Chapter 3.14
Enterprise Architecture Modeling with the Unified Modeling Language

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ABSTRACT

Organizations make extensive use of information systems to support planning, decision making, controlling, and to leverage competitive advantage. Organizations are also complex entities that integrate contrasting concepts such as strategy, people, processes, technology, and information. These concepts must be aligned towards the same purpose to ensure that the organization is able to evolve while maximizing the usage of its resources. However, misalignment issues often occur despite large investments in management, organizational, and technological infrastructures. Misalignment also hinders change since it makes it difficult to understand the organization and seamlessly communicate its concepts. This chapter describes the key concepts for modeling an organization's enterprise architecture using the unified modeling language. Enterprise architecture consists of defining and understanding the different elements that shape the organization

and how these elements are interrelated with the purpose of understanding and facilitating organizational evolution and change. To achieve this goal, the chapter proposes an enterprise architecture model that separates core organizational concerns as different architectural views, allowing both the modeler and the model user to focus in isolation on organizational, business, information, application and technological aspects.

INTRODUCTION

Organizations are complex entities that deal with contrasting concepts such as people, value chains, business processes and information systems, and technology. Representing the knowledge about an organization proves to be a challenging task since it requires multiple concepts to be represented in a coherent and integrated way, and not as a set of unrelated and independent elements. Failing to deliver such an integrated representation contributes to the materialization of heterogeneous and misaligned views on the organization that would hinder the detection of problems and improvements, as well the ability to assess the overall organization.

For an organization to change it must be self-aware, meaning the knowledge on the organizational concepts is comprehensively shared and understood. This allows minimizing the mismatch between the organization's actual state of affairs and the state as perceived by the different stakeholders. This gap will hold back the definition and implementation of the changes that are required for an organization to evolve. In addition, with the ubiquitous proliferation of information systems and technology, the above-mentioned problems are accentuated as the pressure to change grows and the systems facilitate information sharing and process automation, regardless of its quality and how processes are actually aligned with the organization goals. Indeed, despite the investments made on the research and development of systems and technology, most organizations still do not have adequate tools or methodologies that enable the management and coordination of these systems in such a way as to support planning, changing, decision making, controlling and, especially, as a means to use these systems to explicitly leverage competitive advantage.

Identifying the architecture of the enterprise should therefore be considered as a fundamental step for any organization that renders important to be ready to act rather than react, and to be able to understand whether its elements are aligned. The enterprise architecture results from the continuous process of representing and keeping aligned the elements that are required for managing the organization. In this paper, the term architecture stands for the fundamental arrangement of the components within any kind of sociotechnical system, as well as their relationships to each other and the environment, and the design rules for developing and structuring the system (IEEE, 2000). The components are depicted in the form of a model, while reducing insignificant and redundant aspects. The design rules, on the other hand, stipulate the development and structuring of the model that specifies the types of components, the types of relationships and consistency conditions for the use of components, and their relationships.

Therefore, and set in the context of an organization, the definition of the enterprise architecture strategically aims at:

- Modeling the role of information systems and technology in the enterprise in order to control its life cycle.
- Assessing the alignment between enterprise-wide concepts so that suitable corrective actions can be defined.
- Aligning information systems with business processes and information, thus establishing a reference for efficient resource management.
- Planning sustainable changes.