Study of Virtualness, Task Interdependence, Extra-Role Performance and Team Climate in Indian Software Development Teams

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The paper studies the effect of virtualness on team climate and extra-role performance of team members and the moderating effect of task interdependence in this relationship. The sample consists of 125 team members from 25 software development teams. Virtualness index (developed for this study), Team climate inventory (Anderson & west, 1994), task interdependence scale (Pearce & Gregersen, 1991) and Organizational Citizenship Behaviour (OCB) (Podsakoff & MacKenzie 1989) scale were used for measurement. Correlation analysis and 3x2 ANOVA were used for analysis. Results showed that virtualness negatively affected the following variables: a) all the dimensions of vision scale of TCI, b) interaction frequency and influence dimensions of participatory safety scale (TCI) and c) generalized compliance dimension of OCB. Though task interdependence had a significant main effect on OCB and team climate, it did not have any moderating effect.

**Key words:** virtual teams, virtualness, Extra-role performance, task interdependence, team climate

**INTRODUCTION**

Recent advancements in information and communication technology have changed the way teams work by diminishing physical and temporal boundaries and have led to the birth of a new category of teams called virtual teams. Generally virtual teams are defined as teams in which members are geographically dispersed and interact using technology-mediated communication to achieve their goals.

Using virtual teams has many advantages both for the organization and for the employee. For the organization, a virtual team helps acquire best expertise in spite of the geographical location of the employee. It also helps to reduce costs and time incurred due to employee travel. Virtual teams help to nurture inter- and intra-organizational collaboration and are very useful in cross functional projects and project outsourcing. They are very useful in a wide range of business activities like project management, decision making, and strategic planning.

As more and more organizations became multinational corporations and outsourcing became a common phenomenon, the need for virtual teams increased (Brooks, 2006, p.46). Also, as
affordability of technological innovations increased, more and more work teams started opting for those technologies in various levels to manage their functions and communicate within them. Due to these changes, it becomes very difficult to classify a team into a pure face-to-face or virtual team. All these issues have made management scholars re-evaluate their classification of teams into face-to-face teams and virtual teams. They now consider level of virtualness as a characteristic of every work team. (e.g. Griffith & Neale 2001, p. 382; Griffith, Sawyer & Neale 2003, p. 266; Martins, Gilson & Maynard 2004, p. 807; Chudoba, Wynn, Lu, Watson-Manheim, & Mary 2005, p.283; Kirkman & Mathieu 2005, p. 705). Most of these studies measure virtualness as a product of level of physical dispersion within the team, kind and frequency of technology used for communication and the temporal dispersion between the members. Communication technologies are classified according to their media richness. A medium is rich if it enables immediate feedback, uses visual and audio channels, has a personal source, and uses natural language communication (Daft and Lengel, in Workman, Kahnweilerb and Bommerb 2003, p. 206). Media which are less in the qualities are called as leaner media. Face to face interaction is considered to be rich, followed by video conferencing, telephone, instant messaging, and email so on.

While the number of empirical and theoretical work on virtual teams is progressively increasing, there is still much scope for further exploration. Though psychosocial variables like trust, conflict, heterogeneity, satisfaction, leadership, empowerment, cognitive style and so on have been studied in virtual team context, most of those studies have either been conducted on student samples or are incomprehensive. Due to these limitations the relevance of those studies in organizational context is not clear. Also, most studies on level of virtualness have studied its impact on various in-role performance behaviours of the team members but there are no studies on the effect of level of virtualness on extra-role performance of the team members. Though team climate is considered to be an index of positive relationship with the team as well as a strong determinant of team functioning, no research has studied the effect of virtualness on team climate.
Extra-role performance behaviours are certain behaviours of employees, which are not part of their formal job requirements as they cannot be prescribed or required in advance for a given job but they help in the smooth functioning of the organization as a social system.

