

EMPIRICAL EVIDENCE ON FACTORS INFLUENCING VIRTUAL TEAMS - A MULTI LEVEL PRESPECTIVE

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Abstract : Virtual teams are an emerging corporate trend in international companies worldwide. Heightened expectations of revenue gain demanded quick reactions to market and geographically scattered clientele of companies have forced organizations to restructure their way of working and out of these needs virtual teams are born. Teams that interact by using technology—mediated communication devices and platforms are called Virtual teams. Employees operating in such a setting typically face geographical dispersion among team members various time zones different cultures and possibly a remote leader. Cost savings and enhances efficiency along with quick knowledge transfer and flexibility form the benefit base of virtual teams on the other hand issues are faced concerning communication trust, technology usage clarity of roles and processes motivation and team spirit. Leading virtual teams is demanding as these teams possess similar needs as conventional teams require additional efforts from the team head as face-to-face interaction with and among team members is rare. The paper helps to find the influencing factors for virtual team effectiveness. For the study four factors are been taken i.e., Leadership style, Trust, communication and culture. The study reveals that there is a significant and positive relationship between the variables of study and virtual team performance.

Key words: Virtual teams performance, leadership style, Communication, culture, trust

I. INTRODUCTION

In today's world of fast moving global markets and fierce competition organizations will need to have the ability to adapt quickly or cease to exist in this kind of business environment

(Quinn, 1991). In recent years, activities in all types of organizations have become increasingly more global, competition from both foreign and domestic sources has grown dramatically, and a continued shift from production to service/knowledge-based work environments (Townsend et al., 1998). Information and communication technology advancements have changed than in the past and have created jobs that are more complex and dynamic (Hunsaker & Hunsaker, 2008).

organizational structures, communications, strategies, processes, policies, and so on, must turn more flexible according to the changing world. A new concept called Virtual teaming has emerged as a new way of managing and organizing work that allows people to work together even though they are geographically separated. People working in virtual teams use technology to communicate with each other rather than working face-to-face or traveling to meetings. Here people work together apart and found to be very different to traditional teaming, where people work together (The Virtual Teaming Association, 2003).

According to Kayworth and Leidner (2002), many large organisations have been looking at a way to be more flexible and versatile, and more team oriented, in order to deal with the demands of this fast changing marketplace. Ongoing developments and improvements of information technologies have made these organizations able to be more flexible and responsive according to Fulk and DeSanctis (1995), by ways of utilizing virtual teams over more traditional team structures (Jarvenpaa & Ives, 1994).

According to Powell, Piccoli & Ives (2004) in their meta-analysis of current literature on the subject, came to the following: "Virtual teams are groups of geographically, organisationally and/or time dispersed workers brought together by information and communication technologies to accomplish one or more organisational tasks." They also add that while these virtual teams might be ongoing, in general they are assembled on an "as needed basis", and therefore are often short-lived (Powell et al., 2004).

A virtual team is a temporary geographically dispersed team enabled to function by modern information and communication technology and there is no longer any need for a company to be restricted in recruiting the best people for a specific task. They can now recruit the best talent without any geographic or cultural restrictions (Townsend, DeMarie & Hendrickson, 1998).

LITERATURE REVIEW

According to (Malhotra et al., 2007) Virtual teams are groups of geographically and/or organizationally dispersed co-workers that are assembled by telecommunications and information technologies to accomplish an organizational task. Virtual teams are used by organizations such as cross-functional project teams, task forces and line management (Brown et al., 2007).

Virtual teams help organizations to get qualified individuals for a particular job irrespective of their location, enable them to respond faster and provide greater flexibility to individuals working from any place (Hunsaker & Hunsaker, 2008).

Virtual teamwork is more complex than working face-to-face (Heimer and Vince, 1998) and site specific cultures and lack of familiarity are reported to be sources of conflict (Hinds and Bailey, 2003).

DIMENSIONS OF VIRTUAL TEAMS

Virtual teams are different from that of conventional teams and have many advantages and disadvantages (Bergiel et al., 2008) for organizations that deploy virtual teams to perform tasks. These dimensions of virtual teams help organizations to improve their processes. Trust, communication, leadership, goal setting and technology all emerge as factors vital to the formation of a successful virtual team (Barczak et al., 2006; Brennan and Braswell, 2005; Couzins and Beagrie, 2005).

COMMUNICATION

The most important characteristic of virtual teams is that they cross boundaries of space (Hunsaker & Hunsaker, 2008). Generally the members of traditional teams work in close proximity to one another, Unlike the members of traditional teams who work in close proximity virtual teams are separated, by many miles or continents (Pape, 1997; Townsend et al., 1996). Members

of virtual teams though have ability in speaking languages of other members of team, they don't tend to relate in face-to-face mode, rather they utilize technologies for example, email, videoconference, telephone, webcam, internet, and so on to liaise.

