BPM and SOA

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SOA Service Usage Types

The promise of speed and flexibility in responding to opportunities or competitive pressures continues to drive adoption of new technologies. The combination of SOA and BPM are increasingly playing complementary roles in the overall enterprise IT environment. But, how much are they really contributing to improved business responsiveness? Well, like all the technologies before them, and those yet to follow, acquiring the technology is just the first step. The hard part is knowing how to use the technologies. In this case, knowing what kinds of services complement business processes and how to design and implement services that support your business goals.

In my July 2006 column "What Kind of Service does a Business Process Need" www.bptrends.com, I described several different dimensions that we could use to categorized services:

- **Scope** – defines the organizational boundaries that a service is expected to operate in, such as enterprise, line-of-business, or workgroup.
- **Ownership –** defines what organizational unit is responsible for support of a service throughout its lifecycle.
- **Granularity** – describes the size of a service in terms of the amount of business function performed in a single request. I described small, medium, and large granularity services.
- **Construction** – refers to how the service has been implemented, such as composite, new, wrapper, or external 3rd party.

I also described a service hierarchy that combines these dimensions into a few common service types:

- **Business Service** – A service that provides a high granularity of business value to service consumers across the enterprise. The functions and information match closely to the semantics and syntax required of business processes. A business service is typically composed of finer grained (smaller) services.
- **Domain Service – A** mid-level service that provides business functionality within a specific business domain. Domain services provide common functionality in the construction of business services, but are not made available to service consumers outside of the business domain or organizational scope.
- **Utility Service** – A low-level service that provides discrete business functionality. The utility service is typically useful across the entire enterprise, such as address checking or part number validation. Utility services are typically provided and managed by a central service organization.
- **Integration Service** – A service that integrates functions and or data from existing systems and exposes itself as a service. The granularity of the service will be a compromise between what is desired by the enterprise model and what is possible based on the existing system.
- **External Service** – A service that is implemented and hosted by a 3rd party provider, such as credit checking or shipment tracking. External services can be business, domain, or utility services.

This column discusses another important dimension of service, that of the intended usage. Typically, we construct the SOA service layer (which is made up of the above service types) with three broad categories of service usage types;

- **Task services** – Services that implement a business function, activity, or task, such as calculate the price of an insurance quote, or validate the format of an address. Task services come in all different sizes ranging from discrete utility services to large business services. Smaller services tend to be more general purpose. Larger business services are usually compositions of smaller services and may be designed to support one or more specific process activity.
- **Entity services** – Services that primarily manage access to business entities. Examples of business entities are customers, policies, claim, etc., and correspond to major business information concepts. Entities are usually medium to large sized. Entities should be independent of any particular business process and, instead, are intended to be used in multiple different business processes.
- **Decision services** – Services that execute business rules to provide business decisions. An example of a decision service would be the underwriting of an insurance policy. Decision services generally provide yes/no answers to complex questions, or they support frequently changing externalized rules, such as tax regulations. Decision services are usually composed into other services and are small to medium in size.

The usage classification of services does not replace the previous dimensions. Rather, it can be applied to the different types in the service hierarchy. For example, we can have a business service that is task-focused or entity-focused. Similarly, we can have a domain service that is decision-focused, etc.

Overall, we combine these different types of services together to provide flexible business capabilities that support the activities of business process. Best practices provide a variety of patterns, techniques, and tools for service compositions that help us reduce dependencies, limit coupling, and maximize flexibility. Figure 1 provides a high-level illustration of a typical pattern designed to reduce dependency and increase reuse of entity services. The pattern shows a task level process service orchestrating multiple processes together. Each lower process provides access to one or more entity services. A task service might also make use of a decision service as part of its composition. However, an entity service is prohibited from directly invoking another entity service.

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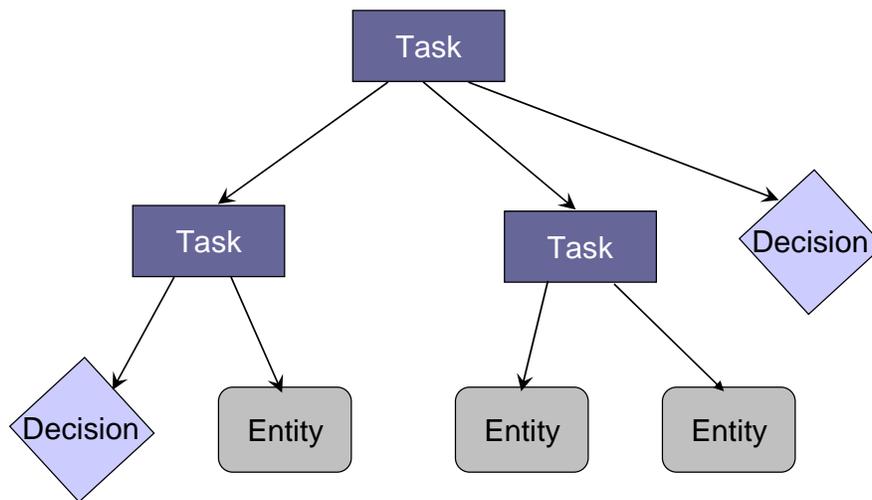
Figure 1. SOA Service Usage Categories

Let's look closer at decision services since they represent a new concept in most SOAs. One of the fundamental principles of architecture is the concept of separation of concerns. As architects or designers, we do this for many reasons – to manage complexity by breaking a problem down into parts, to focus a solution on a particular subject area, to reduce coupling, to facilitate change in volatile areas of the business while minimizing impact on more stable areas, etc.

