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ABSTRACT

Virtual organizations are important to enable collaboration and enhance interaction among a diverse set of people regardless of their temporal and spatial dispersion. Some research has assumed that communication media will mask traditional elements of diversity while other research suggests mediated teams simply pay attention to different cues. The relationships among the media, team member diversity (broadly defined) and outcomes have not been examined. This research in progress seeks to understand how various components of diversity enhance, inhibit, or are overcome in virtual organizations. The goal of this study is to understand how virtual organizations evolve over time, with a particular eye toward understanding the role of diversity in this process, thus enabling us to identify the conditions under which virtual organizations will be successful. Guided by social change, diversity, attribution, and media theories, we propose a theoretical framework with a set of research questions and hypotheses.

Keywords

Virtual organization evolution, virtual organization collaboration, social change process, diversity, media characteristics, social and task outcomes.

INTRODUCTION

Virtual organizations are characterized by a high degree of dispersion – temporal and spatial. The use of technology in this type of organization is expected to enable collaboration and enhance interaction, thus minimizing the perception of dispersion. Research has examined a wide variety of virtual configurations, ranging from virtual teams that are formed for a specific purpose and disbanded as quickly as they were formed (Jarvenpaa and Leidner, 1999), to virtual enterprises that connect organizations, teams, and other pre-existing entities (Shachaf, 2008). Three things are common across these configurations: they employ technology, they involve a variety of individuals, and they change over time.

When examining virtual organizations, we need to consider the technology *and* the social environment in which it is used (Emery and Trist, 1965; Miller, 1975; Trist and Bamforth, 1951). Research has demonstrated that there is a mutual adaptation that occurs between the technology and individuals who use it, such that both are shaped by the other (e.g., DeSanctis and Poole, 1994). The technologies that facilitate the creation of virtual organizations fall under the broad category of computer-mediated communication. These technologies embody a variety of characteristics, such as the degree to which they enable rehearsability, reprocessibility, and synchronous communication (Dennis, Fuller and Valacich, 2008) or provide feedback and foster feelings of immediacy and social presence (Daft and Lengel, 1986; Short, Williams and Christie, 1976). Different media embody these characteristics to varying degrees and lead to different forms of organizing and communicating. In addition, different media are a better fit than others for certain tasks (Fuller and Dennis, 2009). Thus, media selection and use is an important part of the technical aspect of examining virtual organizations.

A key reason for leveraging technology to support virtual teams and organizations is to enable inclusion of the appropriate people – a diverse set of people – regardless of their temporal and spatial dispersion. Yet, diversity introduces a number of interesting social elements into the organization. Diversity, broadly defined, refers to perceived or actual differences among individuals (Williams and O'Reilly, 1998). Organizational research suggests that diversity can be harmful when it creates an

environment whereby individuals are classified into ingroups and outgroups thus leading to dissension and conflict and ultimately poor performance (Jehn, Northcraft, and Neale, 1999; Harrison, Price, and Bell, 1998). In contrast, diversity can contribute positively to the performance of a group when the task is non-routine and when opinions, ideas, and perspectives are shared among the diverse members of a group (Dailey and Steiner, 1998; Jehn et al., 1999; Jehn, Chadwick, and Thatcher, 1997). Researchers have theorized that certain aspects of diversity will be invisible when interacting in mediated environments (Connolly, Jessup, and Valacich, 1990; Weisband, Schneider, and Connolly, 1995), while others have found that individuals use any available piece of information to categorize others (Lea and Spears, 1992; Walther, 1996, 1997). Thus, the interaction of communication media and member diversity represents an important area of inquiry in virtual teams and organizations, incorporating the technical and social aspects.

The interaction of media and diversity elements in virtual organizations does not happen at a single point in time, rather it is an ongoing process that can be associated with the development of the virtual organization. Understanding how and why organizations evolve has been a question management scholars have faced for years (Van de Ven and Poole, 1995). While a number of theoretical perspectives have been proposed to study change processes, Van de Ven and Poole (1995) suggest that there are four key building blocks that lay the foundation for studying organizational change processes: life cycle, teleological, dialectical, and evolutionary. They argue that these four theories, or some interaction among them, can be used to explain most, if not all, organizational change processes.

