

Chapter XI

An Analysis–Form of Soft Systems Methodology for Information Systems Maintenance

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ABSTRACT

Soft Systems Methodology (SSM) has been employed to increase the effectiveness of organizational requirement analysis in Information Systems (IS) development in recent years. Various forms of SSM for IS development have been developed and examined in different environments by different researchers. There appears to be little research or application that can be identified of the use of SSM in IS maintenance. The objective of this chapter is to develop a conceptual “analysis-form” of SSM for IS maintenance, so that further research can be undertaken in the application of this conceptual model.

BACKGROUND

During the past few decades, many information systems (IS) were developed in a wide range of working environments. There are many reasons for change to an existing IS in an organization. Examples are functionality, flexibility, continu-

ous availability, and correct operation (Lehman, 1989; Lientz & Swanson, 1980). Once an IS has been developed, it is rarely free of errors and occasionally operates in the same way in the changed environment (Leveson, 1995). Literature suggested that IS maintenance is gaining more notoriety because of its increasing cost (Smith,

1999). People are becoming more concerned about how to improve the IS maintenance process so as to reduce IS maintenance costs.

IS maintenance is a knowledge intensive task (Anquetil, de Oliveira, de Sousa, & Batista Dias, 2006). A good understanding of different aspects of IS is needed, to, for example, identify the problems to solve, the software process to adopt, the computer language and system architecture to be used. All these examples consume high levels of human effort as well as costs.

Maintaining software is primarily a cognitive task that has been described in various ways by different investigators (Eioerman & Dishaw, 2007). Lutters and Seaman (2007) suggested the use of documentation for IS maintenance. Von Mayrhauser, Vans, and Howe (1997) focused on the software comprehension process associated with maintenance described as the Integrated Comprehension Model. In this process model, individuals employ a top-down model in which they engage in hypothesis generation and verification, a program model in which they develop a flow of control abstraction of the program, and a situation model in which they develop data-flow/functional abstraction of the program. IS professionals use all three approaches and use them interchangeably.

Based on the literature, human knowledge is a major factor in IS maintenance. Soft Systems Methodology (SSM) is concerned with human activity systems (Platt & Warwick, 1995). SSM should be a very useful tool for IS maintenance as it aims to improve human conditions by understanding and changing the situation (Checkland, 1992).

SSM focuses upon a stage-by-stage process. An early model, which was presented by Checkland (1981), consisted of seven iterative stages. It explained the action devices to improve the problem situation by comparison with the “real world” and “systems thinking about the real world.” The classical form of SSM (seven-stage structure),

the developed form of SSM, and the Processes for Organization Meanings (POM) model all do not produce any outputs suitable to satisfy the technical needs of IS users and programmers. Thus a model is required that incorporates both organizational and technical needs.

This chapter describes a review of SSM and the application of SSM to IS development. Then, an “analysis-form” of SSM for IS maintenance is presented with its design and structure. The objective of this chapter is to present a SSM “analysis-form” conceptual model for IS maintenance so that further research can uncover the applicability of this conceptual model through its use.

LITERATURE REVIEW

Problems on IS Maintenance

An understanding of the problems of IS maintenance is critical. IS maintenance problems can be grouped into four categories—psychological, characteristic, practical, and management problems.

Psychological Problems

Higgins (1986) pointed out that the maintenance process involves psychological problems. Reasons why programmers are unlikely to undertake the maintenance process include:

- Program was written by another programmer;
- One programmer may use radically different logic from another programmer;
- It provides ample opportunities for failure other than for success;
- Need to study the whole program even if it requires a small change; and/or
- Users always compare the new system with the old one.

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