

The Impact of Organizational Coordination and Climate on Marketing Executives' Satisfaction with Information Systems Services

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ABSTRACT

Information system (IS) managers rely on a number of devices to improve performance and the perception of performance on the part of the user. These techniques can be a variety of tools and organizational structures put in place by various levels of management. Horizontal coordination activities are such a device, one that is intended to improve the communication between users and IS developers. Past research has found an impact of coordination on IS success. However, the climate, general attitudes about the IS function in an organization in which the developers and users operate, can serve as an important moderator. Analysis of a sample of marketing executives indicates that the climate is an important moderator and may impact the ability of structural features to improve perceived performance. Managers must consider the climate as an important feature.

Keywords: Horizontal coordination, IS services, organizational climate

I. INTRODUCTION

Over the past 40 years, the role of the information system (IS) department within an organization has undergone tremendous change. During the 1960s, data processing was predominantly a backroom function with little customer interaction. The primary responsibility of the IS department was to develop and maintain reliable software systems. The 1980s brought a period of decentralization and end-user computing, as individual users grew proficient in the use of PCs and telecommunication technologies that include e-mail, publishing, and data/decision support systems, among others [Gerrity and Rockart 1986]. In the 1990s, the role of IS departments evolved to providing a variety of services that facilitate and coordinate various end-user computing needs [Kettinger and Lee 1995]. IS departments that define their roles in organizations as providing various services to meet user computing needs increased from 40 percent in 1985, to 58 percent in 1991, then to 78 percent in 1996 [Guimaraes 1996]. Researchers have noticed this trend for years and argued that the delivery of information services should be viewed as business transactions between an IS service provider and its users [Kettinger and Lee 1995].

Today, users are no longer dependent beneficiaries of IS departments, but are highly demanding customers [Pitt et al. 1995]. In this view, satisfaction of the customer is paramount to success. This holds particularly true in the area of marketing information systems that has seen widespread acceptance of computer-based systems [Li et al. 2001]. Not only is the tradition of system use by marketing executives high, but new systems crucial to the success of marketing by an organization are under continual development, including customer relationship marketing systems and sophisticated decision tools for brand management [Jiang et al. 2000]. Therefore, marketing information systems provide a venue for the study of user satisfaction with IS performance as well as being a significant arena in their own right.

Past research has identified a number of significant factors that strongly relate to end users' overall satisfaction with certain characteristics of IS departments, including computing experience of end users [Magal 1991; Rivard and Huff 1988], quality of the IS staff [Magal et al. 1988; Mirani and King 1994], organizational support environments [Lawrence and Loh 1993; Lederer and Spencer 1988], quality of services [Bergeron et al. 1990; Leitheiser and Wetherbe 1991], variety of services [Bergeron et al. 1990; Carr et al. 1993], and a clear IS role definition [Li and Shani 1991; Magal et al. 1988; Oglesby 1987]. Many of these are related to customer satisfaction in the marketing literature including quality, variety, logistics support, and relationships. These success factors relate to the quality of the IS product or service, the variety of services offered, and the quality of the IS personnel, while other factors describe organizational concerns such as climate and coordination including communication and support.

Climate refers to the overall support and attitude toward IS in the organization. It encompasses the importance of IS as perceived by users and management and the support given in pursuit of IS initiatives. Researchers have suggested that the climate between IS staff and their customers is critically important for IS product development, yet can also be problematic [Newman and Robey 1992; Robey and Newman 1996]. For example, Kirsch and Beath [1996] found that trusting and open communication between IS team members and users is positively correlated with performance satisfaction. Marketing researchers find that climate either directly or indirectly influences customer satisfaction [Nygaard and Dahlstrom 2002; Rogg et al. 2001; Schmit and Allscheid 1995]. Consistently, the critical role of establishing, developing, and maintaining successful relationships between providers and customers is advocated by marketing theorists [Anderson and Narus 1990; Kotler 1991].

Organizational coordination is formal structure in place to promote effective communication between disparate departments as well as an allowance for informal communication. Specifically, some IS researchers have examined various coordination mechanisms to facilitate IS department-user cooperation [Brown 1999; Nidumolu 1995]. Coordination mechanisms attempt to integrate and link different units of an organization to accomplish common goals. Horizontal coordination mechanisms are designed to facilitate cross-unit collaboration. In IS development, effective horizontal coordination across the organization facilitates the involvement of different stakeholders working on a common project to agree to system requirements, share information, and mesh activities. Nidumolu [1995, 1996] argued that horizontal coordination across the organization, in terms of mutual adjustments and lateral communication, leads to an improved quality of interaction between system analysts and users. Other researchers have come to similar conclusions [Curtis et al. 1988; Kirsch and Beath 1996].

Although certain IS department success factors have been identified in previous studies, they have not directly examined the role of the IS-user climate [Li and Shani 1991]. Furthermore, IS researchers suggest that horizontal coordination may influence the climate between users and IS staff [Nidumolu 1995]. The purpose of the present study is to examine the relationship among horizontal coordination, the IS-user climate, and user satisfaction with the IS department's services. A model incorporating relationship management theory and organizational coordination is derived and tested to answer the following research questions: How does the IS-user climate relate to user satisfaction with an IS department's services and how does organizational horizontal coordination impact these two variables of concern?

