



Chapter XVI

Evaluation of Component-Based Development Methods

Nicky Boertien, Rabobank Nederland, The Netherlands

Maarten W.A. Steen, Telematica Instituut, The Netherlands

Henk Jonkers, Telematica Instituut, The Netherlands

ABSTRACT

Component-based development (CBD) has received a lot of attention in software engineering literature over the last few years. Awareness has been raised that CBD is the way to go in software development, especially in the domain of e-business where the benefits of reusing components, i.e., faster time-to-market and quality, are essential. The question now is how to realize the full potential of CBD? Did we achieve reuse yet? In order to answer these questions, we evaluate and compare five popular methods for component-based development, including Catalysis, the Rational Unified Process, and Select Perspective, on their maturity and fitness-for-use in the context of e-business engineering. The evaluation is done based on our own reference framework for e-business development and a list of objective criteria. The methods each emphasize certain aspects of CBD, but as yet none of them offers a complete solution.

INTRODUCTION

Component-based development (CBD) is often hailed as the solution to application development in the 21st century (e.g., see Larsen, 2000; Segev & Bichler, 2000). Largely based on its focus on reuse, its proponents promise faster time-to-market, cost reduction, better quality, flexibility, and scalability. These are all qualities that are badly needed in the networked economy of today.

At the same time we witness the birth of a new engineering discipline. Enterprises are increasingly dependent on information and communication technology (ICT). ICT has evolved from a supporting role to the core business of many organizations. This transition to e-business (i.e., doing business using ICT) requires a multidisciplinary approach that combines elements of business process reengineering (BPR), supply chain integration, marketing, and software engineering (Janssen & Steen, 2001). We call this new discipline *e-business engineering*.

As we will argue below, CBD has a central role to play in e-business engineering. The question that we were concerned with is: What kind of method enables us to take advantage of all benefits of CBD in the context of e-business engineering? The goal of our research is developing a methodology for component-based e-business engineering that is, as much as possible, based on best practices. This chapter reports on the first step we took in this direction, the evaluation of a selection of CBD methods: CADA, Catalysis, Comet, Rational Unified Process, and Select Perspective.

Component-Based Development

Component-based development is an approach for system analysis and design that has evolved from the object-oriented (OO) paradigm. It has received a lot of attention in software engineering literature over the last few years (IEEE Computer Society, 1998, 1999; ACM, 2000). Rather than fine-grained objects, it places large, independently packaged, reusable components, sometimes referred to as subsystems, at the core of software development (D'Souza & Wills, 1999).

CBD emphasizes reuse, while other methods such as OO ignore this issue, or introduce it too late in the lifecycle (Meijler & Nierstrasz, 1997). Components represent coherent parts of a system that can be independently stored and assembled into new software systems. The potential for savings on development time and costs are obvious. In addition, because of its structure, a component-based application will be more flexible and scalable. The use of components guarantees a better quality as components are frequently used and improved over time.

Ideally, a software developer could use components of other unknown developers. This would shorten software development times even further, but it

19 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/evaluation-component-based-development-methods/23021

Related Content

FOOM - Functional and Object-Oriented Analysis and Design of Information Systems: An Integrated Methodology

Peretz Shovaland Judith Kabeli (2001). *Journal of Database Management* (pp. 15-25).

www.irma-international.org/article/foom-functional-object-oriented-analysis/3258

Logistics Management Using Blockchain: A Review of Literature and Research Agenda

Nwosu Anthony Ugochukwuand S. B. Goyal (2022). *Utilizing Blockchain Technologies in Manufacturing and Logistics Management* (pp. 122-144).

www.irma-international.org/chapter/logistics-management-using-blockchain/297161

Concept-Oriented Model

Alexandr Savinov (2009). *Handbook of Research on Innovations in Database Technologies and Applications: Current and Future Trends* (pp. 171-180).

www.irma-international.org/chapter/concept-oriented-model/20701

Issues and Methods for Access, Storage, and Analysis of Data From Online Social Communities

Christopher John Quinn, Matthew James Quinn, Alan Olinskyand John Thomas Quinn (2018). *Handbook of Research on Big Data Storage and Visualization Techniques* (pp. 402-432).

www.irma-international.org/chapter/issues-and-methods-for-access-storage-and-analysis-of-data-from-online-social-communities/198772

Using Regression to Compromise Statistical Databases: A Modification of the Attribute Correlation Modeling Approach

Myun J. Cheonand Patrick R. Philipoom (1991). *Journal of Database Administration* (pp. 15-22).

www.irma-international.org/article/using-regression-compromise-statistical-databases/51087