

Agent-Oriented Based Enterprise Architecture Implementation Methodology

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Abstract. Enterprise Architecture (EA) is managed, developed, and maintained by Enterprise Architecture Implementation Methodology (EAIM). There is ineffectiveness in existing EAIMs due to the complexities; these complexities come from EAIM's processes, models, methods, and strategy. Consequently, EA projects may be faced with lack of support in the following parts of EA: requirement analysis, governance and evaluation, a guideline for implementation, and continual improvement of EA implementation. This research aims to represent an Agent-Oriented based EAIM. The proposed EAIM was evaluated by means of a case study. The results show that proposed EAIM could directly affect the effectiveness of EA implementation in following items: reducing the mismatch between business and IT, defining reachable goals for enterprise, employing easy implementation practices and easy learning procedure, using efficient documentation, applying appropriate communication among project team member, providing an effective environment for alignment of business and IT, and using effective plan for governance and migration plan. This research extends the application of Agent Technology, which provides new area of research for academics and provides effective EAIM, which can be employed by practitioners in EA project.

Keywords: Agent-Oriented, Enterprise Architecture, EAIM, Enterprise Architecture Implementation, Implementation Methodology.

1 Introduction

Enterprise Architecture (EA) is a blueprint for providing an integrated system within an enterprise in order to align enterprise's business and Information Technology (IT). EA contains a framework and methodology. Enterprise Architecture Framework (EAF) provides a structure for designing EA artefacts. Enterprise Architecture

Implementation Methodology (EAIM) provides the practices for developing and implementing the artefacts.

EAIM describes the structured approach in order to answer the EA implementation needs and provide a specific plan for enabling the EA artefacts [1, 2]. EAIM should covers all aspects of the EA lifecycle, including: the planning for enterprise understanding projects, the analysis of business requirements, the design of systems, the evolution of systems, and the ongoing enhancements of all of the above [3].

In EA, the effectiveness is determined by the degree in which the outputs of EA implementation can help the enterprise attain its intended goals [4]. Besides, EA function effectiveness is: “The degree in which organizational objectives are attained through the outputs of the EA function”. Effectiveness may be objectively measured using organizational performance data related to the implementation of EA decision-making [5].

There is ineffectiveness of EA implementation methodology that is used to support Enterprise Architecture implementation due to the complexities; these complexities come from EAIM's processes, models, methods, and strategy [3, 6]. Consequently, EA projects may be faced with lack of support in the following part of EA: requirement analysis, governance and evaluation, a guideline for implementation, and continuous improvement of EA implementation.

The objective of this study is to develop an effective EAIM in order to reduce the complexities of EA implementation practices and provide effective environment for reaching to intended goals of EA project within an enterprise.

The remainders of this paper are divided into the following parts: relation of Agent Technology and EAIM is described in Section 2, and the proposed EAIM is represented in Section 3. The case study and conclusion of this study are expressed in section 4 and 5 respectively.

2 Agent Technology and EAIM

There is trend in current EA research area to use Agent-Oriented Technology (AOT). Several researches have been done about the usage of AOT in EA and Enterprise Integration such as: [14], [15], [16], and [17]. Although most mentioned researches were done in order to use AOT concepts and principle inside the EA, this research more focuses on capturing the practices and modelling method from Agent Oriented Methodologies (AOM) to use in developing an EAIM.

There are a number of AOMs which are different in development phases, methods, and modelling such as: TROPOS, MAS, PASSI, Gaia, ADELFE, INGENIAS, and MESSAGE. There are potentials within AOMs for contributing in developing EAIM with some key support's elements and components.

Business and IT are complex, and bringing this two approaches together in EA would make a project more complex [18]. AOM represents new software methodology, which addresses the complexity of analysis, development, and maintenance in a better and appropriate plan [26].

EA is an ongoing process and needs to adapt to future changes, this is because of business changes or competitiveness in business [19, 20]. In this regard, the EAIM