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### Virtual Teams and Management Challenges

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#### Introduction

Collaboration is becoming increasingly important in creating the knowledge that makes business more competitive. Virtual teams are growing in popularity [1] and many organizations have responded to their dynamic environments by introducing virtual teams. Additionally, the rapid development of new communication technologies such as the Internet has accelerated this trend so that today, most of the larger organization employs virtual teams to some degree [2]. A growing number of flexible and adaptable organizations have explored the virtual environment as one means of achieving increased responsiveness [3]. Howells et al. [4] state that the shift from serial to simultaneous and parallel working has become more commonplace. Based on conventional information technologies and Internet-based platforms virtual environments may be used to sustain companies' progress through virtual interaction and communication.

This paper provides comprehensive aspects of virtual teams based on authentic and reputed publications, after define virtual teams and its characteristics, addressing virtual environments and relationship with management and employee challenges. Finally conclude that virtual team cannot be successful unless the knowledge and information in the company are effectively captured, shared and internalized by the entity manager. Doing an extensive literature survey, further studies are recommended. Managerial implications on those issues are also discussed.

#### Virtual Teams Definition

This era is growing popularity for virtual team structures in organizations [1, 5]. Martins et al. [6] in a major review of the literature on virtual teams, conclude that 'with rare exceptions all organizational teams are virtual to some extent.' We have moved away from working with people who are in our visual proximity to working with people around the globe [7]. Although virtual teamwork is a current topic in the literature on global organizations, it has been problematic to define what 'virtual' means across multiple institutional contexts [8]. It is worth mentioning that virtual teams are often formed to overcome geographical or temporal separations [9]. Virtual teams work across boundaries of time and space by utilizing modern computer-driven technologies. The term "virtual team" is used to cover a wide range of activities and forms of technology-supported working [10]. Virtual teams are comprised of members who are located in more than one physical location. This team trait has fostered extensive use of a variety of forms of computer-mediated communication that enable geographically dispersed members to coordinate their individual efforts and inputs [11]. From the perspective of Leenders et al. [12] virtual teams are groups of individuals collaborating in the execution of a specific project while geographically and often temporally distributed, possibly anywhere within (and beyond) their parent organization. Amongst the different definitions of the concept of a virtual team the following from is one of the most widely accepted: [13], "virtual teams as groups of geographically, organizationally and/or time dispersed workers brought together by information technologies to accomplish one or more organization tasks". The degree of geographic dispersion within a virtual team can vary widely from having one member located in a different location than the rest of the team to having each member located in a different country [14].

#### Advantages and Pitfalls of Virtual Teams

The availability of a flexible and configurable base infrastructure is one of the main advantages of agile virtual teams. [10]. Virtual R&D teams which members do not work at the same time or place [15] often face tight schedules and a need to start quickly and perform instantly [16]. On the other hand, virtual teams reduce time-to-market [17]. Lead Time or Time to market has been generally admitted to be one of the most important keys for success in manufacturing companies [18]. Table 1 summarizes some of the main advantages and

Table 2 some of the main disadvantages associated with virtual teaming.

Table 1: Some of the main advantages associated with virtual teaming.

Advantages	References
Reducing relocation time and costs, reduced travel costs	[1, 19-29]
Reducing time-to-market [Time also has an almost 1:1 correlation with cost, so cost will likewise be reduced if the time-to market is quicker [30]]	[17, 18, 23, 24, 29, 31-38]
Able to tap selectively into center of excellence, using the best talent regardless of location	[1, 22, 24, 26, 39-43]

Greater productivity, shorter development times	[19, 35]
Greater degree of freedom to individuals involved with the development project	[44]
Higher degree of cohesion (Teams can be organized whether or not members are in proximity to one another)	[1, 45, 46]
Producing better outcomes and attract better employees	[6, 20]
Provide organizations with unprecedented level of flexibility and responsiveness	[13, 24, 28, 31, 36, 47-49]
Respond quickly to changing business environments	[21, 35]
Sharing knowledge, experiences	[50, 51]
Enable organizations to respond faster to increased competition	[47, 52]
Better team outcomes (quality, productivity, and satisfaction)	[46, 53]
Most effective in making decisions	[54]
Higher team effectiveness and efficiency	[17, 55]
Self-assessed performance and high performance.	[8, 56]
Cultivating and managing creativity	[12]
Improve the detail and precision of design activities	[57]
Provide a vehicle for global collaboration and coordination of R&D-related activities	[58]

