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Leadership in Virtual Teams: The Case for Emotional Intelligence

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ABSTRACT

As the use of virtual teams has increased in organizations, there has been an increase in research focused on those settings. This study identifies factors associated with effectiveness and satisfaction at both the member and team level. Among other variables leadership characteristics and behaviors have been shown to influence virtual team outputs. However, new research in the leadership area, particularly that related to emotional intelligence (EI) has not been investigated as influencing virtual team success. Through a review of existing literature on virtual teams, leadership and emotional intelligence, we develop a research model that suggests the relationship between emotional intelligence and virtual team effectiveness and satisfaction. We then propose a research methodology to investigate this relationship.

Keywords

Leadership, Emotional Intelligence, Virtual Teams

INTRODUCTION AND MOTIVATION

Advances in communication technology coupled with the development of collaborative information technologies such as email and electronic data interchange in the 1980's raised the possibility of traditional space- and time-bound teams of working in a virtual environment without temporal-spatial constraints. A variety of fields such as healthcare (2008), manufacturing (Malhotra, Majchrzak and Rosen, 2007; Maznevski and Chudoba, 2000), software development (Zhang, Tremaine, Egan, Milewski, O'Sullivan and Fjermestad, 2009), and education (Cramton, 2001; Fuller, Hardin and Davison, 2007; Jarvenpaa and Leidner, 1999), to name a few, use virtual teams for group work. In the past, both proprietary and open standards technologies including email, instant messaging, video conferencing, and file transfer protocols have enabled the flow of information and digital resources necessary to plan, coordinate, control, and perform a variety of virtual team activities. Recent developments in open source, open access, Web 2.0, and Internet 2 technologies have spawned a new generation of collaborative technologies ranging from Huddle to CISCO Telepresence ushering in a new technological context for virtual work. These developments in conjunction with a technology-enabled social networking culture mark the advent of the Virtual Team 2.0 era.

The popularity of virtual teams indicates the existence of benefits to various stakeholders of teamwork. These benefits include competency-based rather than location-based team member selection and

flexibility to be less bound to a traditional "9 to 5" workday. Reducing personal and organizational costs can be achieved through lowering commute expenses, reducing physical space requirements, and finding savings in labor and other resource acquisition costs. However, virtual teams have problems that are unique as well. Key challenges to virtual teamwork success are building and maintaining trust (Jarvenpaa, Shaw and Staples, 2004), maintaining effective communication (Henderson, 2008), and motivating members (Gibson and Cohen, 2003). Sarker and Sahay (2004) highlight specific challenges such as mismatch in practices/norms, incompatibility of IS development knowledge, mismatches in psychological and social clocks of team-members, which arise on account of limited human visible interaction and time separations. Literature indicates that team leadership plays a vital role in ameliorating problems encountered in virtual teams and for ensuring their success (Malhotra et al., 2007; Pierce and Hansen, 2008).

While the literature on leadership in virtual teams is developing, it has yet to mature to the extent that exists in the traditional face-to-face research field. The leadership literature has a long and rich tradition, and new research on effective leadership continues to emerge (Yukl, 2008). However the applicability of leadership theories developed in a traditional context to a virtual context to address unique problems encountered in virtual teams needs to be explored in depth. Our research objective is to add to the body of virtual team leadership literature by augmenting it with emerging leadership research being developed in the traditional leadership framework.

The context of our research is software development, which is people- and knowledge-intensive, thus presenting unique leadership challenges (Faraj and Sambamurthy, 2006). Software development occurs in teams staffed by information technology (IT) and business professionals that include business and systems analysts, programmers, trainers, and infrastructure specialists (Dennis, Wixom and Tegarden, 2005). Software development teams are increasingly dispersed temporally and spatially, given the ease with which labor and capital can be sourced globally to keep development costs down (Levina and Vaast, 2008). Our objective in this paper is to identify key leadership skills that are essential to effective IS leadership, with particular reference to software development. Specifically, we focus on Emotional Intelligence, a leadership skill that emerging leadership literature highlights as a critical component for leadership success, and its applicability for software development virtual teams' leadership.