II. BACKGROUND

IS managers must strive to provide quality services to their internal users and external customers. To determine the performance of the IS function in an organization, a number of measures of success have been proposed for IS services and products [DeLone and McLean 1992]. Eight determinants of IS department success are identified from a review of studies: (1) quality of user-developed applications, (2) user computing experience and knowledge, (3) IS staff quality, (4) variety of IS services, (5) service quality, (6) facilitation of end-user computing, (7) organizational commitment, and (8) IS role definition [Essex et al. 1998]. Still, user satisfaction has been the predominant means of evaluating IS department success [Essex et al. 1998; Magal et al. 1988]. Studies have shown a positive correlation between user satisfaction and other determinants of IS success, such as IS utilization and system success [DeLone and McLean 1992]. These results indicate that satisfaction is a good surrogate for success.

To achieve success, IS management has adopted a number of strategies to manage IS departments more effectively; however, not all are equally successful [Guimaraes 1996]. These strategies result in a variety of IS departmental structures, processes, and service orientations [Leitheiser and Wetherbe 1986]. Recognizing the importance of communication with other stakeholders in system development, coordination mechanisms have been proposed [Kydd 1989]. For example, Nidumolu [1995] found that horizontal coordination can have a direct positive effect on project performance.

Horizontal linking mechanisms are innovations of organizational design that first appeared in organizational theory literature in the 1960s [Mintzberg 1979]. According to Mintzberg, horizontal coordination is the extent of formal and informal contact between individuals in order to coordinate

the work of two units. Horizontal coordination is used to help remove the barriers to cross-unit collaboration by increasing communication. The implementation of horizontal coordination could be *structural* (e.g., formal teams) or *informal* (spontaneous and voluntary contacts). Galbraith [1994] argues that horizontal mechanisms can be used to help remove the barriers to cross-unit collaboration that are created by the organization's reporting arrangements. Daft [1992] views permanent teams, full-time integrators, and standing teams as capable of high levels of horizontal coordination. Project management literature also has long suggested the importance of the communication between the IS project team and users in defining the project scope and in controlling project changes [Boehm 1989; Nidumolu 1995].

Horizontal coordination mechanisms can be viewed as design tools that are used to increase coordination, communication, and decision making across organizational unit boundaries [Brown 1999]. Extensive horizontal coordination between users and IS staff often leads to a high degree of user participation in the project. The extent of horizontal coordination may positively influence the user attitudes toward system development and lead to a high level of collaboration between IS users and IS staff. Although the above studies consider the impact of horizontal coordination on the working environment, the indirect effect of the relationship between the coordination and IS success has been overlooked.

The IS-user climate is defined as the extent of the users' positive attitudes toward the overall IS function—including users' feelings of IS staff commitment and willingness to support their needs, management support toward the IS function and the IS staff, and user attitude toward their interaction with the IS staff. IS researchers generally believe that a positive IS-user climate will influence the extent of user participation and involvement, and it is by participating that users influence a project [Hartwick and Barki 1994; Robey 1994; Robey, et al. 1989, 1993]. Li and Shani [1991] showed that the IS climate could significantly affect the IS staff's job satisfaction and job stress. Kirsch and Beath [1996] argue that a positive IS-user climate could be achieved by implementing coordination mechanisms and, at the extreme, this positive IS-user climate is characterized by sharing responsibilities and providing needed expertise to each other. Nevertheless, these studies did not consider the effect of IS-user climate on success.

A positive IS-user climate, as measured by users' attitude toward the IS function, can have critical influence on user participation and user involvement in software development. User participation and user involvement forms more realistic expectations [Ginzberg 1981] and, thus, increases user acceptance, user satisfaction with the system, and system use. Many studies relate user involvement and user participation to system quality, system usage, and user satisfaction [Barki and Hartwick 1994; Tait and Vessey 1988]. On the other hand, nonsupportive users were often found to exhibit a negative attitude toward systems development, shaping a negative IS-user climate. In short, the IS-user climate has been considered as a critical mediating factor for system success.

III. RESEARCH HYPOTHESES

The chain of relationships suggested by the literature points to our model, presented in Figure 1. IS department success is the ultimate goal and is influenced directly by the IS-user climate. The IS-user climate is directly influenced by horizontal coordination in the organization. Furthermore, success may also be impacted by the extent of horizontal coordination. Each link is formulated as a hypothesis.

