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A SOFT SYSTEMS PERSPECTIVE FOR DECISION SUPPORT SYSTEMS DEVELOPMENT

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The traditional Decision Support Systems development approaches are mainly based on the understanding of the problems and the use of adequate models to solve the problems. The roles of different relevant parties in the development process have been undermined. The human factors and environmental factors are fundamental to the development of DSS and must be taken into account. This paper adopts the soft systems concept to represent the DSS development as a soft system which allows us to consider all relevant facets of the environment. Based on the soft systems concept, a new methodology for establishing the DSS development system (DSSDS) is introduced.

1 Introduction

Decision Support Systems (DSS) have been emerged as an important element of computerised information systems. In this paper, DSS are systems with the following characteristics:

- deal with problematic decision making situations
- improve the effectiveness of decision making
- assist and not replace human decision makers
- based on information technologies

This paper reviews the various approaches for designing DSS and examines their common features. From this study, some directions for improving the process of DSS development have been identified. Different development approaches rest on particular views of DSS. This usually skew the developing of DSS and produce a less than satisfactory DSS. This paper applies soft systems concept to the development of DSS to address some of the problem issues in other approaches.

2 DSS development

The development of information systems usually adopts a system development life cycle approach and follows well developed systems engineering guidelines. The SDLC focuses on design stages and have distinct separation between design and implementation of the system. However, the development of DSS requires a lot of interactions and changes in the process to cope with rapid changing decision making requirements. DSS could be used for once-in-a-life situations. Because of

these, various approaches have been designed to satisfy the special DSS building requirements, e.g. flexibility, evolving capabilities, timeliness and support user's decision making style (Hogue & Watson 84).

DSS development usually consists of a blend of different approaches which suits a particular situation. DSS can be built with a combinations of two fundamental strategies (Stabell 83):

- a non-directed approach based on computer-based technology developed as a simple, easy-to-use tools.
- a directed approach based on improving decision making effectiveness, which consists of costly, long term organised effort.

DSS development can be classified into ad-hoc to integrated approach (Sprague and Carlson 82) which has a variety of tactical options ranging from quick-hit, stage development to the development of a complete DSS.

The design of DSS can be differentiated into two approaches (Sheinin 80). Universal approach assumed that in the decision-making process a manager faces a set of alternatives. Formal methods can be applied to select the best alternative and these methods can be incorporated into the DSS. In Problem-oriented approach, a peculiar means is generated as a given problem arises to assist in the process of generating alternatives and resolving the problem.

Keen proposed an adaptive approach to develop DSS. In this approach a final system can be developed through an adaptive process of learning and evolution (Keen 78). This approach differs from traditional techniques in that it explicitly proceeds without functional specifications which contradict the recommendations underlying the system development life cycle. Adaptive design include all the middle-out, incremental, and evolutionary techniques.

Stabell articulated the idea of building DSS based on the decision-oriented approach (Stabell 83). It focuses on the decision that define the unique context of DSS and the decision should have implications for the why, how, and what of building such a system. The approach requires an explicit goal for system development beyond the goal of getting the system used.

The ranges of approaches point out that different problem situations need different ways to provide a suitable DSS to the clients.

addresses the cultural, political and individual difference in which the DSS has to cater for. These secure that the DSS developed through the DSSDS is both useful and usable.

Stage 4 and 5 take care of different world views of participants that include the decision makers, designers, implementors and top management in the design process. This is one of the strengths of SSM. The meaning of DSS may be very different to different parties involved. By resolving this through the establishment of primary task or issued based root definitions, the perspectives of different parties can be considered or perhaps integrated.

Stage 6 and 7 compare the conceptual model with real world decision making situation. These steps bring the model out to face reality and engage once more with the difficult situation. It is through these stages that the models can be refined to reflect accurately the decision making situation.

Stage 8 is the production of the physical system according to the requirements. The actual use of the DSS will induce changes to be feedback into the process for next iteration.

The DSSDS requires the designer to stay within the organisation throughout the whole process of building the DSS and have close collaboration with the decision makers. They should involved with following through and monitoring changes in the organisation in which they were working (Warmington 80).

Concept of appreciation (Checkland 86) is adopted to enable the continue improvement of DSSDS to cope with changes. The appreciation system developed (Figure 3) consists of monitoring and control stages to ensure the DSSDS can perform to its design objectives. Monitoring includes the following areas, i.e. Efficacy, Efficiency and Effectiveness. In the case of DSS development, we must monitor all the stages of DSSDS to ensure the DSS designed is both useful or effective and being used.

4 Conclusion

SSM is applied in this paper to look at the process of designing DSS. A DSSDS is established as a result of this study. The DSSDS provides DSS developers with a balanced view in developing DSS. An appreciation system keep improving the DSSDS to cope with environment or organisation changes.

The DSSDS established addresses both the decision-making and organisation issues in the design stages. The success of the DSSDS depends on the monitoring and control as well as the appreciation stages. Further research is carried out on the monitoring and appreciation mechanisms.

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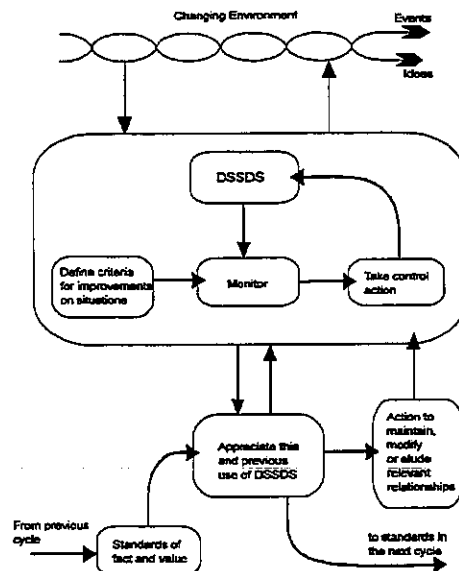


Figure 3. Appreciation system