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Chapter 10

Tailoring Software Development Processes Along TQM Concepts: A Way to Narrow User-Perceived Expectations Gap for Information Systems

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A number of researchers (e.g., Rockart and Scott-Morton, 1984; Porter, 1985, 1992; Gilmour and Hunt, 1993; Leonard-Barton and Sinha, 1993; Alter, 1996) have emphasised the potential that information systems have for providing the competitive edge. The perception that an organisation is at a competitive disadvantage without computer systems has significantly increased users' expectations for information systems. These expectations have been further increased by the sensational media promotions of new computer products and services in the marketplace. Some vendors, acting in their own self-interest, may make inflated claims about their products putting more gap between users' expectations for information systems and the actual services delivered by the systems. The information technology industry has come under growing pressure to produce high-quality systems quickly and inexpensively to satisfy the growing user expectations (Lederer and Mendelow, 1990). This chapter looks at how some of the concepts of TQM can be applied to narrow the user expectations gap for information systems.

The consequences of information systems (IS) failures become more acute as organisations continue to invest large amounts of resources in information technology and

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application development. These IS failures have been classified variously in the literature. Block (1983), for example, classifies IS failures into 12 categories (see Table 1), whereas Williams (1991) classifies them into development failures and operations failures, while others (e.g., Lyytinen, 1988; Szajna and Scamell, 1993) identify some IS failures as user expectations failures. Szajna and Scamell (1993, p.494) define user expectations for an information system as:

> "a set of beliefs held by the targeted users of an information system associated with the eventual performance of the IS and with their performance using the system,"

while Lyytinen (1988, p.46) describes expectation failure as representing:

> "a pluralistic and political account of IS failure [which] defines an IS failure as a gap between stakeholders' expectations expressed in some ideal or standard and the actual performance."

Lyytinen identifies two main categories of IS failures: development failures and use failures. These categories with their subcategories are shown in Table 2. Indeed, Szajna and Scamell suggest the realisation of user expectations as one possible means of assessing the eventual success or failure of an IS.

Whereas there are various models for software process and software process maturity and improvement, user expectations for IS are on the increase, while software development processes are not keeping up pace in order to satisfy the set of beliefs held for IS, resulting in high expectations gap (Sallis et al. 1995). Indeed, Sallis et al. (1995, p.29) reaffirm: "Only a quality software process will consistently produce quality software". It is, therefore, appropriate to take a look at software development processes and incorporate concepts that are necessary to arrive at a quality software process. Quality, according to the International Standard Quality Vocabulary (ISO 8402-1986) is:

> "The totality of features and characteristics of a product or service that bear on its ability to meet stated or implied needs."

Behavioural theories and models such as the expectancy theory, the cognitive dissonance theory, the theory of reasoned action (TRA), the technology acceptance model (TAM) and, of late, the service quality models (Pitt et al. (1995), have been proposed by a number researchers to be incorporated into software development processes to enhance user expectations' success of IS. For example, Guimaraes and Ramanujam (1986); Lee (1986); Doukidis, et al. (1992); and Igbaria's (1993) models are drawn upon users' perceptions and expectations of IS to improve efficiency, improve income, value for money, sufficient training, adequate vendor assistance, and sufficient manuals, while Nolan and Seward (1974); O'Reilly (1982); Jenkins and Ricketts (1985); Doll and Torkzadeh's (1988, 1994) models are drawn upon users perceptions and expectations of information content, accuracy, format, ease of use and timeliness of information from IS. Recently, the concepts of Total Quality Management (TQM) is being suggested by some researchers as worth incorporating into the software development process (e.g., Abel, 1992; Keyes, 1992; Zadrozny and Tumanic, 1992; Kan, 1995; Aggarwal and Lee, 1995).

This chapter discusses the application of TQM concepts in the software development process to narrow the user expectations gap for information systems. The chapter begins by briefly examining the causes of user perceived expectations gap for IS. The chapter then examines the shortfalls in software development processes leading to IS expectations failure. Finally, the chapter proposes the adoption of some concepts of TQM in the software development process to, at worst reduce user expectations failures, and at best eliminate them.