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APPLIED INFORMATION MANAGEMENT

Using Collaboration for Successful Global Virtual Team Management

CAPSTONE REPORT

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Table of Contents

List of Figures

List of Tables

Abstract

Virtual teams have become the norm in response to global business demands. This literature review poses the question, What can IT mangers learn about the nature of collaborative work that will improve their ability to successfully manage these teams? A synthesis of literature published in the past decade is examined to present unique characteristics of virtual teams and recommended strategies and tools to enable collaborative work, in support of more successful team management.

Introduction to the Literature Review

General Topic

This inquiry is designed to examine how concepts of collaborative work form the basis for understanding unique characteristics of global virtual teams and for recommendation of strategies for successful global virtual team management. According to Kimball (1997), the nature of teams within contemporary organizations has changed significantly because of changes in organizations and the nature of the work they do. Kimball (1997) suggests that while organizations have become more distributed across geography and across industries, in turn global business demands and new technologies have led to the creation of a virtual workplace, built around a structure known as global virtual teams. Fisher and Fisher (2001) observe that for many companies, employees and teams routinely collaborate virtually for a number of distinct reasons.

Kimball (1997) believes that managing virtual teams is not about taking old management techniques and transposing them for delivery using new media. Rather, it is about expanding available tools to create new dynamics aligned with the best thinking about supporting collaborative work. Kimball (1997) reports the following:

Virtual teams are fast becoming more the rule than the exception in organizations. It's time to stop thinking of them as a special case and start developing strategies for dealing with the new challenges they create. Virtual teams need the same things all teams need – a clear mission, an explicit statement of roles and responsibilities, communications options, and opportunities to learn and change direction. The job of the manager of a virtual team is to help the team learn how to be a virtual team (p. 11).

Khosrowpour (2001) indicates that by adopting technology designed to support

collaborative work, such as Internet, e-mail, net-and-video conference system, video-phone,

information system, etc., individuals in virtual teams are able to communicate with others to

accomplish specific objectives within specified timeframes and without being present physically.

Research Problem

Rifkin (2006) states that strides have been made in developing successful global

managers but most managers still lack the necessary cultural awareness when dealing with

overseas employees and partners, as well as the experience of managing increasingly complex

processes long distance. Adams (2001) explains that it is not unusual for managers to be in one

location with their teams located in several other places around the world. The research question

posed in this literature review is, What can mangers learn about the nature of collaborative work

that will improve their ability to successfully manage global virtual teams? The goal of this

inquiry is to help IT managers of global virtual teams understand unique characteristics these

teams through an examination of collaborative work concepts.

A search of the literature reveals articles that identify issues around the topics of

collaborative work and strategies to successfully manage global virtual teams. Edwards and

Wilson (2004) remark that the effort required to select team members from all over the globe, to

find resources from any organization, and then to link people via communication technology,

might be a daunting one. In addition, Edwards and Wilson (2004) state that orienting an

individual to a virtual team demands a very steep learning curve and any dissatisfaction can

quickly spread within the organization. Moreover, Kayworth and Leidner (1999) notice that

given the separation across time and space, firms need to adopt innovative technologies to

provide rich channels of communication to facilitate task coordination among globally dispersed team members.

Godar and Ferris (2003) suggest that global virtual teams possess distinctive characteristics that many organizations misunderstand, and when that situation occurs, organizations may try to manage virtual teams in similar ways as traditional teams are managed. However, Godar and Ferris (2003) observe that it may not be useful to apply concepts and techniques from traditional teams to virtual teams as a way to understand and assess the value of virtual teams.

While there is no single article that describes all the techniques used to successfully manage global virtual teams, it is possible to provide an overview of collaborative work and global virtual team management strategies by combining the ideas of selected authors from specific areas related to collaboration and global virtual teams. For instance, Hoefling (2003) believes that the key to successful virtual teams is not technological expertise, but a clear understanding of what it takes to get the enterprise ready for virtual work. As noted above, Kimball (1997) considers that managing virtual teams is about expanding available tools to create new dynamics aligned with the best thinking about supporting collaborative work.

Dwyer (2007) suggests that even with an array of new Web-based collaboration tools at their disposal, most managers find handling remote or virtual teams extremely challenging. The assumption underlying this inquiry is that managers need to understand the nature of collaborative work before they can address unique characteristics of these teams and adopt strategies designed to help them to successfully manage and support global virtual teams. This literature review attempts to reach this goal.

Audience/Significance

Malone (2004) notes that management is at the heart of every virtual team's effectiveness. Individuals working on virtual teams are, generally, experiencing a new way of working that is unfamiliar. In addition, Malone (2004) explains that the management of these teams requires a different set of skills than those needed for management and supervisory roles. Therefore, the audience selected for this inquiry is IT managers of large corporations in which global virtual teams are becoming the norm. Rifkin (2006) dubs a few of these as "insightful giants" including General Electric, Cisco Systems, and Intel. IT mangers in these kinds of organizations perform a variety of activities that include:

1. managing many resources dispersed in multiple locations

2. planning and directing the work of a group of individuals

3. monitoring their work

4. making proper decisions to address performance issues

This literature review is designed to benefit these IT managers who have entered the world of virtual management by focusing their attention on unique characteristics global virtual teams through an examination of concepts of collaborative work.

Research Limitations

This study offers several important findings to the literature, but there are some limitations to this study as well. Limitations are used to help frame the scope of this document and AIM (2007) provides a list of limitations that include:

1. the parameters that define the topic like intended audience

2. the time frame set for the literature collection publication dates

3. the decisions made to design the search strategy, including literature collection criteria

4. focus (particular perspective), defined by the sub-topics

5. rhetorical pattern choice described in the writing plan

Intended audience.

Rifkin (2006) comments that despite nearly two decades of corporate globalization efforts, many organizations still struggle to find managers who are comfortable and effective in the increasingly global economy. He goes on to say that most suffer both from a lack of cultural awareness when dealing with employees and partners overseas and from a lack of experience managing increasingly complex processes over long distances. Thus, the selected literature for this study, in which concepts of collaborative work are examined, is targeted to IT managers of corporation with globalization efforts.

Steinfield et al. (2002) point out that, while extensive literature on group work has concentrated predominantly on "co-located" teams, organizations are increasingly depending on virtual teams, in which interaction and collaboration takes place among geographically distributed individuals. As a consequence, Steinfield et al. (2002) affirm that an interest in how to improve collaboration in global virtual teams is growing. Therefore, this study is designed to present information concerning collaborative work that can be used to manage global virtual teams more successfully.

Time frame.

Leedy and Ormond (2005) advise to select resources with recent copyright dates because they give a sense of current perspectives in the field pertinent to the research problem. Most of

the material found for this study is dated between 1997 and 2007, and material before the early date is scarce or almost nonexistent. In addition, by excluding resources posted before 1997, the review does not take into consideration outdated content that has probably been replaced by more current material, as implied by Lester and Lester Jr. (2005).

Literature collection criteria.

As suggested by the research evaluation done by Lester and Lester Jr. (2005), preference is given to three types of sources: scholarly books, biographies, and scholarly articles. As this study does not document or focuses on the life of a virtual team manager, biographies are not selected as part of the sources for the study. Furthermore, material for the study is selected from Google Book Search, Intel Library, and EBSCO Host, since these search engines provided the best results when retrieving scholarly books and articles. Other search engines like Google and Pandia are used to complement information used for the study.

Focus.

University of North Carolina (2007) presents a set of strategies for writing the literature review. One of these strategies is to find a focus in which the literature review is usually organized around ideas. UNC (2007) indicates that themes have to be identified in order to connect all the sources together. Therefore, for this study, the researcher identifies the main themes as unique characteristics of global virtual teams, collaborative work to addressing these characteristics, and based on collaborative work concepts, strategies for IT managers of virtual teams. The use of the term 'global' – and all derivatives – in the Review of the Literature Bibliography section is somewhat problematic, and deserves further explanation. This researcher remarks that while the term is often included in titles and abstracts, it does not always

appear in the selected full text articles. The decision is made to use the term judiciously in this paper. Particular derivatives are included in the Definitions section of the document.

> ***Rhetorical pattern/Introduction to the Writing Plan.***

UNC (2007) provides a description of a rhetorical pattern termed thematic, which directs the research to organize a literature review around a topic or an issue rather than, for example, the progression of time. While progression of time may still be an important factor in a thematic review, more authentic thematic reviews tend to break away from chronological order. A review organized in this manner could shift between time periods within each section according to the point made, and this definition seems to be the best approach for this inquiry. The following themes are identified:

1. *unique characteristics* of virtual teams in contemporary organizations
2. *collaborative work as key* to addressing unique characteristics of virtual teams
3. *recommended strategies,* based on collaborative work concepts, for IT managers of virtual teams

Definitions

This section defines terms that have specific meaning in relation to the main topic, or distinctive meaning that the average reader must understand in order to benefit from the research of this study (AIM, 2007). Leedy and Ormrod (2005) suggest that the definition of each term must interpret the term as it is used in relation to the literature review, and dictionary definitions are seldom either adequate or helpful. Therefore, each definition is cited from the selected literature. In addition, the key words are highlighted in bold and the list of definitions is sorted alphabetically to quickly help the reader find the definitions.

Asynchronous communication: Communication that does not require immediate response and tending to foster a more formal structured type of communication. It allows for data to be digested and a response clearly worded, avoiding ambiguity. Such communications are often performed via e-mail, which is, in fact, an extremely ambiguous communication medium (Edwards & Wilson, 2004).

Collaboration and collaborative relationships: Collaboration is the process of decision making among independent organizations involving joint ownership of decisions and collective responsibility for outcomes. For collaborative relationships, the definition could be elaborated to include a commitment to working together, goal congruency, and benefit sharing (Hosni & Khalil, 2004).

Collaborative team: Term defined as a cross-functional and organizational workgroup brought together to tackle a project for a finite period (Bal & Foster, 2000).

Collaborative work: The different steps – including gathering partners distributed in space, time, and organizations – among several organizations required to complete a given task,

to achieve a given goal, or to allow enterprises to create a partnership for specific projects (Van der Aalst et al., 2003).

Co-located team: This term refers to non-virtual traditional teams where the team members are physically in one specific site, usually belong to the same organization, possess diverse skills and resources, and collaborate to produce a final product (Bidgoli, 2004).

Coordination: This term has been defined in different ways by different authors, although many definitions share a common foundation. In essence, coordination is the glue that binds together the activities of the team members, so that the interdependent activities needed to perform a task fit together into a smooth process. In other words, coordination is managing dependencies between activities (Ramesh & Dennis, 2003).

Distributed team: Distributed teams, sometimes called virtual teams, consist of members who are distributed across buildings, states, and countries, who (sic) come together for a specific project and then disband when the project is (Mayer, 1998).

Dispersed team: Generally defined as groups of individuals working across space, time, cultural and/or organizational boundaries that interact primarily through some combination of electronic communication technologies in order to accomplish interdependent tasks guided by a common purpose (Heneman & Greenberger, 2002).

