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CONTINGENCY FACTORS AFFECTING THE USER INVOLVEMENT
ROLE IN THE DESIGN OF SUCCESSFUL INFORMATION SYSTEMS

by

Charles R. Franz

A DISSERTATION

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Contingency Factors Affecting the User Involvement Role in
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CHAPTER I

Introduction

Overview

An important question facing designers of information systems asks why systems which seem to be well designed technologically fail to be utilized by their intended users. The management informations systems (MIS) literature shows rather general agreement that the success (utilization) of information systems can be improved by involving the user. Although various approaches to user involvement are presented in the MIS literature, a lack of research exists on the type of involvement and the extent to which users should become involved in the design of information systems under various conditions.

The purpose of this dissertation is to investigate types of user involvement in designing and implementing information systems for managerial decision makers (users) and the resultant success (defined as perceived usefulness) of the information system to the user. Furthermore, user involvement is studied under various organizational and user conditions to investigate the effect which these various

conditions have upon the user involvement process, as well as the subsequent user-perceived outcomes of the information system.

The general research question to be investigated in this dissertation is the following:

What is the effect on user involvement of different organizational and individual factors in designing and implementing successful information systems?

Background on User Involvement in MIS Design

A persistent issue in the computer literature has been the role of user involvement in the development of successful systems.¹ At the end of the fifties questions were raised regarding the importance of users sharing the responsibilities in converting manual systems to electronic data processing systems. Toward the end of the sixties, MIS design was being debated as top down versus bottom up. Top down advocated that user involvement roles should consist of considerable responsibility, in order to assure that the MIS would integrate and "fully" support the organization's goals and objectives in accordance with the systems approach. During the seventies interest in user involvement shifted from the earlier top down perspective to studying more the

¹System is used to broadly connote a range from routine data processing systems to MIS and information systems.

user involvement role played by specific manager-users in designing their particular information system.

Early analysis and design. During the early stages of data processing, systems analysts concentrated on automating the existing manual and/or unit record systems such as payroll and customer billing. The systems analyst assumed the primary responsibility for analyzing the existing procedures and designing the new computer-based system. Improving the efficiency of routine tasks was the major objective of the computerization process. Because the existing systems to be automated were very routine, the processed documents were readily identified, and the design process appropriately consisted of modeling the existing procedures on the computer. In addition the outcome of the system could be easily observed and compared to previous outcomes. Hence, it was relatively straightforward to "build" the new system to duplicate the old system.

However, as early as the late fifties dissatisfaction with the traditional systems design approach began to appear. Thurston (1959) questioned whether it was in the best interests of the company to relegate systems and procedures responsibilities solely to the technical specialists. He concluded that a shared responsibility for planning and installation would result in more acceptable systems to users. In a five year longitudinal case study, Mann and Williams (1960) questioned whether work-role

changes produced by technological change could be ignored. They concluded that for the changeover from a previously manual system to electronic data processing equipment, technical efficiency and economic feasibility were not sufficient to assure operational feasibility (i.e. the amount the system would be understood and used by the intended users).

Total systems approach to MIS design. During the sixties management attention began to focus on the computer's potential to provide management information. Electronic data processing had demonstrated its ability to lift the clerical burden off the shoulders of the organization and attention was beginning to shift toward solutions for hard-pressed management problems.

The ideal MIS was advocated as a totally integrated system, capable of providing all the right information to the right person at the right time (Coleman and Riley, 1973, p.8). Ideally the top down approach to MIS design meant employing the systems approach. The systems approach was considered a necessary viewpoint to ensure that goals and objectives of the organization (system) would be the guiding framework for planning and designing the MIS. Important in the early design concept was identification of data sources, information flows and decision points in the organization. Only in as much as the information requirements were analyzed and determined correctly within a systems approach

framework would the MIS effort succeed.

However, the ideal MIS as a totally integrated information system did not prove feasible and fell short as a good design concept. Management decision making was naively assumed to consist mostly of structured, routine problems. Furthermore, sufficiently definitive techniques for analyzing management information requirements, especially in unstructured decision making areas, failed to be developed to adequately enable implementation of the ideal MIS. This followed as a result of the general lack of understanding management decision making on the part of the technical systems personnel.

In addition the traditional systems analysis viewpoint continued to prevail during the sixties. The earlier successes of technical personnel in predominately planning and controlling for data processing activities (e.g. accounting applications, order-billing, etc.) carried into the third generation hardware era. Even though more and varied types of users throughout the organization (both horizontally and vertically) were requesting computer services, thus increasing the complexity of systems, the responsibility for organizational planning and development of systems was essentially abdicated to the technical systems personnel (i.e. the data processing department).

