Technostress and Organization Loyalty of IS&T Workers – A Path Model

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Abstract

This paper examines the relationship between organizational loyalty and technostress for IS&T workers. A survey was conducted in the United States Midwest. The path model developed from the results indicated that perceived job stress lowered job satisfaction, while better technology management strategy increased job satisfaction and organizational commitment.

Keywords: Technostress, Loyalty, Organizational commitment

1. Introduction

In 1939, Schumpeter (1939) theorized that radical technological innovations would spawn waves of social change, spanning generations, even eras. Since then, digitalization has been altering how business relates to customers, suppliers, and competitors. Business innovation has been increasingly dependent on information system innovation (Cash and Konsynski, 1985). An information economy has been evolving, and with it the unparalleled importance of one occupational class – the Information and System Technology (IS&T) worker. As a key element in the infrastructure of information systems, the IS&T worker has become an important resource of the organization. For an organization to be successful, it needs to develop a strong team of IS&T workers to achieve competitive advantages in information systems (Porter, 1998).

Associated with their critical role in the organization, IS&T workers are facing increasing technostress in this fast changing environment. Few professionals are faced with as much direct obsolescence of key skills as are computer programmers (Kaluzniacky, 1998). Changes in the technological and organizational environment, as well as escalating job demands, all add to the stress. Stress of IS&T workers may affect the productivity and efficiency of the organization. Organizational cycles of innovation are driven by the rate at which IS&T workers can adapt to the speed of technological change. IS&T job stress may ultimately have more negative effects on the organization than on the employee. Glass (1997) indicated that 42% of system and programming design faults could be directly attributable to programmer stress. A study of Japanese programmers operating under stress by Furuyama, Arai, and Iio (1997) found that software development had a much higher rate of fault generation when programmers were under stress. Better scheduling and the reduction of stress would have reduced mistakes by 37%. Combining the results of the Fujigaki (1993) and Furuyama et al. (1997), Glass (1997) indicated that stress might be responsible for more than 70% of the developmental faults.

Brod (1984) defined technostress as “a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner. It manifests itself in two distinct and related ways: in the struggle to accept computer technology, and in the more specialized form of over identification with computer technology.” According to a publication issued by the National Institute for Occupational Safety and Health (Center for Disease and Control, 2008), 40% of workers reported their job was extremely stressful while three fourths of employees believed that workers have more on-the-job stress than a generation ago. Hudiburg (1997) contended that a portion of the population was suffering from technostress or technology induced occupational stress. He warned that when people interacted with computers, there was the potential for negative outcomes: computer stress, computer anxiety, negative computer attitudes, computer phobia, and computer aversion. If stress is ignored, it may lead to headaches, feelings of emptiness, cynicism, a sense of isolation, lack of intimacy, lowered sex drive, and increased absenteeism.
IS&T workers are at a great risk of experiencing technostress as the result of organizational demands and occupational stressors. One source of stress for IS&T workers comes from the need to deal with legacy systems. Most organizations face a dilemma of whether to install a costly new system, or stay with their existing legacy systems, which are often expensive to maintain and incompatible with the new way of doing business. Many IS employees are asked to modify existing legacy systems, rendering more fragility and complexity to the old systems.

Another source of stress comes from the conflicting demands from the user community. IS&T workers focus primarily on the infrastructure of a product, and are concerned with its compatibility to existing platforms, structures, and processes, operational feasibility, technical support, and training. User communities make information technology decisions based on application outcomes, with little, if any, regard for system requirements.

A third source of stress is related to the job insecurity of IS&T workers. Many organizations look to off-shore outsourcing to solve some of their technology issues and contain operating expenses. Based on a survey conducted among 300 business and information technology executives representing outsourcing buyers, outsourcing vendors, and legal firms, Deloitte Consulting (2008) found that a large percentage of the companies that outsourced were able to reach their financial objectives and averaged a strategically important return on investment of over 25%. Offshore contractors offer a relatively inexpensive labor pool, one that is talented, and equipped with foreign language and proficient programming skills. According to a study sponsored by Information Technology Association of America (2007), increasingly US enterprises were adopting a “cities of excellence” model, sourcing services from the best location for their respective IS&T functions and processes.

