

15 CONFERENCEXP: An Enabling Technology for Organizational Resilience

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Abstract

In order to respond to dynamic challenges, this paper argues that companies can develop a resilient capacity through the development of virtual teams and use of enabling technologies such as video-conferencing. The ability to respond to change creates pressure for proactive responses and the development of organizational flexibility and structural agility. Virtual teams and the use of technology such as video-conferencing can help organizations meet the evolving challenges of the business world and enable organizations to adapt better. This technology enables workers to increase their productive capacity and take advantage of expert collaborations. As a result, managers are looking to video-conferencing technology to help implement initiatives on the development of organizational resilience.

This practitioner report relates experiences from a project designed to give students experience of virtual teams in which the skills necessary to become effective members of a resilient organization can be acquired. This practitioner report also attempts to relate the tactics management uses to build resilient organizations and the supporting role video-conferencing can play. A new video-conferencing technology—ConferenceXP—is also described as a platform for the creation of flexible, distributed and virtual teams.

Keywords

Video-conferencing, virtual teams, organizational resilience

Please use the following format when citing this chapter:

Scott, Murray, Sorcinelli, Gino, Gutierrez, Peter, Moffatt, Chris, DesAutels, Philip, 2006, in International Federation for Information Processing (IFIP), Volume 206, The Transfer and Diffusion of Information Technology for Organizational Resilience, eds. B. Donnellan, Larsen T., Levine L., DeGross J. (Boston: Springer), pp. 219-227.

1 INTRODUCTION

Competitive pressures constantly force organizations to reevaluate their business strategies (Porter 2001; Venkatraman 1994). Indeed, in the current business environment, the attainment of success is due more to the continuous capacity for change rather than relying on traditional advantages (Hamel and Valikangas 2003). The ability to respond to change creates pressure for proactive responses and the development of organizational flexibility and structural agility (Paul et al. 2004). Virtual teams and the use of technology such as video-conferencing can help organizations meet the evolving challenges of the business world and enable organizations to adapt better (Townsend et al. 1998).

This practitioner report describes a project underway to create a virtual problem-based learning project, where students develop the socio-technical skills necessary to become effective members of globally distributed virtual teams.

2 THEORETICAL BACKGROUND

In order to respond to dynamic challenges, this paper argues that companies can develop a resilient capacity through the development of virtual teams and use of enabling technologies such as video-conferencing. Virtual teams are commonly described as a group of geographically dispersed individuals, formed to complete a specific project, that communicate using information and communications technology (Sarker and Sahay 2003).

Recent trends such as globalization, distributed teams, and market pressures for new product development have increasingly led to the development of cross-functional virtual teams (Paul et al. 2004). With the increasing shift from the production of material goods to information-based products, virtual teams not only have increased in economic importance but also provide important benefits such as increased utilization of employee time and availability and the ability to leverage expert knowledge regardless of location (Quinn 1992).

The effective utilization of human skill is an important factor not only in achieving resilience (Hamel and Valikangas 2005) but also in the fostering of innovation in virtual teams. Virtual teams have frequently been cited as suitable environments for innovative potential given their focus on problem solving and the resultant need for expert knowledge and creativity (Vissers and Dankbaar 2002). The scarce availability of such expert knowledge coupled with other competitive factors such as travel and cost have created a significant demand for companies to explore technological platforms to facilitate the work of virtual teams (Press 1998). One of the most promising of these communications technologies is video-conferencing (Fish et al. 1993).

2.1 Communication: Supporting Innovation in Virtual Teams

Innovation capacity is influenced by communication levels in an organization. For example, in large organizations, the connection between external market opportunities

and internal organizational resources may appear, on the surface, to be somewhat *ad hoc*. This linkage between internal and external actors depends on communication channels to facilitate the routing of information about new market opportunities. In practice, innovative capacity is dependant on informal social networks of professional acquaintances who make the linkages needed to form the appropriate project teams and realize the potential of new ideas. Proponents of this view emphasize three aspects of communication: first, the importance of context, second, the role of narrative, and third, the so-called “small world network” phenomenon. These three concepts will be expanded upon in this section.

2.1.1 Context

Researchers in knowledge management have drawn attention to the importance of context in knowledge creation. Nonaka and Konno (1998) see knowledge as being embedded in *ba* (shared places), where it is then acquired through one’s own experience or reflections on the experiences of others. Snowdon (2000) describes a somewhat similar concept that he calls *cynefin*—a Welsh word that represents the link between a community and its shared history “in a way that paradoxically both limits the perception of that community while enabling an instinctive and intuitive ability to adopt to conditions of profound uncertainty” (p. 10). Snowdon uses the concept to emphasize that people never start from a zero base when a knowledge management system is being designed because all members of the system come with baggage, positive and negative, derived from multiple histories.