Geographically distributed organization: An organization composed of employees who are located in multiple locations and the team members share a common management reporting structure (Jones et al., 2005).

Geographically distributed project teams: A project team is comprised of individuals from different organizations (with different management reporting structures) who are brought together to deliver a specific set of results (Jones et al., 2005).

Global virtual team: Heneman and Greenberger (2002) define global virtual team as a virtual or geographically dispersed team, which is generally defined as groups of individuals working across space, time, cultural and/or organizational boundaries that interact primarily through some combination of electronic communication technologies in order to accomplish interdependent tasks guided by a common purpose. Generally, global virtual teams are teams whose members are located in two different countries.

Globalization: Process of increasing the connectivity and interdependence of markets and businesses. This process has speeded up dramatically in the last two decades as technological advances make it easier for people to travel, communicate, and do business internationally (InvestorWords, 2007).

Information Technology (IT): In its narrow definition, IT refers to the technological side of an information system. It includes hardware, databases, software, networks, and other devices. Sometimes, the term IT is also used interchangeably with information system, or it may even be used as a broader concept that describes a collection of several information systems, users, and management for an entire organization (Khosrowpour, 1999).

Internet: A decentralized networking infrastructure connecting publicly accessible interconnected computers around the world with the purpose of carrying various information and services such as electronic mail, online chat, file transfers, and other resources of the World Wide Web (Bidgoli, 2004).

Literature review: Research proposals and research reports typically have a section that reviews the related literature. The review describes theoretical perspectives and previous research findings regarding the problem at hand. Its function is to look again (re + view) at what

others have done in areas that are similar, though not necessarily identical to, one's own are of investigation (Leedy & Ormrod, 2005).

Soft skills: Non-technical skills, abilities, and traits that pertain to personality, attitude, and behavior rather than to formal or technical knowledge. Soft skills are required to function in a specific environment to work effectively as a member of a team. Soft skills include problem-solving skills, verbal communication skills, interpersonal and teamwork skills, personal qualities, and work ethic (Ackerman, 1998).

Synchronous communication: Communication that occurs at the same time. Teams use synchronous communication technologies such as the telephone and video conferencing. Synchronous technologies have more social presence than do asynchronous, but they tend to go unrecorded (Lane, 2004).

Virtual: Lipnack and Stamps (2000) provide three contemporary meanings for virtual:

1. Not real but appears to exist, something that appears real to the senses but is not in fact
2. not the same in actual fact but in essence, almost like
3. virtual as in virtual reality, a recent meaning invented for an emerging capability

Virtual collaborative design: The process of combining ideas, expertise and forces by using computer based technology, which supports synchronous or asynchronous distributed collaboration between the participants of stakeholders (Dasgupta, 2006).

Virtual enterprise: A consortium of industrial organizations, which come together to form temporary partnerships to respond quickly to changing customer demand. In a virtual enterprise, the partner organizations are geographically distributed, possess diverse skills and resources, and collaborate virtually to produce a final product (Bidgoli, 2004).

Virtual team: A virtual team is a group of people who work interdependently with a shared purpose across space, time, and organization boundaries using technology. Virtual teams are geographically dispersed and culturally diverse, often do not have constant membership, and are completely dependent upon technology, particularly the Internet (Bidgoli, 2004).

Virtual team manager: A virtual team manager, also known as a distance manager, is someone in charge to lead people who are not normally located together at the same place at the same time. Virtual team managers have special challenges associated with managing people from afar (Fisher & Fisher, 2001).

Research Parameters

Parameters refer to the way in which the literature review is framed and conducted (AIM, 2007). The goal of this section is to document the research methods used to develop the literature review, including four key components: search strategy, documentation approach, evaluation criteria, and writing plan (AIM, 2007). In the search strategy section, the author of this literature review includes search engines, databases, and search terms. The documentation approach section describes how the information selected for the study has been recorded. The evaluation criteria section illustrates how it was decided what to include and what to exclude from the literature review. Finally, the writing plan section represents how the Review of the Literature (see page 38) is framed based on one of the rhetorical or organizing patterns.

Search Strategy Report

Material for this literature review has been selected from different sources by performing searches in academic search engines and commercial search-engine sites utilizing key-search terms and controlled vocabularies. These sites have provided a list of books, journals, and academic documents, which have been evaluated to determine whether the articles were of value for the literature review.

Key-search terms and controlled vocabularies.

The following key search terms and controlled vocabularies were refined based on the focus topic.

- collaborative work
- dispersed
- global team

- global team management

- management

- managing global virtual teams

- managing virtual teams

- virtual

- virtual team management

Search engines.

The search engines for identification and retrieval of references used in this inquiry thus far include the following:

- Google

- Google Book Search

- Google Scholar

- HighWirePress – Stanford University

- Pandia

Library resources.

The academic databases used for the study include the following:

- EBSCO Host (Business Source Corporate)

- EBSCO Host (Science and Technology Collection)

- Intel Library

Documentation Approach

Leedy and Ormrod (2005) caution that conducting a thorough literature review takes a great deal of time but it takes less time if an approach to the task is planned ahead of time. The

approach has to be done in an organized and systematic fashion. Leedy and Ormrod (2005) propose several suggestions for maximizing the efficiency of the review. This review considers the tasks suggested by Leedy and Ormrod (2005). Details follow:

1. Use of a systematic way of recording the information gathered. The tool should allow easy organization of information obtained to date. The use of a laptop is recommended.

2. Keep track of the specific searches conducted. This task ensures no duplication of effort.

3. Let computer make the list if possible. For instance, if an online database is used, the list can be downloaded to a computer disk.

4. Record all basic information as sources are read. For example, essential bibliographic information or how the sources relate to the research problem.

Tracking Bibliography, Documentation Tool, and Results.

There are 29 references comprising the annotated bibliography used to develop the Review of the Literature (see Review of the Literature Bibliography). Appendix A provides a report, in the form of tables, of the search strategy and results.

Connotea™ is the tool chosen to keep track of all the bibliography. Connotea™ is a free software, easy to install and simple to use. The process involves visiting a website and clicking on the link to add all the information, which is saved into My Library database. Once bookmarked, all the sites can be exported into Word. Unfortunately, the tool did not provide all the functionality needed for the review document. Therefore, a different mechanism is used to record the information, which works as follows. Once an article is identified as a good source for the literature review, the pertinent information is recorded, in alphabetical order, in the Review

of the Literature Bibliography and in the References section of this document. The information captured includes author, year of publication, title, retrieved date, source, and abstract if the article is to be used in section Full Bibliography.

Evaluation Criteria

The evaluation of literature during collection and selection of books and articles includes the following criteria:

1. Adequacy of coverage is based on depth as recommended by Lester and Lester Jr. (2005). If the topic is covered in enough depth to be helpful to the study, the article should be selected. Otherwise, if the topic is only covered as a broad overview then the source is discarded.

2. Relevancy to the topic is established by assessing the content of the title, the table of contents, abstracts, and opening paragraphs. If the key-search terms and controlled vocabularies do not appear in the title, the table of contents, abstracts, and opening paragraphs, the material is discarded. Otherwise, the material is selected for the study.

3. Year of publication is determined by timeliness. If the date of publication is appropriate for the topic (1997 – 2007), the source is selected. UNC (2007) suggests that some disciplines, like in the sciences, require information to be as current as possible, since this information, even two years old, could be obsolete. Therefore, in the study of collaborative work and tools in managing global virtual teams within IT departments, more up-to-date articles take precedence over older articles.

4. Accuracy of the article refers to whether the opinions and conclusions of the authors reviewed are supported with references. Only material where the author can be referenced through other retrieved literature is selected for this literature review.

5. Accessibility refers to whether a source is accessible from an online database at no charge. If free access to a given database or an article is not possible, then the article is not selected for this literature review.

6. Credibility of the reference is accomplished by identifying the nature of the information as suggested by Lester and Lester Jr. (2005). Proper analysis is done on the author in order to determine the author's credibility. If information on the author's credentials does not exist, or is not sufficient, the material is not selected for the literature review.

7. Quality of references is based on a list of criteria documented by Tillman (2003), which includes the following elements:

   • Ease of identifying the authority of authors (bullet 6) and the currency of the material retrieved (bullet 3).

   • Stability of information in terms of reliability. Is the information going to stay in the location, where it was found, for a period of time?

   • Ease of use. Documents selected are formatted in PDF or Word formats. In addition, the books selected online have to be readable and the font has to be able to increase for readability purposes. If the font used in the document is difficult to read, the documents are discarded.

Writing Plan

UNC (2007) notes that the focus of a literature review is to summarize and synthesize the arguments and ideas of others. UNC (2007) goes on to say that literature reviews are useful reports that keep professionals current in the field. As organizations implement more virtual teams, it becomes increasingly important to know how IT managers have to structure and manage global virtual teams (Godar & Ferris, 2003). Thus, for this study, IT managers are the professionals who should benefit most from this literature review, with focus in two areas: examining how concepts of collaborative work form the basis for understanding unique characteristics of virtual teams and related recommendations on strategies for successful virtual team management.

The organization method used to focus this section is thematic. The thematic review of this literature is organized around the main topic of what mangers can learn about the nature of collaborative work that will improve their ability to successfully manage virtual teams. The thematic review of this literature review examines in more detail *unique characteristics* of virtual teams in contemporary organizations, *collaborative work as key* to addressing unique characteristics of virtual teams, and *recommended strategies*, based on collaborative work concepts, for IT managers of virtual teams.

Review of Literature guidelines.

UNC (2007) recommends following a few guidelines when writing the review of the literature. The subsequent items are identified and followed for the development of this study:

1. Use evidence refers to the fact that the interpretation of available sources must be backed up with evidence to show that what the author of this literature review is saying is valid. For example, the statement by Hoefling (2003) – virtual work is a fact

of life as companies manage teams of individuals dispersed on sites across the country or around the globe – is used to support the idea that virtual teams are becoming the norm in recent years.

2. Be selective by choosing only the most important key points in each source to be used in the review. The key points of the sources presented in the Review of the Literature Bibliography section make reference to the themes: global virtual teams have unique characteristics, collaborative work is key factor to addressing these unique characteristics, and based on collaborative work concepts, managers of global virtual teams benefit from recommended strategies.

3. Use quotes sparingly indicates the rule of using quotes only to emphasize a point, or if what the author of the source says cannot be rewritten easily by the author of this study. As shown within this study, only one direct quote has been used under General Topics. Information selected, in the form of citations, from the references identified in the Review of the Literature Bibliography section is used to build the inquiry.

4. Summarize and synthesize by rephrasing the source's significance and relating it to this study. The purpose of this study is not to copy <u>verbatim</u> what authors deem to be factual facts about collaborative work and global virtual management, but synthesize those facts and present them in a summary form.

