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The Impact of Technostress Components on the Employees Satisfaction and Perceived Performance:
The Case of Qatar

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ABSTRACT

The present study investigates the effects of technostress creators and inhibitors on job satisfaction, organizational commitment and perceived performance. A research model derived from the Transaction-Based Model of Stress and Coping Theory was developed and tested using a web-based survey questionnaire. The variables considered are technostress creators, technostress inhibitors, job satisfaction, organizational commitment, and perceived performance. A Structural Equation Model using a convenience sample from Qatar population was used to test the model. The results show that organizational commitment has a significant positive effect on perceived performance. Job satisfaction has a significant positive effect on organizational commitment. Technostress creators have a significant negative effect on job satisfaction. Technostress inhibitors have a significant positive effect on job satisfaction. Implications for managers and researchers are reported.

KEYWORDS

Employees Performance, Employees Satisfaction, Organizational Commitment, Qatar, Technostress Creators, Technostress Inhibitors, Transaction-Based Model of Stress and Coping Theory

1. INTRODUCTION

Adopting new ICT in organizations has become indispensable. The 21st century has experienced significant advances concerning Information and Communications Technology (ICT). This has, in turn, a profound effect on the day-to-day activities/work and the lives of employees. As indicated by Raišienė and Jonušauskas (2013), companies have also benefited from advances in ICT as they experience great advances in production and their effectiveness of their employees. However, according to Brillhart (2004), valuable as these advancements are, they have brought some challenges, such as stress and health problems. ICT is a double-edged sword (Lei and Ngai, 2014); it results in increased communication by using collaborative technologies such as instant messaging and voicemails, boosts productivity in organizations, and facilitates access to information for decision-making (Riedl, 2013). At the same time, it has a dark side, which may result in negative outcomes (Tarafdar et al., 2011;

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Zheng and Lee, 2016). ICT may make the employees feel compulsive about being connected all the time, forced to respond to work-related information in time, and resigned about frequent upgrades, which cause stress, job dissatisfaction and health-related problems (Tarafdar et al., 2010; Çikrıkci, 2016). This can lead to a type of stress known as "Technostress".

Fuglseth and Sørebø (2014) define the negative psychophysical effects brought about by the use of ICT as "technostress". Similarly, Ragu-Nathan et al. (2008), indicate that "Technostress", a term invented by Brod, a clinical psychologist, in 1984, refers to the inability to cope or deal with ICT in a healthy manner. Ragu-Nathan et al., (2008) go on to say that "Technostress" is a term used to represent the negative effects that technology can cause to a person's psychological state; for example, loss of concentration, inability to sleep, headache, and many other symptoms. Technostress, therefore, is one of the fallouts of an end user's attempts to deal with ICT and the changing cognitive and social obligations related to their use. As outlined by Tarafdar et al., (2010), technostress effects have appeared more over the past few years with the rapid expansion of ICT in the workplace.

Even though the topic of stress has been studied, research on technostress has been very little. Tarafdar et al., (2010) and Ragu-Nathan et al., (2008) conducted studies on this subject to isolate the essence of technostress and illustrate its effects. In relation to their studies, they claim that people suffering from technostress have a lower job fulfillment level and output, and are less committed to their companies. Although such researchers expose the essence of technostress, they do not clearly illustrate the specific technological characteristics that lead to such stress. It is such conceptualization that basically envelops the concept of technostress, making the relationship and boundaries between stress and technological characteristics unclear. For instance, techno-overload is among the aspects used to capture technostress. This aspect emphasizes that technology brings a heavier workload (Tarafdar et al., 2010).

Understanding the impact of technostress on employee satisfaction, commitment, and perceived performance is an important step towards benefiting from an advanced computing environment. Previous research on technostress (e.g., Lei and Ngai, 2014) shows that there is a negative relationship between technostress and employees' satisfaction and performance. Tarafdar et al., (2007) show that there is an inverse relationship between technostress and productivity. In addition, Tarafdar et al., (2011) show that technostress significantly reduces job satisfaction, commitment, innovation, and productivity. Employees continually have to increase their daily interaction with ICTs, which may increase the negative effect of ICT use on them and enable people to be connected anytime and anywhere (Wang et al., 2008).

It should be noted that most of the previous studies on this technostress subject were conducted in the developed countries. To the best of our knowledge, very few studies have been conducted in developing countries. This study provides a better understanding of the growing technostress phenomenon, especially, in emerging countries like Qatar. The present study will contribute to the emerging literature on the negative outcomes of ICT use by highlighting the influence of technostress on employee's satisfaction, organizational commitment and perceived performance. From the other side, it deals with the power of technostress inhibitors to alleviate the effect of technostress by extending the literature on technostress.

The main objective of this study is to propose and test a theoretical model, which based on the Transaction-Based Model of Stress and Coping Theory (Lazarus, 1966; McGrath, 1976; Lazarus and Folkman, 1984; Cooper et al., 2001; and Tarafdar et al., 2010). The study aims to investigate the impact of technostress on job satisfaction, organizational commitment and perceived performance in public and private sectors in Qatar. It is important to investigate ways of alleviating the negative effects of technostress in order to improve the organizational outcomes by identifying the most important technostress inhibitors. With this in mind, the following research questions were identified:

RQ1: Do technostress creators negatively affect employees' job satisfaction, organizational commitment and perceived performance?

RQ2: Do technostress inhibitors reduce the negative impact of technostress on job satisfaction, organizational commitment and perceived performance?

The current study is organized as follows: the next section reviews the Transaction-Based model, technostress creators and technostress inhibitors literature leading to the formulation of hypotheses. Then a methodology section will show the development of instruments and methods of data collection and data analysis. This is followed by the results of the study and discussion of the results and their implications. Finally, the study's limitations and future research possibilities are outlined.

2. THEORETICAL BACKGROUND

The Transaction-Based Model of Stress and Coping Theory (Lazarus, 1966; McGrath, 1976; Cooper et al. 2001) has provided the foundation for several studies of stress. Most of the studies of technostress employed the Transactional-Based Model (TBM) (Fuglseth and Sørebø, 2014; Tarafdar et al., 2010; Tarafdar et al., 2011). It focuses on the interaction of people with stress in order to predict stress outcomes. There are many reasons for its popularity among researchers. It can explain why technostress can lead to negative or positive outcomes. It allows us to understand and study the nature of the different types of technostress. In addition, it can be used to predict people's adoption behavior when a new system is being implemented (Lei and Ngai, 2014). The TBM model has four main components, which include stressors, situational factors (could reduce the impact of the stressors such as social support, role redesign, and employee participation), strain (outcome for the individual), and other organizational outcomes (e.g., high turnover and absenteeism). Stressors are usually the factors or conditions that generate stress. Technostress is associated with five stressors. These stressors are called technostress creators, which include techno-overload, techno-invasion, techno-insecurity, techno-complexity, and techno-uncertainty (see Table 3 in the Appendix). These stressors (due to role and task stress) lead to a rise in strain level, which is seen in the individual's psychological and behavioral outcomes in response to the stressor (Ayyagari et al., 2011). This shows the positive relationship between the stressors and strain. Strain reduces productivity, increases job dissatisfaction levels, and leads to less innovation and creativity at work, and poorer performance (Ayyagari et al., 2011; Tarafdar et al., 2011).

