

行政院國家科學委員會補助專題研究計畫成果報告

※ 衝突潛源與建設性衝突管理-以資訊系統開發過程為例 ※

✧ Conflict Potentials and Constructive Conflict Management ✧

✧ – An Example of Information System Development ✧

計畫類別：☒個別型計畫 ☐整合型計畫

計畫編號：NSC 89-2416-H-006-006-SSS

執行期間： 88 年 8 月 1 日至 89 年 7 月 31 日

計畫主持人：葉桂珍

共同主持人：賴孟寬

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衝突潛源與建設性衝突管理－以資訊系統開發過程為例

Conflict Potentials and Constructive Conflict Management – An Example of Information System Development

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1、中文摘要

由人類功能的觀點，本計畫提出資訊系統開發過程中，兩個可能的衝突潛源－使用者的「情緒敵對」與「實質不滿」。主要目的在驗證，就「建設性衝突管理」而言，認清一可能引起衝突的情境，並透過「使用者參與」解決該情境或潛源，比僅解決開發過程中的一些外在衝突，更重要許多。

關鍵字：情緒敵對、實質不滿、使用者參與

Abstract

From the view of human functioning, this study proposes two conflict potentials – users' substantive dissension and emotional hostility, during IS development. The purpose is to show that recognizing a situation that has the potential to cause conflict and solving it through user participation is more imperative than simply reducing the manifest conflict to constructive management of conflict during IS development.

Keywords: emotional hostility, substantive dissension, user participation

2. INTRODUCTION

Intergroup hostility, poor communication, and negative perceptions of other parties have been noted in the IS (Information System) development literature as symptoms of conflicts between users and IS developers (e.g. [13, 4]). While the competitiveness within a conflict can increase the participants' motivation and creativity, a high level of conflict can damage the system as it may be used merely to justify adversarial positions rather than to seek answers [6]. At first glance, these conflicts seem more interdepartmental than interpersonal, yet following the theorists on conflict (e.g., [8]), perceptions of the intergroup conflict are also much affected by the quality and frequency of the interpersonal interaction. Personal biases over in-group/outgroup differences develop and grow more pronounced as conflict increases [8]. A conflict structure in terms of personal functioning is appropriate for a study of conflict

process during IS development.

This paper has two primary objectives: firstly, from the view of human functioning, to propose two conflict potentials – user *emotional hostility* and *substantive dissension*, and quantify their effects on IS development outcomes. Secondly, if project outcomes in fact are negatively affected, we examine whether user participation can moderate those effects. The sample tested was end-users from Taiwan's enterprises, where users seem less involved in an IS development than their counterparts in the US.

3. BACKGROUND

3.1. Conflict Potentials

Conflict potential can be viewed from several perspectives. As causes of conflict, Barki and Hartwick [3] suggest look for dimensions associated with organizational factors; Banner [1] suggest consider from the levels of human functioning. In discussing the transformational perspectives for conflict resolution, Banner [1] points out that serious conflict is mainly due to people's high attachment to something at either the *physical* or *mind* function level of human. Banner's theory of two-leveled conflict potentials is analogous to the two conflict issues proposed by Ware and Barnes [15]. Ware and Barnes' [15] indicate that most conflicts originate from two distinctly different types of issues: *substantive*, which involve disagreements over organizational practices such as policies, procedures, roles and responsibilities, and *emotional*, which involve highly personal perceptions and feelings about other people and about the substantive issues at hand. The *emotional* conflict is hard to detect, since, due to social norm, people often rationalize and express it as a substantive issue [15]. A conflict research, however, needs to start with both issues, because, while the emotional feelings may be justified in expression, it often turns into memory distortions. Such

distortions may prevent in-group members from disconfirming stereotypes of an out-group [8], and eventually become a potential fuel of future conflicts.

3.2. Conflict and User Participation

Smith and McKeen [13] conclude four sources of conflict during IS development: disagreement about computerization control, differences in goals and time frames, lack of measurable benefit, and disagreement over roles and responsibilities. **User participation** is the behaviors, assignments, and activities that users or their representatives perform during IS development [2].