The stress faced by IS&T workers may be different from other employees in the organization. Research revealed vast differences existed between the abilities, cognitive perspectives, and personality styles of IS&T professionals and the general public (Nash and Redwine, 1988). IS&T workers are distinct with their own identity, attitudes, interests, collegueship, collective action, power, status, and work consciousness (Orlikowski and Barley, 2001). MIS personnel differ from employees in other fields on a number of personality and motivational factors such as need for achievement, need for growth and social needs. Burn, Tye, Ma, and Poon (1994) reported that IS professionals had very different needs and expectations from their working environments and that IS&T personnel were not as generally motivated by mere compensation. A survey conducted among IS&T employees showed that mere salary adjustment was judged to be ineffective to lock-in talent (Middlebrook, 1997). More than half (56%) of all respondents indicated that compensation was not among the top three reasons prompting IS&T employees to leave their jobs. These data take on added significance when we consider the unique role IS&T knowledge workers play in organizational cycles of innovation.

Because of their unique motivational factors, vigorous research is required to understand the relationships of technological management strategies to the job stresses, job satisfaction and organizational loyalty of the IS&T worker. The purpose of this study is to further investigate the relationship between job stress and organization loyalty for the IS&T worker. A survey was conducted among IS&T workers to understand these relationships. Path analysis was used to model the direct and indirect relationships among technology management strategies, job stresses, job satisfaction, organizational commitment, and organizational loyalty. From a theoretical perspective, this research adds to our understanding of the path model relationships between stress and loyalty, and the roles of intermediary variables such as job satisfaction, commitment, and technology management strategies in affecting the relationships. From a practical perspective, this study helps to examine how better technology management strategies can be adopted to cope with employee stress, and to improve job satisfaction, organizational commitment and loyalty.

In Section 2, we review the literature and present the model for the relationships among stress, techno management strategies, job satisfaction, organizational commitment, and organizational loyalty. Section 3 discusses the survey conducted among IS&T workers. Section 4 presents the results and analysis while section 5 discusses the results and section 6 concludes with directions for further research.

2. A Path Model for Technostress and Organizational Loyalty

2.1. Occupational Job Stress of IS&T Workers
Stress in the workplace adversely affects productivity, absenteeism, turnover, and employee hearth and well-being (Spielberger and Reheiser, 1996). Occupational stress is defined in terms of job characteristics that pose a threat to the individual because of a poor match between the abilities of the employee and the demands of the job. Stress occurs when there is role conflict, or when subordinates worry over circumstances they cannot control, and is exacerbated when employees have no input into possible outcomes. Sauter and Hurrell (1999) noted that the lack of control inhibited learning and undermined the motivation that was needed to overcome the stress associated with the demanding work. Other job conditions, such as environmental factors at work, including air quality, lighting, and noise also might increase the employee’s anxiety and frustration. According to Evans and Johnson (2000), even low-level noise could increase stress and decrease motivation.

Ivancevich and Matteson (1987) discussed a series of job related stressors that related directly to IS&T workers: qualitative overload (when the work requires more knowledge, skills, and abilities than the individual possesses), career progress, development opportunities, and rewards. An individual's response to stress is determined by the importance that the person associates with the outcome, the uncertainty of the outcomes, and the extent of the effect of the outcomes. For the IS&T worker, small mistakes have the potential to be devastating. Data can be destroyed very quickly and on a very grand scale, while failures in quality factors may have huge consequences.

Rapid technology and application software innovations demand that information workers stay current. New versions of software are released constantly, and as knowledge demands proliferate, IS&T workers face challenges on their knowledge, skills, and abilities (KSA). Further, as an organization downsizes, re-structures, merges, or consolidates with other organizations, IS&T workers are faced with changes in their roles and responsibilities. Employees are often required to add difficult and ambiguous tasks to their workloads, producing “role conflict” and job stresses (Kahn, Wolfe, Quinn, Snoek, and Rosenthal, 1964). Joshi and Rai (2000) reported that poor quality of information, as well as role conflict and role ambiguity, enhanced work-related stressors, “thereby setting the stage for several dysfunctional consequences.”

In addition to role conflict, the stress of IS&T workers is further exacerbated by the need for further education. Because of the demands of these on-the-job stressors, a large number of IS&T workers are in a constant state of learning. Continuous education is a requisite of any IS&T occupation. This overriding demand for on-going knowledge acquisition and training is compounded by the lack of time. There is limited time while on the job, and performance demands often require IS&T employees to take work home. The pressure to continuously learn is worsened by the rate of change in the technology, and by the fast pace at which new hardware and applications become obsolete.