2.1. Technostress

Technostress is a term that encompasses 'technology' and "stress." Brod in 1984 described technostress as "A modern disease that is caused by the inability to cope or deal with ICT" (Ayyagari et al., 2011). Technostress, therefore, is described as the stress experienced by individuals due to the inability to cope with the requirements dictated by their use of ICT in organizations (Raišienė and Jonušauskas 2013).

According to Tarafdar et al. (2007), five main technostress creators associated with the use of ICT can be identified. They comprise Techno-overload-- ICT's potential to force employees to work faster and longer (Fuglseth and Sørebø, 2014); Techno-invasion-- ICT's potential to invade its users' personal life, so that they find themselves being reached anywhere at any time (Tarafdar et al., 2011); Techno-insecurity-- the threat felt by users that they will losing their job or position, due either to being replaced by another employee who understands the advanced technology better or of being replacing by new ICT, both which can cause stress (Ahmad et al., 2014); Techno- complexity-- the complexity of the information system used in an organization, which forces its users to spend more time and effort to gain the required ICT skills in order to oblige other companies and vendors to keep up by means of the latest hardware, software, and applications (Raišienė and Jonusauskas, 2013); and Techno-uncertainty-- the constant changes, upgrades, and amendments made to existing ICT systems, or the constant adoption and deployment of new technology in organizations, which may cause employees in the field to lose confidence and feel stressed (Fuglseth and Sørebø, 2014; Raišienė and Jonušauskas 2013). They feel anxious and frustrated because their knowledge so quickly

becomes obsolete and because of the pressures put on them to learn and adopt new technologies (Tarafdar et al., 2007).

2.2. Technostress Inhibitors

In order to reduce the impact of technostress creators, organizations could focus their effort on technostress inhibitors (situational variables in the organizational environment) which according to Ragu-Nathan et al., (2008) include the following: 1) literacy facilitation-- influences the relationship between the technostress and the task complexity (Saganuwan et al., 2015). It refers to support mechanisms in terms of educating the employees by establishing good relationships with the ICT department and sharing knowledge through training. This decreases the number of mistakes made by the employee and speeds up learning (Fuglseth and Sørebø, 2014). Such practices may help in reducing techno-complexity; 2) technical support provision-- refers to the assistance and technical support mechanisms provided to professionals in the context of their use of ICTs (Tarafdar et al., 2010); and 3) involvement facilitation-- the mechanisms that keep employees involved in adopting and developing ICT, in all the phases from system initiation, through planning, process, and development up to testing. Employees can provide inputs and suggestions regarding the system's features, which will increase the value and quality of the system and keep the employees satisfied with it (Tarafdar et al., 2010).

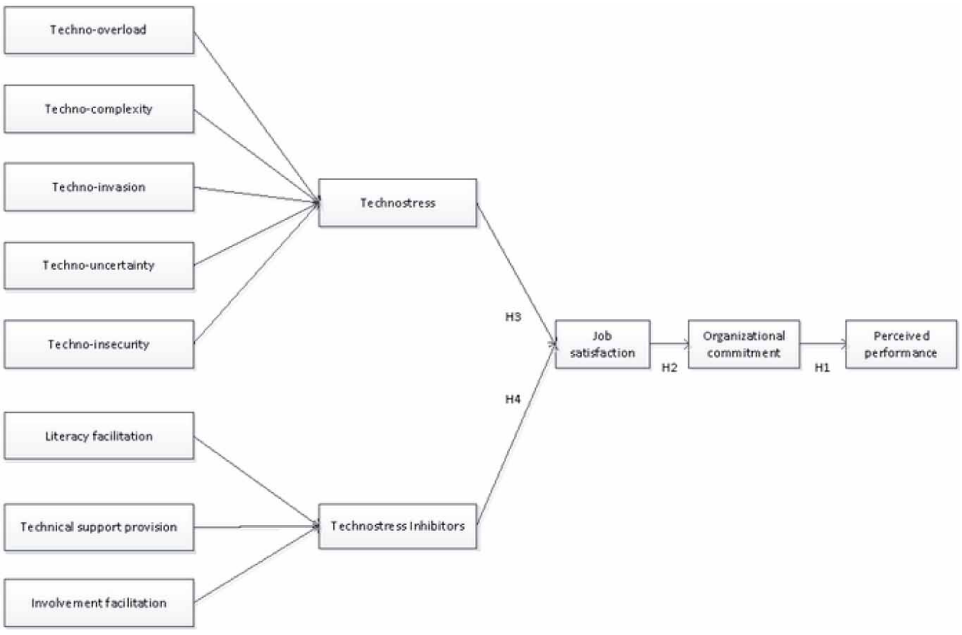
3. LITERATURE REVIEW AND RESEARCH HYPOTHESES

The following research model depicted in Figure 1 is proposed. The literature review and hypotheses follow the model.

3.1. Perceived Performance and Organizational Commitment

In the corporate sector, performance is measured in terms of returns (Khosrow-Pour, 2013). The incorporation of technology leads to innovation, which has in most cases positive implications for

Figure 1. The proposed research model



returns. Improving employees' performance in any organization reflects many positive outcomes, such as satisfied employees (Yücel, 2012). Organizational commitment is defined by Cole and Bruch (2006) as "an individual's emotional attachment to and involvement in an employing organization". Both organizational commitment and job involvement are critical factors with a direct effect on organizational performance. Commitment to the organization's objectives can help the organization to perform at peak level. Therefore, employees who are emotionally attached to an organization work hard for it, believe in their organization's goals and values, and intend to continue to work for the organization. In addition, employee commitment to an organization can reduce absenteeism and turnover, and improve performance (Dixit and Bhati, 2012). Simosi (2013) develops the notion of organizational commitment through three main stages: The first stage is compliance, which is the lowest level of commitment. Employees in this stage usually accept the influence of others in the organization, in order to gain specific rewards or get benefits in return, such as pay. The second stage in organizational commitments is the identification stage; in this stage, the employee accepts the influence of others in order to maintain the relationship with the organization. The employee feels proud of joining this organization due to the attractiveness of the organizational goals. The last stage is the internalization stage, which is the highest level of organizational commitment. In this stage, there will be congruence between the employee's personal values and the organizational values, which is intrinsically rewarding. Several studies have identified positive relationship between organizational commitment and perceived performance (Khan et al., 2011). According to Mazayed et al., (2014) there were significant positive relationships between job involvements, employee's commitment and organizational productivity. Organizations with high employee commitment to the organization and high job involvement show high performance and productivity. Similarly, Dixit and Bhati (2012) reported that managers' commitment to the organization was significantly related to performance. Thus, the following hypothesis was posited:

H_1: Organizational commitment positively influences perceived performance.