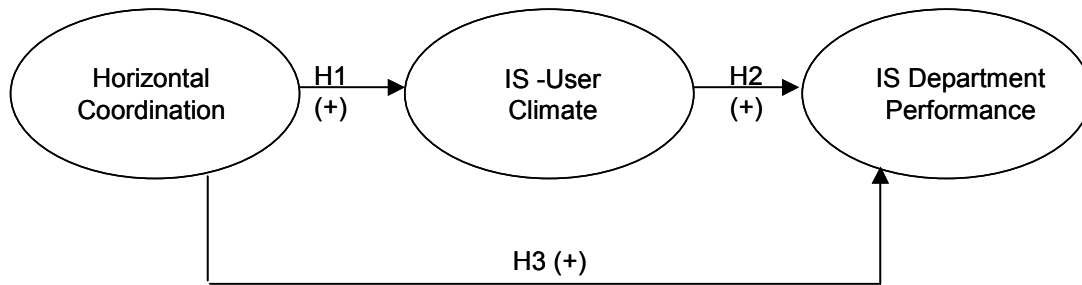


Figure 1. Research Model

Nadler and Tushman [1988] use organizational behavior theories to assert that organizational communication practices can exert considerable influence on their employees' behaviors. Ghoshal and Bartlett [1996] described the usage of informal mechanisms for developing a shared vision across operating units. Mohrman [1993] argued both formal and informal mechanisms are required to achieve lateral integration, and that informal mechanisms offer the advantage of being easier to implement in highly dynamic situations. IS studies have shown a positive correlation between the extent of coordination between IS staff and users and the relationship between IS staff and users [Brown 1999; Kirsch and Beath 1996]. In sum, organizational horizontal coordination will enhance employee interactions to others, and hence employee attitudes toward other units. Based upon the discussion, we formulate the following hypothesis:

H1: *There is a significant positive association between organizational coordination and IS-user climate.*

The past two decades saw a turn toward relationship management in marketing theory and practice. Relationship marketing is part of the developing network paradigm [Thorelli 1986]. Marketing emphasizes the process of a network of customer-provider interactions as a key feature of customer satisfaction. Integrative interactions are characterized by cooperative behavior of the customers. Customers and providers seek ways to achieve mutual objectives [Pruitt 1981]. This network/interaction theory stresses supplier-customer interactive relationships to achieve organizational success [Gummesson 1987]. The relationship can be built through both informal and formal mechanisms and encouraged by organizational climate. In particular, climate moderates relations between structure and satisfaction [Rogg et al. 2001] and serves to modify behaviors influencing satisfaction [Schmit and Allscheid 1995]. This relationship between seller and customer mimics the user/developer relationship. Based upon this interaction theory and the empirical findings in the IS literature discussed above, we propose the following:

H2: *There is a significant positive association between IS-user climate and IS-department performance satisfaction.*

Organizational structure, such as horizontal coordination devices, are placed in the organization to improve performance [Blake and Mouton 1985]. They lead to formal structures that improve the

efficiency of an organization and also provide a modicum of communication and control [Nystrom 1978]. Informal structures also exist within an organization developed at the convenience of the employees. When effective, communication leads to improved performance by reducing uncertainty and improving understanding [Cronan and Means 1984; Laudon and Laudon 1996]. Control theory posits that a tighter reign on the processes used by an organization will promote more productivity through fewer errors and less rework [Carver and Scheier 1981; Lord and Hanges 1987]. Formal techniques have been shown to enhance shared understanding of work processes among development constituents [Rai and Al-Hindi 2000]. These studies and theories suggest that

H3: *There is a significant positive association between organizational coordination and satisfaction with IS-department performance.*

IV. RESEARCH METHODOLOGY

SAMPLE

Data were collected from a sample of 1,000 companies randomly selected from a recent version of the *Standard and Poor's Directory*. The questionnaire was sent twice to the marketing executive in each sampled company. These executives were selected as being likely to have a better understanding of both the organizational and systems aspects. A total of 162 questionnaires was received, giving a 16 percent response rate. Furthermore, four of the returned questionnaires were unusable due to excessive missing values. Such a response rate is typical in industrial research [McLeod and Rogers 1985; Mentzer et al. 1987; Rogers and Williams 1989]. Among the 158 usable questionnaires, 74 were received from our first wave of mailing while 84 were received from the second wave. A series of χ^2 tests on the responses to each question on the instrument showed no significant difference on any response between the two waves.

Table 1 provides a summary of the characteristics of the firms responding to the questionnaire. Respondents tend to be concentrated among larger firms. Most of them have small to medium departmental budgets and number of employees. Of the companies surveyed, 92 percent indicated that their experience with computer based information systems exceeded 10 years. Moreover, most of the executives (94 percent) have been with the companies for at least one year. They are quite aware of the current conditions of the companies. A majority (91 percent) of them are using computers daily or weekly. They are experienced computer users; 94 percent of them have at least two years of computer experience. In order to avoid including subjects that may not have had sufficient contact with the IS staff, we eliminated eight executives who did not have at least two years of computer experience. Furthermore, two executives indicate that they are newcomers; only working for their companies for 6 and 10 months respectively. These executives were also excluded from this study.

