On Supporting Collaborative Problem Solving in Enterprise Architecture Creation

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Abstract. Creating enterprise architecture can be perceived as a creative problem solving task, since it involves managing organizational complexity and inflexibility by devising a synergic solution from all organizational units. Creative (or collaborative) problem solving in several fields has been supported by supplementing domain specific techniques with functionalities of a Group Support System (GSS). This paper aims to demonstrate how GSSs can also be used to support collaborative problem solving in enterprise architecture creation. Using the Design Science research methodology, a method was designed to support collaborative problem solving during architecture creation. This method draws from enterprise architecture approaches that are used in practice, and collaborative problem solving theories in academia. It has been evaluated using an experiment and two real life cases. This paper presents findings from this evaluation. The findings were used to refine the method, and they indicate that the effectiveness of academia-based artifacts in addressing problems encountered in practice, can only be achieved through continuous and diverse evaluation of these artifacts in practice.

Keywords: Enterprise Architecture Creation, Collaborative Problem Solving.

1 Introduction

Alignment between an organization's business and IT strategies enables it to realize value (or improved business performance) from its IT investments [8]. However, this alignment is not enough, as there is need to align human, organizational, informational, and technological aspects of an organization [24]. Aligning all these aspects requires using enterprise architecture [29,24], or an integrated or multi perspective approach [15,36]. With enterprise architecture, an organization is able to manage the complexity and inflexibility of its business processes, information systems, and technology infrastructure [27]. Enterprise architecture addresses enterprise-wide integration [15]. Thus, creating enterprise architecture requires formulating a synergic solution from all organizational units. This synergy of the various capabilities in an organization enables it to acquire a sustainable competitive advantage [31].

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Creating enterprise architecture generally involves: creating a joint conceptualization of problems, strategies or solutions [24]; identifying and refining stakeholders' concerns and requirements; developing architecture views that show how these requirements will be addressed, trade-offs that need to be made to resolve any conflicts [35]; assessing alternatives; risk assessment and mitigation; making decisions [24]; and communicating the architecture [26,24]. On the other hand, collaborative problem solving (or decision making) involves: having direct and reciprocal communication (about the situation at hand) among parties involved; being creative in formulating solution strategies and new alternatives; making shared decisions; and reaping joint payoffs from the decisions made [28]. It can be noted that the enterprise architecture creation activities mentioned above, involve collaborative problem solving activities. Thus, enterprise architecture creation can be perceived as a collaborative (or creative) problem solving task. Collaboration of actors is faced with several challenges, e.g. lack of consensus, a poor grasp of the problem, ignored alternatives, groupthink, conflicts, digressions, distractions, hidden agendas, poor planning, wrong people, poorly defined goals, premature decisions, lack of focus, misunderstandings, fear of speaking, and waiting to speak while others are dominating [23]. These are the challenges one would certainly expect when executing enterprise architecture creation as a collaborative problem solving task.

However, despite the above difficulties, collaboration is still essential for solving complex problems since no single individual possesses all the prerequisites (i.e. experience, resources, information) for problem solving [3,23]. Several technologies are in place to support collaborative problem solving or collaborative work in general, e.g. Group Support Systems (GSSs), web conferencing, virtual work spaces, teleconferencing, videoconferencing, dataconferencing, web-based collaboration tools, e-mail, and proprietary groupware tools [3,25]. This paper aims to demonstrate how GSSs can be used to support collaborative problem solving in enterprise architecture creation.

Moreover, the paper also discusses the design and evaluation of a method that is being developed using the Design Science research methodology, to complement enterprise architecture approaches with GSS functionalities (and support for collaborative problem solving). Design Science is a research paradigm that is used to develop innovative artifacts (i.e. processes, methods, models, frameworks etc) that offer solutions to significant problems in industry [10]. This implies that Design Science encourages practice-driven research since according to Hevner et al. [9,10], problems encountered in the business environment (or in practice) are treated as the requirements of any Information Systems research (in academia) that is conducted using Design Science. This is why this methodology is suitable for this research. The evolving method focuses on supporting Collaborative Evaluation of (Enterprise) Architecture Design Alternatives (CEADA). The method is therefore referred to as CEADA, pronounced as 'Keda'. This artifact draws from enterprise architecture approaches used in industry and collaborative problem solving theories developed in academia.