Though those extra-role performance behaviours have been studied under various taxonomies like organizational citizenship behaviour, organizational spontaneity, contextual performance behaviours, prosocial behaviour, and so on, Organizational Citizenship Behavior (OCB) has gained tremendous popularity both in theory and research.

According to Organ and Ryan (1995 p. 782) OCB can be classified under 5 major headings namely:

i) Altruism: work-related and personal help in the work place.

ii) Generalized Compliance: complying with organizational rules even without supervision.

iii) Sportsmanship: willingness to tolerate the inevitable inconveniences of the work place without complaining.

iv) Civic virtue: the active participation and involvement of employees in company affairs.

v) Courtesy: "touching base" with others before taking actions or making decisions that would affect their work.

Though most studies have studied OCB in organizational context, few studies have studied OCB as team construct (Podsakoff, Ahearne & Mackenzie 1997, p. 264, Van Der Vegt, Van De Vliert, Oosterhof 2003, p.718). Podsakoff et al. (1997, p.263) argued that OCB is important for teams because it serves to "lubricate" the social functioning of the organization, reduce friction, and enhance efficiency. OCB may be an important means by which team members coordinate with each other and
even across work groups. Hence, OCB may be instrumental to work groups and teams and without 
OCB work groups cannot function smoothly.

With respect to virtualness, there are no studies to empirically establish its relationship with OCB. On 
the other hand various studies have shown level of virtualness to be a significant variable influencing 
interpersonal and group process within the teams. Level of virtualness is not only found to affect 
interpersonal processes like communication (Straus, 1996 p. 115), trust (Jarvenpaa & Leidner 1999, 
p. 798), cohesiveness (Lind, 1999 p.281) and so on, it also influences team outcomes like member 
satisfaction (Caballer, Francisco, José-Maria 2005, p.252) and results (Schmidt, Montoya-Weiss & 
Massey 2001, p.588). Though some of these studies have mixed results, majority of the studies find a 
negative effect of virtualness on team outcomes. With this background we assume that high levels of 
virtualness characterized by high levels of physical dispersion within the team members and the 
extensive use of impersonal communication technologies will negatively influence OCB within the 
team. Therefore we hypothesize;

**Hypothesis 1**: Level of virtualness would negatively affect the extra-role performance of the team members.

*Team Climate*

Team climate has been defined as shared perceptions referring to the “proximal work group” 
refers to the manner of working together that the team has evolved and it can include several different 
aspects like communication patterns, participation, safety, norms, cohesiveness, task style, vision and 
innovativeness. Team climate is found to be a crucial determinant of team performance (Agrell, & 
Gustafson 1994, p.149, and Anderson and West, 1998, p. 236). Since virtualness was found to 
negatively influence interpersonal aspects of team behaviour such as cohesiveness (Chidambaram 
1996, p.152) we assume that virtualness would negatively influence team climate.

**Hypothesis 2**: Level of virtualness would negatively affect team climate.

*Task interdependence*
In simple words, task interdependence is the extent to which a task requires coordination between different members for its accomplishment. Task interdependence not only affects task performance of the employees but also influences their extra role performance. In a research Bachrach, Powell, Bendoly and Richey, (2006) found a strong main effect of task interdependence on OCB. They (Bachrach et al, 2006) argue that as the need for interaction for task completion increases, the situation lends itself to coordination and becomes more receptive to collective efforts and cooperation. These collective efforts are exhibited in the form of extra-role performances. Task interdependence being a crucial determinant of extra-role performance, we assume that it would help to reduce the negative effects of virtualness on extra-role performance. Thus we hypothesize that;

**Hypothesis 3a:** Task interdependence would have a positive influence on extra-role performance

**Hypothesis 3b:** Task interdependence would have a moderating effect on the relationship between virtualness and extra-role performance of the team members.

