Towards a Theory on Collaborative Decision Making in Enterprise Architecture

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Abstract. Several challenges in enterprise architecture development indicate the need for collaborative decision making to be deployed during architecture creation. However, how this should be achieved remains ad hoc. This paper, therefore, presents an evolving theory that is currently being used to guide the development of a method for supporting collaborative decision making during enterprise architecture creation. The first iteration to evaluate the relevance of the concepts in this theory was done using an exploratory survey, and the findings are briefly presented.

Keywords: Enterprise Architecture, Collaborative Decision Making.

1 Introduction

Some challenges in enterprise architecture development can be addressed by complementing architecture approaches with collaborative decision making. Therefore, this research uses the Design Science research methodology to develop a method for supporting collaborative decision making during enterprise architecture creation. Since the method will specifically enable Collaborative Evaluation of Enterprise Architecture Design Alternatives (CEADA), it is herein referred to as CEADA. Design Science facilitates the creation and evaluation of practical innovative artifacts for solving significant organizational problems [2]. The resultant artifact in this research is the CEADA method. However, there is need to formulate a theory, based on existing theories, that will guide the development of CEADA. This theory can help researchers and practitioners to gain insight into the orchestration of key determinants for collaborative decision making to be successfully realized during enterprise architecture creation. Section 2 presents the evolving theory and section 3 presents the results from the first iteration of the theory as well as the conclusion.

2 Joint Decision Making in Enterprise Architecture

Theory refers to the body of knowledge that describes, explains, and increases understanding of a situation in order to predict future occurrences and to lay

R. Winter, J.L. Zhao, and S. Aier (Eds.): DESRIST 2010, LNCS 6105, pp. 538–541, 2010.

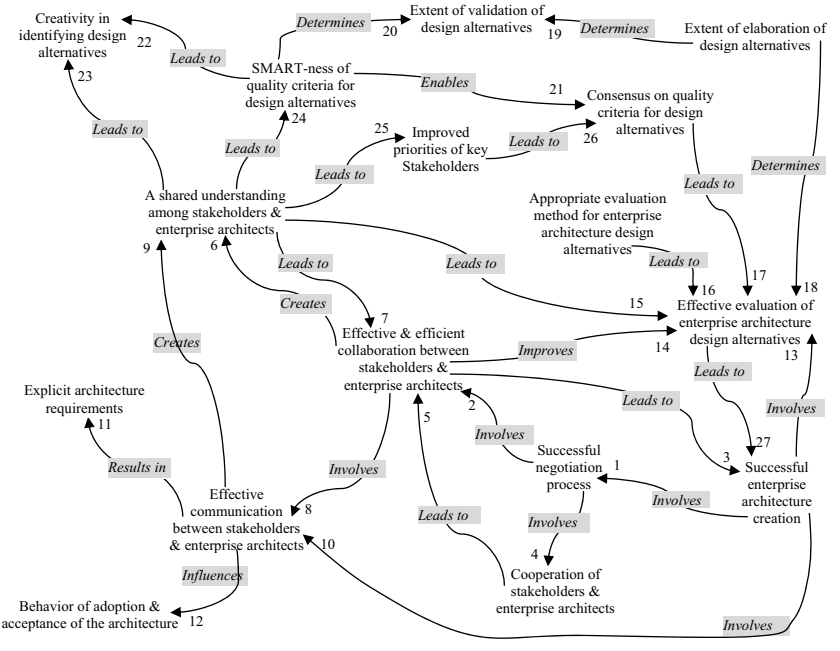

Fig. 1. Theory on Collaborative Decision Making in Enterprise Architecture

a foundation for improvement opportunities [3]. The situation of interest is the effective and efficient deployment of collaborative decision making into architecture creation in order to deliver an understandable, feasible, acceptable, and efficient enterprise architecture for an organization. This section shows how the existing knowledge on enterprise architecture creation and (collaborative) decision making is used to explain this situation and predict ways in which it can be addressed. The guidelines for theory formulation in [3,7] have been used to formulate the theory shown in figure 1 and briefly explained below.

