Article

An Investigation on Exhaustion of SAP ERP Users: Influence of Pace of Change and Technostress

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Abstract: Despite recent growing research interest on ERP research, the understanding on ERP induced exhaustion is still limited. This study examines how the pace of change of ERP functionalities and interface causes exhaustion in workplace. For this purpose, we conducted an investigation on 128 ERP users from two different organizations in Bangladesh. We extended theory of technostress by integrating pace of change of ERP system. Result suggests that pace of change on ERP system significantly affect work-overload, work-life conflict and role ambiguity on ERP users. Result also shows that work-overload and role ambiguity are strong predictors for ERP induced exhaustion.

Keywords: Technostress; SAP; ERP; Pace of Change

1. Introduction

Currently, managers from industries need to make swift planning and proficient judgment in order to sustain in a very competitive market. Since the last two decades, Enterprise Resource Planning Software Systems (ERPs) became a standard and archetypical technology to support stakeholders' decision practice within the industry.

The primary benefit of ERP systems relates to the integration of data and processes and improved business efficiency [1]. As a result of the potential benefits reaped by ERP systems, they have been adopted by the majority of enterprises globally. The world "Simple" does not go along with ERP system [2]. Inflexibility of ERP systems causes frustration to the users which encourage managers to hire more programmers and sometimes any changes in the process also create problem on change the functionality of ERP system.

Prior research suggested, general technologies [3], email [4], mobile phones [5] cause stress among employees at workplace. Research also suggested that ERP systems are complex because of poor interface usability [6][7][8]. By noting that, we believe that complex systems like ERP can also cause stress just like other information and communication technologies at workplace.

In this paper, we aim to provide a more detailed context of technology stress related factors rooted in theory of technostress of [3]. The key objective of this study is to test the impact of pace of change on techno-induced stressors like role ambiguity; work home conflict and work overload which leads to exhaustion at workplace. In doing so, the research question of our study is

RQ. Is there any influence of pace of change of ERP system cause technostress on users?

2. Literature Review and Model Development

Ref [9] explained stress as a condition of user where the individual's capability and work place demands do not match. Researcher also mentioned that IT integrated systems are tightly controlled and those affect the job design and overall work structure of users. Ref [3] updated the previous research models of [9] and [10]. Their research explained that features/functions of technology cause

individuals to perceive stressors, which will make individuals to respond to these stressors psychologically.

Ref[11]investigated the unique attributes of office-home smartphone (OHS) use, such as work overload, productivity and flexibility and their impacts on work-to-life conflict and other work-related outcomes. Their research demonstrated that an increased work overload due to OHS use results in greater work-to-life conflict thus creating job stress and user resistance to OHS. Their study also reveals that the productivity gained due to OHS use can decrease work overload.

Some researchers conducted a user survey amongst 661 working professionals with the aim to build and test a model of technostress [3]. They made use of the person–environment fit model as a theoretical lens for their research. Evaluation of their proposed model advocates that some technology characteristic such as intrusiveness and dynamism i.e. pace of change are directly related to stressors e. g. role ambiguity, work overload, work–home conflict and so forth.

Based on the research of [3] we chose three stressors that can cause exhaustion or depression: work-overload, work-home conflict, role ambiguity. Ref.[12] argued that ERP systems are very exigent and radically changes the business process. ERP system related changes make users work environment indistinct and unsteady. Thus our hypotheses are

> H1: Pace of change positively influence role ambiguity of users
> H2: Pace of change positively influence work home conflict of users
> H3: Pace of change positively influence work overload of users

In manufacturing industries using ERP is a secondary job in some cases. As a result, role ambiguity occurs when the perception of lacking clear about whether users should deal with ERP-problems or work activities. Again, when ERP systems creates tension over learning new features and lighten work home boundaries then work home conflict occurs. Similarly, ERP system creates demand on quick report generation and decision making but users might feel pressure about time and accurate data input. Thus we formulated the hypotheses as follows

> H4: ERP induced role ambiguity positively influence exhaustion of users.
> H5: ERP induced work home conflict positively influence exhaustion of users.
> H6: ERP induced work overload positively influence exhaustion of users.