Accordingly, we address the following research questions in this paper.

1. What is the nature of Emotional Intelligence in virtual teams? We review extant literature on Emotional Intelligence and propose both team leader's and team members' Emotional Intelligence are vital for virtual team effectiveness.
2. How does Emotional Intelligence influence virtual team success? We develop our research model proposing team leader's and members' Emotional Intelligence impact at individual and team levels with consequent implications for virtual team success. .

The rest of the paper proceeds as follows. First we survey literature on virtual teams, leadership, and emotional intelligence. Next we develop a theoretical model and a series of research proposition explicating the role of emotional intelligence for virtual team success. Third we present our proposed research methodology to empirically validate the research model. Finally we conclude the paper by discussing salient implications of this research.

THEORETICAL BACKGROUND

Virtual Teams and Leadership

A commonly accepted understanding of a virtual team is one where it members use technology mediated communications, who work across organizational, geographical and time boundaries to carry out team tasks and realize team goals (Jarvenpaa et al., 1999; Wakefield, Leidner and Garrison, 2008). A team is considered to be a collection of individuals who work interdependently on tasks, share responsibilities, and are aggregately regarded as a distinct social entity within an organizational system (Wakefield et al., 2008). Definitions of virtual teams generally focus on three characteristics 1) geographically dispersed individuals, 2) using information technology, 3) to accomplish a common goal. (Cramton, 2001; Maznevski et al., 2000)

While researchers point to a lack of existing research, the amount of research on virtual teams has grown in recent years (Caya, Mortensen and Pinsonneault, 2008). A challenge in researching virtual teams is that the degree of "virtualness" or "virtuality" (Kirkman and Mathieu, 2005) varies from team to team. The variability includes the extent of geographic dispersion (Reilly and Ryan, 2007) and the degree to which IT supported communication is used (Gibson et al., 2003). Consequently, the applicability or the generalizabilty of research across different contexts is debated.

Much of the research focuses on variables impacting success measured as output quality. Caya et al (2008) conducted an exhaustive analysis of the literature to identify variables associated with virtual team success. Variables positively associated with output quality include leadership (Henderson, 2008), structured processes (Massey, Montoya-Weiss and Hung, 2003), communication (Kanawattanachai and Yoo, 2007), self and team efficacy (Fuller et al., 2007), trust (Jarvenpaa et al., 2004), cohesion and interpersonal relationships (Workman, 2007), shared understanding, shared norms of IT use and task IT fit. Variables that are negatively associated with output quality include a lack of mutual knowledge (Cramton, 2001), geographic dispersion (Huang and Trauth, 2008) and conflict (Kankanhalli, Tan and Kwok-Kee, 2007).

The predominant set of variables that influence the success of a virtual team is team member related, and if not addressed adequately, can lead to conflict (Hinds and Mortensen, 2005). The virtual team leader plays an important role in managing these variables, but yet not much is understood how a virtual leader can manage a virtual team to avoid unproductive outcomes such as conflict (Wakefield et al., 2008). However, leadership research developed in the traditional context is rich and can help identify key components of virtual team leadership.

Extant literature views leadership as a trait- or attribute- based (e.g. *who* one is), behavior-based (e.g. *what* one does), or a process- or relationship- based (e.g. *how* one interacts) (Yukl, 2008). Consequently, many definitions of leadership exist, and we adopt House et al's (1999) definition of leadership as "the ability of an individual to influence, motivate, and enable others to contribute toward the effectiveness and success of the organization". Given that virtual teams, particularly the teams in the domain of software development, are knowledge worker intensive, the above definition would help examine virtual team leadership in detail. Further, it is imperative to define leadership appropriate to the context (Yukl, 2008).