Table 1. Sample Demographics

<i>Characteristic</i>	<i>N</i>	<i>%</i>
Industry Type:		
• Manufacturing product	80	51
• Non-manufacturing product	38	24
• Service	40	25
Annual Company Sales:		
• Small (less than \$100 million)	24	15
• Medium (\$100 million to less than \$500 million)	36	23
• Large (\$500 million to less than \$1 billion)	38	24
• Very large (\$1 billion or more)	60	38
Number of Company Employees:		
• 500 or less	8	5
• 501 to 2,000	33	21
• 2,001 to 10,000	59	37
• Over 10,000	58	37
Annual Department Budget:		
• Small (less than \$1 million)	42	27
• Medium (\$1 million to less than \$5 million)	30	19
• Large (\$5 million to less than \$20 million)	17	11
• Very large (\$20 million or more)	7	4
• No response	62	39
Number of Department Employees:		
• 10 or less	75	48
• 11 to 50	50	32
• 51 to 200	10	6
• Over 200	7	4
• No response	16	10
Years of Company's Computer Experience:		
• Less than 5 years	1	1
• 5 to 10 years	11	7
• 11 to 20 years	21	13
• 11 to 20 years	21	13
• 21 to 30 years	42	27
• Over 30 years	18	11
• No response	65	41

<i>Characteristic</i>	<i>N</i>	<i>%</i>
Respondent's Years in the Company:		
• Less than 1 years	2	1
• 1 to 5 years	60	38
• 6 to 10 years	38	24
• 11 to 20 years	39	25
• Over 20 years	16	10
• No response	3	2
Respondent's Years of Computer Experience:		
• Less than 2 years	1	1
• 2 to 5 years	13	8
• 6 to 10 years	56	35
• 11 to 20 years	55	35
• Over 20 years	28	18
• No response	5	3
Respondent's Frequency of Computer Usage:		
• Daily	116	73
• Two or three times per week	20	13
• Once per week	10	6
• Once per month	8	5
• Less than once per month	1	1
• Never	1	1
• No response	2	1

CONSTRUCTS

Horizontal Coordination

The items of this construct were adopted from Taylor and Bowers [1972]. The construct measures the degree of information and knowledge sharing, collaboration, conflict resolution, and decision communications among organizational members. The five items are listed in Table 2. Each item was scored using a seven-point scale from 1 = definitely disagree to 7 = definitely agree. Items were presented such that the greater the score, the greater the coordination regarding the particular item.

IS-User Climate

This construct was adopted from Li and Shani [1991]. It was originally developed by Bailey and Pearson [1983] to measure the user attitude toward the IS function. The items are listed in Table 2.

Table 2. CFA Properties of the Constructs

	Standardized Loadings	t-Values	Alpha
HORIZONTAL COORDINATION			.76
1. In this company, the amount of information you receive concerning other departments and shifts is adequate.	.54	5.91	
2. In this company, different units or departments plan together and coordinate their effort harmoniously.	.71	7.86	
3. When decisions are being made in this company, the persons affected are asked for their inputs.	.52	5.67	
4. In this company, disagreements between departments are always accepted as necessary and desirable and effectively worked through.	.62	6.90	
5. In the company, information is widely shared so that those who make decisions or perform jobs have access to all available know-how.	.74	10.50	
IS-USER CLIMATE			.91
1. The competition between IS unit and the non-IS units for organizational resources/responsibility for the success of computer-based information systems or services which are of interest to both parties is logically resolved.	.86	13.03	
2. The IS users feel confident about the IS in this company.	.84	12.48	
3. The IS staff is willing and committed to subjugate external, professional goals in favor of organizational goals and tasks.	.81	11.91	
4. Upper management has a positive degree of internal enthusiasm, support, or participation toward computer-based information systems or services or toward computer staff who supports them.	.74	10.51	
5. The manner and methods of information exchange between the user and the IS staff are effective.	.52	6.63	
6. The hierarchical relationship of the IS function to the overall organizational structure is adequate.	.86	13.08	
7. The IS users are willing and committed to achieve organizational goals by utilizing the information system capability.	.72	9.98	
IS-DEPARTMENT PERFORMANCE SATISFACTION			.86
1. How efficient do you feel the current IS support is?	.68	9.07	
2. How effective do you feel the current IS support is?	.82	11.85	
3. How adequately do you feel the current IS support meets the information processing needs of the computer users in your own area?	.80	11.47	
4. How adequately do you feel the current IS supports meets the information needs of the broader class of users they serve?	.83	12.11	

The instrument asked participants to identify the extent of their agreement (or disagreement) with each statement. Each item was scored using a seven-point scale from 1 = definitely disagree to 7 = definitely agree. All items were presented such that the greater the score, the greater the users' positive attitude toward the IS-department.

IS-Department Performance Satisfaction

The construct used to measure IS-department performance satisfaction was originally developed by Ives et al. [1983] for measuring user satisfaction with the IS function. The four items are listed in Table 2. The questionnaire asked respondents to indicate satisfaction of each item in Table 2 regarding their information systems department support. Each item was scored using a seven-point scale. Items were presented such that the greater the score, the greater the satisfaction with the particular item.

