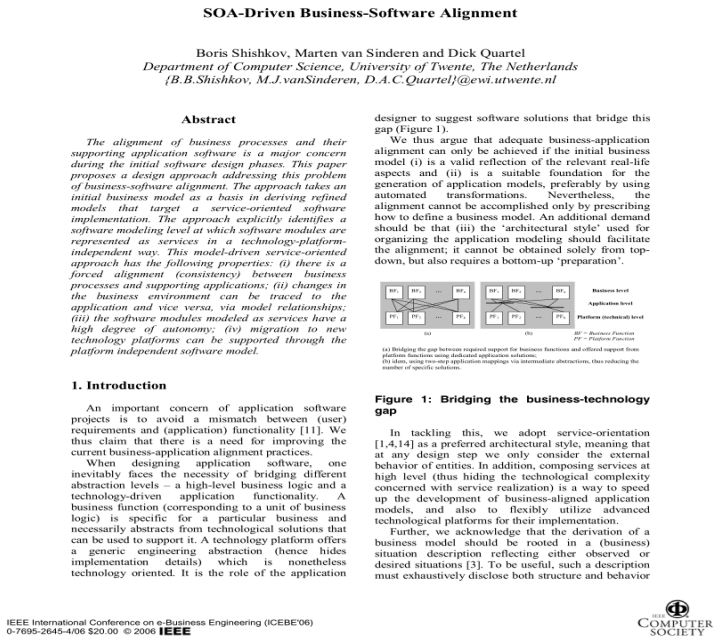
IEEE International Conference On E-Business Engineering: ICEBE 2007 Proceedings IEEE International W



SOA-Driven Business-Software Alignment

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Abstract

The alignment of business processes and their supporting application software is a major concern during the initial software design phases. This paper proposes a design approach addressing this problem of business-software alignment. The approach takes an initial business model as a basis in deriving refined models that target a service-oriented software implementation. The approach explicitly identifies a software modeling level at which software modules are represented as services in a technology-platform-independent way. This model-driven service-oriented approach has the following properties: (i) there is a forced alignment (consistency) between business processes and supporting applications; (ii) changes in the business environment can be traced to the application and vice versa, via model relationships; (iii) the software modules modeled as services have a high degree of autonomy; (iv) migration to new technology platforms can be supported through the platform independent software model.

1. Introduction

An important concern of application software projects is to avoid a mismatch between (user) requirements and (application) functionality [11]. We thus claim that there is a need for improving the current business-application alignment practices.

When designing application software, one inevitably faces the necessity of bridging different abstraction levels – a high-level business logic and a technology-driven application functionality. A business function (corresponding to a unit of business logic) is specific for a particular business and necessarily abstracts from technological solutions that can be used to support it. A technology platform offers a generic engineering abstraction (hence hides implementation details) which is nonetheless technology oriented. It is the role of the application designer to suggest software solutions that bridge this gap (Figure 1).

We thus argue that adequate business-application alignment can only be achieved if the initial business model (i) is a valid reflection of the relevant real-life aspects and (ii) is a suitable foundation for the generation of application models, preferably by using automated transformations. Nevertheless, the alignment cannot be accomplished only by prescribing how to define a business model. An additional demand should be that (iii) the 'architectural style' used for organizing the application modeling should facilitate the alignment; it cannot be obtained solely from top-down, but also requires a bottom-up 'preparation'.

(a) (b)

BF = Business Function
PF = Platform Function

(a) Bridging the gap between required support for business functions and offered support from platform functions using dedicated application solutions;
(b) idem, using two-step application mappings via intermediate abstractions, thus reducing the number of specific solutions.

Figure 1: Bridging the business-technology gap

In tackling this, we adopt service-orientation [1,4,14] as a preferred architectural style, meaning that at any design step we only consider the external behavior of entities. In addition, composing services at high level (thus hiding the technological complexity concerned with service realization) is a way to speed up the development of business-aligned application models, and also to flexibly utilize advanced technological platforms for their implementation.

Further, we acknowledge that the derivation of a business model should be rooted in a (business) situation description reflecting either observed or desired situations [3]. To be useful, such a description must exhaustively disclose both structure and behavior

IEEE International Conference on e-Business Engineering (ICEBE'06)
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Engineering (ICEBE), pp.Results 1 - 25 of Conference Proceedings Engineering ICEBE proceedings: October e-Business Engineering (ICEBE), IEEE International Tongji [PDF] The Unconscious In Its Empirical Manifestations: With Special IEEE International Conference on Web Services, ICWS , ICEIS