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# VIRTUAL TEAMS: AN EXPLORATORY STUDY OF KEY CHALLENGES AND STRATEGIES

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## 1. INTRODUCTION

Virtual arrangements are proposed as a way for organizations to face the challenges of the upcoming century and to operate both efficiently and innovatively (Jarvenpaa and Ives 1994; Savage 1996). Among other emerging arrangements, virtual teams, both within and across organizations, are relatively recent phenomena brought about in part by the development of technologies such as Internet, groupware and videoconferencing (Barnatt 1995; Lipnack and Stamps 1997). The reluctance of many workers to relocate for a new job, the global nature of the marketplace, the need to complete projects as quickly as possible, and the need to tap the best brains no matter where they may be are all examples of virtual team drivers within and across organizations (Geber 1995; Lipnack and Stamps 1997).

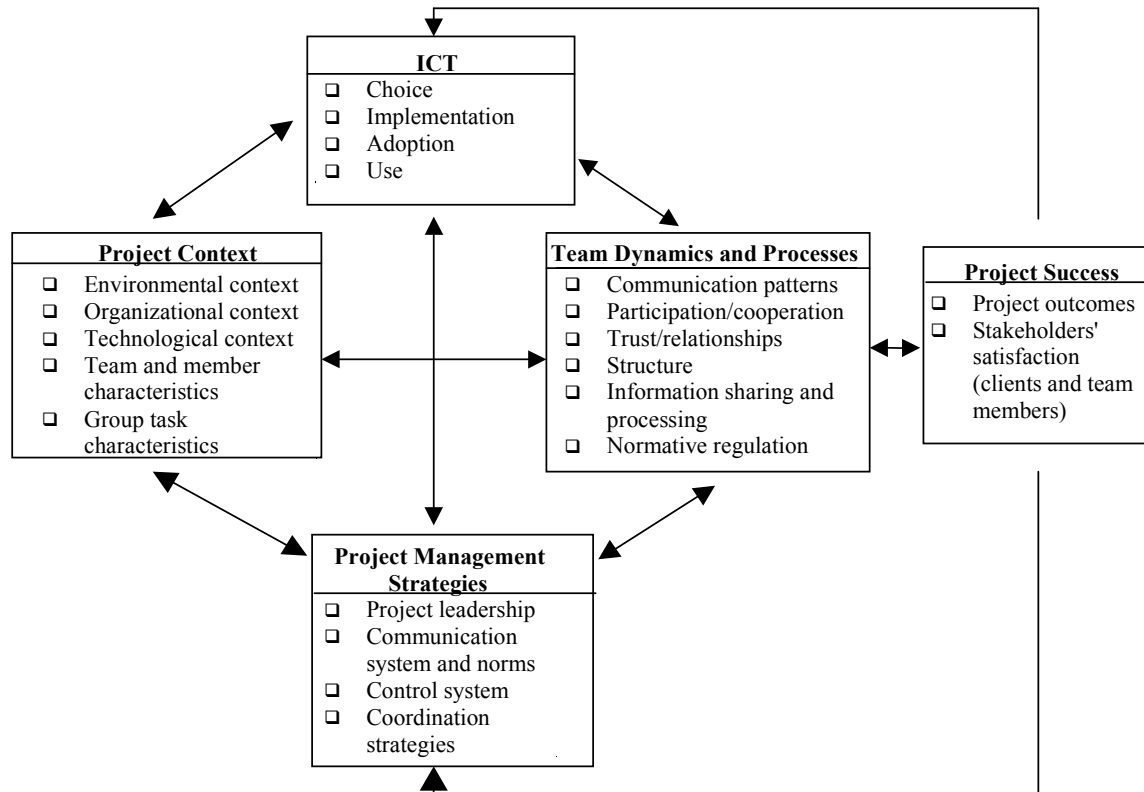
A virtual team, like any other team, is a group of people who interact through interdependent tasks guided by a common purpose. Virtual team members, however, work across space, time and organizational boundaries, with links strengthened by information and communication technologies (ICT). In other words, they are globally distributed teams in which personnel, resources and work may be dispersed over multiple, geographically separate sites. Importantly, virtual teams often are considerably more diverse than conventional teams, with members representing not only different technical specialties, but different cultures, languages and organizational allegiances as well (Fisher and Fisher 1998).

