A Path Analytic Study of the Antecedents of Organizational Commitment of IS Managers

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Information systems (IS) technology has become a strategic resource for most organizations to compete successfully in today's highly uncertain marketplace. One critical component of this strategic resource is the IS human resource. Unlike many other professions, the IS professionals historically displayed a much higher rate of turnover due to rapid technological changes, job stress and emerging employment opportunities. Such excessive turnover can be very costly to the organization in terms of costs of recruiting and re-training, and the loss of systems development productivity. Therefore, maintaining a qualified and stable body of IS staff has been continually ranked among the most important issues for the successful functioning of IS departments. However, these important IS human resource management issues have not received enough empirical research attention within the IS management literature. The current study attempts to fill this gap by empirically examining the relationships among a set of organizational and psychological factors (i.e., management support, degree of IS control, IS strategic significance, role stressors) and the organizational commitment of IS managers. Empirical data was collected through large-scale questionnaire survey. The rigorous statistical method of LISREL path analysis was used. Results show that these variables are closely related to each other, which provides valuable insights for organizations to more effectively manage their IS human resource.

INTRODUCTION

Information systems (IS) technology is drastically changing every aspect of our lives as well as that of organizations. Organizations are increasingly dependent on IS technology to obtain market information, design and produce products, keep in contact with customers, and manage daily operations (McGee and Prusak, 1993). In many organizations, IS has emerged from a traditional supportive function to a strategic resource that may finally determine the firms' competitive capability (Sabherwal and King, 1991). As a result, firms have been investing heavily in IS technologies in the hope of remaining competitive.

The introduction of new technologies has offered new ways for organizations to restructure and manage their IS. For example, technological advances have made it possible to implement concepts such as re-engineering which have impacted on IS structure through networking and downsizing (Benjamin and Levinson, 1993; Teng, Grover and Fiedler, 1994). These changes, coupled with the increased knowledge, awareness, and demands of IS users, have considerably altered the IS executive's work environment, thus creating the potential for increasing job stress. Job stress in turn profoundly alters IS executives' commitment to the organization and their motivation to stay with the organization (King and Sethi, 1997).

Maintaining a qualified and stable body of IS staff has been continually ranked among the most critical factors for the successful functioning of IS departments. However, it is shown that the turnover rate among IS professionals is still very high (Tan and Igbaria, 1994). Such excessive turnover can be very costly to the organization in terms of costs of recruiting and re-training, and loss of systems development productivity (Igbaria et al., 1994). While the difficulty of the retention of qualified personnel cannot be understated, a particular problem in the retention of IS personnel is attributed to their "higher growth needs", which makes the efforts involved in motivating IS personnel quite substantial (Couger and Zawacki, 1980; Igbaria et al., 1991). While these and similar issues have been

addressed in the organizational behavior literature, the human resource management issues relating to IS professionals have not received enough research attention within the IS literature (Ginzberg and Baroudi, 1988; Sethi, Barrier and King, 1999). As Baroudi and Ginzberg (1986) already pointed out, there is considerable interest in understanding how to increase IS personnel productivity, satisfaction, and organizational commitment, and to decrease turnover. Given the importance of retaining qualified IS personnel, studies directed at gaining further understanding of the factors that influence the turnover of IS personnel would contribute to the theoretical IS literature and also have practical significance. The purpose of this study is to address the above identified gap in the IS literature.

The next section reviews the research on organizational commitment, both in the organizational behavior and the IS literature, and provides a theoretical framework and a discussion of variables of interest. This is followed by hypothesized relationships of variables to organizational commitment. The research methodology and analysis of results are then presented, followed by discussions and implications of findings.