2.2. Technology Management

Professional and personal development is an important component for the management of the organization for reducing the stress of IS&T employees. Empowerment strategies work best in IS&T career development. Empowerment is the practice of giving employees responsibility and authority to make decisions over their work (Atchison, 1991). The domain of knowledge provided by IS&T employees is linked to career development. Education of an individual has been found to affect technology adoption (Chuang, Rutherford and Lin, 2007), while a social culture of creativity and exposure contributes to an individual’s creativity (Wu, Wen, Wu and Lin, 2008). Promoting an organization culture of information technology helps IS&T professionals build healthy organizational relationships (Nord, Nord, Cormack and Cater-Steel, 2007). Workers’ stresses can be reduced when managers link workers’ activities to career aspirations, craft individual development plans, and provide coaching and training for employees to reach their potential (Ivancevich and Ganster, 1987). IS&T workers want mentoring and career development (Dissanayake, Takahashi and Herath, 2006) to keep their skills current with technology. Lally (1997) suggested that management should pursue a strategy of providing comprehensive training and ongoing support, utilizing the talents of employees who are comfortable with new technology.

Mak and Sockel (2001) found that technology management strategy was a motivational factor that affected the retention and turnover of IS&T employees. Dobbs (2000) contended that IS&T professionals should define their own curricula, as they know it best. He found that employees left their jobs because of the uncomfortable working environment created by their managers. She
contended that managers who are effective not only perform the basic management functions, but also are good communicators, helping employees develop and learn. Managers may concentrate on end results and goal setting rather than processes (Bunk, 1999). Goals provide guidance and flexibility for the knowledge worker to grow personally and professionally. Empowerment, goal setting, and collaboration appear to be effective tools for IS&T managers. Hence we hypothesize:

**H1: Perceived technology management is related to perceived job stress of IS&T workers.**

The better is the technology management perceived by IS&T workers, the lower is their perceived job stress.

2.3. Job Satisfaction

Hackman and Oldham (1980) stated, “If the last several decades of research on behavior in organizations has taught us anything, it is that people at work seek simultaneously many kinds of satisfaction, not just those with economic roots.” Job satisfaction is important for the successful implementation and use of computer technology (Igbaria and Guimaraes, 1993). Locke (1976) defined job satisfaction as an emotional reaction which “results from the perception that one’s job fulfills or allows the fulfillment of one’s important job values, providing and to the degree that those values are congruent with one’s needs.” A less formal definition describes job satisfaction as a positive emotional state reflecting affective attitude towards the job situation. It represents a positive desire to continue to work for one’s organization. Job satisfaction is analogous to liking one’s job and feeling good about it. As such, it is affected by individual’s perceptions, values, and needs, and an individual’s dispositions influences his/her job satisfaction (Poulin, 1995).

Based on the Dual Factor Theory of Motivation (DFT), job dissatisfaction and job satisfaction are not opposites. According to DFT, job satisfaction is related to the content of a job (labeled as motivator factors), while dissatisfaction is related to the context of the job (labeled as hygienic factors). The “right” hygiene factors do not cause satisfaction, but “wrong” ones result in dissatisfaction (Shipley and Kiely, 1988). Support for DFT has been mixed, even in “Herzberg’s own study, nearly one-third of the results contradicted DFT” (Shipley and Kiely, 1988). Even if DFT was not applied, lack of job satisfaction would not be considered job dissatisfaction, but rather a middle neutral state. Siggins (1992) indicated that because jobs are multifaceted, individuals can simultaneously find satisfaction and dissatisfaction with different aspects of their jobs. Job dissatisfaction can be attributed to the organizational failure to commit to talent development, lack of guidance, trust, and involvement, and apparent absence of objectivity or fairness (Jenkins, 1988). Igbaria and Guimaraes (1993) found that the stress due to ambiguity was the most dysfunctional variable for lowering job satisfaction of information centre employees. Poulin (1995) found that changes in professional development opportunities were positively associated with increased job satisfaction. Better technology management strategies providing better opportunities for IS&T workers would lead to better job satisfaction. We hypothesize:

