

Chapter VI

Mixing Soft Systems Methodology and UML in Business Process Modeling

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ABSTRACT

The chapter provides an action research account of formulating and applying a new business process modeling framework to a manufacturing processes to guide software development. It is based on a mix of soft systems methodology (SSM) and the Unified Modeling Language (UML) business process modeling extensions suggested by Eriksson and Penker. The combination of SSM and UML is justified through the ideas on Multimethodology by Mingers. The Multimethodology framework is used to reason about the combination of methods from different paradigms in a single intervention. The proposed framework was applied to modeling the production process in an aluminum rolling plant as a step in the development of a new information system for it. The reflections on the intervention give details on how actual learning and appreciation is facilitated using SSM leading to better UML models of business processes.

INTRODUCTION

Alter (2006) points the fact that techno-centric analysis of business and Information Technology problems is one of the many causes which contributes to the poor results in information systems

development. This underlines the need to bridge the description of business problem contexts with Information Systems (IS) modeling. This requires the application of an interdisciplinary body of knowledge to IS development incorporating the systems approach (see Mora et al., 2007). In call-

ing for greater application of systems thinking in Information Systems, Alter (2006) also emphasized the dangers of promoting single non-systemic approaches, among them Business Process Re-engineering as a panacea for implementation problems. The theoretical motivations for the work on process modeling reported here are of a somewhat similar nature. A recent example of addressing just one aspect of complex problems like enterprise system implementation is a thought provoking paper by Sommer (2002:20). It recognizes that many Enterprise Resource Planning (ERP) implementation failures can be attributable to overzealous implementation cycles, a lack of top management support, traditional scope creep, inadequate requirements definition and a host of other factors but focuses only on the role of middle management in the implementation process. The resulting research model is interesting but it is impossible in our opinion to determine whether middle management or inadequate requirements definition can be taken independently from the other factors affecting IS success. It is hard to ignore the interdependencies between all factors involved. Hence, in line with Alter's (2006) ideas, we conclude that there is a fundamental need for systemic ways of capturing the richness of business processes and expressing their models more adequately for the purposes of building enterprise information systems.

Systems thinking was recently applied to the design of business processes in manufacturing by Clegg (2006). Clegg's (2006) effort was aimed at building process models that can be nested within a hierarchy but without consciously adopting any reductionist principles. Clegg (2006) uses systems thinking and input-transformation-output process analyses to produce a new process modeling methodology called process orientated holonic modeling. The paper's value is that it provides a systemic way of building a large scale view of business processes within a company. The effort however does not give indication of how the models

can be directly used in the design of information systems. There is no discussion of how one can go from the granularity level of business processes analysis through to a granularity necessary for modeling applications development to reflect the redesigned processes. This is an issue that we attempt to address in this chapter.

The practical reason for the research discussed here emanated from the needs of the employer of the first author which at the time the project took place was an aluminium rolling and extrusion company. In the late nineties, it grappled with understanding the complexities influencing the design of business processes. It is widely accepted that the notion of a business process (see Hammer and Champy, 1993; Kumar and Hillegersberg, 2000:23-25) is central to organisational change and IT development initiatives. In other words the business process serves as the unit of design and the unit of evaluation in change programs. A fundamental activity of all these process-improvement initiatives is business analysis and modeling.

The aluminium semi-fabricator needed to support the complex manufacturing process with suitable information systems and had failed to deliver successful information systems projects using traditional approaches on a number of occasions. The company was looking for better ways of linking process modeling with the development of its information systems. It had already decided on using the Eriksson and Penker (2000) UML business modeling extensions to model business processes which had appeared in an Object Management Group's (OMG) Press book publication. There was however no agreement on how to conceptualise the context of the business situation. Some authors working in business process modeling had suggested the use of soft systems methodology (SSM) to enhance business process analysis and modeling (see Ackermann *et al.* (1999:202) and others). The general theme amongst these researchers seems to be that SSM

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