THEORETICAL FRAMEWORK

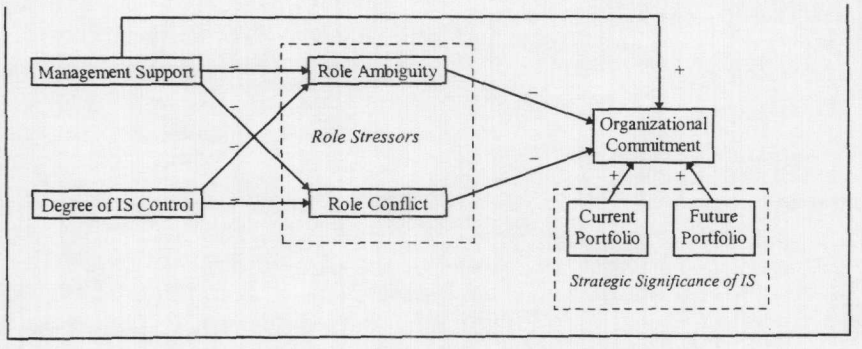
The organizational behavior literature has identified job stress and organizational commitment to be significant predictors of employee turnover (Williams and Hazer, 1986; Shore and Martin, 1989). Glisson and Durick (1988) summarized that variables that contribute to organizational commitment can be divided into three groups: (1) Variables that describe characteristics of the workers who perform the tasks (individual variables); (2) Variables that describe characteristics of the jobs or tasks performed by the workers (job-related variables); and (3) Variables that describe characteristics of the organization in which the tasks are performed (organizational variables).

The relationships among these variables and organizational commitment have been well researched in organizational behavior theory (Mathieu and Zajac, 1990). Several conceptual models linking organizational commitment to a variety of individual, job-related, and organizational variables have also been proposed in the organizational behavior literature (Cotton and Tuttle, 1986). The IS literature, however, has not thoroughly studied the specific impact of variables from all three categories. The existing few IS human resource management research focused primarily on the effects of individual and job-related variables on the organizational commitment and turnover of IS personnel. For example, Baroudi (1985) examined the impact of boundary spanning (job-related variables) and role stressors (individual variables) on IS personnel organizational commitment and turnover. A study by Igbaria and Greenhaus (1992) tested the effects of demographic variables (age, education, etc.) (individual variables), role stressors (role conflict and role ambiguity) (individual variables), and career-related variables (salary, promotability) (job-related variables) on the organizational commitment of IS personnel. Given the constant change and high pressure in IS working environment as discussed earlier, more empirical research attention on IS organizational variables is warranted.

The current study develops a path analytic model by integrating variables from all three categories. It extends the organizational behavior research into the IS management area by examining the linkages between management support, degree of IS control, IS manager role ambiguity, role conflict, strategic significance of IS, and organizational commitment of IS managers. The hypothesized model under investigation is depicted in Figure 1.

In the model, management support and degree of IS control are considered as organizational (group 1) variables, and strategic significance of IS as job-related (group 2) variables, while role stressors are considered as individual (group 3) variables. The current study does not include some antecedent variables originally proposed in the meta-analysis by Mathieu and Zajac (1990) because this is only part of a major research project. For example, job satisfaction is commonly cited as antecedent to commitment. However, considering that the effects of job satisfaction has been well studied in both the organizational behavior literature (Netemeyer, Burton and Johnston, 1995) and the IS literature (Igbaria and Guimaraes, 1993), and the job satisfaction variable was not included in the major research framework. The variables included in the hypothesized model are defined as follows:

Figure 1: Hypothesized Model



1. Management Support: the degree to which top management understands the importance of IS, creates a supportive environment for IS, and involves in the activities of IS function (Raghunathan and Raghunathan, 1988).

2. Degree of IS Control: the degree to which IS function has control over IS through formalization and standardization of rules and procedures, and through authority of decision making concerning IS activities (Cash et al., 1992).

3. Strategic Significant of IS: the degree to which IS activities are vital to the firm's daily operation, product innovation, and competi-

tive capabilities (Raghunathan and Raghunathan, 1990). According to Cash et al. (1992), IS strategic significance can be viewed from two dimensions, i.e., strategic significance of existing IS (*Current Portfolio*) and strategic significance of IS under development (*Future Portfolio*).

4. *Role Stress*: traditionally consists of two elements (Rizzo et al., 1970)
   ◊ *Role Conflict*: the degree to which individuals encounter incompatible job demands or expectations from their role partners (e.g., peers, management, customers) that cannot be satisfied simultaneously.
   ◊ *Role Ambiguity*: the degree to which individuals have inadequate knowledge or information with which to perform their jobs.
5. *Organizational Commitment*: the degree of an individual's willingness to stay or propensity to leave his or her organization. It includes a strong belief in and acceptance of the organization's goals and values, a willingness to exert considerable effort on behalf of the organization, and a definite and strong desire to maintain membership in the organization (Mowday et al., 1982).