Conflicts during IS development may be resolved through user participation in the process. Robey and Farrow [10] have studied the influence of participatory dynamic on conflict and its resolution during IS development. Barki and Hartwick [3] extended Robey and Farrow's [10] work by arguing the appropriateness of separating conflict into two constructs as *disagreement*, and *manifest conflict*. They suggest that, as a key cause of conflict, *disagreement* may increase *manifest conflict*; in addition, due to provision of more occasions for personal voices, *manifest conflict* is also possibly elevated by *user participation*. Following the above discussion, conflict resulting from the user participation process can be resolved constructively. However, no works have separated the conflict potentials in IS development into *physical* and *mind* levels, or *substantive* and *emotional* issues, for study of conflict process as suggested by conflict scientists. It is the purpose of this paper to supplement the gap in part.

3.3. User Participation in IS Developing in Taiwan

Taiwan, while succeeds in high-tech manufacturing, has encountered obstacles in the development of its information service sector. Environmentally, the problems include small operation size, small domestic market, low software prices, inadequate R&D ability, deficient intellectual property law, and lack of marketing plans and services [14]. Apart from the ecological barriers, it is also facing a number of MIS issues. Among them, Wang and Turban [14] indicate inadequate user participation and poor IS-user communications as two key issues, and Chou and Jou [5] indicate users/senior managers communications and users' needs, all related to users, as the three top problems. End-users in Taiwan are usually found to have lukewarm attitude toward participation and unable to specify their precise needs [9]. The current MIS issues in Taiwan are similar to those of the US in 1980s [5]. The inadequacy of user participation in Taiwan may be in part due to its ecological nature, or shorter history in development of IT.

4. THE PROPOSITIONS

Effective user participation is essential for the success of systems development and implementation. It helps resolve conflicts between IS-staff and end-users. Primarily, the above discussions on conflict potentials, the effect of user participation on conflict resolution, and the user participation status in Taiwan, lead to the following research propositions for this study.

Proposition 1. User emotional hostility and substantive dissension increase manifest conflict between users and developers during IS development.

Proposition 2. User emotional hostility and substantive dissension have a negative effect on satisfaction with conflict resolution and with the final system, and on the perception of project success.

Proposition 3. User emotional hostility and substantive dissension will significantly advance user participation during IS development.

Proposition 4. User participation in the whole development process of an IS project affects positively on the project outcomes; that is, the negative effects of users' substantive dissension and emotional hostility on conflict resolution, project success and user satisfaction can be moderated by users participation in the whole development process.

5. METHODOLOGY

5.1. Variable Operationalizations

Seven variables were established using the previously given definitions: user emotional hostility, user substantive dissension, manifest conflict, user participation, conflict resolution, project success, and user satisfaction. The two potentials – emotional hostility and substantive dissension, were developed specifically for this study. Manifest conflict, user participation, conflict resolution, and project success constructs were modified from those of Robey *et al.* [11,12]. Except for user satisfaction, each variable consisted of several components (items), and these items were phrased in statement form. Responses to the items were measured on a 7-point unipolar scale ranging from “very low” to “very high”. Refer to Appendix for variable operationalizations.

5.2. Sampling

A questionnaire was designed that includes project information, personal background, and the seven construct items. The questionnaires were distributed to students in two Executive Education Programs offered by a leading business school in Taiwan. Each was asked to give a questionnaires to one end-user in their organization, who had participated at some point in an IS development project. Each questionnaire stated the general purpose of the research and that

participation was voluntary. To ensure that the results were confidential and not reviewed by the respondents' managers, prepaid postage was provided for returning the questionnaire directly to the authors. A total of 300 questionnaires were distributed, with 93 usable responses returned.

For this sample, the manufacturing sector accounts for 37.6% of respondent jobs, transportation for 8.6%, construction for 7.6%, information services for 5.4%, medical care for 5.4%, retail for 5.4, public utilities for 5.4%, government for 7.5% banking and insurance for 10.8%, and 11.8% in other sectors. Other demographic data in terms of two user groups are listed in Table 1.

