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From conceptual process models to running systems: A holistic approach for the configuration of enterprise system processes ☆

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Abstract

This paper proposes a method which aims at increasing the efficiency of enterprise system implementations. First, we argue that existing process modeling languages that feature different degrees of abstraction for different user groups exist and are used for different purposes which makes it necessary to integrate them. We describe how to do this using the meta models of the involved languages. Second, we argue that an integrated process model based on the integrated meta model needs to be configurable and elaborate on the enabling mechanisms. We introduce a business example using SAP modeling techniques to illustrate the proposed method.

Keywords: Information Modeling Concepts; Business Process Modeling; Reference modeling; Model configuration; System configuration

1. Introduction

The common presupposition of enterprise systems (ES) is that they support organizations in their operations and lead to significant efficiency gains. However, this is only true for well-implemented ES that support an organization's processes. The list of major ES project failures is long with famous examples such as FoxMeyer Drug which was allegedly driven into bankruptcy by the implementation of an ES and sued SAP for it [34]. Other examples include Mobil Europe and Dow Chemical both of which spent hundreds of millions of US$ for their ES implementations [11].

The difficulties arise from the gap between the generic character of an ES and the non-generic, individual character of an organization. Within academia this development is reflected by a constantly growing body of literature on configuration [1,7,11,15,18,26,33] emphasizing that information systems are typically not implemented in an organizational context but adapted to organizational needs from 'off-the-shelf' packages. Major ES vendors similarly aim at tackling this problem by including an increasing amount of adaptation

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mechanisms into their packages in order to support the configuration process within organizations.

This paper introduces a method which targets increased usability of conceptual modeling for the purpose of ES configuration as conceptual modeling is underutilized in this context [38]. One of the reasons for this is that modeling is often seen to be a tool for documentation purposes only and as such not perceived as a value-adding tool within an ES project. Also, if modeling is used for requirements engineering purposes, usually the models do not automatically impact on the software configuration which again drives the perception that modeling is an overhead. Since modeling is underutilized the question arises as to how to create an improved value proposition related to conceptual modeling as part of an ES project. This paper's approach to achieve this goal features three different aspects:

- Various perspectives of modeling: managers and technical project members have a different perspective on a business process. To meet the requirements of different user groups, alternative modeling languages have evolved. Changing established modeling languages is time consuming and may result in resistance of project members to use modeling. We therefore propose to integrate existing process modeling languages.
- Model configuration: a set of predefined conceptual models needs to be adapted to the specific requirements of an organization.
- ES configuration by means of model configuration: usually, ES software needs to be adapted to the specific requirements of an organization. Graphical, intuitive means for configuring a system, i.e., system configuration by model configuration, are only rare as of today.

The model integration we propose differs from integration concepts underlying techniques such as UML or ARIS. We propose to integrate process modeling techniques which have evolved for different stakeholders such as management or technical analysts. The next section of the paper will elaborate on this topic. Second, we propose to make the integrated languages configurable which will be the concern of the remainder of our paper. Section 3 will discuss the vertical integration of process models subsequently followed by a discussion of process configuration in general in Section 4. Section 5 contains a business example that will provide a better understanding of our approach. Finally, a short outlook will be given and future prospects will be discussed.

2. Perspectives in process modeling

Within the fields of Information Systems and Computer Science, numerous process modeling languages have evolved. These techniques vary in their degree of comprehensibility to certain user groups, i.e., they are of different pragmatic quality [25]. Some process modeling languages depict business processes from a high-level perspective with a focus on understanding key points of the process (for instance SAP's Collaborative Business Scenarios). In these cases an intuitive comprehensiveness for a large number of users with typically limited modeling experiences is more important than a high expressive power and detailed descriptions of a process. Other modeling techniques describe a business process with the purpose of executing the process automatically (workflow languages). Such techniques demand high rigor and express details, but are often only used by a limited number of experienced modelers.

We distinguish between the three perspectives: management, business process analyst, and technical analyst, and discuss them in more detail. This framework follows the commonly accepted distinction between managerial and non-managerial work on the one hand [47], and between business and IT on the other hand. Furthermore, this framework appropriately reflects the nature of ES projects, where the main involved parties are an organization's management, functional departments, its IT department, and external implementation partners. The management perspective allows for communicating process models as description of ES processes and functionality to management. The business process analyst perspective enables implementation partners and organizational actors from functional departments to communicate about the aspired functionality of the ES. Finally, the technical analyst perspective allows for specifying business processes in a format that can be processed by IT. These models can be used as a communication tool between IT departments and implementation partners. The remainder of this section will be concerned with discussing these three perspectives in more detail and motivating why they are important in the context of ES configuration.

2.1. Management perspective

The management perspective on a business process needs to provide a quick and intuitive overview of the business processes of an organization including related inter-organizational business processes. Management is