Snyder (2003) employees with good language skills, they interpret written and verbal communication with the help of their own culture but People who are distant from one another are less likely to share information freely and less likely to pay attention to information from the distant team members as such virtual teams have more difficulty developing a shared group identity and attending to the information that flows among team members hence lack of attention reduce shared understanding in virtual teams (**Gibson and Cohen, 2006**). Teams with more geographically separation have more diversity in perspectives and attitudes. **Karloe (1995)** investigated that Danish and American workers used different paradigms for understanding problems and potential solutions and attributed these differences to disparities in local routines and behavioral norms. Distant teams are likely to be demographically dissimilar than collocated teams (**Gibson and Cohen, 2006**).

CULTURE

Generally teams experience challenges in culture, logistics, communication, and so on, but with virtual teams, those challenges are aggravated (**Brown et al., 2007**).

Gatlin-Watts et al. (2007), with exploring multicultural virtual teaming project implementation identified that the virtual projects remove travel barriers and promote a virtual exchange of cultural information. Culture has invisible dimensions such as Beliefs, Values, Perceptions, attitudes and visible dimensions Communication styles, Response to conflict, Decision making styles, etc. People from different countries and cultures will have their own view of the world and ways of doing things. (As an example, try asking each person to define „team“ and see what you get.).

Oertig and Buergi (2006) in his studies on cross-cultural project stressed to take into account the value of ongoing investment in language and intercultural communication training. They concluded that training is important for new members of project teams working in different continents, to reduce potential distrust, and make teams to work together efficiently.

TRUST

Trust, then, is efficient. You save yourself a lot of time and trouble by being able to rely on someone's word (**Arrow, 1974**). One of the key issues in virtual teams is to develop trust. In face-to-face relations, trust is built simpler than virtual mood.

According to **Handy (1995)** benefits of the virtual organization, can be increased by trust than on control. Virtuality requires trust as Technology is not enough for building trust. It is often the result of team members knowing that all people in a team can be counted on to complete their assigned tasks. Trust is a vital factor for virtual teams as there is a lack of personal face-to-face interaction (**Bergiel et al., 2008**). Establishing trust is important for the successful formation and growth of any new work team (**Glacel, 1997; Awe, 1997; Senge et al., 1994**). **Joinson (2002)**: Getting a team together physically is easy to enhance communication and trust between its members and minimize the sense of isolation.

TEAM LEADERSHIP

Berge (1996) proposed leadership as mediation in order to overcome the variety of task and relational problems that may be encountered by a group. In virtual teams, leaders are often the nexus of the team, facilitating communications, establishing team processes, and taking responsibility for task completion (**Duarte and Tennant-Snyder, 1999**).

O'Hara-Devereaux and Johanson, 1994, and recent research (**kayworth and leidner, 2001**) found out leadership issues in virtual teams (**Pauleen, 2003**). In traditional teams involving face-to-face interaction, leadership has a strong influence on team performance and individual team members' satisfaction (**Bass, 1990; Hackman, 1990b**). Leaders always are people that can influence on other behavior, attitude, and perspective, and can drive team to obtain its objectives. Leaders can accelerate tasks distribution between team members and with this, they produce better performance. By assigning tasks to individuals with the skills, knowledge, and abilities to perform them best, a leader can greatly increase team effectiveness and efficiency (**McGrath, 1984**). Leaders inspire others through communication of a vision for the team work (**Conger and Kanungo, 1988**). Clarity of goals and objectives is critical to effective team functioning, and leaders can facilitate team members in understanding of objectives (**Hackman, 1990b**). Effective team leaders also network with individuals inside and outside the team (**Tyran et al., 2003**).

OBJECTIVES OF THE STUDY

1. To study the importance of virtual teams in organizations
2. To investigate the factors influencing for effective performance of virtual teams

HYPOTHESES OF THE STUDY

Based on the literature review and Theoretical framework the following hypotheses are been developed

H1: There is a relationship between Leadership style and virtual team performance

H2: There is a relationship between communication and virtual team performance

H3: There is a relationship between Trust and virtual team performance

H4: There is a relationship between Culture and virtual team performance

THEORETICAL FRAMEWORK OF THE STUDY

Variables

Communication

Trust

Virtual team performance

Leadership style

Culture

RESEARCH METHODOLOGY

Sample and sample population

Population is the entire group of people, events or things of interest that the researcher wishes to investigate **Sekaran (2006)**. The population of this study is employees in Services sector. The sample of this study were 217 employees in services sector working in Virtual teams. **Sekaran (2006)** defined the A sample is the process of selecting a sufficient number of elements from the population, so that results from analyzing the sample are generalizable to the population **Sekaran (2006)**. The sample of this study is randomly selected by using purposive sampling technique.

