

# EMPIRICAL RESEARCH ON INVESTIGATING THE RELATIONSHIPS AMONG TECHNOLOGY STRESSORS, WORK EXHAUSTION, AND TURNOVER INTENTION IN IS EMPLOYEES

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## ABSTRACT

In recent years, research topics on employee turnover are in the comprehensive and broad range. However, the antecedents and the relationships between technology stressors and work exhaustion has not been extensively studied in the IS field. To bridge the knowledge gaps, the present research focuses on a group of specialized technical workers - IS employees in the context of ICT to investigate the effects of technology stressors on work exhaustion, and turnover intention. By reviewing previous research which focused on technostress, this research constructs a conceptual model to test and examine the hypothesized relationships among these variables. Through the results of an empirical survey in Taiwan, this research is expected to contribute to the understanding of technology stressors under ICT workplace.

**Keywords:** Technology stressors, Work exhaustion, Turnover intention, IS employees, IT governance

## INTRODUCTION

Organizations always expect to acquire greater advantages through the implementation of information and communication technology (ICT); yet, the use of this technology seems less likely to lead to the anticipated benefits and does not always display efficiency and effectiveness, and employee turnover is considered as the critical influence in making a substantial impact on organizations [4,5,6]. Employee turnover in enterprise is notable because it is costly to select, recruit, and cultivate a new employee, and also refers to opportunity costs in reducing productivity and losing customer satisfaction [5,7,8]. According to the report from past literature, reducing employee turnover rates by only 5 percent can save approximately 10 percent of operational costs and substantially improve worker productivity for an organization. In particular, scholars indicated that in a company, customer satisfaction level could drop sharply from 75 percent to 55 percent after the loss of sophisticated service staff; in their study, the high employee turnover rate was found to be closely linked with low profitability and growth.

IS employees in the service industry are regarded as valuable assets. The cost of losing IS employees is more substantial than losing common service workers because the former ones have a high degree tacit knowledge and specialized skills in using ICT and information systems to perform technical operations in organizations [2,4]. In addition, owing to the use of ICT has been commonly applied in e-business implementation to increase profits for business survival, IS employees must constantly adapt to new technologies, functionalities, and workflows for coping with the electronic workplace. In this circumstance, the experienced exhaustion and turnover intention have emerged in ICT employees. What management issues should be considered as an antecedent of employee turnover? What ICT problems that caused by IS employees' turnover needed to be clarified? Brillhart (2004) revealed that computer and technology related applications are the source of stress in the electronic workplace. Ragu-Nathan et al. (2008) demonstrated that the stress experienced by end users of ICT can reduce employees' organizational commitment and intention to remain. However, it is worth mentioning that stress caused by the application of ICT has been spreading in e-business organizations and impacting on IS employee's antisocial behavior [1,5,8,9].

In recent years, the research of employees turnover is comprehensive and broad in scope; yet, the antecedents and the relationships between technology stressors and work exhaustion have not been extensively recognized in the IS field. The purpose of this research is to focus on a group of specialized technical workers - IS employees in the context of ICT to investigate the relationships among technology stressors, work exhaustion, and turnover intention. Based on the turnover model of Moore (2000) and extending the study of Tarafdar et al. (2010) which focus on technostress, this research constructs a hypothesized model to test and examine the relationships among technology stress, work exhaustion, and turnover intention to bridge the knowledge gaps in IS employees' turnover and ICT governance. Two research questions are proposed to better understand the stressors of turnover intention, and they are (1) What technology stressors under the workplace of ICTs can cause work exhaustion and turnover intention for IS employees ? (2) How to eliminate the levels of work exhaustion and turnover intention from IS employees?

## **LITERATURE REVIEW OF TECHNOLOGY STRESSORS**

The concept of stress is derived from the territory of organizational behavior. Stress has been studied as different states in the workplace for various situations such as work stress, job stress, task-related stress, and the stress in specific organizations with different occupations or technological applications [1,2,7]. Recently, stress research has not only been discussed in the field of organizational behavior, but also in psychological medicine, workplace, and information system. Ragu-Nathan et al. (2008) noted that the task-related stress experienced by the end users of ICT is termed "technostress". Ayyagari et al. (2011) also explained that technostress is a modern disease that is caused by personal incapability to handle or cope with ICT in a healthy manner. The phenomenon of technostress, however, has become a crisis that threatens individuals' well-being and e-business success and eventually leads into negative results of work exhaustion and turnover intention. In brief, stress is characterized as a person-environment interaction and

as a person's mental or emotional response that makes people depressed and irritable, and can further upset their physical health [8,9,10].