2.1.2 Narrative

Denning (2004) emphasizes the importance of narratives in innovation processes. In his view, narratives capture context whereas abstractions decontextualize knowledge. Narratives also communicate tacit knowledge. Through narrative, people tell more than they know whereas abstractions only convey explicit knowledge.

Bolin et al. (2004) show how some common organizational initiatives like business process reengineering and total quality management tend to fail in motivating and engaging people sufficiently and outlined an alternative method for driving change management through narrative. They view narrative as a vehicle for change and organizational development and propose the use of myths, tales, and stories as triggers in change projects in order to develop a creative and dynamic atmosphere in which change can be achieved.

2.1.3 Small World Networks

Freeman (1991), in his review of the literature, noted that empirical studies of innovation since the 1950s had demonstrated “the importance of both formal and informal networks, even if the expression *network* was less frequently used” (p. 502), and that “multiple sources of information and pluralistic patterns of collaboration were

the rule rather than the exception” (p. 503) Indeed, Allen et al. (1983) contend that “the overwhelming dominance of personal contact in technology transfer has been replicated in study after study, yet it is consistently ignored by policy-makers” (p. 201).

In order to describe the transition from a regular lattice to a random graph, Watts and Strogatz (1998) introduced the concept of small-world network. It is notable that the small-world phenomenon is indeed very common. Another interesting manifestation of the “small-world effect” is Milgram’s (1967) so-called “six degrees of separation” principle, suggested by a social psychologist.

The research by Watts and Strogatz on small world networks and by Barabási and Albert (1999) on “scale-free” networks has enlarged our concept of what actually constitutes a network. The key contribution of this new small world network view is that it should be possible to configure links in a social network in a manner so as to get a small-world network effect (where information can flow across the network in a relatively few hops), but also retain the benefits of high clustering (where closely knit groups focus on their specific goals and deliverables). The key to the approach is the identification of social connectors. “Sprinkled among every walk of life...are a handful of people with a truly extraordinary knack of making friends and acquaintances. They are connectors” (Gladwell 2000, p. 20).

2.2 Video-Conferencing and Resilience

Video-conferencing provides the technical platform to facilitate the interaction of virtual team members and offers better communication opportunities than other computer-mediated tools due to enhanced social presence and the potential for high levels of media richness (Townsend et al. 2001). As a result, this technology enables workers to increase their productive capacity and take advantage of expert collaborations (Kettinger and Grover 1997). Managers are looking to video-conferencing technology to help implement initiatives on the development of organizational resilience (see Table 1).

In order to achieve the benefits of virtual teams and develop organizational resilience, the successful diffusion and implementation of this technology is critical. From a study of video-conferencing in virtual workgroups, Townsend et al (2001) argue that there is a clear imperative for organizations to teach employees how to interact effectively in a virtual environment. It is also noted that perceptions of the technology are moderated by the social experiences of the users and that the subsequent evaluation of its usefulness is determined by a complex set of cultural beliefs and expectations (Sarker and Sahay 2003; Townsend et al. 2001). Valikangas (2004, p. 2) identifies four steps to corporate resilience and points out that the first and fundamental step is the development of a “greater willingness to access information from multiple sources for richer contentso that cross-functional decision making gets better results.”

Table 1. Resilience and ICT to Support Virtual Teams (adapted from “Putting Organizational Resilience to Work,” L. Mallak, *Industrial Management* (40:6), 1998)

Tactics Used by Managers to Build a Resilient Organization	How Can Video-Conferencing Can Play a Supporting Role
Use positive reinforcement to increase the frequency and intensity of desired behaviors.	Provide platform for regular feedback, public recognition and encouragement.
Provide constructive feedback when individuals fail so they can see what went wrong and walk away from the experience with a positive mental framework.	Facilitate “after-action reviews” of what went wrong so that staff walk away from the experience with a positive mental state.
Gradually expand decision-making boundaries.	Promote the flow of information across the team so that the quality of decision-making is enhanced.
Break down organizational structures that act as barriers against resilience.	Enable inputs to be gathered and participation to be nurtured from all levels and locations of the organization.
Develop bricolage skills.	By stressing the need to design and implement solutions on the fly in a problem-based learning environment, staff become more comfortable about taking the necessary steps and calculated risks to solve problems and satisfy customers.

3 PRACTICE REPORT: IMPLEMENTING CONFERENCEXP IN A MULTICULTURAL, COLLABORATIVE, PROBLEM-BASED LEARNING ENVIRONMENT

During the 2005 academic year, students from the University of Massachusetts, Amherst (UMass) participated in a cross-cultural, collaborative project with the National University of Ireland, Galway. The Business Information Systems (BIS) program at NUI Galway and the Isenberg School revised their curriculum so students learn to manage, share, and use information technology more effectively in collaborative work-group settings. Connecting the workplace and the classroom to enhance the educational experiences of management students and prepare them to become future business leaders who can survive and thrive in an environment that mandates organizational resilience is the driving force behind this cross-cultural educational effort. This project made use of ConferenceXP, a conferencing platform developed by Microsoft Research (MSR), to connect students in a virtual transatlantic classroom.

