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The art of Shooting the Moving Goal – Explorative Study of EA Pilot

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Abstract: Enterprise Architecture (EA) has been recognised as an important tool in modern business management for closing the gap between strategy and its execution. The current literature implies that for EA to be successful, it should have clearly defined goals. However, the goals of different stakeholders are found to be different, even contradictory. In our explorative research, we seek an answer to the questions: What kind of goals are set for the EA implementation? How do the goals evolve during the time? Are the goals different among stakeholders? How do they affect the success of EA? We analysed an EA pilot conducted among eleven Finnish Higher Education Institutions (HEIs) in 2011. The goals of the pilot were gathered from three different stages of the pilot: before the pilot, during the pilot, and after the pilot, by means of a project plan, interviews during the pilot and a questionnaire after the pilot. The data was analysed using qualitative and quantitative methods. Eight distinct goals were recognised by the coding: Adopt EA Method, Build Information Systems, Business Development, Improve Reporting, Process Improvement, Quality Assurance, Reduce Complexity, and Understand the Big Picture. The success of the pilot was analysed statistically using the scale 1-5. Results revealed that goals set before the pilot were very different from those mentioned during the pilot, or after the pilot. Goals before the pilot were mostly related to expected benefits from the pilot, whereas the most important result was to adopt the EA method. Results can be explained by possibly different roles of respondents, which in turn were most likely caused by poor communication. Interestingly, goals mentioned by different stakeholders were not limited to their traditional areas of responsibility. For example, in some cases Chief Information Officers' goals were Quality Assurance and Process Improvement, whereas managers' goals were Build Information Systems and Adopt EA Method. This could be a result of a good understanding of the meaning of EA, or stakeholders do not regard EA as their concern at all. It is also interesting to notice that regardless of the different perceptions of goals among stakeholders, all HEIs felt the pilot to be successful. Thus the research does not provide support to confirm the link between clear goals and success.

Keywords: enterprise architecture, stakeholders, goals, success

1. Introduction

The structure of the paper is as follows. Firstly, the problem area is introduced, including the key concepts used in the paper. Secondly, the methodology and data collection are described. Thirdly, results of the analysis and discussion are presented, and finally conclusions are presented.

Enterprise Architecture (EA) has a number of definitions in the current literature (see for example: CIO Council 2001; TOGAF 2009; Zachman 1997). We shall adopt the definition of EA, which is based on two common concepts shared by the EA definitions (Syynimaa 2010). Firstly, EA is a formal description of an organisation at a specific time. Usually there are descriptions at least of two different states of the organisation: current and future. Secondly, EA is a managed change between these states. As a description, EA is usually described by using a four layer model (Pulkkinen 2006). These layers are Business Architecture (BA), Information Architecture (IA), Systems Architecture (SA), and Technology Architecture (TA).

Lately EA's usability and power in strategy execution has been recognised (Gregor et al. 2007; Ross et al. 2006). The four layer model of EA uses a top-down approach (Pulkkinen 2006; TOGAF 2009). Output of a higher level is input for a level below it: BA→ IA→SA→TA. Strategy of an organisation is described on the BA level, so the future state of the organisation's BA includes possible changes in the strategy. As such, EA can be used as a tool for closing the gap between the strategy and its execution.

The current literature implies that for EA implementation to be successful, it should have clearly defined goals (Iyamu 2009; Martin et al. 2004; Miller 2003). However, the goals of different stakeholders are found to be different, even contradictory (van der Raadt et al. 2008). According to the guide to the Project Management Body Of Knowledge (PMBOK), project goals are "the quantifiable criteria that must be met for the project to be considered successful" (Duncan 1996, p. 52). Moreover, unquantifiable goals are of very high risk.

The rationale of the research can be summarised as follows. EA has been found to be an important tool in strategy execution. To implement EA successfully, one should have clear goal(s) set for the implementation. These goals have been found to be different among stakeholders, even contradictory. General project management literature suggests setting quantifiable goals. Thus in this exploratory research, we seek answers to the questions: What kind of goals are set for the EA implementation? How do the goals evolve during the time? Are those goals different among stakeholders? How do they affect the success of EA implementation?

Empirical data was gathered from an EA implementation pilot conducted among eleven Finnish Higher Education Institutions (HEIs) during 2011. The goals of the pilot were to start EA work in the Higher Education field and to build a basis for a continuous EA function in HEIs. The pilot was organised in six sub-groups having one or more participants, each focusing on a certain topic (Riihimaa et al. 2011). For instance, one of the groups focused on co-operation in teaching and student movement. In addition, each individual HEI had its own internal focus areas. The structure of the pilot can be seen in **Figure 1**.