3.2. Job Satisfaction and Organizational Commitment

Job satisfaction is "a pleasure or positive emotional state resulting from the appraisal of one's job experiences" (Locke, 1976, p.1300). Job satisfaction is an important issue for the researcher in organizational behavior because when the job satisfaction is high, a positive feeling will be held about the job. However, when job satisfaction is low, a negative feeling will be held (Robbins et al., 2013). Previous research shows that job dissatisfaction is associated with many negative behaviors such as labor turnover, accidents in the workplace, and absenteeism (Judge and Kammeyer-Mueller, 2012; Kammeyer-Mueller et al., 2005; Kinicki et al., 2002). Both job satisfaction and organizational commitment, as variables, affect organizational outcomes (Testa, 2001). Job satisfaction can be a kind of response to job related issues, while organizational commitment is a global response to the organization. Therefore, organizational commitment is more consistent over time than job satisfaction (Eslami and Gharakhani, 2012). Many studies have found positive correlations between job satisfaction and organizational commitment (Yücel, 2012; Ragu-Nathan et al., 2008). Eslami and Gharakhani (2012) found that job satisfaction factors, including personal relationships, promotions, and favorable conditions at work have significant and positive effects on organizational commitment. Moreover, Yücel (2012) reported that a high level of job satisfaction results in higher organizational commitment and lower turnover. So, Job satisfaction is positively related to organizational commitment. According to Klaus et al., (2014) in their study of IT professionals, organizational commitment is positively related to job satisfaction. However, organizational commitment is negatively related to role stress. Similarly, according to Ragu-Nathan et al., (2008), the 608 respondents who were ICT users from different organizations revealed that technostress creators diminish job satisfaction, which leads to less organizational commitment. Thus, the following hypothesis was posited:

H_2: Job satisfaction positively influences organizational commitment.

3.3. Technostress Creators and Job Satisfaction

There were a few attempts in theorizing technostress. One the oldest theories is the theory of self-regulating systems and cybernetics introduced by Wiener (1948) in which originally described the machine control mechanism, however, it has been used to understand human cognitive processes. Another one of these theories is Cybernetic Theory of Stress, Coping and Well-Being in Organizations introduced by Edwards (1992) which starts with an individual perception about a situation, and then this situation will be compared to conditions that are more desirable. As a result, there could be discrepancies between the two cases, which could create the stress (e.g., technostress). This stress will have a negative effect (tension) on well-being, which leads to either reducing the source of the stress (technostress creators) or coping with it by employing technostress inhibitors (Fischer and Riedl, 2015). In this study, we based our model on the Transaction-Based Model of Stress and Coping Theory (Lazarus, 1966; McGrath, 1976; Lazarus and Folkman, 1984; Cooper et al., 2001; and Tarafdar et al., 2010).

Technostress is considered a negative phenomenon. Some researchers believe that it may cause a feeling of deteriorating memory, impatience with others and increasing the inability to rest (Raišienė and Jonušauskas 2013). Ragu-Nathan et al., (2008) bring out the idea of a user being discontented; they describe excessive stress in relation to ICT use as an aspect that could lead to displeasure among workers. Tarafdar et al., (2010) discovered aspects whereby technostress negatively affects an employee's satisfaction, with particular reference to the use of ICT. Originally, the five technostress creators were developed by Tarafdar et al., (2007) consists of techno-overload, techno-invasion, techno-insecurity, techno-complexity, and techno-uncertainty.

According to a study by Tu et al., (2005) about computer-related technostress, the organizations that reward their employees for increasing their computer skills and literacy often cause them significantly more technostress, because rewards make users to work longer than they are able. Moreover, according to Moore (2000) in a study of IT professionals and managers from the United States in various industries, work overload was the strongest contributor to exhaustion among the technology workers. Also, in the study of Ayyagari (2012) of working professionals, information overload or techno-overload is positively related to technostress. Moreover, Barley et al. (2011) studied emails as a source of stress. Seventy-nine employees from three different departments in an international company participated and the results revealed that the more time people spent on handling their e-mail, the greater was their feeling of being overloaded, which increased the sense of technostress. The study revealed that 75 percent of employees use filters and other features to reduce unwanted and unimportant emails. Forty five percent of the employees suffered from two types of e-mail anxiety: that they would lose control of the inflow of e-mails and that, they would miss important information.

Techno-overload or work overload can cause anxiety and stress by involving long difficult working hours and the pressure to work overtime, which result in dissatisfaction. Dissatisfaction results in health issues and poor job performance. The aggregate result is reduced job satisfaction (Altaf and Awan, 2011). Information and work overload can create more stress and employees may feel dissatisfied and frustrated at work. The study of Pradana and Salehudin (2013) of the 41 auditors from accounting firms operating in the Jakarta region indicated that work overload has a significant effect in increasing the intention to find a new job that is more satisfying.

The growth of the competitive business environment makes employees organization careful to ensure that they can be reached whenever they are needed, whatever the time, since the organizations are expected to run without interruption. This lets organizations monopolize the time and location of those workers involved with IT, who in consequence cannot spend enough time with their family and friends (Smith and Salvendy, 2013). The availability of computing intranet and extranet devices

and mobile communication enables employees to be always connected with the firm and never feel free from the technology, which causes what is called techno-invasion.

The intervention of ICT into employees' privacy at work and at home, blurring the boundaries between them; this increases stress and reduces job satisfaction. Constant connectivity may cause employees to lose control over both time and space. The sense of satisfaction and security inversely affects employees when they have no privacy and are always on call (Tu et al., 2008).

Employees may experience anxiety and dissatisfaction because of spending more time on learning more about ICT to comply with the organizational requirements; their acquired knowledge quickly becomes obsolete, which causes techno-complexity. Employees tend to feel that the variety of applications and functions has in recent years grown increasingly complex in its technical terminology and capabilities (Ibrahim et al., 2014; Tu et al., 2008). Many employees do not understand how this technology should be used in their organization. According to the study by Ayyagari et al., (2011), work overload and role ambiguity were found to be the two most dominant stressors. In their framework "Integrated Theoretical Framework of Technostress Based on Cybernetics" Fischer and Riedl, (2015) emphasize the job characteristics which include job control and job content and the technological environment (e.g., rapid changes and reliability).

Employees feel threatened and insecure over the possibility of losing their job by when new ICT is adopted or of other employees with better and newer technological knowledge and skills taking their job from them (techno-insecurity). According to Ahmad et al. (2012), the techno-insecurity was less significant than other creators of technostress. More dissatisfaction in the workplace results from the high techno-insecurity among the users of the information systems (Oncioiu, 2013). If they cannot adapt to new work processes with the new technology and cannot cope with the learning requirements, they will increasingly feel job dissatisfaction. Employees may experience anxiety and feel their job stability being threatened, which increases the dissatisfaction when they perceive their computer knowledge to be inadequate (Ibrahim et al., 2014; Tu et al., 2008). According to Buitendach and De Witte, (2005), the relationship between job insecurity, job satisfaction and organizational commitment, a higher score of job insecurity is associated with a lower score for total job satisfaction.

