Chapter III
Discovering and Modelling Enterprise Engineering Project Processes

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ABSTRACT

Often, in an enterprise engineering (EE) project, it is quite difficult to figure out what exactly needs to be done due to the rather generic (and often proprietary) character of the EE methods available. In addition, selecting appropriate elements from the multitude of available and emerging architecture frameworks (AFs) in order to model and manage the given EE undertaking is a non-trivial task. This chapter proposes a way to assist the inference of processes and to facilitate the selection and use of AF elements needed to accomplish EE projects. This is accomplished by assessing and organising AF elements into a structured repository (SR) using a generalised architecture framework (ISO15704:2000 Annex A) and by providing a "method to create methods" (a meta-methodology) for specific EE tasks that also guides the selection of AF elements from the SR. A brief introduction outlining the previously mentioned EE problems is followed by the description of the meta-methodology principle and of the assessment reference used. Next, a case study presents a sample application of the meta-methodology for a real EE project. The chapter closes with conclusions on the presented approach and a description of further work to refine and enrich the meta-methodology.

INTRODUCTION

Typically, the scope of enterprise engineering (EE) projects requires significant resources and involves large turn-around periods. Therefore, such projects should be approached using suitable and mature methods, modelling constructs, and tools. EE practice in the virtual enterprise (VE) domain (Globemen, 2000-2002) has shown that often, the initial problem in an EE project is the

lack of a clear image of the activities that need to be performed to manage and execute that project. The currently available public and proprietary EE methods are quite generic, resembling reference models that need to be customised for specific projects; this typically requires knowledge of those methods (Noran, 2003a).

EE artefacts typically required by EE projects, such as modelling frameworks (MFs), reference models (RMs), modelling constructs (languages), and tools, etc., can be provided in an integrated manner by architecture frameworks (AFs). Note that the term "architecture framework" is understood in this chapter as an artefact defining the types of elements needed to support the creation of an object from the identification of the need to create that object through to its decommissioning. However, often the artefacts composing a single AF do not provide sufficient coverage for a specific EE project and thus, a combination of elements from several AFs is necessary. The complexity involved in most EE tasks makes the selection of AF elements a non-trivial task, usually requiring knowledge of the elements' outcomes, prerequisites, and dependencies on other AF elements.

This chapter proposes a basic method to guide the creation of a set of activity type descriptions expressing what needs to be done in a particular EE project, based on *domain* knowledge (i.e., based on project stakeholder/champion knowledge about the participating entities and their relations). The proposed method also assists in the selection of suitable AF elements for the specific needs of the particular EE project, based on their capabilities assessed in relation to a reference AF.

Note that the method and the reference AF used in this example do *not* prescribe the use of any specific AF or AF elements; they provide a way to assess AF element capabilities, to present a set of steps that specify types of activities needed to accomplish specific EE tasks and to *recommend* sets of AF elements suitable for those tasks; it is then up to the user to select specific AF elements out of ranked lists, or override the recommendations. Therefore, this approach could be reused by EA practitioners to evaluate and select their preferred AF elements and to assess other methods for applicability to their specific EE project(s).

BACKGROUND: ISSUES IN ENTERPRISE ENGINEERING PRACTICE

The critical review of several mainstream AFs described in (Noran, 2003a, 2004a) has identified some of the problems associated with the use of AF elements in EE practice. The reviewed AFs were Purdue enterprise reference architecture (PERA) (Williams, 1994), GRAI (graphs with results and activities inter-related) (Doumeingts, 1984), computer integrated manufacturing – open system architecture (CIMOSA) (CIMOSA Association, 1996), the Zachman framework (Zachman, 1987), command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) (C4ISR architectures working group, 1997), and architecture for information systems (ARIS) (Scheer, 1992).

Note that subsequently, several other AFs such as TOGAF (the Open Group architecture framework) (The Open Group, 2006), FEAF (Federal enterprise architecture framework) (U.S. Federal CIO Council), Department of Defence architecture framework (DODAF) (Department of Defence Architecture Framework Working Group, 2003), and TEAF (Treasury Enterprise architecture framework) (Department of the Treasury CIO Council, 2000) have also been examined and found to be related to, and/or display similar main problems to the first six AFs. These problems are summarized next.