Task interdependence was found to be one of the crucial determinants of work group effectiveness (Wageman, 2001 in Hertel, Conrad & Orlikowski 2004; 4). According to Anderson and West (in Loo 2003, 512) three necessary but not sufficient conditions are important for shared climate within a team: individuals must interact, individuals must have some common goal which predisposes them toward collective action, and there must be sufficient task interdependence to develop shared understandings. Since task interdependence is an important determinant of team climate, we assume it would help reduce the negative effect of virtualness on team climate. Thus we hypothesize that;

**Hypothesis 4a:** Task interdependence would positively impact climate of the team

**Hypothesis 4b:** Task interdependence would have a moderating effect on the relationship between virtualness and team climate.

**METHOD**

*Sample*
Sample consists of 125 subjects from 25 software development teams. The average age and tenure in the team of the team members are 28 years and 1 year respectively. Among these 25 teams 15 teams had at least one member in another geographical location, mostly in another time zone. Since most software development teams were handling outsourced projects for a client in another geographical location, it would typically have majority of its members in the same office location called as offsite location. In most cases there would be a member who would be working in the client’s official location for customer support and coordination and he/she would be called the onsite member.

**Instruments**

**Virtualness Index:** Different authors have used different criteria to measure virtualness (e.g. Griffith & Neale 2001, p. 382, Griffith et al., 2003, p. 266. Martins et al., 2004, p. 807, Kratzer, Leenders & Van Engelen 2004, p.43, Kirkman & Mathieu 2005, p.75, Chudoba et al., 2005, p.283). Most of these authors consider geographical and temporal dispersion within the team and level and type of technology used for communication as crucial factors to measure virtualness in teams. For the present study, we estimated virtualness of the team as function of level and type of technology used for communication and the number of members in different geographical locations. Before administering the virtualness index for the main study, we gave a list of communication tools to 40 software executives and asked them to rate those tools based on its media-richness in a five point rating scale. Test-retest reliability of those ratings was found to be .83. Later in the main study subjects (team members) were asked to mention how frequently he/she uses each of those tools to communicate with other team members (both members of the same location and other location). Members of other location (onsite members) are once again classified as members belonging to same time zone or different time zone. Cumulative virtualness is arrived at by giving appropriate weightage to the frequency and media richness of the tool used, physical and temporal dispersion between the members.
**Extra-role performance**: OCB scale (Podsakoff and MacKenzie 1989), which measured 5 dimensions namely --altruism, courtesy, sportsmanship, conscientiousness, and civic virtue was used to measure extra-role performance. It is a seven point rating scale, where the rating of 1 means the other team members never perform those behaviour and 7 means other team members always perform those behaviours. Various studies found support for a five-dimension model of citizenship and reported reliabilities over .70 for each dimension (Podsakoff, MacKenzie, Moorman, and Fetter, 1990 p.73 and Moorman, 1991).

**Task interdependence**: measured using modified version of task interdependence scale developed by Pearce and Gregersen, (1991). The scale is a seven point rating scale where 1 means strongly disagree and 7 is strongly agree. Its reliability (Cronbach’s alpha) was found to be 0.74.

**Team Climate Inventory**: team climate is measured using Team Climate Inventory developed by Neil Anderson and Michael West (1994). Team climate inventory is a five point rating scale and has the following sub scales

1. Participatory safety includes: a) Information Sharing (3 items): extent to which information is shared. b) Safety (2 items): extent to which the team is safe for risk taking. c) Influence (3 items): degree to which members positively influence team decision-making. d) Interaction Frequency (4 items)


3. Vision includes: a) Clarity (2 items): clarity of team objectives. b) Perceived Value (4 items): extent to which objectives are perceived to be of value. c) Sharedness (3 items): degree of agreement about team’s objectives. d) Attainability (2 items): perceiving team objectives as realistic.
4. Task orientation includes: a) Excellence (2 items): commitment to achieve high standards. b) Appraisal (3 items): monitoring and critical appraisal of each other. c) Ideation (2 items): generation of positive ideas.

5. Social desirability on social and task related aspects explain to what extent the responses are unrealistic and exaggerated.

