



# Scalable enterprise systems: Quality management issues

Cecilia Temponi\*

*Texas State University; 601 University Drive; San Marcos, TX 78666, USA*

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## Abstract

Enterprises in today's business environment conduct transactions beyond the traditional boundaries of their physical locations. Many organizations offer services and/or finished products through a combination of delivery methods. Some of these delivery methods involve the Internet, the sales staff on the physical site and/or on the calling centers (own or outsourced). Organizations with such parallel delivery methods face great complexity in business structure and in the dynamics among different business functions. Such organizations are designated as Scalable Enterprise Systems (SES). The complexity of SESs means additional business challenges to stay competitive and maintain sustainable profitability. The main objective of this paper is the identification of a reference framework for quality management (QM) and business process reengineering (BPR) with *the ability to constantly learn and the flexibility to adjust to concurrent changes of the SES and the environment*. Key elements from QM and BPR are examined and selected, compared and extrapolated to SES. An example is provided to illustrate the relevance of QM and BPR in SES. Future research for SES as it relates to the adaptation of QM and BPR is highlighted.

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## 1. Introduction

Enterprises in today's business environment conduct transactions beyond the traditional boundaries of their physical locations. Many organizations offer services and/or finished products through a combination of delivery methods. Some of these delivery methods involve the Internet, the sales staff on the physical site and/or on the calling centers (own or outsourced).

Organizations with such parallel delivery methods face great complexity in business structure and in the dynamics among different business functions. This complexity means additional business challenges to stay competitive and maintain sustainable profitability. The ever-increasing complexity has led to what is known as Scalable Enterprise Systems or SES (Temponi, 2003). Moreover, a critical challenge for an SES is to maintaining a complex but coordinated and efficient structure in dynamic and highly competitive business environments. This challenge means minimizing the potential impact of destabilizing effects by factors

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\*Tel.: 512 245 3189; fax: 512 245 2850.

E-mail address: [c.temponi@txstate.edu](mailto:c.temponi@txstate.edu) (C. Temponi).

such as core technology, organizational structures that complement the technology portfolio, and allocation of resource(s) to support the technology portfolio and organizational structure, for a given environment (Chandra and Kumar, 2001; Santoro, 1999; Morganwalp and Sage, 2003).

The management of such complexities is a balancing act between *the ability to constantly learn and the flexibility to adjust to concurrent changes of the SES and the environment*. The continuous adaptation mechanism of the organizational structure, technology, and management practices seems to be the natural path to continuously learn to cope with the increased complexity given by changes that occur concurrently, progress to a degree of intricacy and impact the SES. *The duality of continuous learning and flexibility to adjust* increases the likelihood of SES sustainable profitability and presents opportunities that are well addressed with particular use of:

- Quality management (QM) principles such as Deming's production cycle and continuous improvement (CI) (Evans and Lindsay, 2002; Foster, 2004; Jang, 2003; Maull et al., 2003; Schniederjans, 2003), and
- Business process reengineering (BPR) through restructuring to achieve breakthrough performance and discrete initiatives intended to achieve radical redesign and improved work processes in bounded time frames (Aiello et al., 2002; Champy, 1995; Greasley, 2003; Maull et al., 2003; Seelladarai, 2002).

Some of these issues have been addressed in the context of technology tools, manufacturing cells, and modeling approaches by Chandra and Kumar (2001), Jain et al. (1999), Morganwalp and Sage (2003), Park and Favrel (1999), and Santoro (1999).

Organizational objectives such as continuous learning and flexibility to adapt have been taken up with two opposite approaches, which have been present since early 1980s. One approach is characterized by incremental and gradual improvements—QM; the other approach emphasizes radical, time-constrained innovation—BPR. However, the robust realization of these approaches as

it relates to SES has not been fully understood, or may have not progressed concurrently (Alazmi and Zairi, 2003; Kaynak, 2003). This study investigates quality concerns and critical factors as they relate to SES by using preliminary work by Greasley (2003), Santoro (1999), and Temponi (1997, 2003).

This research contributes among other things to the development of awareness of quality practices for SES by clarifying the concept and unique characteristics of SES. Since this study relies on the foundations of QM, BPR, and systems theory, relevant previous research work is reviewed on selected aspects for these topics. Selected quality elements and their implications to SES regarding CI and flexibility to adapt are analyzed in terms of industry scenarios, which facilitate the identification of opportunities for quality improvement initiatives for such complex systems. Since the combination of different components of SES and associated dynamics are not well understood yet, this research is relevant to practitioners because the analysis of industry scenarios may reveal unrealized quality issues for evolving SESs. These quality issues could provide critical information to managers, who must realign SESs to sustain profitability and harmonize internal organizational dynamics. Moreover, many of the identified quality issues for SES might have not been subject to additional academic inquiry and could spark further research. The remainder of this paper is organized as follows: a reference model of QM for SES is presented in Section 4. The model is based on salient characteristics of SES, which are presented next. QM and BPR fundamentals are discussed in Section 3. Section 5 illustrates an industry scenario to make a compelling case of the reference model. Concluding remarks are presented in Section 6, where also future research directions are highlighted.

## 2. Fundamentals on scalable enterprise system

### 2.1. What is a scalable enterprise system?

An SES is a business organization. A business organization is considered a society with growth,

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