Collaborative Project Management: Challenges and Opportunities for Virtual Teams and Projects in E-Collaboration

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ABSTRACT

The virtual team concept has been evolving over the past few decades as researchers and practitioners alike strive to reap the benefits from opportunities and overcome the challenges. In this short opinion piece, we highlight some of the forces that are leading to virtual teams and virtual projects. Next, we present a review of virtual team challenges and opportunities that have been identified by researchers. Finally, we present a brief introduction to the three papers in this special issue.

Keywords: challenges; collaborative project management; opportunities; virtual team

INTRODUCTION

There has been a steady movement away from physical workplaces toward virtual workspaces over the last 50 years. In 1955, people worked together in the same physical location and used information technology (IT) such as mainframe computers, stand-alone data processing, telephones, tie lines, Teletype, post mail, paper memos, typewriters, carbon paper, calculators, and slide rules. Today in 2005, many workers may not travel to a physical place to work at all, rather they may work from wherever they happen to be through shared electronic workspaces with IT that includes laptop computers, personal digital assistants, e-mail, faxes, voice mail, video teleconferencing, enterprise-wide integrated communication, LANs, WANs, the Internet, discussion and news groups, and collaborative software (Nunamaker, Briggs, Romano, & Mittleman, 1998). This movement toward a virtual workspace has lead to the rise of virtual teams and virtual projects.

A number of business and technical forces are changing the fundamentals of project management (PM) as it had been developed over the past few decades, and projects today increasingly involve team
members from multiple geographic locations (Evaristo & van Fenema, 1999) resulting in a new form call virtual teams.

First, advanced information and communication technologies (ICT) enable cooperation in a distributed mode. Technologies like groupware and videoconferencing are increasingly becoming feasible for organizations to use in international projects.

Second, globalization of markets and competition necessitate integration of global managerial and business processes in corporations. This corporate integration is achieved by people working from geographically distributed sites on a given project. Corporations expect organizational teams to cooperate on an international scale, dealing with business problems that have global impacts.

Third, organizations are increasingly adopting a strategy of global sourcing, not only in innovative sectors like microelectronics and semiconductor industry, but also in the areas of financial and business services, manufacturing, and engineering operations. As these strategies require intensive cooperation between the organizations involved in these exchanges, projects including professionals from multiple organizations will occur.

Fourth, cooperation from distributed sites around the world enables organizations to benefit from differences of time zones between locations. Improvement of project cycle time becomes feasible in such a distributed environment.

Fifth, multinationals increasingly organize their R&D activities around globally distributed centers of excellence. Coordination of activities between these centers and integration with business operations requires close cooperation of professionals. Thus, multinational organizations tap into local sources of competence, and leverage this knowledge on a global scale. Globally distributed projects enable realization of these benefits, and increase corporate performance.

The confluence of these trends has given rise to new organizational forms, enabled by advanced ICT, that are labeled virtual organizations. The focus of this first of two special issues on collaborative project management is not at the level of these organizational forms, but at the level of the virtual projects that increasingly occur within or among these types of organizations. These so-called virtual projects involve people cooperating from internationally distributed sites and even different organizations. Professionals working in a geographically distributed fashion participate in multicultural and cross-functional projects with a global focus.

The authors have been writing about and researching on virtual teams and projects for over a decade (see Mittleman, Briggs, Nunamaker, & Romano, 1999; Nunamaker, Briggs, & Romano, 1993; Nunamaker, Briggs, & Romano, 1994; Nunamaker et al., 1998; Ocker & Fjermestad, 2000; Ocker, Fjermestad, Hiltz, Turoff, & Johnson, 1998; Ocker, Hiltz, Turoff, & Fjermestad, 1995-96; Romano, Nunamaker, & Briggs, 1997; Romano, Nunamaker, Briggs, & Vogel, 1998; Romano, Briggs, Nunamaker, & Mittleman, 1999). Many others have also worked in the area of virtual teams over the last 20 years; however, there still remains much to be learned in order for the full potential of virtual teams and projects to be realized. In this paper, we review the literature on virtual teams in terms of opportunities and challenges, and then introduce the three papers that comprise this special issue.

