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# THE VALUE OF CONFLICT IN SOFTWARE PROJECT TEAM: A SOCIAL NETWORK PERSPECTIVE

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## ABSTRACT

Conflict management is critical to project human resource and communication management. Conflict is inevitable in project and teamwork. Properly managed, a certain amount of conflicts is beneficial. However, the relationships between conflict management and team performance are inconsistent in previous studies.

This study investigates the how project members' interpersonal relationships among internal members and external actors are related to the conflict solution satisfaction, and examines the effectiveness social interaction and satisfaction on the relationship between conflict management style and team performance. This study strives to make two contributions. First, this study adds to the sparse empirical evidence on the impact of social interaction ties on conflict management. Second, recent work on social interaction in organization has emphasized how social ties provide information and resource to a focal individual. We attempt to extend this concept at team level. In examining the relationship between social interaction ties and conflict solution satisfaction, and further affect the relationship among conflict management and team performance, this study provides a rationale for project managers to develop their conflict management skills.

**Keywords:** Software project management, Conflict management, social network, team performance.

## INTRODUCTION

Most of previous studies about project conflict management investigate the relationship between conflict and team performance. Similarly, the researches of interaction ties in organization are focus on how interaction affects performance. To our knowledge, no existing empirical research addresses the question of how interaction shapes the behavior of conflicts and the effectiveness of varied interaction ties on conflict resolution. The increasing specialization and outsourcing are reasons to have a project team including members not only in organization but throughout inter-organization (such as customers and suppliers). Consequently, conflicts are increasing as a result of different goal of organization. In this case, to resolve conflicts by organization powers are limited. In addition ICT can help to improve the communication among project members and as such help to create social ties under virtualization and informal interaction, such as Facebook, Line. Consequently, how the social ties affect the conflict management is critical to practitioners and academia. Thus, the purposes of this study are to 1). Investigate different types of social ties existing within project team, and further enhance the effectiveness of informal communication on conflict management. 2). Define the satisfaction for conflict resolution and explore the strategy of conflict management. Furthermore, investigate the relationship among social ties, style of conflict management, and satisfaction for conflict resolution.

## LITERATURE REVIEWS

### Conflict Management in Software Development Environment

Conflict refers to any situation in which organization members have incompatible goals, interests, principles or feelings about team works. The potential conflict may emerge as a result of members coming from different social backgrounds and a diverse work experience and cognition within authority and hierarchical setting. Conflict management is a process which uses a properly management skills and rules of the organization to avoid, processing or accommodating conflict and, in turn, improves group outcomes, including effectiveness or performance in organizational setting[1-4]. Conflict management is one of nine knowledge areas of a project, and is one of the key skills that a project manager should have. 20%-30% of department leaders' time spent in dealing with conflict and its consequence in general organization. However, a lot of conflicts exist due to the limitation of time, budget, resource with respect to a project as well as incompatible goals among project stakeholders, and project managers need more time and effort to resolve interpersonal conflicts.

Conflict can be understood as a complex interaction between many factors, such as negative emotion and lack of communication. The members of software project usually suffer more psychological stress arises from risk and uncertainty of interdisciplinary technology integration or new technology. They also have a stronger need for growth and confident than the general population[5]. Therefore, authority or rule of management is not at all effective at dealing with conflict when both sides are "opinionated experts". These conflicts frequently result in negative outcomes[6]. However, some studies recognized the importance of proper conflict management skills that lead to developing creative and effective project outcomes[7, 8]. Liu et al. (2008) pointed out that a collaboration conflict management style is positively associated with virtual team satisfaction. Schwalbe(2010) considered that managers not only to resolve conflicts, but sometimes to create conflicts those help in project enhancement and improvement. Schwalbe(2010) mentioned conflict might contribute to new ideas and creativity and avoid groupthink.

Previous researches about project management suggest five conflict management strategies: Accommodating, Avoiding, Collaborating, Compromising, and Competing[8, 9]. However, these strategies are just given as general recommendations and are not guaranteed to work for every project. It is worthy to go deep into conflict issues in term of project under instable conditions of software development with widening application areas. Study in software project settings have found that 'Problem-solving' style is positively correlated with 'Satisfactory Conflict Resolution' while 'Asserting' and 'Avoiding' styles are negatively whether conflict among IT staffs or IT users[6]. They also mentioned that 'Satisfactory Conflict Resolution' of IT staffs will affect IS quality while 'Satisfactory Conflict Resolution' of IT users will affect usage of IS. Chen&Tjosvold(2002)investigates how conflict management can contribute to team effectiveness by developing justice in term of three approach: cooperative, avoiding, and competitive[10]. Their research stated that "a cooperative approach to conflict leads to distributive, procedural, and interactive forms of justice which in turn promote team effectiveness." while avoiding approach and competitive approach were not as consistently related to justice as cooperative conflict. Chen&Tjosvold(2002)emphasized the indirect influence of a cooperative approach to conflict on team effectiveness through justice. Moreover, the study of Liu et al.(2008) argued that collaboration style of conflict management affect the team satisfaction instead of team performance.