Almost all organizations constantly upgrade and introduce new applications and systems in order to keep pace with the new technology and in response to the competitive pressures; although this causes techno-uncertainty. The constant requirement for employees to update their knowledge leads to their dissatisfaction. The implementation of a new technology can also lead to greater job dissatisfaction (Tu et al., 2008). According to the study conducted by Jayaraman and Maheshkumar (2013) to measure the level of job satisfaction of library professionals in Coimbatore with job-related features, the respondents were less satisfied with regard to the stress experienced in terms of digital changes and the continuous training required handling their digital library tasks. Tarafdar et al., (2011) studied IT users from two different organizations in which they found that the technostress factors reduce the end users' satisfaction, which also affects the individual productivity in the organization. Thus, the following hypothesis is posited:

H_3: Technostress creators negatively influence job satisfaction.

3.4. Technical Inhibitors and Job Satisfaction

According to Shu et al. (2011), there is a relationship between self-efficacy and techno-insecurity and techno-complexity. They found that if the employees had a higher level of computer self-efficacy, then they could have a lower level of technostress related to computers and that adequate training and support could alleviate technostress. Ragu-Nathan et al., (2008) found that, organizations should encourage employees to explore and learn the new technology, provide technical support through help desk and demonstration workstation and involving employees in planning and implementing phases. As mentioned earlier, Technostress inhibitors include three components; literacy facilitation, technical

support provision and involvement facilitation. These three components could be explained by the coping part of the theory of the Transaction-Based Model of Stress and Coping as described below.

As part of their integrated technostress model, Fischer and Riedl (2015), reported that one of individual characteristics that influence technostress impact is user's technical skills and abilities such as computer literacy. Literacy facilitation increases the level of knowledge that employees have in an organization and encourages the sharing of IT knowledge with other employees, by providing training, manuals and documentation on using applications and systems. Moreover, it enables IT users to cope with learning new ICTs. According to Adekunle et al., (2007) providing training for the employees would allow them to have a better understanding of the new technology, which would reduce the effect of the technostress creators. Furthermore, Burke (2009) found in his study that giving nurse educators technological training allowed them to incorporate technology in the classrooms with lower levels of technostress. According to Jones et al., (2009), training is positively and significantly associated with job satisfaction and job satisfaction is positively and significantly associated, on most measures of performance.

Technical support provision provides users with support and assistance, which reduce the effect of technostress by solving IT users' technical concerns and problems. Fischer and Riedl, (2015) suggest that organizational environment which include physical environment, company culture, as well as potential organizational technostress inhibitors (e.g., technical support) (Ragu-Nathan et al., 2008; Wang et al., 2008). Technical support provision can reduce both techno-complexity and techno-uncertainty (Tarafdar et al., 2010). In the study conducted by Al-Qallaf (2006), it was found that the second cause of work stress was insufficient technical support. Furthermore, Burke (2009) reported that the technostress effect was reduced when there was administrative support within the organization. Moreover, an easily reached help desk and quick response from them will increase employee's job satisfaction. According to the study by Ragu-Nathan et al., (2008), technical support provision as one of the technostress inhibitors enhances job satisfaction, which in turn, enhances the commitment to the organization.

Involvement facilitation refers to the mechanisms that involve the end-user in new technology and engages users in the initiation, planning, process, development and testing of the system. End-users can provide inputs and suggestions regarding the system's features, which, as noted above, increase the system's value and employee's satisfaction (Tarafdar et al., 2010). According to Khan et al., (2011), job involvement and job satisfaction are correlated and so are job satisfaction and organizational commitment. Moreover, based on the justice theory research, it has been reported that the three dimensions (interactional justice, procedural and distributive justice) were positively related to job satisfaction (Hao, Hao & Wang, 2016; Nadiri and Tanova, 2010). We believe that interaction justice, which deals with fair or unfair treatment with respect to communication and involvement of the employees at the work environment, would influence job satisfaction. Ragu-Nathan et al., (2008) provided evidence that technostress inhibitors increase job satisfaction, which leads to increased organizational commitment. Thus, the following hypothesis was posited:

H_4: Technostress inhibitors positively influence job satisfaction.

4. RESEARCH METHODOLOGY

4.1. Instrument Development

A quantitative approach using an online survey was used to collect the data to test the proposed model. The survey questionnaire in the current study consisted of two parts. The first part measures the variables of interest such as technostress creators, technostress inhibitors, job satisfaction, organizational commitment, perceived performance, and culture variables. The items used to measure technostress variables were adapted from Tarafdar and Rague-Nathan

(2008). Four of the technostress creators (Techno-overload (TOV), Techno-invasion (TIN), Techno-uncertainty (TUN), and Techno-complexity (TCO)) contain four items per each. The fifth one (Techno-insecurity (TIS)) contains only three. Technostress inhibitors consist of three factors. Literacy Facilitation (LC) with five items, Technical Support Provision (TSP) with four items, and Involvement Facilitation (IF) with three items. Organizational outcomes comprise job satisfaction (JST), organizational commitment (OC) and perceived performance (PRFM) and each of these contains four items.

The second part requested various items of demographic information, including gender, age, employment sector, educational level, the length of service in the present job, nationality, and the level of confidence in using the computer and technology. The survey questionnaire was available in both Arabic and English. The authors translated the survey from English to Arabic. Then, a bilingual person validated the meaning of the survey to ensure that the meaning of the questions had not been changed in the translation process. Some minor changes were made as a result of pilot testing the survey instrument. Then final version of the survey was prepared. The participants responded to statements on a five-point Likert scale, which ranged from "strongly disagree" (1) to "strongly agree" (5).

4.2. Statistical Procedure

The SPSS and AMOS were used to carry out the analysis. SPSS was used to compute frequencies, means, standard deviation, reliability coefficients, and principle component analysis. Additionally, a confirmatory factor analysis (CFA) approach was taken with AMOS to validate the factor loadings identified in the principle component analysis. A structural model was then run testing the research model and hypotheses. A summary of the steps of statistical analysis is reported below:

1. Running initial descriptive statistics (range, maximum, minimum, mean, standard deviation, frequencies, and percentages) for all scale-item variables;
2. Reliability and validity assessments were performed using Cronbach's alpha, corrected item-total correlations, and exploratory factor analysis. According to Nunnally (1978) the standard reliability value of a scale should be above 0.7 and for the minimum acceptable value for corrected item-total correlations is 0.5 (Hair et al., 2006). Only items with loadings of at least 0.50 were retained (Hair, et al., 2006);
3. The measurement items were finalized;
4. AMOS was used to carry out the analysis. Several goodness-of-fit indices were used to assess the validity of the constructs;
5. Since the five components of technostress creators are distinct, but at the same time they are related and measure one factor and same argument is true for the technostress inhibitor components, a second order construct approach was used for technostress creator components and technostress inhibitors. Moreover, these factors were based on a theoretical model (The Transaction-Based Model of Stress and Coping Theory).