5. Keep own voice is based on the fact that while the literature review presents others' ideas, the voice of the author of this study should remain front and center by starting and ending the body of the literature review with one's own ideas and words. The process of starting with one's own ideas and words is three-fold. First, the research selects the main topic and determines how concepts of collaborative work form the

basis for understanding unique characteristics of global virtual teams and recommendations of strategies for successful global virtual team management. Second, the researcher explains its relevance to the field of information management, specifically to IT managers of large corporations where global virtual teams are becoming the norm. Finally, the researcher identifies authors in the literature that describe the reasons why these IT managers need the literature review. In this case, the review is designed to benefit these IT managers who have entered the world of virtual management by focusing their attention on unique characteristics global virtual teams through an examination of concepts of collaborative work. Similarly, the process of ending with one's own ideas and words is accomplished by synthesizing the selected literature toward the specified research goal of what can mangers learn about the nature of collaborative work that will improve their ability to successfully manage global virtual teams. The synthesis of the study is presented in the Conclusions sections.

6. Use caution when paraphrasing by making sure that the author's information and opinions are represented accurately. This is a critical point in order to avoid plagiarism. The way authors' information is represented accurately is by citing their work and providing the appropriate reference.

Writing Plan Outline.

Based on the general topic for this study, the following themes are identified and the elaborated outline defined:

1. *unique characteristics* of virtual teams in contemporary organizations

2. *collaborative work as key* to addressing unique characteristics of virtual teams

3. *recommended strategies*, based on collaborative work concepts, for IT managers of virtual teams

As suggested by Lester and Lester Jr. (2005), a formal topic outline built of balanced phrases and noun phrases can be beneficial for arranging quickly the topics of the study without detailing the data. The topic outline might develop into a formal full sentence outline, which has two advantages over the topic outline:

1. Many entries in a sentence outline can serve as topic sentences for paragraphs, thereby accelerating the writing process.

2. The subject/verb pattern establishes the logical direction of the author's thinking.

Additionally, Lester and Lester Jr. (2005) state that the decimal outline is an alternative for papers in business and sciences like this study.

Formal Full Sentence Outline.

What can mangers learn about the nature of collaborative work that will improve their ability to successfully manage virtual teams?

1. Existing literature reports unique characteristics of virtual teams in contemporary organizations.

   1.1. Research suggests virtual teams are defined by unique key characteristics

   1.2. Distinction between a virtual and a co-located team is essential to better understand the nature of virtual teams.

2. Existing literature illustrates collaborative work as key to addressing unique characteristics of virtual teams.

   2.1. Trust and communication are key elements of virtual team effectiveness.

2.2. Communicating across different time zones and encountering different cultures affect virtual teams.

2.3. Effective communication is one of the key enablers of building cohesive teams.

2.4. Synchronous and asynchronous communication is a viable mechanism to collaborate in virtual teams.

2.5. Enabling collaborative technology and use it to help build relationships and effective virtual teams; the important role of social presence.

2.6. Collaboration has been viewed as an effective technique in resolving conflicts on teams.

3. Existing literature recommends strategies, based on collaborative work concepts, for IT managers of virtual teams.

3.1. Understanding how virtual teams develop and mature provides managers with insights that might increase a team's contributions to firm performance.

3.2. Actions that managers of virtual teams take to enable collaborative work.

3.3. Managing virtual teams effectively requires important practices in different areas; coordinating, improving collaboration, and effective practices.

3.4. Collaborative software suites can save time and effort while managing virtual teams.

Review of the Literature Bibliography

Lester and Lester Jr. (2005) spell out the importance of the review of literature by stating that the review presents two purposes:

1. The review helps investigate the topic by examining and describing how each source addresses the problem.

2. The review organizes and classifies the sources in some reasonable manner for the benefit of the reader.

This review of the literature bibliography documents the 22 key references that are utilized in the study. The sources are organized by content areas according to the selected categories for the study and presented in alphabetical order within each area. The asterisk (*) denotes an abstract written or modified by the author of this literature review.

1. Literature that proposes unique characteristics of virtual teams in contemporary organizations, relate to the theme of unique characteristics of virtual teams (3 entries).

2. Literature that provides an understanding of the concept of collaborative work, as key to addressing unique characteristics of virtual teams, relate to the theme of collaborative work (8 entries).

3. Literature that recommends strategies, based on collaborative work concepts, for IT managers of virtual teams, relate to the theme of strategies for IT virtual managers (11 entries).

Literature that proposes unique characteristics of virtual teams in contemporary organizations

Bell, B. S., & Kozlowski, S. W. (2002). A typology of virtual teams: implications for effective
leadership. Retrieved October 31, 2007, from
http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1007&context=hrpubs.

As the nature of work in today's organizations becomes more complex, dynamic, and
global, there has been an increasing emphasis on far-flung, distributed, virtual teams as
organizing units of work. Despite their growing prevalence, relatively little is known
about this new form of work unit. The purpose of this paper is to present a theoretical
framework to focus research toward understanding virtual teams and, in particular, to
identify implications for effective leadership. Specifically, we focus on delineating the
dimensions of a typology to characterize different types of virtual teams.

Pauleen, D. (2003). Virtual teams: projects, protocols and processes. Retrieved November 14,
2007, from http://site.ebrary.com/lib/intel/Doc?id=10044332.

As large organizations have become more geographically distributed, the need to work in
distributed virtual teams has become commonplace. We often collaborate with team
members located at another campus, in another city or country, or on another continent.
Some of these team members we seldom (or never) meet in person. Along with the
barrier of distance comes the barrier of time; there may be no single time of day that fits
into the normal working hours of all team members.

Wong, S., & Burton, R. M. (2000). Virtual teams: what are their characteristics, and impact on
team performance? Retrieved December 1, 2007, from
http://www.springerlink.com/content/w05636ht765v0536/fulltext.pdf.

To date, efforts to understand virtual teaming have been largely anecdotal and
atheoretical. Therefore, drawing from the extant research in the groups [sic] domain, we
attempt to ground the definition of a virtual team in well-established group-level
constructs, and design a simulation study to investigate the impact of different virtual
team characteristics on team performance. Essentially, we argue that the virtual team is
defined by three key characteristics—the virtual team context, the virtual team
composition, and the virtual team structure.

Literature that provides an understanding of the concept of collaborative work as key to

addressing unique characteristics of virtual teams

Bal, J., & Foster, P. (2000). Managing the virtual team and controlling effectiveness. Retrieved
November 21, 2007, from
http://web.ebscohost.com/ehost/pdf?vid=33&hid=117&sid=f2240dbe-7258-455c-98cb-
79e3cdd37e9f%40sessionmgr107.

The design, manufacture, and delivery of a product require even-higher levels of expertise and resource. Companies are finding that better internal and external communications can help leverage these resources to better effect; hence, there are initiatives such as simultaneous engineering, knowledge management, and team working. This paper describes current collaborative practices in the automotive supply chain, and identifies some crucial issues that need to be addressed for successful implementation of virtual teams.

Duarte, D., L., & Snyder, N., T. (2001). Mastering virtual teams: strategies, tools, and techniques that succeed. Retrieved November 14, 2007, from https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:8104&selectedBinName=""&searchLanguage=en&searchId=317095&showRelatedSearchLink=yes&doRelatedSearch=no&searchString=Virtual%20team%20management.

Technology and globalization now have created an environment in which teams communicate and collaborate virtually, across boundaries of time, geography, and organizations. Today, in many organizations, most teamwork is virtual. Even in the most provincial and domestic firms, it is rare to find all team members located in one place. Most of us have quickly, and without a choice, become virtual team leaders and members. Communication and collaboration are the two most important factors in team success. A virtual environment fundamentally transforms the ways in which teams operate. Technology introduces a critical variable that radically changes the choices for, and the effectiveness of, communication and collaboration.

Gibson, C., & Cohen, S., G. (2003). Virtual teams that work: Creating conditions for virtual team effectiveness. Retrieved November 1, 2007, from http://mmlviewer.books24x7.com/toc.asp?bookid=9529&keywords=collaborative,work,virtual,teams.

Peppered with best practices and case studies from companies like Lucent Technologies and Whirlpool, this guide shows how to help team members who speak different languages and are from different cultures communicate effectively through virtual teams.

Godar, S., H., & Ferris, S., P. (2003). Virtual and collaborative teams: Process, technologies and practice. Retrieved November 6, 2007, from http://mmlviewer.books24x7.com/book/id_7088/viewer.asp?bookid=7088&chunkid=1&keywords="Virtual%20and%20Collaborative%20Teams".

(*) This book began as a cross-disciplinary conversation about whether, why, and how virtual teams either do or do not fulfill that potential. As organizations implement more virtual teams, it becomes increasingly important to know how best to structure and manage such teams. There are, of course, research-based strategies for managing traditional work groups, and over two decades of research on the benefits and perils of computer- or technology-mediated communication on individuals. See Chapter 2,

Effective Virtual Teamwork, and Chapter 15, A Model for the Analysis of Virtual Teams, for specific references to "collaborative work."

Henttonen, K., & Blomqvist, K. (2005). Managing distance in a global virtual team: the evolution of trust through technology-mediated relational communication. Retrieved November 26, 2007, from http://web.ebscohost.com/bsi/detail?vid=3&hid=2&sid=89437493-de2c-4640-8c23-b2f0554ed5c2%40sessionmgr7.

Virtual teams offer the potential for the efficient combination of a dispersed workforce and the potential for leveraging diffuse knowledge and skills effectively for collaborative innovation. Information technology plays an important role in virtual teams, but virtual teamwork also involves significant social redesign. Trust is argued to be an important component in team development and effectiveness, and within this paper we explore the role and development of trust in the early stages of a virtual team.

Hoefling, T (2003). Working virtually: Managing people for successful virtual teams and organizations. Retrieved November 1, 2007, from http://books.google.com/books?id=IzIi--nssmQC&dq=Managing+Groups+and+Teams/How+Do+You+Manage+Global+Virtual+Teams%3F.

Virtual working is a fact of life as companies manage teams of individuals dispersed on sites across the country or around the globe; take increasing advantage of improving technology and software to telecommute and teleconference; and begin to think about the human element in disaster recovery. The key to successful dispersed working is not technological expertise, but a clear understanding of what it takes to get the enterprise ready for virtual work, and of the skills for bonding individuals into cohesive, high-performance teams across distances and differences.

Kostner, J. (2001). Bionic eteamwork: How to build collaborative virtual teams at hyperspeed. Retrieved November 7, 2007, from http://library.intel.com//Catalog/CatalogItemDetails.aspx?id=39740

All of us who communicate virtually have to be smarter about how to leverage technology not just to send and receive messages, but also to extend our human touch and increase team speed, virtually. We need to embrace collaborative technology, and use it to collaborate, not give slide shows to one another.

Rad P., F., & Levin, G. (2003). Achieving project management success using virtual teams. Retrieved November 6, 2007, from https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:8434&selectedBinName=""&searchLanguage=en&searchId=323822&showRelatedSearchLink=yes&doRelatedSearch=no&searchString=Achieving%20project%20management%20success%20using%20virtual%20teams.

