

Are Mobile Devices Threatening Your Work-Life Balance?

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Abstract:

Employees are constantly engaging in new technologies that allow them to connect to the work place from different locations and at different time periods. The increased ubiquity of information and communication technologies (ICTs) and in particular the use of mobile devices has coincidentally increased the number of hours employees are spending on work related tasks. This study seeks to further previous qualitative research on the influence of mobile device use on individuals. The main objective is to understand how mobile devices influence the work-life balance of business professionals by exploring the relationships between mobile device usage, productivity, employer expectations, flexibility of work structure, and work-life balance. After examining previous literature, a model is developed to formulate hypothesized relationships. An instrument was developed and a survey was conducted. Interesting results emerge contributing to academic knowledge while also helping to gain a better understanding of a current challenge facing many organisations.

Keywords: mobile device | work-life balance | productivity | flexibility | work structure | employer expectations

Article:

1. Introduction

The ubiquity of computing resources generated by the adoption and usage of mobile devices has changed the way individuals in organisations communicate and interact with one another (Mazmanian et al., 2004). The mobile device is viewed as an instrument to increase productivity by improving response time, preparedness, unobtrusiveness, and the conception of existing in an 'always-on environment' (Middleton, 2007). While these attributes seem to have positive influence on an individual's performance, this research is interested in other areas that might also be affected by these changes. Work-life balance theories examine boundaries that individuals form between work and life and how much 'spillover' occurs (Hill et al., 2001). This study seeks to explain how mobile devices influence the work-life balance of business professionals. There have been various qualitative studies published recently that attempt to explore the impact of mobile devices on business professionals (Mazmanian et al., 2004; Middleton, 2007; Middleton

and Cukier, 2006; Prasopoulou et al., 2006), but no explanatory work has been conducted to date that seeks to understand how this technology influences work-life balance. From these studies, it is clear that mobile devices have changed the way business professionals communicate and while they provide a rich description of a smaller set of business professionals, this study provides empirical support and justification.

In order to develop a better understanding of the concepts related to technology and work-life balance, a literature review is conducted. This leads to the development of a model and research hypotheses, which are described next. The next two sections describe the research methodology and the results. They are followed by a discussion section which interprets the results, provides implications and lists limitations. The paper ends with a conclusion section.

2. Literature review

Recent studies have been conducted on the effects of mobile devices that further our understanding of this phenomenon in relation to work-life balance (Ayyagari et al., 2011; Mazmanian et al., 2004; Middleton, 2008). Concepts of interest in the domain consist of productivity, employer expectations, flexibility in work structure, and work-life balance; these will be investigated in our research. As an example, Mazmanian et al. (2004) conducted research on mobile device usage focusing on one particular type of smartphone: Blackberries. In their qualitative study of Blackberry usage in a small financial services firm, the authors argue that mobile device usage leads to a “social dynamic that requires the reconfiguring of public (work) and private (home) boundaries”. The study confirmed individuals’ reconfigurations of expectations and norms of work, shifting individual choices about control, interaction, and responsiveness. Their interviews of employees revealed a creation of shared assumptions of constant availability and accountability and an increasing compulsiveness to respond. The study also suggested that mobile devices entail unanticipated consequences such as addiction, withdrawal, and dependence on the technology.

2.1 Mobile device usage

Previous IT usage research has characterised three main classifications that distinguish the way usage occurs and, more specifically, the purpose of IT use. The three classifications consist of utilitarian, hedonic, and social behaviours. These also constitute how individuals choose to use their mobile devices. Utilitarian usage is described as facilitating effective and efficient action (Wakefield and Whitten, 2006). Examples of utilitarian behaviours include activities such as using e-mail, retrieving documents, searching for information, ecommerce related actions, financial transactions, etc. While previous research has focused on work related utilitarian use, there is also a part of utilitarian use that can be associated with using a mobile device for personal activities. For example, an individual might use the mobile device to access bank accounts and make transfers through a mobile application. Personal utilitarian usage has been essentially ignored by previous research but is important to include as we seek to answer the research question of how mobile devices influence work-life balance. Another usage classification is hedonic behaviour, which is defined as actions that generate pleasure from the consumption or use of a product (Schroeder, 2010). Some examples of hedonic behaviours include playing games, watching videos, or participating in other enjoyable entertainment related

actions. The last classification is social behaviour, which is described as using IT to communicate in order to maintain and develop social relationships (Orlikowski and Scott, 2008). Examples include text messaging, calling, e-mailing, or communicating via social networking sites and applications.

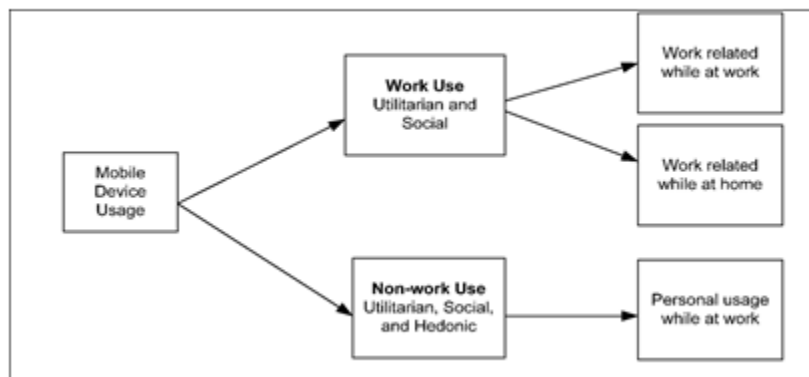
While incorporating these three classifications, we found it necessary to distinguish between work and non-work (personal) activities. Our novel categorisation can be seen in Figure 1. Usage for work purposes contains both utilitarian and social behaviours, while non-work use contains all three classifications. This categorisation helps us to differentiate between the types of usage and is helpful in determining the influence on employer expectations and flexibility.