5.3. Division of users

Respondents were divided into two groups according to their participation conditions. Those who had ever

participated in the design and implementation stages were grouped into User1 (43 respondents), and those who had only participated in the implementation stage were grouped into User2 (50 respondents). Table 1 gives the profiles of each group. There are no significant demographic differences between the two user groups except the project initiator and type of IS system developed. DP/MIS, traditionally concerned with well-defined, stable processes, are classified as the lower-level system, and DSS/OA/ES/EIS the higher-level system. For User1, the IS projects were mostly initiated by user departments for a lower-level system such as DP or MIS. For User2, the percentage of projects initiated by IS was significantly higher and more than 40% involved higher-level systems. These differences suggest that our analyses of conflict between groups need to adjust for the effects of these two project-related variables.

Table 1. Profiles of the Responding User Groups

Variables	Demographic Backgrounds					Regarding the IS Projects	
	Age (yrs)	Female	Education ^(b)	Yrs. Using computer	Yrs. current position	Initiated by user / IS dept.	Higher/Lower ^(c) level type
User1 ^(a) (N=40)	28.9	53%	1.14	4.15	4.08	90% - 10%	20% - 80%
User2 ^(a) (N=53)	28.1	65%	1.28	3.88	3.12	64% - 36 %	43% - 57%

(a) User1: participated in the whole development process, User2: participated in implementation only.

(b) Coding: 1: two-year professional college degree; 2: bachelor; 3: master.

(c) Higher level systems: DSS/OA/ES/EIS; lower level systems: DP/MIS.

** t-value significant at 0.01 level; * at 0.05 level.

5.4. Analysis Method

Path analysis or Structural Equation Modeling (SEM) has been used to examine the social process of IS development [12, 3]. However, both methods are inappropriate in test of causal relationships that have not been confirmed theoretically (e.g., [7]). Since the current purpose is more exploratory than confirmatory, we apply the Multivariate Multiple Regression (MMR) method for our analyses. MMR is appropriate for this study since it allows for correlation between response variables, which we expect, and it also allows us to adjust for the effects of the two project-related variables – project initiator and system type.

6. EMPIRICAL RESULTS

6.1. Construct Factorization

The rotated solution for loading coefficients larger than 0.3 in magnitude is reported in Appendix. Except for one factor which has an internal reliability value of 0.67 (Factor 6/User2), all reliabilities for the entire sample, and for both subsamples (User1 and User2), are over 0.70. Therefore we assume all variables are reliable.

6.2. Correlations between the Responses

Correlation analysis was performed to determine the directions and degree of correlation between the five response variables. The results are reported in Table

2. The correlations between manifest conflict and the three outcomes are all very slight ($|r| < 0.1$), so these relationships were ignored in the analysis. The only variable that is significantly correlated with manifest conflict is user participation, and this correlation is more significant for the group User1, those who were involved in the whole process IS development.

6.3. Result of MMR

Table 3 lists the results of MMR modelling of the two conflict potentials on the five response variables. Since the two potentials are significantly correlated for both user groups (0.35 and 0.44, respectively), the MMR procedure was conducted separately for each potentials for each group. A linear regression model adjusting the effects of *project initiator* and *system type developed* was obtained for each response variable. Only b_1 , the coefficients associated with the two conflict potentials are listed in Table 3.

7. DISCUSSION

7.1. Effects of the Two Conflict Potentials

MMR revealed that the two conflict potentials affected positively on manifest conflict for both user groups as hypothesized in Proposition 1, and negatively on all three outcome variables for both user groups as hypothesized in Proposition 2. Nevertheless, the effects of substantive dissension for

User1 on the three outcome variables were not

significant.

One other interesting finding regarding conflict and the IS outcome process is that manifest conflict did not correlate with any of the three outcome variables, despite their respective relationships with the two conflict potentials. This may suggest that the negative effects on the outcome process result from the two conflict potentials, rather than directly from the manifest conflict itself. In other words, the construct that describes manifest conflict is different from those that describe its potentials. The result also confirm the requirement of looking for the situations that is possible to cause the conflict, rather than simply solving the manifest conflict, for a better understanding of the conflict process during IS development.