To date, the influence of diversity on virtual organization *evolution* has not been studied. However, given the importance of diversity for the performance of traditional teams and organizations, we expect that it will play an important role in the process of virtual organization formation and growth.

This research in progress aims to answer the following questions:

RQ1: How does the social change process unfold in virtual organizations?

RQ2: How do media characteristics interact with actual diversity and diversity perceptions to influence virtual organization outcomes?

RQ3: How do diversity and outcomes influence how the virtual organization is perceived?

LITERATURE REVIEW AND MODEL DEVELOPMENT

The research model is presented in Figure 1. It essentially proposes that media characteristics interact with actual and perceived diversity to influence outcomes during the virtual organization initiation process, or the point at which the organization is forming. What cannot be seen in the model is that we also expect that the interaction among the diversity components, media characteristics, and outcomes will be associated with specific change processes.

Outcomes

A number of relevant outcomes have been identified in prior literature. We focus on social and task outcomes that are important to virtual organizations and that are likely to be affected by diversity and media characteristics. Specifically, we examine social outcomes such as relational identification (the extent to which individuals identify themselves based on their relationship with others in the organization), social networks (e.g, Ahuja and Carley, 1999) and cohesiveness. These outcomes will reflect the extent to which members of virtual organizations feel connected to the organization. For task-relevant outcomes we explore idea generation, participation in the organization (e.g., level, quality, and type), satisfaction, and success (DeLone and McLean, 2003). Finally, we examine individual attitudes toward the virtual organization as a means of understanding perceptions of the organization's role, as distinct from that of the other members, in influencing success and failure of the virtual organization.

Social Change Processes

It is often stated that change is inevitable with the introduction of information systems (IS). Indeed, examples abound of individuals, groups, and organizations that have been transformed – in intended and unintended ways – by technology (e.g., Boudreau and Robey, 2005; Zuboff, 1988). Yet, research has not provided clear answers regarding how and why this happens. As one way of understanding how social changes processes unfold, Van de Ven and Poole (1995) proposed four foundational theories that could be applied to the study of social change. They argued that the four theories were broad enough to be applicable to a number of situations, but also that interaction across the theories would lead to a wide variety of options for models of social change. The four theories they identified are: life cycle, teleology, dialectic, and evolutionary.

Life cycle theory is commonly used in organizational research in discussing organizational growth and development, product development, and even information systems development. Life cycle theories typically map out a series of stages through which the entity will proceed, in a relatively predictable manner. Much as human beings cannot 'grow young', organisms that follow a life cycle process progress along a pre-set course of advancement; they are born, they growand mature, they age, and eventually they die.

In contrast to the process-oriented view of life cycle theory, teleological theory is goal focused (Wright, 1976). The organism sets a goal, implements whatever steps are necessary to achieve the goal, adapts as necessary, and repeats the cycle as needed. Life cycle and teleology represent the two most common theoretical perspectives for studying organizational development and change (Buckle, 2003; Van de Ven and Poole, 1995).

Dialectical theory focuses on opposition and the shifting power associated with it. As members of the organization disagree, how they deal with that conflict has a profound effect on how the organization moves forward. Conflict can be positive in that it offers the opportunity to develop creative solutions (Jehn, 1995; Jehn, 1997); it can also be negative as it eats away at cohesiveness and opportunities for collaboration (Kankanhalli, Tan and Wei, 2007). Regardless, it necessarily results in a change to the organization.

An evolutionary view proposes that change occurs through variation, selection, and retention, just as in biological evolution (Van de Ven and Poole, 1995). An event occurs, representing a variation of some sort. The organization selects among various mechanisms for responding to the variation, including the allocation of (scarce) resources or the generation of a new organizational form. Depending on the outcome of the selection process, the new approach may or may not be retained. This cycle of variation, selection, and retention determines the direction in which the organization moves.

We offer the following hypotheses:

Hypothesis 1a: Virtual organizations that experience positive social and task outcomes will maintain the status quo; they will follow a teleological change process.

Hypothesis 1b: Virtual organizations that experience negative social and task outcomes will dissolve; they will follow a dialectic change process.

