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The Effects of Interaction Styles, Expertise and Personality on Project Team Performance

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Abstract

The study of team performance and the variables affecting team work success has been well documented in the information systems literature. Previous research indicates that expertise, extraversion, and group interaction styles influence successful outcomes in tasks involving work teams. However, there is very little published research on the effects of these variables on team performance in database design teams. The goal of this research is to investigate how a personality trait, and individual expertise affects how teams interact, and how that interaction leads to different levels of team performance in the database design process.

Keywords: Expertise, Extraversion, “Big Five” Personality Model, Task Performance, Database Design.

JEL CLASSIFICATION: L20

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Introduction

Improving the performance of information technology project teams continues to be important to both information technology researchers and practitioners. Several variables have been identified that contribute to the success and failure of such projects, including the expertise personality traits and group interaction styles of team members.

Clark, Walz and Wynekoop (2003) found that highly successful IT personnel working on IT projects exhibited significantly higher levels of extraversion and conscientiousness than their less successful counterparts. Balthazard, Potter and Warren (2004) revealed that expertise, group interaction styles and extraversion were highly correlated with successful performance outcomes in the team environment.

This study investigates how a personality trait and expertise affect team interaction, and how that interaction leads to different levels of performance. We explore how different constellations of extraversion and expertise manifest themselves into group interaction styles and, ultimately, outcomes.

Background Literature

Interaction Styles

Group interaction, aggregated from stable personality factors of the individual group members, can be categorized as constructive, passive/defensive, and aggressive/defensive styles (Cooke & Szumal, 1994). The *constructive style* is characterized by a balanced concern for

personal and group outcomes, cooperation, creativity, free exchange of information, and respect for others' perspectives. The *constructive style* enables group members to fulfill both needs for personal achievement as well as needs for affiliation. The *passive/defensive style* places greater emphasis on fulfillment of affiliation goals only, maintaining harmony in the group, and limiting information sharing, questioning and impartiality. The *aggressive/defensive style* places greater emphasis on personal achievement needs, with personal ambitions placed above concern for group outcome. Aggressive/defensive groups are characterized by competition, criticism, interruptions, and overt impatience.

Group interaction style (GIS) is theorized to affect performance because it can impede or enhance team members' ability to bring their unique knowledge and skills to bear on the task, and the extent to which they develop and consider alternative strategies for approaching the task (Hackman & Morris, 1975). This is particularly critical for groups with heterogeneous levels of expertise, as communication by most expert group members is positively correlated with group performance. While expertise is positively related to team performance, it will be so only if the team exhibits an interaction style that permits the expertise to be heard, considered, and when possible, improved upon.

Groups whose interactions are characterized by a dominant style typically achieve a particular level of task performance and exhibit a certain level of positive contextual outcomes, such as satisfaction with the group solution, group cohesion, and satisfaction with participation. Specifically, predominantly constructive groups produce solutions that are superior in quality to those produced by passive/defensive groups and superior in solution acceptance to those produced by either passive/defensive or aggressive/defensive groups. Predominantly passive/defensive teams produce solutions that are inferior in quality to those of constructive

(and sometimes aggressive/defensive) groups and inferior in acceptance to those of constructive groups. Similarly, groups with predominantly aggressive/defensive styles produce solutions that are not as consistently of high quality as those generated by constructive groups but not as consistently of low quality as those produced by passive/defensive groups. The solutions produced by aggressive/defensive groups generate less overall acceptance than those developed by constructive groups and about the same level of acceptance as those generated by passive/defensive groups (Cooke & Szumal, 1994).

Expertise

Low amounts of expertise (i.e., a team with few or no experts) may lead to large amounts of errors, and high levels of expertise should maximize performance (Balthazard, et al., 2004). Thus, teams with higher levels of expertise have the potential for better quality information sharing among their participants, providing those teams with a greater potential to create a better solution. Counter-intuitively, however, it is probable that large amounts of expertise will result in a less-than-constructive interaction style because, without appropriate training, members may not naturally attempt to share their expertise or seek to improve upon their own knowledge. In addition, if the opinions of the experts differ, conflict is likely and could be disruptive unless the team has a constructive interaction style. Alternatively, lower amounts of expertise may lead to better interactions since participants may attempt to seek knowledge they lack (though the lack of knowledge will ultimately limit the potential of the group).

Personality

Recent research has demonstrated that personality, as assessed through standardized instruments, has a predictive relationship with job performance approaching, and in some cases exceeding, that of cognitive ability (Goffin, Rothstein, & Johnston, 1996; Nowack, 1997). The greatest single advance in personality research has been the emergence and broad acceptance of the Five Factor model of personality, commonly referred to as the "Big Five" (Digman, 1990; Hogan, Hogan, & Roberts, 1996). The Big Five are bipolar dimensions of personality that have been found to form the taxonomic (and factorial) core of personality models and also capture laypersons descriptions of personality as found in everyday language (McCrae & John, 1992; Barry & Stewart, 1997). These dimensions/factors are extraversion, agreeableness, conscientiousness, openness and neuroticism. McCrae and John (1992) investigated the history and evolution of the model and concluded that all five factors were shown to have convergent and discriminant validity across instruments and observers.