Issues of Validity

Although, the scales used in this study have been used and tested in the literature, we examine the validity of their use in this study. We first conducted a confirmatory factor analysis (CFA). When conducting a CFA, if the measurement model provides a reasonably good approximation to reality, it should provide a good fit to the data [Anderson and Gerbing 1988]. The CFA for the measurement model resulted in a comparative fit index (CFI) of .91 ($\geq .90$ recommended), a non-normed fit index (NNFI) of .91 ($\geq .90$ recommended), a normed fit index (NFI) of .85 ($\geq .90$ recommended), and a $\chi^2/\text{degree of freedom}$ ratio of 1.93 (203/105) (≤ 3 recommended) [Anderson and Gerbing 1988]. Thus, the measures represent a reasonable fit for the measurement model.

Convergent validity is demonstrated when different items used to measure the same construct have scores that are strongly correlated. Convergent validity can be assessed by reviewing the t-test for the item loading (greater than twice their standard error). The t-test for each indicator loading is shown in Table 2. The results show that the overall constructs demonstrate high convergent validity since all t-values are significant at the .05 level.

The internal consistency of each construct is examined by Cronbach's alpha values. Alpha will be high if the various items of the construct are strongly correlated with each other. The Cronbach alpha values for the IS-user climate, horizontal coordination, and the IS-department performance satisfaction, were .91, .76, and .86 respectively, all of which exceed the recommended level of .70 [Nunnally 1978].

Discriminant validity refers to relatively weak correlations between the measures of different constructs. The confidence interval test was conducted to assess the discriminant validity among the three variables in this study. This test involves calculating a confidence interval of plus or minus two standard errors around the correlation between the examined variables, and determining whether this interval includes 1.0. If it does not include 1.0, discriminant validity is demonstrated [Anderson and Gerbing 1988]. Table 3 shows that the intervals do not include the value 1.0.

External validity refers to the extent to which the findings can be generalized across times, people, and settings. The external validity of the findings is threatened if the sample is systematically biased—for example, if the response were generally from users having only positive attitudes toward the IS-department. The responses, shown in Table 4, had a good distribution since the means and medians were similar, skewness was less than two, and kurtosis was less than five for all constructs

Table 3. Confidence Interval Tests for Discriminant Validity

	Estimate	Standard Error	Lower Bound	Higher Bound
IS-Department Performance Satisfaction— IS-User Climate	.86	.03	.80	.92
IS-Department Performance Satisfaction— Horizontal Coordination	.30	.10	.10	.50
IS-User Climate—Horizontal Coordination	.35	.09	.17	.53

Table 4. Descriptive Statistics with Correlations

	IS-Department Performance satisfaction	IS-User Climate	Horizontal Coordination
Mean	4.05	4.21	4.68
S.D.	1.19	1.16	1.05
Median	4.25	4.43	4.80
Skewness	-.53	-.52	-.49
Kurtosis	-.47	-.46	.13
Correlations			
IS-User Climate	.77 (.0001)	1.00	
Horizontal Coordination	.21 (.0089)	.29 (.0003)	1.00

[Ghiselli et al. 1981]. Furthermore, regressions were conducted by using IS-department performance satisfaction, IS-user climate, and organizational coordination each as the dependent variable against each demographic category (independent variables). Results did not indicate any significant relationship.

V. DATA ANALYSIS AND RESULTS

The research model and hypotheses were tested using path analysis, specifically structural equation modeling (SEM) techniques using SAS. Three important assumptions associated with path analysis are (1) the normal distribution of variables, (2) an absence of multicollinearity, and (3) a maximum number of variables in the model. The mean scaled univariate kurtosis and multivariate kurtosis tests of normality were conducted. No violation was found. The correlations (see Table 4) among variables were all less than .80, thus no likely violation of multicollinearity was indicated [Anderson and Gerbing 1988]. The total number of variables in this model was three, which fell in the suggested range of three to six [Bentler and Chou 1987]. Overall, the theorized model in Figure 1 fit the data well, having CFI = .91, NFI = .84, NNFI = .91, $\chi^2/\text{degree of freedom ratio}$ = 2.16 (220.69/102). The results of the path analysis are in Table 5.

Table 5. Path Analysis Results: Hypotheses Testing

Dependent Variable	Independent Variable	Hypothesis	Path Coefficient	t-value
IS-User Climate	Horizontal Coordination	H1	.33	3.18*
IS-Department Performance Satisfaction	IS-User Climate	H2	.86	6.02*
IS-Department Performance Satisfaction	Horizontal Coordination	H3	-.01	-.21

*Indicates significant at P-value < .01

The direct effect links (H1 and H2) were both high and significant at the .01 level; however, the direct effect of organizational coordination on satisfaction with IS-department performance was not significant (H3). Of particular interest is the magnitude of the link (.86) between IS-user climate and IS-department performance satisfaction. As suggested by the interaction theory of marketing satisfaction, this result supports the crucial role of IS-user climate as an intermediary variable between horizontal coordination and IS-department performance satisfaction.