According to researchers and practitioners, virtual teams are a benefit as well as a necessity for companies and are bound to become more prevalent (Gorton and Motwani 1996; Lipnack and Stamps 1997). Anecdotes concerning the success of virtual arrangements have received considerable attention in the popular press. This literature typically claims that ICT form the basic foundation for the creation and management of virtual teams or organizations (Henry and Hartzler 1998; Jarvenpaa and Ives 1994). Despite widespread interest in virtual models and their importance for both the professional and scientific communities, this topic has been largely overlooked by business scholars. To date, studies of virtual arrangements have focused mainly on the concept of telecommuting (e.g., Boivin, Rivard and Aubert 1996) or a specific aspect of virtual team success, such as the development of trust (e.g., Jarvenpaa, Knoll and Leidner 1998). Given the lack of empirical evidence in this area, there is a pressing need for rigorous conceptual and empirical work to examine factors that influence virtual team success.

The main objective of this empirical study is to explore the key challenges facing *ad hoc* virtual teams and the coping strategies required. *Ad hoc* virtual teams are defined here as groups brought together for a finite time to tackle a specific project, while permanent teams are conceived as intact workgroups that work together indefinitely. In pursuit of this objective, two interrelated research questions were initially stated: (1) What are the key challenges facing *ad hoc* virtual team managers and members? (2) What strategies can be implemented in order to cope effectively with these challenges?

## 2. THEORETICAL FOUNDATIONS

As a first step, we developed a conceptual framework that considers the full panoply of constructs and variables potentially relevant to the functioning and effectiveness of *ad hoc* virtual teams and places them in relation to one another. To develop the



**Figure 1. A Comprehensive Framework for the Study of Virtual Teams in Organizations**

framework presented in Figure 1, an extensive literature review was conducted in the fields of small groups dynamics, project management and management information systems. Given that this study is aimed at theory building, our conceptual framework will be used solely as a starting point. Basically, it will help make sense of occurrences, ensure that important issues are not overlooked, provide a set of constructs to be investigated, and guide our interpretation and focus. Each component of the research framework is briefly described below.

## 2.1 Project Context

A virtual team, and more specifically a multi-cultural virtual group, evolves in a broader social system that cannot be ignored. For instance, the culture of a society, in terms of work norms and values, technology adoption behaviors, and communication and socialization norms, is likely to influence the dynamics of dispersed multi-cultural groups (Dubé and Paré 1997). At the organizational level, past experiences with other forms of virtual arrangements (e.g., telecommuting), as well as organizational inertia, politics, and culture, can all have major impacts on current efforts to develop effective virtual team dynamics (Haywood 1998). Importantly, team characteristics such as size, geographic dispersion and members' shared work experience are key variables found to have a major influence on both group dynamics and processes and project management strategies (Kerzner 1998). Task characteristics such as complexity, uncertainty, ambiguity and difficulty are also likely to influence group processes (Gladstein 1984) and thus need to be considered in empirical studies of virtual teams. Finally, previous experiences of failure with ICT and/or the structure of existing technological resources are likely to constrain ICT adoption decisions by virtual team members.