**Table 2: Some of the main disadvantages associated with virtual teaming.**

<b>Disadvantages</b>	<b>References</b>
lack of physical interaction	[1, 20, 23, 54]
everything to be reinforced in a much more structured, formal process	[59].
Challenges of project management are more related to the distance between team members than to their cultural or language differences	[60].
Challenges of determining the appropriate task technology fit	[61, 62]
Cultural and functional diversity in virtual teams lead to differences in the members' thought processes. Develop trust among the members are challenging	[23, 56, 58]
Will create challenges and obstacles like technophobia ( employees who are uncomfortable with computer and other telecommunications technologies)	[7]
Variety of practices (cultural and work process diversity) and employee mobility negatively impacted performance in virtual teams.	[8]
Team members need special training and encouragement	[63]

**Virtual and Traditional Teams**

Unlike a traditional team, a virtual team works across space, time and organizational boundaries with links strengthened by webs of communication technologies. However, many of the best practices for traditional teams are similar to those for virtual teams [21]. Virtual teams are significantly different from traditional teams. In the proverbial traditional team, the members work next to one another, while in virtual teams they work in different locations. In traditional teams the coordination of tasks is straightforward and performed by the members of the team together; in virtual teams, in contrast, tasks must be much more highly structured. Also, virtual teams rely on electronic communication, as opposed to face-to-face communication in traditional teams. Table 3 summarizes these distinctions [45]. Diversity in national background and culture is common in transnational and virtual teams [14].

**Table 3: Virtual and traditional teams are usually viewed as opposites.**

<b>Fully Traditional Team</b>	<b>Fully Virtual Team</b>
Team members all co-located.	Team members all in different locations.
Team members communicate face-to-face (i.e., synchronous and personal)	Team members communicate through asynchronous and impersonal means.
Team members coordinate team task together, in mutual adjustment.	The team task is so highly structured that coordination by team members is rarely necessary.

In particular, reliance on computer-mediated communication makes virtual teams unique from traditional ones [16]. The processes used by successful virtual teams will be different from those used in face-to-face collaborations (FFCs) [20]. In an innovation network resembling a "traditional" organization, the innovation process is more restricted by location and time. In other words, the innovation process mostly takes place within the framework of physical offices and working hours. In virtual organizations, individuals' work is not restricted by time and place, and communication is strongly facilitated by IT. Such a product development environment allows a greater degree of freedom to individuals involved with the development project [44]. Hence multinational companies (MNC) are more likely to become tightly integrated into global R&D network than smaller unit [64]. Distributed teams can carry out critical tasks with appropriate decision support technologies [65].

Physical Versus Virtual

Pawar and Sharifi [66] study of virtual versus collocated team success and classified physical teams versus virtual teams in six categories. Table 4 summarizes these differences.

