BPM and SOA: A Strategic Alliance

Dr. Gopala Krishna Behara

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Abstract

SOA can exist without BPM, and BPM has flourished without a firm understanding of SOA. The combination of SOA and BPM is more powerful than either is alone.

SOA provides the ability to create process independence. SOA, loosely coupled with BPM, automatically creates services that can be reused in many ways across an, enterprise, and in multiple processes that can be continuously improved.

This paper consolidates the concept of relating BPM and SOA to create greater business agility. It highlights the demerits of BPM and SOA in Silos and lists the advantages of using BPM and SOA together.

Introduction

BPM

BPM is a methodology, as well a collection of tools that enables enterprises to specify step-by step business processes. Business process management (BPM) addresses how organizations can identify, model, develop, deploy, and manage their business processes, including processes that involve IT systems and human interaction.

SOA

The Service Oriented Architecture (SOA) concept is based on the principle of developing reusable business service and building applications instead of building monolithic applications in silos.

SOA is not a product. It is about bridging the gap between business and IT through a set of business-aligned IT services using a set of design principles, patterns, and techniques.

In an SOA, resources are made available to participants in a value net, enterprise, or line of business – spanning multiple applications within an enterprise or across multiple enterprises. It consists of a set of business-aligned IT services that collectively fulfill an organization's business processes and goals. You can choreograph these services into composite applications and invoke them through standard protocols.

Analysis of BPM and SOA Combination

The combination of business process management and service-oriented architecture will benefit IT professionals and business users. A service-oriented architecture cannot be useful without a business process management infrastructure. BPM is a core element of the service-oriented development of applications (SODA). It is often used to assemble new applications, because SOA and BPM work hand-in-hand in this situation as natural partners. Each business process is modeled as a set of individual processing tasks. These tasks are typically implemented as services within the enterprise. BPM helps in creating process models; process automation, in the form of invoking services.

SOA exposes services, and BPM, which demands process flow completion, consumes services. SOA opens a vast inventory of services for BPM to "bond together" into a comprehensive flow. Regardless of whether this is composite or not, this flow addresses critical business processes.

Recently, more companies are starting to focus on making tools to instantiate business process more strategic and more usable. For example, Microsoft has added some process management capabilities into the new release of Visual Studio. IBM has delivered a suite of business process tools under its WebSphere brand. Oracle has focused on process through its new fusion middleware platform. SAP has put a renewed focus on business process through its strong partnership with IDS Sheer.

Industry Trends in SOA & BPM

By 2009, SOA business application vendor innovation, lower-cost upgrades, and the integration of user productivity tools will be recognized as the leading benefits of SOA (0.8 probability) [1].

The market for business process management (BPM) tools is expected to reach $3 billion by 2009 – IDC [2]

By 2008, more than 60 percent of enterprises will use SOA as a guiding principle when creating mission critical applications and processes- Gartner [3].

By 2008, SOA will enable organizations to increase code reuse by more than 100 percent – Gartner [4]

BPM and SOA in Silos

There are numerous applications in silos, and sharing information among these applications is difficult due to differences in technology platforms and data models.

In the case of BPM based application, there exists a tight coupling between integration technology and individual business applications. Whenever business process changes, the integration technology changes, and it increases the operational cost. This tight coupling also makes this approach harder to change.

Business Processes are devastated in multiple applications affecting all the applications. These affected applications and interfaces must be modified to accommodate the changed business processes.

BPM without services is complex and brittle, because the process layer is required to access the underlying business applications directly.

BPM without services requires the process layer to access the underlying business applications directly. This pollutes the business process with unnecessary details about the current applications, the APIs they provide, their internal data models, and the technologies in which they are implemented.

Also, the business challenges faced by the SOA based solution are to

- Define and validate services, manage reuse, and allocate costs
- Accommodate SOA approach in software development methodologies of the enterprise
- Design underlying infrastructure that support SOA and select technologies that support SOA
- Manage the collection of services and orchestrate services into business processes
- Deal with any lack of SOA expertise and experience

BPM and SOA Together

SOA can exist without BPM, and BPM has flourished without firm understanding of SOA. The combination of SOA and BPM is more powerful than either is in itself. Services are joined together to arrive at a composite business process. SOA minimizes the gap between business analysis and IT development work. Business Processes and data may be considered and designed simultaneously due to access to applications and databases.

As shown in Figure 1, the services layer consists of a line of business services that are aligned to a particular business domain, reusable technical services that can be shared across multiple business domains and the Web services platform, which allows services to be defined and utilized in a manner that is independent of the underlying application and technology platforms.

The services layer provides the ideal platform for the business process layer for the following reasons:

- A line of business services provides coarse-grain business functionality that maps to the business tasks in a business process.
- Business process is not responsible for knowing any details of the underlying application and technology platforms, as Service contracts for the line of business services provide well-defined and unambiguous interfaces for accessing the services.
- Service registry and service discovery facilities provided by the service layer ensure that the business process layer can dynamically locate and access services.
- A service-level data model is defined based on the business domain and is independent of the data model used by any particular application.
- A service-level security model provides single sign-on and role-based access control to ensure that process tasks are authorized to use services.