The lack of support for H3 (direct support for performance satisfaction from horizontal coordination) is interesting. One simple explanation is that moderating variables may be present in the structure but are not incorporated into the model. These could include IS personnel skills in communication, personal relations, or organizational policies on interaction. Although an organization may have certain policies in place to support horizontal coordination, personal relationships between managers that have developed over years may introduce a confound when viewed from an organizational level. Attitudes that shape behavior may be an additional confounding factor [Schmit and Allscheid 1995]. Another explanation may be that user coordination and involvement is an ongoing mix of conflict and resolution [Newman and Noble 1990]. The complex nature of reaching agreement on delivery of product and services is a lengthy process in information systems, where the desires of the user are often sacrificed due to the limitations of resources and technology.

VI. CONCLUSIONS

This paper examines an overlooked but important determinant of IS-department satisfaction on the part of the users: the IS-user climate. A sample of marketing executives provided the responses suggesting that the IS-user climate is an important indicator of user satisfaction with IS department services. Horizontal communication mechanisms were found to be an indicator of the IS-user climate, but not directly related to eventual satisfaction. As such, the relationship between climate and eventual satisfaction is placed in a context that facilitates understanding of how communication mechanisms can improve the climate that impacts eventual success. The ability to segment the relations allows researchers to examine specific techniques aimed at altering climate and practitioners to implement policies that impact less concrete concepts.

This study contributes to practice in three important ways. First, it provides evidence that today's organizations need strategies, such as effective horizontal coordination strategies, in order to break down barriers to collaboration between users and IS staff. In particular, companies should implement horizontal mechanisms such as sharing information among different units, resolving conflicts effectively among units, and planning together to coordinate efforts among units. Second, IS managers may need to recognize that organizational policy may not influence the satisfaction of the IS unit directly but through other variables (i.e., IS-user climate in this study). This is critical for IS managers to understand in order to educate top management. The formal structures in place are not sufficient to ensure eventual satisfaction; they must help cultivate a favorable climate.

Third, the strong relationship between the IS-user climate and user satisfaction with the IS department implies that IS managers must develop and maintain a positive IS-user climate in their organizations to better serve their customers. Yet the results indicate that concrete approaches and structures may be effective in changing the climate. This positive IS-user climate includes increasing user confidence, getting top management support and participation toward IS planning and development, promoting the IS unit as a strategic force within organizations, and getting user commitment. Other tools to change these items have been proposed in the literature and can be investigated using the framework in this study.

Limitations of the study include the restriction to the marketing population and the use of satisfaction as the dependent variable. Although marketing systems serve crucial functions in an organization, those functions may differ, at times significantly, from other system types. Satisfaction is used in many studies as a dependent variable, but has come to be recognized as only one of many success indicators for an information system. Further investigations into other dependent variables are warranted. This study has several additional implications for future research. First, the support for Hypothesis 1 suggests that other organizational mechanisms (such as vertical coordination and formalization) may impact IS-user climate and IS satisfaction. However, there is also a need for investigations to focus on a specific design option for an individual mechanism (e.g., having liaisons or integrators between users) under different IS contexts (such as centralized versus distributed).

Furthermore, organizational theorists have argued that the organizational architect selects mechanisms based upon their cost/benefit tradeoffs [Brown 1999]. Based upon the results of this study, however, the evaluation of cost/benefit tradeoffs for single mechanisms may be too simplistic a view. The organizational researcher should consider effects on other variables that have great impact on final success. Finally, future research may include other success factors along with the IS-user climate to examine their relative importance in determining IS success, such as matching project goals or work impact.

Editor's Note: This paper was first received on January 24, 2002. The article was with the authors one month for two revisions. Phillip Ein-Dor was the editor.

VII. REFERENCES

- Anderson, J. C., and Gerbing, D. W. "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin* (103:3), 1988, pp. 411-423.
- Anderson, E., and Narus, J. A. "A Model of Distributor Firm and Manufacturer Firm Working Partnerships," *Journal of Marketing* (54:1), 1990, pp. 42-58.
- Bailey, J. E., and Pearson, S. W. "Development of a Tool for Measuring and Analyzing Computer User Satisfaction," *Management Science* (29:5), 1983, pp. 530-545.

