

Chapter 20

An Adaptive Enterprise Architecture Framework and Implementation: Towards Global Enterprises in the Era of Cloud/Mobile IT/Digital IT

Yoshimasa Masuda
Keio University, Japan

Seiko Shirasaka
Keio University, Japan

Shuichiro Yamamoto
Nagoya University, Japan

Thomas Hardjono
Massachusetts Institute of Technology, USA

ABSTRACT

Considering the relation between Enterprise Architecture (EA) and IT is a prerequisite when promoting the uptake of IT by societies. In this paper, the authors propose an “Adaptive Integrated EA framework,” based on the results of a survey, to support the strategy of promoting cloud/mobile IT. They considered a unique advanced case and provide details and the structure/mechanism of building this EA framework in a global pharmaceutical company. Moreover, the authors revealed the effectiveness of the proposed EA framework by evaluating/analyzing the problems caused by the rapid shift to cloud/mobile IT in divisions in the US and Europe. Furthermore, they compared the characteristics of The Open Group Architecture Framework (TOGAF) and the “Adaptive Integrated EA framework” (global deployment) in building EA frameworks while evaluating the effectiveness of this framework to achieve digital transformation. Finally, the authors clarify the challenges, benefits, and critical success factors of the framework to assist EA practitioners with its implementation.

DOI: 10.4018/978-1-5225-8176-5.ch020

1. INTRODUCTION

Many global corporations have experienced a variety of changes resulting from the emergence of new technologies, globalization, shifts in customer needs, and the implementation of new business models. Significant changes in cutting-edge IT technology due to recent developments in cloud computing and mobile IT (such as progress in big data technology), in particular, have arisen as new trends in IT. Furthermore, major advances in the abovementioned technologies and processes have created a “digital IT economy,” introducing both business opportunities and business risks, forcing enterprises to innovate or face the consequences (Boardman & KPN 2015). Enterprise systems (ES) are complex application software packages that contain mechanisms capable of supporting the management of the entire enterprise and of integrating all areas of its functioning (Davenport 1998, p.121). This requires Enterprise Architecture (EA) to be effective because contributing to the design of such large integrated systems would in future represent a major technical challenge toward the era of cloud/mobile IT/digital IT. From a comprehensive perspective, EA encompasses all enterprise artifacts, such as business, the organization, applications, data, and infrastructure, which are necessary to establish current architecture visibility and future architecture to produce a roadmap. EA frameworks need to embrace change in ways that adequately consider new emerging paradigms and requirements that affect EA, such as enterprise mobile IT/cloud computing (Buckl et al., 2010/ Alwadain et al., 2014). However, specific EA frameworks, e.g., The Open Group Architecture Framework (TOGAF), are criticized for their size, lack of agility, and complexity (Gill et al., 2014). Masuda et al. (2016) found existing EA frameworks to be inappropriate to achieve digital transformation. On the other hand, the necessity of implementing EA in parallel in the mid-/long term (roadmaps and target architectures, etc.) in the era of cloud/mobile IT/digital IT should be emphasized in terms of promoting the alignment of IS/IT projects with management strategy/IT strategy.

In consideration of the above background information, the purpose of this paper is to propose an “Adaptive Integrated EA framework” to meet the requirements of the digital transformation in relation to the above agility-related aspects. The proposed EA framework should support an IT strategy promoting cloud/mobile IT/Digital IT on the basis of what our prior research suggested. The paper also presents the results of our investigation of an example case in a global healthcare enterprise (GHE), where the abovementioned EA framework is built and practically implemented. This is the only case study of related up-to-date EA toward the era of digital IT and enables us to clarify the effectiveness, adaptability, benefits, and critical success factors of this EA Framework in the era of cloud/mobile IT/digital IT.

2. DIRECTION OF ENTERPRISE ARCHITECTURE

2.1 Related Work

In the past ten years, EA has become an important method for modeling the relationship between the overall image of corporate and individual systems. In ISO/IEC/IEEE42010:2011, an architecture framework is defined as “conventions, principles, and practices for the description of architecture established within a specific domain of application and/or community of stakeholders.” Furthermore, in the TOGAF (2011) technical literature, it is defined as “a conceptual structure used to develop, implement, and sustain an architecture.” In addition, EA visualizes the current corporate IT environment and business landscape

21 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/an-adaptive-enterprise-architecture-framework-and-implementation/224585

Related Content

Big Data and Its Visualization With Fog Computing

Richard S. Segall and Gao Niu (2018). *International Journal of Fog Computing* (pp. 51-82).

www.irma-international.org/article/big-data-and-its-visualization-with-fog-computing/210566

Chemometrics: From Data Preprocessing to Fog Computing

Gerard G. Dumancas, Ghalib Bello, Jeff Hughes, Renita Murimi, Lakshmi Viswanath, Casey O. Orndorff, Glenda Fe G. Dumancas, Jacy O'Dell, Prakash Ghimire and Catherine Setijadi (2019). *International Journal of Fog Computing* (pp. 1-42).

www.irma-international.org/article/chemometrics/219359

Resource Provisioning and Scheduling Techniques of IoT Based Applications in Fog Computing

Rajni Gupta (2019). *International Journal of Fog Computing* (pp. 57-70).

www.irma-international.org/article/resource-provisioning-and-scheduling-techniques-of-iot-based-applications-in-fog-computing/228130

Fake Review Detection Using Machine Learning Techniques

Abhinandan V., Aishwarya C. A. and Arshiya Sultana (2020). *International Journal of Fog Computing* (pp. 46-54).

www.irma-international.org/article/fake-review-detection-using-machine-learning-techniques/266476

Accuracy Determination: An Enhanced Intrusion Detection System Using Deep Learning Approach

Rithun Raagav, P. Kalyanaraman and G. Megala (2023). *Handbook of Research on Deep Learning Techniques for Cloud-Based Industrial IoT* (pp. 309-321).

www.irma-international.org/chapter/accuracy-determination/325949