Enterprise architecture creation involves activities such as: understanding the purpose of the architecture, creating a shared understanding of the 'as-is' and 'to-be' contexts of the organization, determining possible impacts of the desired transformation, and communicating with stakeholders [9]. Decision making, on the other hand, generally involves: intelligence (investigating an environment for any need for improvement), design (devising possible decision/design alternatives, and choice (selecting the appropriate decision alternative) [1]. Moreover, collaborative (or joint or cooperative) decision making involves several individuals cooperating to arrive at a joint decision, which will yield joint consequences for each individual [6]. From these definitions, collaborative decision making in enterprise architecture creation can be defined to involve enterprise architects and organizational stakeholders *cooperating* to: gain *mutual understanding* of the 'as-is' and 'to-be' contexts of the organization; *identify* and *devise* possible design alternatives for realizing the 'to-be' (or target) organization context; *evaluate* the

possible impacts of these design alternatives; and finally *select* the design alternative that is understandable, feasible, acceptable, and efficient. Figure 1 shows the concepts, their relations, and sequences for explaining this definition.

The joint decision in negotiation theory is not only the final decision in a given project; because throughout a negotiation, joint decision opportunities emerge that eventually lead to the final (joint) decision [6]. Relating this to architecture creation, enterprise architecture can be perceived as a collection of joint decisions that have been made throughout the phases of architecture creation. Moreover, development of enterprise (or reference) architecture can be a negotiation process among the units involved [5]. Better still, negotiations help stakeholders understand why all their concerns can not be satisfied. Hence the implication of relation marked 1 and the essence of negotiation theory in architecture creation. Relations 2 and 4 are derived from the definition of negotiation given above. Relations 1 and 2 lead to relation 3 (which is in line with what is recommended, in e.g. [5,9,8], that during architecture creation architects need to collaborate with stakeholders. Relations 1, 2, 3 yield a sequence denoted as 1 – 2 – 3. Since cooperation is when an individual renders the (expected) effort to a group result without intentionally frustrating the efforts of others [10], then the cooperation of individual stakeholders and architects leads to effective and efficient collaboration (hence relation 5). Moreover, since stakeholders provide the organizational resources; determine the requirements and constraints of the architecture; influence others; or are decision-makers, their cooperation is vital for the success of the architecture project [9].

A collaborative environment involves people purposely spending as much time understanding what they are doing as actually doing it, and aiming at creating a shared understanding that didn't exist before [12]. This definition is the basis for relation 6. Moreover, a shared understanding is a basis for effective collaboration [11], and stakeholders' commitment increases as they gain shared understanding of the 'as-is' and 'to-be' aspects [5]. Hence relation 7. From [5], effective communication eliminates ambiguities and this results in explicit requirements for the architecture (see relation 11) as well as positively influencing the acceptance and adoption of the architecture (see relation 12). This results in relations 8, 9, 10. Addressing stakeholders' concerns requires the architect to develop architecture views that show the trade-offs required to resolve conflicting concerns [8]. Such trade-offs are clarified through evaluation of (solution and design) alternatives [9]. Moreover, satisfactory solutions are obtained through evaluating possible (design) alternatives or courses of action [1]. Hence relations 13, 27, 16. For complex problems it can be difficult for an individual to understand and foresee all implications of a given decision, and therefore the best decision requires combining expertise of people from different disciplines [10]. Hence relation 14. Note that sequence 14 – 27 confirms relation 3. Stakeholders' commitment increases as they acquire a shared understanding [5] or a shared goal [10]. Hence relations 25, 26. Consensus on quality criteria for evaluating alternatives will lead to effective evaluation of alternatives (see relation 17). Sequences 25 – 26 – 17 and 7 – 14 imply relation 15. If stakeholders have acquired a shared understanding, then they can unambiguously

define quality criteria for design alternatives, and this leads to SMART (Specific, Measurable, Achievable, Realistic, and Time bound) criteria. Hence relations 24, 21, 22, 20, 18, 19. Sequence 24 – 22 implies relation 23.

3 First Iteration Using an Exploratory Survey

Data can be used to provide support for a theory [7] or to underpin it [3]. An exploratory questionnaire survey on a sample of 70 enterprise architects, was conducted with the aim of evaluating the relevance of concepts that constitute the theory in figure 1. Findings indicate that although 96% of architects execute architecture development as a collaborative process, 90% of them still face challenges related to acceptance of the architecture results. Examples of these challenges include: some organizations lack a clear decision making unit; difficulty in ensuring that all key stakeholders understand the architecture; the architecture sometimes conflicts with personal ambitions; lack of commitment from stakeholders who were not earlier involved; etc. These are byproducts of the quality of collaboration between architects and stakeholders during architecture creation. These challenges can be minimized through considering sequences 6 – 7, 8 – 9, 12 – 13, 24 – 22, 25 – 26 and relations 11, 19, 21, and 23 in figure 1. The survey also revealed factors that hinder effective collaboration, challenges faced when evaluating architecture design alternatives, and methods architects use to manage collaboration with stakeholders. Due to space limitations these aspects can not be discussed here.

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