Collaboration has long been viewed as an effective technique in resolving conflicts on project teams. Collaboration that results from conflict occurs frequently when diverse and conflicting points of view are recognized as important and viable and then are integrated into a unified solution (Blake and Mouton, 1964; Thomas and Kilmann, 1974). As a prelude to working together in finding optimal and integrated solutions, a collaborative leadership approach would guide the team members to treat each other's ideas as important to the overall project outcome. The concept of collaboration also emphasizes learning from others by way of testing all assumptions.

Literature that recommends strategies, based on collaborative work concepts, for IT managers

of virtual teams

Adams, J. D. (2001). Managing dispersed work effectively. Retrieved October 25, 2007, from http://www.eartheart-ent.com/docs/Dispersed_Work.pdf.

> The number of work groups whose members are not working most or all of the time in the same place is growing rapidly as changes in technology have enabled flexible work styles and created a truly global economy. It is not unusual for a manager to be in one location, and her/his team located in several other places around the world. In a rapidly growing number of organizations, dispersed teams are the norm, especially in sales and service functions.

Brown, M. K., Huettner, B., & James-Tanny, C. (2007). Managing virtual teams: getting the most from wikis, blogs, and other collaborative tools. Retrieved November 19, 2007, from https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:18222&searchLanguage=en&searchType=&searchId=323077&showRelatedSearchLink=yes&doRelatedSearch=no&searchString=managing%20virtual%20teams.

> For managers who must meet deadlines with a diverse team, and for team members who want to develop and maintain professional relationships, this practical book discusses team and project management, and covers the tools available for collaboration.

Duarte, D. L., & Snyder, N. T. (2000). Leadership in a virtual world. Retrieved November 19, 2007, from http://web.ebscohost.com/ehost/detail?vid=4&hid=15&sid=23007b73-c0ba-48db-b752-ba94d08d54f5%40sessionmgr104.

> Offers advice on managing virtual teams or technology-enabled groups working across time, space and organizational boundaries. Obstacles to working virtually; Steps for leaders to increase the free flow of information, shared responsibility and cross-boundary collaboration; importance of career development systems and rewards and recognition; essential leadership behavior.

Furst, S.A., Reeves, M., Rosen, B., & Blackburn, R.S. (2004). Managing the life cycle of virtual teams. Retrieved October 29, 2007, from http://pages.stern.nyu.edu/~wstarbuc/mob/VirtualTeams.pdf.

To understand the factors that contribute to virtual team effectiveness, we tracked six virtual project teams from a large food distribution company from inception to project delivery. We identified factors at each stage of the virtual-team life cycle that affected team performance. These results provide specific examples of what managers can do, at various points in time, to increase a virtual team's chances to fully develop and contribute to firm performance.

Gluesing, J., Alcordo, T., Baba, M., Britt, D., McKether, W., Monplaisir, L., Ratner, H., Riopelle, K., & Wagner, K., H. (2002). The development of global virtual teams. Retrieved October 25, 2007, from http://www.anthro.wayne.edu/iitc_site/2003%20Development%20of%20Global%20Virtual%20Teams.pdf.

With the recent and rapid proliferation of global virtual teams (GVTs) as a preferred mode of organizing to accomplish global work, it is not at all surprising that talk about this work has increased as team members and leaders try to figure out how to overcome the delays and misaligned actions that often come with distance, and how to develop as a team as well as keep the team progressing on their task. The chapter concludes with action steps that can help both managers and team members create conditions for effective team development in both new and existing global virtual teams.

Jones, R. C., Oyung, R. L., & Shade, L. (2005). Working virtually: Challenges of virtual teams. Retrieved November 19, 2007, from https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:10840&searchLanguage=en&searchType=&searchId=323114&showRelatedSearchLink=yes&doRelatedSearch=no&searchString=virtual%20managers.

(*) Based on direct experience in managing and participating in virtual teams, as well as developing solutions to help them be more effective, the authors provide unique insight that can be leveraged to help get the most of your virtual team. See Chapter 11, How Teams Work Virtually, for specific references to "collaborative work."

Kayworth, T. R., & Leidner, D. (1999). The global virtual manager: a prescription for success. Retrieved November 1, 2007, from http://ged.insead.edu/fichiersti/inseadwp1999/99-67.pdf.

Virtual teams promise to improve cycle time, reduce travel costs, and reduce redundancies across organizational units. Moreover, the use of global virtual teams provides an opportunity to coordinate complex business tasks across potentially far-flung confederation of organizations. However, virtual teams are beset with a range of challenges inherent to their dispersed and often impersonal nature. Drawing from the

members' assessments of their virtual team experiences, each area of challenge is discussed in detail. This is followed by a set of managerial prescriptions that outline specific critical success factors useful for the implementation of virtual teams.

Kerber, K., W., & Buono, A., F. (2004). Leading a team of change agents in a global corporation: leadership challenges in a virtual world. Retrieved November 8, 2007, from http://www.chartresource.com/feature2004.htm.

Like any team, a virtual team is a group of people who work on interdependent tasks guided by a common purpose. But unlike traditional, co-located teams, a virtual team works across space, time, and organizational boundaries that often extend across nations on a global basis (Lipnack & Stamps, 1997). Through advanced communication technologies, global teams are developing the ability to "work together apart" (Grenier & Meters, 1992), completing assigned projects while rarely, if ever, meeting face-to-face. This paper examines global virtual teams and concludes with recommendations for effectively leading teams in a virtual world.

Kimball, L. (1997). Managing virtual teams: the nature of virtual teams. Retrieved October 31, 2007, from http://www.groupjazz.com/pdf/vteams-toronto.pdf.

The nature of teams has changed significantly because of changes in organizations and the nature of the work they do. Organizations have become more distributed across geography and across industries. Although the technology that supports these new teams gets most of the attention when we talk about virtual teams, it's really the changes in the nature of teams – not their use of technology – that creates new challenges for team managers and members.

Ramesh, V., & Dennis, A. R. (2003). Coordination and communication in global virtual teams: The integrated team and the object-oriented team. Retrieved November 25, 2007, from http://www.indiana.edu/~isdept/research/papers/tr127-2.doc.

We investigated coordination and communication processes in global virtual software development teams for whom virtual work was routine. As in prior virtual team research, some of the teams in our study relied primarily on non-programmed coordination via information rich face-to-face and telephone communication. Other teams, however, relied primarily on programmed coordination via semantically rich digital media. We believe the set of principles embodied in the object-oriented team model may be applicable to many other types of virtual teams performing routine work, especially larger teams facing complex problems.

Steinfield, C., Jang, C., Huysman, M., & David, K. (2002). Communication and collaboration processes in global virtual teams. Retrieved November 19, 2007, from http://cscw.msu.edu/papers/INTEnD_Summary.pdf.

Virtual teams are increasingly global, creating challenges for communication and coordination due to greater distances, multiple time zones, and cultural differences. A

longitudinal research program investigating communication and collaboration in globally distributed engineering design teams is described. A mix of quantitative and qualitative methods reveals a number of insights into the inner workings of a series of global virtual teams. We focus on teams' media and collaborative tool usage patterns, and the effect of media use on such group processes as their awareness of remote teammates' activities, the quality of teams' social interactions, teams' abilities to develop trust, and the extent to which teams developed solutions that they found to be satisfactory.

Review of the Literature

This inquiry is designed to examine how concepts of collaborative work can provide a basis for understanding unique characteristics of global virtual teams. The Review of the Literature is framed around three themes that examine:

1. *unique characteristics* of virtual teams in contemporary organizations

2. *collaborative work as key* to addressing unique characteristics of virtual teams

3. *recommended strategies,* based on collaborative work concepts, for IT managers of virtual teams

The goal is to assist IT managers who have entered the world of virtual management by focusing their attention on unique characteristics global virtual teams as a way to improve virtual team management.

Theme 1: Unique Characteristics of Virtual Teams in Contemporary Organizations

As organizations have become more complex, there has been an increased emphasis on the development of global virtual teams as organized units of work (Bell and Kozlowski, 2002). A virtual team is a group of people who work closely together even though they are geographically separated and may reside in different time zones in various parts of the world (Bal & Foster, 2000). A virtual team is a different type of entity than a co-located team, which refers to traditional teams where the team members are physically in one specific site, usually belong to the same organization, most often possess diverse skills and resources, and collaborate to produce a final product (Bidgoli, 2004).

Defining unique characteristics of virtual teams.

Bell and Kozlowski (2002) identify two characteristics that are present in all virtual teams, which make these teams unique:

1. *Spatial distance among team members restricts face-to-face communication.* This is a critical characteristic because virtual team members rarely interact in traditional face-to-face fashion and instead use a number of mediating technologies, such as videoconferencing and e-mail, to maintain internal links and complete their work. The benefit of this characteristic is that virtual teams provide organizations with the means of accessing unique, highly specialized expertise that is distributed in space.

2. *Use of technological communications to connect team members.* Information and personal communication technologies allow individuals to communicate and share information and data regardless of their location in time and space, and are the primary means by which the members of virtual teams interact. Bell and Kozlowski (2002) stress that these technologies maintain information richness and facilitate decision-making by allowing team members to communicate in a more interactive fashion. Thus, it is necessary for virtual team members to adopt synchronous communication media, such as videoconferencing or groupware, when dealing with complex tasks.

In addition to the characteristics identified by Bell and Kozlowski (2002), Wong and Burton (2000) mention that virtual teams can be defined by three more characteristics:

1. *Virtual team context.* Although a continuous configuring and reconfiguring of ad-hoc teams implies that the team members have not previously had a history of collaboration, leveraging the diverse knowledge and capabilities of people both

within and outside the organization results in the development of virtual teams that

are formed in order to support members engaged in collaboration, while they are

simultaneously distributed throughout the world.

2. *Virtual team composition.* Based on the existing conceptualization of the virtual team,

    teams are often comprised of culturally and organizationally diverse members. With

    advancements in information technology such broadband communication networks,

    intranets, Internet, teleconferencing and videoconferencing capabilities (Fisher &

    Fisher, 2001), more organizations are forming teams that connect participants from

    different countries and organizations. The knowledge and talents of these members,

    rich in their unique cultural and organizational perspectives, are gathered together

    with the intent to maximize the potential of the team.

3. *Virtual team structure.* Due to physical dispersion and the nature of work in which

    virtual team members are typically engaged, they are by necessity connected via

    communication technologies such e-mail, voice mail, and shared files (Fisher &

    Fisher, 2001). These technologies allow members to coordinate their task activities,

    despite the physical distance between them.

Wong and Burton (2000) affirm that virtual teams may be more likely to take more time

coordinating with one another than a team composed of co-located members. Therefore, in order

to address this performance issue, a virtual team may improve its performance by increasing its

understanding of the virtual communication process. Ease of communication will be enhanced

through detailed familiarity with the use of rich and collaborative electronic communication tools.