- Barki, H., and Hartwick, J. "User Participation, Conflict, and Conflict Resolution: The Mediating Roles of Influence," *Information Systems Research* (5:4), 1994, pp. 422-438.
- Bentler, P. M., and Chou, C. P. "Practical Issues in Structural Modeling," *Sociological Methods and Research* (16), 1987, pp. 78-117.
- Bergeron, R., Rivard, S., and De Serre, L. "Investigating the Support Role of the Information Center," *MIS Quarterly* (14:3), 1990, pp. 247-260.
- Blake, R. R., and Mouton, J. S. *The Managerial Grid III: The Key to Leadership Excellence*, Houston, TX: Gulf Publishing Co., 1985.
- Boehm, B. W. *Software Risk Management*, Washington DC: IEEE Computer Society Press, 1989.
- Brown, C. V. "Horizontal Mechanisms Under Differing IS Organization Contexts," *MIS Quarterly* (23:3), 1999, pp. 421-454.
- Carr, H. H., Rainer, R. K., and Young, D. "The State of Information Center Services: An Empirical Study," *Information Systems Management* (10:1), 1993, pp. 54-58.
- Carver, C. S., and Scheier, M. F. *Attention and Self-Regulation: A Control Theory Approach to Human Behavior*, New York: Springer-Verlag, 1981.
- Cronan, T. P., and Means, T. L. "System Development: An Empirical Study of User Communication," *Data Base* (15:3), 1984, pp. 25-33.
- Curtis, B., Krasner, H., and Iscoe, N. "A Field Study of the Software Design Process for Large Systems," *Communications of the ACM* (31:11), 1988, pp. 1268-1287.
- Daft, R. L. *Organization Theory and Design* (3rd ed.), St. Paul, MN: West Publishing Co., 1992.
- DeLone, W. H., and McLean, E. R. "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1), 1992, pp. 60-95.
- Essex, P. A., Magal, S. R., and Masteller, D. E. "Determinants of Information Center Success," *Journal of Management Information Systems* (15:2), 1998, pp. 95-117.
- Galbraith, J. R. *Competing with Flexible Lateral Organizations*, Reading, MA: Addison-Wesley, 1994.
- Gerrity, T. P., and Rockart, J. T. "End-User Computing: Are You a Leader or Laggard?," *Sloan Management Review* (27:4), 1986, pp. 25-34.
- Ghiselli, E. E., Campbell, J. P., and Zedeck, S. *Measurement Theory for the Behavioral Sciences*, San Francisco: Freeman, 1981.
- Ghoshal, S., and Bartlett, C. A. "Rebuilding Behavioral Context: A Blueprint for Corporate Renewal," *Sloan Management Review* (37:2), 1996, pp. 23-36.
- Ginzberg, M. J. "Early Diagnosis of MIS Implementation Failure: Promising Results and Unanswered Questions," *Management Science* (74:4), 1981, pp. 459-478.
- Guimaraes, T. "Assessing the Impact of Information Centers on End-User Computing and Company Performance," *Information Resources Management Journal* (9:1), 1996, pp. 6-15.
- Gummesson, E. "The New Marketing – Developing Long-Term Interactive Relationships," *Long Range Planning* (20:4), 1987, pp. 10-20.
- Hartwick, J., and Barki, H. "Explaining the Role of User Participation in Information System Use," *Management Science* (40:4), 1994, pp. 440-465.
- Ives, B., Olson, M. H., and Baroudi, J. J. "The Measurement of User Information Satisfaction," *Communications of the ACM* (26:10), 1983, pp. 785-793.
- Jiang, J., Zhong, M., and Klein, G. "Marketing Category Forecasting: An Alternative of BVAR—Artificial Neural Networks," *Decision Sciences* (31:4), 2000, pp. 789-812.
- Kettinger, W. J., and Lee, C. C. "Perceived Service Quality and User Satisfaction with the Information Services Function," *Decision Sciences* (25:5/6), 1995, pp. 737-766.
- Kirsch, L. J., and Beath, C. M. "The Enactments and Consequences of Token, Shared, and Compliant Participation in Information Systems Development," *Accounting, Management and Information Technologies* (6:4), 1996, pp. 221-254.