Regarding the creators of technostress, scholars revealed that the factors which create stress can be classified into three general categories in the work and organizational environment: role-related stressors, task-related stressors, and technology stressors. Role-related stressors include role ambiguity, role conflict, and role overload. Task-related stressors can be described as the task characteristics that potentially create the stresses of task difficulty and ambiguity such as work-home conflict, invasion of privacy, work overload, and job insecurity [1,5,6]. Technology stressors represent the events or stimuli that provoke stress in ICT employees, such as techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty [8,9,10]. Focusing on the issues of technostress and drawing on the review of technology stressors, this research illustrates the factors that induce technostress.

In a significant study of technostress, Ragu-Nathan et al. (2008) argued that the phenomenon of technostress is a combination of motivational conditions in using ICT that can be stimulated by events, demands, objectives, or conditions which differ for each individual. Thus, for understanding the associated creators of technostress, scholars referred to six situations of using ICT that can create technostress in end-users [4,6]. Finally, given the related causes of technostress that can be discovered from various aspects in using ICT, five key factors for developing second-order constructs of technostress creators are further developed and tested, and these factors are techno-overload, techno-insecurity, techno-invasion, techno-uncertainty, and techno-complexity. The five factors are examined with exploratory factor analysis, reliability and validity testing, and model testing to identify a second-order construct.

## **RESEARCH METHOD**

For carrying out validity testing, a well-conducted research design is needed to reduce the possible effect of method biases [3]. Thus, to study the relationships among technology stress, work exhaustion, and turnover intention in the particular group of IS employees under ICT context, firstly, the present research proposes a research framework which is based on Moore's turnover model (2000) and extend the study of Tarafdar et al. (2010) to examine the combination of interaction effects among technology stressors, psychological strain of work exhaustion, and behavioral strain of turnover intention in the individuals. Concerning the predictors of technology stressors, five factors are used to estimate the perception of technostress in ICT, and they are techno-overload, techno-insecurity, techno-invasion, techno-uncertainty, and techno-complexity. With regard to the criterion variables, this study reviews prior research [1,4,7,8] to examine the dependent variables - work exhaustion and turnover intention. These two variables are used to evaluate the consequence of IS employees' technology stress: psychological strain of work exhaustion and behavioral strain of turnover intention. Each variable in the model is defined in line with the research context. The conceptual research model is shown as Figure 1. Secondly, based on the theoretical foundation in the studies of Moore (2000) and Tarafdar et al. (2010), this research discovered the factors

that can create stress and affect psychological strain and behavioral strain for the individual, and this is so-called stressors. The relevant hypotheses are proposed below.

H1: Technology stressors have significant influences on work exhaustion in IS employees.

H2: Technology stressors have significant influences on turnover intention in IS employees.

H3: The strain of work exhaustion in IS employees has a significant influence on turnover intention.

Third, in terms of survey approach, a paper-based questionnaire and network survey were designed for the current research. In order to collect representative data, the sampling objects were selected from members of the National Association of Small & Medium Enterprises R.O.C. (NASME) and the Information Service Industry Association of R.O.C. (CISA). In terms of data analysis techniques, statistical software of SPSS for Windows was used to analyze the demographic characteristics of the returned samples and to test the validity, reliability, and the assumptions in multiple regression analysis. Further, the multiple regression analysis technique was used to estimate the regression model and the hypothesized relationships in the model.

### DATA ANALYSIS

The questionnaires were collected from IS employees in micro, small and medium-sized firms between 20 May and 10 August 2014. A total of 381 questionnaires were returned, and 114 of them were incomplete or answered by unqualified respondents. As a result, the number of valid questionnaires was 267, making the valid response rate 70.08 percent. The assessments of content validity, convergent validity, reliability, and discriminant validity of measures were taken in this research. Also, to conduct multiple regression analysis, four structured approaches (normality, linearity, homoscedasticity, and independence of the error terms) were considered as the assumptions underlying this technique [3]. Table 1 summarizes the results of Pearson correlations matrix of independent variables.

Table 1. Pearson correlations matrix of independent variables

Construct	CR	AVE	1	2	3	4	5
1. Techno-overload	.968	.834	<b>.913</b>				
2. Techno-insecurity	.942	.806	.115	<b>.898</b>			
3. Techno-invasion	.963	.834	.532	.179	<b>.913</b>		
4. Techno-uncertainty	.969	.859	.310	.010	.205	<b>.927</b>	
5. Techno-complexity	.969	.836	.316	.359	.355	.205	<b>.914</b>

Note.

