The Impact of Interpersonal Conflict Between Managers and Users on Information Systems Success During the Implementation of a New Information System

Øystein Sørebø

Faculty of Educ. in Business Administration, Buskerud University College, PO Box 6, 3504 Hønefoss, Norway, oystein.sorebo@hibu.no

Tor J. Larsen

Dept of Leadership and Org. Mgt., Norweigan School of Mgt., PO Box 580, 1302 Sandvika, Norway, tor.j.larsen@bi.no

Ann-Kristin Elstad and Anita Gustavsen

Faculty of Edu. in Bus. Admin., Buskerud University College, PO Box 6, 3504 Hønefoss, Norway, annkrise@yahoo.no, anitgus@online.no

ABSTRACT

During the implementation phase, interpersonal conflict among managers and users has a direct influence on information systems success. The theoretical meaning of interpersonal conflict and IS-success is explored as the basis for data collection among 139 users. The analysis shows that interpersonal conflict has a negative influence on IS-success.

INTRODUCTION

The implementation of a new information system (IS) requires that employees are exposed to changes in information processing and job tasks. It is well known that employees have a varying degree of negative reactions toward IS driven changes in their daily work life. Users may, for example, be of the opinion that the "old system" was working well. Hence, they do not necessarily see the benefits of having to adapt to a new IS. In fact, they may have little motivation to make the necessary adjustments. IS experts look upon the lack of willingness to take a new IS into use as a major explanation of IS failure and consequent non-realization of planned IS benefits (Venkatesh et al. 2003).

We believe that disagreement between management and employees may be one of the main antecedents of IS failure and, hence, lack of IS success. While deemed important, few studies have addressed this topic. Typically, research reports focus on conflicts in IS development projects (e.g. Robey and Farrow 1982; Robey et al. 1993; Barki and Hartwick 1994) but not on post development issues – being our objective. Therefore, we explore how an interpersonal conflict during the introduction of a new IS may influence subsequent user perceptions. According to Larsen (1998) our research setting is the "change anchoring phase" in the "usage phase" of the IS lifecycle. More specifically, the objective of the present research is to examine how individual perceptions of a conflict between management and employees during IS implementation may influence the individual perception of IS success.

THEORY AND RESEARCH MODEL

The concept of conflict has been studied for at long time in many fields, for example organizational behavior (e.g. Greenhalgh 1986), marketing (e.g. Geyskens et al. 1999), and information systems (e.g. Robey et al. 1993). The literature defines the concept of conflict as a pervasive phenomenon that permeates a multitude of organizational processes and outcomes (Wall and Callister 1995). While conflict has been defined in many ways, we perceive conflict as an interpersonal phenomenon. Our investigation builds on the definition that Barki and Hartwick (2001:198) forwarded: "*a phenomenon that occurs between interdependent parties as they experience negative emotional reactions to perceived disagreement and interference with the attainment of their goals.*" The definition says that conflict is composed of four properties (or dimensions): interdependence, disagreement, interference, and negative emotion. Barki and Hartwick (2001) describe *interdependence* as something that exists when each party's attainment of goals depends, at least in part, on the actions of the other part. *Disagreement* exists when parties think that a divergence of values, needs, interests, opinions, goals or objectives exists. They say that *interference* exists when one or more of the parties oppose the other party's attainment of interests, objectives, or goals. Finally, *negative emotions* pertain to the feelings of jealousy, anger, anxiety, or frustration. The theoretical proposition is that these emotions emerge when there is major disagreement, or when interference with the attainment of each others' important goals occurs. Barki and Hartwick regard each of these properties as necessary, but not sufficient, conditions for conflicts to occur.