2.2 Work-life balance

The concept of work-life balance is a well-researched area in the field of human resources (Chang et al., 2010). Work-life balance refers to an individual's perception of harmony or equilibrium between work and life domains. Work-life balance can be operationalised as low conflict or high satisfaction in both work and life domains (Chang et al., 2010). Ayyagari et al. (2011) recently conducted a study on a closely related phenomenon called technostress. In this study, they suggest that technostress is influenced by the increased use of mobile devices. They treated technostress as a black box and suggest that the technology itself influences this phenomenon.

We argue that technology alone does not directly influence technostress (i.e., work-life conflict), but there are mediating variables between technology (in this case, mobile device usage) and work-life conflict. In other words, we open the black box and examine the underlying reasons contributing to work-life conflict. In particular changes in productivity, due to mobile device usage, lead to changes in employer expectations, which in turn influence work-life conflict. Thus an underlying quantum change in work expectations may occur leading to disturbances in work-life balance.

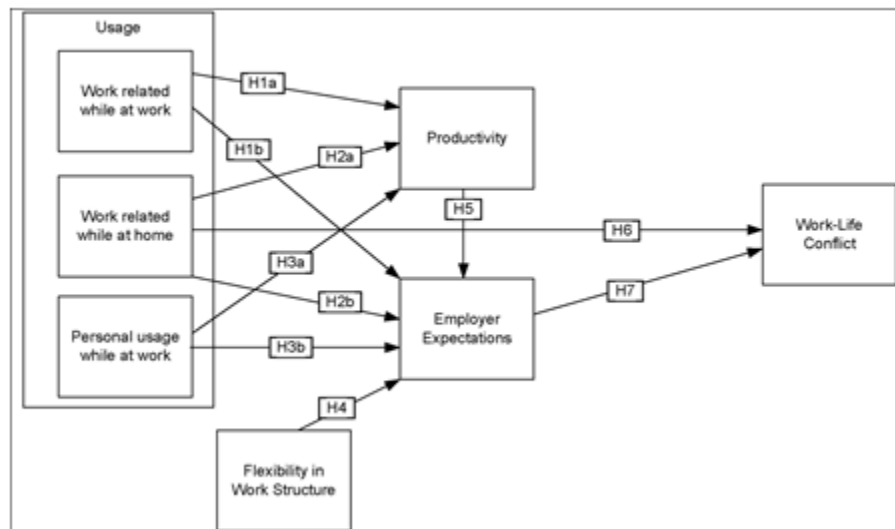
Figure 1 Classification of mobile device usage



3. Model development and research hypotheses

Given the above literature and background, we explore the relationships between mobile device usage, productivity, employer expectations, flexibility of work structure and work- life balance. Figure 2 presents the research model including the theoretically derived hypotheses and clarifies the relationships between the constructs.

Figure 2 The research model



3.1 Mobile device usage and productivity

It is now fully accepted and well documented that the primary reason businesses adopt Information Systems (IS) is to improve productivity (Brynjolfsson, 1993; Dong et al., 2009; Hitt and Brynjolfsson, 1996). The IS discipline itself hinges on the idea that the use of technology will expedite business processes and ultimately increase profits and/or lower costs. However, very little research has been conducted that focus on mobile devices and their impact on productivity in the work environment (Sheng et al., 2005).

Much of the focus of recent research has been on the negative impacts of mobile device usage (Mazmanian et al., 2004; Middleton and Cukier, 2006; Turel and Serenko, 2010; Turel et al., 2011; Wright et al., 2011). Mobile device addiction is an example of a negative aspect that has been discussed in the IS literature. The term ‘crackberrys’ quickly became known as slang for blackberry’s, describing the inability of users who possess one of these mobile devices manufactured by RIM to separate themselves from the technology. Others focus on how mobile devices blur the boundaries between the work and home environments. The negative aspects of mobile device usage include dysfunctionality and addiction (Middleton and Cukier, 2006; Turel and Serenko, 2010). Turel and Srenko (2010, p.41) define Mobile e-mail addiction “as a form of non- substance addiction that involves excessive interaction with both a mobile technology (mobile device) and the content (electronic communication) under conditions of psychological dependency”. Productivity improvements with mobile devices, while generally assumed, demand further investigation. Productivity is often linked with the use of IT to increase efficiency and effectiveness, thereby improving productivity (Porter, 2008). Unlike much of the mobile device

research that has focused on the negative impacts, we seek to better understand how this technology has influenced productivity and related constructs.