7.2. User Participation in Reduction of the Negative Effect of Conflict Potentials

Proposition 3 hypothesized that the two conflict potentials would advance user participation, and Proposition 4 hypothesized that, through user participation in the whole development process, the negative effect of conflict potentials on the three outcomes may be moderated. Our MMR results, however, only support the two propositions in part. According to the findings, only the substantive dissension of User1, the group who participated in the whole process, revealed *significant* relationship with user participation, and *insignificant* relationships with all the three outcome variables. Other cases, including the substantive dissension of User2 and the emotional hostility of both user groups, did not show such a link.

7.3. Constructive Management of Conflict through User Participation

The significant link, substantive dissension affected positively on user participation and user participation affected positively on conflict resolution & various IS related outcomes, may imply that, when users gain enough opportunities to participate, their dissension over substantive issues may elevate their desire to participate for a bargain toward the disagreements. The occasions may in turn provide them a way to moderate their negative perceptions of IS outcomes possibly caused by the divergences. This inference may also be evidenced from part of the data of User2, the group who participated in implementation only. For User2, substantive dissension only related slightly with user participation, but significantly with the negative of the three outcome variables. In other words, due to insufficient participation, users' substantive dissension might not be well resolved, neither their negative perception of the project outcomes. The results also confirm the importance of user participation in both the design and implementation stages for a constructive management of conflict during IS development.

8. OTHER REMARKS

1. Part of this report was presented in WDSI 2000 Conference, Maui, Hawaii, April 18-22, 2000.
2. Due to data difficulty, the result of LISREL was not accomplished as initially designed and was not listed in this report. Interesting readers may contact Quey-Jen Yeh for the LISREL results.

Table 2. Correlation Coefficients between the Five Response Variables ^(a)

		Manifest conflict	User participation	Conflict resolution	Project success
User1	User participation	0.53***			
	Conflict resolution	—	0.31*		
	Project success	—	0.30	0.25	
	User satisfaction	—	0.23	0.20	0.25
User2	User participation	0.19			
	Conflict resolution	—	0.25		
	Project success	—	0.29*	0.73***	
	User satisfaction	—	0.30*	0.57***	0.49***

(a) — : the absolute coefficient values were less than 0.1.

*** p<0.001; ** p<0.01; * p<0.05.

Table 3. Regression Coefficients Computed by MMR ^(a)

	Response Variables	Manifest conflict	User participation	Conflict Resolution (outcome)	Project Success (outcome)	User satisfaction (outcome)	F-value for ^(b) Wilk' s Lambda
User1	Predict Variables						
	Emotional hostility	0.52***	0.01	-0.33*	-0.32*	-0.17	2.48**
User2	Substantive dissension	0.67***	0.45**	0.00	-0.11	-0.08	2.84***
	Emotional hostility	0.43**	0.05	-0.33*	-0.34**	-0.26*	2.03*

Substantive dissension	0.52**	0.17	-0.40*	-0.32*	-0.39**	2.05*
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(a) Significance of t-value: *** p<0.001; ** p<0.01; * p<0.05.

(b) Multivariate F-value for 5 responses and 3 predictors. The 3 predictors include project initiator, type of system developed, and one of the two potential variables.