At this time the McKinsey & Co. report (1968) found that "more successful" computer users were found in

organizations which involved the operating managers in the planning and managing of computer system design projects. By involving the operating managers, the organization was assisting in assuring operational feasibility of the system.² Although involving management was not a new viewpoint in developing systems, Zani (1970) popularized the concept of top down design for MIS development. In proposing a "blueprint for MIS", he stated that users at all levels of management must not only be involved in designing the MIS, but should actually lead the design effort. He strongly advocated management initiation of the MIS design process, which included delineating organizational structure, strategies and various decision-making processes for the technical specialist, and then ensuring proper integration of these elements into the technical systems design.³

Gradually, the emphasis on MIS shifted to collections of information systems working together in an "integrated" fashion to support management decision-making requirements. The attempt to understand MIS as a monolithic endeavor has largely subsided with attention shifting more to satisfying management needs in a more specific manner.

²The McKinsey report discussed three types of feasibility: technical, economic and operational. Operational feasibility asks whether the system will be successfully used, i.e. managers adapting to the system or resisting it, regardless of the technical feasibility or quality of the system.

Current MIS emphasis: Information systems for management. The early MIS orientation of providing information for management decision making still persists in the development of information systems for management today. The change in emphasis has been one of realizing that management requirements change, due in part to organizational changes and environmental changes outside the organization (legal, political, etc.). Much more managability in developing an information system can be achieved by limiting the scope of the information system to serve specific functional areas (marketing, production or finance) and the needs of the decision makers for these particular areas.

Although interest in providing managers with computer-based information has transitioned from global MIS concepts to an emphasis on the more specific information systems, the importance of involving users in systems design has remained constant. Global MIS stressed involving the user at very high levels of management. The main point of

³Zani (1970) viewed management initiation, planning, and guidance of MIS development as essential to successful MIS; the propositions developed in chapter 2 challenge this position.

top down was to make sure that management-user involvement would properly identify and integrate the organization's goals and objectives into the technical design of the MIS. Only in this way would the MIS meet the user's expectations and hence, be accepted and utilized by the users.

But current user involvement perspectives also emphasize the importance of the user assuming an active participative role in systems design. Again as in top down MIS design, active user involvement in information systems design is advocated as producing more acceptable and hence, more useful information systems to users.

Problem Statement

Although research supports the necessity of user involvement in systems design, two aspects of the user involvement problem still require attention. First, most of the research conducted on user involvement has been case studies of failures. Case studies are valuable techniques for discovering research problem areas and suggesting hypotheses for future research. However, more systematic research is required to test these hypotheses in order to contribute to a systematic body of knowledge (Van Horn, 1973).

The second aspect of the user involvement problem is the lack of clarity in the MIS literature in specifying what user involvement should mean. Many user involvement perspectives have been advocated in the MIS literature.*

However the question in information systems design is no longer whether to involve the users, but to be more specific in stating what type of users should be involved in the design process. For example, Zani (1970) advocates top management involvement (top down design) in the entire MIS effort as a universal design principle. Furthermore, specifics regarding the extent of involvement are virtually unknown. Should top management be heavily involved in all areas of MIS design and implementation or only certain critical design areas? Consequently, the purpose of this research is to investigate various types of user involvement and the extent (or degree) to which this user involvement occurs. Furthermore the type and extent of user involvement is suspected to be influenced by various situational factors. Thus factors affecting the type and extent of user involvement should also be investigated.⁵

Chapter two presents a detailed literature search of relevant research on MIS design and concludes with a specific reformulation of the user involvement research problem.

Methodology

The methodology employed consisted of a cross sectional

⁴Chapter two reviews six alternative user involvement approaches.

⁵Possible factors thought to affect user involvement are reviewed in detail in Chapter two.

field survey of more than 100 systems, obtaining data from the dual perspective of the lead systems analyst on the system project and the manager-user(s) of the system. Data was also collected from the DP managers. Users consisted entirely of managerial personnel who held a managerial title and used the information system for some type of decision making purpose.

The data collection methodology consisted of three types: questionnaire responses, interviews and collected documents. The first methodology utilized three sets of questionnaires to collect the data required to test the research hypotheses. The three types of questionnaires were a manager-user questionnaire, a lead analyst questionnaire, and a questionnaire for the head of the data processing department.

The second methodology consisted of interviews with the data processing manager only. Most organizations would not grant the researcher permission to attempt to locate all the users within a given organization, due to the possibility of disrupting personnel in the organization. As a result, questions were asked of the data processing manager regarding the nature of the job and decisions for which the manager-user employed the information system.

The third methodology of data collection was to secure organizational documents. The documents collected were used to support questionnaire responses as well as provide data