Through mobile device usage, many individuals are finding new ways to interact and communicate with others through methods that were previously not possible. Mazmanian et al. (2004) gives an example of an employee being able to send and receive text messages and e-mails while attending an important meeting through the use of their mobile device. This allowed the employee to be more informed and able to respond without disrupting the flow of the meeting or having to reschedule altogether. This is just one example of how mobile device usage would lead to an increase in productivity and therefore it is suggested that:

H1a: Mobile device usage (work related while at work) will be positively related to productivity

A main reason why companies are choosing to issue mobile devices to employees is due to the fact that this technology allows the employees to conduct work related activities at a time in which they were previously not accessible. Individuals are increasingly connected to work through communications that are transferred through mobile devices. Individuals are at home having dinner with their families when their phone vibrates and they stop to read an e-mail or they are on vacation taking phone calls to address problems while they are away. Therefore individuals are increasing work hours and productivity through the use of their mobile devices by working at times and locations which were previously not accessible. For these reasons, it is suggested that:

H2a: Mobile device usage (work related while at home) will be positively related to productivity.

Conducting personal activities while at work through the use of a mobile device explains that these types of usage might be utilitarian, social, or hedonic. No matter the type of usage, these activities take away time and attention from work related tasks. In order to prevent such use, firms are enforcing IT governance mechanisms such as blocking employee's access to certain websites or their ability to stream music. However, employers cannot generally block such items from mobile devices or employees may be able to supersede such practices. Ultimately, employees who engage in personal activities while at work through the use of their mobile devices are distracted from work responsibilities and thus,

H3a: Mobile device usage (personal usage while at work) will be negatively related to productivity.

3.2 Mobile device usage and employer expectations

The ubiquity of mobile devices allows working professionals to be constantly connected with their work environments. Much of the qualitative work conducted to date on mobile devices suggests a change or more specifically an increase in employer expectations. For example, Mazmanian et al. (2004) conducted interviews on working professionals explaining; "In general...people's expectation levels have gone up...People presume that it's fairly easy to

reach you 24/7” (p.4). We propose that with this increase in productivity due to mobile device usage, there is a corresponding increase in employer expectations where employees are expected to conduct work related tasks during periods that were not possible before the advent of mobile devices. For example, with this technology employees are expected to answer e-mails and phone calls while conducting other business related items such as attending a conference or a meeting. This type of pressure to be able to constantly multitask and manage communications through mobile devices in addition to the normal communications that are conducted throughout the day represents how mobile devices have influenced employer expectations. Therefore:

H1b: Mobile device usage (work related while at work) will be positively related to employer expectations.

Even though there is a perceived increase in productivity with the use of mobile devices, there may also be some unintended consequences that are disregarded. Employer expectations are a set of guidelines that are imposed on and required of employees. The main reason for adopting use of mobile devices in the work place is to increase availability of work related communication and information. Therefore, individuals are increasing their availability outside of work, even at home, and employer expectations of that employee are changed by the adoption of a mobile device. IS research suggests that individuals have a tendency to feel pressure to respond to work related items even after normal work hours due to the use of mobile devices and the increased availability (Yun et al., 2012). Therefore:

H2b: Mobile device usage (work related while at home) will be positively related to employer expectations.

On the contrary, the use of mobile devices for personal activities will have a much different influence on employer expectations. This is an area that is severely lacking as IS research has disregarded the implications of the ability of mobile devices to connect employees to non-work related items while at work. The idea that employees can accomplish personal tasks throughout the work day through the use of their mobile device would decrease the perceptions of employer expectations. Individuals, who use mobile devices for personal reasons while at work, spend less time on work related activities and therefore would experience a decrease in employer expectations. While some non-work usage is expected and may actually lead to higher morale and satisfaction, increased usage will result in a change in perceived employer expectations, thus:

H3b: Mobile device usage (personal usage while at work) will be negatively related to employer expectations.

3.3 Flexibility and employer expectations

Hill et al. (2001) found that perceived job flexibility enables more employees to have work-life balance. They also found that perceived job flexibility enables employees to work longer hours before impacting work-life balance (Hill et al., 2001). Flexibility in job structure allows employees more freedom to choose when, where, how, and with whom they wish to invest in work activities and, therefore, flexibility should benefit the work-life balance of employees.

Flexibility in work structure can take on many different forms. Some working professionals are required to spend more than 40 hours a week in an office setting while sales persons and other professionals have a much less structured work environment. Most individuals have a positive perception of flexibility and seek to maximise the amount of flexibility in their occupations. On the contrary, some recent research has shown that flexibility in work structure can have a drastic impact on work-life balance. Clark (2000) developed work/family border theory which discusses the concept of border strength. Border strength refers to how “permeability, flexibility, and blending combine to determine the strength of the (work-life) border”. This concept was understood by Hall and Richter (1988) when they discussed that when boundaries between work and life are less clear, employees have a much harder time negotiating responsibilities of work and life. On balance, however, we postulate:

H4: Flexibility will be positively related to employer expectations

3.4 Productivity and employer expectations

Recent research has shown that due to technology solutions, such as mobile devices which enhance communication and availability, an unexpressed norm has emerged that all individuals will work increasingly from home (Hill et al., 2001; Mazmanian et al., 2004; Middleton and Cukier, 2006). This suggests that increased productivity from the use of mobile devices has guided an increase in employer expectations. As employees learn to incorporate the capabilities of mobile device use, they will increase productivity. Productivity is increased due to many capabilities present in smart mobile devices such as speed, multitasking, instant access to the Internet and other sources of information, and ability to communicate. As productivity with the use of mobile devices increases, the employer’s expectations will also increase. Thus,