- CR: Construct reliability. AVE: Average variance extracted.
- The off-diagonal elements are the correlations among constructs.
- The diagonal elements in bold are the square root of the AVE. The value of each element should be larger than the off-diagonal elements.
- Correlation is significant at the 0.01 level (2-tailed).

For testing the regression model, this research firstly regressed work exhaustion and turnover intention against technology stressors to evaluate the regression coefficients for the estimated signs. Further, this research regressed turnover intention against work exhaustion to test the cause-effect relationship of each

other. The result of regression models – A, B, and C are shown in Table 2. The path coefficients and its significant are shown in Table 3.

Table 2. Summary of regression model A, B, and C

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
A	.558(a)	.312	.298	1.19815	.312	23.634	5	261	.000
B	.449(a)	.201	.186	1.46699	.201	13.166	5	261	.000
C	.533(a)	.284	.281	1.37874	.284	105.004	1	265	.000

Note: The model contains the whole data set of 267 observations.

Mode A: Dependent variable - work exhaustion; Mode B: Dependent variable - turnover intention

Predictors in model A and B: techno-overload, techno-insecurity, techno-invasion, techno-uncertainty, techno-complexity

Mode C: Predictor: work exhaustion, Dependent variable - turnover intention

Table 3. Coefficients of regression model A, B, and C

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
		(Constant)	B	Std. Error			Beta
A			1.336	.356		.000***	
	Techno-overload		.101	.061	.105	.098*	
	Techno-insecurity		.169	.052	.179	.001***	
	Techno-invasion		.320	.059	.338	.000***	
	Techno-uncertainty		-.106	.053	-.109	-1.994	.047**
	Techno-complexity		.209	.069	.179	3.021	.003**
B			2.193	.435		.000***	
	Techno-overload		.070	.075	.064	.936	.350
	Techno-insecurity		.293	.064	.273	4.581	.000***
	Techno-invasion		.045	.073	.042	.625	.533
	Techno-uncertainty		-.257	.065	-.231	-3.929	.000***
	Techno-complexity		.258	.085	.195	3.049	.003**
C			.953	.257		.000	
	Work exhaustion		.606	.059	.533	10.247	.000***

\*\*\* Significant at 0.01 level; \*\* Significant at 0.05 level; \* Significant at 0.1 level (1-tailed)

## RESEARCH FINDINGS AND DISCUSSION

After careful estimation, this research found that 9 out of 11 hypotheses were supported. In model A, the significant main effects of full construct in technology stressors displayed a strong and positive effect on work exhaustion. In model B, most technology stressors are found, only techno-overload and techno-invasion have no significant effect on turnover intention. In model C, the strain of work exhaustion in IS employees shows a strong and positive effect on turnover intention. The summary results of hypotheses tests are shown in Table 4. In sum, properly reducing IS employees' turnover rate can bring greater benefits in cost savings for the enterprise. On the contrary, the turnover costs caused by the leaving of IS staff member can result in inestimable losses to an enterprise. In order to facilitate the improvement of e-business operation in the context of resource constraints, the essential is that the turnover intention experienced by specialized

technical employees needs to be well investigated. Understanding the cause of stress and targeting specialized technical employees can significantly improve IT governance for business competition.

Table 4. Summary results of hypotheses tests

Hypotheses	Results
H1a: Techno-overload has a significant influence on work exhaustion in IS employees.	S
H1b: Techno-insecurity has a significant influence on work exhaustion in IS employees.	S
H1c: Techno-invasion has a significant influence on work exhaustion in IS employees.	S
H1d: Techno-uncertainty has a significant influence on work exhaustion in IS employees.	S
H1e: Techno-complexity has a significant influence on work exhaustion in IS employees.	S
<b>H2a: Techno-overload has a significant influence on turnover intention in IS employees.</b>	<b>N</b>
H2b: Techno-insecurity has a significant influence on turnover intention in IS employees.	S
<b>H2c: Techno-invasion has a significant influence on turnover intention in IS employees.</b>	<b>N</b>
H2d: Techno-uncertainty has a significant influence on turnover intention in IS employees.	S
H2e: Techno-complexity has a significant influence on turnover intention in IS employees.	S
H3: The strain of work exhaustion in IS employees has a significant influence on turnover intention.	S

Note. S: supported; N: not supported

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