Despite these studies use various terms to refer to styles or approaches of conflict management, connotation of these terms are similar. Problem-solving[6], cooperation conflict management[10], and collaboration style of conflict management[7] are refer to the coping strategy that manager actively seeks to interpersonal conflict management, or achieves the largest common denominator between both sides of conflict. However, the results of above studies regarding the relationship between conflict management strategy and team performance are inconsistent. Consequently, this study attempted to explore whether there are other variables that should have been included to explain the effectiveness of conflict management approach.

In this respect, Liu et al.(2008) pointed out a significant relationship between interaction or organization structure and team performance. They found team members who work in a non-hierarchical situation are more likely engage in exchange of knowledge and create new idea or solution for team work. Besides, Tjosvold et al. (2005) demonstrated that teams with stronger team relations and better human relationships are better at managing conflict cooperatively[11]. Human relationships include such as friend-to-friend, parent-to-child, sibling-to-sibling, employer-to-employee, and many more. Social network researches regarding the influence of social interaction on team behavior in common workplace or group have been investigated for many years [12-16]. For example, Oh et al. (2004) found team benefits associated with informal relationships. Mehra et al.(2006) considered that friendship in the workplace allows employees to achieve greater work performance, and formal and informal leaders to coordinate and act efficiently in a group. In addition, Zhou et al.(2009)showed the size of the weak tie network increases creativity. Grosser et al.(2010) argued that the practice of gossip (informal communication) may be recognized as an effective means of workplace communication and could benefit to conflict resolution. Project is a temporary organization with a defined start and end date. Although but the concept of combining social network and conflict management in project organization is still lacking, the above studies form the basis for this study.

### **Social Network and Social Interaction Ties**

A social network is comprised of a set of actors, which can include individuals, work groups, projects, events, objects or products [17]. Social interaction indicates a connection between two or more people or objects, including tangible things such as money, services and products or intangible things such as information, influence or social support[17-19] Some studies have defined social interaction as "ties" [20] or "interaction ties". Regardless of the terminology used, all of these studies focus on capturing social network patterns which correspond to the meaning of social capital that can facilitate resource or information exchange [21, 22] and bring further value or benefits to social actors.

As online activities become part of the daily routine of social actors, interactions among social actors shift from the real world to virtual space. The reality of online collaborative applications brings new communication contexts (e.g., anytime, anywhere and asynchronous) and changes in social behavior. Thus, social researchers have investigated whether the effectiveness and influence of social capital and social networks differ between real world and virtual contexts [20, 23-28]. For example, Chiu et al. (2006) and Wasko&Faraj (2005) noted that social ties resulting from social interaction (or network configuration such as centrality) affect knowledge contribution in the virtual community. Other researchers also suggest that online social capital and social networks fostered through online interaction and reciprocity enable auction actors to participate in auction activities more efficiently and effectively [29-31]. In a common workplace, several researches supported the effectiveness of social interaction and social ties on team performance. For example, Rosenthal (1996) showed a significant relationship between team performance and the average social capital of individuals on the team. He pointed out that a quality management team "composed of employees with more entrepreneurial networks were more likely to be recognized for their success in improving the quality of plant."[32]

Moreover, several researches noted that the strength of tie is key property of information exchange and emotional support among group members. Strong ties create transitivity. Two nodes linked by a strong tie will have mutual acquaintances and have similar or identical perspectives and access to the same information. On the contrary, weak ties are conduits across which an actor can access novel information. However, in-depth interviews and observation are required for determining whether a link in a social network is a strong tie or a weak tie. Thus, based on the study of Luo (2010), this study suggest three types of social interaction, including Emotion, Information, and Consultation Social Ties, which could influence group activity[33]. This classification be applied in practice in term of formal organization and project team.

## **RESEARCH MODEL AND METHOD**

### Research Model

This study aimed to investigate the effect of varied social interaction on conflict resolution. Drawing on the researches of Luo (2010) and Chiu et al. (2006), this study proposed a research model (showed in Figure 1) of satisfaction for conflict resolution with three types of social interaction. Table 1 list the questionnaire items used to measure each construct, together with construct definition.