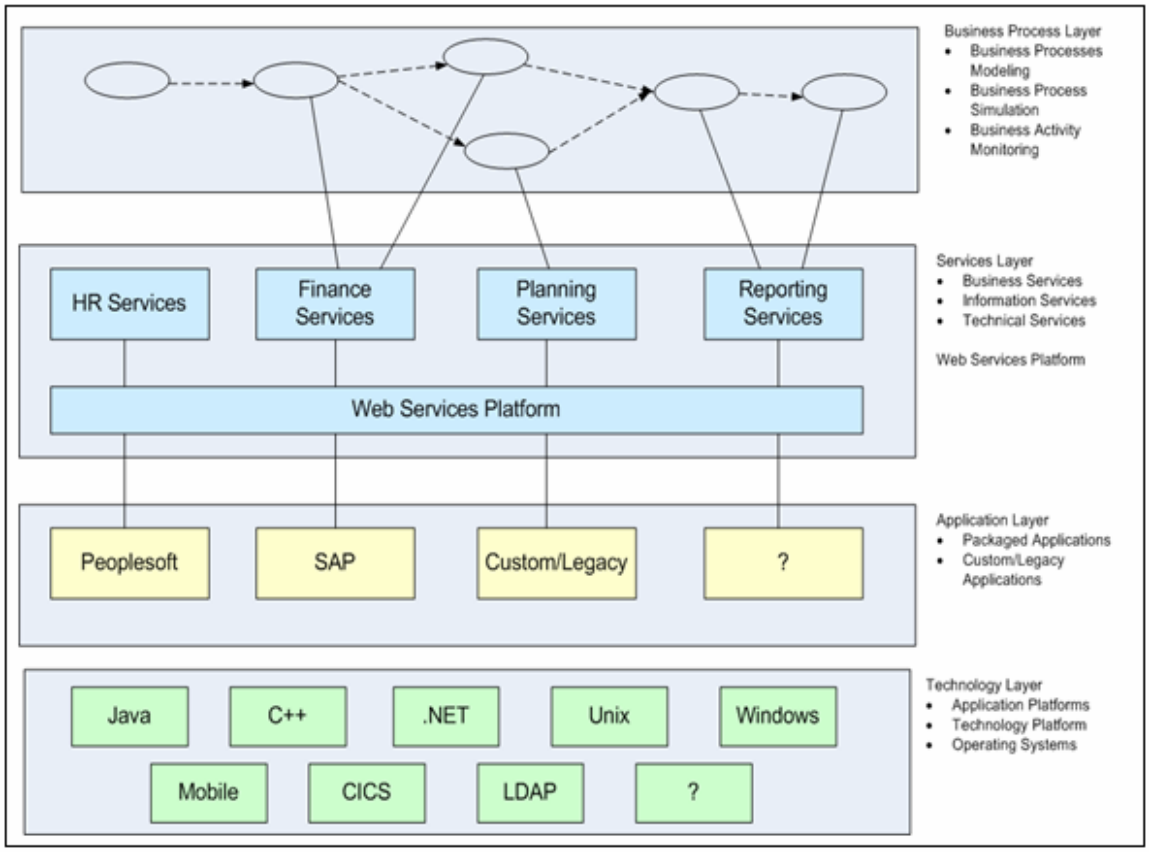

Figure 1. Relation between Business Process Layer and Service Layer

The major point of implementing an SOA is to provide a loosely coupled integration platform that allows application instance to change and evolve without affecting the core integration technology. Similarly, the process modifications that require different applications to communicate with each other should not alter the core integration technology as well as application instance.

This process and service independence helps to establish the relationship between business process modeling and application implementation. Figure 2 depicts the relationship between BPM and SOA. As shown in the diagram, BPM does the modeling, simulation, and redesign of processes. SOA infrastructure orchestrates business processes and mediates service providers. Services are exposed, to be used in various processes. Service changes should not impact processes. Process changes reuse various services as needed.

The process changes will be implemented more rapidly at the enterprise level, because SOA decouples processes from the application implementation, and the communication between process and application happens only through SOA integration. This SOA integration minimizes the gap between process modeling and application implementation.

