



The Collaborative Use of Information Technology: End-User Participation and System Success

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User participation seems especially important in the development of collaborative work systems where the technology is used by a work group to coordinate their joint activities. Users rather than systems analysts are often the best source of information on how they will use information technology to collaborate. It is almost an axiom of systems development that end users should participate in a broad range of activities/decisions, and that they should be permitted to participate in these decisions as much as they want. Despite these widely held beliefs, research has not focused on the differential efficacy of user participation in collaborative versus non-collaborative applications. Building upon the work of behavioral scientists who study participative decision making, Doll and Torkzadeh (1991) present a congruence construct of participation that measures whether end users participate as much as they want in key systems analysis decisions. Using a sample of 163 collaborative and 239 non-collaborative applications, this research focuses on three research questions: (1) Is user participation more effective in collaborative applications? (2) What specific decision issues enhance user satisfaction and productivity? and (3) Can permitting end-users to participate as much as they want on some issues be ineffective or even dysfunctional? The results indicate that user participation is more effective in collaborative applications. Of the four decision issues tested, only participation in information needs analysis predicts end-user satisfaction and task productivity. Encouraging end users to participate as much as they want on a broad range of systems analysis issues such as project initiation, information flow analysis, and format design appears to be, at best, a waste of time and, perhaps, even harmful. These findings should help managers and analysts make better decisions about how to focus participatory efforts and whether end users should participate as much as they want in the design of collaborative systems.

INTRODUCTION

A new era of collaborative organizations characterized by lateral leadership and virtual teams is emerging (Pasternack and Viscio, 1998; Ghoshal and Bartlett, 1997). Firms that compete by developing and deploying intellectual assets are finding that their competitive advantage will depend on developing a superior collaborative capability. Collaboration occurs when two or more people interact to accomplish a common goal. Collaboration means that people who work together support each other by sharing their ideas, knowledge, competencies, and information and/or by coordinating their activities to accomplish a task or goal (Hargrove, 1998). Collaborative work systems are defined as applications where information technology is used to help people coordinate their work with others by sharing information or knowledge. In a longitudinal study, Neilson (1997) describes how col-

laborative technologies such as Lotus Notes can enhance organizational learning.

Knowledge is a social activity. Complex problems can not be solved by specialists thinking and working in isolation, but in coming together through a process of dialogue, deeply informed by human values and focused on practical problems. Today people from all over the world have the capacity to communicate by e-mail and to participate in electronically distributed meetings. Technology has, in most cases, increased the quantity of interactions people are having. But, has it improved the quality of those interactions? To do this will require a shift in thinking and attitudes towards being more creative and collaborative in systems development (Hargrove, 1998).

Can analysts really design collaborative applications that enhance the quality of human interactions without engag-

ing the application's users in the design effort? In other words, should the design of collaborative applications itself be a collaborative activity? The literature on collaborative systems has focused on: (1) the nature and capabilities of the software, and (2) its application to specific problems requiring collaborative interaction. It has largely ignored the issue of user participation in the design of collaborative applications.

User participation is widely accepted as essential to developing successful information systems (Ives and Olson, 1984; Barki and Hartwick, 1994; McKeen, Guimaraes and Wetherbe, 1994). System analysis decisions have a huge effect on the downstream costs, timing, and on the likelihood of overall system success. Through interviews, surveys or joint application development sessions, the specification of user requirements is thought to improve the quality of design decisions and, thereby, improve the satisfaction and productivity of end-users.

Many analyst and user man-hours and considerable expense can be incurred in making sure that the user requirements are correctly specified. Despite the cost and importance of user participation, we have little knowledge of which decision issues are the most important (McKeen and Guimaraes, 1997). Research on user participation has focused more on the form (Barki and Hartwick, 1994) or degree of user participation (Franz and Robey, 1986) rather than the efficacy of specific decision issues. More emphasis should be placed on identifying the key decision issues and how those issues might differentially relate to satisfaction and productivity.

Few doubt whether users should participate in systems analysis decisions. However, should they participate as much as they want? Studies have shown that most end users want (desire) to participate more than they are actually permitted to participate in the development of applications that they use (Doll and Torkzadeh, 1989). Participatory arrangements, time constraints, and resources often constrain user participation and limit its potential (Doll and Torkzadeh, 1991).

User participation seems especially important in the development of collaborative work systems where the technology is used by a work group to coordinate their joint activities. Collaborative systems are especially difficult to design and require user input. Several interacting users are involved and their collaborative requirements emerge from a changing task context. User experience with the emergent nature of this collaborative activity is essential to effective systems design. In collaborative systems, users rather than systems analysts are often the best source of information on how they will use these applications to coordinate their work.

Managers and systems analysts would like to encourage further end-user participation. However, such efforts can be costly and time consuming, especially when they are not well focused on specific issues. We have little information on what decision areas are the most effective avenues for user

participation. Despite the growing importance of collaborative systems, no research studies have specifically focused on: (1) which decision issues are the most effective for improving user satisfaction and task productivity, and (2) whether end users should participate in the development of collaborative systems as much as they want.

COLLABORATIVE APPLICATIONS AND USER PARTICIPATION

The interest in and adoption of collaborative applications is being driven by the needs of organizations to address fundamental business problems, specifically those relating to becoming more flexible organizations, shortening time-to-market, and, above all, becoming more responsive to customers (Marshak, 1994). Historically, information technology was used to support individual users and their needs. Computer systems that were used by groups of people e.g., transaction processing applications, were usually geared toward aggregations of individuals. That is, each user is seen by the system as a discrete unit or a point of input in a sequential process; there is little or no direct interaction, collaboration, or shared work among the users (Johansen, 1988).

In the 1980s, information technology was seen to be a way to support and empower ad hoc teams to meet these needs. Initial applications were aimed at providing a method for these teams to communicate; particular emphasis was placed on teams that could not meet in real time due to organizational or locational differences. Applications such as e-mail, conferencing and bulletin boards provided these teams with the ability to brainstorm, share their findings, and, in some cases, work collaboratively.

For some time now, organizations have turned their focus from supporting teams and groups to looking at their business processes and figuring out how to redesign, support, and manage them to achieve the same overriding goals that has brought attention to teams (Harrington, 1991; Davenport, 1993). Kock (1999) describes how collaborative technologies can facilitate process improvement and enhance organizational learning. Thus, the focus has shifted from the team to the process and, in particular, to the business goal of the process - a satisfied customer and a quality product with short time-to-market.

David Marshak (1994) argues that by the year 2000, collaborative systems will disappear entirely as separate application category. He argues that as applications are redesigned around this process focus and the technologies currently grouped under the umbrella of groupware or collaborative systems become ingrained in the way we work, collaborative systems will simultaneously become transparent and ubiquitous, thus disappearing forever as a separate category of application (Marshak, 1994). If this is true, researchers have to redefine what they mean by a collaborative application.

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