The Role of Wireless Communications in Temporary Team Formation

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ABSTRACT

In this paper, an exploratory study of the impact of wireless communications on temporary teams is presented. Assessed is the impact of cell phone usage on team formation. Also the flow absorption with the wireless artifact is assessed in terms of team performance. Gender differences using the cell phone to build and maintain teams are assessed. The results indicate that there are gender differences in wireless communication and cell phones that facilitate team formation. Interestingly flow absorption with the cell phone improved team performance.

Keywords: Wireless communication, cell phones, flow, richness, team performance

1. INTRODUCTION

Wireless devices have become ubiquitous for work and for play throughout the world serving as accessible transmitters of information at a reasonable cost. Yet little research exists on the impact of these means of coordination on temporary team formation. Wireless communication along with social networking web sites enables invisible colleges of individuals to coordinate collaborative action where Crane (1972, p. 1) states,

> "But in sharp contrast with the attention being paid to how knowledge is stored, distributed, and used, relatively little attention has been paid to why and how knowledge grows."

These media serve as the linchpin of social systems representing an enormous social force with the potential to motivate collective action. Given the potential of these temporary teams to effect significant societal change little is known about the forces that constitute using these media and how they translate into collective action. The purpose of this paper is to address the use of cell phones in enabling temporary team formation and the collective action taken by these temporary teams.

2. TEMPORARY TEAMS

Temporary teams are formed to tackle projects often by groups of knowledge workers involved in information technology, auditing, consulting, etc. (Markus, Tanis, and Fenema, 2000). These teams can function in both face-to-face and in virtual modes enabled by computer based technologies. Temporary teams can exist for differing lengths of time and the membership in these teams can change as the task develops. Some of the team members may have worked with fellow team members on other projects while some team members may be entirely new to the group members. This fluidity of teams both in terms of type of contact and in terms of membership provides an interesting research context in which to address the impact of wireless media on team formation and team functioning.

3. GENDER

Another interesting dynamic to teams is the gender composition of a virtual team. Systematic difference in communication have

been identified by Fishman (1983) and Meyers, Brashers, Winston, and Globe (1997) where women have a tendency to work harder at maintaining communication in a face-to-face situation such that women value connection and cooperation more than men (Meyers et al, 1997). Gefen and Straub (1997) showed that while women perceived email differently than men that these differences in perception did not translate into actual differences in usage.

Schein (1975) showed that women are often classified by sex role stereotypes where women are described as understanding, helpful, and intuitive with men characterized as competent, intelligent, and persistent. Lind (1999) showed that women in virtual teams felt more comfortable in expressing opinions than women in face-to-face teams. What is not clear from this research is how gender impacts the team formation activities which are particularly important in temporary work teams which must organize quickly to work on an issue and then disband.

4. COMUNICATION RICHNESS

Views of wireless media used as conduits of knowledge sharing are based in both information richness theory and in social networking theory (Lind, 2007). In information richness theory it has been shown that richer media are characterized by the transmission of non-verbal cues, immediate feedback, and accessibility (Daft and Lengel, 1984; Lind and Zmud, 1991). Wireless communication provides immediate feedback and is very accessible. Wireless communication modes have also reached a critical mass (Markus, 1987) becoming the preferred form of rapid communication in social networks which serve as a conduit for organizing the social system and diffusing information within the social system. Critical social theory extended information richness where the richness of a medium was determined by how the user of that medium enacted the channel and the information flowing through that channel. Also a person's past communication experiences help to shape channel usage and perceptions. So some individuals embrace rich, complex information while others may filter the information for efficiency or to fit their individualistic approach to information processing (Ngwenyama and Lee, 1997).

As Habermas (1984) argued the purpose of communication is to reach a mutual understanding among those communicating. Wireless cell phone communications provides an accessible and fairly rich medium to use in organizing groups to discuss events, achieve mutual understanding, and to undertake collective action. For many, wireless communications has become their primary means of communication eliminating the need for land phones where the cell phone are always on and accessible to the person. These wireless media have created enormous opportunities for rapid team organization where the team chooses to collaborate electronically or face-to-face.

5. FLOW ABSORPTION

A flow state is one that is playful, exploratory and may involve an artifact of amusement or an intense activity Csikszentmihalyi (1975). Lind (2007) proposed that the wireless communication channel can become such an article of amusement and induce a flow state in the user. The cell phone provides the user control over interaction and engages the user's attention. Csikszentmihalyi (1990, p.4) states with respect to flow,

> "The state in which people are so intensely involved in an activity that nothing else seems to matter, the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it."