The scale has 44 items and used a five point rating scale. Authors have established validity for the tool and the reliability of the scale ranged from 0.84 to 0.94.

**Design**

3x2 ANOVA was used to study the main and interaction effect of the independent variables on the dependent variables. Based on quartile deviation method we classified virtualness scores into 3 levels namely; low, moderate and high. Similarly we used median to classify low and high levels of task interdependence.

**RESULTS**

**Relationship between Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
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<th>4</th>
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<tbody>
<tr>
<td>1. virtualness</td>
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<tr>
<td>3. OCB altruism</td>
<td>-.03</td>
<td>.50**</td>
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<td>4. OCB courtesy</td>
<td>.09</td>
<td>.41**</td>
<td>.50**</td>
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<tr>
<td>5. OCB sportsmanship</td>
<td>-.12</td>
<td>.22**</td>
<td>.17</td>
<td>.25**</td>
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<td>6. OCB Generalized compliance</td>
<td>-.18*</td>
<td>.30**</td>
<td>.27**</td>
<td>.33**</td>
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<tr>
<td>7. OCB civic virtue</td>
<td>-.05</td>
<td>.42**</td>
<td>.38**</td>
<td>.35**</td>
<td>.35**</td>
<td>.39**</td>
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<tr>
<td>8. TCI participatory safety</td>
<td>-.10</td>
<td>.59**</td>
<td>.45**</td>
<td>.42**</td>
<td>.36**</td>
<td>.25**</td>
<td>.52**</td>
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<tr>
<td>9. TCI support for innovation</td>
<td>-.06</td>
<td>.55**</td>
<td>.42**</td>
<td>.39**</td>
<td>.38**</td>
<td>.20*</td>
<td>.43**</td>
<td>.90**</td>
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<tr>
<td>10. TCI vision</td>
<td>-.07</td>
<td>.45**</td>
<td>.31**</td>
<td>.33**</td>
<td>.39**</td>
<td>.18*</td>
<td>.37**</td>
<td>.56**</td>
<td>.54**</td>
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<tr>
<td>11. TCI task orientation</td>
<td>-.16</td>
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<td>.31**</td>
<td>.26**</td>
<td>.31**</td>
<td>.17</td>
<td>.31**</td>
<td>.52**</td>
<td>.52**</td>
<td>.72**</td>
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</tbody>
</table>
* Significant at 0.05 level  ** significant at 0.01 level

Pearson correlation was used for analyzing the relationship between variables studied in the research. Table 1 shows that task interdependence having significant positive relationship with all the dimensions of team climate and OCB. On the other hand, virtualness is related to only few variables. Virtualness of the team was found to have a significant negative relationship with generalized compliance dimension of OCB scale.