**H2: The higher is the job stress perceived by IS&T workers, the lower is their job satisfaction.**

**H3: The better is the technology management perceived by IS&T workers, the higher is their perceived job satisfaction.**

2.4. Organizational Commitment

Organizational commitment has been repeatedly identified as an important variable in the study of employee work behavior. Organizational commitment is defined as the "relative strength of individual's identification with the involvement in a particular organization" (Mowday, Porter, Steers, 1982). Organizational commitment, understood as the degree of employee identification with the organization, can be measured as the employee’s sunk costs or investment in the organization (age, seniority, tenure). Organizational commitment is also measured as a human resource expense (cost of recruitment, training, retention, and employee development). These activities are meant to foster greater employee identification with the organization. The definition of commitment to an organization may also be viewed as a shared set of goals, and employee willingness to place corporate over self interests.

Meyer and Allen (1991) indicated commitment is of three natures: affective, continuance, or
normative. Employees with affective or continuance commitment remained with an organization because of an emotional attachment to the organization, while those with normative commitment remained because they had to. While all three forms of commitment related negatively to withdrawal cognition and turnover, affective commitment had the strongest correlations with organization-relevant (attendance, performance, and organizational citizenship behavior) and employee-relevant (stress and work–family conflict) outcomes. Eisenberger, Fasolo, and Davis-LaMastro (1990) indicated that the perception of being cared for by the organization encouraged individuals to assimilate organizational values. The perception of organizational support enhances employee involvement by creating trust.

We hypothesize:

**H4:** The lower is the job stress perceived by IS&T workers, the higher is their perceived organizational commitment.

**H5:** The better is the technology management perceived by IS&T workers, the higher is their perceived organizational commitment.

Farkas and Tetrick (1989) established a relationship between organizational commitment and job satisfaction. Greater commitment was found to be associated with enhanced job satisfaction. Employees who were highly satisfied with their jobs also demonstrated greater loyalty and commitment to the organization. Igbaria and Guimaraes (1993) studied the consequences of job satisfaction among information centre employees and confirmed the importance of job satisfaction in predicting organizational commitment and intention to leave. Commitment, however, is distinguishable from job satisfaction (Mowday, Porter, and Steers, 1982). Commitment emphasizes an attachment to the employer, and is a response to the whole organization (Igbaria, Meredith and Smith, 1994). Satisfaction, on the other hand, is a response to specific aspects of the employee’s job or career. It is postulated that if the organization promotes self-worth, organizational commitment will increase. This can be accomplished by management ensuring that employees have opportunities to succeed, that workloads match capabilities, and that individual growth needs are satisfied. Hence we hypothesize

**H6:** The higher is the job satisfaction perceived by IS&T workers, the higher is their perceived organizational commitment.

2.5. Loyalty

Loyalty is often construed as organizational commitment. According to Harvey, Novicevic and Speier (1999), the longitudinal corollary to commitment is the development of loyalty to the organization. Loyalty focuses on one’s on-going willingness to identify with the organization's goals and recognition that their future career opportunities are in the organization. Loyalty is also different from job involvement. Loyalty is characterized as the degree of attachment an individual feels toward the organization, while job involvement is often characterized as the degree of importance that the individual’s job contributes to self-image. Loyalty issues have also been linked to turnover intentions and voluntary termination (Cramer, 1996).

Loyalty and commitment have important consequences. Alkhafaji and Tompkins (1991) found that performance, absenteeism, innovation, turnover, and satisfaction were related to employee commitment and loyalty. The research of Igbaria, Meredith and Smith (1994) on commitment and loyalty corroborated its effect on turnover reduction. Sonnenberg (1991) found employees’ attitudes towards work induced management to create personnel policies that motivated and fostered commitment and loyalty. Employees want to work for companies of which they can be proud. That sense of pride spills over as a desire to belong to the organization. Hence we hypothesize:

**H7:** The lower is the job stress perceived by IS&T workers, the higher is their perceived organizational loyalty.

**H8:** The higher is the job satisfaction perceived by IS&T workers, the higher is their perceived organizational loyalty.

**H9:** The higher is the organizational commitment perceived by IS&T workers, the higher is their perceived organizational loyalty.

