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Impact of Information Overload and Task-technology Fit on Technostress

Ramakrishna Ayyagari
University of Massachusetts, r.ayyagari@umb.edu

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Ramakrishna Ayyagari
University of Massachusetts
r.ayyagari@umb.edu

ABSTRACT

Technostress is described as individuals' inability to effectively deal with information and communication technologies (ICTs). Addressing it is important because stressed individuals' productivity is adversely affected. We contribute to technostress literature by studying the impact of information overload and task-technology fit on technostress. We propose that information overload worsens technostress, whereas situations of task-technology fit alleviate technostress in individuals. Results from surveying 664 working professionals provide support for our proposed model. The implications from our study are discussed and provide an avenue for organizations to address technostress.

Keywords

Technostress, information overload, task-technology fit

INTRODUCTION

Interacting with Information and Communication Technologies (ICTs) has become a necessity in an individual's life. Early interactions with ICTs were mostly limited to organizational sphere; however, with the advances in ICTs the interactions now pervade organizational and personal spheres. These interactions force individuals to adjust to the use of ICTs. These adjustments range from integration of ICTs into workplace, to the fear of becoming obsolete, to the phenomenon of technostress (Ayyagari, Grover and Purvis, 2011; Korunka, Weiss and Karetta, 1996; Nelson, 1990).

Technostress is described as one's inability to cope or deal with ICTs in a healthy manner (Brod, 1984). Addressing technostress is important for organizations because it can impact individuals' health and productivity (Ayyagari et al., 2011; Tarafdar, Tu, Ragu-Nathan and Ragu-Nathan, 2007). Previous research in technostress has mostly focused on the consequences of technostress (Tarafdar et al., 2007; Ragu-nathan, Tarafdar, Ragu-Nathan and Tu, 2008; Tu, Wang and Shu, 2005). We extend this line of research by studying the impact of information overload and task-technology fit on technostress. The results from 664 working individuals suggest that information overload due to ICTs has an adverse impact on technostress, whereas task-technology fit alleviates technostress.

The rest of the paper is organized as follows. First, we briefly discuss the key findings from previous technostress research. Next, we develop our research model and present our hypotheses. The data collection and methodology used to test the hypotheses are discussed next. The paper concludes by discussing the results and the implications from the study.

BACKGROUND

Anecdotal evidence from popular press is replete with stories of individuals' maladjustments to ICTs. The stories range from Crackberry (i.e. overreliance on BlackBerry), to hotels locking up cell phones, to latest condition of 'phantom vibration sensation' (CNN, 2006; Rothberg, Arora, Hermann, Kleppel, St Marie and Visintainer, 2010). Keeping up with this trend, the mainstream Information Systems (IS) research has addressed issues like technostress. Initial research in technostress focuses on establishing the importance of technostress by studying its impact on individual productivity and satisfaction.

One of the first studies in technostress in IS field is reported by Tu et al., (2005). In a study of Chinese employees, Tu et al. (2005) found that technostress affected productivity in different ways. For example, greater workload is found to increase technostress. Similarly, Tarafdar et al. (2007) use role theory and find that technostress is directly related to broader concept of 'role stress'. Both 'technostress' and 'role stress' are found to be inversely related to productivity measures. The concept of technostress is operationalized into several dimensions that included concepts of overload, complexity, insecurity and reliability.

Ragu-nathan et al. (2008) identify technostress creators and inhibitors and test their relationships with job satisfaction, and commitment. The results indicate that technostress creators such as work overload and complexity decrease job satisfaction; whereas, technostress inhibitors like 'technical support' enhance job satisfaction and commitment.

Recently Ayyagari et al. (2011) take a different approach to technostress. Their research focuses on technological antecedents to technostress, and also, consistent with broader stress research, the concept of overload is treated as a cause of technostress, rather than as a dimension of technostress.

We extend this line of research in two ways. First, mostly, all the technostress research focuses on the component of work overload. We believe a more nuanced version of overload is more appropriate - the concept of information overload. For example, an individual might have only one task to do, however, may be overloaded by relevant and irrelevant information to accomplish this task. Although, this may be reflected in work overload (depending on how the survey questions are framed), we believe this situation is better reflected by information overload. Since one of the goals of ICTs is to facilitate information flow to accomplish goals, it is important to see if ICTs actually facilitate or create stress due to overload of information.

Second, although ICTs might cause stress, at the same time, proper ICTs for tasks can help individuals cope with stress. We capture this component by including task-technology fit. In summary, we extend the technostress literature by studying the impact of information overload and task-technology fit on technostress.