**Table 4: Classifying physical teams versus virtual teams**

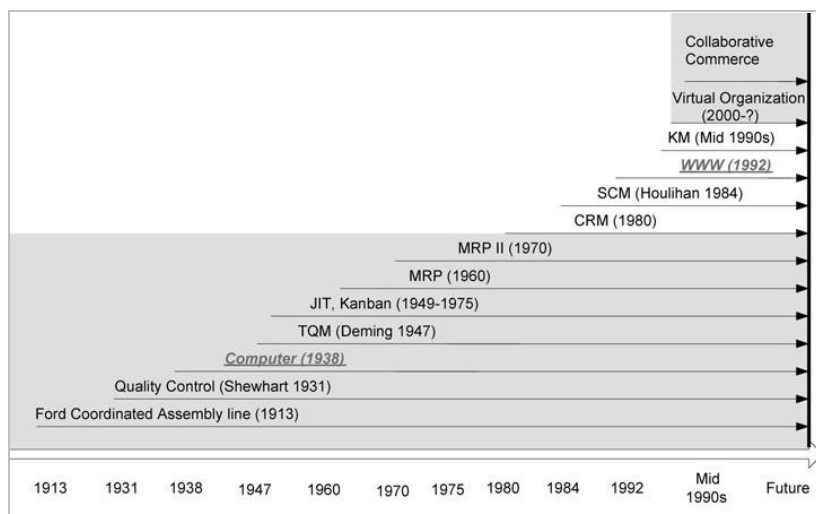
Activity	Physical teams nature	Virtual teams nature
Nature of interaction	opportunity to share work and non-work related information	the extent of informal exchange of information is minimal
Utilization of resources	Increases the opportunity for allocation and sharing of resources	each collaborating body will have to have access to similar technical and non-technical infrastructure
Control and accountability (over and within the project):	the project manager provides the Context for ongoing monitoring of activities and events and thus enhances their ability to respond to requirements.	The collaborating bodies were accountable to the task leaders and the project coordinator who had limited authority to enforce any penalties for failure to achieve their tasks
Working environment	they encountered constraints accessing information and interacting with others outside the collocated team within the company	Sometimes not able to share ideas or dilemmas with other partners.
Cultural and educational background	members of the team are likely to have similar and complementary cultural and educational background	the team members varied in their education, culture, language, time orientation and expertise

Lurey and Raisinghani [59] base on virtual teams survey in 12 separate virtual teams from eight different sponsor companies in the high technology found that, organizations choosing to implement virtual teams should focus much of their efforts in the same direction they would if they were implementing traditional, co-located teams.

**Management Challenges**

More and more companies are faced with the necessity to get the knowledge and expertise they require in different projects from different domains and areas [67], therefore, people from different companies often need to work together to bring the entire knowledge and experience that are needed for the success of a new product, process or service. Virtual teams represent a large pool of know-how which seems to be a promising source of companies' growth. At present, except for open source software, little is known about how to utilize this know-how [68]. Hence manager of enterprises should establish a connection between different departments and companies through virtual team stand on information technology. Based on a time scale, Figure 1 presents significant innovations that have had an impact on operation management (OM) [69]. Over the past decade, the developments in communications, primarily based on ICTs, have created a new platform for OM to connect enterprises and customers in a seamless information network.

The continuous rapid growth in project information volume as the project progresses makes it increasingly difficult to find, organize, access and maintain the information required by project users [70]. This particular problem can be highlighted in two cases document management on site and Information management at the facilities management stage [70]. Dealing with multiple, cross functional people and teams highlighted managing challenge. Manager of virtual team should overcome the managing conflict [49, 62, 71-74], cultural and functional diversity in virtual teams [16, 23, 42, 43, 56, 58, 75-78] and mistrust among the team members [1, 50, 79-81].



**Figure 1 Innovation in operations management (Source: Bayraktar et al.(2007))**

**Conclusions**

Since cross functional and virtual work teams are dealing with complex problems, it makes sense that cross functional virtual management teams are needed to support them. Problems from one team can pollinate widely on to other virtual teams. Management

must define the escalation path to resolve virtual, cross functional issues. While reviewing the previous study refer to Table 1 and

Table 2, it's believed that the advantages of working on the basis of virtual teams far outweigh the disadvantages and firms cannot be successful unless the knowledge and information in the company are effectively captured, shared and internalized by the entities virtual team members.

This paper has provided an extensive review of literature and related resources covering the theme of virtual teams and management issue. Clearly there is a considerable scope for extending this study to specify filed such as small and medium enterprises (SMEs) and relationship with virtual team. Further research has to be done on this topic to fully understand the influence of virtual team on company practically. There is considerable literature on distributed and virtual teams. The coverage includes management challenges, technology enablers and organizational and multi-cultural challenges. However, limited work has been directed towards exploring and analyzing the existing inter-relation. Therefore future research shall be aimed at shifting away from investigating virtual teams separately to the formation and development of a collaborative system which can support a dispersed team effectively. Keeping virtual teams in company growth processes, operating innovatively, effectively and efficiently is of a high importance, but the issue has poorly been addressed simultaneously in the previous studies.

Managers of company should invest less in tangible assets, but more in virtual team to generate knowledge, and increase employees' creativity to stimulate incremental innovations in already existing information technology that will directly generate their future competitive advantage.

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