## **2.2 Project Management Strategies**

The complex, usually uncertain, and highly interdependent nature of project tasks, together with the geographical, temporal, structural, and cultural gaps fundamental to distributed teams, make the management of virtual projects a relatively complex undertaking. Several strategies are proposed in the literature to increase the chances of fielding a successful virtual team. For example, it is often suggested that time and money be spent to bring the team together at the formation stage for a face-to-face start-up session. This helps team members get to know one another, develop friendships, build trust and agree upon work norms by learning common methodologies and a shared language for use in their work together (Henry and Hartzler 1998; Geber 1995). Coordination and control are two other key project management issues in virtual teamwork (Haywood 1998). Indeed, in a virtual context, project leaders can no longer control the work process by traditional means and therefore need to adopt a different set of coordination and control mechanisms. Strategies such as developing practical performance metrics, increasing visibility with frequent deliverables, prototyping and early integration, and defining project reporting mechanisms have been proposed as ways of monitoring remote workers successfully (Haywood 1998).

## **2.3 ICT Choice, Implementation, and Use**

It is recognized that ICT provide powerful support in making the concept of virtual teams a reality (Jarvenpaa and Ives 1994). Virtual team members can be linked through a variety of ICT, including phones, fax machines, Internet, groupware and videoconferencing. It therefore appears important to study how ICT adoption decisions are made and how ICT use impacts on group dynamics. In a different line of thought, team managers are likely to face unpleasant technological challenges such as equipment/software incompatibility or unavailability, infrastructure and equipment complexity, user learning curves, the cost of equipment and communication facilities, and the difficulty of securing a remote access network (Haywood 1998). Technological considerations like these appear critical and hence need to be investigated.

## **2.4 Team Dynamics and Processes**

As shown in Figure 1, team dynamics are colored by the characteristics of the context in which the virtual project takes place, the way ICT are implemented and used, and the appropriateness of the selected project management strategies. Distributed work groups are likely to raise specific issues, including communication and information sharing patterns, trust and members' relationships, participation and cooperation, and norms regulation (Gorton and Motwani 1996; Henry and Hartzler 1998). Other issues of importance are the precise relationships and roles of each team member and the effects of technological support on the degree of structure (how standardized and stable) and the type of structure (how formal) of group dynamics and processes.

## **2.5 Project Success**

While the relationship between *team dynamics and processes* and *project success* is not as clear as social scientists would like it to be, all group performance models posit that the two constructs are interrelated (Goodman, Ravlin, and Argote 1986). In this study, we propose to assess project success in terms of both project outcomes and stakeholders' satisfaction. Indeed, project success should not only include the extent to which the project was completed on time and within budget, but also the extent to which team members were affected by the process of working from a distance—for example, the level of stress due to confusion, technological problems, overtime, conflict, level of motivation and new learning, and the extent to which emerging problems were addressed and resolved satisfactorily (Freeman and Beale 1992).

## **3. RESEARCH METHOD**

Given the exploratory nature of this study, we decided to conduct a qualitative survey using a convenience sampling method. Between November 1998 and March 1999, we conducted in-depth interviews with 20 experienced virtual team leaders and members from 14 organizations in the province of Quebec, Canada. These organizations, both large and small, came from various sectors, namely telecommunications, banking, IT services and manufacturing. Participants held various positions in their company

(CEO, VP, Managing Director, Senior Consultant, Project Manager) and were from a range of business units (Human Resources, Marketing, IT, Engineering, Strategic Development). Respondents were predominately males (60%) with an average virtual team experience of approximately two years.

Each interview started with a brief discussion of the study, carefully designed to arouse the interest of the interviewee, while not biasing responses by providing too much information about the conceptual framework. The core of the interviews was semi-structured. In line with our conceptual framework, an interview guide was developed and used for each interview. All interviews were tape-recorded and then transcribed. The average length of each interview was approximately 75 minutes and resulted in 328 pages of transcripts.

Coding is a key analytical technique adopted in the infancy stage of data analysis. A coding scheme was developed based on each category of our conceptual framework. The original list of codes was then used by each researcher separately to codify and extract the data from the transcripts of the first 12 interviews. The results indicate a fairly strong agreement (0.8) between the two coders for all 12 interviews. Upon coding completion, the actual percentage of agreement and Cohen's kappa coefficient will both be computed. The following step in data analysis consisted in identifying the key challenges and strategies specific to *ad hoc* virtual teams. Challenges and strategies were identified through an in-depth analysis of coded segments from each interview. Section 4 presents a few preliminary insights from the analysis of the first 12 interviews.

