Chapter 6.1
A Domain Specific Strategy for Complex Dynamic Processes

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ABSTRACT

This chapter identifies the issues that might create orthogonal complexities for process dynamism, and decouples the components implementing them in a "domain specific" way. Authors believe that traditional process management techniques for modeling and executing the processes still fall short to improve the dynamism of an enterprise. Some of the reasons are: using too "generic" techniques and tools for process management that are not scalable enough for typical business cases, having lack of architectural coverage to manage the tradeoffs between dynamism and other business quality issues, insufficient support for integrating legacy business processes, and unbalanced guidance between "primary" and "supportive" processes. In order to improve the business agility particularly with dynamic processes, effective abstraction and composition techniques are needed for the systematic design of primary and supportive processes in an organization. Authors bring in the "Domain Specific Kit" abstraction as a way to improve the dynamism of complex processes.

INTRODUCTION

For many decades, enterprises have been looking for efficient, reliable, flexible and adaptable processes. The increasing agility in business world enforces organizations to be more dynamic in every possible way. But, traditional process management techniques for modeling and automating the core

business processes fall short to enhance the dynamism in an enterprise. In traditional business process management, IT mainly abstracts the complexities of business processes with automated methods and tools that unsurprisingly introduce the categorization of processes as "primary" and "supporting" ones.

In order to improve the dynamism of complex business processes, IT departments should no longer be the roots of this process categorization, but rather they should provide the right toolset to business departments for flexible process modeling and execution. However, this is not that much easy to achieve. Proposals abound to segregate the business and IT perspectives for dynamic processes, but these efforts have fallen short so far for many practical cases.

Some of the issues behind this incapability can be detailed as follows: first, existing approaches are too "generic" to be used for every sort of complex [business] process. On the other hand, organizations run the business in different domains and expectedly, they have to comply with different process requirements. One example is integrating different processes of two organizations, one from banking domain and the other from automotive domain, for the processing of consumer loan for automobile sale transaction. The composition of their processes could not be simply orchestrated at run time without having a process choreography model at design time. The generic "process orchestration" models or strategies cannot easily solve service-oriented quality issues such as cross-domain security protocols (Tufekci et al., 2006; Aktas and Cetin, 2006).

The second issue is the lack of architectural coverage. The "dynamism" of a complex process is primarily a "non-functional requirement", which cannot be achieved by using pure "functional" approaches. Rather, architectural modeling plays an important role here to ensure the process quality. Hence, modeling the business processes with declarative approaches and implementing them using only Web Services will not be enough for process dynamism. This minimalist "functional" thinking cannot help design the architectural aspects (i.e. security, performance, flexibility, modifiability, extensibility and adaptability) of dynamic complex processes. Instead, a reference architecture model (in a meta-level) is needed to conceptually design the domain specific components of process management. That is why Service Level Agreements (SLA) is still a debate in the Service-Oriented Architecture (SOA) community to compose services of different processes (Keller and Ludwig, 2002).

The third drawback is the lack of support for integrating the legacy processes. We know that enterprises still have to run the business with legacy processes worth of billions of dollars, which cannot be simply reshaped in a night. Thus, any strategy to improve the dynamism of complex processes should consider the existing process assets accordingly. The domain specific abstractions could help in that sense to abstract the complexities of existing services and processes so that they can be migrated in a reasonable period of time (Sneed, 2000; SEI, 2005; Ziemann et al., 2006; Cetin et al. at ICPS, 2007; Cetin et al. at ICSEA, 2007).

Additionally, existing approaches focus on the dynamism of "primary processes" but, on the other hand, they mostly neglect the dynamism of "supporting processes" and "organizational processes" (Havey, 2005; Tufekci et al., 2006). This degrades the overall process dynamism since supporting and organizational processes used by IT departments may easily put a barrier against the agile processes of business departments. This is almost the case when IT departments should comply with software process improvement standards (Yeh, 1991; Cetin et al. at EuroSPI^2, 2006).

The last difficulty occurs in the setup procedures of service and process execution infrastructures for business agility. The classical way of setting up information systems to model and execute the complex processes follows agile or heavyweight methodologies, but with one com-

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