Note: Prior work does not provide guidance on what we might expect when one outcome is positive and the other is negative. Thus, we have no hypotheses regarding positive social outcomes and negative task outcomes or negative social outcomes and positive task outcomes. This will be an exploratory aspect in our study.

Diversity and Attribution Theories

In each of the four theories discussed above, organizational elements interact to impact organizational change and development. Diversity can play a very important role in this process. By examining actual and perceived differences among members of actual virtual organizations over time, we will be able to better understand how diversity influences organizations. Diversity influences organizational elements because people are attracted to similar others (Byrne, 1971) and tend to identify with others who are similar to themselves (Tajfel and Turner, 1986). This identification may lead members to categorize others as part of their ingroup or part of their outgroup. However, over time various relational and task-based interactions may cause individuals to adjust their perceptions of others. For example, success on an organizational task may lead team members to identify strongly with their team. Failure on a task may lead team members to attribute failure to other team members.

As we investigate the effects of diversity over the life of a virtual organization, it is important to consider the role of attribution theory. Attribution theory is helpful in explaining how teams resolve misunderstandings and conflict (Cramton, 2001). Researchers have identified three forms of attributions: personal attribution, situational attribution, and categorical attribution (Kankanhalli et al., 2007). Personal attribution refers to a situation whereby an individual blames another person or their behavior for a problem (Blakar, 1984). For example, if a student fails a test, it is the teacher's fault. Situational attribution occurs when a problem is blamed on the situation or context (Blakar, 1984). For example, if a server goes down unexpectedly then a missed deadline may be blamed on the technology. A third type of attribution is categorical attribution whereby a problem is blamed on the characteristics of social categories (Lea and Spears, 1992). For example, team members with children may be blamed for a missed deadline because they were not able to stay up all night completing a project.

Diversity during Organizational Change

Life cycle theory suggests that an organism, in this case an organization, will follow a pre-established set of stages as it develops over time. When considering the impact of diversity on this process, it is important to note that diversity

characteristics are generally irreversible. For example, gender, ethnicity, and functional background generally stay the same. However, it is possible that perceived differences change over an organization's lifetime. Whereas one may initially feel that organization members are very different on a broad range of characteristics, over time organization members may come to identify with the larger organization and perceive there to be few differences between members. Alternatively, one may perceive there to be more differences than actually exist, especially when one has experienced frustration in the virtual organization environment. Organizational members may use categorical attributions (Lea and Spears, 1992) to explain the frustration, thus further enhancing the effects of perceived differences.

Actual and perceived diversity may also influence the teleological process. Through the teleological lens, reaching the goal is the most important thing to an organization. The potential negative effects of diversity such as conflict, low levels of satisfaction, miscommunication, and frustration (Jehn et al., 1999) mean little under this perspective as long as the outcome is deemed successful. Virtual organization members will stay together and convince themselves that the frustration is worth it because of the final outcomes. Should the outcome be unsuccessful, it is likely that organization members will attribute failure to other individuals or categories of individuals (Blakar, 1984; Lea and Spears, 1992).

Under a dialectical perspective, actual and perceived diversity will be an extremely important element in the maturation of an organization. Individuals will use status (in the form of organizational or functional background) to gain power within the organization. As initiatives are undertaken, others are likely to jockey for power resulting in ongoing conflict. Perceived diversity is likely to change constantly as allegiances change. In addition, problems are likely to be viewed as a result of categorical attribution resulting in even more conflict.

The evolutionary view posits that an organization goes through stages and a change will cause the organization to adapt and possibly alter its course. In these types of organizations, actual and perceived diversity is not likely to play a strong role in the organizational outcomes until there is a change. At this time, faultlines (or subgroups among different demographic groups) may form (Lau and Murnighan, 1998; Bezrukova, Jehn, Zanutto and Thatcher, 2009) leading to more change and possibly conflict. Over time, subgroups may break away from the existing organization and form a new organization. However, this could be seen as a normal adaptation to the change event, and thus not necessarily a negative outcome.

We offer the following hypothesis:

Hypothesis 2a: Virtual organization participants that experience both negative social and task outcomes will have a negative perception of the virtual organization, regardless of the virtual organization's role in the outcomes.