HYPOTHESES DEVELOPMENT

Effects of Management Support

Management Support and Organizational Commitment. The relationship between management support and organizational commitment is well documented in the organizational behavior literature, as supportive leadership has significant positive impact on an individual's commitment to the organization. Glisson and Durick (1988) verified that supportive leader behavior in the form of leader consideration is an excellent predictor of organizational commitment. Leader consideration refers to the consideration of a supervisor for subordinate's feelings, problems, and input for decisions. A longitudinal study by Majchrzak and Cotton (1988) also verified that supportive managerial environment has significant positive impact on individuals' organizational commitment. In a meta-analysis of the antecedents of organizational commitment, Mathieu and Zajac (1990) found significant positive relationship between leader consideration and organizational commitment.

In the IS literature, management support has been consistently identified as a key positive factor in influencing the success of many IS related activities (Raghunathan and Raghunathan, 1988; King, Grover and Hufnagel, 1989). IS managers perceive such support as an indicator of top management's confidence in the ability of IS to help meet organizational goals. A supportive managerial attitude would provide IS executives with an environment in which they believe that their work will be recognized and appreciated, and thus is more likely to motivate them to be committed to the organization. Therefore, it is hypothesized that:

H1: Management support has direct positive effects on the organizational commitment level of IS managers.

Management Support and Role Conflict, Role Ambiguity. A supportive management may help individuals to clarify their objectives and management expectations, thus reducing the level of role conflict and role ambiguity. In a meta-analysis of 96 studies on role ambiguity and role conflict, Jackson and Schuler (1985) verified that leader consideration has significant negative correlation with role conflict and role ambiguity. Glisson and Durick further confirmed the above relationship based on an empirical study of 319 employees in 22 organizations. Majchrzak and Cotton (1988) also found that supportive managerial environment is an effective way of reducing role stress during the adjustment to technological change. Similarly, in their study about the antecedents and consequences of role stress, Schaubroeck et al. (1989) found social support to be a significant predictor of both lower role conflict and role ambiguity. Therefore, it is hypothesized that:

H2a: Management support has direct negative impact on the level of role conflict of IS managers.

H2b: Management support has direct negative impact on the level of role ambiguity of IS managers.

Effects of Degree of IS Control

Degree of IS Control and Role Conflict, Role Ambiguity. Nicholson et al. (1983) found a significant negative relationship between formalization, participation in decision making (PDM) and role conflict, role ambiguity. A causal model proposed by Jackson (1983) identified PDM as a primary factor for reducing role conflict and role ambiguity. The meta-analysis on role stress by Jackson and Schuler (1985) indicates that formalization and participation can help reduce role conflict and role ambiguity. Michaels et al. (1988) also found that formalization has direct negative effect on role conflict and role ambiguity of sales people. Schaubroeck et al., (1989) found participation to be a significant antecedent variable of lower role ambiguity using covariance structure analysis. With the increasing popularity of end-user computing, the IS function tends to lose control over IS activities in some organizations. While the literature suggests that increasing user control may lead to better IS usage, the lack of IS control can also cause problems for the organization, such as lack of standardization and data hygiene (Cash et al., 1992). Yet another often overlooked but important problem is that the degree of IS control, in the forms of standardization, formalization, and authority over IS decision making, may significantly influence the role conflict and role ambiguity of IS personnel. IS executives who feel that they are losing control over IS activities are likely to be subject to feelings of frustration and loss of power, resulting in higher levels of role stress. Therefore, it is hypothesized that:

H3a: Degree of IS Control has direct negative impact on the level of role conflict of IS managers.

H3b: Degree of IS Control has direct negative impact on the level of role ambiguity of IS managers.

Since previous literature already verified that formalization and participation in decision making has no direct effects on organizational commitment (Michaels et al., 1988; Schaubroeck et al., 1989) but has indirect influence through role stressors, thus this study did not hypothesize a direct path from degree of IS control to organizational commitment.