H5: Productivity will be positively related to employer expectations

3.5 Mobile device usage at home and work-life conflict

Individuals adopt mobile devices because they allow them increased flexibility and mobility when it comes to use. While, work-life conflict may be mediated through other constructs, there may also be a direct effect with mobile device usage as suggested in the literature (Yun et al., 2012). For instance, a marketing manager who generally works 40 hours a week in a corporate office will likely obtain a mobile device for the purpose of conducting work related activities while away from the office. This practice obviously contributes negatively to the quality of life and work-life balance. In other words, it creates a work-life conflict. Thus,

H6: Mobile device usage (work related while at home) will be positively related to work-life conflict

3.6 Employer expectations and work-life conflict

Work-life conflict has been shown to significantly influence an individual’s psychological state (Chang et al., 2010). Employee expectations, operationalised as work overload in this study, has been included in other research with work-life conflict to measure stress on individuals

(Ayyagari et al., 2011). Similarly, we posit a direct relationship between the two constructs and suggest that an increase in employer expectations will result in an increase in work-life conflict. An increase in employer expectations results in a shift in behaviours that allow employees to meet the increased expectations of the employer. As an illustration, an employee who experiences an increase in employer expectations due to the ubiquitous nature of the mobile device would spend more time at home and other locations conducting work related activities. This behavioural would negatively affect work-life balance and increase work-life conflict. Thus,

H7: Employer expectations will be positively related to work-life conflict

4. Research methodology

A survey methodology was used in order to add empirical support to previous research that suggests that mobile device usage influences work-life balance. A questionnaire was created and administered to test the relationships between mobile device usage, productivity, employer expectations, flexibility of work structure and work-life balance. After developing the initial instrument, a pretest was conducted seeking the opinions of professionals on the topic, in order to revise the survey and ensure that the items are easily understood (Straub, 1989). This pre-test was administered to 11 information systems doctoral students who were advised to review each item carefully in order to validate the content and provide suggestions to improve the questionnaire. Feedback was used to revise the instrument and ensure that the measures are reliable with respect to content validity.

A pilot study was conducted using an MBA class of working professionals to review the items and ensure that there are no major issues in the development of the instrument. No such issues were observed. With a small sample size that usually exists with pilot studies, we used simple regression to better understand our model and test the relationships that were presented. Analyses of the pilot data showed support for the model; therefore we proceeded with the full study. The full study involved large-scale data collection that included employees from a diverse number of companies and job responsibilities. A sample of 165 individuals was collected which represented a diverse set of attributes such as: age, gender, job responsibility, job field, income level, marital status, and number of dependents.

4.1 Measures

In developing the measures, whenever possible, we adapted items from existing instruments from the literature. When existing instruments were not available, relevant studies provided useful information to develop new items. All items were assessed using a five-point Likert-type scale and the instrument is composed entirely of reflective measures. We also controlled for important variables such as: gender, age, and respondent position type. Measures of productivity and employer expectations required some creativity as they were not directly available in the literature. They had to be adapted from proxy measures; we discuss these below and provide justification for their inclusion. Appendix A shows a complete list of all items in the instrument.

4.2 Productivity measure

In order to operationalise productivity, we adapted our measure from the work of Moore and Benbasat (1991), where they provide items for usefulness. These items centre on the two main objectives of productivity which are to increase efficiency and effectiveness. Productivity is often defined by scholars as output over input and the measures defined for usefulness are focused on increasing output and decreasing input (Brynjolfsson, 1993; Hitt and Brynjolfsson, 1996). Our adapted items focus on measuring work productivity from the perspective of the individual.

4.3 Employer expectations measure

In order to operationalise employer expectations, we adapted the construct of work overload. Items for this construct are readily available (Moore, 2000) and generally represent what is commonly understood to mean employer expectations. Thus, they had to be modified only slightly.

4.4 Participants

The online questionnaire was distributed 325 recipients via e-mail. These recipients consisted of authors' contacts who met the criteria of being employed and using a mobile device. We received 188 responses, representing a response rate of 58%. This is much higher than typical response rates in IS research, as much lower response rates have been reported in top IS journals (Sivo and Saunders, 2006). One hundred and sixty five responses were usable as some respondents failed to respond to all questions, as the design of the instrument only allowed individuals who currently use a mobile device and are currently employed to complete the survey. Upfront, for clarity and unambiguity, we defined a mobile device as a personal device that combines a cell phone with a hand-held computer, typically offering internet access, data storage, e-mail capability, etc. (such as a smart phone).

Table 1 shows the demographic composition of the sample. Gender was well represented with 45% females and 55% males. Age ranges were broken down into six different categories with the median age range in the expected 35–44 age range. Position type was also captured in which the largest representative position type was middle management. These demographics are similar to previously reported demographics from work-life balance related studies in IS research (Ayyagari et al., 2011; Moore, 2000).

Table 1 Demographics of respondents

<i>Demographic item</i>		<i>Count</i>	<i>Percentage</i>
Gender	Male	91	55
	Female	74	45
Age range	18–24	7	4
	25–34	64	39
	35–44	37	22
	45–54	25	15
	55–64	29	18
	65 and over	3	2
Position type	Upper management	18	11
	Middle management	51	31
	Administrative staff	2	1
	Support staff	14	8
	Student	46	28
	Educator	5	3
	Other	29	18

5. Results

The measurement and structural models were analysed with partial least squares (PLS) using SmartPLS (Version 2.0). PLS was chosen for its ability to handle both complex models and smaller sample sizes (Wetzels et al., 2009). We found support for several important relationships which will be discussed later.