3. Methodology
A survey was conducted among IS&T workers to test the aforementioned relationships (summarized in Figure 1). The survey instrument was developed based on literature reviews on technology management, perception of management, job satisfaction, commitment and loyalty (Igbaria, Meredith, and Smith, 1994). The questionnaire was patterned after existing instruments, specifically the Organizational Commitment Questionnaire of Mowday, Porter and Steers (1982), the User Information Satisfaction Measure of Ives and Olson (1984), and Larson’s questionnaire on job stress (1996). The instrument used a seven-point Likert-like scale. The questionnaire was revised based on feedback from pretests with IS&T practitioners. In all, a total of 1400 surveys were distributed, 285 surveys were returned, and 271 usable surveys were obtained.

3.1. The Sample

The sample consisted of individuals from 18 different industry sectors, with 70% in the following sectors: manufacturing firms (25%), Big 5 (now 4) accounting-consulting firms (16%), general software consulting/developers (13%), education (11%), and health care (5%). More than half (58%) of the IS&T knowledge workers (158) reported working for companies with more than 1,000 employees. One quarter of the group (26%) reported working for organizations that employ between 100 and 1,000. Forty respondents (15%) indicated working for companies with less than a hundred employees.

More than 82% of the respondents were between 25 and 45 years old. There were 170 males (63%) and 68 females (25%). Thirty-three respondents (12%) did not indicate gender. Most (65%) of the respondents had been college trained. More than 73% of the respondents identified their functional responsibility as system analyst, programmer, or project leader. More than half of these (51%) had more than 5 years IS&T experience, while nearly two-thirds (64%) of respondents had been with the same company for two (2) or more years. Over 61% had two to ten years of employment with their current organization. The respondents were distributed across a variety of development platforms. Twenty-four percent (24%) of normal work activity was concentrated on new development, 31% on enhancements and retro fits, 37% on maintenance and legacy activities, and 8% on education.

3.2. Instrument Validity and Reliability

Table 1 lists the items in the questionnaire. All five item construct groups had good validity and reliability, as indicated by the high factor loadings and Cronbach’s alpha (Bollen, 1989). The factor loading was high (ranging from 0.53 to 0.93), and all the items represent one factor accounting for at least 53% of variance, showing that the items represented one construct. The Cronbach’s alpha for the items ranged from 0.77 to 0.93, indicating high reliability.

4. Results and Analysis

Path analysis with LISREL 8 was used for the analysis. Path analysis captures the direct and indirect relationships among the variables in the structural equation model (Jöreskog and Sörbom, 1989; Bollen and Long, 1993; Bollen, 1989). The hypotheses H1, H2, H3, H5, H6, H8, and H9 were accepted while H7 and H4 were rejected at the significance level of 0.05. Figure 2 shows the model estimates with the hypothesized relationships.

Figure 3 shows the final model with the insignificant relationships removed. The chi-square statistic was 4.82 with 3 degrees of freedom. It was 2.51 with 1 degree of freedom when the insignificant relationships were included as in Figure 2. Applying the likelihood ratio test for the comparison of models (Bollen, 1989), the chi-square difference was 2.31 (=4.82-2.51) with 2 degrees of freedom (=3-1), which was not statistically significant at the 0.05 level (critical value for 2 degrees of freedom is 5.991). Thus the model in Figure 3 is a better model.

The adequacy of structural models is assessed using various measures (Bollen, 1989). The null hypothesis is set up as a priori not to be rejected and the chi-square statistic tests whether the observed data fit the hypothesis of the proposed model. A smaller chi-square value indicates a better fit. For small sample sizes that might have slightly departed from normality, the chi-square per degree of freedom should be used instead. A ratio of approximately five shows a reasonable fit, while a ratio
between one and two is an excellent fit (Browne and Cudeck, 1993). The ratio of the model in Figure 3 was 1.607 (chi-square = 4.82 with three degrees of freedom), indicating a very good fit. Other measures of fit include the goodness of fit index (GFI), normed fit index (NFI), the non-normed fit index (NNFI) and the comparative fit index (CFI), with one indicating a perfect fit and any value above 0.9 suggesting a good fit. The model in Figure 3 had values of GFI, NFI, NNFI, and CFI greater than 0.9, showing an excellent fit. Further, the model was assessed using the root mean error of approximation (RMSEA) and standardized root mean square residual (SRMR). The RMSEA is a measure of the discrepancy per degree of freedom for the model, and a value of 0.05 or below indicates a very good model fit (Browne and Cudeck, 1993). The SRMR is an absolute fix index sensitive to misspecification and a value of 0.05 or below indicates a good fit. The model has a RMSR of 0.048 and a SRMR of 0.017, thus indicating a good model fit.