We proceed with the concept of IS-success, which we define as a favorable or desired outcome; i.e. such as the attainment of benefits from the use of a software solution (DeLone and McLean 2003). Rather than looking upon IS success as a single phenomenon, we employ both perceived usefulness and user satisfaction. According to Dillon and Morris (1996:10) perceived usefulness is defined as: "*the degree to which a person believes that use of the system will enhance his or her performance.*" Bhattarcherjee (2001:355) define user satisfaction as: "*an affect, captured as a positive (satisfied), indifferent, or negative (dissatisfied) feeling*" toward an IS solution. Perceived usefulness is in

the literature usually seen as a precursor of user satisfaction (Bhattacherjee 2001).

We propose that conflict (operationalized as consisting of the four properties of interdependence, disagreement, interference and negative emotion) has a negative influence on perceived usefulness and user satisfaction. We agree with Barki and Hartwick (2001) that interdependence may be an underlying cause of conflict; i.e. when the latter is understood as being composed of disagreement, interference and negative emotion. However, they also indicated through their definition of conflict that negative emotion may be a result of disagreement and interference.

Based on these arguments we forward three theoretical propositions; First, interdependence will reduce the level of negative interference and disagreement. The argument is that actors that are mutually interdependent must cooperate in a constructive manner. Second, disagreement and interference will have a direct impact on emotional reactions. The suggested causal relationship is that more disagreement and interference will lead to more negative emotional reactions – as can be inferred from the following statement in Barki and Hartwick (2001:198): "*…as they experience negative emotional reactions to perceived disagreement and interference...*"; Third, negative emotions (i.e. frustration and irritation) will reduce the level of perceived usefulness and user satisfaction. Our propositions with our appurtenant hypotheses are shown graphically in Figure 1.

As can be seen from Figure 1, we suggest eight hypotheses for testing. The hypotheses are either a directly specified in our three propositions or other authors' specification (for example, that perceived usefulness impacts user satisfaction.). The principle of co-variation hypotheses will be employed – saying that every hypothesis will be tested toward all other.

METHODS
A company in the wholesale business with 16 geographical departments agreed to participate in the study. The company had recently replaced an old DOS-based system for logistics support with a newly purchased Windows based system; i.e. Opus Logistics (http://www.microlise.com). The company agreed that subjects participating in the study would be managers and users directly related to the implementation effort. The present authors concluded that the research objective of the study "change anchoring" phenomena in the IS lifecycle "usage phase" was met.

Since variables and items had been used in previous research efforts and found reliable with acceptable validity (cf. Barki and Hartwick 2001, Bhattacherjee 2001), a questionnaire was developed as the vehicle for data collection. An early version of the instrument was presented to 10 prospective respondents who where encouraged to write comments if items were found to be ambiguous or non-understandable. Valuable questionnaire improvements were made through this pre-test.

The questionnaire was distributed on-site in three of the 16 departments. 139 out of 225 potential users of the new system answered the questionnaire. The users who answered the questionnaire where all real Opus users and also subject to so-called mandatory use. Twelve percent of the respondents were women and eighty-eight percent were men. The average respondent was 45 years old (i.e. 28% in their twenties, 28% in their thirties, 14% in their forties, and 30% above fifty), and 20% of the sample held a university degree. These demographics were checked against the company's personnel data and found equivalent. Along these dimensions our sample is representative.

The recommended two step procedure of checking item data quality measurement before hypothesis and relationship testing was followed (Anderson and Gerbing, 1988). Items were checked for skewness and kurtosis, and were found to have unproblematic univariate distributional characteristics (i.e. values below 2.0). One question had 11 percent missing values, but was not dropped since this is close to the recommended threshold for percentage of missing values; i.e. being < 10. All other questions had less that ten percent missing values and therefore maintained for analysis.

DATA ANALYSIS
We employed Partial Least Squares (PLS Graph, version 3.0) to analyze the data (Compeau and Higgins 1995, Plouffe et al. 2001, Wixom and Watson 2001). PLS have several strengths that make it appropriate for our study, including its ability to handle complex predictive models and small samples. The analysis proceeds with measurement model results and structural model results.