5.1 Measurement model

Overall, the measurement model showed high reliability. Composite reliabilities were high, greater than 0.80, suggesting internal consistency (Fornell and Larcker, 1981). Additionally, average variance extracted (AVE) for all latent variables were well above the 0.5 cutoff (Chin, 1998; Fornell and Larcker, 1981), suggesting convergent validity. Values for AVE and composite reliability for each construct are presented in Table 2 for all key constructs.

Table 2 AVE and composite reliability

	<i>AVE</i>	<i>Composite reliability</i>
Personal at work	0.611404	0.925968
Usefulness	0.671575	0.910725
Work at work	0.697324	0.91983
Flexibility	0.791953	0.950058
Work at home	0.682880	0.927484
Work life conflict	0.824691	0.959175
Work overload	0.892245	0.976408

Discriminant validity was tested by ensuring that all item loadings were greater than the associated cross loadings and that the square root of AVE was larger than inter-construct correlations (Chin, 1998). Indicators load highly on their associated factors; all loadings exceeded the 0.70 cutoff (Fornell and Larcker, 1981). In all cases, item loadings were higher than associated cross loadings. Table 3 shows the factor loadings and cross loadings for all variables.

Additionally, the square root of AVE for each latent variable was higher than the correlations for the corresponding latent variables. Table 4 shows latent variable correlations with the square root of AVE on the diagonals. Together, factor loadings and cross loadings and AVE and latent variable correlations suggest that the measurement model has adequate discriminant validity.

Table 3 Factor loadings and cross loadings

<i>Item</i>	<i>Work at work</i>	<i>Work at home</i>	<i>Personal at work</i>	<i>Productivity</i>	<i>Expectations</i>	<i>Flexibility</i>	<i>Work life conflict</i>
WAW_1	0.881067	0.609918	0.076977	0.284791	0.494107	0.478596	0.32513
WAW_2	0.870509	0.669301	0.11716	0.272966	0.481098	0.47501	0.288363
WAW_3	0.87164	0.683529	0.07146	0.261702	0.471908	0.489535	0.357217
WAW_5	0.747609	0.647061	0.232178	0.21118	0.40615	0.291523	0.278792
WAW_6	0.796166	0.574997	0.031539	0.272214	0.435646	0.384866	0.409571
WAH_1	0.727393	0.85309	0.139928	0.22299	0.568332	0.440536	0.379655
WAH_2	0.692124	0.872273	0.211447	0.148745	0.476891	0.353682	0.236522
WAH_3	0.686794	0.891403	0.2	0.217122	0.505494	0.396771	0.330377
WAH_4	0.383907	0.649129	0.39809	0.025048	0.302762	0.213332	0.312181
WAH_5	0.617778	0.871391	0.265815	0.168906	0.388975	0.264753	0.291692
WAH_6	0.592143	0.795844	0.134017	0.265563	0.424401	0.327147	0.355977
PAW_2	0.189722	0.271058	0.704548	-0.038988	0.072225	0.050498	0.016227
PAW_3	0.107818	0.211156	0.738211	0.011175	0.012175	0.007642	-0.00995
PAW_4	0.074398	0.181002	0.70981	-0.066856	-0.00144	0.09426	0.057853
PAW_5	0.032848	0.172534	0.782374	-0.091567	-0.04416	0.066278	0.074478
PAW_6	0.030043	0.129726	0.858765	-0.108732	-0.09854	0.013119	-0.02092
PAW_7	0.149979	0.232324	0.862012	-0.136472	0.034601	0.026662	0.004346
PAW_8	0.180785	0.273026	0.841448	-0.13675	0.013555	-0.03800	0.090965
PAW_9	0.039802	0.195733	0.738491	-0.074522	0.00463	0.011351	0.027168
USE_1	0.265341	0.201324	-0.05013	0.74229	0.281185	0.288606	0.161154
USE_2	0.231933	0.166966	-0.05157	0.838288	0.311621	0.166547	-0.00052
USE_3	0.291955	0.219614	-0.17162	0.849333	0.261135	0.228196	0.050596
USE_4	0.195884	0.140483	-0.1499	0.828737	0.307051	0.167279	0.003214
USE_5	0.293732	0.183267	-0.11635	0.834253	0.248528	0.222197	0.003481
WOV_1	0.514928	0.47648	-0.07145	0.313317	0.930323	0.525508	0.328203
WOV_2	0.450001	0.480483	0.021001	0.276895	0.918591	0.474238	0.303071
WOV_3	0.543028	0.55387	-0.03449	0.307854	0.966776	0.565795	0.34772
WOV_4	0.545182	0.543534	0.034043	0.358431	0.947684	0.52691	0.319963
WOV_5	0.535856	0.541999	-0.01101	0.360674	0.958726	0.528107	0.291599
FLX_1	0.498825	0.441957	0.023004	0.296332	0.516959	0.859931	0.410871
FLX_2	0.470778	0.389009	0.051593	0.268315	0.546911	0.896487	0.462989
FLX_3	0.481193	0.379906	0.003413	0.169972	0.513243	0.920241	0.560859
FLX_4	0.418479	0.326508	0.016772	0.199291	0.446824	0.894877	0.480219
FLX_5	0.397079	0.288978	0.031281	0.224137	0.430332	0.876898	0.464491
WLC_1	0.416033	0.356148	-0.00764	0.103894	0.317466	0.495241	0.913523
WLC_2	0.424741	0.426609	0.11558	0.010988	0.334294	0.494819	0.949963
WLC_3	0.284802	0.288625	0.046989	0.043405	0.26223	0.453757	0.922967
WLC_4	0.30716	0.317995	0.051068	0.012652	0.289867	0.493385	0.891042
WLC_5	0.342377	0.346217	-0.00591	0.070698	0.314638	0.486088	0.860626

5.2 Structural model

The structural model was analysed with SmartPLS (version 2.0). Figure 3 presents the results of the PLS analysis along with the path coefficients.