**VIRTUAL TEAM CHALLENGES AND OPPORTUNITIES**

Virtual teams and projects offer great opportunities for new ways to work productively; however, they also pose difficult challenges that are still hard to overcome. In Table 1, we identify both opportunities and challenges provided by virtual teams from the literature.
Table 1. Virtual team opportunities and challenges

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<tr>
<th>Opportunities</th>
<th>Challenges</th>
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<tr>
<td>Reduced travel (Economist 2004; Garrison &amp; Deakin, 1988; Goodridge, 2001;</td>
<td>Reduced or missing nonverbal cues and feedback mechanisms (Beranek, Broder, Romano, Sump, &amp; Reinig, forthcoming; Kayworth &amp; Leidner, 2001; Sproull, 1991)</td>
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<td>Potter, Cooke, &amp; Balthazard, 2000; Presswire 2002; Townsend, DeMarie, &amp;</td>
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<td>Hendrickson, 1998)</td>
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<td>Broader pool of expertise (Beranek et al., forthcoming; Blackburn, Furst, &amp;</td>
<td>Difficulty iterating to consensus or converging toward a decision (Bordia, 1997; Hiltz, Johnson, &amp; Turoff, 1986)</td>
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<td>Rosen, 2003; Hertela, Geister, &amp; Konradt, 2005; Townsend et al., 1998)</td>
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<td>Potential for 24-hour work across time zones (time constraint independence)</td>
<td>Reduced opportunities for team building and weaker bonds (Bouas &amp; Arrow 1996; Burke &amp; Chidambaram, 1996; Espinosa, Cummings, Wilson, &amp; Pearce, 2003;</td>
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<td>Simultaneous interaction of local and remote teams (Sarker &amp; Sahay 2004)</td>
<td>Need for more explicit communication (Bordia, 1997; Goodbody, 2005; Montoya-Weiss, Massey, &amp; Song, 2001)</td>
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<td>Rapid acquisition of feedback on routed material (Nunamaker et al., 1998)</td>
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<td>Participants can contribute whenever they want to or have time (Armstrong &amp;</td>
<td>Coordination difficulties (Carmel, 1999; Herbsleb, Mockus, Finholt, &amp; Grinter, 2000)</td>
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<td>Cole, 1995; Nunamaker et al., 1998)</td>
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<td>Decreased status differences (Dubrovsky, Kiesler, &amp; Sethna, 1991; Sproull &amp;</td>
<td>Communication channel management more difficult (Bordia, 1997; Goodbody, 2005; Hertela et al., 2005)</td>
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<td>Kiesler, 1986; Zigurs, Poole, &amp; DeSanctis, 1988)</td>
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<tr>
<td>Improved quality, cost, and time use by teams (Potter et al., 2000; Townsend</td>
<td>Procrastination may be more likely to occur</td>
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<td>et al., 1998)</td>
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<td>Increased comprehensiveness of reporting (Townsend et al., 1998)</td>
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<tr>
<td>Decreased cycle time (Armstrong &amp; Cole, 1995)</td>
<td>Increased comprehensiveness of reporting (Townsend et al., 1998)</td>
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<td>Delayed or disparate feedback (Carmel, 1999; Crampton, 2001; Herbsleb et al., 2000)</td>
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<td>Difficulty maintaining task focus over time (Chidambaram &amp; Jones 1993; Walther &amp; Burgoon, 1992)</td>
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<td>Task completion may take longer (Benbasat &amp; Lim, 1993; Fjermestad &amp; Hiltz, 1998-99; Hiltz et al., 1986;)</td>
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<td>Establishing and maintaining goal alignment may be difficult (Axtell, Fleck, &amp; Turner, 2004; Robey, Khoo, &amp; Powers, 2000)</td>
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<td>Connectivity of all participants can be difficult (Romano et al., 1998)</td>
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<td>Cultural and functional differences affect team productivity, process, and communication (Espinosa et al., 2003; Jarvenpaa, 1998; Jehn &amp; Northcraft, 1999; Kayworth &amp; Leidner, 2000; Maznevski &amp; Chudoba, 2000; O’Hara-Devereaux &amp; Johansen, 1994; Olson &amp; Olson, 2000; Robey et al., 2000; Sarker &amp; Sahay 2004)</td>
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Table 1. Virtual team opportunities and challenges (cont.)

