EVALUATION OF ENTERPRISE ARCHITECTURE IMPLEMENTATION: A CRITICAL SUCCESS FACTORS

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Abstract

This paper provides a review of Critical Success Factors (CSF) to support the evaluation of the implementation of enterprise architecture. To produce appropriate critical success factors, a literature review was conducted from several previous researches. The method used in this paper follows the flow of the Systematic Literature Review (SLR). This paper produces an understanding of the organization regarding Critical Success Factors (CSF) for the evaluation of enterprise architecture implementation. These factors are communication, organizational learning, management commitment, governance, goals, benefits, and scope. Communication and organizational culture are the most important things in evaluating Enterprise Architecture (EA) implementation with a percentage of 60% of paper studied. The results obtained from this discussion can be used by researches or practitioners as a consideration in evaluating enterprise architecture implementation.

Keywords: CSF, Enterprise architecture, Evaluation.

1. Introduction

Enterprise Architecture is alignment process between a company and information technology regarding business. It combines information systems, people and organizations, as well as processes in a company [1]. Enterprise Architecture (EA) is used by companies to provide an integrated environment to support corporate business alignment and Information Technology (IT). The EA project consists of two main approaches which are Enterprise Architecture Implementation Methodology (EAIM) and Enterprise Architecture Framework (EAF) [2]. EA adopts EAF as the base to design various aspects of the company and EAIM is a methodology for implementing EA in a company. The output of EAF is EA artefacts, such as models, diagrams, graphics, and documents. In addition, EAIM acts as an effort to implement EA artefacts in a company. The implementation of EA effectively provide flexible as well as stable flexible environment for a company [3]. To this point, several EAIM have been proposed by academics and practitioners in several kinds of literatures.

Regardless of the difference in implementation practices and development phases, both have the same principles and concepts of transition from current architecture (As-Is) to architectural needs (To-Be) [4]. Although, EAIMs have the same definition, several EAIMs have different perspective, practice, and approach. It is define as general reference procedure that shows: (1) descriptions as well as practices that guide in handling step-by-step guidelines to change the current into the desired architecture; (2) the condition as well as structure of the existing system; (3) descriptions as well as practices that lead to regulating and overseeing systems and artefacts; and (4) description as well as practices that lead to keep the company informed to face future adjustments. This method is appropriate to be a guide for professional practitioners because of its conciseness and completeness [2].

However, EA implementation is just a part of EA project; the company should keep in mind the insights gained during the implementation. It is because the insights gained can be effectively implemented in the next EA project [3]. EA Evaluation (EAV) is the determination process of EA artefacts values. Continuous evaluation of EA is required because EA practitioners and companies need assessment whether the practices, products, artefacts and methods have achieved their aims. Evaluation leads to the creation of information which assists in judgment and decision-making regarding Information System (IS) program, policy, integration, or service. Then, it guides the decision makers in taking the correct step [3]. There has only few researches on critical success factors to evaluate the implementation of an enterprise architecture. This study aims to obtain critical success factors to support the evaluation of Enterprise Architecture Implementation. In conducting this research, the method used was Systematic Literature Review (SLR).

2. Methodology

The method of research used in this study using the method proposed by Moher D et al, namely Systematic Literature Review (SLR) where the paper searches needed are from electronic databases such as ScienceDirect, IEEE, Springer, and others. An overview of the methodology used is shown in Fig. 1.

2.1. Identification

At this stage, identified papers are checked for any duplication. If there is duplication, the paper is filtered. From this stage, all papers that have been obtained are not duplicated.

2.2. Screening

Check is made regarding the suitability of the contents with the title of the paper, whether related to the topic being discussed or not. The number of available papers is still entirely based on the keywords, titles, and contents that have been determined.

2.3. Eligibility

At this stage, a check is made on the feasibility of the existing paper to produce a more supportive paper from the research. Based on this stage, 19 papers were produced which support the discussed topic.

2.4. Included

The feasibility check of the existing paper is made at this stage to produce the most supportive paper from the research. Based on this stage, the 10 most supporting papers were produced for the topic being discussed.

Based on the references that have been mentioned, the methodology has four stages. The Identification stage has resulted in the number of papers without any redundancy. The Screening stage produced a number of papers related to the researched factors. The Eligibility stage produce the feasible paper. The Included stage is the final result. The methodology is shown in Fig. 1.
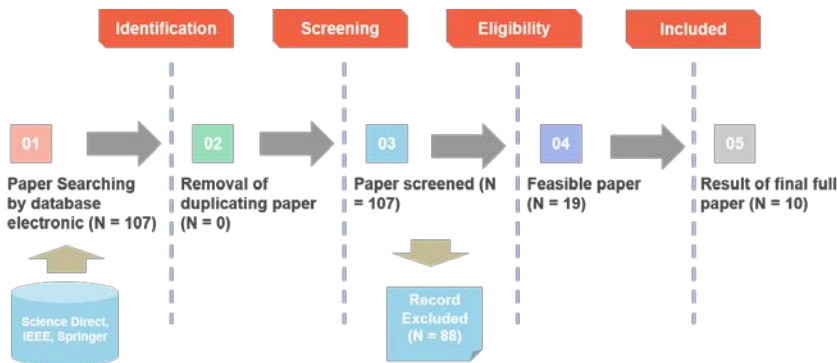

Fig. 1. Research methodology.

3. Results and Discussion

3.1. Results

Based on the results of the Systematic Literature Review (SLR), several factors were produced to support the successful evaluation of EA implementation. These factors are presented in Table 1.

Table 1. Critical success factors.