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>F Ratio</th>
<th>df</th>
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</thead>
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<td>Altruism</td>
<td>Task interdependence</td>
<td>22.708**</td>
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</tr>
<tr>
<td>Courtesy</td>
<td>Task interdependence</td>
<td>20.789**</td>
<td>1</td>
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<td>Sportsmanship</td>
<td>Task interdependence</td>
<td>8.479**</td>
<td>1</td>
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<td>Generalized compliance</td>
<td>Task interdependence</td>
<td>4.767*</td>
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</tr>
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<td></td>
<td>Virtualness</td>
<td>3.915*</td>
<td>2</td>
</tr>
<tr>
<td>Civic virtue</td>
<td>Task interdependence</td>
<td>15.543**</td>
<td>1</td>
</tr>
<tr>
<td>Participatory safety</td>
<td>Task interdependence</td>
<td>24.68**</td>
<td>1</td>
</tr>
<tr>
<td>Information sharing</td>
<td>Virtualness</td>
<td>3.15*</td>
<td>2</td>
</tr>
<tr>
<td>Participatory safety</td>
<td>Task interdependence</td>
<td>26.68**</td>
<td>1</td>
</tr>
<tr>
<td>Influence</td>
<td>Overall virtualness</td>
<td>3.1*</td>
<td>2</td>
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<tr>
<td>Participatory safety</td>
<td>Task interdependence</td>
<td>20.65**</td>
<td>1</td>
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<tr>
<td>Interaction frequency</td>
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<tr>
<td>Participatory safety</td>
<td>Task interdependence</td>
<td>34.22**</td>
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<td>Articulated support</td>
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<td>Support for innovation</td>
<td>Task interdependence</td>
<td>14.7**</td>
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<td>Enacted support</td>
<td>Overall virtualness</td>
<td>2.9*</td>
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<td>Vision</td>
<td>Task interdependence</td>
<td>13.6**</td>
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<td>clarity</td>
<td>Overall virtualness</td>
<td>4.6**</td>
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<tr>
<td>Perceived value</td>
<td>Task interdependence</td>
<td>19.04**</td>
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<td>Overall virtualness</td>
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<td>sharedness</td>
<td>Task interdependence</td>
<td>27.5**</td>
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<td>Vision</td>
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<td>Attainability</td>
<td>Task interdependence</td>
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<td>Task orientation</td>
<td>Overall virtualness</td>
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<td>Ideation</td>
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<td>Task orientation</td>
<td>Task interdependence</td>
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<td>Task orientation</td>
<td>Task interdependence</td>
<td>17.8**</td>
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<tr>
<td>Excellence</td>
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* Significant at 0.05 level  ** significant at 0.01 level
Two way ANOVA was used to study the main and interaction effect of the virtualness and task interdependence on the OCB and team climate. Table 2 shows that task interdependence having significant main effect on the all the sub-dimensions of OCB and team climate. Post-hoc analysis showed that high task interdependence group having high scores in all team climate and OCB sub scales and thus hypotheses 3a and 4a are supported.

Virtualness had a significant main effect on generalized compliance dimension of OCB scale (F = 3.195, p<0.05). Post hoc tests showed that there is a significant difference between groups with moderate (M = 5.07, SD = .97) and high (M =4.48, SD = 1.3) levels of virtualness. In Participatory safety scale of team climate inventory, virtualness significantly influenced both influence (F = 3.184, p<0.01) and interaction frequency (F = 3.102, p<0.05) dimensions. Post hoc tests showed in influence scale, moderate virtualness group (M = 4.21, SD = .66) had significantly higher scores than high virtualness group (M = 3.86, SD = .81). The above case is true with interaction frequency scale also (M = 4.34, SD = .67 and M = 4.01, SD = .75). In vision scale of team climate, virtualness had a significant impact on the following sub-dimensions; clarity (F = 2.9, p<0.5), perceived value (F = 4.64, p<0.01), sharedness (F = 2.93, p<0.05), attainability (F = 3.91, p<0.05). In all the above dimensions groups with moderate virtualness had higher mean scores when compared to high virtualness groups. Thus hypothesis 1 and 2 are partially proved.

In contrary to hypotheses 3b and 4b we did not find any moderating effect of task interdependence on the relationship between virtualness and dependent variables and thus those hypotheses are disproved.

**DISCUSSION**

Among the independent variables, task interdependence has significantly high positive correlations with all the dimensions of team climate and extra-role performance. Which means, higher the task interdependence within the team, positive would be the team climate and higher would be the level of extra-role performance. High levels of interdependence insist on the need for cooperation within the team so that those tasks can be accomplished successfully. Cooperation between members can be both task-related assistance and extra-role performance. Similar positive relation between OCB and
task interdependence has been found in a study by Neilson, Sundstrom and Halfhill (in comaeu & Griffith 2005, p. 324). Similarly, when cooperation between the team members is high, it facilitates participation, sharedness of team goals, task orientation and support for innovation within the team. Thus team members may perceive their team climate to be positive.

Team virtualness was found to have a significant negative relationship on the perception of generalized compliance within the team. This shows, higher the physical dispersion between the members less would be the compliance between them. As members work across time, regulation with regard to work hours becomes irrelevant and thus members become more autonomous. Thus physical dispersion within the team can reduce the pressure on the team members to be compliant.

