Linking Value Chains – Combining e3Value and DEMO for Specifying Value Networks

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Abstract. In this paper we provide a model for the bonding of systems in a value network. Our main contributions are: 1) a structural model of the chains and their viewpoints, and 2) a specification of how to use that structure within a process that supports the formalization of the rationale behind system development decisions. To provide a solution to this challenge we combine System Development and Value Modeling disciplines. From DEMO, we use the Generic System Development Process from the Tao-theory and its Value-oriented System Development Process implementation. We formalize basic concepts from e3Value, namely start stimulus, end stimulus, gates and scenario paths in an integrated way with system construction models. We provide a methodology for constructing e3Value models systematically and improve DEMO modeling by devising individual value networks in an adequate way and how different system components combine to form them.

Keywords: Value Network, Value Chain, Business Modelling, e3Value, DEMO, Enterprise Engineering.

1 Introduction and Motivation

The need of consistently and coherently design organizations is an increasingly pressing issue to modern enterprises. In fact, both academia and industry seem to have definitively embraced the topic, and rightfully so. Laudon notes that enterprise performance is optimized when both technology and the organization mutually adjust to one another until a satisfactory fit is obtained [2]. However, studies indicate as much as 90 percent of organizations fail to succeed in applying their strategies [3]. Misalignments between the business and its support systems are frequently appointed as a reason of these failures [2, 4]. Aligning Business and IT is a widely known challenge in enterprises as the developer of a system is mostly concerned with its function and construction, while its sponsor is concerned about its purpose, i.e., the system’s contribution. Also, business vision of a system and its implementation by
supporting systems is not modelled in a way that adequately supports the development and evolution of a system and its positioning in a value network.

Academic interest in Business Modeling has been increasing, as is the maturity of its practical application. The specification of Value Models brings to fore all the relevant actors involved in the interaction with the environment, as well as the significant value transactions and relations between them to provide value to systems in the environment. However, the issue remains how to integrate Business Modeling with constructional modeling in a way that allows designing and managing alignment.

In order to meet this challenge, it is necessary to relate the key concepts of the two disciplines, and create mechanisms to validate coherence that convey the conceptual relations specified, combining both disciplines in a system development process that supports rationale specification.

This paper presents an ontology for modelling value networks, supported by an integration between DEMO [5], from the perspective of Enterprise Engineering, and e3Value [6], from Value Modelling. The objective in matching DEMO and e3Value is introducing value-oriented reasoning for obtaining value-traceable outcomes in system design. We can summarize the mutual benefits as 1) being able to express the value context of any transaction as a manifestation of purpose; and 2) trace value-production to coordination/production facts/acts level, enabling system construction modelling. Using the ontology for inductive building of the value network, the approach consists in performing a conceptual system development process instantiation for consecutive nodes of the value network, using DEMO’s function/construction alternation [7].

The paper begins by establishing the problem at hand in terms of a duality between purpose and construction and objectively defining the problem. In section 3, the matching ontology between DEMO and e3Value is presented. Following, in section 4 we present the Value Network Ontology, the main contribution, and the paper closes with conclusions and future work.

2 The Problem at Hand

The purpose of an organization is to create value, which is done by producing value objects towards its environment (the network). Organizations can be seen as artificial systems [5, 8, 9], as social systems [5] and also as actors in value networks [6]. Every artificial system, e.g., purposefully build by man, is a value system. Purposefully is the key term, as it conveys the intention that the creator has of extracting some kind of benefit from it. We hypothesize that it is both useful and feasible to create an integrated model that combines Enterprise Engineering and Value Modelling aspects while keeping coherence and formality between two different kinds of models not normally easy to match in a systematic and rational way.