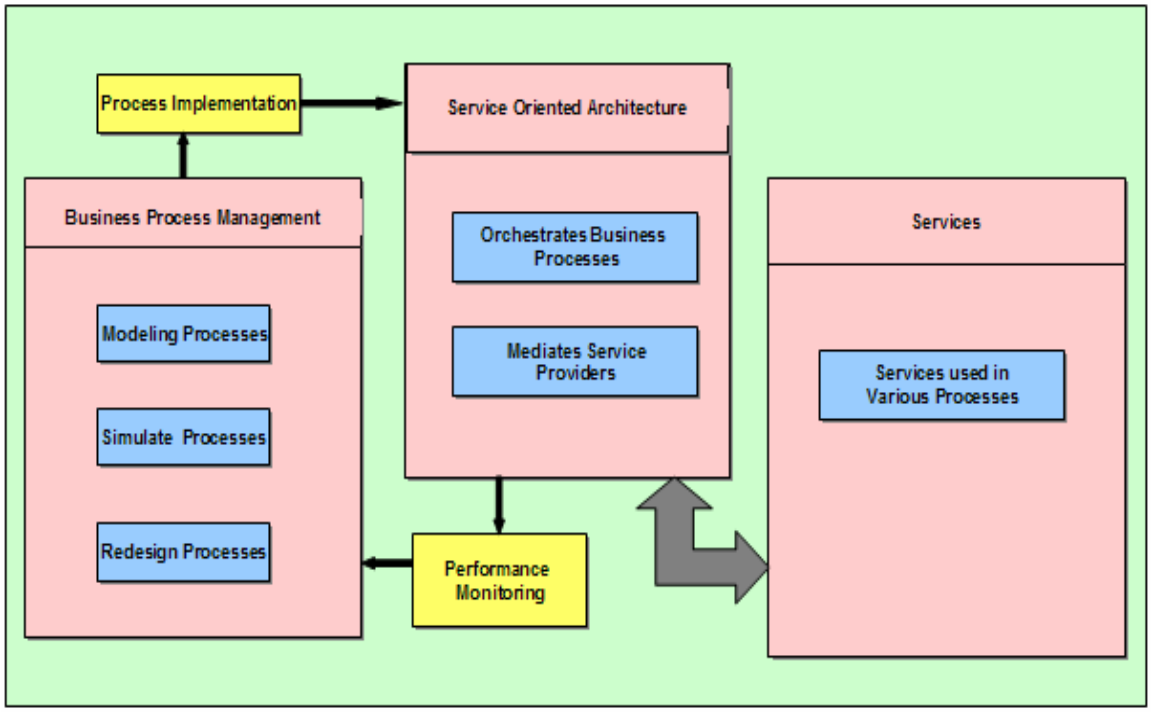

Figure 2. Relation between BPM and SOA

Enhancing Process Design using SOA

SOA creates modular business components that encapsulate business logic and data with interfaces. The modules created are used to execute process flow steps. All the process steps in a business process may or may not be tied to the SOA service. BPM blends SOA derived services with calls to integration brokers and other non-SOA services.

SOA is a tool for designing business processes. Services can be joined to deliver composite business functions or business processes. A single service can be reused in the context of multiple business processes. Therefore, SOA is a set of design principles that can be applied to the design of both computing and process assets.

SOA helps business owners in designing IT systems that enable business processes. This improves the adaptability of process change, increases reuse, and improves process consistency.

The SOA approach affects the overall efficiency of IT operations, in particular, application development in the form of reuse of common, shared business services in multiple processes and systems.

For large organizations, the business processes, business rules, and policies are inconsistent and are redefined for each new application and process. SOA helps in reducing the inconsistencies in the form of creation of well defined and managed business services that are shared across multiple systems, irrespective of underlying technology implementation.

Influencing SOA through Process Management

BPM helps in converging the process services to build the composite business flows. BPM capabilities are built using state machines. The state machines help in integrity of business processes and in tracking the processes, which invokes many services.

By using BPM, SOA is tied to the process services to develop composite business flows. BPM adds additional runtime power for service composition and the ability to modify a flow in exchange for more runtime complexity. BPM can also provide the assurance that long-running processes are performed and run any necessary compensating transactions in the case of failure.

BPM leverages and extends SOA's power by adding a flexible, agile runtime layer to the services exposed by SOA.

Conclusions

BPM and SOA provide a perfect combination for enterprise computing. BPM provides the higher-level abstraction for defining businesses processes, as well as other important capabilities of monitoring and managing those processes. Services provide the functions that support those processes. SOA provides the capabilities for services to be combined and to support and create an agile, flexible enterprise. BPM without SOA is useful for building applications, but difficult to extend to the enterprise. SOA without BPM is useful for creating reusable and consistent services, but lacks the ability to turn those services into an agile, competitive enterprise.

SOA provides the ideal level of abstraction for defining reusable business functionality, completely encapsulating underlying applications and technology platforms from the BPM system.

SOA generates modular business components that encapsulate business logic and generally accepted interfaces. The modules can easily execute the steps in a process flow.

SOA is the crucial foundation for BPM, supporting rapid assembly and orchestration of process services into larger, end-to-end processes.

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Glossary of Terms

Acronym/Abbreviation	Definition
BPM	Business Process Management
SOA	Service Oriented Architecture
SOAD	Service Oriented Analysis and Design
SODA	Service-Oriented Development of Applications
GUI	Graphical User Interface
API	Application Program Interface
BP	Business Process
BR	Business Rule

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Dr. Gopala Krishna Behara is an Enterprise Architect at Wipro Technologies. He can be reached at gopalkrishna.behra@wipro.com Work # 91 40 3079 5115; Mobile # 91 9848814235