Effects of Strategic Significance of IS

Cash et al. (1992) have proposed that the strategic significance of an organization's IS can be captured by the strategic significance of the portfolio of systems applications currently in operation and the portfolio of systems applications to be developed for the future. The positioning of IS along each of these two dimensions indicates the current and future importance of IS to the organization. This study uses Current Portfolio and Future Portfolio to represent these two dimensions of IS strategic significance.

IS Strategic Significance and Organizational Commitment. An important aspect of commitment is the definite desire of personnel to maintain organizational membership. IS managers are expected to maintain their ties to the organization if they feel higher levels of personal importance, self-achievement, and task significance that their organizational role likely brings them. Steers (1977) first found that an individual's sense of personal importance to the organization and need for achievement positively affect commitment. In their book about the psychology of commitment, Mowday, et al. (1982) also stated that perceived personal importance is one of the most important antecedents of organizational commitment. That is, when employees felt that they were needed or important to the organization's mission, commitment attitudes increased. Moreover, an empirical study by Glisson and Durick (1988) found significant positive relationship between task significance and organizational commitment. In their comprehensive meta-analysis of the antecedents, correlates, and consequences of organizational commitment, Mathieu and Zajac (1990) also confirmed that such job characteristics as challenge, significance, and enrichment have significant positive relationship with organizational commitment. It is therefore hypothesized that:

H4a: The strategic significance of current portfolio has direct positive effect on the level of organizational commitment of IS managers.

H4b: The strategic significance of future portfolio has direct positive effect on the level of organizational commitment of IS managers.

Effects of Role Stressors

Role Stress and Organizational Commitment. This is one of the most widely studied relationships in organizational behavior literature where this core relationship of the current hypothesized model has been validated. These relationships, though important for effective management of IS organization, have not been well researched in IS literature except for Igbaria and Greenhaus (1992) and King and Sethi (1997) studies. The current study will be an attempt to address this important IS human resource management issue using a large sample of IS managers.

It is generally proposed in the existing literature that role conflict and role ambiguity leads to higher psychological strain, thus reducing the individual's willingness to stay with the organization. An early meta-analysis (Fisher and Gitelson, 1983) of 43 studies on role conflict and ambiguity found organizational commitment to be the number one negative correlate of role conflict and role ambiguity. Based on data collected from a sample of 577 medical center employees, Brooke et al. (1988) found that role stress has significant negative relationship with organizational commitment using confirmatory factor analysis within LISREL framework. Jamal (1990) found the same negative relationship between role stressors and organizational commitment from a sample of 215 nurses. A meta-analysis by Brown and Peterson (1993) further confirmed that role conflict and role ambiguity have significant negative effects on salesperson organizational commitment.

More recently, Netemeyer et al. (1995) used LISREL path analysis and found that role ambiguity and role conflict both have a negative effect on organizational commitment. In the IS literature, Sethi et al. (1999) confirmed the significant positive relationship between role stressors and IS professional burnout, while burnout negatively impacts organizational commitment. In summary, the following hypothesis can be made:

H5a: Role conflict has direct negative impact on the level of organizational commitment of IS managers.

H5b: Role ambiguity has direct negative impact on the level of organizational commitment of IS managers.

The above review and discussion of literature is summarized in Table 1.

RESEARCH METHODOLOGY

Data Collection

A self-administered questionnaire was mailed to 800 information systems executives chosen at random from a list of 3,000 senior IS executives. This list of 3,000 names was obtained from the "directory of top IS executives" database maintained by Applied Computer Research, Inc. This subset was selected at random from its list of senior IS executives in more than 10,000 different organizations all around the U.S., thus representing all types of organizations, industries, corporate cultures and geographic areas. There were 237 responses of which 231 were complete and hence usable. The response rate is about 29%, which is considered to be satisfactory. Table 2 provides an industry classification of the sample companies and Table 3 presents information on company revenues. Companies with revenues of $50 million and above are well represented (85%) in this sample. The results of this study may