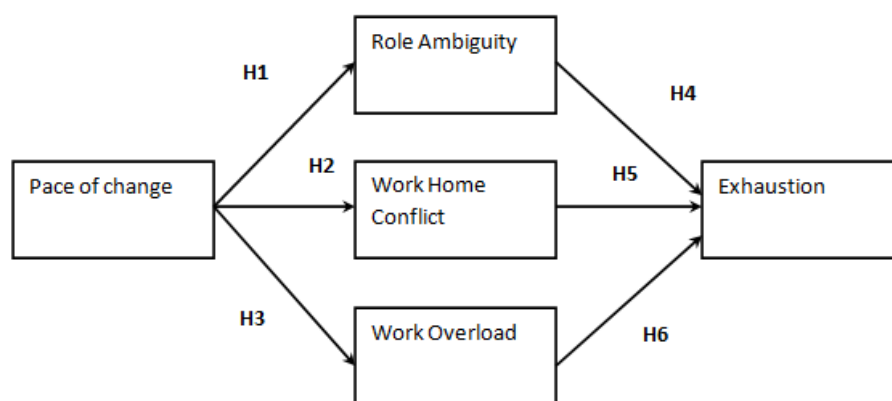As a result, our proposed research models are shown in Figure 1 below.

Figure 1. Research Model.

3. Research Methodology

3.1 Data Collection Method

A total of 300 questionnaires were distributed among the ERP users of two different manufacturing organizations in Dhaka, Bangladesh. 128 questionnaires in total were returned with 42.6% response rate. To make the research model significant including effect size 95 our required

sample size was 119. Between two sections of questionnaire the first elicited the demographic data; and the second focused on items to measure the constructs of our research model.

3.2 Measurement Items

All of the measurement items were measured from published literature. To capture work-overload, work-life conflict, role ambiguity and exhaustion were adapted from [3]. The measure items for pace of change were adopted from the research of [12]. Likert scale ranges from 1= strongly disagree to 5=strongly agree presented with items to measure the theoretical concepts.

Table 1. Measurement Items

	Pace of change	
PC1	I feel that there are frequent changes in the features of ERP.	[12]
PC2	I feel that characteristics of ERP change frequently	
	Work Home Conflict	
WHC1	Using ERP. blurs boundaries between my job and my home life.	[3]
WHC2	Using ERP. for work-related responsibilities creates conflicts with my home responsibilities.	
WHC3	I do not get everything done at home because I find myself completing job-related work due to ERP.	
	Work Overload	
WO1	ERP. create many more requests, problems, or complaints in my job than I would otherwise experience.	[3]
WO2	I feel busy or rushed due to ERP.	
WO3	I feel pressured due to ERP.	
	Role Ambiguity	
RA1	I am unsure whether I have to deal with ERP problems or with my work activities.	[3]
RA2	I am unsure what to prioritize: dealing with ERP problems or my work activities.	
RA3	I can NOT allocate time properly for my work activities because my time spent on ERP.s-activities varies.	
RA4	Time spent resolving ERP problems takes time away from fulfilling my work responsibilities	
	Exhaustion	
EX1	I feel drained from activities that require me to use ERP.	[3]
EX2	I feel tired from my ERP activities.	
EX3	Working all day with ERP is a strain for me.	
EX4	I feel burned out from my ERP activities.	

3.3Sample Profile

The demographic respondents tabulated in Table 2 which were derived from descriptive analysis. The majority of the age group (49.2 %) was in the category of 25-29 years old. Most of the respondents were Male (79.6 %) than the females (20.3 %). 67.1% of total respondents use ERP system more than 5 hours.

Table 2. Demographic Info

PercentageFrequency		
Gender		
Male	102	79.6
Female	26	20.3
Age		
25-29	55	42.9
30-35	38	29.6
More than 35	35	27.3
Use of ERP		
1-5 hrs	42	32.8
5 to 10 hrs	86	67.1

3.4Data Analysis Techniques

Smart PLS version 2.0, a variance based Structural Equation Modelling (SEM) was used to analyze the hypotheses. The reasons of using this technique are as follows:

(a) PLS is an appropriate technique to analyze m method for testing a multivariate, multi-path model[13].

(b) PLS places a minimal restriction on the sample size [14]

The two-step analytical procedure suggested by [15] was adopted to analyze data whereby the measurement model was evaluated first and then followed by the structural model. Also, following the suggestion of [14], the bootstrapping method (500 resample) was done to determine the significant level of loadings, weights, and path coefficients.

4. Result

4.1 Measurement Model

Convergent validity is the degree which indicate specific construct that should converge or share a high proportion of variance. According to [16], factor loadings and average variance extracted (AVE) more than 0.5 and composite reliability (CR) of 0.7 or above is seemed to be acceptable. According to Table 3, AVE of the constructs is above 0.5 and the composite reliability values are more than 0.7. So, we can conclude that convergent validity has been established.