Media Characteristics

The communication media that enable the 'virtual' aspects of virtual organizations embody a number of characteristics that can facilitate and hinder effective communication, which ultimately impacts outcomes. Research has identified a number of media characteristics, such as ability to convey social presence, immediacy, concurrency, and rehearsability, to name a few (Daft and Lengel, 1986; Dennis et al., 2008; Dennis and Kinney, 1998). The various characteristics have been posited to influence communication in a variety of ways. For example, email has been characterized as a lean medium as it is text-based and conveys little social presence (Daft and Lengel, 1986; Markus, 1994; Zmud, Lind, and Young, 1990). However, more recent research has suggested that, over time and with experience, traditionally lean media become richer (Carlson and Zmud, 1999). Massey and Montoya-Weiss (2006) proposed that perceptions of one medium can influence perceptions of another, such that a traditionally lean medium can be seen as richer when used in conjunction with a rich medium. Ultimately, the ability of a medium to convey meaning (i.e., its richness) is an important factor in influencing group and organizational outcomes associated with the media.

Aspects of the media may interact with elements of diversity such that the various elements are either highlighted or diminished. Researchers have argued that lean media, such as email or text-based discussion forums, would hide elements of diversity such that they would no longer have an influence on interaction and outcomes (Weisband and Atwater, 1999). Recent work has argued that while some of the more obvious social elements of diversity are effectively hidden by the text-based media, communicators actually look for new clues in order to ascribe characteristics to unknown communication partners (Walther, 1996; 1997). Thus, while we might anticipate the role of diversity to diminish in a mediated environment, there is at least some evidence to suggest that it persists, albeit in a different manner. In fact, research by Carte, Chidambaram, and Becker (2006) and Carte and Chidambaram (2004) suggests that media have "reductive" or "additive" capabilities, depending on their ability to provide visual or auditory communication. They propose that reductive media, such as group support systems or email, may be particularly helpful for groups in the early stages of life, while additive media, such as desktop video conferencing, may enhance a group's performance later in its life cycle. Thus, there seems to be a complex relationship among diversity elements, communication media, and developmental processes.

The work of Carlson and Zmud (1999) sheds additional light on how the effect of media characteristics might evolve over time. Channel expansion theory suggests that as communication partners have experience with each other and with the media, they will be able to communicate 'beyond' the media's capabilities. In essence, channel expansion theory suggests that lean media can become richer when the communication partners have had time to develop their own language and means of communicating via the media. In time, the media should become just another mechanism for getting information from point a to point b. This implies that the media's effect on the diversity-outcome relationship will be most intense in the early stages of the virtual organization's development. Over time, however, it should have decreasing impact to the point that it is non-significant in later stages of virtual organizational development.

We offer the following hypotheses:

Hypothesis 3a: Media characteristics with reductive capabilities will minimize the effect of social diversity on outcomes.

Hypothesis 3b: Media characteristics with additive capabilities will heighten the effect of informational diversity on outcomes.

Hypothesis 3c: Media characteristics will interact with actual diversity to effect outcomes during the early (i.e., initiation) stages of virtual organization formation, but not the later stages.
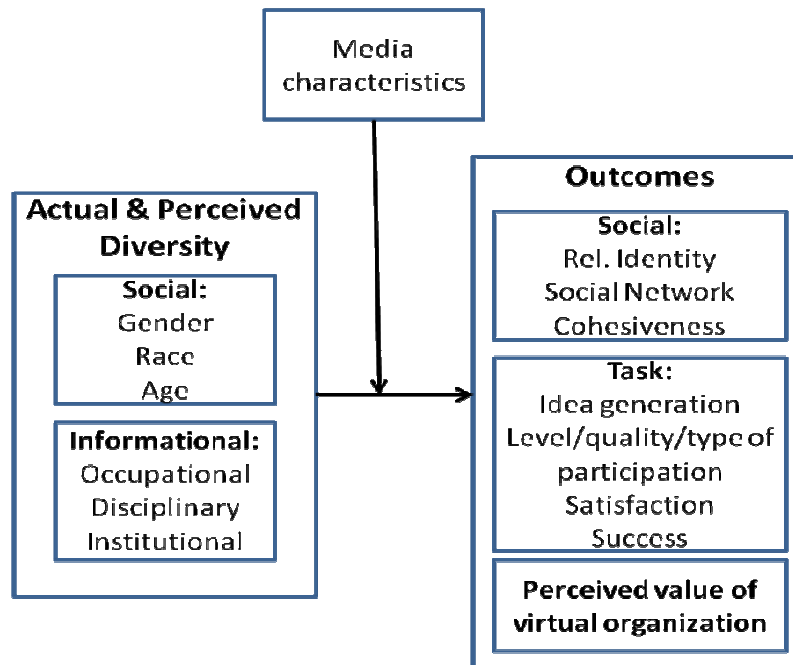