In this paper we adopt the 'who one is' (trait- or attribute-based) view of leadership to detail what characteristics one must possess to effectively motivate and influence team members so that trust and understanding of each other increases and consequently conflict decrease. 'Who one is' influences 'what one does' per social cognitive theory and we specifically focus on the emotional or the affective aspect of 'who one is' in this research.

Emotional Intelligence

Emotional intelligence (EI) in organizational behavior is a growing research area that has attracted much attention as well as debate. Popularized by Goleman's bestseller "Emotional Intelligence: Why it can matter more than IQ" (1995), EI started appearing in the literature much earlier in the 1960s but it was first formally defined in Salovey and Mayer's (1990) journal article. Mayer and Salovey (1997) later decomposed EI abilities into four branches 1) perceive emotion (in self and others); 2) use emotion to facilitate thought; 3) interpret emotion; 4) manage emotion in self and others (Ashkanasy and Daus, 2005; Mayer et al., 1997; Mayer, Salovey and Caruso, 2004). This model is widely recognized as the "ability measure" of EI. Similar to how cognitive intelligence is measured, the Mayer and Salovey model measures the ability of dealing with emotion, not personality or traits. In general, EI can be defined as "a set of skills concerned with the processing of emotion-relevant information and measured with ability-based scales" (Mayer, Salovey, Caruso and Sitarenios, 2003, p 97). The debates and criticisms surrounding EI relate to how it is measured and whether they are distinguishable from other abilities and personality attributes (Brackett and Mayer, 2003). The so called "mixed" models which combine measures of both "abilities" and self-reported personality have shown inconclusive results (Ashkanasy et al., 2005).

When properly measured as abilities, EI has been consistently supported by strong scientific evidence and empirical studies (e.g., Brackett et al., 2003; Law, Wong and Song, 2004; Mayer et al., 2004; Mayer et al., 2003). Distinct from personality and cognitive intelligence, EI has significant impact on many important organizational behaviors. For example, EI has been found to positively affect team leadership and outcome (Prati, Douglas, Ferris, Ammeter and Buckley, 2003), creativity (Ivcevic, Brackett and Mayer, 2007), interpersonal relations (Brackett et al., 2003), job performance (Cote and Miners, 2006), job satisfaction (Sy, Tram and O'Hara, 2006; Turner and Lloyd-Walker, 2008), motivation (Christie, Jordan, Troth and Lawrence, 2007), and academic and professional success (Romanelli, Cain and Smith, 2005).

There are four main ways that EI is measured 1) Bar-On's EQ-i (1997) has five-dimensional trait-based model consisting of intrapersonal, interpersonal, adaptation, stress management, and general mood factors, 2) Goleman's Emotional Competency Index (Sala, 2002) is a trait-based model measuring self-awareness, self-management, social awareness, and social skills, 3) Emotional Intelligence Questionnare (EIQ) is a seven-dimensional trait-based model consisted of self-awareness, emotional resilience, motivation, interpersonal sensitivity, influence, intuitiveness, and conscientiousness (Dulewicz, Higgs and Slaski, 2003), and 4) Mayer-Salovey-Caruso EI Test (MSCEIT) (Mayer, Salovey and Caruso, 2002). MSCEIT is based on Mayer and Salovey's (1997) four branches. "1) Perceiving Emotions: The ability to perceive emotions in oneself and others as well as in objects, art, stories, music, and other stimuli. 2) Facilitating Thought: The ability to generate, use, and feel emotion as necessary to communicate feelings or employ them in other cognitive processes 3) Understanding Emotions: The ability to understand emotional information, to understand how emotions combine and progress through relationship transitions, and to appreciate such emotional meanings 4) Managing Emotions: The ability to be open to feelings, and to modulate them in oneself and others so as to promote personal understanding and growth."