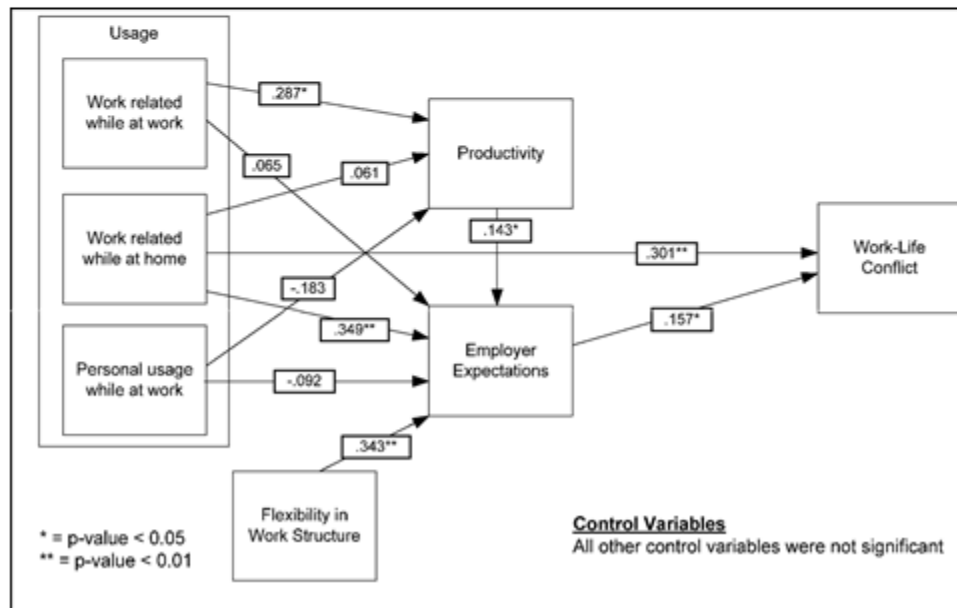
Statistical evidence indicates that an increase in usage of mobile devices (work related while at work) increases the productivity of the employee ($\beta = 0.287$; p -value < 0.05). Thus, we found support in favour of hypothesis H1a. However, evidence did not corroborate that an increase in usage (work related while at work) increases employer expectations ($\beta = 0.065$; p -value > 0.05) – thus not supporting hypothesis H1b.

H2a was not supported ($\beta = 0.061$; p -value > 0.05). Thus an increase in usage at home for work related activities does not seem to contribute to employee productivity. However, on the contrary, H2b is supported ($\beta = 0.349$; p -value < 0.01), meaning that employer expectations go higher with increased usage of mobile devices at home for work related activities.

Table 4 Latent variable correlations with square root of AVE on diagonals

	<i>Personal at work</i>	<i>Productivity</i>	<i>Work at work flexibility</i>	<i>Work at home</i>	<i>Work life conflict</i>	<i>Expectations</i>	
Personal at work	0.962272						
Productivity	-0.133846	0.954319					
Work at work flexibility	0.122297	0.313358	0.959077				
Work at home	0.028757	0.26217	0.512816	0.974709			
Work life conflict	0.254099	0.223436	0.761015	0.414976	0.963059		
Expectations	0.046227	0.052837	0.39703	0.534679	0.387686	0.979374	
Expectations	-0.013705	0.34312	0.549643	0.556049	0.550867	0.337166	0.98813

Figure 3 Results of PLS analysis



There was no support for the hypotheses related to personal usage of mobile devices while at work. While the relationships to productivity and employer expectations were both numerically

negative, they were both insignificant ($\beta = -0.183$, p -value > 0.05 ; and $\beta = -0.092$; p -value > 0.05 , respectively). Thus both H3a and H3b are not supported.

Hypothesis H4 was supported, i.e., an increase in flexibility of work structure increases employer expectations ($\beta = 0.343$; p -value < 0.01). Hypothesis H5 was also supported, implying that an increase in productivity due to the use of mobile devices increases employer expectations ($\beta = 0.143$; p -value < 0.05). Hypothesis H6 was supported, i.e., increased in usage of mobile devices at home for work related activities increases work-life conflict ($\beta = 0.301$; p -value < 0.01). Lastly, work-life conflict increases with increasing employer expectations ($\beta = 0.157$; p -value < 0.05), lending support to hypothesis H7. The relationships of all control variables, i.e., gender, age, and position type, to the dependent variables were found to be insignificant.

The results are summarised in Table 5.