Table 1. Literature Basis of the Hypothesized Path-Analytic Model

Relationships studied in this paper	Relationships described in previous literature	Nature of relationships
lanagement Support and)C	Leadership - OC (Glisson and Durick, 1988) Supportive managerial environment - OC (Majchrzak and Cotton, 1988) Leader consideration and Participative leadership - OC (Mathieu and Zajac, 1990)	Significant Positive Relationship
lanagement Support and 'C, RA	Leader initiating structure, Leader consideration - RC,RA (Jackson and Schuler, 1985) Leadership - RC,RA (Glisson and Durick, 1988) Supportive managerial environment - RC, RA (Majchrzak and Cotton, 1988) Social support - RC, RA (Schaubroeck, etc., 1989)	Significant Negative Relationship
)egree of IS Control and 'C,RA	Formalization, PDM - RC, RA(Nicholson, etc., 1983) PDM - RC, RA (Jackson, 1983) Formalization, Participation (Jackson and Schuler, 1985) Formalization - RC, RA (Michaels, etc., 1988) Participation - RA (Schaubroeck, etc., 1989)	Significant Negative Relationship
S Strategic Significance nd OC	Perceived personal importance, Need for achievement - OC (Steers, 1977) Personal importance (Mowday, etc., 1982) Task significance - OC (Glisson and Durick, 1988) Job characteristics - OC (Mathieu and Zajac, 1990)	Significant Positive Relationship
'C, RA and OC	RC, RA - OC (Fisher and Gitelson, 1983) Role Stress - OC (Brooke, etc., 1988) RC, RA - OC (Jamal, 1990) RC, RA - OC (Igbaria and Greenhaus, 1992) RC - OC (Brown and Peterson, 1993) RA - OC (Netemeyer, etc., 1995) RC, RA - OC (King and Sethi, 1997) RC, RA - OC (Sethi etc., 1999)	Significant Negative Relationship

OC - Organizational Commitment
RC - Role Conflict
PDM - Participation in decision making
RA - Role Ambiguity

therefore be more appropriately relevant to companies in these size categories. Manufacturing and finance sectors are represented by 57% of the sample. This information is relevant while generalizing the results of this study.

Measurement Instruments

All variables in the current study are measured with multiple items on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree". The mean value of the multiple items representing the variable is considered as the value of that variable. Negatively worded questions are appropriately recoded.

Management Support was measured by seven items developed from the management leadership and IS management literature (Raghunathan and Raghunathan, 1988, 1990). Representative items include "Top management involvement with IS function is strong" and "Top management understands the importance of IS function".

Degree of IS Control was measured by five items developed from the organizational behavior and IS strategic planning literature. Specific references were made to the concepts of "IS dominance" and "User dominance" (Cash et al., 1992). Typical items include: "There is lack of standardization and control over data hygiene" and "IS feel it is losing control over IS activities to users."

Role Conflict and Role Ambiguity were measured respectively by 5 and 6 items adopted from the widely accepted Job-Related Strain index developed by Rizzo, House and Lirtzman (1970).

Current Portfolio and Future Portfolio dimensions of IS strategic significance were operationalized using multiple items modeled after the illustrative questions presented in Cash et al. (1988) and adapted by Raghunathan and Raghunathan (1990).

Organizational Commitment was measured using the short version of the Organizational Commitment Questionnaire (OCQ) developed by Mowday et al. (1982) which is used extensively in the organizational behavior literature.

Scale Reliability and Validity

To ensure the content validity of the instrument items, the draft questionnaire was first read to two IS researchers who checked the items for appropriateness and relevance. Two IS executives of major organizations were then asked to complete the questionnaire and comment on the clarity and appropriateness of the items. Modifications were made to the final questionnaire based on their comments. Table 4 reports means, standard deviations, and reliability values for each of the variables. The reliability values based on Cronbach's alpha are all 0.8 and above which are well above the recommended minimum value of 0.7 (Nunnally, 1978).

The LISREL Path Analysis Procedure

The primary analytic technique in the current study is path analysis. The hypothesized model depicted in Figure 1 was tested using structural equation modeling (SEM), a second-generation multivariate technique that has gained increasing popularity in the last decade. The linear structural relations (LISREL) statistical software package was used for structural equation modeling purposes. Using the correlation matrix as input to the program, we analyzed the variance-covariance matrices and estimated the path coefficients of the specified model with maximum likelihood method. The input correlation matrix is presented in Table 5.

As can be observed from the correlation matrix, the data support the hypothesized directions of all relationships in the current study.