With regard to the relationship between team climate dimensions and OCB, almost all the sub factors of both the variables are positively related to each other. This result could reflect the reciprocal relationship between OCB and team climate. OCB acts as a social lubricant that facilitates the team climate. Similarly, in long run, team climate creates a nurturing environment that facilitates extra-role performance within the team.

Results also showed task interdependence to be a crucial variable affecting both team climate and OCB. ANOVA showed a significant main effect of task interdependence on all the dimensions of OCB. Post hoc tests showed the impact to be positive, that is members who have perceived their team tasks to be highly interdependent also have perceive their teams to be high in extra-role performance. Similar result was found in a study by Comeau and Griffith (2005, p. 323), in which the authors found a significant main effect of task and goal interdependence on OCB. In that article, the authors argue that task interdependence results in the increased need for interaction for task completion. This increased interaction can nurture coordination and cooperation within the team and thus enhance OCB within the team. According to Smith et al. (in Pearce and Gregersen 1991) task interdependence would be an important determinant of employees' citizenship behaviors toward one another because interdependent employees realize that their co-workers can retaliate.
Similar to the significant positive correlation between task interdependence and team climate dimensions, ANOVA results also showed a significant impact of task interdependence on all the team climate dimensions. Post hoc tests showed that high levels of task interdependence led to perception of positive team climate by the members. High level of task interdependence within the team is characterized by dependence between members in successful achievement of their tasks and thus the rewards associated with it. When team tasks are highly interdependent, failure of a member to achieve his/her task can lead to problems for others in the team. Therefore team members are forced to cooperate through task related assistance in order to achieve those tasks. Thus task interdependence can nurture reciprocity of task related assistance within the team and can lead to positive interaction and cooperation within the team. In a longer run cooperation and increased interaction between the members can result in positive climate within the team through increased participatory safety, shared team goals, support for innovation and task orientation.

Among OCB dimensions, virtualness was found to significantly impact generalized compliance. Post hoc tests showed that groups with moderate amount of virtualness tend to have high generalized compliance than groups with high levels of overall virtualness. This show that virtualness affects generalized compliance only after a certain point (after moderate level). Also members who belong to teams with high levels of virtualness tend to be less compliant than moderately virtual teams. Maybe as teams become more physically dispersed, the level of autonomy increases and rules related to work hours, task completion and so on becomes more flexible. Also the using leaner media to communicate can lead to high virtualness as well as lead to impersonal communication. Due to this impersonal communication members can exhibit less generalized compliance.

In team climate participatory safety scale, team virtualness significantly impacted influence and interaction frequency dimensions. Groups with moderate overall virtualness had significantly higher scores in those two dimensions than teams with high virtualness. In our study the level of virtualness is determined by the type of communication tool used, frequency of usage as well as physical and temporal dispersion between the members. Therefore virtualness is a product of level of physical
dispersion between the members and usage of rich/lean media tools for communication. If the team members use lean media very frequently to communicate with the members of the onsite location, it will increase team virtualness and affect the effectiveness of team communication. Studies have also shown that the type of technology used by virtual teams is very crucial in the efficiency, performance, trust and interpersonal relationship within the team (Daft & Lengel in Martins et al., 2004, p. 809). Therefore extensive use of leaner media, especially with the onsite member may lead to a sense of social distance within the member. Due to this perceived social distance, members might feel that the team interaction and the influence over each other in making team decisions are insufficient.

Blackburn et al., ( in Martin et al., 2004, p.. 812) argue that developing a shared vision or mission may be more difficult in virtual teams, as it is harder for members to establish a unified sense of purpose due to diminished member interactions. This argument has been supported by the findings of our study. In the vision scale of team climate inventory, moderate amount of virtualness has increased teams’ perception of shared goals when compared to high virtualness. The results show that after a certain level, overall virtualness of the team tend to negatively influence the members’ perception of clarity, value, sharedness and attainability of the team goals. Communication between members is very important to bring in a sense of sharedness and responsibility of group goals. When negative effects of physical dispersion is intensified by extensive use of lean communication media, it can lead to communication problems and thus may affect the team members perception of the team goals.