## **4. PRELIMINARY RESULTS**

In a virtual environment or context, as a general rule, it appears that although team members have to make important adjustments, the role of the project leader seems to require the most change. We have summarized below three of the key challenges facing virtual team leaders, along with some of the coping strategies they tend to adopt.

### **4.1 Challenge #1: Building a “Jelled” Virtual Team**

Commitment and alignment around a team's purpose is best gained in a face-to-face meeting where the team builds its own vision and the members work together to develop trust, mutual accountability and an atmosphere of collaboration. Respondents clearly indicated that when team members are in remote locations, alignment and commitment are more difficult to generate. They consistently said that starting a new project with a face-to-face meeting is a highly useful investment. Such a meeting provides the necessary clarity of focus and direction and gives people a chance to establish relationships and develop a sense of belonging to the team. Social activities also permit the development of team unity, a key factor when conflicts arise during the project. Many respondents also emphasized the importance of formal operating norms that members agree to uphold when they join the team. These include such things as meeting deadlines, attendance at teleconferences, and how to honor commitments to other team members.

### **4.2 Challenge #2: Keeping the Synergy Flowing**

Distance is a major barrier to project managers who normally exercise their leadership and influence using their personal traits, for example a strong presence, charisma, and the ability to speak articulately. Keeping the momentum going can be difficult in any situation, but virtual teams find this to be especially difficult because of their dispersed locations. Communication is the vehicle for creating synergy, keeping the team together, and moving forward. Many respondents emphasized the instrumental role ICT play in supporting open communications and helping team members to “stay close” to each other. A key issue regarding effective communication using ICT relates to the choice of a particular technology or mix of technologies for a specific situation. This choice seems to depend on a variety of factors including the task at hand, equipment and/or software availability and compatibility, and the computer skills of team members, to name a few. Besides the support provided by ICT, the existence of explicit value statements and operating norms that members agree to early in the project can also go a long way in fostering effective communications.

### 4.3 Challenge #3: Monitoring the Work of Team Members

“Management by walking around” is a technique used by many successful project managers to identify problems early in a project. Unfortunately, management by observation is simply not possible for distributed teams. Virtual team leaders must, therefore, adapt and manage by objective, which is not as easy as it might seem. It is relatively easy, according to our respondents, to “forget” team members who are in a different location. While the work of others in a conventional team can be monitored naturally at the water cooler, for example, much more discipline and effort is required in a virtual setting. In short, the managers of successful distributed teams manage by objective and are able to create project plans and implement standardized methods and tools such as frequent deliverables, early integration and pilots.

## 5. EXPECTED CONTRIBUTIONS

According to our respondents, managing a virtual team as though it were a traditional one is a recipe for disaster. There are many challenges involved in making virtual teams work, and the preliminary results reveal that these consist of a variety of human, technological and management issues.

Overall, we plan to conduct a total of 40 in-depth interviews with experienced virtual team leaders and members from a variety of organizations and positions and to present a detailed analysis of the results at the conference. More specifically, we intend to identify and compare the challenges and strategies reported by both team leaders and team members and to derive a preliminary list of critical factors associated with *ad hoc* virtual team success. We anticipate that our results will be valuable to IS researchers and practitioners alike. First, both the conceptual framework presented here and the results of the study should contribute to a deeper understanding of virtual team management and allow researchers from a variety of fields to test ideas about how to build and manage virtual teams. For practice, this study should provide insights and guidelines for managers faced with the challenge of leading virtual teams. Finally, our results should address salient aspects of the conference theme by providing valuable insights into how organizations can prepare for the challenges of the new millennium.

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