Table 5 Summary of proposed hypotheses

<i>Hypotheses (β, p-value)</i>	<i>Supported?</i>
H1a: Mobile device usage (work related while at work) will be positively related to productivity (0.287, <0.05)	Yes
H2a: Mobile device usage (work related while at home) will be positively related to productivity (0.061, >0.05)	No
H3a: Mobile device usage (personal usage while at work) will be negatively related to productivity (-0.183 , >0.05)	No
H1b: Mobile device usage (work related while at work) will be positively related to employer expectations (0.065, >0.05)	No
H2b: Mobile device usage (work related while at home) will be positively related to employer expectations (0.349, <0.01)	Yes
H3b: Mobile device usage (personal usage while at work) will be negatively related to employer expectations (-0.092 , >0.05)	No
H4: Flexibility will be positively related to employer expectations (0.343, <0.01)	Yes
H5: Productivity will be positively related to employer expectations (0.143, <0.05)	Yes
H6: Mobile device usage (work related while at home) will be positively related to work- life conflict (0.301, <0.01)	Yes
H7: Employer expectations will be positively related to work-life conflict (0.157, <0.05)	Yes

6. Discussion and implications

Work-life balance is an important concern for today's worker especially when the lines between work and life are rapidly blurring. The work-life balance of employees is of major concern to organisations as they seek to find balance between increasing productivity and work overload. As more individuals become connected through mobile devices we can expect increases in blurring the boundaries between work and life.

Exploring and trying to better understand how a firm might gain and sustain a competitive advantage from IT has long been the focus of academic research in the fields of IS, management, and strategy. Two main views in the search of sources for competitive advantage include the industry structure view and the resource based view (RBV) of the firm. In the RBV Barney (1991) suggests that resources must be valuable, rare, imperfectly imitable, and non-substitutable

to create a competitive advantage for the firm. We suggest that a better understanding of how mobile devices influence the constructs in our study, organisations will gain insight into how to incorporate this resource.

In this regard, as one of the early studies, our study makes several contributions. These include:

- Introduction of a classification scheme of mobile device usage. This classification could be used to better understand a number of relevant research areas that are applicable to the field of IS.
- Development of a research model which opens the ‘black box’ or intervening variables of work-life balance. While a concept in its own right, work-life balance is closely related to techno-stress, which has been recently examined in the literature (Ayyagari et al., 2011).
- Reporting of several interesting findings. While some findings corroborate conventional wisdom, some did not and provide us a richer understanding of work-life balance as being affected by emerging technologies.

In order to better explain the findings, open ended qualitative follow-ups were conducted with some of the subjects. A combination of empirical survey analysis and rich qualitative data is a way to triangulate findings and help describe results in an insightful manner.

6.1 Effect on productivity

Productivity is one of the most important constructs in business related research because it directly influences the success of the focal firm. In this study, mobile device usage in the office for work related activities was found to influence employee productivity. This finding suggests that activities such as checking e-mail while in a meeting or answering urgent text messages are seen to increase productivity and are useful to working professionals who have mobile devices. However, mobile device usage at home for work related activities, while having a positive relationship with productivity, was not statistically significant. Similar results have been reported by Wright et al. (2011). As one of the respondents said:

“My work is for a financial company with super-strict controls on security, so I don’t mix home and work at all ...”

This statement suggests that individuals are somewhat reluctant to use the full capabilities of a mobile device while away from the office and a secured network. It may also be the case that companies have procedures and rules that discourage such actions in order to preserve confidential information that may be leaked over an unsecured network. Other respondents said that they use the mobile device for minor or inconsequential activities – thus possibly not affecting productivity significantly. Some representative comments include:

“I use my mobile device mainly to check e-mail from time to time, mainly on days off or when I’m working away from my desk.”

“I use my mobile device to read e-mails more than write them. Keeps me from getting behind while I’m out.”

It may be that the productivity aspects of mobile technology have not been fully in play. The use of mobile devices is still in the early stages and many individuals have been reluctant to embrace this newer technology. Therefore many individuals are still at an infancy stage with their mobile devices and, over time, we believe that this finding could change.

Also, as hypothesised, the use of mobile device usage in the office for personal work was found to have a negative relationship with productivity. What truly surprised us was that it was insignificant. It may be that there are some motivational aspects of being able to do some personal tasks in the office which actually offset any loss of time. It may also be that some tasks which required taking time off from work can now be accomplished in a much shorter time by the mobile device. However, our respondents’ comments elicited mixed responses, such as:

“At work, I use my mobile device most of the day to listen to music or talk radio while working.”

“As far as I’m concerned mobile devices are an interference in the work place, they are much more used for personal business than they are company business.”

“Mobile device shouldn’t be allowed to be used in a production type business.”

Clearly, our evidence is less than conclusive and demand further investigation. A promising area of study would be to study how employees are using their mobile devices for different types of personal activities in the office (such as listening to background music, interacting on social networks, playing games, and accomplishing utilitarian tasks) and their impacts on productivity, and work-life balance. Once these effects are clearly known, effective strategies can be developed to encourage positive behaviour and discourage negative behaviour, rather than making blanket policies such as censoring all mobile device usage.

6.2 Effect on employer expectations

The significant findings influencing employer expectations indicate that productivity, mobile device usage from home for work related activities, and flexibility are all positive influencers. This means that increases in productivity also lead to increases in employer expectations. As individuals become more productive and can achieve more with the use of their mobile devices, their employers and co-worker’s expectations change. The level of expected output is increased which is evident in the following statement:

“Due to mobile devices, upper management, customers, suppliers, etc., expects more from you. Personal quality time alone or with family sometimes suffers due to all these higher expectations.”

The finding related to work-related use at home is quite interesting. While it did not seem to impact individual productivity, it does increase employer expectations. The use of the mobile

devices provides individuals almost unlimited connectivity to the work place. Although many have found this to be a very positive outcome, others have yet to understand how to control its invasive nature. A domino effect appears to have emerged in which the employers and co-workers begin to expect connectivity and availability at all times, which is reflected in the following comments.