People become absorbed in their cell phone artifacts staring at its screen for messages as they move from location to location. The cell phone provides for the users some control over their life as they schedule their day's activities and check for messages to see if any of these activities have changed. Flow provides a feeling of order and goals where as Csikszentmihalyi (1990, p. 31) says,

> "goals are clear, feedback relevant, and challenges and skills are in balance, attention becomes ordered and fully invested."

6. PROPOSITIONS

As discussed, cell phones present enormous opportunities to facilitate group formation. Temporary teams can easily be assembled to attack a problem. Individuals who have

achieved a state of flow with their cell phone usage will extend this knowledge to using the cell phone artifact as a tool for organizing collective action with teams.

Proposition #1: Cell phone knowledge by team members will facilitate team formation.

In teams where the members have achieved a state of flow with their cell phones, the team members will be better able to manage the ongoing activities of the group. The wireless artifact is used to arrange group meetings and non face-to-face interaction and will then facilitate the acquisition of information in the face-to-face group meetings.

Proposition #2: Flow absorption by team members with the cell phone artifact will enhance team performance.

Research has shown that gender differences exist in media usage with early email showing that women used email as much as men but perceived it differently. Further research showed that women felt more empowered in virtual as compared to face-to-face teams. In this research it is proposed that women will make more use of cell phones in trying to organize a team and to keep the team functioning.

Proposition #3: Women will make greater use of cell phones in organizing the team than men.

7. RESEARCH DESIGN AND ANALYSIS

Students (n = 148) from traditional face-to-face classes were assigned to teams to carry out a class project. Team members were given a survey to assess their use of cell phones in the context of coordinating their team activities. These surveys were administered at the end of their team project.

Table 1 [see Appendix] shows the questions and the mean scores from all 148 respondents. Of these respondents 66 were women and 80 were men.

Table 2 shows t-tests comparing the mean scores for each of the measures from Table 1 comparing the female respondents to the male respondents.

From the t-tests in Table 2 there were only two significant differences but both were higher for the women. Women viewed cell phones as a means to make team activities easier, and they also felt that cell phone made it easier to work with the team outside of class. This provides support for Proposition #3 that women will make greater use of cell phones in organizing the teams.

In this exploratory research the items from the survey were used in hierarchal regression to address the Proposition #2 on team performance. The items from the survey that entered the regression are show in Table 3 yield a R-Square of .302. Team performance was predicted significantly by cell phone enhances team work, flow absorption (loose track of events), and enjoy playing with cell phone features (another dimension of flow). Talking to team members with cell phone, relying on teammates for materials, the extent of use of cell phone in team work, use of cell phone to arrange meetings, and the use of cell phone to work with team members outside of class were not significant. Interestingly the extent that the cell phone enables the group member to do the team work more quickly had a negative, non-significant coefficient. This may be explained that while the cell phone is very useful for organizing the meeting the use of the cell phone for non team activities in a team meeting can take away from team performance. The tolerance indicates little if any multicollinearity among the independent variables.

In assessing Proposition #1, hierarchical regression was run where the dependent variable was the extent that the cell phone was used to setup meetings. Table 4 shows a good model fit was achieved and the two key predictors were extent that the cell phone was easy to use and the extent that the cell phone enabled the accomplishment of activities more quickly. The tolerance indicates little if any multicollinearity among the independent variables These results yield strong support for Proposition #1.

8. DISCUSSION

This exploratory study provides support for the propositions. Support is strong for the proposition that cell phone knowledge by team members supports team formation. This means that those who were more skillful at using the cell phone features and could accomplish activities more quickly, were better able to setup team meetings.

In support of Proposition #2 team performance was significantly predicted by cell phone usage with the team, by the flow item, with the user loosing track of events when using the cell phone, and the user's desire to play with the feature of the phone. This shows that not only knowledge of the phones' features but also immersion in the communication context of the phone allows these users to improve team performance. The cell phone becomes an extension of their communication culture that enables the team to quickly become involved in the team project work.

9. FUTURE RESEARCH

Research is needed with both face-to-face and virtual teams regarding team performance and team functioning. One area of team functioning is collective team identification (Bergami and Bagozzi, 2000; Van Der Vegt and Bunderson, 2005) which addresses the commitment to the team by its members. Through this process of social identification the team becomes a cohesive unit to enable collective action as the group develops shared mental models (Mathieu et al, 2000). The shared mental models are enabled by using technologies, task accomplishment, team interaction, and individual differences of team members. This paper addresses team organization and team performance using cell phone technology and showed that there are differences in team perceptions regarding the cell phones when comparing male to females. Needed are further studies to address the impact of cell phones on the cohesion and collective team identification of both the virtual and face-to-face teams.

