Managing the Political and Cultural Aspects of Large-Scale MIS Projects: A Case Study of Participative Systems Development

ROBERT S. TRIPP
University of New Mexico

Whether user participation in the Management Information Systems (MIS) development process is beneficial continues to be an uncertain issue. Although proponents claim user participation is important to MIS success, others indicate that user participation can be dysfunctional, thus leading to suboptimal systems that take longer to develop. Nonetheless, very little is written about how to implement and manage participative systems development activities. This paper presents a case study on how participative systems development was implemented and managed in a very large scale MIS project. The discussion points out that while adopting this development approach did lengthen the schedule and increase the costs of the development over original projections, it also led to a series of smooth incremental implementations.

In both the government and private sectors, large-scale, complex management information systems (MIS) developments commonly fail to meet performance requirements within originally projected cost and schedule estimates (McFarlan 1981, Appleton 1986, GAO 1986). This failure occurs for several reasons, including lack of top management involvement, poor user attitudes, and resistance to change (Doll 1985, Markus 1983, White and Leifer 1986). In trying to ascertain why these failures occur, recent government audits have pointed largely to the inability of developing agencies to adhere strictly to the procedures outlined in the Standard Development Life Cycle (SDLC) model (GAO 1986). The SDLC model prescribes the following sequence of steps: 1) define requirements; 2) develop a functional description; 3) develop system specifications; 4) develop test plans and user and operations manuals; and 5) design code and data bases, testing, and implementation. Specific tasks must be completed before the next one begins.

Much of the MIS literature has discussed technical approaches to solving problems associated with using the SDLC in large-scale developments. Ahituv and Newmann (1984), King (1982), and Synnott and Gruber (1981) have outlined the shortcomings of using the sequential
process, especially for developing very large scale MIS, pointing out that establishing detailed requirements specifications and detailed system designs before developing any portion of the system is impractical. Tripp and Filteau (1987) indicate that because these phases may span several years in large-scale systems, environmental factors will probably change before the systems are completed, thus requiring changes in system requirements and design.

To avoid some of these problems, Snyder and Cox (1985), Juergens (1977), Wong (1984), and Snow (1984) advocate decomposing large-scale systems into smaller increments for evolutionary design, development, and implementation. They argue that this evolutionary approach reduces the risks associated with very large projects and can accommodate changes in requirements by adapting changes to the system as the increments are released to users.

Another portion of the MIS literature has argued that MIS failures occur because proper behavioral approaches are omitted in the development process. For example, some authors have indicated that large-scale, complex developments have failed because of the lack of top management participation and support of developments, while others have contended that user attitudes and resistance to change have caused failures (Doll 1985, Markus 1983, White and Leifer 1980).

To overcome some of these behavioral problems, practitioners have tried to involve users and top management directly in the development process. However, as Tait and Vessey (1988) point out, the effects of including users and top management directly when developing large-scale systems are unclear. Hirscheim (1985) indicates that very little of the literature discusses how to make participative system development operational.

This paper presents a case study illustrating how a participative systems development approach was implemented in a very large scale MIS development. Specifically, it describes the methods used to involve users and developers in defining and controlling requirements specifications in implementing the Air Force’s largest distributed processing MIS, the Requirements Data Bank (RDB).

The paper has five major sections. The first section explains the RDB’s purpose and magnitude, and the second section outlines the project’s organizational approach and structure. The third section describes the roles of the groups involved in the development process and how they changed during the various phases of development. The fourth section describes key facets of the RDB configuration management approach and how requirement changes were handled and controlled. The final section discusses lessons learned in the RDB development that led to the current approaches in the RDB project.

**Background: The Requirements Data Bank (RDB)**

The Air Force Logistics Command’s (AFLC) primary mission is to ensure that materiel resources are available to support Air Force weapons systems. This mission greatly depends on the AFLC Materiel Requirements Planning (MRP) process, which involves forecasting the acquisition and repair requirements of approximately 900,000 spares, repair parts, and equipment items worth nearly $28 billion (BDM 1986). This forecasting process involves predicting approximately $15-17 billion annually for acquiring and maintaining these items (Air Force 1982).

Beginning in the mid-’70s, the Air Force MRP process was criticized as inefficient. Specifically, in managing MRP tasks, the AFLC used 22 different data systems, and because these systems were developed in the ‘50s and ‘60s, they were antiquated. To meet logistics objectives, AFLC realized it had to improve the existing MRP process. To develop and implement these improvements, the Air Force undertook the Requirements Data Bank (RDB) (Air Force 1982) - a major MIS development project (which is still in progress).

A cadre of top functional people were identified and removed from day-to-day management activities to identify the requirements for the