Relationships among geographic dispersion, team processes, and effectiveness in software development work teams

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Abstract

This study examines the relationships among geographic dispersion, team processes, and effectiveness in teams carrying out software development work. Geographically dispersed teams have become prevalent in many knowledge- and service-based organizations. However, researchers have not established the nature of the associations among geographic dispersion, team processes and team effectiveness for real teams operating in organizations to carry out particular tasks. This paper uses the sociotechnical systems perspective to orient the exploration of this question. A study of 218 members of 39 software development work teams was conducted. Results show that geographic dispersion significantly and negatively relates to work processes and team effectiveness.

Keywords: Virtual work teams; Field studies; Geographic dispersion; Sociotechnical systems; Team design; Software development

1. Introduction

Globalization and the availability of computer-mediated communication have spurred the creation of work teams, composed of people distributed across locations. For example, a team that designs and develops a graphical user interface for a client's new payroll management system may include programmers working interdependently from the U.K. and India, using media such as electronic mail, instant messaging, telephone, shared databases, and videoconferencing. Some 137 million workers worldwide are involved in remote electronic work (Soloman, 2001).

“Virtual teams” are groups of people with a common purpose, who carry out interdependent tasks across locations and time, using technology to communicate much more than they use face-to-face meetings (Lipnack and Stamps, 1997; Maznevski and Chudoba, 2000). Organizations use virtual teams to improve the utilization of scarce resources and carry out projects that involve multiple locations. People with the right skills can work on projects although they live on a different continent. Experts can contribute to projects at several locations. Organizations also disperse teams when some members must work at a customer site or require access to specialized remote facilities. Virtual teams sometimes coordinate the activities of multiple dispersed groups. Team dispersion rarely is the first choice of project managers. Team members are dispersed when organizations must accommodate technical requirements, employees, or customers, or choose among constraints (Leonard et al., 1998).

Our conceptual and empirical understanding of virtual teams is undeveloped. Theories and models are few and they lack empirical backing. Studies often utilize samples of student teams rather than real organizational work teams. The available evidence from virtual teams operating in organizations tends to have been gathered inductively, with an emphasis on practical matters (e.g., Lurey and Raisinghani, 2001). We lack conceptually grounded critical examinations of the impact of geographic dispersion on the ability of real organizational teams to work together to accomplish their tasks. The present study draws on a fundamental perspective concerning work team design, the sociotechnical perspective, to explore the impact of geographic dispersion on a specific type of task, software development.