

**COLLABORATIVE TECHNOLOGY USE:**

**A MULTILEVEL THEORY AND  
EMPIRICAL DEMONSTRATION**

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EMPIRICAL DEMONSTRATION

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**Priya Seetharaman**

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PRIYA SEETHARAMAN

Submitted by:

Forwarded by:



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## ABSTRACT

Increasing complexity in organisational decision making situations and the need for diverse knowledge necessitate use of groups in organisations. Coupled with this, the proliferation of information technology infrastructure has augmented information processing capability of organisations. Collaborative technology is one such IT infrastructure in organisations. It is the collective system of interactive computer-based tools that facilitate a variety of organisational group tasks. With the growing implementation of group support technologies in different forms in organizations, there is a strong need to understand the phenomenon better. Use of technology support for collaborative work is believed to increase productivity in organizations. It is hence important to examine the use of such technologies in greater depth.

Current research on IT use in organisations, group decision support systems and virtual teams have taken a restricted view of the phenomenon of use of collaborative technology in organisations. IT use theories, such as the popular Technology Acceptance Model, have for instance mainly focused on the perceptions regarding usefulness and ease of use and their impact on the intention to use IT and collaborative technology applications. Research on group decision support systems and virtual teams has, on the other hand, primarily concentrated on the impact of collaborative technology use on group performance parameters. While there has been ample research on the effect side of the overall phenomenon, there has been a dearth of studies on the causal side. There is hence a research gap with respect to understanding what drives the use of collaborative technology in organisations.

This study is aimed at enhancing the understanding of the use of such group support infrastructure in organisations. Using case study as a research methodology, the multilevel framework identifies factors that facilitate and inhibit collaborative technology use. These causal factors have been structured in three main constructs including pressures to use collaborative technology, group orientation towards collaborative work and group inclination to use collaborative technology.



The first causal construct, pressures to use collaborative technology, reflects the pressures experienced by the group to collaborate on the group task as well as to use collaborative technology to support the group task. Certain organisational situations may naturally require members of the organization to collaborate and work jointly on particular tasks. These situations generate drivers which allow individuals in organizations to collaborate. Additionally, groups are more likely to collaborate using technology when there is sufficient compulsion to utilize it for their task and/or when there is a tremendous drive or inclination to use technology support. This is especially true when alternative media are available to complete the task. Under such circumstances, task, group and organization related pressures to use collaborative technology play an important role in determining the extent to which groups use collaborative technology. These include aspects such as geographical and temporal dispersion of the group and the response time requirements imposed by the task.

The group's cultural orientation in terms of its collectivistic tendencies is the second causal construct identified. This construct is based on both the group's cultural orientation and the orientation of the organisation culture towards collaboration. The cultural environment of the organisation in which a group is embedded is greatly likely to influence the group members in their tendency to work synergistically as a group. Group cultural attributes include innate characteristics of the group, such as task orientation; uncertainty and risk aversion; trust and cohesion and openness to information sharing, etc. These, along with the leader's role and his perceived power are likely to influence the group's propensity to collaborate.

Finally, the group inclination to use collaborative technology reflects the tendency of the members of the group, individually and collectively, to favor the use of such a technology over alternative means, to accomplish the specified group task. A positive orientation or inclination of the group members towards collaborative technology is likely to translate into greater levels of actual use of the technology and vice-versa.



Using the possible values of these three constructs, eleven feasible and non-transient collaborative technology environment states are identified and the plausible characteristics of each described.

The nature of impact of each of the three constructs and the environment states on the use of collaborative technology has also been analysed in detail. In order to do this, the dependent construct — ‘use of collaborative technology’— has been defined in terms of two factors – scale of use and sophistication of use. Scale of Use represents intensity and spread of collaborative technology use. In other words it captures the magnitude of use. On the other hand, sophistication refers to the use of the general collaborative technology infrastructure and specific collaborative technology applications at various levels of refinement, as reflected in the activities performed using the technology such as information sharing, information management, group information management and synchronous group activities. Using these two factors as dimensions of collaborative technology use, a matrix named ScaSo Matrix giving rise to four broad categories of organisational groups with respect to their use of collaborative technology, has been developed. The four categories include amateurs, passive experts, satisficers and active experts.

The framework represents a significant improvement over existing studies in the area mainly through two aspects. First, the study is more integrative in nature, i.e. it tries to explain the phenomenon as a whole rather than a particular aspect of it. Second, the study also presents broad typologies which aid in macro-level identification and classification of groups, along with detailed micro-level variables and measures which can aid in actually evaluating the state of each variable.

The prescriptive value lies in the identification of the micro-level variables, which have an impact on the characteristics of use of collaborative technology; and analysis of the nature of this impact. This understanding, along with the different suggested mechanisms to influence the micro and macro level causal factors, lends the dissertation a very significant prescriptive value.