Figure 1. Research Model

RESEARCH METHOD

Research Site

Our research site is the iPlant Collaborative (www.iplantcollaborative.org), a newly formed virtual organization funded by NSF that will be comprised of multiple smaller virtual organizations. iPlant's objective is to enable diverse groups of scientists to solve grand challenge questions in plant science through the development of a cyberinfrastructure. Community members self-form into grand challenge teams that will essentially represent virtual organizations that have emerged to solve a critical research problem in plant science.

The iPlant Collaborative is an appropriate setting for this research for three reasons. First, the smaller virtual organizations have just formed, offering us a unique opportunity to study the birth of these organizations. Given iPlant's philosophy to be by, for, and of the community, we will have an opportunity to truly examine the self-directed emergence of these virtual

organizations. Second, NSF's mandate for iPlant (and other research it funds) encourages diversity along a number of dimensions. Yet, there is little research to help us prepare for the challenges that diversity poses in virtual organizations. In fact, research suggests that fostering interdisciplinary research is an ongoing challenge (Rhoten, 2004). Conversations with the iPlant management team indicate that they agree with this assessment. They are well aware of and seriously pursuing diversity along interpersonal, institutional, and disciplinary dimensions. Thus, iPlant offers an excellent environment for studying the effects of diversity in a virtual organization. Finally, iPlant's focus on cyberinfrastructure development provides an opportunity to not only study the relationship among diversity, media characteristics, and outcomes, but to also influence the media that is designed and provided to the grand challenge teams. Thus, iPlant offers an ideal environment for studying the entire evolution of highly diverse virtual organizations that have a variety of media available to them.

Research Status

In this section, we describe the research method and the progress to date investigating the research questions and hypotheses set forth above. This research uses multiple qualitative and quantitative methods of data collection, including questionnaires, structured/semi-structured interviewing, and system log files. Participants in this research project will consist of members of the iPlant management team, grand challenge workshop participants, and grand challenge team members.

Research Phase 1

The goal of phase one was baseline data collection. To date, we have gathered data on the diversity dimensions of the project participants, as well as data about media perceptions and attitudes. We have gathered observational data from the grand challenge workshop meetings and we are in the progress of gathering system log data from the iPlant web site and wiki. In addition, we are interviewing iPlant management team members and workshop participants. This phase of the research is 90% complete.

Research Phase 2

The goal of phase two is to gather data regarding ongoing interactions, perceptions, and outcomes. This period of time in the development of a group is when we expect the diversity and media components to interact to affect the outcomes. During this early part of the organization's development, we anticipate that the organization will be developing their use pattern for the media, discovering differences and similarities among team members, and outlining a plan of work to attack the grand challenge problem.

During phase 2, we will gather system log data from the iPlant web site, wiki, and grand challenge team discovery environment. This data will be used to begin development of process maps of the social changes the virtual organization experiences. We intend to survey participants three times – one survey has been completed, with the second one scheduled for May and the third for November. During this time, we will interview grand challenge team members and distribute surveys to capture data regarding diversity perceptions, media perceptions, and progress toward goals. We will interview iPlant management team members to obtain assessments of the virtual organization's progress toward its goals.

Research Phase 3

The goal of this phase is to examine the social change process that has occurred over the life of the virtual organization. This last major phase will serve to provide data regarding longitudinal changes in perceptions and outcomes. This phase will be a follow on from phase 2 and will continue until the virtual organization has achieved its goal, has dissolved or this project has ended. Phase 3 will include data collection similar to that of phase 2.

CONCLUSION

In this paper, we describe a longitudinal study that explores the elements of diversity in conjunction with the media used to enable collaboration. We expect that these factors interact to influence virtual organization outcomes. The long term benefit of this research is an understanding of the factors that influence positive and negative outcomes associated with the social and task-based aspects of the virtual organization.