No.	Criteria	Number of Paper	Previous Research	Description
1	Goals, benefit, and scope of the deployment of Enterprise Architecture	5	[5-9]	Goals, benefits, and scope of the deployment of EA are some of the important things for evaluating EA implementation. This can be seen by many papers explained it after Organizational Culture and Communication
2	Architectural measurement	1	[7]	One paper states that EA is influenced by factors of architectural measure
3	Integration of architectural approach into organizational methods and standards	1	[7]	One paper states that EA is influenced by factors of Integration of architectural approach into organizational methods and standards
4	Reference models and architectural patterns	2	[7, 8]	Reference models and architectural patterns affect EA based on two papers
5	Transformation strategy and plans	1	[7]	According to Andrzej Sobczak, transformation strategy and plans including factors that affect EA
6	Relevance	1	[10]	Pontus Johnson stated that the Relevance and Credibility factor affects EA
7	Credibility	1	[10]	
8	Information quality	2	[5, 10]	Two papers state that information quality affects EA
9	Management Commitment	5	[5, 6, 8, 9, 11]	Management Commitment in EA is one of the important things for evaluating EA implementation. This is proven by many papers explained about Management Commitment after Organizational Culture and Communication.
10	Participation in business units	3	[5], [11- 14]	Participation business units must be considered in evaluating the implementation of EA because it mentioned by some paper.
11	Technical Skill	3	[8, 9,11]	Technical Skill must be considered in evaluating the implementation of EA because it mentioned in some paper.
12	Organizational Culture	6	[5, 8, 9,] [12- 20]	Organizational Culture in EA is one of the most important things for evaluating EA implementation. This is proven by many papers explained it.
13	Communication	6	[5, 6, 9, 13, 14, 21]	Communication in EA is one of the most important things for evaluating EA implementation. This is proven by many papers explained it.
14	Governance	5	[5, 9, 13,14, 21]	Governance in EA is one of the important things for evaluating EA implementation. This is proven by many papers explained it after Organizational Culture and Communication

Based on the results in Table 1, it is shown that there are 14 critical success factors to evaluate the implementation of an EA based on the papers that have been selected. There are five factors mentioned by more than five papers which are Communication, Organizational Culture, Management Commitment, Governance, and Goals, Benefits, and Scope. The reference for all factors based on ten papers.

3.2. Discussion

The evaluation stage in assessing the feasibility of implementing EA is needed. Previous researchers have suggested the things that are should be considered in evaluating EA through a method that has been produced. In this paper, we have reviewed and summarized the key factors in evaluating EA implementation. All of the critical success factors are based on Table 1 which consist of top five factors (See Fig. 2.) as follows:

   i. Communication is supported by 6 out of 10 papers studied.
  ii. Organizational Culture is supported by 6 out of 10 papers studied.
 iii. Management Commitment is supported by 5 out of 10 papers studied.
  iv. Governance is supported by 5 out of 10 papers studied.
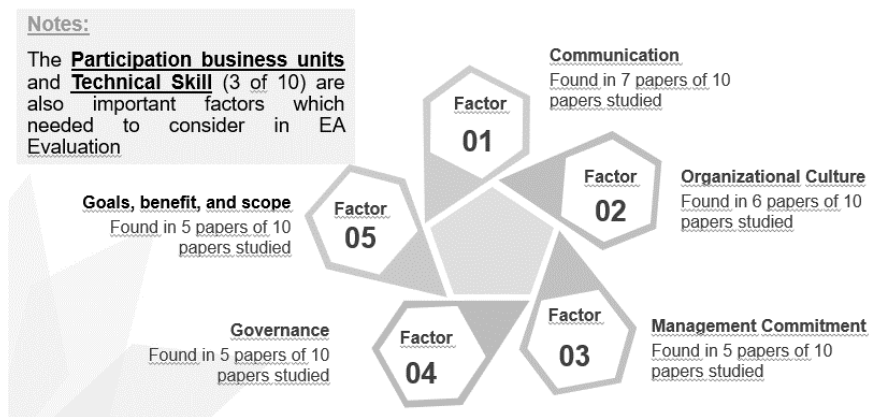   v. Goals, Benefits, and Scope are supported by 5 out of 10 papers studied.

Fig. 2. The Top 5 factors of critical success factors.

Communication and Organizational Culture in EA implementation is one of the most important things for evaluating EA implementation, it is shown from 60% of the paper explained. Communication-related to EA implementation is a process that provides information from stakeholders about all issues related to EA. Organizational Culture describes the basic values and organizational confidence that is useful in carrying out EA management. Management Commitment, Governance, Goals, Benefit, and Scope are stated by 50% of the paper and it makes sure that EA processes are given adequate period, money, and funds so that business objectives can be achieved. In addition, Participation Business Units and Technical Skills can be considered as critical success factors in evaluating EA implementation. It is because Participation, Business Units, and Technical Skills are supported by 30% papers.

4. Conclusion

This Systematic Literature Review observes the CSFs EA Evaluation has been conducted. In this study, five main factors have been found in CSFs, namely: Communication, Organizational Culture, Management Commitment, Governance, Goals, Benefit, Scope, and Communication talk about how to communicate with the related parties about the implementation of the Enterprise Architecture (EA). Organizational Culture influences the management of EA. Management Commitment has an impact on the sustainability of the EA. Governance factor affects good governance of the EA. Goals, Benefit, and Scope are the basis for the conformity of EA implementation. The five factors are expected to be the main consideration and as a support in conducting EA evaluations. For future research, the researcher can analyze sub-factors from five main factors.

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