CONCLUSION AND SUGGESTIONS

As virtualness is becoming an important characteristic of all work teams, it becomes very important to understand its effect on the team behaviour. In this context, we hope our research would be a significant value addition.
In contrast to our expectations, virtualness influenced only some dimensions of OCB and team climate. The results show that highly virtual teams tend to have problems in creating team vision and encompassing it among the value system of team members. According to Anderson and West (1994, p.6), vision gives focus and direction to members’ energies and helps the team to be effective and creative. Similar to team vision, virtualness had a negative effect on interaction frequency and influence dimensions of participatory safety scale (TCI). Also the level of courtesy within the team decreases when the virtualness increases. These results can be partly attributed to the insufficient interaction between the members as well as to the choice of media for communication.

High virtualness means members are physically dispersed and they use more of leaner media to communicate than richer media. Though in most cases it is unavoidable to reduce the physical dispersion between the members, use of richer media can be increased and thus virtualness can be reduced to the moderate level. We suggest that along with increasing interaction among members, frequent face to face meetings should be arranged during early stages of team development when team objectives are set. Teams should also use rich media like video conferencing, especially during the crucial stages of the project. Creative use of available media will help improve team climate. For example, electronic bulletin boards can be used to display vision statement of the team, so that members get a sense of shared responsibility towards those goals. Also, online calendars can be used not only for official reminders but also for mentioning birthdays of the team members which can help in improving the interpersonal relationship between the members.

Team leadership can also play a significant role in improving interpersonal and group processes within the team. According to Leenders, van Engelen & Kratzer, (2003 p.85), team leaders who play the role of ‘communication integrators’ are very crucial for the success of the team. Communication integrators identify those team members who would benefit from joining a particular stream of communication and then use their leadership to bring them into the discussion rather than merely channeling communication between team members (Leenders, et al 2003, p.85). Team leaders can
also establish positive team processes by developing supportive team member relations, creating
team-based reward systems, and selecting only those team members who are qualified to do the work.
(Lurey & Raisinghani, 2001, p.532). The team leader should also ensure periodically, whether the
members are clear with the team objectives and understand their level of agreement with those
objectives.

Apart from understanding the effect of virtualness on team behaviour, our research has also found out
the significance of task interdependence on the team climate and OCB. Task interdependence
emerges as a crucial determinant of team climate and OCB in our research. The results emphasize the
importance of designing team tasks to ensure optimal level of task interdependence to hold the team
together and nurture positive team climate.

In short we conclude that, virtualness in the form of technology mediated communication and
physical dispersion between the members are unavoidable in the changing organizational set up. At
the same, we should learn ways to manage virtualness and ensure an optimal level of it for effective
team functioning. Also, more focus should be given in designing team tasks to establish task
interdependence, so that cooperation and coordination between the members can be nurtured.

REFERENCE

Agrell, A & Gustafson, R 1994, ‘The Team Climate Inventory (TCI) and group innovation: a
psychometric test on a Swedish sample of work groups’, *Journal of Occupational and
Organizational Psychology*, vol. 67, pp. 143–151.

Anderson, NR & West, MA 1998, ‘Measuring climate for work group innovation:
development and validation of the team climate inventory’, *Journal of Organisational

Anderson, NR & West, MA 1994, *The team climate inventory: manual and user’s guide*,
ASE, NFER-Nelson, Windsor.

Bachrach, DG, Powell, BC, Bendoly, E, & Richey, RG 2006, ‘Organizational citizenship
behavior and performance evaluations: exploring the impact of task interdependence’,
*Journal of Applied Psychology*, vol. 91, no. 1, pp. 193-201. Retrieved June 1, 2006,
from PsycARTICLES database.


