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A Case Study

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Introduction

User involvement has always been considered an important contributor to the success of information systems, despite inconclusive evidences to support such claims. None of the studies on user involvement have paid attention to environmental context. This paper reports on a system that demonstrates how the external environment actually affects user involvement and system success. It also provide some insights for future research on user involvement.

Literature Review

The literature on user involvement maintains that for a system to be successful, users need to be involved in the initiation, requirements definition, design, and implementation stages of system development (Ives and Olson, 1984; Doll and Torkzadeh, 1989). Ives and Olson (1984) concludes that user involvement will improve systems quality and user acceptance. On improving systems quality, user involvement will: provide more accurate and complete assessment of user requirements (Norton and McFarland, 1975; Robey and Farrow, 1982), provide the IS group with expertise and knowledge about the organization the system is to support (Lucas, 1974), avoid unacceptable or unimportant features in the system (Robey & Farrow, 1982), and improve users' understanding of the system (Lucas, 1974, Robey and Farrow, 1982). On increasing user acceptance, user involvement will: help users develop realistic expectations (Gibson, 1977), provide users with opportunities to bargain and resolve conflicts about system design (Keen, 1981), develop system ownership for users (Robey and Farrow, 1982); decrease users' resistance to change (Lucas, 1974), and gain users' commitment to the system (Lucas, 1974; Markus, 1983). Although Ives and Olson (1984) reports mixed results in empirical findings due to lack of strong theory, inability to demonstrate benefits of user involvement, and faulty methodologies (Tait and Vessey, 1988), the general consensus is that user involvement is important to information systems successes.

Much effort has been put into validating the importance of user involvement to information system success. Researchers have looked at improving the measurement instruments for user involvement (Franz and Robey, 1986; Baroudi, et al., 1986; Robey, et al., 1989; Doll and Torkzadeh, 1989; Barki and Hartwick, 1994) and developing

theoretical models (Robey and Farrow, 1982; Franz and Robey, 1986; Tait and Vessey, 1988; Doll and Torkzadeh, 1989; McKeen, et al., 1994) to better explain the relationships between user involvement and system success. However, the effect of changing business environment on user involvement has been neglected. Although both Franz and Robey (1986) and Tait and Vessey (1988) included organizational context into their model, they stopped at the internal environment without examine the external environment. Pressures from changing business environment should increase users' involvement in, and acceptance of, a system that will help relive the pressures. Lower involvement and acceptance of the same system would be expected if there is no external pressure. The external environment has a moderating effect on user involvement and system success.

Research Methodology

Qualitative research is necessary to generate in-depth understanding of the effect environment has on user involvement. Detailed data collection was conducted through unstructured face-to-face and telephone interviews and review of materials.

The QDM System

Quality Data Management (QDM) system was selected because it experienced significant environmental changes and counters the traditional wisdom of user involvement. It is a system developed by the IS department at MI that provides quality data documents in the form of Certificate of Analysis (COA) for chemical products to customers, in a timely manner. The system receives quality testing data from quality laboratories at production sites throughout North America electronically, stores those data centrally, compares those data to specifications on customer's orders, and produces customer specific COAs. The COAs can be distributed to the customers via EDI, fax, mail, or can be attached to the product shipments.

QDM was a visionary system initiated by one IS manager. "We could see that our outside customers were going to require quality data transmissions on the various products that we were shipping them. We were the one that saw it coming and said we better do something and get ready for this." The majority of potential user departments did not believe that such a system would be necessary at that time. Most reacted "We don't need that. We're handling it ourselves on our little PC and it's only a couple of customers that wanted COA." Because of this reason, no users were involved in the initial development of the system and none were willing to fund the project.

Due to the lack of user sponsor, the IS department had to develop the basic outline and infrastructure of the system based on their own knowledge about "what the EDI transactions for quality required" and on their experiences of quality documents in paper. Believing that flexibility would be required when the system is used by different user departments, one major feature of the system has been to allow users to create different COAs any way they wanted without IS interventions. "That was the main thrust of the system as it originally conceived. That was our impression of what was going to be required in the industry and I did not want to be in the position that we had to put

programmers on it every time they wanted a different COA created. So we simply built it in a generative mode."

At the stage when detailed information such as the type of data or interface were needed, the project members went to solicit information from potential users. It was through this information gathering that one department, IOX, decided to try out and fund the project. It was at this detail design and coding stage that users got involved by signing-off certain project documents. Half way through the coding for IOX, the company purchased another firm (PLS) that also required the system. The priority of the project shifted to PLS and one department within PLS actually became the first group to implement QDM. Other like IOX, OPD, and so on followed. Currently, over 70% of all potential user groups for QDM have expressed interest to implement the system and about 40% are already using QDM.

Discussion

The success of QDM system clearly demonstrated the impact of the external environment on user involvement and system success. The IS department has a user oriented culture. Users are referred to as customers and all projects are customer funded. However, since the pressure from customers requiring COAs from the external environment was not strong in the beginning, no users were motivated to get involved. The IS department had to keep the project going on its own, till a user group was willing to fund it. In this case there was no user involvement in the initiation and requirement definition stages. There was only involvement by weak control with 'sign-off' responsibility (Ives and Olson, 1984) during the design and coding stage. According to the literature, this low level of user involvement would be expected to have low system quality, user acceptance and satisfaction, and a high likelihood of failure. Instead, the system became very successful. Besides the IS department's efforts to make sure that they produce a quality system that is useful to the users, the changes in the external environment played an important role.

The changes in MI's business environment are partly attributable to the quality movement and the adoption of ISO 9000 certifications. An increasing number of companies in the chemical industry are requiring their suppliers to provide COAs to certify the quality of the products received. MI itself requires COAs from their own suppliers to be ISO certified. COA is used as a quality assurance from the supplier to the customer and can be crucial to product delivery. "We had a customer reject a shipment because an error in data entry showed zero strength for our dye on the COA. A dye cannot have a strength of zero. We had to correct the error and reprinted the COA for the customer to accept the shipment." Due to the increasing number of customers requiring COAs, which leads to increasing amount of manual preparation work for the COAs, the pressure was making users eager to adopt system such as QDM as soon as possible. Whether the users were involved in the system development were less important to system success. The environmental context took precedence and overshadowed the value of user involvement.

However, this assertion does not in any way diminish the contributions of user involvement. The fact that QDM project members collected information from various

user groups to increase the system's adaptability to the different needs of the user groups made QDM more acceptable to the users. Although the level of user involvement was not as high as that suggested by the literature, the implementation would not have been as smooth and there would have been more complaints toward the system and IS department without it. The business environment could impose system usage and acceptance but user involvement would still affect system quality and user satisfaction.

Conclusion

The main contribution of this study is the identification of the environmental context as an important factor affecting user involvement. The QDM project clearly demonstrates the importance of the environment on user involvement and systems success. Some lessons that can be learned from this case are:

- IS department is in the position to develop visionary systems because of its knowledge in information technology and its access to multiple departments.
- Development of visionary systems based on through knowledge of users' business requirement will ensure systems success.
- High environmental pressure makes user involvement less relevant to systems success.
- Lack of environmental pressure might not motivate users to get involved in IS initiated systems and could lead to systems failure.
- Qualitative research is valuable in developing a rich understanding of the user involvement construct.

The limitations of a single case is apparent in this case. There might be other relationships between environment and user involvement that are not observed in QDM. Nevertheless, this study points out one important factor for research in user involvement. Qualitative researchers should follow the lead of this study and take another in-depth look at user involvement to identify additional factors that might affect user involvement. Quantitative researchers should include environmental context and other factors into future model testing for user involvement.

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