Specific contributions of the project include the following. It will be among the first to examine perceived diversity in conjunction with objective diversity, in a mediated setting. Our study will be the first to explicitly examine the role of technology in supporting or harming diversity in virtual organizations. Finally, the context for the proposed study offers a unique opportunity to study virtual organization evolution as the organizations are being formed. Thus, this represents one of the first studies of virtual organization evolution that begins at the beginning.

REFERENCES

1. Ahuja, M.K. and Carley, K.M. (1999) Network structure in virtual organizations, *Organization Science,* 10, 6, 741-757.

2. Boudreau, M.C. and Robey, D. (2005) Enacting integrated information technology: A human agency perspective, *Organization Science,* 16, 3-18.

3. Bezrukova, K., Jehn, K.A., Zanutto, E. and Thatcher, S.M.B. (2009) Do workgroup faultlines help or hurt? A moderated model of group faultlines, team identification, and group performance, *Organization Science,* 20, 1, 35-50.

4. Blakar, R. (1984) Communication: A Social Perspective on Clinical Issues, Columbia University Press, New York.

5. Buckle, P. (2003) Uncovering system teleology: A case for reading unconscious patterns of purposive intent in organizations, *Systems Research and Behavioral Science,* 20, 5, 435-443.

6. Byrne, D. (1971) The Attraction Paradigm, Academic Press, New York.

7. Carlson, J.R. and Zmud, R.W. (1999) Channel expansion theory and the experiential nature of media richness perceptions, *The Academy of Management Journal,* 42, 2, 153-170.

8. Carte, T.A., Chidambaram, L. (2004) A capabilities-based theory of technology deployment in diverse teams: Leapfrogging the pitfalls of diversity and leveraging its potential with collaborative technology, *Journal of the Association for Information Systems*, 5, 11-12, 448-471.

9. Carte, T.A., Chidambaram, L. and Becker, A. (2006) Emergent leadership in self-managed virtual teams, *Group Decision and Negotiation,* 15, 323-343.

10. Connolly, T., Jessup, L.M., and Valacich, J.S. (1990) Effects of anonymity and evaluative tone on idea generation in computer-mediated groups, *Management Science,* 36, 6, 97-120.

11. Cramton, C.D. (2001) The mutual knowledge problem and its consequences for dispersed collaboration, *Organization Science,* 12, 3, 346-371.

12. Daft, R.L., and Lengel, R.H. (1986) Organizational information requirements, media richness and structural design, *Management Science,* 2, 5, 554-571.

13. Dailey, B.F. and Steiner, R.L. (1998) The influence of group decision support systems on contribution and commitment levels in multicultural and culturally homogeneous decision-making groups, *Computers in Human Behavior,* 14, 10, 147-162.

14. DeLone, W.H., and Mclean, E.R. (2003) The Delone and Mclean model of information systems success: A ten-year update, *Journal of Management Information Systems,* 19, 4, 9-30.

15. Dennis, A.R. and Kinney, S.T. (1998) Testing media richness theory in the new media: The effects of cues, feedback, and task equivocality, *Information Systems Research,* 9, 3, 256-274.

16. Dennis, A.R., Fuller, R.M., and Valacich, J.S. (2008) Media, tasks, and communication processes: A theory of media synchronicity, *MIS Quarterly,* 32, 3, 575-600.

17. DeSanctis, G., and M. S. Poole. (1994) Capturing the complexity in advanced technology use: Adaptive structuration theory, *Organization Science,* 5, 2, 121-147.

18. Emery, F.E. and Trist, E.L. (1965) The causal texture of organizational environments, *Human Relations,* 18, 1, 21- 32.

19. Fuller, R. and Dennis, A.R. (2009) Does fit matter? The impact of task-technology fit on team performance for repeated tasks, *Information Systems Research,* 20, 1, 2-17.

20. Harrison, D.A., Price, K.H. and Bell, M.P. (1998) Beyond relational demography: Time and the effects of surface- and deep-level diversity on work group cohesion, *Academy of Management Journal*, 41, 1, 96-107.