Measurement Model Results
The six constructs in our research model are reflective. The adequacy of reflective constructs is determined through looking at: (1) individual item reliabilities, (2) the convergent validities of measures associated with individual constructs, and (3) discriminant validity between constructs (Hulland 1999). Table 1 shows the test outcome for all constructs and items

As can be seen from Table 1, only three items from the interdependence and disagreement scale have loadings below the 0.7. Hence, item three in the interdependence scale and item two in the disagreement scale were deleted due to item reliability far below the recommended threshold of 0.50 for squared loadings (i.e. $0.57^2 = 0.32$).

For each construct the assessment of convergent validity or internal consistency is also included (cf. Alpha). The calculated value for the alpha coefficient should exceed 0.70 (Nunnally 1978). The criterion is met for all six construct in our model, suggesting satisfactorily internal consistency.

Fornell and Larcker (1981) suggests that discriminant validity among constructs should be based on the average variance extracted (AVE), which is the average variance shared between a construct and its measures. As Table 2 shows, the square root of AVE values is consistently greater than the off-diagonal correlations, suggesting satisfactorily discriminant validity among constructs.

Structural Model Results
As is customary when using PLS, the structural model test results are graphically shown in Figure 2. Standarized regression coefficients are shown in adjacent to each path and the appurtenant t-values are shown in brackets below its corresponding regression coefficients. R^2 values are shown in brackets under each endogenous latent construct.

We learn from Figure 2 that seven of the eight path coefficients have a significant association with intervening and dependent constructs. We conclude that all hypotheses, besides hypothesis 2, are supported. The PLS analysis documents acceptable levels of explained variance for interference, disagreement, negative emotions and satisfaction. The
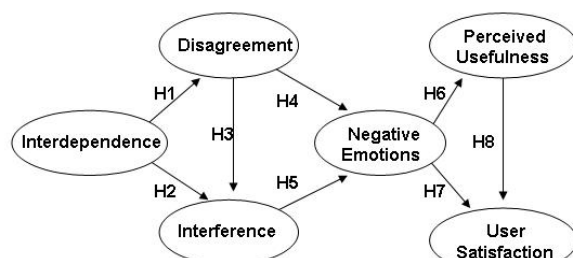
Figure 1. Research Model and Hypotheses

Table 1. Item Means, Standard Deviations, and Internal Consistencies

Interdependence (Alpha = 0.76)				
	Mean	Std.Dev.	Loading	t-Stat
The staffs' use of OPUS was depending on collaboration with the IS-instructors	5,90	1,69	0.74	6.0
The management encouraged the joint collaboration of users the IS-instructors	5,72	1,75	0.85	10.4
The IS-instructors was dependent on the users in connection with the implementation	5,10	1,75	0.57	3.1
The outcome of the implementation was dependent on a cooperation between the users and the IS-instructors	5,86	1,63	0.78	8.4
Disagreement (Alpha = 0.75)				
My feeling is that the management and the users was different in their:	Mean	Std.Dev.	Loading	t-Stat
… opinion of the contribution from OPUS	4,25	1,89	0.66	6.2
… opinion about when it was reasonable to get OPUS in use	3,78	2,26	0.57	4.2
… meaning about how the implementation of OPUS should be managed (e.g. arrangement of meetings, providing of information, training, etc.)	3,43	2,08	0.85	19.2
… mening of how to effectively utilize OPUS	3,37	1,99	0.87	26.2
Interference (Alpha = 0.85)				
To which degree do you mean that the management prevented:	Mean	Std.Dev.	Loading	t-Stat
… the users to start using OPUS in their own way	2,41	1,78	0.90	21.6
… the users to utilize OPUS in their own way	2,57	1,74	0.90	26.0
… the users to reach their initial goals and objectives with using OPUS	2,44	1,71	0.83	12.9
Negative emotion (Alpha = 0.90)				
To which degree do you mean that the management:	Mean	Std.Dev.	Loading	t-Stat
… decided something that made the users frustrated in connection with the implementation of OPUS	3,85	1,90	0.95	57.9
… decided something that made the users irritated in connection with the implementation of OPUS	3,86	1,95	0.96	73.0
Perceived usefulness (Alpha = 0.93)				
	Mean	Std.Dev.	Loading	t-Stat
Using OPUS improves my job performance	3,41	1,98	0.87	23.4
Using OPUS increases my task productivity	3,17	1,89	0.90	33.6
Using OPUS enhances my job effectiveness	3,27	1,94	0.90	33.9
I find OPUS very useful for my job	4,19	1,86	0.72	10.8
Using OPUS makes it more easy to do my job tasks faster	3,01	1,99	0.90	33.7
Using OPUS does it more easy to perform my job	3,15	1,79	0.82	14.5
Satisfaction (Alpha = 0.88)				
What is your general experience with using OPUS?	Mean	Std.Dev.	Loading	t-Stat
Very dissatisfied/Very satisfied	4,13	1,31	0.86	18.3
Very displeased/Very pleased	4,05	1,30	0.86	19.0
Very frustrated/Very contented	4,25	1,59	0.76	10.7
Absolutely terrible/Absolutely delighted	4,06	1,45	0.85	25.3