“Since my company pays for my data plan, I do feel obligated to check it all the time. I definitely don’t work just 8-5. I check my work e-mails all the time, even on vacation. My husband has said he is going to throw it in the ocean if I don’t stop checking it. Ha! I try to be good about not checking them when on long vacations, but on the 1 and 2 days here and there, I do check and respond to some/most of the e-mails. I am trying to get better about it!”

Another influencer of employer expectations is the flexibility in work structure. Although flexibility is often thought of as a positive aspect and sought after benefit, studies have shown it to have negative characteristics (Yun et al., 2012). Our study shows that as flexibility in work structure increases, so does the perceived employer expectations. The statement below reinforces this concept.

“My phone allows me to get out of the office and allows flexibility like attending personal events but ... I am also ‘at work’ whether mentally or physically more often.”

The ‘work flexibility’ construct in relation to technology has not been investigated in-depth and we recommend that it be examined carefully as well its antecedents and effects.

6.3 Effect on work-life conflict

Both hypotheses concerning work-life conflict were found to be significant. Even though mobile device usage at home for work activities was shown to have significant relationship with work-life conflict, through the mediating effect of employer expectations, we also hypothesised a direct positive relationship with work-life conflict. Through previous research, it was posed that mobile device usage at home for work activities would directly increase work-life conflict (Mazmanian et al., 2004; Middleton, 2008; Middleton and Cukier, 2006). The significance of this relationship is further demonstrated by some of the interviewee comments:

“Mobile devices definitely interfere with family/time away from work.”

“I check it as soon as I wake up, sometimes not even out of bed yet. I also tend to check just before getting into bed. This as a result extends my work day dramatically and prevents true disconnection.”

Another interesting finding was the significant positive relationship between employer expectations and work-life conflict. The finding suggests that an increase in employer expectations will result in an increase in work-life conflict. The comments below reflect the same sentiment.

“Seems to never be a way to disconnect. Even when on vacation, President will often expect me to answer calls or e-mails. The mobile device is awful for work life balance.”

“In the days of just cell phone or laptop, things were different. Back when neither of those played a part in the work day I experienced a better work/life balance just due to being more present when home.”

In our initial formulation of the model, we had specified a direct relationship between flexibility and work-life conflict. We expected that with greater flexibility, there would be less conflict, i.e., a negative relationship. However, we were surprised that not only was this relationship not negative but it was actually significantly positive. In other words, *flexibility increases conflict!* This seemed a rather disturbing finding at the time. However, upon further reflection and background research, we were to develop a very insightful explanation. We incorporated employer expectations as a mediator variable between flexibility and conflict. What actually occurs is this: *increased flexibility increases employer expectations, which in turn increases work-life conflict.* The above explanation, while logically sound and empirically proven, needs to be tested in future research, along with other explanations.

6.4 Implications for research

Ayyagari et al. (2011) conducted a study on the broader subject of ICT's and stress. The authors suggest that future research should seek to focus on a specific technology in order to provide more robust results than the more conservative ones they displayed. The research in this paper serves to extend their work while also providing a more specific model that is tailored to the domain of mobile devices. The innovative nature of mobile devices has caused many changes in the behaviours of working individuals and this study has sought to explore these relationships further. This research also provides statistical validity to a stream of qualitative work on the relation of mobile device use and work-life balance which has been suggested by numerous studies (Middleton and Cukier, 2006; Turel and Serenko, 2010; Wakefield and Whitten, 2006). Future studies should expand on the model and provide other constructs that might help to strengthen the relationships that were found to be significant. Another area in which to expand this study would be to apply the research model to another type of ICT, which would test the model for a different domain to see if the relationships would remain or need to be modified. As new capabilities and technologies associated with mobile devices are developed, it will be important to reevaluate the model and the specified hypotheses.

7. Limitations

One limitation of the study comes from the conflict that can be found between conducting a study that is generalisable and one that is more specific (Ayyagari et al., 2011). We focused on one technology, so results to other similar technologies need to be applied with caution. Our respondents consisted of employees from very different organisations and fields. Future research might seek to better understand the types of specific differences that exist between employees from different organisations and fields. Organisations tend to have very

differing cultures which might have a direct influence on what role mobile devices play in relation to their work-life balance. Also employees from different fields may have different roles and reward systems such as: a salesperson whose salary is based on purely commission, a drug company employee whose sales commissions are partly based on salary, and a furniture salesperson with a totally salary based payment. Another limitation is that while the research model captures the most important elements, it is not exhaustive and can possibly benefit from the addition of more variables.

8. Conclusions

This study represents an important step in understanding the influence mobile devices have on employee's perceptions of mobile device usage, productivity, employer expectations, flexibility of work structure, and work-life balance. It provided support for the hypothesis that individuals using mobile devices for work related activities while at work will have increased productivity. Another important finding is that employer expectations have increased due to mobile devices because of three reasons: mobile device usage at home to conduct work related activities, enhanced productivity, and greater flexibility. However, the use of mobile device at home for work related activities contribute to work-life conflict; so also increased employer expectations contribute to this conflict. Our research has implications for managers of the modern organisation in understanding the role of mobile devices at work as well as at home and devising appropriate policies for their effective utilisation. We also believe that more research needs to be conducted in order to fully understand the impact of not only mobile devices but also new and emerging technologies on the quality of life and work-life balance.

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