Figure 3 summarizes the maximum likelihood parameter estimates. Here $\beta_{32} (t = 18.75)$ was 0.84 and was significant at the 0.05 level, suggesting that "Organizational Commitment" significantly affects "Organizational Loyalty" in a positive way, and the higher the employee’s organizational commitment, the higher is the employee’s organizational loyalty. Similarly, $\beta_{31} (t = 3.87)$ was 0.17 and $\beta_{21} (t = 8.77)$ was 0.46, and both were significant at the 0.05 level. This suggests that "Job Satisfaction" significantly affects "Organizational Commitment" and "Organizational Loyalty", and that the higher is the job satisfaction perceived by the employee, the higher is the employee’s commitment and loyalty to the organization. However, "Job Satisfaction" was negatively affected by "Perceived Job stress", as $\gamma_{11} (t = -4.09)$ was −0.19 and significant at the 0.05 level, indicating that the higher is the job stress perceived by the IS&T employee, the lower is the perceived job satisfaction. In addition, $\phi_{21} (t = -3.56)$ was −0.37 and was significant at 0.05 level, suggesting that "Techno Management" is negatively correlated to "Perceived Job stress", and better technology management strategies lowers perceived job stress. Further, $\gamma_{12} (t = 11.48)$ was 0.52 and $\gamma_{22} (t = 6.62)$ was 0.32, and both were significant at the 0.05 level. This suggests that "Techno Management" significantly affects "Job Satisfaction" and "Organizational Commitment". Thus good technology management practice enhances organizational loyalty of IS&T workers through combating their job stress and improving their job satisfaction and commitment.

5. Discussion

This study explored the relationship between "Perceived Job Stress" and IS&T "Employee Loyalty". Overall the results indicated that perceived job stress lowered job satisfaction while job satisfaction increased organizational commitment and loyalty, and perceived job stress indirectly lowered commitment and loyalty.

Different from our original hypotheses, job stress did not have a direct negative effect on organizational loyalty and commitment. This effect was found to be indirect, mediated by job satisfaction. The organization may mitigate the effect of job stress on loyalty and commitment through improving employee job satisfaction. An encouraging finding of this study is that "Perceived Job Stress" was negatively correlated to "Techno Management". Better technology management strategies will lower job stress, enhance job satisfaction, organization commitment and loyalty among IS&T employees.

It is important that organizations enhance the commitment and loyalty of the most qualified IS&T professionals. Agarwal and Ferratt (2001) found that some organizations sought long-term relationships with IS&T professionals while others only sought only short-term relationships. Our results suggested that IS&T workers value a human resource strategy that reflects an understanding of their unique position in the organization. The psychological contract between employers and IS&T workers can only benefit from improving corporate attention to the working conditions and retention factors of the IS&T worker. Central among these issues is offering the IS&T worker the relief from stresses associated with increasing job complexity, threatened obsolescence, and imperative demand for new skills. As information technology is interwoven into every business model and functional work design, the expense of replacing IS&T workers goes beyond recruitment, training, staffing, and mentoring. It includes the loss of organizational experience and know-how. Veteran IS&T employees have networks of preferred vendors and industry-specific colleagues. They have trusted relationships
with internal customers. Organization-specific knowledge, trust, and commitment were valuable for productive contributions. As the rate of change in information system and technology increases, the solution lies not in mere outsourcing but in better developing human resources within the organization. As management continues the development of human resources as capital assets (Weiss, 2000), IS&T workers will increase in value relative to the organization’s investment in them.

6. Conclusion

This research contributes to a better understanding of IS&T human resource management. The issues of organizational commitment and job satisfaction are applied as mediators to the relationship between stress and loyalty. The study extends the research of job stress by positioning occupational stress, not as a determinant variable, but as an antecedent variable. Future research may address other aspects of job stress, such as the effect of job stress on innovations. Technostress can be addressed as a precipitant agent, a prescriptive inhibitor of innovation potential for IS&T workers, that affects their contribution to the organization.