They are designed to expand upon the concept of technological and social factors as critical to

determining successful performance in virtual teams. Collaboration, a critical determinant of

virtual team performance, is enhanced by increased communication and by facilitating rapid information sharing and interactions. Communication technologies should improve virtual team performance by providing structure so members can operate and collaborate efficiently and effectively.

Distinguishing between virtual and co-located teams.

Pauleen (2003) observes that all teams must communicate, coordinate, and collaborate to get the project or task done. While co-located teams accomplish these tasks mainly through face-to-face meetings, virtual teams predominantly use information and communication technology to communicate, collaborate, share information, and coordinate efforts. He makes an important observation that co-located teams use information and communication technology as well, e.g., to exchange electronic documents or schedule meetings. The difference is one of magnitude. Virtual teams perform *most* of their work through the use of information and communication technology. Pauleen (2003) emphasizes the fact that working predominantly through information and communication technology represents the key factor that distinguishes virtual teams from co-located teams.

Theme 2: Collaborative Tools As Key to Virtual Teams Effectiveness

Bal and Foster (2000) confirm that the utilization of technology, tools, and methods of communication in the work environment, allow virtual teams to keep in touch, collaborate, and be more effective as a team. These tools include face-to-face meetings, phone, fax, e-mail, file sharing, and video conferencing. Bal and Foster (2000) add that other technologies are also utilized to share information and aid the process of working virtually. However, they argue that organizations are not required to have all the best technology available to implement and work

with virtual teams, and attention should be paid to cross-cultural differences in order to help communicate more effectively.

In addition, Pauleen (2003) argues that virtual team effectiveness can vary greatly from team to team. He adds that being equipped with the most advanced collaboration technologies is not enough to make a virtual team effective. He goes on to say that IT should not focus on designing or deploying collaborative technologies without understanding the various needs of the virtual teams and how they work.

Trust and communication as key elements of collaborative virtual team effectiveness.

Henttonen and Blomqvist (2005) consider the role of trust in virtual teams as the most important component of team development and effectiveness. They describe trust as a mechanism for increasing the potential benefits of collaboration, and for decreasing the costs of coordination in collaborative relationships. They go on to say that a trusting climate within a virtual team enables the building of commitment and cohesion, as well as the development of new ideas and new creative ways of thinking. Trusting relationships among team members help the team to concentrate on the given tasks, and the overall contribution of the team to the organization is maximized. In other words, they think that team members are less willing to contribute and cooperate if there is a lack of trust.

Pauleen (2003) states that in order to be effective, a virtual team requires not only technologies and collaborative capabilities but also the development of new skills, processes, behaviors, and the establishment of new norms and the communication of expectations. Pauleen (2003) believes that there are many organizational variables that affect virtual team effectiveness, but collaborative behaviors such as group dynamics, leadership styles, trust, and communication patterns can build the foundation for effectiveness. Gibson and Cohen (2003) note that in virtual

collaborations, trust is harder to identify and develop, but the trust may be a more critical and crucial element of virtual team functioning.

Pauleen (2003) explains that virtual teams need trust in order to function. Trust is an efficient way of gaining group cooperation. He expands on the notion that online, trust is more effective than instructions, authority, or status in getting people who might be strangers to one another to work together. He affirms that trust is not a simple quality and the kind of trust that is the cornerstone of distance relations of virtual teams is different from the type of trust that binds face-to-face interactions in co-located teams. Pauleen (2003) expands on how virtual collaborators, acting at a distance, respond to pattern-based self-organizing collaboration. Pauleen (2003) explains that a pattern-based self-organizing collaboration is a model that can be followed when people working together create objects and processes relying on a minimum of rules and social interaction. Pauleen (2003) adds that this type of collaboration will not suit all personalities in a working environment, and people who prefer strong social environments will be less effective in a virtual team environment.

In reference to communication, Gibson and Cohen (2003) explain that communication is particularly critical in virtual collaboration, enabling parties to link across distance, time, departments, and organizations. In particular, electronic communication loosens constraints of proximity and structure, making it possible for virtual team members to exchange messages with one another. Gibson and Cohen (2003) and other authors argue that the real power of virtual team collaboration is realized only when communication processes are effective. They expand on the inherent relationships between communication and trust, stating that communication processes in virtual teams are the underlying mechanisms for establishing trust.

Communicating across different time zones and different cultures.

Gibson and Cohen (2003) explain that research suggests that the greater the cultural differences among virtual team members, the greater is the expected difficulty in communicating. When these differences are prevalent, disruption in the work flow and work performance are to be expected. As Duarte and Snyder (2001) state, cultural differences can include national cultures, organizational cultures, functional cultures, and team cultures. They inform that these cultures can be sources of competitive advantage for virtual teams that know how to use cultural differences to create synergy within the team. However, Duarte and Snyder (2003) state that these differences can be detrimental to the teams if they are not understood and not used in a positive way.

Similarly to differences in culture, time zones can affect the performance of virtual teams. In order for virtual teams to function seamlessly around the clock, team members have to ensure that information from one location gets to another location in a timely manner. The issue arises when team members who span multiple time zones cannot communicate in real time, creating distance among members (Fisher & Fisher, 2001). Duarte and Snyder's (2001) advice to take into consideration the differences in time zones since these can derail the success of virtual teams. Duarte and Snyder (2001) emphasize the importance of communicating the differences in time zones among the team members so every member knows exactly each member's location and the time zone.

Effective communication is a key enabler of building cohesive teams.

Gibson and Cohen (2003) provide three explanations as to why effective communication is critical when building cohesive teams. First, they state that *open and prompt communication* is an indispensable characteristic of trusting relationships and without proper communication,

cooperative relationships tend to suffer. Therefore, communication helps in developing a satisfactory working relationship. Second, they note that virtual team members use *informed communication* to facilitate the processes of gathering information of other members' credibility and trustworthiness. This process is accomplished by collecting information using exchange of information as a way of showing goodwill. Third, they affirm that *sustained communication* helps build trust because it provides the basis for continued interaction, from which members develop common values within the virtual team. This sustained interaction is a crucial mechanism for holding the members together.

Synchronous and asynchronous communication is a viable collaboration mechanism.

Hoefling (2003) states that companies that outsource, telecommute, or are geographically dispersed are considered virtual organizations. In such companies, technology is the largest enabler for successful virtual work, which allows virtual teams to work across greater distances and multiple time zones. She comments that these virtual teams rely more on relationships and alliances forged by 'electronic handshakes', a phrase which is used to refer to both synchronous and asynchronous collaborative tools. She affirms that organizations have the opportunity to:

1. Become a cross-collaborative organization technologically connected by utilizing virtual teams that find meaning and satisfaction from the work of the team across time and distance.

2. Address issues and opportunities by collaboratively join together within and among asynchronous and geographically dispersed virtual teams.

Hoefling (2003) differentiates between synchronous and asynchronous collaborative tools. She determines that collaborative tools and work may be synchronous, including elements like live Internet using streaming video, electronic whiteboards, and interactive software. On the

other hand, she identifies e-mail and voicemail as asynchronous collaborative tools. Additionally, and as noted by Pauleen (2003), collaborative tools and technologies must begin to focus attention on asynchronous work and capabilities in order to keep team members easily apprised of any changes. In doing so, virtual teams could improve their effectiveness significantly. He observes that there is too much focus on synchronous collaborative capabilities and not enough on asynchronous capabilities. As corporations continue to become more global, there are limited hours in a day that virtual team members can meet synchronously.

The important role of social presence.

Duarte and Snyder (2001) explain that the role of technology in virtual teamwork has enabled virtual teams to overcome the complexities of communicating across time zones and distance. Duarte and Snyder (2001) emphasize that the successful use of technology includes understanding the technological needs of the team, matching the technology available, and facilitating the technology to maximize the team's performance. They expand on this concept by stating that selecting the technology that matches the requirements of the team's tasks is what enables effective communication and collaboration. In addition, they identify a major factor that can help virtual teams; social presence. The authors define social presence as the degree to which the technology facilitates a personal connection with others. For example, synchronous communication, such as face-to-face meetings, audio and video conferences, tend to have more social presence – large amount of information available, including spoken words, facial expressions, body language, and environment surroundings – than asynchronous communications such as e-mail and voice mail. Although the use of technologies that enable communication with more social presence may be perceived as better, the authors state that less social presence sometimes can be better for virtual teams because it reduces interpersonal

distractions, such as appearance, mannerisms, seeing team members coming in and out of the room, and team members eating or drinking.

Kostner (2001) highlights that in order to build relationships, people used to need to travel to be in one location, but this does not hold true anymore, especially with the use of collaborative technology, which allows virtual team members to be in touch and build relationships. She also adds that collaborative technology enables everyone on the team to collaborate faster and keep tasks on track, resulting in better communication and more efficiency. In 2001 she noted that organizations still felt very strongly about having an initial face-to-face meeting, but that collaborative technology could change this perspective. In fact, Kostner believes that virtual team work can be dramatically enhanced by the way a team uses technology to collaborate, and when the collaboration is done correctly, the payoffs are immense.

Conflict in a virtual team.

Conflict can be expected in any collaborative team environment. However, Rad and Levin (2003) remark that in a virtual team interaction, mood and morale are less apparent than in a co-located team and it is more difficult to express frustration in the virtual environment. They highlight that if virtual team conflicts are not resolved in a timely manner and in the appropriate way, they might be far more difficult to resolve than in co-located teams where synchronous communication – in the form of face-to-face meetings – occur more often. Therefore, Rad and Levin (2003) clarify that conflicts in virtual team should be addressed in a proactive fashion with the appropriate amount of thought, commitment, and monitoring. They also present actions that are needed in order to formalize the identification and resolution of the issue. The resolution of the conflict is accomplished by a collaborative effort of the virtual team by addressing:

1. Team members should raise an issue in writing, through meetings with other team members, or through meetings with a facilitator.

2. Team members should conduct meetings to discuss possible resolutions.

3. Team members should agree to resolve the conflict or identify a member to facilitate the resolution.

In addition, Rad and Levin (2003) stress the importance of utilizing the collaborative environment as a structure in which to ameliorate conflict. If team members are prepared to interact in a professional and cooperative manner with each other, they will be more likely to demonstrate a healthy respect for personal, ethnic, and cultural differences and thus avoid conflict.

Theme 3: Recommended Strategies, Based on Collaborative Work Concepts, for IT Managers of Virtual Teams

Developing virtual teams.