There are several reasons why personality should be considered when examining team performance. Individuals working in teams each bring something to the team that affects the way the team interacts. This "something" consists of expertise, cognitive ability, and the personalities exhibited by each team member. Research indicates that there is a complex and profound relationship between personality and job performance (Barrick & Mount, 1991; Barrick et al., 1998). Also, many companies use personality assessment tools (e.g., Myers-Briggs Type Indicator — MBTI) to assist in hiring decisions and work assignments of their employees.

The predictive utility of personality assessment is enhanced when job type and personality constructs are matched, either based on the findings of previous research, rational analysis, or a thorough personality oriented job analysis (Raymark, Schmit, & Guion, 1997). This is to say, different tasks demand different personality profiles (Hogan, 1996).

Extraversion, widely agreed to be the first "Big Five" personality factor, appears to be a valid predictor for tasks involving social interaction (McCrae & Costa, 1987). As such, it is the most appropriate initial factor to examine as we deal with interaction styles and performance in teams in this study.

Extraversion refers to the degree to which individuals are gregarious, friendly, compliant, cooperative, nurturing, caring and sympathetic in contrast to introversion, which is characterized by those who are shy, unassertive, and withdrawn. Extraversion affects interpersonal relations through the quality of social interactions (Barry & Stewart, 1997; McCrae & John, 1992). Extraverts are usually active participants in group interactions and often have high intragroup popularity (Barry & Stewart, 1997). Barrick and Mount (1991) also found that extraversion was a personality factor that consistently related to success in the work place. They concluded that extraversion correlates positively with individual performance in jobs involving social interaction. Barry and Stewart (1997) found that at the individual level, extraversion was the "key" personality correlate with individual impact on group performance. At the group level the proportion of high extraversion members in a group was found to be curvilinearly related to group processes and performance (Barry & Stewart, 1997).

The proportion of group members that are high in extraversion may be related to the groups' interaction style, which in turn, affects both the objective group performance (i.e., task solution quality) and subjective contextual outcomes such as acceptance of the group solution. Too few extraverts can result in low performance whereas too many extraverts can lead to a decrease in group performance due to the group's lessened ability to remain focused on task completion (McCrae & Costa, 1992, 1996). Two possible reasons are: 1) extraverts may be more concerned with pleasurable social interactions than task completion (Barry & Stewart, 1997) and,

2) too many extraverts may result in intra-team conflict. Recalling that one of the characteristics of extraverts is dominance, conflict can occur when there are too many dominant individuals (Mazur, 1973).

To summarize, previous research shows that, while expertise is positively related to team performance, it will be only so long as the team exhibits an interaction style that permits the expertise to be heard, considered, and when possible, improved upon. The presence of extraverted team members is conducive to this process only if those members place high value on social rather than task-related processes. If expertise held by non-extraverts is suppressed, the results may be lower information sharing, lower performance, and lower satisfaction with the process. Even if extraverts hold the expertise, dominated introverts will likely feel less free to contribute and improve upon the knowledge, yielding lower performance as well as lower satisfaction with the team process..

Propositions

The general propositions, which the hypotheses will be based on, are as follows:

Proposition 1: *The proportion of extraversion members in a team will influence the development of group interaction styles.*

Proposition 2: *The proportion of extraversion members in a team will predict task performance outcomes.*

Proposition 3: *The proportion of extraversion members in a team will predict contextual performance outcomes.*

Proposition 4: *The proportion of expertise members in a team will predict task performance outcomes.*

Proposition 5: *Group interaction styles will influence task performance outcomes.*

Proposition 6: *Group interaction styles will influence contextual performance outcomes.*

Methodology

This study involves 106 senior-level and graduate students from a large metropolitan university that were formed into 30 project teams. The teams completed a modified version of the Lost River Wind Riders database design project (Parker, 2005). The project was modified so that it would fit within the time constraints of a one-semester undergraduate database class. The students worked throughout the semester in teams working on the different parts of the project in conjunction with the coverage of the relevant topic areas in the class. This project accounted for a significant portion of their grade, thereby contributing to the motivation for doing well.

At the end of the semester, the students completed survey instruments that measured their personality styles and their group interaction styles. Two measures of individual expertise were used. In the first measure, the researcher assessed the expertise of the subjects by having them complete a survey (see appendix A). In the second measure, expertise was determined by the overall course grade achieved by each student at the end of the course. The participants completed the Adjective Checklist[®] instrument, which measures personality characteristics of the subjects, and the Group Styles Inventory[®] which measures how the subjects interact in a team environment.

Statistical Analysis

Hypotheses will be developed and tested using correlation analysis, and PLS analysis.

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