REFERENCES

- [1] D. K. Banner, "Conflict resolution: A recontextualization," *Leadership & Organization Development Journal*, 16(1) (1995), pp. 31-34.
- [2] H. Barki and J. Hartwick, "Rethinking the concept of user involvement," *MIS Quarterly*, 13(1) (1989), pp. 53-63.
- [3] H. Barki and J. Hartwick, "User participation, conflict, and conflict resolution: The mediating roles of influence," *Information Systems Research*, 5(4) (1994), pp. 422-438.
- [4] R. P. Bostrom, "Successful application of communication techniques to improve the system development process," *Information and Management*, 16 (1989), pp. 279-295.
- [5] H. W. Chou and S. B. Jou, "MIS key issues in Taiwan's enterprises," *International Journal of Information Management*, 19(1999), pp. 369-387.
- [6] F. Collins, "Human Issues Play Lead Role in Information Systems Melodrama," *Data Management*, 24(8) (1986), pp. 26-29.
- [7] J. F. Hair, R. E. Anderson, R. L. Tatham and W. C. Black, *Multivariate Data Analysis*,
- [8] G. Labianca, D. J. Brass, J. B. Gray, "Social networks and perceptions of intergroup conflict: The role of negative relationships and third parties," *Academy of Management Journal*, 41(1) (1998), pp. 55-67.
- [9] Lim, C. T. (1991) *Experiences of computerization*, Information Management Association Communication, 26, pp. 23-24.
- [10] D. Robey and D. Farrow, "User involvement in information system development: A conflict model and empirical test," *Management Science*, 28(1) (1982), pp. 73-85.
- [11] D. Robey, D. L. Farrow and C. R. Franz, "Group process and conflict in system development," *Management Science*, 35(10) (1989), pp. 1172-1191.
- [12] D. Robey, L. A. Smith and L. R. Vijayasarathy, "Perceptions of conflict and success in information system development projects," *Journal of Management Information Systems*, 10(1) (1993), pp. 123-139.
- [13] H. A. Smith and J. D. McKeen, "Computerization and management: A study of conflict and change," *Information and Management*, 22 (1992), pp. 53-64.
- [14] P. Wang and E. Turban, "Management information systems issues of the 1990s in the Republic of China: An Industry Analysis," *International Journal of Information Management*, 14 (1994), pp. 25-38.
- [15] J. Ware and L. B. Barnes, "Managing interpersonal conflict," in J. J. Gabarro (Eds.) *Managing People and Organizations*. (Boston, Mass.: Harvard Business School Publications, 1992).

Appendix. Factor Analysis Results for the 22 Measured Items

Contents of the items	Factor loading ^(a)					
	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
Perceived project success:						
1. Productiveness of the IS team	0.82		0.35			
3. Budget control of the IS team	0.82					
4. Schedule adherence of the IS team	0.80					
2. Operation efficiency of the IS team	0.79		0.34			
5. Interaction of the IS team with other departments	0.71					
6. System quality furnished by the IS team	0.59	-0.35	0.40			
Substantive dissension:						
3. User-developer disagreement on technical/system performance issues		0.76				
4. Extra work assigned to users due to participation of the IS project		0.74				
2. Dissatisfaction of users with the allotment of duties		0.74				
1. User-developer disagreement on the procedure of IS related activities		0.68				
Satisfactory conflict resolution:						
2. Conflict events resolved to the mutual satisfaction			0.92			
3. Personal satisfaction to conflict resolution as a whole			0.84			
1. Disagreement mutually compromised by users and developers			0.84		0.31	
Manifest conflict:						
2. User-developer debate on important issues during development				0.83		
1. Extent user-developer disagree with each other during development		0.33		0.81		
3. Frequency of user-developer overt conflicts during development		0.36		0.76		0.30
User participation:						
2. Frequency users voiced opinions/problems in related IS meetings					0.88	
3. Extent problems proposed by users discussed in the meetings					0.77	
1. Time users spent in participating related IS meetings		0.46			0.71	
Emotional hostility:						
3. Unsatisfactorily resolved conflicts between users and developers						0.76
1. User unwillingness to cooperate before establishment of IS team		0.38				0.74
2. Past unpleasant experiences between IS and functional managers	-0.31			0.43		0.67
Eigenvalue	5.97	4.64	1.77	1.60	1.37	1.03
Percentage of variance accumulated	27.1	48.2	56.2	63.5	69.8	74.4

Internal reliability of Cronbach's Alpha – total sample (N=93)	0.89	0.81	0.91	0.87	0.81	0.72
– User1 (N=40)	0.91	0.82	0.93	0.86	0.77	0.78
– User2 (N=53)	0.87	0.78	0.90	0.87	0.84	0.67

(a) Loading values less than 0.30 are not listed.