Furst et al., (2004) note that understanding how virtual teams develop and mature provides managers with important insights that might increase a team's contributions to firm performance. In addition, they provide specific examples of what managers can do to increase the virtual team's performance. Furst et al., (2004) mention Tuckman's stage model of development, which includes the following stages: forming, storming, norming, and performing. Furst et al., (2004) state that evidence shows that virtual teams evolve through these stages of development but there are differences in the speed and pattern of development. Their findings underscore the critical role that management can play in assisting virtual teams through the early stages of development. The findings describe the steps for the four development phases as

follows. In forming, managers' steps include: (1) provide coaching from experienced team members, (2) develop a shared understanding and sense of team identity, (3) develop a clear mission, and (4) acquire senior management support. In storming, the steps include: (1) face-to-face team building sessions, (2) training, and (3) use diplomacy and mediation to find solutions to existing problems. In norming, steps include: (1) create team charters, (2) set individual accountability, (3) establish procedures for information sharing, and (4) design procedures appropriate for task, and social information. Finally, in performing, steps include: (1) ensure departmental and company culture supports virtual team work, and (2) provide support and resources for team to perform successfully.

Gluesing et al., (2002) identify several actions steps that can be defined to help both managers and team members to create virtual teams, revitalize stalled ones, or create conditions for effective team dynamics in new and exiting virtual teams. Gluesing et al, (2002) affirm that if managers and team members pay close attention to the processes of virtual teaming, particularly those that help team members keep abreast of changes and integrate their work across multiple contexts, they can foster development and increase their level of performance. As stated by Gluesing et al., (2002), virtual teaming is all about integration and teams that engage in integrative processes consistently throughout the formation and ongoing development of the team will be more likely to reach maturation and perform more efficiently and effectively. In addition, Gluesing et al., (2007) state that to sustain development in virtual teams, or even accelerate it, teams need to engage consistently and frequently in integration processes and avoid process that can lead to disintegration. They provide actions steps for managers including:

1. Create opportunities for social interaction.
2. Check for understanding.

3. Redefine the team tasks when conditions change.

4. Initiate travel by a team member to another location.

5. Hold regularly scheduled face-to-face meetings in different locations.

6. Engage in frequent communication.

7. Pair team members.

8. Utilize a team website or collaborative virtual space.

9. Encourage company networking.

Enabling collaborative work – leadership.

Kimball (1996) observes that in order to manage effectively, the virtual team manager must focus on specific kinds of activities. She states that managing virtual teams is not about using old management techniques but rather thinking about new ways of supporting collaborative work and she identifies several actions that managers can take in order to support virtual teams. These actions relate to the theme of collaboration and collaborative work of virtual teams. In addition,

Kayworth and Leidner (1999) note that given the complex nature of virtual team environments, the quality of team leadership becomes a vital issue and the ability to manage these virtual teams has a significant impact on the success of virtual team performance. Similarly, Jones et al., (2005) discuss the essential competencies for virtual teams and they explain that these skills are enablers for collaborative work and can help effectiveness of virtual teams. The skills and qualities these authors enumerate include:

1. Organizational skills like multi-tasking are essential when working in a virtual team in order to keep track of people separated by times zones and distance.

2. Time management is especially critical during meetings in virtual teams as it is not obvious when members start to disengage.

3. Attention to detail is important because it ensures that information and answers are gathered during the virtual interaction.

4. Listening and testing for understanding is a critical skill since most of the interactions will be on the phone and listening to the tone of voice is the only cue.

5. Summarizing and communicating clearly and succinctly becomes extremely important in a virtual environment since people tend to ignore verbose and unclear messages.

6. Ability to work in an ambiguous environment is important and will help virtual team members to accomplish goals and become more effective.

7. Encourage members to explore questions about how the team members work together.

8. Support the creation of shared spaces as infrastructures where people work together.

9. Facilitate the coordination of the technology, work processes, and the formal organization.

10. Support activities that make the informal communication network visible.

11. Set clear team goals and provide continuous performance feedback relative to these goals.

12. Engage in activities to build team cohesiveness among team members.

13. Express flexibility and empathy towards virtual team members.

14. Virtual team leaders should exhibit cultural awareness.

Kerber and Buono (2004) affirm that the challenge for leaders of virtual teams is to create a level of collaboration and productivity without travel and face-to-face meetings and these

leaders must be able to facilitate team cohesiveness across distance and time by taking full advantage of existing and emerging collaborative technologies. Moreover, Kerber and Buono (2004) state that it appears that virtual collaboration is encouraged and emerges when a team and its leader follow recommendations that include:

1. Work together on an important business challenge that team members find personally compelling.

2. Jointly define and commit to the team's identity, goals, and processes.

3. Implement a focused performance management process that is embedded in team routines.

4. Create lavish information flow by using familiar as well as new communication technologies to overcome distance and time.

5. Tie these efforts together through the personal commitment and dedication of the team leader.

Coordinating collaborative work.

Ramesh and Dennis (2003) assert that managing team processes and performing work in global virtual teams can be challenging, even with the use of a myriad of collaboration technologies. In addition, they suggest that there are significant differences between a team's initial use of collaboration technology and how that use evolves into routine. Moreover, they argue that coordination is likely to be strikingly different between virtual and co-located teams, because most of the coordination in co-located teams is done in face-to-face meetings. In contrast, virtual teams do not have the luxury of using frequent face-to-face meetings to coordinate activities, although research suggests that periodic face-to-face meetings can be critical for virtual teams. Ramesh and Dennis (2003) conclude there are two fundamentally

different models by which virtual teams can perform coordination. These are first, the relatively ad hoc and non-programmed approach to coordination in which the use of face-to-face or telephone communication is the norm; and second, the more structured and programmed approach to coordination in which e-mail, groupware, repository tools, and templates are used.

Improving collaboration.

As stated by Steinfield et al., (2002), virtual teams are becoming the norm and interest in how to improve collaboration in virtual teams is growing. More and more research is being done around dynamics of virtual teams, particularly within the context of computer-based communication and collaborative systems. The payoffs to organizations from efficient virtual teams are considerable according to Steinfield et al., (2002), since these organizations can gain increased flexibility as teams with the proper expertise can be performed much quicker. The authors note that a range of less costly tools for richer group interaction and collaboration are available today, including PC-based video conferencing and Web-based collaborative systems. In addition, these tools can be used to create a common team workspace and a place for team members to achieve their tasks, which in return improve the overall team's performance. Steinfield et al., (2002) suggest that the more team members are able to achieve awareness about other distant members' activities and improve social relationships and trust, the more a virtual team's performance can be improved.

Effective practices.

Adams (2001) identifies the most important practices, in five areas, for successful managers of dispersed teams. The five areas and practices that need to be followed by dispersed teams are:

1. *Management style* – In management style, she identifies the following practices: coaching and flexibility, results focus, issues and performance problems, and technology tools.

2. *The remote employee* – In this area, she identifies the following practices, or success factors, to develop an effective team: good communication, commitment to be a team player, trustworthy, discipline, work independently, and management skills.

3. *New employee orientation* – In this area, she highlights the importance for a manager to provide: orientation and mentoring.

4. *Meetings* – In this area, she suggests that successful managers should aim for: quarterly face-to-face meetings, have some informal time, video conferencing, and good communication.

5. *Teamwork* – In this area, she proposes managers to: have a clear charter for the team, agree on rules and procedures, define clear roles and responsibilities, and understand specific goals for the team.

Adams (2001) emphasizes the fact that it is important to observe that dispersed teams benefit extremely if these practices are followed, and also magnifies the difficulties caused when these practices are not followed by these teams.

Duarte and Snyder (2000) explain that despite the potential benefits of virtual teams, there are many obstacles that managers have to address, and since virtual teams spend more time with the computer than in face-to-face time with colleagues, effective practice is more important than ever. They affirm that in virtual teams, it is the job of leaders to foster communication and collaboration across distance, time, cultures, and organizational boundaries. Duarte and Snyder

(2000) identify steps or strategies that managers can take to increase the flow of information, shared responsibility, and cross-boundary collaboration. The strategies include:

1. Managers have to focus on showing that they trust others to work in the best interests of the enterprise. Managers can accomplish it by sharing information with the team members as fully and quickly as possible, including the members in the decision making and acknowledging their contributions.

2. Managers have to let the virtual team members see them act virtually by modeling the behaviors they expect.

3. Managers should be certain that members have access to compatible technologies when developing a communication and collaboration strategy.

Creating collaborative software suites.

 Brown et al., (2007) state that collaborative software suites, knows as groupware or computer supported cooperative work, can save time and effort when managing teams. When virtual teams chose a collaborative suite, the first task is to find out the primary purpose. For instance, communication applications, broadcast applications, sharing applications, or gathering applications. Brown et al., (2007) remark that managers, and also team members, can benefit from software like instant messaging, as these windows act as a virtual office. Managers can see who is in and who is unavailable. In addition, they note that managers use other Web-based tools, which help managers to maintain visibility on what needs to be done and allow them to track the overall progress of the team.

Conclusions

This purpose of this inquiry is to examine how concepts of collaborative work form the basis for understanding unique characteristics of global virtual teams and for recommendation of strategies for successful global virtual team management. The goal is to present IT managers who have entered the world of virtual management with a set of unique characteristics of global virtual teams, aligned with a parallel set of collaborative work concepts designed to help these managers perform as effective virtual team leaders.

Khosrowpour (2001) explains that by adopting technology designed to support collaborative work, such as Internet, e-mail, net-and-video conference system, video-phone, information system, etc., individuals in virtual teams are able to communicate with others to accomplish specific objectives within specified timeframes and without being present physically. When talking about how to manage these virtual teams more successfully, Kimball (1999) states that managing virtual teams is not about taking old management techniques and transposing them for delivery using new media. Rather, it is about expanding available tools to create new dynamics aligned with the best thinking about supporting collaborative work. This inquiry has presented detailed information aimed towards IT managers who have to manage virtual teams on a regular basis.

Figure 1: A Summary of the Nature and Support of Virtual Teams, is provided as a quick overview of the three main components of this inquiry. First, the five most frequently cited *unique characteristics* of virtual teams in contemporary organizations are listed. As described by Bell and Kozlowski (2002) and Wong and Burton (2000), virtual teams are characterized by:

1. Spatial distance among team members restricts face-to-face communication – Teams use a number of mediating technologies, such as videoconferencing and e-mail, to maintain internal links and complete their work.

2. Use of technological communications to connect team members – As stated by Bell and Kozlowski (2002), it might be necessary for virtual team members to adopt synchronous communication media, such as videoconferencing or groupware, when dealing with complex tasks.

3. Virtual team context – Leveraging the diverse knowledge and capabilities of people both within and outside the organization results in the development of virtual teams that are formed in order to support members engaged in collaboration.

4. Virtual team composition – With advancements in information technology such broadband communication networks, intranets, Internet, teleconferencing and videoconferencing capabilities, more organizations are forming teams that connect participants from different countries and organizations.

5. Virtual team structure – Due to physical dispersion and the nature of work in which virtual team members are typically engaged, they are by necessity connected via communication technologies such e-mail, voice mail, and shared files (Fisher & Fisher, 2001).