Though all the seven variables considered in this study have been developed and validated in earlier research, we

Table 2: Type of Companies in the Sample

Industry Type	Number
Business Services	7
Finance/Insurance	52
Government	3
Manufacturing	86
Medicine/Law/Education	10
Petroleum	5
Public Utility	12
Transportation	10
Wholesale/Retail	22
Others	24
Total	231

Table 3. Company Sales (Millions of $)

SALES	NUMBER OF RESPONDENTS
LESS THAN 100 M	51
100 TO < 250 M	33
250 TO < 500 M	25
500 TO < 1000 M	43
1000 M AND ABOVE	57
OTHERS (Sales not marked)	22
TOTAL	231

Table 4. Statistical Attributes of Scales Used in the Research

Variables	Number of Items	Mean	Standard Deviation	Reliability
Management Support	7	3.51	0.87	0.91
Degree of IS Control	5	3.65	0.81	0.84
Role Conflict	5	2.74	0.69	0.81
Role Ambiguity	6	2.55	0.70	0.82
Current Portfolio	6	4.44	0.63	0.89
Future Portfolio	9	3.47	0.55	0.84
Organizational Commitment	8	4.07	0.61	0.87

Table 5. Correlation Matrix of Variables in the Model

Variables	X1	X2	X3	X4	X5	X6	X7
Management Support (X1)	1						
Degree of IS Control (X2)	0.34	1					
Role Conflict (X3)	-0.15	-0.36	1				
Role Ambiguity (X4)	-0.43	-0.35	0.35	1			
Current Portfolio (X5)	0.34	0.24	-0.12	-0.31	1		
Future Portfolio (X6)	0.27	0.06	-0.03	-0.26	0.35	1	
Organizational Commitment (X7)	0.38	0.34	-0.43	-0.37	0.32	0.36	1

Table 6. Path-Analytic Results of the Hypothesized Model

Variables	Predictor Variables	Hypothesized Direction	Path Coefficients	t - Value
Role Conflict	Management Support	-	NS	0.15
	Degree of IS Control	-	-0.33	-4.85
Role Ambiguity	Management Support	-	-0.32	-4.99
	Degree of IS Control	-	-0.17	-2.69
Organizational Commitment	Management Support	+	0.23	3.75
	Role Conflict	-	-0.34	-6.26
	Role Ambiguity	-	-0.12	-2.00
	Current Portfolio	+	NS	0.09
	Future Portfolio	+	0.24	3.97

NS - non significant

tested the LISREL measurement models of the seven variables again to ensure the convergent and discriminant validity of the measurement instruments used in this study. The results, including item loadings, major fit indices and amount of variances explained are listed in the Appendix. As can be seen, all LISREL measurement modeling results are satisfactory, indicating good instrument validity.

PATH ANALYSIS RESULTS

The results of the path analysis are shown in Table 6. The table lists all nine hypothesized relationships, directions, path coefficients, and their t-values.

As can be seen from Table 6, two of the nine hypothesized paths are non-significant, i.e., the direct negative effect of management support on role conflict (Hypothesis H2a), and the direct positive effect of current portfolio on organizational commitment (Hypothesis H4a). The possible implications of these findings will be discussed later.

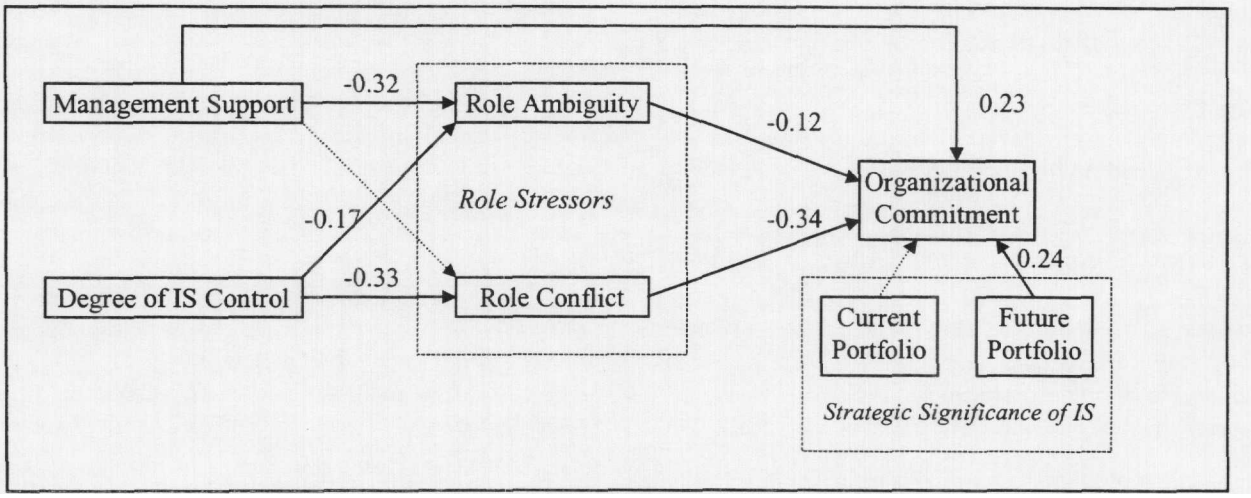
There is no single statistical test that best describes the strength of a structural equation model's prediction power. Rather, several measures may be used to assess its goodness-of-fit. In LISREL models, these measures may be divided into three categories: measures of absolute fit, measures of incremental fit, and measures of parsimonious fit (Hair, et al., 1992).