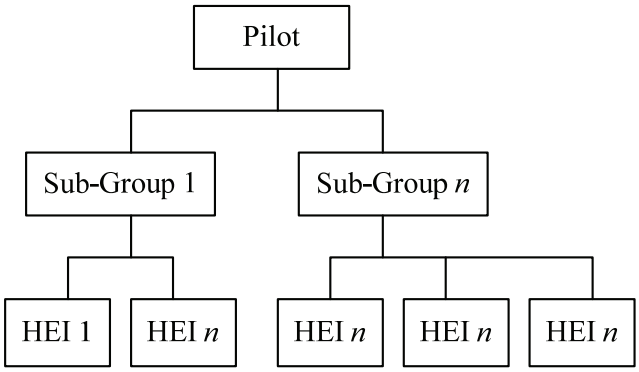

Figure 1: Pilot structure

2. Methodology

EA implementation is considered to be a process, where the initial state of an organisation is changed from the state before EA t^1, to the state where EA is implemented t^2. The process is illustrated in **Figure 2**. In this paper, we are performing exploratory research on an EA pilot. Methodologically *EA pilot* is regarded as an instance of EA implementation, which is executed as a project. *Goals* are objectives, targets, etc., set for the pilot. Goals can be measurable (quantifiable) or qualitative (unquantifiable). *Success* of any implementation project is found to be difficult to measure quantifiably, as the concept of success is too subjective (Cale et al. 1987). We accept this subjective nature of the concept of success, and define it as the perceived feeling of success of participating individuals.

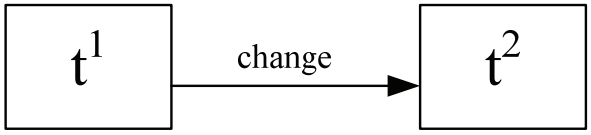

Figure 2: EA implementation (Syynimaa 2012)

Data used in this paper consisted of a subset of data gathered from three different stages of the pilot as part of a larger research. *Goals before the pilot* were gathered from the project plan of the pilot in a textual form. *Goals during the pilot* were gathered from interviews, which were conducted as phone interviews. Interviews were recorded and transcribed. Three different roles were interviewed in each HEI: Chief Information Officers (CIOs), managers (president, rector, etc.), and Quality Assurance (QA) staff. A semi-structured interview technique was used, where interviewees were given a certain theme to answer. In the case of goals, the question/theme asked was (translated from Finnish): *"With regard to the pilot, what are your or your institution's goals for the pilot?"* *Goals after the pilot* were gathered from a questionnaire sent to the pilot's project and steering group members two months after the pilot. In the questionnaire the goals of the pilot were asked as an open ended question from four different perspectives: personal goals, institution's goals, group's goals, and pilot's goals. Also *Most important results* and the success of the pilot were gathered from the very same questionnaire.

All textual data was coded using the open-coding technique used in Grounded Theory (Glaser et al. 1967). As the purpose was simply to categorise similar goals under the same code, no axial or selective coding was used. During the coding, a new category was added if the goal did not fit to any existing goal. Thus, some codes may be overlapping, or even from different category layers. The perceived success of the pilot was arrived at by using a Likert scale (1-5) question.

3. Results and discussion

The unit of analysis in this research is the sub-group. The sub-group level was used for two reasons. First of all, there is data available from different states only at the sub-group level. Secondly, usage of the sub-group level helps us to hide identities of HEIs, as some goals could be connected to a certain HEI. One HEI formed a separate sub-group but was also a member of another sub-group having multiple members. This HEI has been analysed as a part of the latter sub-group only, thus the total number of analysed sub-groups is five.

During the coding eight distinct goals were found: *Adopt EA Method, Build Information Systems, Business Development, Improve Reporting, Process Improvement, Quality Assurance, Reduce Complexity,* and *Understand the Big Picture*. *Adopt EA Method* means goals related to adopting, learning, and introducing the EA method. In these cases, the goal of the EA pilot is to adopt the EA method *per se*, without any "greater" goal. *Build Information Systems* refers to goals for building an information system. *Business Development* refers to goals for business development, for instance by a comparison to other HEIs, or sustaining competitiveness by merging some functions with another HEI. *Improve Reporting* refers to goals for improvement of reporting in terms of automation, quality and ease of access. *Process Improvement* refers to goals for improvement of HEI's processes, whether business or information and communication technology (ICT) processes. *Quality Assurance* refers to goals related to QA function and its activities. *Reduce Complexity* refers to goals for reducing complexity of either processes or information systems. *Understand the Big Picture* refers to goals for understanding the big picture of the HEI as a whole, including information systems. Examples of the codes can be seen in **Table 1**.

Table 1: Codes and examples of goals (translated from Finnish)

Code	Goal
Adopt EA Method	"Familiarising ourselves with EA framework"
Build Information Systems	"To build a shared data warehouse for all Higher Education Institutions"
Business Development	"Benchmarking to other HEIs"
Improve Reporting	"To ease reporting"
Process Improvement	"To support process based development of information systems"
Quality Assurance	"To prepare for QA audit"
Reduce Complexity	"Reducing overlapping work"
Understand the Big Picture	"To better understand consequences of our decisions"

Results of the analysis can be seen in **Table 2**, where each row represents a sub-group. The three next columns, *Before*, *During*, and *After*, refer to goals set for the pilot. The fourth column, *Results*, refers to the most important results of the pilot. The last column refers to the perceived success of the pilot on a scale of 1-5. The values of the success column are medians of respondents' answers of the particular sub-group. In the *During* column, respondents' role(s) are also given. These roles are: C=Chief Information Officer, M=Management (principal, rector, president), Q=Quality Assurance staff.

