

## Chapter 6.7

# Managing Socio–Technical Integration in Iterative Information System Development Projects

**Bendik Bygstad**

*Norwegian School of Information Technology, Norway*

### ABSTRACT

The challenges of information systems (IS) development have changed significantly in the past 15 years. From a situation where the main problem was to build stable systems based on a requirements specification, the IS project manager now faces challenges of integration; for example: how to integrate a new information system into large existing information infrastructures and unstable business processes? Building on a socio-technical perspective, four types of integration were identified and analyzed: external and internal stakeholder integration, and internal and external technical integration. A longitudinal case study of an e-business development project in the airline industry identified and highlighted some managerial challenges of integration. Findings include: Internal technical and (to some extent) stakeholder integration is well supported by

traditional project management techniques and software engineering frameworks, such as the Rational Unified Process (RUP). However, the challenges of external stakeholder and technical integration is underrated in IS development research, and not well supported in RUP.

### INTRODUCTION

Fifteen years ago, most IS projects were greenfield projects; on the basis of a requirements specification, a brand-new system was designed and programmed. When (eventually) finished, it was installed and run, and the users were trained in new interfaces and routines. The main challenges for the project manager were to get the requirements specification right and complete, and to develop the system to be technically stable.

Of course, this is still a demanding craft, requiring specialized skills, sound methodologies and competent project management. However, the project manager today faces two more challenges:

- Most information systems are developed to support a business process, whether the scope is a dramatic process transformation or process improvement (Davenport, 1993; Laudon & Laudon, 2004). It is essential that the new system integrates with the business process, because a project that fails to do so will be a failure, even if the software product is well designed and programmed.
- A new system must also relate to an existing information infrastructure. The information infrastructure is seen as a heterogeneous network, comprising an installed base of technology, organization, culture and work practices (Hanseth & Lyytinen, 2004; Hanseth & Monteiro, 1996). Both opportunities and constraints are heavily influenced by the attributes of this base. In a successful organization, this heterogeneous network is an immensely valuable resource; it constitutes the backbone of the organization. But in a world of change, it also may be a barrier to business adaptation or innovation, because the information infrastructure is hard and expensive to change.

The successful IS project manager must address both these challenges. In a way, this redefines the role of the project manager, making him or her an integrator of both social and technical forces. The question is: How is the manager going to make people and technology work together in a complex and unstable setting?

Ideally, the process models of Business Process Reengineering (BPR) and IS development should answer this question. Unfortunately, the BPR community never really developed a full methodology for this integration (Giaglis, 1999).

During the late 1990s, the software engineering community embraced *iterative and incremental* process frameworks (Larman & Basili, 2003), such as RUP (Jacobson, Booch & Rumbaugh, 1999), Object-oriented Process, Environment and Notation (OPEN) (Henderson-Sellers & Unhelkar, 2000), Extreme Programming (Beck, 2000) and Dynamic Systems Development Method (DSDM) (Stapleton, 2003). The growing practice communities contend that these frameworks have the potential to integrate the business process and the new information system through step-wise stakeholder and technical integration (Blomberg, 2001; Kruchten, 2000; Stapleton, 2003). The basic mechanism is the short iteration that produces a small release that can be tested, integrated into the information infrastructure and assessed by the business organization.

This deserves attention not only in the realm of software engineering, but also in the broader context of information technology (IT)-based organizational change. While skeptics have pointed to lack of practical integration support for e-business architectures (Smolander, 2003), and poor project management support (Henderson-Sellers & Unhelkar, 2000), the large RUP community points to a number of success projects (Rational, 2006b). This paper explores, analytically and empirically, two important questions in this context:

- How can the IS project manager integrate the new information system with the business process and the information infrastructure?
- What integration support is there in software engineering frameworks, like RUP?

The rest of this paper is structured as follows. In the next section, the concept of integration is defined and discussed. Then, the integration support in RUP is briefly assessed. The research approach, longitudinal process research (LPR), is presented. Next, the integration challenge is

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