4.3. Sample and Data Collection

Most of the previous research in this area used samples from either a single organization or a particular occupation. Meanwhile, in this study, the target participants were not limited to any particular occupations or any single organization. Every employee who uses ICT on a daily basis at work was a potential participant. The link to the survey was sent mainly through multimedia applications such as twitter and WhatsApp to a scattered sample from the society in the State of Qatar. Since the survey link was forwarded to some participants' families and friends, the total sample that refers to all the persons who were presumably contacted could not be determined; hence, the response rate is not reported. Four hundreds and ten responses were received; 401 of them were usable.

5. DATA ANALYSIS

5.1. Characteristics of Respondents

Based on the descriptive statistics data, approximately sixty-seven percent of the samples were females. Thirty seven percent of respondents were less than 31 years old. Thirty two percent of the respondents were within the range 31-40 and around thirty-one percent of the respondents were more than 41 years old. Additionally, fifty-five percent indicated that they were working in the government sector; forty-five percent were working in the semi-government/private sector. About seventy percent of the respondents had a bachelor's degree. Thirty-six percent of the respondents had work experience of less than 5 years. Around thirty-four percent of the respondents had work experience ranging from 5 to 10 years and around thirty percent of the respondents had work experience of more than 10 years. Approximately, seventy-five percent of the respondents indicated that their level of computer confidence was eight or above, on a scale from one to 10.

5.2. The Psychometric Properties of Measure

As shown in Table 1, the minimum value of Cronbach's alpha (0.70) was met by all constructs, as suggested by Nunnally (1978) and Spicer (2005). The Cronbach's alpha values ranged from 0.777 to 0.891. Cronbach's alpha is the most commonly used test to measure the scales of each variable from multiple Likert questionnaires (Field, 2009). Two items (TIS4 and IF1) were dropped from the analysis because they were loaded on two factors with a loading value greater than 0.40. The values of the correlated item-total correlations for all items showed a high correlation, which was an indication of high convergent validity.

The parameters for the structural equation model illustrated in Figure 1 were estimated by the maximum likelihood method using AMOS 24.0. The model fit indices for the measurement and structural equation models are reported in Table 2. All fit indices met the recommended values. Most of the standardized factor loadings for each construct were above the 0.7 level as shown in Figure 2. Following the guidelines recommended by Comrey and Lee (1992), this represents a good fit of the data. It should be noted that because of second order analysis; the techno uncertainty was dropped from the analysis since its factor loading was 0.38. Additionally, the technostress inhibitors factor, compared to the technostress creators, load well on its three sub-constructs as shown in Figure 2.

6. RESULTS OF THE STUDY

6.1. Hypothesis Testing

As mentioned earlier, the second order analysis was employed. As shown in Figure 3, all hypotheses were supported at level of significance less than 0.01. Organizational commitment significantly predicts perceived performance with standardized coefficient of 0.37 and $R^2 = 0.13$. Moreover, job satisfaction is significantly associated with organizational commitment with the standardized coefficient of 0.74 and $R^2 = 0.55$. The relationship between technostress creators, technostress inhibitors and job satisfaction was significant. While technostress creators have a significant negative impact on job satisfaction, technostress inhibitors has a significant positive impact on job satisfaction with standardized coefficient of -0.25 and 0.52, respectively. It should be noted that all sub-constructs for both technostress creators and inhibitors were significant.

It should be noted that the mediating effect of organizational commitment on the relationship between job satisfaction and perceived performance was tested using the following procedure:

1. The coefficient between job satisfaction and organizational commitment was estimated (A=0.72) as shown in Figure 4;
2. The direct effect of job satisfaction on perceived performance (coefficient C) was estimated (C=0.48);

Table 1. Reliability and validity evaluation

Construct Items	Factor Loadings								Corrected Item-Total Correlations
	TOV	TIN	TCO	TIS	TUN	LC	TSP	IF	
TOV1	**0.738**	0.195	-0.63	0.219	0.136	-0.096	0.125	0.111	0.565
TOV2	**0.818**	0.170	0.158	-.030	0.111	-0.007	-0.015	0.091	0.704
TOV3	**0.774**	0.220	0.201	0.89	0.137	0.013	-0.47	-0.02	0.711
TOV4	**0.654**	0.241	0427	0.003	0.072	0.124	-0.52	-0.104	0.620
TIN1	0.300	**0.702**	0.120	-0.23	0.047	0.088	-0.009	-0.047	0.582
TIN2	0.159	**0.747**	0.056	0.83	0.105	0.152	-0.038	0.048	0.599
TIN3	0.219	**0.721**	0.199	0.99	0.179	0.079	-0.018	0.082	0.652
TIN4	0.070	**0.767**	0.137	0.084	0.120	-156	0.103	-0.013	0.562
TCO1	0.118	0.033	0.764	0.104	-0.002	-0.089	-0.05	0.097	0.638
TCO2	0.069	0.090	0.860	0.108	0.060	-0.013	-0.048	0.065	0.774
TCO3	0.103	0.306	0.638	0.168	0.084	-0.078	0.059	-0.099	0.560
TCO4	0.105	0.110	0.860	0.137	-0.027	-0.008	-0.008	0.033	0.788
TIS1	0.265	0.096	0.365	**0.545**	0.062	-0.076	-0.086	-0.025	0.604
TIS2	0.059	0.119	0.207	**0.793**	0.075	0.069	-0.36	0.006	0.547
TIS3	0.096	0.088	0.253	**0.743**	0.088	0.007	-0.70	-0.096	0.691
TUN1	0.040	0.086	0.003	-0.067	**0.783**	0.211	0.100	-0.041	0.635
TUN2	0.158	0.092	0.068	0.02	**0.854**	0.122	-0.046	0.037	0.768
TUN3	0.078	0.098	0.061	0.134	**0.792**	-0.056	0.071	0.199	0.680
TUN4	0.128	0.156	0.002	0.100	**0.816**	0.039	0.088	0.063	0.724
LC1	-0.043	0.012	-0.056	0.052	0.130	**0.820**	0.209	0.206	0.667
LC2	-0.011	0.074	-0.051	0.015	0.119	**0.788**	0.304	0.265	0.717
LC3	0.019	0.074	-0.039	-0.006	0.066	**0.747**	0.337	0.257	0.775
LC4	0.024	0.025	-0.127	-0.005	0.081	**0.607**	0.356	0.223	0.730
LC5	0.040	0.041	-0.09	-0.001	0.067	**0.695**	0.378	0.231	0.783
TSP1	0.005	0.015	0.017	-0.111	0.043	0.231	**0.793**	0.124	0.795
TSP2	-0.033	0.018	0.029	-0.124	0.116	0.229	**0.761**	0.132	0.756
TSP3	0.008	-0.019	-0.001	0.060	0.018	0.031	**0.817**	0.129	0.702
TSP4	0.002	-.005	-0.083	0.02	0.045	0.240	**0.797**	0.136	0.791
IF2	0.070	0.054	0.035	-0.103	0.067	0.365	0.222	**0.677**	0.619
IF3	0.040	0.018	0.066	0.003	0.084	0.249	0.262	**0.726**	0.776
IF4	0.018	-0.018	0.024	-0.001	0.122	0.276	0.273	**0.761**	0.767
Cronbach's Alpha	**0.824**	**0.790**	**0.848**	**0.777**	**0.857**	**0.891**	**0.890**	**0.849**	

3. The indirect effect of job satisfaction on perceived performance was estimated by including organizational commitment in the model (estimating C' and B);
4. To have a mediation effect for organizational commitment, the value of C' should be reduced substantially or be close to zero. In our case, we do not have even a partial mediation. In fact using bootstrapping method in AMOS, the significance level (p-value) for indirect effect of job satisfaction on perceived performance was 0.465, which also indicates the lack of mediation presence.

