Chapter 4

How Models and Methods for Analysis and Design of Information Systems can be Improved to Better Support Communication and Learning

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ABSTRACT

Various models and methods are used to support information system development process, but after many years of practice, projects still continue to fail. One of the reasons is that the conventional modeling approaches do not provide efficient support for learning and communication among stakeholders. Lack of an integrated method for systematic analysis, design and evolution of static and dynamic structures of information system architectures is the core of frustration in various companies. Semantic problems of communication between business analysis and design experts lead to ambiguous and incomplete system requirement specifications. The traditional modeling approaches do not view business data and process as a whole. Our goal is to propose a method, which would help system designers to reason about the pragmatic, semantic and syntactic aspects of a system in a communication and learning perspective. Service-oriented paradigm was shortly presented as one of the possible solutions to the problems of integration.

INTRODUCTION

Changes in market, global competition and distributed environments force companies to produce their products and services with better quality and more flexibly, which results in necessity for introduction of new technological solutions. Information systems, as support for realization of business processes become of great importance. It

demands a better understanding and integration of organizational and technical components. If goals stated by business experts should fit with the outputs from implementation, it is necessary that all partners involved in system development process have a common understanding of both organizational and technical aspects.

Information systems are developed to support information exchange among people and to perform businesses more effectively. Information system development is the way in which information systems are conceived, analyzed, designed and implemented (Avison & Fitzgerald, 2006). The analysis and design of information systems is based on understanding of the organizational objectives, structure and processes as well as how to exploit information technology for advantage. It is the process consisting of many phases, necessary to overcome to get a final result, which should be consistent with the user requirements. Information systems analysis and design is a complex process involving different stakeholders with different views, purposes and backgrounds that develop and maintain information systems. Mutual understanding and agreement among all these stakeholders is crucial in this process. Communication is the basis of understanding. It is the prerequisite for successful communication. Semantic problems of communication among different stakeholders are reasons for ambiguous, and incomplete system requirements that contribute to the failures of system development projects (Yoo, Catanio, Paul, & Bieber, 2004). Distributed environments of information system makes communication and learning more difficult and complex. To obtain the improvement of understanding in use and development of these systems, this ability also has to be supported during the development process.

The quality of system specifications and successful communication between business people and system developers lies not in amount of methods, models and diagrams. To come to consensus and understanding it is necessary to

have integrated models and methods. An integrated method will help systematically identify semantic conflicts that arise during development process as well as it guide how to achieve the complete picture of the system, while showing the way how to link and check consistency between pragmatic, semantic and syntactic levels of system specifications. An integrated method for analysis and design can contribute to complete, consistent and unambiguous system understanding as well as guide systematic development process (Avison & Fitzgerald, 2006). The models should be useful in many perspectives (Fowler, 1997); from having semantic power to express the necessary 'domain entities' and relationships among them, have ability to clarify the meaning of ambiguous terms and ensues that no different interpretations of concepts occur. Having this semantic power models and methods would support communication and learning among people.

Many methodologies with different techniques and tools are used to support the information development process. Already in the early sixties when computers more regularly were used in different companies it was realized that something should be done concerning the development process (Langefors, 1995). The failures flagged among other things to the developers that the methods for this process have to be better. There are two important issues concerning models and methods used as a means of communication during information system development process a) Methods should provide integrated guidelines for the whole information system development process. Such graphical representations should have a reasonable pedagogical capacity that promotes learning and communication among different partners involved and facilitates understanding of information systems architectures b) Architectures should be built in such a way that they have enough semantic power to represent communicational aspects of the information systems. Common to them all is that these methods and models in some way

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