NetWeaver BPM
IT centric orchestrations	SAP NetWeaver BPM. Consider ccBPM if only ABAP background
IT-Business shared orchestrations	SAP NetWeaver BPM.
Business Rules integration	Both solutions support integration with Business Rules with equal supporting capabilities. The decision factor will rely on any of the other use cases.

These two summary charts are intended to provide best guess recommendations. Real case scenarios may require a hybrid implementation of the two main solutions: SAP NetWeaver BPM and SAP Business Workflow. These charts are intended to guide what pieces of a possible hybrid system should be implemented with the available SAP orchestration solutions.

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