INSTRUMENTATION

This research is quantitative. The instrument that it is employed in this research is a questionnaire adopted from other researchers who measured the scale in different studies. The questionnaire consists of six sections.

These sections are as follows:

1. Background Information: This section seeks to find the background information of the respondents such as their age, gender, marital status, and length of services.,
2. Leadership style
3. Communication
4. Trust
5. Culture and
6. Virtual team performance

Table 1 OPERATIONALIZATION OF VARIABLES

Variables	Types of scale	Degree of scale	Source
Communication	Likert scale	1-Strongly Disagree 2- Disagree; 3-Neutral; 4- Agree; 5-Strongly Agree	aul, et al (2005); Piccoli, et al.(2004
Trust	Likert scale	1-Strongly Disagree 2- Disagree; 3-Neutral; 4- Agree; 5-Strongly Agree	Sarker, et al (2003); Jarvenpaa, et al., (1998)
Leadership	Likert scale	1-Strongly Disagree 2- Disagree; 3-Neutral; 4- Agree; 5-Strongly Agree	□MLQ Avolio& Bass (2004)
Culture	Likert scale	1-Strongly Disagree 2- Disagree; 3-Neutral; 4- Agree; 5-Strongly Agree	Castle (2009),

Data Analysis

Data analysis technique is an attempt to find the answer of the research hypothesis. There are two methods of data analysis used in this research. Descriptive statistical analysis and Inferential Statistical Analysis. Descriptive statistical analysis in this research described the data for each indicator that used to measure latent variables. Inferential statistical analysis used two methods.

Reliability and Validity Variables

For testing consistency among multiple measurements Cronbach's alpha coefficient was calculated. Table shows that these coefficients for all factors are greater than 0.8, which is good for scale reliability. . For this study, the Cronbach's Alpha is used to test the reliability and consistency of the elements of variables. Table shows that majority of the variables show Cronbach's Alpha exceed 0.7. Since the Alpha value is high, therefore, the scale questions were considered to have internal consistency.

Reliability statistics of variables

Table.2 Reliability statistics of variables

Scale	No. of items	Cronbach's Alpha	Status
Virtual team performance	8	.77	Acceptable
Leadership	8	.84	Good
Communication	5	.78	Good
Trust	6	.84	Acceptable
Culture	5	.80	Good

Correlation among variables:

The Pearson correlation coefficient is a measure of the strength of the linear relationship between two variables. It is referred to as Pearson's correlation or simply as the correlation coefficient. If the relationship between the variables is not linear, then the correlation coefficient does not adequately represent the strength of the relationship between the variables. Pearson can range from -1 to 1.

A value of -1 indicates a perfect negative linear relationship between variables, a value of 0 indicates no linear relationship between variables, and a value of 1 indicates a perfect positive linear relationship between variables. Table below shows the Pearson correlation between employee performance and other variables.

Table 3 Correlation test among variables

		Virtual team performance
Leadership	Pearson correlation	.385
	Sig (2-tailed)	.000
	N	217
Communication	Pearson correlation	.265
	Sig (2-tailed)	.000
	N	217
Trust	Pearson correlation	.186
	Sig (2-tailed)	.000
	N	217
Culture	Pearson correlation	.234
	Sig (2-tailed)	.000
	N	217

****Correlation is significant at the 0.01 level (2-tailed)**

The table shows that the highest correlation is found between Virtual team performance and Leadership at correlation of 0.385 and followed by Communication, Culture and trust at correlations of 0.265, 0.234 and .186 respectively.

Results Hypotheses Testing:

The relationship between the variables is examined based on the Pearson correlation and the value of the coefficient of the relationships.

Virtual team Performance and Leadership:

The above Table shows that the correlation between virtual team performance and organizational culture is positive as the positive sign in front of the coefficient and it is significant at the level of 0.01. Therefore, the first hypothesis of the research is accepted. H1 is accepted.

Virtual team Performance and Communication :

The second research question seeks to find the relationship between employee performance and job satisfaction. The second hypothesis of this research proposed a positive and direct relationship between the two variables.

Table 4 shows that the correlation between Virtual team performance and at 0.265 is positive because of the positive sign and is significant at the 0.01 level. Therefore, the second hypothesis H2 is accepted.