The measures of absolute fit include the Goodness-of-Fit Index (GFI) and Root Mean Square Residual (RMSR). GFI is a non-statistical measure ranging in value from 0 (very poor fit) to 1 (perfect fit) that represents the overall degree of fit, but is not adjusted for the degrees of freedom. RMSR is a measure of the average of the residuals between observed and estimated input matrices. Covariance or correlation matrices may be used for the input matrices (Dillon & Goldstein, 1984; Hair, et al., 1992). Models with a RMSR score below 0. 10 (Chau, 1997) are considered to be evidence of good fit.

Measures of incremental fit compare the proposed model to some baseline model, most often referred to as the null model (Bentler & Bonnet, 1980). The Normed Fit Index (NFI) and the Comparative-Fit-Index (CFI) are usually used for this purpose. NFI and CFI values greater than 0.90 are considered to be indicative of good model fit.

Finally, measures of parsimonious fit relate the goodness-of-fit model to the number of estimated coefficients required to achieve this level of fit. The Adjusted Goodness-of-Fit Index (AGFI) is often used to measure parsimonious fit. AGFI is an extension of GFI. It is adjusted by the ratio of the degrees of freedom for the proposed model to the degrees of freedom for the null model. GFI and AGFI values of 0.90 or more are considered evidence of good fit (Dillon & Goldstein,

Figure 2: The Final Path-Analytic Model



1984; Hair, et al., 1992).

The proposed LISREL structural model has excellent model fit with GFI of 0.97, AGFI of 0.91, NFI of 0.91, CFI of 0.93, and RMSR of 0.061. All meet the recommended value. The final path-analytic model is depicted in Figure 2. The dotted lines represent non-significant paths. In summary, LISREL analysis supports Hypotheses H1, H2b, H3a, H3b, H4b, H5a, and H5b, while Hypotheses H2a and H4a are not supported.

DISCUSSION

The results of the path analysis indicate that management support and future IS significance have direct positive impact on organizational commitment, while role conflict and role ambiguity have direct negative effects on organizational commitment. Moreover, management support and degree of IS control positively influence organizational commitment of IS managers indirectly through reducing role conflict and role ambiguity. These findings are consistent with those in organizational behavior and marketing management literature (Mathieu and Zajac, 1990; Brown and Peterson, 1993; Netemeyer, Burton and Johnston, 1995).

The results also show that management support can help reduce role ambiguity, while its impact on reducing role conflict is not significant. Similar results were discussed in the meta-analysis of role ambiguity and role conflict by Jackson and Schuler (1985). That is, a supportive management may provide IS managers with more knowledge and information to clarify their roles, but the support is sometimes not enough to solve the problem of simultaneous role requirements on IS personnel from all over the organization. The management may appear to be supportive of IS activities in general, but it usually does not give enough attention to IS staff at the personal level to relieve them from role burdens. The management may sometimes even add on to this role burden by raising their expectations. Thus a significant implication from the current research is that management should take actions to support IS staff at individual level to help them coordinate multiple role requirements. Also, it might be interesting for future research to look into the effects of different forms of management support on role stressors and organizational commitment.