explaining a reasonable amount of variance in IS success. The theoretical implication is that our model has merit. During the implementation phase, business managers and IS experts must consider the negative influence of interference and disagreement on the employees emotions, and accordingly, on their perceived usefulness and user satisfaction.

The lack of a significant relationship between interdependence and disagreement is not necessary surprising. In their study, Barki and Hartwick (2001) didn't find any empirical support for an association between respondents' appraisal of interdependence and the three other dimensions of interpersonal conflict. Therefore, the strong negative relationship between interdependence and interference may be more surprising than the lack of association between interdependence and disagreement. The explanation may be that interdependence has a potential to reduce the experience of interference, i.e. perceived as a distinctive negatively behaviour. And further, that it is the experience of interference that release disagreement between the managers and users. Consequently, our results indicate that interdependence may be the underlying key factor to reduced disagreement through the intervening factor interference.

The present research has limitations, especially with concerns to our use of a cross-sectional survey data. This data collection approach does not allow explicit directional tests. This does not mean that the causal relationships we have specified in Figure 1 and 2 are void. The theoretical arguments for our IS conflict-success model provide support for the existence of causal relationships among constructs. Structural equation analysis provides some support for causal relationship relative to techniques such as correlation and regression since all the relationships in the measurement and structural model are tested simultaneously. In spite of the support for causal relationships, conclusive statements about causality in survey research cannot be made since alternative explanations cannot be ruled out. Longitudinal design is the approach that should be employed to settle the issue.

*Table 2. Correlations among Constructs & Square Root of Average Variance Extracted*

Construct	1	2	3	4	5	6
1. **Interdependence**	**0.79**					
2. **Disagreement**	-0.14	**0.80**				
3. **Interference**	-0.37	0.53	**0.88**			
4. **Negative emotion**	-0.28	0.44	0.49	**0.98**		
5. **Perceived useful.**	0.12	-0.15	-0.04	-0.20	**0.88**	
6. **Satisfaction**	0.22	-0.37	-0.29	-0.40	0.50	**0.79**

association between negative emotions and usefulness may be questionable since the significance level of the standardized regression coefficient is low and the explained variance is only 4 percent.