Table 2. SEM fit

Parameter	Estimate		Recommended Value
	MM	SM	
Chi-square/Degree of freedom	2.86	2.27	<= 3.0
Goodness-of-fit index	0.911	.0921	>= 0.9
Adjusted goodness-of-fit index	0.902	.0912	>= 0.8
Normal fit index	0.915	0.926	>= 0.9
Comparative fit index	0.928	0.931	>= 0.9
Standardized root mean square residual	0.068	0.058	<=0.08

Figure 2. Measurement model

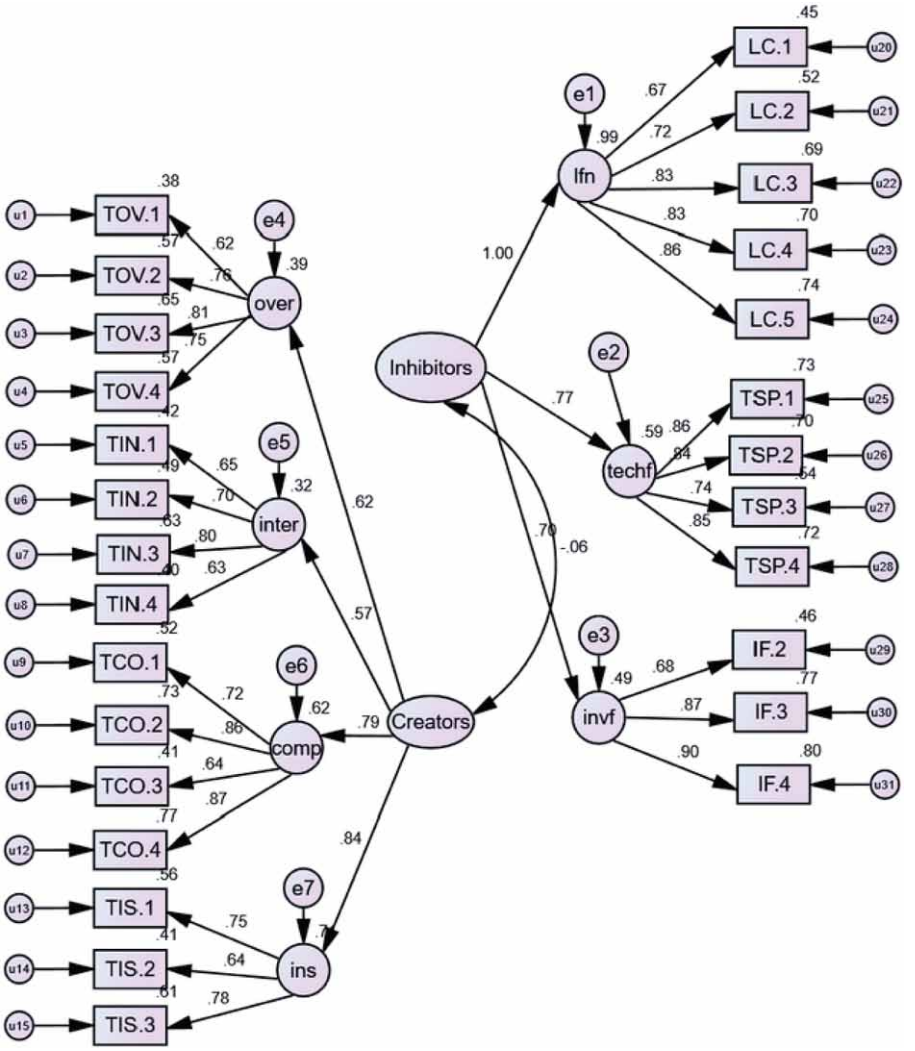


Figure 3. Model results (standardized path coefficients)

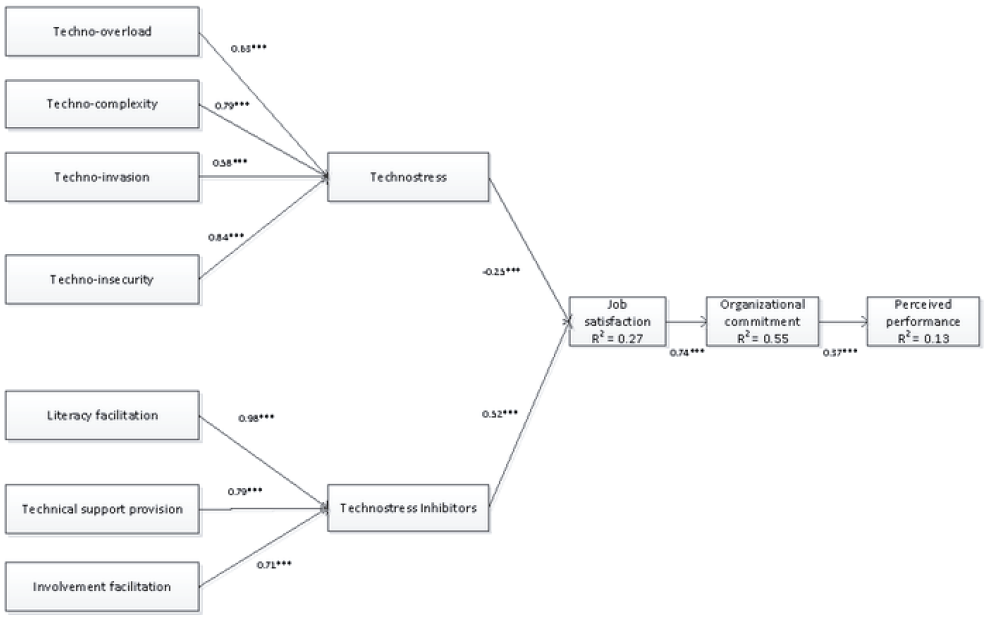
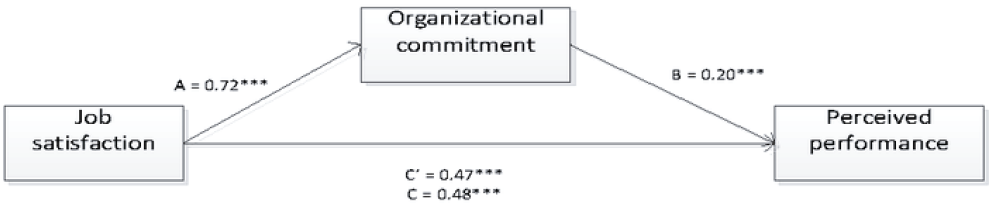


Figure 4. Testing the mediation effect



We conclude that organizational commitment does not mediate the relationship between job satisfaction and perceived performance. In other words, job satisfaction does not lead to higher perceived performance through organizational commitment. Further investigation of the triangulated relationship is worth pursuing. On the other hand, job satisfaction significantly mediates the relationship between technostress inhibitors and organizational commitment (p-value=0.001). Technostress inhibitors would lead to higher perceived performance through job satisfaction. However, the mediation effect of job satisfaction on the relationship between technostress creators and organizational commitment was not significant (p-value = o.127).