HYPOTHESES DEVELOPMENT

Broadly, the concept of person-environment theory is used to explain technostress phenomenon (Ayyagari et al., 2011; Tarafdar et al., 2007). In essence, it is argued that there is equilibrium between an individual and individual's work environment. Any imbalance in this equilibrium leads to strain (Cooper, Dewe and O'Driscoll, 2001; Edwards 1996). In our context, we are dealing with individual's interaction with technology in work settings. Therefore, if individual faces imbalance in interaction with technology then it would lead to 'stress due to technology' (technostress). The imbalance or misfit could occur in two ways (Edwards, 1996). First, the misfit could occur between the demands placed by the environment and the individual's ability to address the demands. For example, the task demands placed by the work environment might exceed individual's abilities to deal with it. This results in a stressful situation. Second misfit could occur if the individual's values do not suit the work environment. For example, a working parent might value flexible work arrangement to attend to family issues. However, if the work environment does not provide this benefit, this results in a stressful situation. We apply the person-environment framework to develop our hypotheses, as described below. The model developed in this paper is shown in Figure 1.

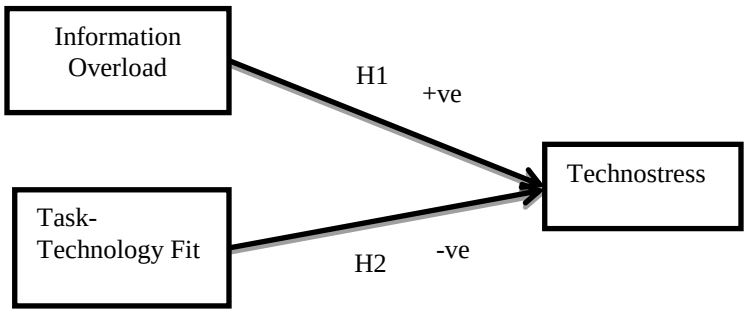

Figure 1. Proposed Research Model

In simple terms, information overload can be described as a situation in which the available information exceeds the individual's capacity to process the information (Eppler and Mengis, 2004). The concept of information overload is used in different contexts in IS field. For example, information overload is used in the context of group decision support systems (Grise and Gallupe, 1999), online price dispersion literature (Grover, Lim and Ayyagari, 2006), and online customer reviews (Park, Lee and Han, 2006). Irrespective of the context, information overload is generally associated with adverse effects. For example, Grover et al., (2006) argue that when information overload occurs, consumers lack the ability to rationally make decisions and therefore, price dispersion exists in online markets.

In our context, if the information provided by ICTs in an individual's work context (i.e. it can be due to emails, or access to knowledge-databases etc.) exceeds individual's perceived abilities to deal with this information, it reflects an imbalance in the equilibrium. The misfit here is reflective of information overload. From P-E theory, the misfit (reflected by information overload) leads to strain due to ICTs. Therefore, it is hypothesized that:

H1: Information overload is positively related to technostress[1].

The concept of 'fit' (or misfit) is previously studied in IS research. Specifically, it is argued that fit between task and technology leads to improved performance (Goodhue and Thompson, 1995). Task technology fit inherently represents the person-environment fit discussed earlier. In essence, task-technology fit is a measure of the equilibrium i.e. task technology fit directly measures the equilibrium between the demands of the tasks and individual abilities (with technologies) to deal with the task demands. From P-E theory, the fit (reflected by task-technology fit) should lead to reduced levels of strain due to ICTs. Therefore, it is hypothesized that:

H2: Task-technology fit is negatively related to technostress.

METHODOLOGY

Since our study explores the relationship between information overload, task-technology fit and technostress, regression analysis is deemed appropriate. The scales used in this study are presented in Appendix A. The desired sample for our study is working individuals who use technology for their work-related tasks. The key point here (our study's boundary condition) is that the individuals should consider technology use with respect to work related tasks. Although important, the negative cognitions of individuals using technology in personal sphere is beyond the scope of this study (for example, stress due to addiction to video games).

We have used a third-party company for our data collection. We developed the survey and provided the link to the survey to the data collection company. The survey respondents are opted-in, meaning that the respondents sign up to take surveys through the data collection company and have the option to not do surveys at any time. For their efforts, the respondents are given incentives by the survey company. In total, 664 usable responses were received for our project.

RESULTS

The correlations and the descriptive statistics for the three variables are provided in Table 1. About 52% of the sample is male, and the average age of the respondents is 49 years with an average of 14.5 years of technology experience.

	Information Overload	Task-Technology Fit	Technostress
Information Overload	3.65 (1.48)		
Task-Technology Fit	-.106**	5.32 (1.12)	
Technostress	.435**	-.202**	2.90 (1.55)
** Significant at 1%. Diagonal values are means with standard deviations.			