BPM is an example of separating out the workflow or schema of a business process from the rest of the application logic so that the workflow can be executed and managed in a specialized environment, and so that the business can rapidly respond to changes by quickly modeling new processes. SOA helps facilitate this by providing business services as the basic building block of business processes.

Similarly, Business Rule Management (BRM) is an example of separating out business rules from the rest of the application logic so that the rules can easily be changed to support new business requirements. The idea of providing a specialized environment for processing business rules has been around for a long time in industries such as Insurance that are subject to geographical idiosyncrasies and ever changing regulatory requirements. However, until recently, there has been little interest with or integration of BRM into Service Oriented Architectures.

Conveniently, the structure of SOA and its relationship to BPM gives us some guidance in understanding where separate rules might provide the most value in an enterprise SOA environment. Services provide the most flexibility, value, and reuse at the level of discrete activities within a business process or subprocess. But rather than tasks being bound directly to a business process as was often the case in earlier generation BPM implementations, SOA supports multiple different processes or subprocesses with reusable task services at the top (composite) and middle of the architectural service layers. These same levels make sense when we want to unbind the business rules from the business processes and include them in our service compositions.

As such, we are now seeing the emergence of a new kind of service, *decision services* – services that execute business rules to provide business decisions. These decision services occupy the same layers as other SOA services and provide standard interfaces for use by processes. The main difference comes in the implementation, which is delegated to specialized rules engines for execution.

Figure 2 shows the typical BPM / SOA layered architecture (see my December 2005 column "BPM and SOA: Where does one end and the other begin?"). However, in this drawing I have expanded the service layer to show the different usage types.
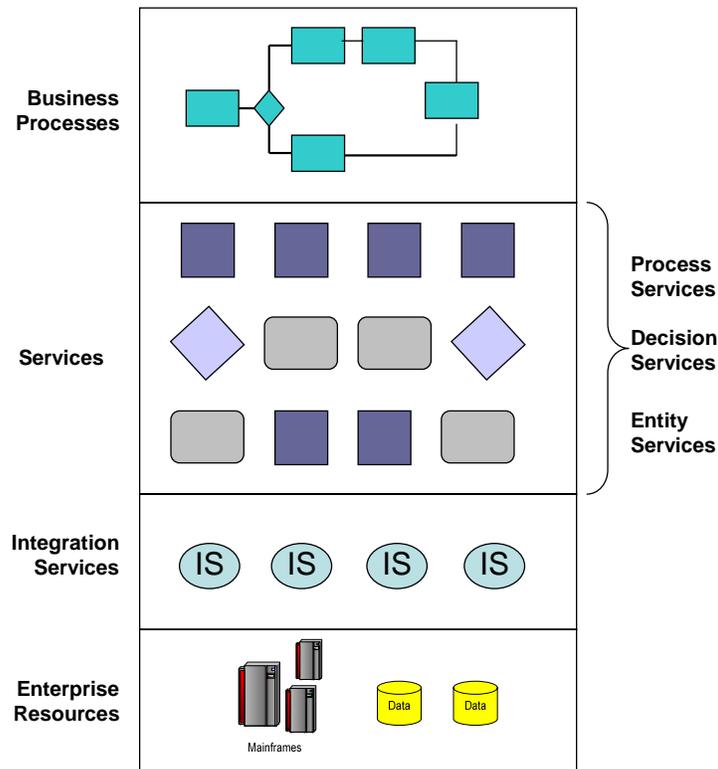
Figure 2. BPM / SOA Layered Architecture

As before, the tasks of the business processes are still implemented by services (most often, task-focused service), High-level task-focused business services are composed of other, smaller services. Now, we can create new and different compositions of services using the richer set of process, entity, and decision service usage types, combining the benefits of flexible, changeable rules, along with the benefits of modularity, flexibility, and reuse promised by SOA.

Maximizing the value of technology has always been a major challenge of IT. While I won't attempt to address organizational issues, I have tried to address another major obstacle, knowing how best to use the technologies to achieve your enterprise goals and objectives. So, as you look at how to integrate the BPM and SOA activities at your company, you also want to see if there are some business rules (BRM) activities going on as well. They all play a complementary role in IT, and, when used intelligently, can build agility and flexibility at the enterprise level, rather than creating new silos of technology.