Chapter VIII

Collaboration in the Large: Using Videoconferencing to Facilitate Large-Group Interaction

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ABSTRACT

This chapter discusses the social, organizational and technical challenges and solutions that emerged when facilitating collaboration through videoconferencing for a large, geographically dispersed research and development (R&D) organization. Collaboration is an integral component of many R&D organizations. Awareness of activities and potential contributions of others is fundamental to initiating and maintaining collaboration, yet this awareness is often difficult to sustain, especially when the organization is geographically dispersed. To address these challenges, we applied an action research approach, working with members of a large, geographically distributed R&D center to implement videoconferencing to facilitate collaboration and large group interaction within the center. We found that social, organizational and technical infrastructures needed to be adapted to compensate for limitations in videoconferencing technology. New social and organizational infrastructure included: explicit facilitation of videoconference meetings; the adaptation of visual aids; and new participant etiquette practices. New technical infrastructure included: upgrades to videoconference equipment; the use of separate networks for broadcasting camera views, presentation slides and audio; and implementation of new
technical operations practices to support dynamic interaction among participants at each location. Lessons learned from this case study may help others plan and implement videoconferencing to support interaction and collaboration among large groups.

INTRODUCTION

Collaboration is a strategic component of many research and development (R&D) efforts. Because challenges resulting from the need to solve complex problems may often be best addressed by collaboration among experts who apply complementary knowledge from different disciplines, or specializations within disciplines. Indeed, national agencies, such as the U.S. National Science Foundation (NSF), have established grant programs, such as the Science and Technology Center program and Industry-University Research Center program, that provide funding to large multi-disciplinary and multi-institutional R&D groups to address complex problems. Typically centers funded by these national agencies have 50 to 100 or more participating faculty, undergraduate and graduate students, postdoctoral fellows and industry members. These groups are often geographically distributed, and not all members may have worked together or even interacted with each other previously. Therefore, it is often challenging to establish and maintain collaboration. Awareness of the activities and potential contributions of others is fundamental to initiating and maintaining collaboration, yet this awareness is difficult to sustain.

To address these challenges, we have been studying structures and processes within the NSF Science and Technology Center for Environmentally Responsible Solvents and Processes (NSF STC-ERSP) using an action research approach (Stringer, 1999; Whyte, 1997). Our approach investigates social, organizational and technical aspects of large-group collaboration, and iteratively recommends and evaluates mechanisms to facilitate collaboration among group members. Thus, our action research approach is evolutionary in nature, building on existing social and technical infrastructures, and continually exploring new ways to facilitate collaboration over time. This chapter describes these efforts in connection with one collaboration awareness mechanism, large-group videoconferences. Our efforts have focused on both social and technical infrastructures that are required to enable and empower collaboration. We conducted 25 interviews with center members and observed approximately 50 videoconference meetings over 12 months. Through these interviews and observations, we identified “best practices” for collaboration in the large.

Problems of transition from co-located to multi-site meetings using videoconferencing will occur in most organizations and the benefits of broader participation may only be realized when time and resources are invested to notice what does not work, or what is not happening, and to explore and evaluate alternatives. This requires investigating and exploring ways that the social infrastruc-
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