Next, we have assessed the discriminate validity which extent a construct which is truly distinct from other [16]. This can be established by the low correlations between all measures of interest and the measures of other constructs. To address discriminate validity, the square root of the AVE is compared against the correlations of other constructs, when the AVE is greater than its correlations with all other constructs then discriminate validity has been established [17][18] (refer Table 4).

Table 3. Composite reliability and AVE

	Composite Reliability	**Average Variance Extracted (AVE)**
EX	0.909	0.715
PC	0.913	0.839
RA	0.904	0.702
WHC	0.829	0.618
WO	0.850	0.656

Table 4. Discriminant Validity

|	EX	PC	RA	WHC	WO
EX	**0.846**				
PC	0.266	**0.916**			
RA	0.735	0.254	**0.838**		
WHC	0.422	0.499	0.455	**0.786**	
WO	0.529	0.276	0.530	0.623	**0.810**

Note: Diagonal represents the square root of Average Variance Extracted (AVE) while the other entries represent squared correlations

4.2 Structural Model

The structural model represents the relationship between constructs or latent variables that were hypothesized in the research model. Table 5 and figure 2, shows the results of the structural model from the PLS output and out of six, five of our hypotheses are strongly significant. Pace of change (PC) has significant influence on RA(β = 0.254, p<0.01), WHC(β = 0.499, p<0.01) and WO(β = 0.276, p<0.01). Further, RA(β = 0.628, p<0.01) and WO(β = 0.180, p<0.01) are found strong predictor of EX. But our final hypothesis H6 is not significant which means WHC has no significant relation with EX.

Table 5. Hypothesis Test Result

	Relationship	Path co-efficient	T Statistics	P Values	Remark
H1	**PC -> RA**	0.254	3.036	0.003	Supported
H2	**PC -> WHC**	0.499	7.309	0.000	Supported
H3	**PC -> WO**	0.276	3.036	0.003	Supported
H4	**RA -> EX**	0.628	9.702	0.000	Supported
H5	**WHC -> EX**	0.024	0.293	0.769	Not Supported
H6	**WO -> EX**	0.180	2.389	0.017	Supported
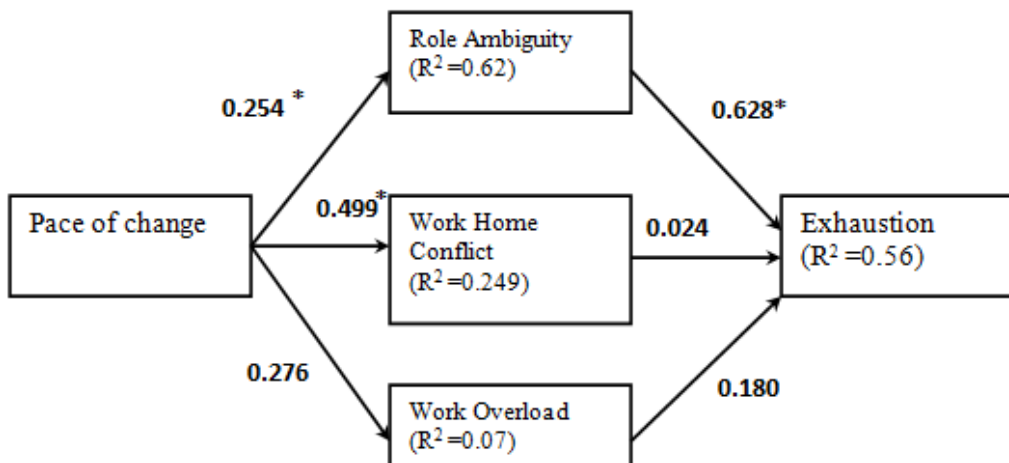
Figure 2. Research Model with result

4. Discussion and Implications

This research aims to identify whether pace of change for ERP system triggers techno-induces stressors which leads to exhaustion. Our result reveals that pace of change strongly influences stressors like role ambiguity, work home conflict and work overload. Analysis result shows that pace of change explains 62%, 24% and 7% variance role ambiguity, work home conflict and work overload consequently. Our hypotheses test results are consistent with the research of [12][19]. According to our data, role ambiguity, work overload and work-home conflict explains 56% variance on exhaustion related ERP system. These findings are aligned with the research of [3]. The relationship between work home conflict and exhaustion was positive but not significant. We assume that, most of ERP used in Bangladesh are offline system and connected through intranet. As a result, users can't work from home which put less pressure on them.

The research enriches the body of knowledge related ERP system and technostress. Theoretically, it extends the original theory of technostress by including pace of change.

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