Emotional Intelligence, IT & Virtual Teams

EI is not a new concept in IT. In the 1970s, Joseph Weisenbaum, a computer scientist at MIT alluded to the importance of EI when he wrote about the "whole person" that possesses skills beyond one's

intellect (Schick, 2004). Kent Beck, the creator of Extreme Programming, does not believe that IT work is "some Vulcanic world of pure rationality" and there is the need for the "whole person" (Kaluzniacky, 2004). More than ever, in today's fast-paced technology world, EI is critical in IT work success. In project management, a process vital to virtual team success, over 90 percent of the team performance issues are attributed to leadership and management skills, leaving only a small fraction of the problems related to technical skills and ability (Langer, Slaughter and Mukhopadhyay, 2008; Muzio, Fisher, Thomas and Peters, 2007).

While individual work is highly dependent on cognitive intelligence, group performance is heavily influenced by EI, which is critical in developing work relationships in group settings (Ashkanasy et al., 2005). Consequently, EI is particularly important in virtual teams. IT teams are vulnerable to emotional conflicts. Many people leave the technical field because they have problems with their supervisors reflecting a lack of 'Emotional Intelligence' (Perry, 2001). When compared with sales personnel, IT employees in general had lower levels of EI (Yildirim, 2007), which highlights the fact that both leaders and team members may have lower level of EI compared to their counterparts in other parts of an organization.

Pierce and Hansen (2008) found that leadership qualities have significant effect on virtual team member trust which in turn affect team effectiveness. Pierce and Hansen measured leadership using the big five personality factors (Goldberg, 1992). Wakefield et al. (2008) found that by playing certain leadership roles, team leaders can reduce team conflicts. Leadership factors relate to EI, however, they are distinct (Daus and Ashkanasy, 2005). It is also suggested that the importance level of EI to leadership is dependent on the relevance of EI to a particularly career or profession (Daus et al., 2005). EI's effect on virtual team in an IT context remains untested.

RESEARCH MODEL AND PROPOSITIONS

The overarching theoretical framework guiding our research is the Social Cognitive Theory (SCT), which explains how people acquire and maintain behavioral patterns (Bandura, 1977, 1986). SCT not only provides the framework to understand behavior and salient influencers of behavior, but also helps formulate intervening strategies with consequent performance implications. The core thesis of SCT is that there is a dynamic reciprocal relationship among an individual's social and physical environments, their personal factors, and the behavior exhibited. Personal factors include cognitive, affective, and conative factors that influence behavior. Bandura (1986) terms this dynamic relationship as a "triadic reciprocality".

Our research model is shown in Figure 1, and focuses on the variance of two facets of this dynamic relationship, namely personal factors and behavior. The third facet, the environment, which is the virtual team environment, is held constant, as we are not manipulating this dimension, and nor are we comparing virtual with traditional teams where members are physically collocated. More specifically, the model depicts emotional intelligence, an affective personal factor influencing behavior, measured as various performance measures, both at individual and team levels.

Caya et al (2008) in their meta analysis of virtual team research, identify three distinct dimension of virtual team performance: productivity, viability, and personal development. They detail the dimensions as follows: *Productivity* is the "extent to which a team's output meets or exceeds the standards". Quantity, efficiency, output quality, timeliness, and creativity are commonly used measure of productivity. *Viability* is the "extent to which carrying out its work permits or enhances a team's ability to continue working together". Willingness to work together in the future is a commonly used measure

of viability. *Satisfaction and personal development* is the "extent to which a team's experience satisfies the personal needs and contributes to the growth and personal well-being of its members". Satisfaction, learning, and personal growth are typical measures of this dimension.