The result that the significance of current IS has no significant impact on organizational commitment may indicate that IS managers associate career growth potential within the organization with the future importance of IS to the organization. Therefore, it appears that necessary innovation of the firm's information systems can not only give the firm new competitive capabilities, but also enhance the commitment of IS personnel and help retain them.

While the current study verified the important relationships among role stressors and commitment of IS managers, future studies should further look into the specific relationship between commitment and IS performance. Although the commitment-performance relationship has been extensively researched in general organizational and marketing management literature, similar studies are scarce under the IS management setting. Furthermore, this paper studied two factors affecting role stress of IS managers, i.e., management support and degree of IS control. It would be interesting for future research to examine the positive or negative impact of other factors on IS personnel role stress, such as improper learning curve assumption about IS from top management and lack of shared understanding about the role of IS between IS personnel and top management. Since this is a part of a major study, effects of some of the antecedent variables such as 'job satisfaction', the effects of which on commitment had been well established in prior studies, were not included in this study. This may be considered as one of the limitations and can be alleviated in a future, more comprehensive study.

CONCLUSION

Human resource management issues, such as job stress, tension, job satisfaction, commitment, and turnover, have

long been overlooked in IS management literature. In fact, these issues are closely related to the psychological and physical well-being of IS personnel and may become very costly to the organization if not managed properly. The current study tries to extend the research findings in organizational behavior and marketing management literature to the IS management setting, and studied the relationship among management support, degree of IS control, IS strategic significance, role stressors, and organizational commitment of IS managers using path analysis. The results of this study demonstrate that these variables are closely related to each other. We believe that the empirical findings of the current study will contribute to the IS human resource management literature, and provide valuable insights for organizations to more effectively manage their IS personnel and enhance IS performance.

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Appendix. LISREL Measurement Modeling Results

Variables		Item Loadings	Amount of Variances Explained	GFI	NFI	CFI	RMSR
Management Support	MS1	0.78	One factor explained 66.2% of variance	0.89	0.90	0.91	0.053
	MS2	0.77					
	MS3	0.81					
	MS4	0.81					
	MS5	0.79					
	MS6	0.67					
	MS7	0.71					
Degree of IS Control	IC1	0.50	One factor explained 61.1% of variance	0.95	0.94	0.95	0.055
	IC2	0.53					
	IC3	0.75					
	IC4	0.85					
	IC5	0.83					
Current Portfolio	CP1	0.66	One factor explained 65.3% of variance	0.96	0.96	0.97	0.033
	CP2	0.81					
	CP3	0.74					
	CP4	0.82					
	CP5	0.83					
	CP6	0.68					
Future* Portfolio	FP1	0.74	Factor 1 explained 26.0% of variance	0.96	0.96	0.98	0.039
	FP6	0.75					
	FP9	0.87					
	FP4	0.81	Factor 2 explained 31.9% of variance				
	FP5	0.83					
	FP7	0.78					
	FP8	0.78					
	FP2	0.74	Factor 3 explained 18.5% of variance				
	FP3	0.88					
Organizational Commitment	OC1	0.55	One factor explained 53.6% of variance	0.94	0.93	0.95	0.050
	OC2	0.76					
	OC3	0.68					
	OC4	0.82					
	OC5	0.62					
	OC6	0.75					
	OC7	0.51					
	OC8	0.73					
Role Conflict	RC1	0.62	One factor explained 57.6% of variance	0.97	0.96	0.97	0.038
	RC2	0.81					
	RC3	0.76					
	RC4	0.61					
	RC5	0.62					
Role Ambiguity	RA1	0.62	One factor explained 52.9% of variance	0.97	0.95	0.97	0.040
	RA2	0.66					
	RA3	0.49					
	RA4	0.67					
	RA5	0.83					
	RA6	0.65					

* As conceptualized by Ragunathan, Ragunathan and Tu (1999), the "Future Portfolio" construct actually has three sub-factors, i.e., Factor 1 - future projects for product and service differentiation; Factor 2 – future projects for operational and decision support; Factor 3 – future projects for systems enhancement. For the purpose of LISREL structural modeling in this paper, we took the mean value of all nine items of the three sub-factors to represent the "Future Portfolio" variable.