Table 1 Summary of the Survey Items used in this Study's Analysis

	Definition	Items
Emotion Social Ties	Formalizing based on stable social relationship, such as family and friendship, and may provide ways to relieve work pressure or express emotion.	I really care about keeping good interaction with my family members.
		I have close friend who could share my feelings, my happiness and sadness.
		I usually talk about unpleasant work experience with my family members or friend.
		I spend a lot of time interacting with my family members or friend.
Information Social Ties	A conduit for information exchange, including work-related message, notify or gossip.	I really care about keeping good interaction with my classmates.
		My classmates frequently share project information for me.
		I usually go lunch and have a chat with my classmates.
		My classmates frequently share gossip news for me.
Consultation Social Ties	A formal communication channel transmits information or knowledge about project and information technology.	I really care about keeping good interaction with IT expert.
		I have good friend who could share IT Knowledge.
		I frequently share my knowledge with classmates.
		I spend a lot of time interacting with IT expert.
Satisfaction for conflict resolution	The attitude of project members regarding how a clear and consistent opinion is developed with stakeholders in the process of conflict management.	The resolution of conflict and reducing of discrepancies about project always effectively achieved.
		I am satisfied with the trading and interactions I have experienced with actors in the auction website.
		I usually despair about the result of conflict resolution. (Reverse item)

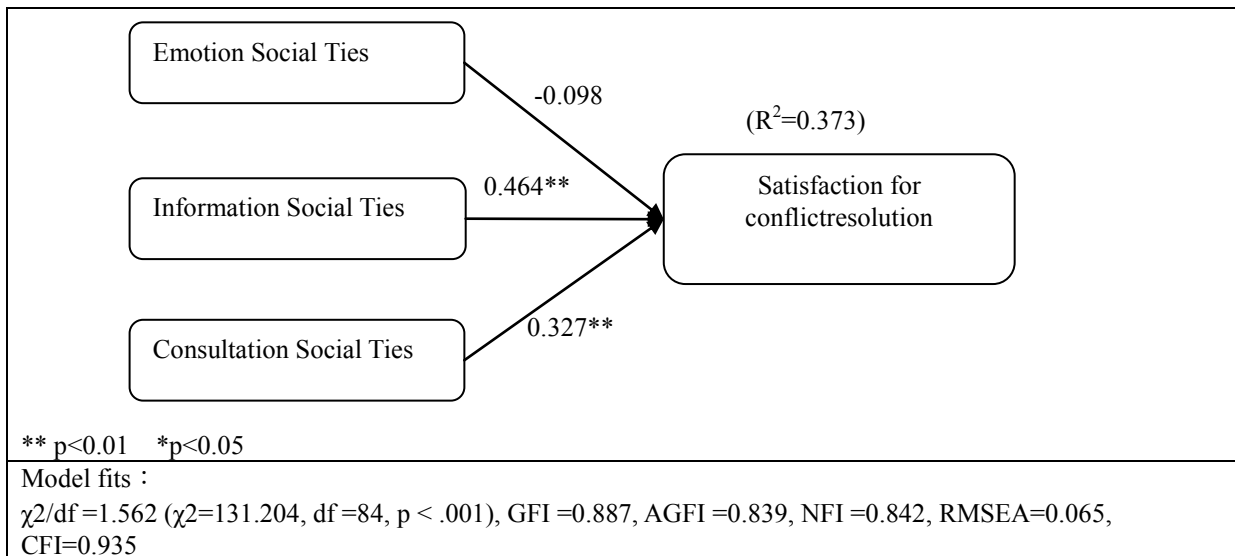


Figure 1 research model and testing results

#### Research process and subjects

The sample data for the study was taken from students who are major information technology and having a graduation project in Taiwan. The graduation project is similar a small software project that students have to integrate their IT capacity and teamwork with collaboration to complete an IT system. Respondents were directed to complete a Questionnaire.

### DISCUSSION AND CONCLUSION

The theoretical model and hypothesized relationships were tested collectively using AMOS 5.0. Goodness of fit was tested using six common model-fit measures: chi-square/degrees of freedom, goodness-of-fit index (GFI)[34], adjusted goodness-of-fit index, normed fit index (NFI)[35], root mean square error of approximation (RMSEA) [36] and comparative fit index (CFI)[37]. Taken together, the results of the model fit analysis suggest that the structural model acceptably fit the data (see Figure 1).

The results of this study show that the effect of three dimensions of social tie on satisfaction is different. Information and consultation social ties are significant predictors of satisfaction, while emotion social ties are insignificant. Moreover, the path coefficient between information social ties and satisfaction is 0.464 which is stronger than the path from consultation social ties to satisfaction. These results suggest that conflict resolution of software project rely on not only the exchange of technology, but also on informal communication. The relationship between emotional social ties and satisfaction is insignificant. A possible explanation is most of emotion social ties are linking project members to their family or friends instead of project stakeholder, and providing emotion output rather than practical solution for conflict.

To summary, this study suggests that creating technology and knowledge exchange network, as well as informal communication network, are critical to conflict resolution of project. For example, having a dinner party or outdoor activities far from project could be encourage the exchange of information and further enhance the effectiveness of informal communication on conflict resolution.

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