Virtual team Performance and Trust: The third research question seeks to find the relationship between virtual team performance and Trust. The third hypothesis of this research proposes a positive and direct relationship.

Table 3 shows that the correlation between the two variables is positive at 0.186 because of the positive sign in front of the coefficient. The relationship is significant at the level 0.01. Therefore, the third hypothesis H3 is accepted.

Virtual team performance and culture

The fourth research question is to find out the relationship between virtual team performance and culture and this research proposes a positive and direct relationship between virtual team performance and culture.

Table 3 shows that the relationship is positive because of the positive sign in front of the coefficient and it is statistically significant at the level of 0.01 while the 2-tail value of the relationship is 0.06. Therefore, the fourth hypothesis H4 is accepted.

Discussion

This research has proposed and tested four main hypotheses. The finding reveals that four of these hypotheses were accepted.

1. The first hypothesis proposed a relationship between virtual team performance and Leadership and it was found that this relationship is positive and significant. **Bell & Kozlowski (2002)** Leadership is affected by temporal distribution, boundary spanning, lifecycle and member roles
2. The second hypothesis of this research proposed a relationship between virtual performance and communication. The hypothesis confirmed to be accepted and the relationship between the two variables was found positive and significant.
3. Effective communication is a critical element of team effectiveness, in virtual teams (**Furst, Blackburn, & Rosen, 1999; Mathieu, Maynard, Rapp, & Gilson, 2008; Jarvenpaa & Leidner, 1999**), drivers of communication for performance in virtual teams is of great importance
3. The third hypothesis of this research assumed that the relationship between Virtual team performance and Trust activities is positive and significant. After testing the hypothesis, the assumption was accepted and the relationship was found as assumed. The finding of the study was supported by other researchers' findings **Mayer, Davis, and Schoorman's** model of trust, Mutual trust and shared understanding is required for the growth of team members. Since members of virtual teams know that they have to interact for a limited tenure; they can change their attitude towards developing trust in the other members of a team.
4. The fourth hypothesis of this study proposes a positive relationship between Virtual team performance and culture. Finding of the study shows that the relationship is positive and significant and the related hypothesis is accepted. The findings of the study is supported by researcher's **Chang et al.(2011)**, "For virtual teams, research findings imply that team leaders should be aware of cultural differences as well as project issues within teams" (p. 305). The team leaders awareness of cultural differences among employees and use of appropriate management strategy will allow them to increase effectiveness in communication and performance of virtual teams.

Conclusions

This study has been conducted to find the factors that influence the virtual team performance in IT industry. The findings of the study reveal that there is positive and direct relationship between Virtual team performance and Leadership, communication, Trust and Culture. Based on the findings of the study, a set of recommendations have been developed. They are

1. Leadership plays a significant role in performance of virtual teams. So, organizations have to take up a leadership style which improves the performance of the teams.
2. Better communication, building trust by understanding the culture improves performance of virtual teams.

References

- Anderson, A.H., McEwan, R., Bal, J. and Carletta, J. (2007), "Virtual team meetings: an analysis of communication and context", *Computers in Human Behavior*, 23 (5), 2558-80.
- Arrow, K. (1974), *The Limits of Organisation*, WW Norton, New York, NY.
- Awe, S. (1997), "Trust in the balance: building successful organizations on results, integrity, and concern", *Library Journal*, 122 (9), 84.
- Barczak, G., McDonough, E. and Athanassiou, N. (2006), "So you want to be a global project leader?", *Research Technology Management*, 49 (3), 28-35.
- Barge, J. K. (1996), "Leadership Skills and the Dialectics of Leadership in Group Decision Making." In R. Y. Hirokawa and M. S. Poole (eds.), *Communication and Group Decision Making*. (2nd ed.) Thousand Oaks, Calif.: Sage Bass,
- B. M. (1990). *Bass and Stogdill's Handbook of Leadership*. New York: Free Press.
- Bass, B. M., and Avolio, B. (1994). *Improving Organizational Effectiveness Through Transformational Leadership*. Thousand Oaks, Calif.: Sage.
- Bell, B.S. and Kozlowski, S.W.J. (2002), "A typology of virtual teams: implications for effective leadership", *Group and Organization Management*, 27 (1), March, 14-49.
- Bennis, W.G. and Nanus, B. (1985), *Leaders: The Strategies of Talking Charge*, Harper Collins, San Francisco, CA.

