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PARTICIPATORY SYSTEMS ANALYSIS

Frank G. Duserick, Ernest L. Enke, and Amy Rummel, Alfred University
Randall Rummel, Pacific Mountain Farms

ABSTRACT

For analysts in the discipline of Management Information Systems intent on increasing the level of understanding by users of critical information system concepts, utilization of the traditional structured systems analysis approech is the norm. A preliminary investigation followed by a feasibility analysis, identification of alternative solutions and general systems design are the normal activities that take place. Frequent interactions by analysts with the end-user and/or system requestor take place primarily on a scheduled basis with the analysts' presenting their findings and recommendations. Interviews, documentation, observation and questionnaires are the primary vehicles for data collection by the analyst. However, analysts and their clients are often In an adversarial relationship because of the mystery of technology, because of the feeling that the analyst does not really understand the issues the end-user is facing or because the client does not know what he/she wants want he/she knows they want something better. This paper presents a research framework to compare traditional and participatory approaches to systems analysis using a process oriented analytical procedure.

INTRODUCTION

For the purpose of this study, systems analysis is a mental process--a way of thinking about a problem, analyzing its components and structuring a solution. It is a systematic approach to the analysis of informetion processing needs. It does not include the design and development of computer based solutions to these problems. It is the "study of a specific domain of interacting objects for the purpose of understanding and documenting their essential characteristics" (Embley 1992). The focus of this research is on the analysis phase of the Systems Development Life Cycle (SDLC). The critical outcome of the analysis phase is for the analyst to have a clear understanding of user requirements so that proper focus is directed at subsequent life cycle activities.

In the 1970's, Teichroew (1977) and Ross (1977) developed structured techniques for performing analysis of information systems. DeMarco (1979) and Cane and Sarson (1979) formalized the structured analysis process, concepts and techniques in their books. In the early 1980's, detailed development methods (Jackson 1983; Orr 1982; Warnier 1981) that focused on data structure and that utilized process analysis activities became (and still are) dominant as methods to investigate and express findings in the analysis phase of the Systems Development Ufe Cycle (SDLC). This study will utilize the process approach presented by DeMarco (1979).

RESEARCH METHODOLOGY

The purpose of this research is to compare user performance between the participatory and traditional approaches to the functional decomposition of existing systems in the Systems Development Life Cycle. The research model for the study utilizes method (traditional or participatory), task and human as the control or independent variables to measure performance. The independent variable (model) is the presentation methodology (traditional or participatoryl utilized to provide the research subjects a basis for developing or modifying an information system to meet managerial and user requirements.

The main performance variable, modeling correctness, is the degree to which a particular analytical approach provides the correct solution not only in terms of semantic richness, but also in terms of solutionrepresentation.

Semantic richness or understandability is considered as more important than solution representation.

Research Hypotheses

The focus of this proposed research can be broadly stated as follows: "The use of participatory approach will provide better results than traditional methods when conducting an analysis of an existing system." This above statement implies a comparative analysis of products generated by the two methodologies.

The Experiment

A laboratory study was utilized to address the research question in order to control internal validity (Stone 1978), definition and manipulation of independent variables (Fronkin 1976), extraneous variables (McGrath 1979) and resistance to innovation (Zaltman 1973). The traditional class-oriented test sublects were presented with a similar project to address but with few formal lectures and one examination. However, the participatory oriented classes had their client available for at least seventy five percent (70%) of class contact hours. In addition, the client was available on an as needed basis. Moreover, the client was willing to develop e fundamental working knowledge of DeMarco's process oriented systems analysis technique as the course progressed. The syllabi in both groups was the same as they relate to assigned readings and required texts.

Preliminary Findings

The traditional instructional portion of this research was completed in December 1989 and December 1990. The participatory component was completed in December 1991 and December 1992. An elective systems analysis class was utilized for the experiment. A Mann-Whitney test was conducted to compare the two populations for each of the hypotheses. Preliminary analysis indicates that the null hypotheses that the two populations are identical cannot not rejected for the primary hypotheses. While no discernable difference was detected in objective measurements, subjective analysis of student (group and individual) performance by the instructor indicates a higher level of personal satisfaction that students will more clearly remember the analytical techniques because they worked in a participatory client-analyst relationship where the student's performance was consistently being measured by an outsider. The client and the instructor collaborated on assigning final grades to groups and to individuals. Moreover, client satisfaction appeared to be appreciably higher with the participatory groups' performance than with the traditional analytical approach that had infrequent client-analyst contact.

CONTRIBUTIONS

The premise for this research was based upon the growing interest in participatory approaches with limited empirical evidence that it is a more viable approach than the traditional structured methodology for systems analysis. The objectives of this research were to develop a model for comparing participatory and traditional methodologies for systems analysis, to utilize the model to test performance of the subjects and to identify and apply appropriate measures for assessing performance. The primary contribution of this research effort is the development of a framework to compare the efficacy of utilizing a participatory pedagogical approach for systems analysis.