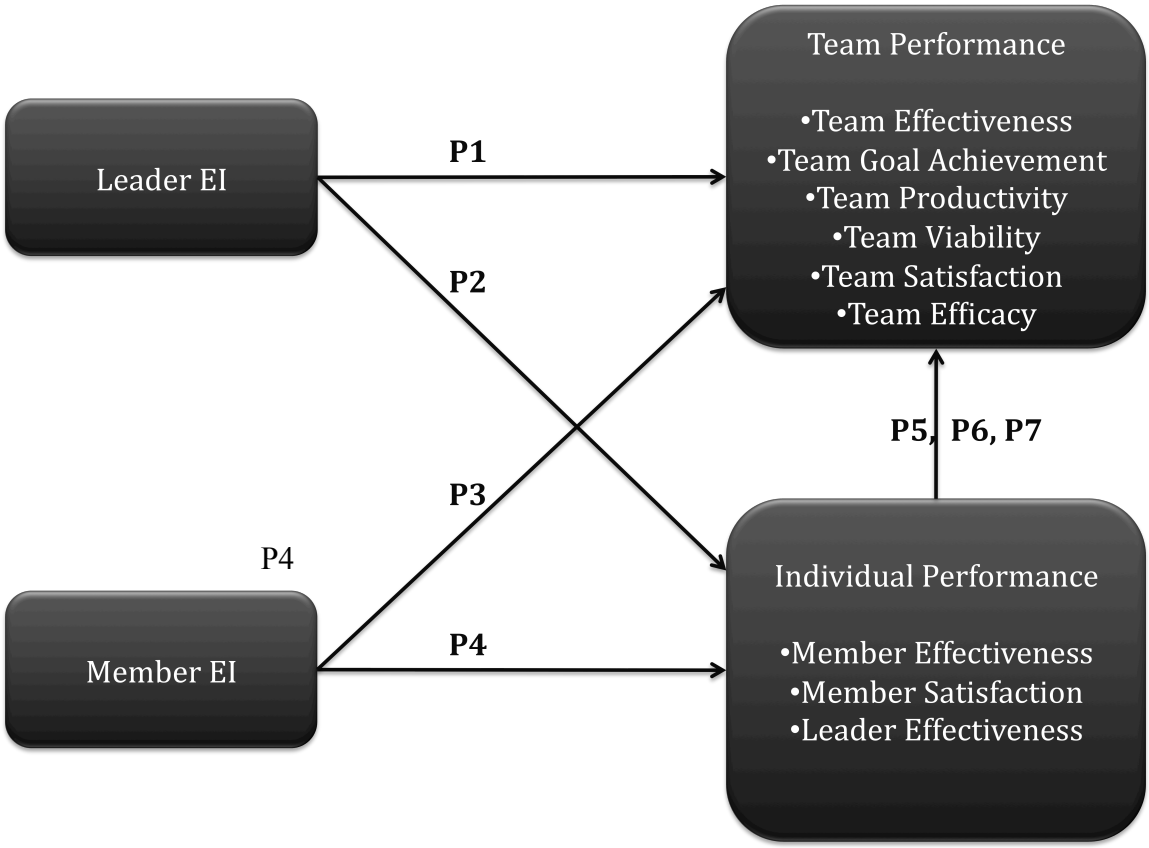

Figure 1. Research Model

We adapt and extend the performance constructs identified by Caya et al (2008) as follows. First, we consider these measures at individual and team levels. Second, we add effectiveness, and project goal achievement, as two other performance measures. We further add team efficacy as a team level performance measure. Efficacy is a central tenet of SCT (Bandura, 1977, 1986), refers to "one's judgments of his/her capabilities to organize and execute courses of action required to attain designated performance". Accordingly, we use Fuller, Hardin, and Davidson's (2007) definition of team efficacy as "a group's belief in its ability to work together successfully in a non-collocated, technology-mediated environment".

The research model depicts both team leader's and team members' emotional intelligence impacting performance. The inclusion of individual members' emotional intelligence should be noted. Earlier we had presented team performance being dependent of member EI and not just the leader EI. Our inclusion of member EI is to highlight the importance of individual's "soft skills", and how their emotional abilities influence the success of a project. Further, we contend that member EI is crucial for successful leadership.

The research model incorporates seven major propositions. Propositions 1, 2, 3 and 4 examine the effects of emotional intelligence on team performance (Prati et al., 2003) and individual performance (Cote et al., 2006; Sy et al., 2006; Turner et al., 2008). Propositions 5, 6, and 7 suggest that individual performance impacts team performance.