7. DISCUSSION AND IMPLICATIONS

This study used the Transaction-Based Model of Stress and Coping Theory as a basis for developing and testing a model to investigate the impact of technostress creators and inhibitors on employee's job satisfaction, organizational commitment, and perceived performance. The results of the present study provide valuable addition to previous findings in the field of technostress. By knowing the technostress factors that negatively or positively affect employees' job satisfaction, which in turn

affect the organizational commitment, which in turn affect employee's perceived performance. One can focus on the positive effects of some factors and mitigate the negative effects of the other factors.

The results of this study indicate that organizational commitment has a significant positive impact on perceived performance. This finding is in accordance with work done by Dixit and Bhati (2012). It was found that employees are enthusiastic over showing their commitment to their organizations in order to maximize productivity, which will further enhance the organization's reputation. Some previous researchers have found that employees who are highly committed to their job are more productive (Dixit and Bhati 2012; Mazayed et al., 2014). When commitment to an organization increases, it generally helps the organization to retain employees and experience global competition.

Furthermore, the result revealed that job satisfaction has a significant positive impact on the organizational commitment. This finding is in accordance with works done by Klaus et al., (2014) and Eslami and Gharakhani, (2012). Job satisfaction can determine the level of commitment to the organization since most of the employees are willing to be involved in the organization's decisions, if they are satisfied with their job. Employees who are happy and comfortable in their jobs are more willing to stay in the organization. Usually, highly committed employees are more likely to accept the organization's values and goals. The positive relationship between job satisfaction and organizational commitment will benefit the organization, since employees with more organizational commitment will make great efforts to help their organizations to succeed.

The findings also indicated that job satisfaction mediates only the influence of technostress inhibitors on organizational commitment. Therefore, managers should focus on improving job satisfaction in order to raise the level of commitment to the organization; hence, managers should assign reasonable tasks related to the employees' job and improve the opportunities to develop their career.

The results also revealed that factor of technostress creators was negatively significant in predicting job satisfaction. Therefore, technostress creators decrease employee's job satisfaction. This finding is in accordance with Tarafdar et al., (2010) and Ayyagari et al., (2011). If employees believe that they lacked enough knowledge about the use of technology at work, they have to spend more time and effort in learning how to use any new technology in the workspace in order to accomplish their tasks, and then they will start developing symptoms of technostress, which would to job dissatisfaction. In general, employees need more time to understand and upgrade their technological skills to keep pace with developments since new technology always requires fresh knowledge and skills. Most of the employees surveyed felt that keeping up with new technology by updating their skills and knowledge added more stress and pressure. As a result, employees tend to become less satisfied with the use of technology. This dissatisfaction reduces the willingness to extend the use of technology at work. In addition, complicated tasks are likely to cause more technostress than simpler tasks. One task may be easier for employees who know more about the technology, while the same task may be more difficult for employees who know less. Therefore, in order to reduce the negative effect of techno-complexity, training, rehearsal, set up a series of courses with especial reference to employees with less knowledge, teamwork, and sharing knowledge should be always available for the employees in every organization, including for managers, to reduce the anxiety associated with technostress. Technical support should always be ready and available for the employee questions and easy reaches with quick response to the critical situations. Meanwhile, management should involve employees in the technology implementation phases in order to make them ready for the new technology and the new changes.

The results indicate that respondents had little fear of being replaced or unemployed by the new technologies or by other employees who have a better understanding of new technologies. This result is consistent with Ahmad et al. (2012) and Şahin and Çoklar (2009) and Ahmad et al. (2014). Employees believed that invasion of technology into employees' private lives were minimal. This finding is also consistent with Ahmad et al. (2012). An explanation for this finding is that most of the organization's systems are accessible only on site, whereas working outside the office and after

office hours is limited. As a result, employees felt that there was no interference by technology in their private lives.

The results indicate that technology overload level was also minimal. This finding is consistent with the result of Tu et al., (2005). Using new technologies pushes employees to work faster. Nevertheless, the Qatari culture often encourages employees to endure work overload rather than quit their jobs. However, extremely high overload may overwhelm employees' lives. Extra work may increase anxiety and will affect the employee's performance in the long-run. Therefore, organizations should give more attention to the risk of overloading employees with extra technological tasks in order to increase their productivity. In addition, organizations have to introduce any new technologies rationally and gradually. Moreover, rewards and encouragement from the management to the employees who use new technologies may improve their performance. However, excessive technology may lead to technostress.

The results of this study also revealed that, collectively, technostress inhibitors are found to be significant predictors for job satisfaction. This finding supports the results of Ragu-Nathan et al., (2008), Tarafdar et al. (2010), and Tarafdar et al. (2011). Most of the respondents agreed that providing training for the employees would have a positive impact on their job satisfaction. It would make them feel more secure, appreciated and essentially needed by the organization, which in turn will lead to higher level of job satisfaction. Thus, managers need to increase the level of technological awareness by providing more training, knowledge sharing, teamwork, and creating users' manuals and clear documentations for any new system or application, in order to reduce the technostress negative outcomes. Most of the respondents agreed that participation in decision-making during the planning and implementation process would positively influence job satisfaction. Employees would be more satisfied with their jobs if managers give them the chance to participate and be involved in some issues related to their work environment. In addition, involving the employee's in decision-making can benefit both the employee and the organization. This will benefit the organization by developing a better decision from the technical perspective and the issues that might occur, and will benefit the employees to be more familiar with the systems even before the final implementation. Finally, assistance and technical support can help to reduce the technostress outcomes by providing facilities such as an accessible help desk in order to answer employees' queries and solve their technical problems. We can conclude that technostress inhibitors can reduce the intensity and negative outcomes of the technostress creator factors and so further enhance employees' job satisfaction. For example, training, teamwork programs, and IT department support would positively influence employees' job satisfaction. Additionally, involving employees in the decisions related to implementing new technologies would increase their satisfaction. Reducing the uncertainty over using the new technologies would increase the positive impact of the technostress inhibitors on job satisfaction and reduce the fear of any complexity, overload, uncertainty, invasion, and insecurity generated from the technology, which in turn would increase job satisfaction.

There are several important implications for both practitioners and researchers revealed from the results of this study. This study confirmed the applicability of the of the Transaction-Based Model of Stress and Coping Theory in a new context. A potential future study could be employing alternate methods to measure technostress, for example, experimental design by measuring technostress before and after implementing new technology. Moreover, demographic factors could be used as moderators to identify both technostress creators and inhibitors and to examine whether the primary relationships in the model differ for various demographic groups, such as those formed by age, gender, employment sector, educational level, and length of service. Researchers could focus on the possible stressful impacts of technology on end users at certain times of the year. Professionals in certain fields might experience higher stress levels at predictable intervals. Researchers might focus on the technostress effects considering the technology type, for example, phones, computers or tablets. Moreover, researchers may replicate the study on a larger scale to include other countries. Another plausible future research could be considering the culture impact in the future research models since it has

been proven significant. Finally, the study could be utilized as a basis for conducting comparative studies between developed and emerging countries.