DISCUSSION, IMPLICATIONS AND LIMITATIONS

Our research objective was to investigate interpersonal conflict between managers and users with regard to the implementation of a new information system. We found support for seven out of eight hypotheses. The indication is that Barki and Hartwick's (2001) operationalization of conflict into four properties contributes to

Figure 2. Research Model PLS Analysis Results
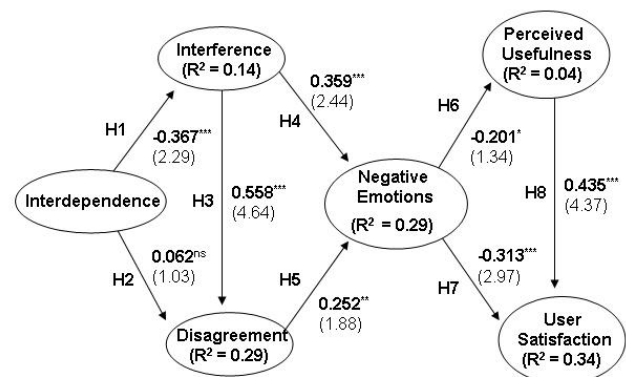
Notes: Stars indicate significance level: ***(p<.001), **(p<.05), *(p<.10).

REFERENCES

Barki, H. and Hartwick, J. "Interpersonal conflict and its management in information system development," MIS Quarterly, (25:2), 2001, pp 195-225.

Barki, H. and Hartwick, J. "User Participation, Conflict, and Conflict Resolution: The Mediating Roles of Influence," Information System Research (5:4), 1994, pp. 422-438.

Bhattacherjee, A. "Understanding Information Systems Continuance: An Expectation – Confirmation Model," MIS Quarterly, (25:3), 2001, pp. 351-366.

Compeau, D. R. and Higgins, C. A. "Computer Self-Efficacy: Development of a Measure and Initial Test," MIS Quarterly, (19:2), 1995, pp. 189-211.

DeLone, W.H. and McLean, E.R. "The Delone and McLean Model of information systems success: A ten year update," Journal of Management Information Systems, (19:4), 2003, pp. 9–30.

Dillon, A. and Morris, M.G. "User acceptance of information technology: Theories and models," Annual Review of Information Science and Technology, (31), 1996, pp. 3-32.

Fornell, C. and Larcker, D. F. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," Journal of Marketing Research, (18), 1981, pp. 39-50.

Geyskens, I., Steenkamp, J.B. and Kumar, N. "A Meta-Analysis of Satisfaction in Marketing Channel Relationships," Journal of Marketing Research, 1999, (36), pp. 223-238.

Greenhalgh, L. "SIVIR forum: Managing conflict," Sloan Management Review, 1986, (27), pp. 45-51.

Hulland, J. "Use of Partial Least Squares, (PLS) in Strategic Management Research: A Review of Four Recent Studies," Strategic Management Journal, (20:2), 1999, pp. 195-204.

Larsen, T.J. "Information Systems Innovation: A Framework for Research and Practice," in Larsen, T.J. and McGuire, E. (Eds.), Information Systems Innovation and Diffusion: Issues and Directions. Hersey, PA: Idea Group Publishing, 1998, pp. 411-434.

Nunnally, J.C. "Psychometric Theory," 1978, McGraw Hill, New York.

Plouffe, C. R., Hulland J. S. and Vandenbosch M. "Research Report: Richness Versus Parsimony in Modeling Technology Adoption Decisions – Understanding Merchant Adoption of a Smart Card-Based Payment System," Information Systems Research, (12:2), 2001, pp. 208-222.

Robey, D., and Farrow, D.L. "User Involvement in Information Systems Development: A Conflict Model and Empirical Test," Management Science, (28:1), 1982, 73-85.

Robey, D., Smith, L.A. and Vijayasarathy, L.R. "Perceptions of Conflict and Success in Information Systems Development Projects," Journal of MIS, (10:1), 1993, pp. 123-139. Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. "User Acceptance of Information Technology: Toward a Unified View", MIS Quarterly, (27:3), 2003, pp. 425-478.

Wall, J.A. Jr. and Callister, R.R. "Conflict and its Management", Journal of Management, (21:3), 1995, pp. 515-558.

Wixom, B. H. and Watson, H. J. "An Empirical Investigation of the Factors Affecting Data Warehousing Success," MIS Quarterly, (25:1), 2001, pp. 17-41.

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