21. Jarvenpaa, S.L. and Leidner, D.E. (1999) Communication and trust in global virtual teams, *Organization Science,* 10, 6, 791-815.

22. Jehn, K. A., Northcraft, G., and Neale. M.A. (1999) Why differences make a difference: A field study of diversity, conflict, and performance in workgroups, *Administrative Science Quarterly,* 44, 741- 763.

23. Jehn, K.A. (1997) A qualitative analysis of conflict types and dimensions in organizational groups, *Administrative Science Quarterly,* 42, 3, 530-557.

24. Jehn, K. A., Chadwick, C., and Thatcher, S. M. B. (1997) To agree or not to agree: The effects of value congruence, individual demographic dissimilarity and conflict on workgroup outcomes, *International Journal of Conflict Management,* 8, 287-306.

25. Jehn, K.A. (1995) A multi-method examination of the benefits and detriments of intragroup conflict, *Administrative Science Quarterly,* 40, 2, 256-282.

26. Kankanhalli, A., Tan, B.C.Y., and Wei, K-K. (2007) Conflict and performance in global virtual teams, *Journal of Management Information Systems,* 23, 3, 237-274.

27. Lau, D.C. and Murnighan, J.K. (1998) Demographic diversity and faultlines: The compositional dynamics of organizational groups, *Academy of Management Review,* 23, 2, 325-340.

28. Lea, M. and Spears, R. (1992) Paralanguage and social perception in computer-mediated communication, *Journal of Organizational Computing,* 2, 321-342.

29. Markus, M. L. (1994) Electronic mail as the medium of managerial choice, *Organization Science,* 5, 4, 502-527.

30. Massey, A. P. and Montoya-Weiss, M. (2006) Unraveling the temporal fabric of knowledge conversion: A model of media selection and use, *MIS Quarterly,* 30, 1, 99-114.

31. Miller, E.J. (1975) Socio-technical systems in weaving, 1953-1970: A follow-up study, *Human Relations,* 28, 4, 349-386.

32. Rhoten, D. (2004) Interdisciplinary research: Trend or transition? *Items & Issues,* 5, 1, 6-11.

33. Shachaf, P. (2008) Cultural diversity and information and communication technology impacts on global virtual teams: An exploratory study, *Information and Management,* 45, 131-142.

34. Short, J., Williams, E., and Christie, B. (1976) The Social Psychology of Telecommunications, Wiley, New York.

35. Tajfel, H. and Turner, J.C. (1986) The social identity theory of intergroup behavior, in S. Worchel and W. G. Austin (Eds.) *Psychology of Intergroup Relations,* Nelson-Hall, Chicago, IL, USA, 7-24.

36. Trist, E.L. and Bamforth, K.W. (1951) Some social and psychological consequences of the longwall method of coal-getting, *Human Relations,* 4, 3-38.

37. Van de Ven, A. and Poole, M.S. (1995) Explaining development and change in organizations, *Academy of Management Review,* 20, 510-540.

38. Walther, J.B. (1997) Group and interpersonal effects in international computer-mediated collaboration, *Human Communication Research,* 23, 3, 342-369.

39. Walther, J.B. (1996) Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction, *Communication Research,* 23, 1, 3-43.

40. Weisband, S. and Atwater, L. (1999) Evaluating self and others in electronic and face-to-face groups, *Journal of Applied Psychology,* 84, 4, 632-639.

41. Weisband, S.P., Schneider, S.K. and Connolly, T. (1995) Computer-mediated communication and social information: Status salience and status differences, *Academy of Management Journal,* 38, 4, 1124-1152.

42. Williams, K., and O'Reilly C. A. (1998) Demography and diversity in organizations: A review of 40 years of research, in B. M. Staw and L. L. Cummings (Eds.) *Research in Organizational Behavior*, Vol. 20, Oxford, UK, Elsevier Science Inc., 77-140.

43. Wright, L. (1976) Teleological Explanations, University of California Press, Los Angeles.

44. Zmud, R., Lind, M. and Young, F. (1990) An attribute space for organizational communication channels, *Information Systems Research,* 1, 4, 440-457.

45. Zuboff, S. (1988) In the Age of the Smart Machine: The Future of Work and Power: Basic Books Inc., New York.