

Chapter II

Co-Engineering Business, Information Use, and Operations Systems for IT-Enabled Adaptation

Jay Ramanathan

The Ohio State University, USA

Rajiv Ramnath

The Ohio State University, USA

ABSTRACT

Today's service-oriented organizations must embrace variation and learn to adapt to an externally driven environment. They also must deal with increasing complexity among entities—business processes, internal/external organizations, enterprise software and assets. We refer to enabling methods, such as Adaptive Complex Enterprise (ACE) architecture. The holistic ACE architecture here is based on complete dynamic performance traceability of interacting entities as they produce value. The architecture is operationalized through the related co-engineering methodology of this chapter. With traceability, the business agents have the information for decision-making and adaptation, using information technology (IT) as needed. The unified business-IT architecture approach here is easier than applying a plethora of disconnected business, system engineering and IT frameworks. We use examples to show the resulting analysis for continuous improvement both in the immediate and longer time frames. Benefits occur from the roles of all stakeholders—the business, internal, and external organizations, as well as IT.

INTRODUCTION

Introducing ACE

Today's environment (with new opportunities, global competition, economic conditions, compliance requirements, etc.) is very fast changing and turbulent, causing organizations (orgs) to react using strategies like increased product customization, mergers and acquisitions, outsourcing, supply chain management and so forth. As a result, the service aspects of customer *requests* (e.g., an order, a request for quote, a return, new requirement) are becoming increasingly complex. To thrive, orgs are required to manage a wide variety of *entities* (business models, processes, internal/external orgs, agents, enterprise software and assets) *and their interactions* to provide value despite an externally driven context. We use the term '*adaptive*' to describe orgs that deal with this complexity, and effect improvements on a continuous basis and in *accelerating time* frames to effect growth and success. These improve-

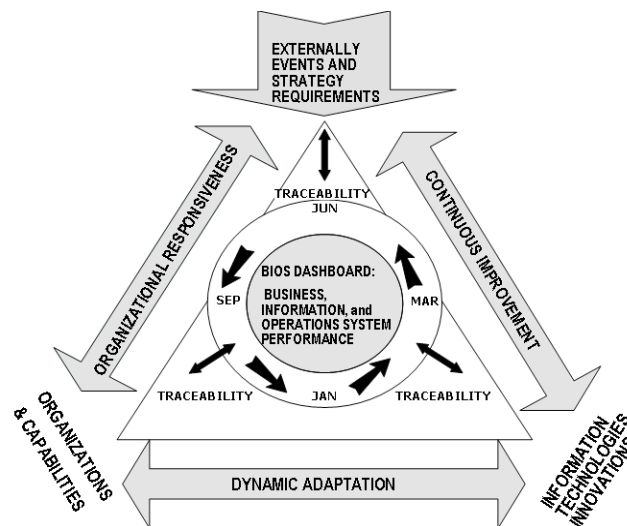
ments are in effective operations, enhancements and innovations. Orgs with this objective are termed ACE.

The ACE must sense its environment and respond by *embracing* variation, unlike organizations of the industrial age, which accomplished their objectives by steadily eliminating variation. IT has the inherent promise of enabling the ACE with recent advancements in service-oriented technologies. We show how we can now compose and create ACE architectures that are executable and provide the visibility to deal with variation. Key ACE characteristics and requirements are discussed next.

Characteristics of the ACE Architecture Framework

- **Performance-centered business-IT adaptation:** We define *adaptation* as improvement within decreasing time cycles. This requires visibility and a holistic *performance-centered* architecture that will

Figure 1. The objective of an ACE is to embrace externally driven change through organizational responsiveness and continuous improvement.



24 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/engineering-business-information-use-operations/4228

Related Content

Total Quality Management and Assets Quality: The Scenario of Indian Banking Sector

Dolly Gaur (2021). *International Journal of Business Analytics* (pp. 38-57).

www.irma-international.org/article/total-quality-management-and-assets-quality/269486

Design Configuration in Industrialized House Building

Fredrik Wikberg, Anders Ekholmand Stefan Olander (2014). *Encyclopedia of Business Analytics and Optimization* (pp. 716-725).

www.irma-international.org/chapter/design-configuration-in-industrialized-house-building/107275

Support Vector Machine Models for Classification

Minghe Sun (2014). *Encyclopedia of Business Analytics and Optimization* (pp. 2395-2409).

www.irma-international.org/chapter/support-vector-machine-models-for-classification/107423

Identifying and Ranking of Alternative Fuels by Using AHP and PROMETHEE II Methods to Find Best Fuel for Bus Rapid Transit System

Iman Dadashpourand Ahmadreza Rostami (2018). *International Journal of Business Analytics* (pp. 74-87).

www.irma-international.org/article/identifying-and-ranking-of-alternative-fuels-by-using-ahp-and-promethee-ii-methods-to-find-best-fuel-for-bus-rapid-transit-system/212636

Online Advertisement Using Web Analytics Software: A Comparison Using AHP Method

Manu Sharmaand Sudhanshu Joshi (2020). *International Journal of Business Analytics* (pp. 13-33).

www.irma-international.org/article/online-advertisement-using-web-analytics-software/246026