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<th>Opportunities</th>
<th>Challenges</th>
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<td>Inconsistent reward systems may lead to communication problems (Scott &amp; Einstein, 2001)</td>
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<td>Increased susceptibility to process losses (Kirkman et al., 2002; Orlikowski, 2002; Shapiro, Furst, Spreitzer, &amp; Von Glinow, 2002)</td>
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<td></td>
<td>Time-zone differences affect monitoring of and rhythm of activities (Lau &amp; Murnighan, 1998; Maznevski &amp; Chudoba, 2000; O’Leary &amp; Cummings, 2002)</td>
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<td></td>
<td>Building trust is difficult. (Cascio, 2000; Coutu, 1998; Jarvenpaa et al., 1998; Jarvenpaa &amp; Leidner, 1999; Platt, 1999; Townsend et al., 1998)</td>
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**SUMMARY AND INTRODUCTION TO PAPERS**

The brief review of the growing literature in this area summarized in Table 1 clearly shows that more challenges remain relative to opportunities. It is with these challenges and opportunities in mind that we next introduce the three papers that comprise this special issue, each of which contributes to the literature about virtual teams and collaborative project management to help us understand how to capitalize on the opportunities and overcome the challenges.

The first paper by John McAvoy and Tom Butler, “A Paradox of Virtual Teams and Change: An Implementation of the Theory of Competing Commitments,” reports on a longitudinal study of agile software development teams. Initially the team, consisting of seven developers and one project manager, used use cases to develop the software. Over time the commitment to this process diminished. The authors investigate the theories and processes underlying this change. The results suggest, somewhat counterintuitively, that striving for cohesion in a virtual team may be counterproductive.

The second paper by Deepak Khazanchi and Ilze Zigurs, “Patterns for Effective Management of Virtual Projects: Theory and Evidence,” reports on data collected from several virtual focus groups to address the basic research question “What patterns of communication, coordination and control are associated with successful virtual projects?” They identify different communication technologies used under different project complexities and what patterns of communication are more effective than others.

The third paper in this special issue by Irma Becerra-Fernandez, Martha Del Alto, and Helen Stewart is “A Case Study of Web-Based Collaborative Decision Support at NASA.” The paper describes use of collaborative decision support system at NASA. The technology was developed to support NASA’s mandate for faster, better, cheaper, and smarter. The results suggest that the technology provides support that enables the mission to be more agile.
The three papers in this first of two special issues on collaborative project management focus on virtual teams and virtual projects. All three papers provide an interesting perspective on this timely and important topic that deals with not only the technology, but also the human issues involved in complex virtual PM. Together they provide useful insights and valuable guidance for PM researchers and practitioners alike. We are pleased to have had the opportunity to work with the authors and the Editor-in-Chief of IJeC Ned Kock, and truly believe that this issue is a valuable contribution to the growing body of knowledge in the area of collaborative project management.

REFERENCES


Dr. Nicholas C. Romano, Jr. is assistant professor of management science and information systems at Oklahoma State University (OSU). He received a BS in biology (1986), BS in MIS (1988), MS in MIS (1992), and PhD in MIS (1998) from the University of Arizona. Prior to joining OSU in 2001 he was an assistant professor of MIS at the University of Tulsa and Research Scientist at the University of Arizona’s Center for the Management of Information. His research interests involve collaborative systems and include technology-supported learning, group support systems design, use and facilitation, knowledge creation and management, collaborative project and process management, electronic customer relationship management, and information systems accessibility. Dr. Romano has published papers in a number of scholarly journals, conference proceedings and practitioner journals, including the Journal of Management Information Systems, International Journal of Electronic Commerce, the Journal of the American Society for Information Science, Information Systems Frontiers, Proceedings of the Hawaii International Conference on Systems Sciences, Proceedings of the Conference of the Association of Management, and Proceedings of the Americas Conference on Information Systems.

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