Needed are studies that compare virtual teams to face-to-face teams and to assess if the cell phone is only advantageous for the mostly face-to-face teams. Will the wireless technology affect the development of trust (Javenpaa, Shaw, and Staples, 2004) and cohesion (O'Reilly, Caldwell, and Barnett, 1989) equally within the face-to-face and virtual teams? These studies need to be conducted in project contexts for field workers in different time zones. The effectiveness of these media need to be assessed for projects of low complexity and for large complex projects. This will enable researchers insight into the impact of project complexity on communication media choice.

10. REFERENCES

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TABLE 1 DESCRIPTIVE STATISTICS: CELL PHONE SURVEY
Likert Scaled Items 1 to 5: No Extent to Very Great Extent

Items: Extent to which:	Mean	Std. Dev
easy for you to become skillful using the cell phone	3.75	1.12
the cell phone increases your productivity during a typical day.	3.89	.96
you use cell phone to arrange meetings with the team.	3.88	1.03
you loose track of events using the cell phone		
you enjoy playing with features of the cell phone.	3.15	.92
you use text messaging with teammates.	3.02	1.42
the cell provides control over team activities.	3.02	1.18
you feel in control.	3.03	1.25
you use cell phones in talking to fellow team members	3.59	1.11
you rely on teammates for information/materials.	2.67	1.03
you rely on teammates.	2.41	1.15
you depend on teammates.	2.34	1.06
your cell phone enables you to do work with the team more quickly.	3.42	1.10
you use the cell phone to work with the team outside of class.	3.50	1.18
cell web browsing helps with team performance.	2.16	1.33
cell phones improve team performance.	3.45	1.05
you use the cell phone in team work.		
cell phone enhances team work.	3.52	.98
the cell phone makes team activities easier.	3.82	.93
used cell phone to accomplish team activities quickly.	3.83	.87
Sample Size (N)	148	

TABLE 2 GROUP STATISTICS BY GENDER

Items Extent to which:	Mean Males n=66	Mean Females n=80	*
easy for you to become skillful using the cell phone	3.72	3.79	
the cell phone increases your productivity during a typical day.	3.86 (.93)	3.95 (.98)	
you use the cell phone to arrange meetings with team.	3.83 (.97)	3.91 (1.08)	
you loose track of events using cell phone.	3.34 (.86)	3.21 (.96)	
you enjoy playing with features of the cell phone.	3.21 (.76)	3.19 (.89)	
you use text messaging with teammates.	2.89 (1.31)	3.10 (1.50)	
the cell phone provides control over team activities.	2.73 (1.00)	3.24 (1.23)	*
you feel in control.	2.92 (1.21)	3.11 (1.28)	
you use cell phones in talking to fellow team members.	3.44 (1.13)	3.70 (1.10)	
you rely on teammates for information/materials.	2.67 (1.06)	2.65 (1.02)	
you rely on teammates.	2.52	2.47	
you depend on teammates.	2.36	2.34	
the cell phone enables you to do work more quickly.	3.18 (1.07)	3.58 (1.09)	
you use the cell phone to work with the team outside of class.	3.30 (1.04)	3.64 (1.27)	*
cell web browsing helps with team performance.	2.39 (1.25)	1.95 (1.29)	
cell phone improves team performance.	3.42 (.96)	3.45 (1.12)	
you use the cell phone in team work.	2.53 (1.21)	2.30 (1.10)	
the cell phone enhances team work.	3.53 (.96)	3.74 (1.02)	
the cell phone makes team activities easier.	3.11 (1.05)	3.58 (1.31)	**
used cell phone to accomplish team activities quickly.	3.85	3.82	

T-test: * p <.10, ** p <.01

TABLE 3 PERFORMANCE REGRESSION MODEL

Dependent Variable: Team Performance Rsquare = .302	B	Significance	Tolerance
(Constant)	.483	.263	
cell phone enhances work with the team	.256	.007**	.653
loose track of events using cell phone	.158	.067*	.873
enjoy playing with features of cell phone	.136	.088*	.697

Significance: * p <.10, ** p <.01, *** p < .001

TABLE 4 MEETING SETUP REGRESSION MODEL

Dependent Variable: Cell phone to setup meetings Rsquare = .395	B	Significance	Tolerance
(Constant)	2.120	.350	
easy for you to become skillful	.272	.082***	.893
used cell phone to accomplish activities more quickly	.202	.076**	.891

Significance: * p <.10, ** p <.01, ***p<.001