- Berge, Jk. (1996), "leadership skills and the dialectics of leadership in group decision making", in Hirokawa, R.Y. and poole, M.S. (Eds), *Communication and Group Decision Making*, Sage, Thousand Oaks, CA, 301-42
- Couzins, M. and Beagrie, S. (2005), "How to . . . successfully manage remote teams", *Personnel Today*, 27.
- Duarte, N. and tenant, Snyder, N. (1999), *Mastering Virtual Teams: strategies, Tools, and Techniques that succeed*, Jossey-Bass, San Francisco, CA.
- Fleming, B. L. (2006). *THE VIRTUAL TEAMS POCKETBOOK*, Management Pocketbooks Ltd., U.K.
- Gatlin-Watts, R., Carson, M., Horton, J., Maxwell, L., and Maltby, N. (2007). A guide to global virtual teaming. *Team Performance Management*. 13(1/2), 47-52.
- Geber, B. (1995), "Virtual teams", *Training*, 32 (4), 36-40.
- Gibson, C. B., and Cohen, S. G. (2006), *Virtual Teams That Work Creating Conditions for Virtual Team Effectiveness*, John Wiley & Sons, Inc. San Francisco. USA.
- Glacel, B.P. (1997), "Teamwork's top ten lead to quality", *The Journal for Quality and Participation*, 20 (1), 12-17.
- Hackman, J. R. *Groups That Work (and Those That Don't)*. San Francisco: Jossey-Bass, 1990b.
- Handy, C. (1995), "Trust and the virtual organization", *Harvard Business Review*, 73 (3), 40-50.
- Hanson, K.S. (2007), "Emerging elements of leadership in a complex system: a cognitivist approach", EdD doctoral dissertation, San Diego State University/University of San Diego, San Diego, CA.
- Jackson, P., (1999). *Virtual Working Social and organisational dynamics*. Routledge, London and New York.
- Joinson, C. (2002), "Managing virtual teams", *HR Magazine*, 47(6), 69-73.
- Karnoe, P. (1995). *Competence as Process and the Social Embeddedness of Competence Building*. Academy of Management BEST PAPERS PROCEEDINGS. 55th Annual , Meeting, Vancouver, Canada August 6-9.
- Kayworth, T.R. and Leidner, D.E. (2001), "leadership Effectiveness in Global Virtual Teams", *Journal of Management Information Systems*, 18 (3), 7-40.
- Lipnack, J. and Stamps, J. (1997), *Virtual Teams: Reaching Across Space, Time, and organizational Boundaries*, John Wiley and Sons.
- Lipnack, J. and Stamps, J. (2000), *Virtual Teams: People Working across Boundaries with Technology*, 2nd ed., John Wiley & Sons, New York, NY.
- Malhotra, A., Majchrzak, A. and Rosen, B. (2007), "Leading virtual teams", *Academy of Management Perspective*, 21 (1), 60-70.
- Mayer, R. C., Davis, J. H., and Schoorman, F. D. (1995). "An Integrative Model of Organizational Trust." *Academy of Management Review*, 20 (3), 709-734.
- O'Hara-Devareaux, M. and Johnsen, S. (1994), *Global Work: Bridging Distance, Culture, and Time*, Jossey-Bass, San Francisco, CA.
- Ojala, M. (2004), "Being virtual", *Online*, 28 (3), 5-8.
- Pape, W.R. (1997), "Group insurance: virtual teams can quickly gather the knowledge of even far-flung staff", *Inc.* 19 (9), 29-31.
- Robey, D., Koo, H.M. and Powers, C. (2000), "Situational learning in cross-functional virtual teams", *Technical Communication*, 47(1), 51-66.
- Senge, P., Kleiner, A., Roberts, C., Ross, R.B. and Smith, B.J. (1994), *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization*, Doubleday, New York, NY.
- Snyder, B. (2003), "Teams that span time zones face new work rules", *Stanford Business Magazine*, May, 3-15.
- Townsend, A.M., DeMarie, S.M. and Hendrickson, A.R. (1996), "Are you ready for virtual teams?", *HR Magazine*, 41 (9), 122-7.
- Townsend, A.M., DeMarie, S.M. and Hendrickson, A.R. (1998), "Virtual teams: technology and the workplace of the future", *Academy of Management Executive*, 12 (3), 17-29.
- Virtual Teaming Association (2003), "Announcement and call for expressions of interest", updated version, July, available at: www.knowab.co.uk/vta/
- Warkentin, M., Sayeed, L. and Hightower, R. (1999), "Virtual teams versus face-to-face teams", in Kendall, K.E. (Ed.), *Emerging Information Technologies Improving Decisions, Cooperation, and Infrastructure*, SAGE Publications, Thousand Oaks, CA, pp. 241-62.