In addition, since loyal employees with a higher propensity to stay with the organization may not necessarily perform better in their jobs, future study may address if loyalty and continuance affect job performance, and if so, how, and to what degree. Further, future research may also include a larger sample, with respondents from various states and various countries. Other factors such as demographic information, industry types and organization culture may also be examined.

7. References


### Table 1. Items within the Questionnaire

<table>
<thead>
<tr>
<th>Variable</th>
<th>Item</th>
<th>Question</th>
<th>Cronbach’s Alpha</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Job stress</td>
<td>Stress01</td>
<td>I feel stressed that I am NOT staying current in new technologies.</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stress02</td>
<td>I feel exhausted trying to stay current with the IS industry.</td>
<td>0.68</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stress03</td>
<td>I am stressed that my company’s IS technologies are out of date.</td>
<td>0.76</td>
<td></td>
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<tr>
<td></td>
<td>Stress04</td>
<td>I feel intimidated by how fast things change within IS technologies.</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stress05</td>
<td>A reason that I would like to learn more newer technologies is that I am embarrassed to admit there are areas that I do NOT know much about.</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td>Techno Management</td>
<td>TechMgt01</td>
<td>For the most part, I think management does a good job of matching up its technology needs with the people who have the appropriate talent.</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TechMgt02</td>
<td>For the most part, I think management does a good job of training IS personnel that want to learn more about newer technologies.</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TechMgt03</td>
<td>I am happy with the direction management takes in keeping people current with technology.</td>
<td>0.93</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TechMgt04</td>
<td>I think management provides adequate educational opportunities.</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TechMgt05</td>
<td>All in all, the company is doing a good job of meeting my growth needs.</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>JobSat01</td>
<td>I am satisfied with the amount of job security I have</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JobSat02</td>
<td>I am satisfied with the amount of personal growth and development I get in doing my job.</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JobSat03</td>
<td>I am satisfied with the respect and treatment I receive from my boss.</td>
<td>0.82</td>
<td></td>
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<tr>
<td></td>
<td>JobSat04</td>
<td>I am satisfied with the feeling of accomplishment I get from my job.</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JobSat05</td>
<td>I am satisfied with the support and guidance I receive from my supervisor.</td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JobSat06</td>
<td>I am satisfied with the amount of independent thought and action I can exercise in my job.</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JobSat07</td>
<td>I am satisfied with how secure things look for me in the future in this organization.</td>
<td>0.74</td>
<td></td>
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<tr>
<td></td>
<td>JobSat08</td>
<td>I am satisfied with the amount of challenge in my job.</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JobSat09</td>
<td>I am satisfied with the quality of the supervision I receive in my work.</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>JobSat10</td>
<td>I am generally satisfied with my job.</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Organizational Commitment</td>
<td>Commit01</td>
<td>I am willing to put in a great of effort beyond what is normally expected in order to help this organization be successful.</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Commit02</td>
<td>I talk up this organization to my friends as a great place to work.</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>Commit03</td>
<td>I would accept almost any type of assignment in order to keep working for this organization.</td>
<td>0.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commit04</td>
<td>I find that my values and the organization’s values are similar.</td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commit05</td>
<td>I am proud to tell others that I am part of this organization.</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commit06</td>
<td>My company inspires me to do my best in the way of job performance.</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commit07</td>
<td>I am extremely glad that I chose this organization to work for over others I was considering at the time I joined.</td>
<td>0.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commit08</td>
<td>I really care about the fate of this organization.</td>
<td>0.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commit09</td>
<td>For me this is the best of all possible organizations in which to work.</td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Loyalty01 | I have a strong desire to remain a member of my organization. | 0.89 |
| Loyalty02 | The organization inspires the best in me in the way of job performance. | 0.87 |
| Loyalty03 | I am glad that I work for this organization. | 0.91 |
| Loyalty04 | I would encourage a friend to work for my company. | 0.88 |
| Loyalty05 | I feel loyal to my company. | 0.89 |
| Loyalty06 | It would be difficult for me to emotionally distance myself from this organization. | 0.62 |

**Figure 1.** Path Model for IS&T Worker Job Stress and Loyalty
Figure 2. Model Parameters of Constructs with Hypothesized Relationships
(Note: the dotted lines indicate insignificant relationships)
Figure 3. Finalized Path Model (with insignificant relationships removed)