3.1 Project Objectives

In line with the characteristics of virtual team work and the imperative to provide instruction in the use of video-conferencing, faculty members from BIS and UMass derived two main project objectives: (1) to provide students with experience of the technology so they can align communication and decision making for problem solving and in doing so use video-conferencing to evaluate alternatives, and (2) to provide experience of working in virtual teams in a cross-cultural environment. The focus on problem-solving in this environment is further supported by Mallak (1998), who identifies members of the resilient organization as sharing decision-making power which in turn enables timely and effective responses to unexpected change.

Faculty members in both programs have identified the following learning objectives for the students:

- To master problem-solving skills through searching for, retrieving, analyzing, synthesizing, and integrating information and ideas
- To distill information into manageable categories and translate that information into effective business decisions
- To collaborate and work productively with others in multicultural work environments

3.2 Project Design

There are two key components to this project's pedagogical design. The first is the design of IT-related exercises and group projects that (1) build on the strengths of a cross-cultural educational environment, (2) foster interdependence among students, (3) are relevant to student learning goals, and (4) fit student skill sets and abilities. The second is a facilitation methodology for cross-cultural learning groups that builds on the best practices of effective teaching, but also adapts them to account for environmental and cultural differences.

4 THE CONFERENCEXP PROJECT

The UMass/BIS project made use of ConferenceXP as the video-conferencing platform. The ConferenceXP project was initiated at Microsoft Research in 2002. The main goal of this project was to provide a platform that would enable and support the creation of flexible, distributed, and virtual teams. To date, research and investigation around ConferenceXP has been directed toward exploring its effectiveness in distributed learning and collaborative learning environments in higher education. The ConferenceXP project also attempts to take advantage of the availability of increased bandwidth and computing power to create a low cost, highly scalable platform of high fidelity conferencing and collaboration over the Internet. ConferenceXP provides a unique implementation of video-conferencing as it makes use of new technologies and platforms such as multicasting and Internet 2.

4.1 ConferenceXP Services and Applications

ConferenceXP provides three services that enhance and extend its functionality. The ConferenceXP venue service manages venues which are virtual spaces where users can participate in real-time collaboration activities. The ConferenceXP archive service enables recording and playback ConferenceXP sessions.

These core services provide the platform for researchers who can design and prototype collaborative and innovative applications that take advantage of the ConferenceXP platform.

4.2 ConferenceXP Platform and Architecture

The foundation of the ConferenceXP project is the ConferenceXP research platform, which enables researchers and developers to deploy distributed applications that incorporate support for high-quality, low-latency audio and video conferencing over broadband networks, as well as collaborative applications like shared presentation, ink-enabled annotations using Tablet PC's, and shared video.

The ConferenceXP client provides built-in support for high-quality, multi-point conferencing over high-bandwidth, multicast-enabled networks. The multi-point conferencing capability supports full-screen, real-time video at 30 frames per second, as well as collaborative applications like chat, shared presentation, and shared video. Presentation and ink-enabled annotations are integrated with Microsoft OneNote.

5 CONCLUSION

The importance of video conferencing lies in the ability of the technology to provide an enabling environment for creativity and flexibility and hence to support resilience. This paper has highlighted the need for companies to possess the ability to respond to environmental pressures in order to remain competitive. Developing a resilient capacity, therefore, requires management to ensure that employees have the necessary skills to become effective members of a resilient organization. Such tactics include positive reinforcement of desired behaviors, providing constructive feedback, encouraging the expansion of decision-making boundaries, removing organizational barriers to resilience and the development of bricolage skills. Video-conferencing is an important enabling technology in this context as it provides a platform for feedback, facilitates experiential reviews, promotes the gathering and flow of information, and provides a supportive problem-based learning environment.

This practitioner report describes a project undertaken by UMass and NUIG to develop a course that provides such an environment for students to learn these skills and in doing so enable students to become more effective employees in the future. The key features of the course design were to create assignments that promoted a problem-based learning approach, encouraged students to access and synthesize information from multiple sources, enabled a sharing of decision-making power, and exposed students to the communication challenges inherent in cross-cultural virtual teams.

This project was made possible through the use of ConferenceXP, the product of a three year research project from Microsoft Research. This technology was specifically designed to provide organizations with a platform to enable the creation of virtual teams and was further motivated by the recent increase in bandwidth to provide high quality video-conferencing facilities.

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