Second, the nature of collaborative work has been detailed in order to addressing these unique characteristics. Furst et al., (2004) note that an understanding of how virtual teams develop and mature can provide managers with the important insights that might increase a team's contributions to firm performance. The use of tools, technologies, behaviors, and processes aid the creation and management of virtual teams, but Gibson and Cohen (2003)

indicate that in virtual collaborations, trust is harder to identify and develop, yet trust may be a more critical and crucial element of virtual team functioning. In addition, Kostner (2001) comments that virtual team work can be dramatically enhanced by the way a team uses technology to collaborate, and when the collaboration is done correctly, the payoffs are immense.

Finally, and based on collaborative work, the inquiry has shown that beyond understanding how virtual teams develop and mature, managers must also become aware of the best strategies to take to enable collaborative work. Strategies include important practices in different areas to manage virtual teams effectively, the use of collaborative software suites to save time and effort while managing virtual teams, and actions that support and enable sharing information as a way to collaborate in virtual teams and enhance team performance.

Unique Characteristics of Virtual Teams in Contemporary Organizations

• Defining unique characteristics of virtual teams:
    • Spatial distance among team members restricts face-to-face communication
    • Use of technological communications to connect team members
    • Virtual team context
    • Virtual team composition
    • Virtual team structure
 	
 • Distinguishing between virtual and co-located teams

Collaborative Tools As Key to Virtual Teams Effectiveness

• Trust and communication as key elements of collaborative virtual team effectiveness
 • Communicating across different time zones and different cultures
 • Effective communication is a key enabler of building cohesive teams
 • Synchronous and asynchronous communication is a viable collaboration mechanism
 • The important role of social presence
 • Conflict in a virtual team (addressing it):
    • Team members should raise an issue in writing, through meetings with other team members, or through meetings with a facilitator
    • Team members should conduct meetings to discuss possible resolutions
    • Team members should agree to resolve the conflict or identify a member to facilitate the resolution

Recommended Strategies, Based on Collaborative Work Concepts, for IT Managers of Virtual Teams
- Developing virtual teams: - Forming, storming, norming, performing   - Opportunities for social interaction   - Check for understanding   - Redefine the team tasks when conditions change   - Initiate travel by a team member to another location   - Hold regularly scheduled face-to-face meetings in different locations   - Engage in frequent communication   - Pair team members   - Utilize a team website or collaborative virtual space   - Encourage company networking   - Enabling collaborative work – leadership: - Organizational skills   - Time management   - Attention to detail   - Listening   - Communicating   - Work in ambiguous environments   - Understand team dynamics   - Create shared spaces   - Coordinate technology   - Informal communication   - Set clear goals   - Build cohesiveness   - Express flexibility and empathy   - Cultural awareness   - Work together   - Define and commit to team's goals   - Implement a focused performance management process   - Create lavish information flow to overcome distance and time   - Tie efforts together   - Coordinating collaborative work   - Improving collaboration   - Effective practices: - Management style   - Remote employee   - New employee orientation   - Meetings   - Teamwork   - Focus on trust   - Role modeling   - Access to compatible technologies   - Creating collaborative software suites

Figure 1: Summary of the Nature and Support of Virtual Teams

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References

Ackerman, F. (1998). The changing nature of work. Retrieved November 28, 2007, from

> http://books.google.com/books?id=4sUBjCXP37QC&dq=defining+soft+skills

Adams, J. D. (2001). Managing dispersed work effectively. Retrieved October 25, 2007, from

> http://www.eartheart-ent.com/docs/Dispersed_Work.pdf

AIM (2007). Writing guides. Retrieved December 1, 2007, from

> https://blackboard.uoregon.edu/webapps/portal/frameset.jsp?tab_id=_2_1&url=%2Fweba
>
> pps%2Fblackboard%2Fexecute%2Flauncher%3Ftype%3DCourse%26id%3D_237667_1
>
> %26url%3D

Bal, J., & Foster, P. (2000). Managing the virtual team and controlling effectiveness. Retrieved

> November 21, 2007, from
>
> http://web.ebscohost.com/ehost/pdf?vid=33&hid=117&sid=f2240dbe-7258-455c-98cb-
>
> 79e3cdd37e9f%40sessionmgr107

Bell, B. S., & Kozlowski, S. W. (2002). A typology of virtual teams: implications for effective

> leadership. Retrieved October 31, 2007, from
>
> http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1007&context=hrpubs

Bidgoli, H. (2004). The Internet encyclopedia. Retrieved November 19, 2007 from

> http://books.google.com/books?id=wshm3f0hyI8C&dq=virtual+team+definition

Brown, M. K., Huettner, B., & James-Tanny, C. (2007). Managing virtual teams: getting the

> most from wikis, blogs, and other collaborative tools. Retrieved November 19, 2007,
>
> from
>
> https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:1

8222&searchLanguage=en&searchType=&searchId=323077&showRelatedSearchLink=
yes&doRelatedSearch=no&searchString=managing%20virtual%20teams.

CSU (2007). Colorado State University: What is a review paper? Retrieved November 14, 2007,
from http://writing.colostate.edu/guides/documents/review_essay/pop2a.cfm

Dasgupta, S. (2006). Encyclopedia of virtual communities and technologies. Retrieved
December 1, 2007, from
http://mmlviewer.books24x7.com/book/id_14702/viewer.asp?bookid=14702&chunkid=7
61701201&keywords=synchronous,communication

Duarte, D. L., & Snyder, N. T. (2000). Leadership in a virtual world. Retrieved November 19,
2007, from http://web.ebscohost.com/ehost/detail?vid=4&hid=15&sid=23007b73-c0ba-48db-
b752-ba94d08d54f5%40sessionmgr104

Duarte, D. L., & Snyder, N. T. (2001). Mastering virtual teams: strategies, tools, and techniques
that succeed. Retrieved November 14, 2007, from
https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:8
104&selectedBinName=""&searchLanguage=en&searchId=317095&showRelatedSearch
Link=yes&doRelatedSearch=no&searchString=Virtual%20team%20management

Dwyer, K. P., (2007). How to manage employees in remote locations. Retrieved October 25,
2007, from http://www.bnet.com/2403-13059_23-165147.html

Edwards, A., & Wilson, J. R. (2004). Implementing virtual teams: A guide to organizational and
human factors. Retrieved November 6, 2007, from
http://books.google.com/books?id=oRPmZQTdIkQC&dq=management+of+virtual+team
+challenges

Fisher, K., & Fisher, M. D. (2001). *The distance manager: a hands-on guide to managing off-site employees and virtual teams*. New York: McGraw-Hill.

Furst, S.A., Reeves, M., Rosen, B., & Blackburn, R.S. (2004). Managing the life cycle of virtual teams. Retrieved October 29, 2007, from

http://pages.stern.nyu.edu/~wstarbuc/mob/VirtualTeams.pdf

Gibson, C., B., & Cohen, S., G. (2003). Virtual teams that work: creating conditions for virtual team effectiveness. Retrieved November 12, 2007, from

http://mmlviewer.books24x7.com/toc.asp?bookid=9529&keywords=collaborative,work,virtual,teams

Gluesing, J., Alcordo, T., Baba, M., Britt, D., McKether, W., Monplaisir, L., Ratner, H., Riopelle, K., & Wagner, K., H. (2002). The development of global virtual teams. Retrieved October 25, 2007, from

http://www.anthro.wayne.edu/iitc_site/2003%20Development%20of%20Global%20Virtual%20Teams.pdf

Godar, S., H., & Ferris, S., P. (2003). Virtual and collaborative teams: Process, technologies and practice. Retrieved November 6, 2007, from

http://mmlviewer.books24x7.com/book/id_7088/viewer.asp?bookid=7088&chunkid=1&keywords="Virtual%20and%20Collaborative%20Teams"

Heneman, R., L., & Greenberger, D., B. (2002). Human resource management in virtual organizations. Retrieved November 6, 2007, from

http://books.google.com/books?id=PqCSdZSGXrwC&dq=dispersed+teams+definition

Henttonen, K., & Blomqvist, K. (2005). Managing distance in a global virtual team: the evolution of trust through technology-mediated relational communication. Retrieved

November 26, 2007, from

http://web.ebscohost.com/bsi/detail?vid=3&hid=2&sid=89437493-de2c-4640-8c23-
b2f0554ed5c2%40sessionmgr7

Hoefling, T (2003). Working virtually: Managing people for successful virtual teams and

organizations. Retrieved November 1, 2007, from

http://books.google.com/books?id=IzIi--
nssmQC&dq=Managing+Groups+and+Teams/How+Do+You+Manage+Global+Virtual+
Teams%3F

Hosni, Y., A., & Khalil, T., M. (2004). Management of technology: Internet economy:

Opportunities and challenges for developed and developing regions of the world.

Retrieved November 6, 2007, from

http://books.google.com/books?id=IcctCoj9ojwC&printsec=frontcover&dq=collaboratio
n+work+in+global+teams

InvestorWords (2007). Globalization. Retrieved October 29, 2007, from

http://www.investorwords.com/2182/globalization.html

Irwin, B. (2007). Virtual teaming soft skills relevant to all projects. Retrieved October 25, 2007,

from http://www.pmforum.org/library/tips/2007/PDFs/Irwin-8-07.pdf

Jarvenpaa, S., L., & Leidner, D. (1999). Communication and trust in global virtual teams.

Retrieved November 25, 2007, from

http://web.ebscohost.com/bsi/detail?vid=7&hid=9&sid=89437493-de2c-4640-8c23-
b2f0554ed5c2%40sessionmgr7

Jones, R. C., Oyung, R. L., & Shade, L. (2005). Working virtually: Challenges of virtual teams.

Retrieved November 19, 2007, from

https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:1 0840&searchLanguage=en&searchType=&searchId=323114&showRelatedSearchLink= yes&doRelatedSearch=no&searchString=virtual%20managers

Kayworth, T. R., & Leidner, D. E. (1999). The global virtual manager: a prescription for success. Retrieved November 1, 2007, from http://ged.insead.edu/fichiersti/inseadwp1999/99-67.pdf

Kerber, K., W., & Buono, A., F. (2004). Leading a team of change agents in a global corporation: leadership challenges in a virtual world. Retrieved November 8, 2007, from http://www.chartresource.com/feature2004.htm

Khosrowpour, M. (2001). Managing information technology in a global economy. Retrieved November 6, 2007, from http://books.google.com/books?id=7Cq7nDrm5cEC&printsec=frontcover&dq=virtual+team+definition

Khosrowpour, M. (1999). Managing information technology resources in organizations in the next millennium. Retrieved November 25, 2007, from http://books.google.com/books?id=pLIXL0fA_j8C&pg=PA905&dq=information+technology+definition&ei=M1BMR8OzD4HKtAPGqaniBg&sig=Y7STrt3HR90OX7aWTsEqLBBavd4#PPP1,M1

Kimball, L. (1997). Managing virtual teams: the nature of virtual teams. Retrieved October 31, 2007, from http://www.groupjazz.com/pdf/vteams-toronto.pdf

Kostner, J. (2001). Bionic eteamwork: How to build collaborative virtual teams at hyperspeed. Retrieved November 7, 2007, from

http://books.google.com/books?id=eNZ4bt3glZAC&dq=global+team+Collaborative+wor
k

Lane, H. W. (2004). The Blackwell handbook of global management: A guide to managing

complexity. Retrieved December 1, 2007, from

http://books.google.com/books?id=vyJNu1cfxFkC&pg=PA240&dq=synchronous+comm

unication+in+global+virtual+teams&ei=8-FYR4nzKYKwsgOSk9jACg&sig=9dcDZhJK-

u4WGgAY-DSxMYegQNQ#PPP1,M1

Lester, J. D., & Lester, Jr., J. D. (2005). Writing research papers: A complete guide. New York:

Pearson Education, Inc.