Proposition 1: Team Leader's emotional intelligence has a positive effect on team effectiveness, team goal achievement, team productivity, team viability and team satisfaction.

Proposition 2: Team Leader's emotional intelligence has a positive effect on member effectiveness, member satisfaction, and leader effectiveness

Proposition 3: Member's emotional intelligence has a positive effect on team effectiveness, team goal achievement, team productivity, team viability and team satisfaction.

Proposition 4: Member's emotional intelligence has a positive effect on member effectiveness, member satisfaction, and leader effectiveness.

Proposition 5: Member effectiveness has a positive effect on team effectiveness, team goal achievement, team productivity, team viability and team satisfaction.

Proposition 6: Member satisfaction has a positive effect on team effectiveness, team goal achievement, team productivity, team viability, and team satisfaction

Proposition 7: Leader effectiveness has a positive effect on team effectiveness, team goal achievement, team productivity, team viability, and team satisfaction.

PROPOSED RESEARCH METHODOLOGY

The unit of analysis for this research is a virtual team within an organization. Specifically, we restrict teams to software development teams within the information systems domain, given the research context aforementioned. The key respondent would be a virtual team participant. As this research requires the cooperation and project sponsorship of participating organizations, we plan to recruit 3 organizations that extensively use virtual teams to participate in the study. The organizations will be recruited based on prior relationship and commitments these organizations have with the IS program where the researchers are from. One organization will be used for the pilot study and the remaining for the main study. The organizations will be asked to identify several of their virtual teams that can participate in this research.

The survey methodology will be used for data collection. The survey questionnaire would contain Likert type scales for respondents to provide data. The independent variable in this research is emotional intelligence of team leaders and members. Mayer-Salovey-Caruso EI Test (MSCEIT) (Mayer et al., 2002) will be employed to measure EI. The dependent constructs will be measured using items recommended in (Cote et al., 2006; Prati et al., 2003; Sy et al., 2006; Turner et al., 2008). All our constructs are conceptualized as reflective constructs.

Pre-testing of the scales will be carried out using data collected in the pilot organization to ensure reliability and validity. Data will be analyzed using Partial Least Squares (PLS), a variance based Structural Equation Modeling technique. Our choice of this second generation technique is for the reason that it allows us to test the entire model at once unlike first generation techniques such as regression analysis (Chin, Marcolin and Newsted, 2003). Further, PLS is more suitable for theory

building than theory confirmation research contexts, and consequently appropriate in this research (Barclay, Higgins and Thompson, 1995).

Our research model includes both individual and group level predictors and criterions. It is imperative that in situations such as these to separate and group variables by their levels in any statistical analysis (Fuller et al., 2007). Further, as recommended by Fuller, Hardin, and Davidson (2007), should any group level effects be detected, individual level relationships must be evaluated in that context, and statistical techniques such as hierarchical linear models (HLM), within-and-between analysis (WABA) be employed to account for these effects. We will adhere to these prescriptions in our analysis of the data collected.

CONCLUDING REMARKS

The traditional model of virtual work in software development where requirement analysis is done at client locations (to facilitate rich interaction between user and developer teams) with subsequent phases such as design, coding and testing completed at off-shore locations is changing to a model where all phases being coordinated virtually (Nath, Sridhar, Adya and Malik, 2008). Software development is a knowledge intensive activity that relies on individual and group memory and knowledge. Effective leadership is critical to motivate a knowledge work team particularly in a virtual context (Giuri, Rullani and Torrisi, 2008; Pauleen, 2003). Virtual software development team performance is directly linked with team motivation, team flexibility and team satisfaction with the team leader (Zhang et al., 2009).

In this paper, we argued for the consideration of emotional intelligence, a personal affective factor, as a leader characteristic that can positively impact individual and team performance. We also argued for the co-consideration of team member EI. This theoretical discourse, and future empirical validation of the research model should help understand effective IS leadership and formulate leader and team training strategies. Future extension of this research could include emotional intelligence in a larger model to further explain the variance virtual team performance.

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