Table 2: Results

Before	During	After	Results	Suc.
Adopt EA method Quality assurance	Adopt EA method (C Build information systems (MQ Business development (M Process improvement (M Reduce complexity (MQ	Adopt EA method Business development Process improvement	Adopt EA method	4
Business development	Adopt EA method (M Improve reporting (M Process improvement (C Quality Assurance (M Understand the big picture (C	Adopt EA method Business development Process improvement Understand the big picture	Adopt EA method Understand the big picture	4

Before	During	After	Results	Suc.
Adopt EA method	Business development (CM Reduce complexity (CM Improve reporting (Q Quality assurance (Q Build information systems (M Process improvement (M Understand the big picture (M	Adopt EA method Process improvement Improve reporting	Adopt EA method Process improvement	3
Process improvement Understand the big picture	Adopt EA method (M Build information systems (C Business development (M Improve reporting (M Process improvement (CQ Understand the big picture (CM	Adopt EA method	Adopt EA method	4
Build information systems Quality assurance	Quality assurance (C Adopt EA method (CM Business development (M Process improvement (CQ Understand the big picture (Q	Adopt EA method Business development Process improvement Quality assurance Understand the big picture	Adopt EA method Business development	3

Results summarised in **Table 2** lead us to the following findings. Before the pilot, goals were mostly related to the expected outcomes of the EA pilot. This was the case in four out of five sub-groups. Adopting the EA method was mentioned in the goals of only two sub-groups. It should be noted that the project plan, which was a source for before-the-pilot data, was composed mainly by CIOs. Moreover, its purpose was to "sell" the project to HEIs' management.

During the pilot, there were a lot more goals mentioned than before the pilot. There were a number of respondents, mainly managers and QA staff, who were not members of project groups. Thus their view of the pilot's goals was based solely on internal communication and publicly available material. Variance of the answers can be explained by this to some degree. However, it does not explain why goals mentioned by CIOs are different from those before the pilot. It is also interesting to note that in some cases goals are not related to respondents' own duties. For example, in some cases CIOs' goals were Quality Assurance and Process Improvement, whereas managers' goals were Build Information Systems and Adopt EA Method. This could be a result of a good understanding of the meaning of EA, or that stakeholders do not regard EA as their concern at all.

Goals after the pilot were gathered from a questionnaire sent to the pilot's steering and project groups. Thus all respondents should have been aware of the goals before the pilot. Still, most of the goals mentioned were related to EA adoption. This was also the case when asking the most important results of the pilot. All sub-groups mentioned the adoption of the EA method as one of the most important results of the pilot. Two of the sub-groups mentioned only the EA method, while the rest of the sub-groups also mentioned another goal. Goals after the pilot and most important results were gathered on the same questionnaire, which explains their similarities as all of the results were also mentioned as goals.

The most interesting finding is that there is no single sub-group which mentioned even a single goal in all the stages *and* as the most important result. Moreover, in only two cases was one of the before-the-pilot goals mentioned. This could be interpreted as a failure, but not a single sub-group perceived the pilot as being a failure. Findings of the research can be summarised as follows. Goals set to EA implementation evolve during the implementation project. There is also a notable variance of the goals among different stakeholders. Development of the goals and their variance among stakeholders does not seem to affect the perceived success of the implementation. It is fair to put the question why the EA pilot was perceived as being a success, when all the participants felt the adoption of the EA method was the most important result. Half of the participants also had some business results, but not even one of those were original goals mentioned before the pilot. Does it mean that Enterprise Architecture does not provide business results at all? Or does it mean that business outcomes are felt to be so natural a result of the EA implementation, that only that was seen as important?

4. Conclusions

Previous research on EA implementation has shown that clear goals set for the implementation are one of the key success factors (Iyamu 2009; Martin et al. 2004; Miller 2003). Also communication during the implementation has been found to be a very important factor (Gregor et al. 2007; Iyamu 2009; Kaisler et al. 2005; Richardson et al. 1990; Shupe et al. 2006; van der Raadt et al. 2009). The research findings show that regardless of the different perceptions of goals among stakeholders, all sub-groups felt the pilot was successful. Thus the research does not provide support to confirm the link between clear goals and success. What it clearly indicates though is that communication plays a key role in the implementation, which can be seen in the variance of goals mentioned during the pilot. The author acknowledges the limitations of the research, especially in generalising the findings. The exploratory nature of the research limits the applicability of the findings strongly to the context where it was conducted. However, the power of exploratory research is in its ability to raise more questions than it can answer. Research has therefore more scientific than practical implications. This research for instance introduces some observations that are likely to be present also in a wider context, and thus can provide an interesting area for further research. For instance, the effect of clear (or unclear) goals to the success of EA implementation requires more systematic research.

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