Lipnack, J., & Stamps, J. (2000). *Virtual teams: People working across boundaries with*

technology. New York: John Wiley & Sons.

Malone, O. (2004). 101 Leadership actions for creating and managing virtual teams. Retrieved

November 1, 2007, from

https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:1

0353&selectedBinName=""&searchLanguage=en&searchId=323077&showRelatedSearc

hLink=yes&doRelatedSearch=no&searchString=managing%20virtual%20teams

Mayer, M. (1998). The virtual edge: Embracing technology for distributed project team success.

Retrieved, November 19, 2007, from

https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:3

047&selectedBinName=""&searchLanguage=en&searchId=323233&showRelatedSearch

Link=yes&doRelatedSearch=no&searchString=distributed%20team

Misiolek, N. (2005). Dissertation proposal: patterns of emergent leadership in ad hoc virtual

teams. Retrieved December 1, 2007, from http://web.syr.edu/~eimisiol/PROPOSAL.pdf

Pauleen, D. (2003). Virtual teams: projects, protocols and processes. Retrieved November 14, 2007, from http://site.ebrary.com/lib/intel/Doc?id=10044332

Rad, P., F., & Levin, G. (2003). Achieving project management success using virtual teams. Retrieved November 6, 2007, from

https://intel.skillport.com/skillportfe/mml/search_booksummary.cfm?assetId=_ss_book:8 434&selectedBinName=""&searchLanguage=en&searchId=323822&showRelatedSearch Link=yes&doRelatedSearch=no&searchString=Achieving%20project%20management% 20success%20using%20virtual%20teams

Ramesh, V., & Dennis, A. R. (2003). Coordination and communication in global virtual teams: The integrated team and the object-oriented team. Retrieved November 25, 2007, from http://www.indiana.edu/~isdept/research/papers/tr127-2.doc

Rifkin, G. (2006). The soft skills of global managers. Retrieved October 25, 2007, from http://hbswk.hbs.edu/archive/5370.html

Solomon, C. M. (2001). Managing virtual teams. Retrieved November 21, 2007, from http://web.ebscohost.com/ehost/pdf?vid=33&hid=117&sid=f2240dbe-7258-455c-98cb-79e3cdd37e9f%40sessionmgr107

Steinfield, C., Jang, C., Huysman, M., & David, K. (2002). Communication and collaboration processes in global virtual teams. Retrieved November 19, 2007, from http://cscw.msu.edu/papers/INTEnD_Summary.pdf

Tillman, H. N. (2003). Evaluating quality on the Net. Retrieved November 20, 2007, from http://www.hopetillman.com/findqual.html

University of North Carolina (2007). University of North Carolina: Literature reviews. Retrieved

November 14, 2007, from

http://www.unc.edu/depts/wcweb/handouts/literature_review.html

Van der Aalst, W., Hofstede, A., T., & Weske, M. (2003). Business process management.

Retrieved November 12, 2007, from

http://books.google.com/books?id=oQDTIZofV68C&dq=collaborative+work+definition

Wong, S., & Burton, R. M. (2000). Virtual teams: what are their characteristics, and impact on

team performance? Retrieved December 1, 2007, from

http://www.springerlink.com/content/w05636ht765v0536/fulltext.pdf

Appendix A

Appendix A includes a list of tables (Tables 1 – 7) of search engines and databases sorted alphabetically. Each search engine has a list of 10 search terms, a number of results, dates, and comments in the form of quality and relevancy.

Search Engine / Database	Search Terms	Results: #	Dates	Comments: Quality / Relevancy
EBSCO Host / Business Source Corporate	Collaborative work	1,725	1997-2007	Poor: Too many results and seldom related to the topic
	Dispersed	2,586		Poor: Too many results and seldom related to the topic
	Virtual	29,483		Poor: Too many results and seldom related to the topic
	Global team management	1,864		Poor: Too many results and seldom related to the topic
	Managing virtual teams	80		Good: Several results related to the topic
	Global team AND collaborative work	17		Fair: some results related to the topic
	Virtual team management	479		Good: several results related to the topic
	Managing virtual AND dispersed teams	4		Fair: all results relevant to the topic but not many results retrieved
	Managing virtual AND dispersed teams AND collaborative work	1		Good: record relevant to the topic but not many results retrieved
	Managing global virtual teams AND collaborative work	1		Good: record relevant to the topic but not many results retrieved

Table 1: Search Terms and Results for EBSCO Host – Business Source Corporate

Search Engine / Database	Search Terms	Results: #	Dates	Comments: Quality / Relevancy
EBSCO Host / Science and Technology Collection	Collaborative work	386	1997-2007	Fair: some results relevant to the topic, but most of them outside the scope of this study
	Dispersed	9,511		Poor: many results and seldom related to the topic
	Virtual	38,111		Poor: many results and seldom related to the topic
	Global team management	2		Good: one article relevant to the topic
	Managing virtual teams	12		Excellent: eight results relevant to the topic
	Global team AND collaborative work	0		Poor: no records retrieved
	Virtual team management	2		Good: one article relevant to the topic
	Managing virtual AND dispersed teams	0		Poor: no records retrieved
	Managing virtual AND dispersed teams AND collaborative work	0		Poor: no records retrieved
	Managing global virtual teams AND collaborative work	0		Poor: no records retrieved

Table 2: Search Terms and Results for EBSCO Host – Science and Technology Collection

Search Engine / Database	Search Terms	Results: #	Dates	Comments: Quality / Relevancy
Google	Collaborative work	8,680,000	Past year	Poor: too many records retrieved
	Dispersed	747,000		Poor: too many records retrieved
	Virtual	27,300,000		Poor: too many records retrieved
	Global team management	4,870,000		Poor: too many records retrieved
	Managing virtual teams	151,000		Fair: too many records retrieved and some relevant to the topic but too many commercial sites
	Global team AND collaborative work	201,000		Fair: too many records retrieved and some relevant to the topic but too many commercial sites
	Virtual team management	507,000		Fair: too many records retrieved but some relevant to the topic but too many commercial sites
	Managing virtual AND dispersed teams	64,300		Fair: too many records retrieved and some relevant to the topic but too many commercial sites
	Managing virtual AND dispersed teams AND collaborative work	110,000		Fair: too many records retrieved and some relevant to the topic but too many commercial sites
	Managing global virtual teams AND collaborative work	494,000		Fair: many records retrieved, some relevant but too many commercial sites

Table 3: Search Terms and Results for Google

Search Engine / Database	Search Terms	Results: #	Dates	Comments: Quality / Relevancy
Google Book Search	Collaborative work	2,460	1997-2007	Fair: too many results and some relevant to the topic
	Dispersed	3,170		Fair: too many results and some relevant to the topic
	Virtual	6,330		Fair: too many results and some relevant to the topic
	Global team management	1,770		Good: several results relevant to the topic
	Managing virtual teams	702		Good: several results relevant to the topic
	Global team AND collaborative work	661		Good: several results relevant to the topic
	Virtual team management	1,027		Good: several results relevant to the topic
	Managing virtual AND dispersed teams	274		Good: several results relevant to the topic
	Managing virtual AND dispersed teams AND collaborative work	59		Excellent: good number of results and very relevant to the topic
	Managing global virtual teams AND collaborative work	108		Excellent: good number of results and very relevant to the topic

Table 4: Search Terms and Results for Google Book Search

Search Engine / Database	Search Terms	Results: #	Dates	Comments: Quality / Relevancy
Google Scholar	Collaborative work	257,000	1997-2007	Poor: too many records retrieved
	Dispersed	248,000		Poor: too many records retrieved
	Virtual	656,000		Poor: too many records retrieved
	Global team management	87,300		Fair: many results, some relevant to the topic
	Managing virtual teams	20,300		Fair: too many results and some relevant to the topic
	Global team AND collaborative work	34,000		Fair: too many results and some relevant to the topic
	Virtual team management	47,400		Fair: too many results and some relevant to the topic
	Managing virtual AND dispersed teams	6,210		Fair: too many results and some relevant to the topic
	Managing virtual AND dispersed teams AND collaborative work	3,690		Fair: too many results and some relevant to the topic
	Managing global virtual teams AND collaborative work	11,800		Fair: many results, some relevant to the topic

Table 5: Search Terms and Results for Google Scholar

Search Engine / Database	Search Terms	Results: #	Dates	Comments: Quality / Relevancy
HighWirePress – Stanford University	Collaborative work	44,265	1997-2007 `	Poor: too many results and some relevant to the topic. Few articles are free
	Dispersed	41,978		Poor: too many results and some relevant to the topic. Few articles are free
	Virtual	32,058		Poor: too many results and some relevant to the topic. Few articles are free
	Global team management	16,942		Poor: too many results and some relevant to the topic. Few articles are free
	Managing virtual teams	2,116		Poor: too many results and some relevant to the topic. Few articles are free
	Global team AND collaborative work	5,521		Poor: too many results and some relevant to the topic. Few articles are free
	Virtual team management	4,158		Poor: too many results and some relevant to the topic. Few articles are free
	Managing virtual AND dispersed teams	426		Good: many results are relevant to the topic. Few articles are free
	Managing virtual AND dispersed teams AND collaborative work	277		Good: many results are relevant to the topic. Few articles are free
	Managing global virtual teams AND collaborative work	563		Good: many results are relevant to the topic. Few articles are free

Table 6: Search Terms and Results for HighWirePress – Stanford University

Search Engine / Database	Search Terms	Results: #	Dates	Comments: Quality / Relevancy
Intel Library	Collaborative work	20	1997-2007	Good: few results and most of them relevant to the topic
	Dispersed	7		Excellent: three results relevant to the topic
	Virtual	226		Fair: some results relevant to the topic
	Global team management	0		Poor: no records retrieved
	Managing virtual teams	8		Excellent: all results relevant to the topic
	Global team AND collaborative work	0		Poor: no records retrieved
	Virtual team management	19		Excellent: 12 results relevant to the topic
	Managing virtual AND dispersed teams	0		Poor: no records retrieved
	Managing virtual AND dispersed teams AND collaborative work	0		Poor: no records retrieved
	Managing global virtual teams AND collaborative work	0		Poor: no records retrieved

Table 7: Search Terms and Results for Intel Library