- Kotler, P. Presentation at the Trustees Meeting of the Marketing Science Institute, November, Boston, 1990.
- Kydd, C. "Understanding the Information Context in MIS Management Tools," *MIS Quarterly* (13:3), 1989, pp. 277-290.
- Laudon, E. W., and Laudon, J. P. *Managing Information Systems: Organization and Technology*, Upper Saddle River, NJ: Prentice Hall, 1996.
- Lawrence, M., and Loh, G. "Exploring Individual User Satisfaction Within User-Led Development," *MIS Quarterly* (17:2), 1993, pp. 195-208.
- Lederer, A. L., and Spencer, V. L. "The Effective Information Center: Targeting the Individual User for Success," *Journal of Systems Management* (39:1), 1988, pp. 22-26.
- Leitheiser, R. L., and Wetherbe, J. C. "A Comparison of Perceptions About Information Center Success," *Information & Management* (21:1), 1991, pp. 7-17.
- Leitheiser, R. L., and Wetherbe, J. C. "Service Support Levels: An Organized Approach to End-User Computing," *MIS Quarterly* (10:4), 1986, pp. 336-350.
- Li, E. Y., McLeod Jr., R., and Rogers, J. C. "Marketing Information Systems in Fortune 500 Companies: A Longitudinal Analysis of 1980, 1990, and 2000," *Information & Management* (38:5), 2001, pp. 307-322.
- Li, E. Y., and Shani, A. B. "Stress Dynamics of Information Systems Managers: A Contingency Model," *Journal of Management Information Systems* (7:4), 2001, pp. 107-130.
- Lord, R., and Hanges, P. "A Control System Model of Organizational Motivation," *Behavior Science* (32), 1987, pp. 161-178.
- Magal, S. R. "A Model for Evaluating Information Center Success," *Journal of Management Information Systems* (8:1), 1991, pp. 91-106.
- Magal, S. R., Carr, H. H., and Watson, H. J. "Critical Success Factors for Information Center Managers," *MIS Quarterly* (12:3), 1988, pp. 413-425.
- McLeod, R., and Rogers, J. C. "Marketing Information Systems: Their Status in Fortune 500 Companies," *Journal of Management Information Systems* (1:1), 1985, pp. 57-75.
- Mentzer, J. T., Schuster, C., and Roberts, D. J. "Microcomputers Versus Mainframe Usage by Marketing Professionals," *Journal of the Academy of Marketing Sciences* (15:2), 1987, pp. 1-9.
- Mintzberg, H. *The Structuring of Organizations*, Englewood Cliffs, NJ: Prentice-Hall, 1979.
- Mirani, R., and King, W. R. "Impacts of End-user and Information Center Characteristics on End-User Computing Support," *Journal of Management Information Systems* (11:1), 1994, pp. 141-166.
- Mohrman, S. A. "Integrating Roles and Structure in Lateral Organizations," in *Organizing for the Future: The New Logic of Managing Complex Organizations*, J. R. Galbraith and E. E. Lawler III (eds.), San Francisco: Jossey-Bass, 1993, pp. 109-141.
- Nadler, D., and Tushman, M. *Strategic Organization Design: Concepts, Tools and Processes*, Glenview, IL: Scott Foresman Co., 1988.
- Newman, M., and Noble, F. "User Involvement as an Interaction Process: A Case Study," *Information Systems Research* (1:1), 1990, pp. 89-112.
- Newman, M., and Robey, D. "A Social Process Model of User-Analyst Relationships," *MIS Quarterly* (16:2), 1992, pp. 249-266.
- Nidumolu, S. R. "The Effect of Coordination and Uncertainty on Software Project Performance: Residual Performance Risk as an Intervening Variable," *Information Systems Research* (6:3), 1995, pp. 191-219.
- Nidumolu, S. R. "Structural Contingency and Risk-based Perspectives on Coordination in Software-Development Projects," *Journal of Management Information Systems* (13:2), 1996, pp. 77-113.

- Nunnally, J. C. *Psychometric Theory*, New York: McGraw-Hill, 1978.
- Nygaard, A., and Dahlstrom, R. "Role Stress and Effectiveness in Horizontal Alliance," *Journal of Marketing* (66:2), 2002, pp. 61-83.
- Nystrom, P. C. "Managers and the Hi-Hi Leader Myth," *Academy of Management Journal* (21:2), 1978, pp. 325-331.
- Oglesby, J. N. "How to Shop for Your Information Center," *Datamation* (33:11), 1987, pp. 70-76.
- Pitt, L. F., Watson, R. T., and Kavan, C. B. "Service Quality: A Measure of Information Systems Effectiveness," *MIS Quarterly* (19:2), 1995, pp. 173-187.
- Pruitt, D. G. *Negotiation Behavior*, New York: Academic Press, 1981.
- Rai, A., and Al-Hindi, H. "The Effects of Development Process Modeling and Task Uncertainty on Development Quality Performance," *Information & Management* (37), 2000, pp. 335-346.
- Rivard, S., and Huff, S. L. "Factors of Success for End-User Computing," *Communications of the ACM* (31:5), 1988, pp. 552-561.
- Robey, D. "Modeling Interpersonal Processes During Systems Developing: Further Thoughts and Suggestions," *Information Systems Research* (5:4), 1994, pp. 439-445.
- Robey, D., Farrow, D. L., and Franz, C. R. "Group Process and Conflict in System Development," *Management Science* (35:10), 1989, pp. 1172-1191.
- Robey, D., and Newman, M. "Sequential Patterns in Information Systems Development: An Application of a Social Process Model," *ACM Transactions on Information Systems* (14:1), 1996, pp. 30-63.
- Robey, D., Smith, L. A., and Vijayasarathy, L. R. "Perceptions of Conflict and Success in Information Systems Development Projects," *Journal of Management Information Systems* (27:4), 1993, pp. 459-478.
- Rogers, J. C., and Williams, T. G. "Comparative Advertising Effectiveness: Practitioners' Perceptions Versus Academic Research Findings," *Journal of Advertising Research* (29:5), 1989, pp. 22-37.
- Rogg, K. L., Schmidt, D. B., Shull, C., and Schmitt, N. "Human Resource Practices, Organizational Climate, and Customer Satisfaction," *Journal of Management* (27:4), 2001, pp. 431-450.
- Schmit, M. J., and Allscheid, S. P. "Employee Attitudes and Customer Satisfaction: Making Theoretical and Empirical Connections," *Personnel Psychology* (48:3), 1995, pp. 521-536.
- Tait, P., and Vessey, I. "The Effect of User Involvement on System Success: A Contingency Approach," *MIS Quarterly* (12:1), 1988, pp. 91-110.
- Taylor, J. C., and Bowers, D. G. *Survey of Organizations*, Ann Arbor, MI: CRUSK, University of Michigan, 1972.
- Thorelli, H. B. "Networks: Between Markets and Hierarchies," *Strategic Management Journal* (7:1), 1986, pp. 37-51.

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