# Virtual Work Research Agenda

**France Bélanger**
*Virginia Polytechnic Institute and State University, USA*

## INTRODUCTION

The paper by Bélanger, Watson-Manheim, and Jordan (2002) addresses the gap between research conducted and practitioner concerns in virtual work. One of the key difficulties in conducting research in this area is the overlap between terms used (McCloskey & Igbaria, 1998; Pinsonneault & Boisvert, 2001). While there are other distributed work arrangements such as hotelling, neighborhood work centers and flextime, most of the previous literature has focused on telecommuting (telework) and virtual teams/organizations. In this article, the term virtual work represents work environments where individuals spend some time working in a non-face-to-face (FTF) mode, using information and communication technologies to perform work activities.

Virtual work environments are increasingly employed by organizations. While there is increased complexity and potential for problems, virtual work strategies allow organizations a great deal of flexibility to compete in a rapidly changing business environment. While existing research provides insights into such environments, it does not clearly deal with major concerns faced by managers (referred to as the "gap" between research and practice). One of the potential reasons for this gap is that practicing managers are concerned with current challenges in their own work setting while academics are concerned with developing more generalizable rules and understanding.

This article addresses these issues, with three particular objectives:

1. examine the gap between research and practice in virtual work;
2. investigate factors leading to the gap; and,
3. identify a research agenda that addresses emerging issues and concerns relevant to practice in virtual work.

## BACKGROUND

To explore the gap between virtual work research and practice, the authors first review previous literature, which they then compare to concerns raised by practitioners in two organizations. To identify relevant academic research, the authors searched for articles in mainstream IS journals. They then used the "snowball" technique, mining citations in articles for further references. They did not include the large number of conference papers and studies of home-workers, entrepreneurs, or supplemental work at home. They focused on empirical and/or theoretically grounded studies.

### Literature Review

Their review of recent literature (1998 to 2001) revealed six literature reviews and 35 empirical studies. In the original paper, a table including methodology details and key concepts was provided but is not included here for brevity, although sample references are provided. Overall, literature addresses the following questions:

- Who are the virtual workers? There are two types of studies that discuss who virtual workers are. The first type is descriptive, usually presenting demographics and other characteristics of virtual workers based on general surveys or public records (e.g., Johnson, 2001). The second type investigates characteristics of telecommuters (e.g., Bélanger, 1999b).
- How is communication influenced by virtual work? This area has been the most researched in recent years. The published work comprises studies of communication patterns (e.g., Bélanger, 1999a) and studies of choices of communication modes (e.g., Wiesenfeld, Raghuram, & Garud, 1999).
- What technologies are used and how do they influence virtual work outcomes? There were few studies prior to 1998 focusing on technologies in virtual work. Recent studies look at computer-mediated communication systems, the Web, the role of technologies in affecting productivity of teleworkers (e.g., Bélanger, Collins, & Cheney, 2001), and usage patterns of technology in virtual teams (e.g., Majchrzak, Rice, Malhotra, King, & Ba, 2000).
- What is the nature of the work-family conflict in virtual work? There are some recent studies looking at stress but most studies were published prior to 1998 (e.g., Duxbury, Higgins, & Mills, 1998), or in non-IS mainstream journals.

- What are the outcomes of virtual work environments? Most hypothesis-driven studies used outcomes of virtual work, such as productivity, satisfaction, or level of communication, as dependent measures (e.g., McCloskey, 2001). Potential outcomes were also discussed extensively in pre-1998 literature.
- What happens in virtual group work? Studies investigate trust, development processes, and performance in virtual teams, and perceptions in virtual groups (e.g., Maznevski & Chudoba, 2000).
- What are the key issues in managing remote group workers? Studies typically look at issues with managing teleworkers (e.g., Staples, 2001).

Overall, the review showed that a number of barriers, enablers, and outcomes of virtual work have been studied. The samples have often been limited, for example, one organization, which can limit the generalizability of the findings. However, sample size has increased in recent years. In general, given the complexity of organizations, the current research still seems to be narrowly focused.

## Case Narratives

To investigate the gap, interviews were conducted in two organizations with distributed workers but with quite different levels of worker distribution. The first organization is Booz Allen Hamilton. It is a global management and technology consulting firm. For their IT practice of the Worldwide Technology Business (WTB), they rely on distributed teams comprised of geographically dispersed employees. The teams are classified as functional, delivery, development, and external teams. Their flexible matrix allows members to participate on multiple teams.

The organization has had success using technology support for team communication. The technologies available include project management, collaboration, and knowledge management tools. Management challenges, however, do occur with practical issues such as the needs for breadth of multi-disciplinary domains, collaboration tools, and training. In managing the breadth of multi-disciplinary domain, identifying the right "mix" of team members with requisite skill sets is a challenge. While electronic collaboration tools are available, managers are not sure whether and how using particular tools makes positive outcomes more likely. Computer and collaboration technology training is left up to each consultant. Management wonders whether project managers are effective because of interpersonal qualities or because of automated tools usage.

The second case is a Fortune 100 telecommunications company headquartered in Southeast USA. It services residential and business telephone customers in nine states. The narrative focused on the management of 700 network service technicians responsible for installation and repair of telephone services within one district. Technicians complete four to five work orders per day assigned by a centralized provisioning center. They are evaluated based on efficiency in completing orders and quality of the work performed. Some teams are staffed in shifts 24 hours/day, seven days/week, while others have eight-hour days with frequent overtime.

Technicians and supervisors use information and communication technologies extensively, including cell phones, pagers, and wireless laptops. The first work order is loaded on the technician's laptop before the work day begins. Technicians update the work order, and completed orders are updated in the system as soon as a worker establishes a connection. A new work order is then assigned. Such a system allows dynamic assignment of work orders based on changing priorities throughout the day.

Managers are responsible for overseeing eight to 15 technicians, including visiting and inspecting the site where work was completed. Supervisory duties also include providing training for technicians (formal and informal). They must respond to individual questions which arise due to unique field conditions or changes in technology. In addition, they must conduct performance evaluations, counsel technicians on career development, and mentor technicians new to the job.

Such responsibilities pose challenges for managers. Management challenges include work activity coordination, measurement tools, training, and information sharing for team building. Coordinating activities of distributed field workers who face process changes, often due to field conditions, is challenging. Supervisors are not able to observe the work performed, which causes difficulty in providing feedback to technicians on the quality of their work. Training in a timely and consistent manner is difficult with staggered schedules of field workers. In addition, it is difficult for distributed workers to develop relationships with team members. Thus, inability to share information with team members, especially for newer people, poses a challenge for managers.

## MAIN TRUST OF THE ARTICLE

A number of managerial themes emerged from the interviews. The themes are summarized in Table 1, and only a few sample questions are provided in the following text for each theme. Please refer to Table 1 for further research questions.

Team building is an issue due to the complexity of lateral communication among team members in virtual work environments. The lack of physical interaction causes

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