The results of the study have valuable implications for practitioners. Managers has to focus on increasing employee's commitment by using the developed model to assess the technostress level, since this model is not for a specific technology, as it could be customized to fit different departments. Results also reveal that job satisfaction has a positive impact on organizational commitment. Therefore, involving employees in all the phases from the system initiation up to system testing would have a great impact on reducing technostress creators and increasing job satisfaction and organizational commitment. Managers should hire knowledgeable and well qualified staff in "help desk" section to answer employee's questions. Moreover, Short response time for technical support and a help desk available 24/7 would help employees to reduce their stress and anxiety, and there will be fewer disturbances in the workflow. Managers should focus on creating a climate of teamwork and ensuring a positive engagement with the employees, as well as building trust between the employees and themselves. Organizations should disseminate technology knowledge through different training programs. It is critical to get some support from the higher management level to get their resources and commitment. Management should provide series of technical courses such as system applications products and non-technical courses such as leadership and teamwork courses to improve employee's technical knowledge, in addition to improve employee's capabilities at all levels taking greater responsibility for their works, working better together, and communicating more effectively. Preparing a good manual and procedures, providing clear documentation and sharing knowledge between employees can reduce technostress. Finally, managers should assign reasonable amount of tasks to the employees to improve the opportunities to develop their career.

8. RESEARCH LIMITATIONS

The present study has some limitations, which should be considered when interpreting the results. First, the relatively small sample size, which nonetheless was adequate for the number of variables. This small sample size made it impractical for the present study to randomly divide the sample into subsamples, as recommended by Breckler (1990). A larger sample size would ensure that sufficient numbers of valid questionnaires were collected; it would enhance the validity and lessen the risk of biased results. Compared to previous studies in technostress, such as Tarafdar et al. (2007) and Ragu-Nathan et al. (2008), the sample of 401 in the current study was within acceptable levels. Second, data were collected at a single point in time. Therefore, research in future could consider longitudinal data to further improve the proposed model. Moreover, in the current study, the measure of technostress did not include physiological symptoms such as blood pressure, but the study might be more valuable if such a factor was introduced. Moreover, a plausible future research could be investigating the impact of the cultural dimensions on the proposed research model since employees from different mental programming and cultural groups will hold different values, which may lead them to engage in different behavior.

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APPENDIX

Table 3. List of scale items

Construct	Item	Description	Mean	Std. Deviation
Techno-overload α = 0.824	TOV1	I am forced by technology to work much faster	3.5087	1.15566
	TOV2	I am forced by technology to do more work than I can handle	3.0823	1.21067
	TOV3	I am forced by technology to work with very tight time schedule	3.2045	1.19502
	TOV4	I have a higher workload because of increased technology complexity	3.0948	1.28101
Techno-invasion α = 0.790	TIN1	I spend less time with my family due to technology advancement	3.6259	1.25089
	TIN2	I have to be in touch with my work even during my vacation due to technology advancement	3.5761	1.27469
	TIN3	I have to sacrifice my vacation to keep current on new technologies	2.8628	1.22827
	TIN4	I feel my personal life is being invaded by technology advancement	3.5012	1.24323
Techno-complexity α = 0.848	TCO1	I do not know enough about ICTs to handle my job satisfactorily	2.3441	1.06361
	TCO2	I need a long time to understand and use new technologies	2.3441	1.08456
	TCO3	The new technologies can be confusing	3.0299	1.16581
	TCO4	I often find it too complex for me to understand and use new technologies	2.4065	1.08713
Techno=insecurity α = 0.777	TIS1	I feel a constant threat to my job security due to new technologies	2.3641	1.12121
	TIS2	I have to constantly update my skills to avoid being replaced	2.9751	1.24474
	TIS3	I am threatened by co-workers with newer technology skills	2.5012	1.19190
	TIS4	I do not share my knowledge about technology with my co-workers for fear of being replaced	1.9152	1.00886
Techno-uncertainty α = 0.857	TUN1	There are always new developments in the technologies we use in our organization	3.8404	.95628
	TUN2	There are constant changes in computer software in our organization	3.6035	1.00989
	TUN3	There are constant changes in computer hardware in our organization	3.3017	1.07760
	TUN4	There are frequent upgrades in computer networks in our organization	3.5511	1.00896

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Table 3. Continued

Construct	Item	Description	Mean	Std. Deviation
Literacy Facilitation α = 0.824	LC1	Our organization encourages knowledge sharing to help deal with new technology	3.7830	.93290
	LC2	Our organization emphasizes teamwork in dealing with new technology-related problems	3.7756	.94578
	LC3	Our organization provides end-user training before the introduction of new technology	3.6384	1.09381
	LC4	Our organization fosters a good relationship between IT department and end users	3.7606	1.02837
	LC5	Our organization provides clear documentations to end users on using new technologies	3.6534	1.04978
Technical Support Provision α = 0.891	TSP1	Our end-user help desk does a good job of answering questions about technology	3.8055	.92036
	TSP2	Our end-user help desk is well staffed by knowledgeable individuals	3.8105	.88260
	TSP3	Our end-user help desk is easily accessible	3.8454	.93597
	TSP4	Our end-user help is responsive to end-user requests	3.8155	.82514
Involvement Facilitation α = 0.890	IF1	Our end-users are encouraged to try out new technologies in our organization	3.6908	.96909
	IF2	Our end-users are rewarded for using new technologies in our organization	3.0349	1.19112
	IF3	Our end-users are consulted before the introduction of new technologies in our organization	2.9950	1.15541
	IF4	Our end-users are involved in technology change and/or implementation in our organization	3.1347	1.12331
Job Satisfaction α = 0.895	JST1	I like doing the things I do at work	4.0998	.83368
	JST2	I feel a sense of pride in doing my job	4.2369	.83740
	JST3	My job is enjoyable	3.9401	.93081
	JST4	I am satisfied with the feeling of accomplishment I get from my job	3.9825	.92585
Organizational Commitment α = 0.827	OC1	I would be happy to spend the rest of my career in this organization	3.5536	1.18437
	OC2	I enjoy discussing my organization with people outside it	3.6209	1.09816
	OC3	I really feel as if this organization's problems are my own	3.3791	1.17727
	OC4	This organization has great deal of personal meaning for me	3.7930	1.02691
Perceived Performance α = 0.936	PRFM1	The technology helps to improve the quality of my work	4.1347	.81659
	PRFM2	The technology helps to improve my productivity	4.0923	.84496
	PRFM3	The technology helps me to accomplish more work than would otherwise be possible	4.0623	.86522
	PRFM4	The technology helps me to perform my job better	4.1397	.84288

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