Table 1. Descriptive Statistics and Correlations

The results of the regression analyses are shown in Table 2. The regression model is significant and explained about 21% of the variance in technostress.

Independent Variable	Standardized Coefficient (Beta)	t
Information Overload	.418	12.04**
Task-Technology Fit	-.158	-4.55**
Dependent variable: Technostress. ** Significant at 1%. Adjusted R-Squared = .211		

Table 2. Regression Results

[1] The word 'technostress' is used to represent 'strain due to ICTs' in this paper. It should be noted that 'technostress' is normally referred to as the overall phenomenon and 'strain due to ICTs' stress' manifestation (Ayyagari et al., 2011)

The results of the proposed model are shown in Figure 2. Hypothesis 1 states that information overload will be positively related to technostress. The results indicate a standardized regression coefficient of .418 between information overload and technostress that is significant at 1%. Therefore, H1 is supported.

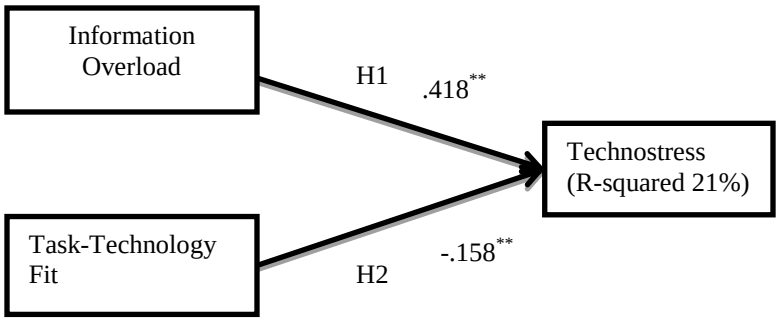

Figure 2. Research Model with Results

Hypothesis 2 states that task-technology fit will be negatively related to technostress. The results indicate a standardized regression coefficient of -.158 between task-technology fit and technostress that is significant at 1%. Therefore, H2 is supported.

DISCUSSION AND IMPLICATIONS

The goal of this research is to extend the technostress literature by including the information overload and task-technology fit concepts. We have used person-environment framework to explain why the misfit between individual abilities and environment demands lead to technostress. Before we discuss our results, some of the limitations of our work need to be noted. Our data collection occurred at single point in time. Therefore, future research could consider longitudinal data to further improve the proposed model. Further, our measure of technostress didn't include physiological symptoms (such as blood pressure, or carpal tunnel syndrome etc.). Exploring technostress by including variables from this dimension could be valuable.

Notwithstanding these limitations, our results offer some guidelines. ICTs can lead to situations of information overload in work settings. Since our results indicate that individuals are stressed in these situations, organizations need to provide tools for individuals to deal with information overload. This can occur in terms of training interventions for individuals and/or development and use of ICTs that enable individuals to deal with information overload. This idea is similar to search engine Bing's (http://www.bing.com) premise that it can help individuals deal with search overload.

Previous research on technostress has mostly focused on what leads to technostress. Only Ragu-nathan et al. (2008) explicitly include technostress inhibitors (for example, concept of technical support). The concept of task-technology fit could be utilized as an inhibitor of technostress. Our results indicate that higher levels of task-technology fit lead to lower levels of technostress. Therefore, this could present a useful avenue for organizations to evaluate task and technology context proactively to reduce technostress.

CONCLUSION

Recently issues related to individuals' maladjustment to ICTs have garnered attention. Technostress is one such phenomenon which is important to address because of it impacts on productivity. We contributed to this research by studying the impact of information overload and task-technology fit. Results from surveying 664 working individuals indicated that information overload increases technostress, whereas task-technology fit acts as a way to reduce technostress. It is hoped that the results provided in this study provide an avenue for organizations to address technostress.

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APPENDIX A

Construct	Items
Information Overload[a] (developed)	1. The amount of information available due to ICTs is overwhelming.
	2. ICTs create more information than I can cope with.
Task-Technology Fit[a] (developed based on Pendharkar, Khosrowpour and Rodger, 2001)	1. The available ICTs fit the needs of my work tasks.
	2. The available ICTs fulfill the requirements of my work tasks.
	3. There is a synergistic match between the ICTs I use and my work demands.
Technostress[b] (from Ayyagari et al. 2011)	1. I feel drained from activities that require me to use ICTs.
	2. I feel tired from my ICT activities.
	3. Working all day with ICTs is a strain for me.
	4. I feel burned out from my ICT activities.
Scale anchors: [a]: 1-Strongly Disagree to 7-Strongly agree; [b]: 1-Never to 7-Daily	

Table A1. Scales Used in the Study