

IRM PRESS

701 E. Chocolate Avenue, Hershey PA 17033-1117, USA Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.irm-press.com **ITB9179**

Chapter VI

Software Confederations—An Architecture for Global Systems and Global Management

Jaroslav Král Charles University, Prague

Michal Žemlička Charles University, Prague

ABSTRACT

Many (especially the large) software systems tend to be virtual peer-to-peer (P2P) networks of permanent autonomous services (e.g., e-government should be supported by the network of information systems of individual offices). The services are loosely coupled, a service can join/leave the system quite easily. We call such networks software confederation (SWC). The paradigm of the SWC is orthogonal to the paradigm of the object-oriented methodology. The architecture of SWC is an engineering necessity in the case of global or very large information systems (IS) and provides many software engineering advantages like incremental development, openness, modifiability, maintainability, etc. SWC is a necessity in many other cases. SWC supports the trend of large enterprises or modern states

This chapter appears in the book, *Managing Globally with Information Technology* by Sherif Kamel. Copyright © 2003, IRM Press, an imprint of Idea Group Inc. Copying or distributing in print or electronic forms without written permission of Idea Group Inc. is prohibited.

to be decentralized, dynamic, and able to work in the time of globalization. Software confederations are the result of the tendency to globalization, and at the same time, the tool allowing of implementation of IS for a globalized society. SWC changes basic features of a CEO's work as well as a CIO's. In both cases, it supports the decentralization. This paper discusses the motivation of software confederations, the techniques of their design and implementation, including the use of XML (inclusive SOAP-UDDI), their software engineering advantages, relation to object-oriented technology and methodological consequences of their use. The main conclusion is that the concept of SWC is the crucial for the future software and information technologies and substantially changes the management tasks of the CIO and CEO.

INTRODUCTION

The last 15 years were impressive for the success of object-oriented (OO) software and OO methodology. The OO paradigm was so successful and has become a respected standard. A unified OO methodology known as UML (unified modeling language) was developed by OMG and included into successful CASE tools. The success of OO was so great that it has overshadowed cases when object-orientation is not the best technique to use. Examples are the integration of legacy systems as well as of third-party products providing permanent services. Such systems are used as black boxes. Such architecture becomes crucial for information systems in global world and for global management. The architecture is not properly supported by the standard OO paradigm formalized in UML.

It appears, but is not generally accepted, that OO is good for systems that are mainly sequential. These systems have been developed mainly from scratch (with the exception of the use of OO libraries) and as one logical unit for example, the developers have good knowledge about all the parts of the developed system or they can easily gain it; no large constituent parts of the system must be used as black boxes). The result is that the reusability of the object-oriented code is rather low (Finch, 1998). The number of cases when people must use a paradigm other than an object-oriented one is surprisingly large. This scenario occurs when information technology should support global activities or the cooperation between competing companies.

It is usually required and expected that company information systems should support all company activities. The company cooperates with many external subjects; the set of these subjects and the level of the cooperation with particular partners changes quickly. It is therefore not possible to have an inflexible company IS.

It seems reasonable to enable temporal groups of companies to build information systems supporting their cooperation needs and common activities. On the other hand, it is reasonable that information systems of the members of such groups (coalitions) should be insensitive to the environment changes and protected against the attacks of outsiders (e.g., hackers) on their systems and data.

The easiest way to complete this task is to implement interconnections of existing information systems of the cooperating companies. Access gates of the companies' information systems than can serve both as watchdogs against hacks and espionage and as data transformers (they e.g., can convert the communication protocols from the proprietary one to the public one—and vice versa).

Copyright © 2003, Idea Group Inc. Copying or distributing in print or electronic forms without written permission of Idea Group Inc. is prohibited.

23 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: <u>www.igi-</u> <u>global.com/chapter/software-confederation-architecture-</u> <u>global-systems/25804</u>

Related Content

IT Industry Development and the Knowledge Economy: A Four Country Study

Phillip Ein-Dor, Michael Myersand K. S. Raman (2006). *Advanced Topics in Global Information Management, Volume 5 (pp. 1-29).* www.irma-international.org/chapter/industry-development-knowledge-economy/4559

Who Contributes to the Sunk Costs of Motor Vehicle Carbon Emissions and Human Capital?

Wei Zhang, Hong Chenand Sufang Wang (2022). *Journal of Global Information Management (pp. 1-21).*

www.irma-international.org/article/who-contributes-to-the-sunk-costs-of-motor-vehicle-carbonemissions-and-human-capital/300815

Exploring the Issues for the Success of Multichannel Network Businesses in Korea

Yoon-Jin Choiand Hee-Woong Kim (2020). *Journal of Global Information Management (pp. 90-110).*

www.irma-international.org/article/exploring-the-issues-for-the-success-of-multichannel-networkbusinesses-in-korea/246098

Contextual Factors, Knowledge Processes and Performance in Global Sourcing of IT Services: An Investigation in China

Rong Du, Shizhong Ai, Pamela Abbottand Yingqin Zheng (2013). *Global Diffusion and Adoption of Technologies for Knowledge and Information Sharing (pp. 82-109).* www.irma-international.org/chapter/contextual-factors-knowledge-processes-performance/72183

The Effect of Media Richness on the Stability of Physician-Patient Relationships on E-Consultation Platforms

Xuan Liu, Xiaofei Wang, Jia Liand Meimei Chen (2022). *Journal of Global Information Management (pp. 1-26).*

www.irma-international.org/article/the-effect-of-media-richness-on-the-stability-of-physicianpatient-relationships-on-e-consultation-platforms/315301