Factors Affecting Groupware Success: A Case Study

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Introduction

The impacts of groupware on work, organizational structures and organizational effectiveness have recently received increasing attention. However, relatively little is known about these impacts and circumstances under which the impacts occur. Kraut et al. (1994) identify two streams of research exploring the adoption and use of new technologies. Utility approaches emphasize fit between task characteristics, design of new technology and organizational structures. For example information richness theory proposes that communication media have varying capacities for resolving ambiguity and facilitating understanding. McGrath and Hollingshead (1993) argue that tasks requiring idea generation require only the transmission of specific ideas, while tasks requiring negotiation and conflict resolving may require the transmission of maximally rich information, including facts, values, attitudes, and expectations.

Social influence approaches focus on the communication contexts and processes through which potential adopters learn about and develop new attitudes towards innovations (Fulk 1993). Organizational support concerning IS implementation has also been emphasized by several researchers as a potential determinant of IS success (Igbaria et al. 1995, Davis et al. 1989). Leonard-Barton and DeSchamps (1988) suggest that both managerial and individual factors may influence innovation use directly, and these factors also interact one with another to influence use. Users' evaluations of new technology depend not only upon personal interests, skills and needs, but are also affected by organizational leaders' attributes, opinions or actions.

Applegate (1991) suggests that also user receptivity (i.e. users' IS-related experiences and knowledge) can significantly impact their beliefs about the usefulness of a new system. These beliefs are an important determinant of use, because individuals are more likely to undertake behaviors they believe will result in valued outcomes than those which they do not see as having favorable consequences (Compeau - Higgins 1995).

These three theoretical streams have frequently been viewed as mutually exclusive. However, Kraut et al. (1994) argue that both individualistic rational evaluations of net benefit (utility) and social influence processes influence adoption of new technologies. This paper aims to compare the significance of these factors and, additionally, the significance of users' IS-related experiences on groupware adoption and (perceived) success.

Research Variables

Task characteristics are closely related to the ability to exploit new technology (Goodhue - Thompson, 1995). Tasks performed by technology users are an important part of the context in which technology is used. Task types can be classified according to McGrath's task typology. He posits four basic task performance processes: idea generation, decision making, negotiation and conflict solving, and executing tasks. McGrath and Hollingshead (1993) argue that tasks differ in how much they require the transmission
of information that is more or less "rich" in its contents. Tasks requiring idea generation may require only
the transmission of specific ideas, while tasks requiring negotiations may require the transmission of
maximally rich information including facts, values, attitudes etc. They refer to information richness theory
(Daft - Lengel, 1986) and suggest that communication media differ in the richness of the information that
they can and do convey. The electronic communication media including groupware are toward low-
richness end of continuum compared to face-to-face communication. Thus, groupware is supposed to yield
effective performance in groups doing mainly idea generation.

Another important feature in task characteristics is the interdependence between task performers.
Individuals working in groups and teams are assumed to be dependent on each other's performance. Fulk
and DeSanctis (1995) suggest that the use of electronic communication technology will benefit most those
organizations, in which horizontal interdependencies are high. In Fulk's study (1993) task interdependence
(within work group) was found to have a significant relationship to communication system use.

Organizational support provided by management and technical staff is also found to be positively
correlated to new technology assimilation. It is usually assume that management has a very central role in
new technology implementation. Managers can encourage (or discourage) adoption through expressed
mandates, preferences, reward systems and incentives (Leonard-Barton, 1988; Moore - Benbasat, 1991).
Management should also have a key role in aligning business activities and information technology
(Venkatraman, 1991). Management also controls access to infrastructure supporting assimilation (e.g.
training and education). Technical support refers to quality of support and help provided by IS department
or information center. This includes availability of assistance for users in problem situations and the
maintenance of the organization's technical infrastructure.

Previous computer usage, IS-related attitudes, user skills and user training are indicators of prior IS-related
experience. They have been found to be positively correlated to new technology usage and success
(DeLone - McLean, 1992; Igbaria, 1990). People and organizations having a wide variety of experiences
are better able to adopt new systems, because they have a storage of accumulated knowledge. This
knowledge can be exploited in assessing the new technology. Tyre and Orlikowski (1993) suggest that
experienced users have more flexible technological frames (i.e. cognitive elements or mental models that
individuals have their organization, work, technology, and so on). They have more realistic ideas and
perceptions about the potential benefits and problems of the new technology, and they are also able to use
the new technology innovatively. If the new technology is sufficiently different from existing technologies,
the existing frames need to modified in order to understand or interact effectively with the new technology.

Method

Groupware adoption and success were explored in a large industrial case company. A questionnaire was
sent to 200 users of ICL Teamware Office system, which is quite similar to Lotus Notes (Teamware Office
includes e-mail, electronic bulletin boards and electronic calendar).

Task characteristics were measured by three dimensions: task type, task analyzability and task
interdependence. Task type was operationalized following McGrath's task typology, in which tasks are
divided in four subtypes (McGrath - Hollingshead 1993). These subtypes are idea generating, problem
solving and decision making, communicating and negotiating, and executing tasks. Respondents were
asked to indicate the extent to which tasks of each type are included in their work. Task analyzability was
measured by using the measurement instrument developed by Withey et al. (1983). Task interdependence
was measured by using modified version of the instrument developed by Hiltz and Johnson (1990).

Organizational support was measured as suggested by Igbaria et al. (1995). The measure encompassed two
broad categories: technical support (technical competence of technical staff, the ability of IS staff to
understand the requirements of work tasks to IS, quick availability of support and advice, and ability to
work closely with users) and management support (top management encouragement of IT use, immediate
superior encouragement of IT use, allocation of resources, and top management visions).
Previous IS-related experiences were measured along three dimensions: IT use, attitudes toward IT use, and user skills. In addition, respondents were asked, how frequently they have participated user training during last three years. The instrument developed by Igbaria (1990) was used to measure these constructs.

Groupware success was measured by asking users the impacts of Teamware Office on four constructs. These constructs are information quality, individual productivity, coordination, and organizational effectiveness. Success measures are based on the IS success framework developed by DeLone and McLean (1992).

Results

Improvements in information quality and coordination (both on work group and organizational level) were the most important perceived benefits of the Teamware Office system. Some respondents also indicated that their personal productivity has improved. However, organizational effectiveness had not improved significantly.

Results also indicate that previous IS-related experiences and social influence are more important determinants of success than task characteristics in the early phase of groupware assimilation. Individuals using frequently other information systems are often more anxious to adopt new technologies and they also tend to have better abilities to assess the value of new innovations. Managerial support was very important for users, whose tasks are less interdependent. Perceived quality of technical support did not correlate with perceived groupware success.

Discussion

First of all, the results suggest that the role of social context is very essential in groupware adoption. Technical problems were of minor importance, while problems related to motivation, training, attitudes and organizational support were emphasized. These results are consistent with Orlikowski's (1992) findings. Task-technology fit was less important determinant of success. However, the importance of task characteristics will probably increase as users get acquainted with the Teamware Office system.

It is also obvious that business process changes and improvement in organizational effectiveness are not automatic consequences of groupware implementation. User training and motivation should be used to create an innovative environment. The integration of the system in business processes requires both time and effort from management and technical staff.

References


