The Impact of IT Consumerisation Usage on Perceived Stress Levels

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Declaration

I declare that the work described in this dissertation is, except where otherwise stated, entirely my own work, and has not been submitted as an exercise for a degree at this or any other university. I further declare that this research has been carried out in full compliance with the ethical research requirements of the School of Computer Science and Statistics.

Signed: _____

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To my classmates, especially those in my project groups, who made these two years so much easier to get through.

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Abstract

The popularity of mobile devices has increased exponentially over the past ten years with the total sales of smartphone and tablet devices to reach 1.6 billion by the end of 2013. Smartphones and tablet devices are classed as consumer technologies having originated in the consumer market. These privately-owned devices are now commonly used in the workplace in what has become known as IT Consumerisation. By definition IT Consumerisation is the co-use of privately owned technologies for work and personal purposes. IT Consumerisation has many proclaimed benefits such as increased employee productivity, flexibility and availability. However, with this increased availability the demands on the workforce have increased and consumer technology users find themselves working longer hours, dealing with increased role expectations and being exposed to occupational stressors. The cost of stress related illness and absenteeism to the Irish economy is reported to be approximately €100m per annum. This research project examines the potential link between consumer technology usage and perceived stress levels. 75 employees from an IT service provider completed an online questionnaire targeting their consumer technology usage for work purposes and their perception of their stress levels as a result of these technologies. Using a Pearson r correlation, a medium effect relationship was found between consumer technology usage and perceived stress levels. There was no relationship found between self-directed usage of these technologies and perceived stress levels. Manager and non-manger roles were also taken into account. Managers were found to score significantly higher on consumer technology usage but not on the stress level variable. This research project concludes that there is a relationship between how employees are using their consumer technologies for work purposes and the levels of stress that they are experiencing. It proposes that employers raise awareness of the risks of using these technologies and employ stress preventive initiatives in order to protect employee health and reduce absenteeism.

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Abbreviations

3G – Third Generation

4G – Fourth Generation

BYOD – Bring Your Own Device

CIO – Chief Information Officer

HR – Human Resources

IDC – International Data Corporation

ISO – Information Security Officer

ICT – Information and Communications Technology

IT – Information Technology

MDM – Mobile Device Management

OHS – Office Home Smartphone

PSS – Perceived Stress Scale

RQ – Research Question

SBC. – Server Based Computing

SPSS – Statistical Package for the Social Sciences

WFC – Work Family Conflict

1. INTRODUCTION

This research project examines the technological behaviours of consumer technology users in an IT population. It looks to investigate a potential link between these behaviours and the perceived stress levels of these users.

1.1 Context and Background

"The Consumerisation of Information Technology", "IT Consumerisation", and "Bring Your Own Device (BYOD)" are very relevant terms in technology and business today. They are sometimes used interchangeably to refer to the co-use of privately owned technologies for business and personal purposes (Niehaves et al., 2012). Whereas BYOD refers specifically to the use of a physical device for work purposes, IT Consumerisation is an all-encompassing term to include both hardware and software that originated in the consumer market and is now used for work activity (Association, 2011; Harris et al., 2012). Harris-Ferrante (2012) in a Gartner report listed consumerisation as the "Top Industry Prediction" for 2012. In 2013 another Gartner report entitled the "Top 10 Strategic Technology Trends for 2013" listed three mobile, or consumer technologies related entries in the top 10 (Cearley & Claunch, 2013). The use of smart phones, tablet devices or social media applications in both a work and personal setting are real-life examples of IT Consumerisation.

The growing popularity of using consumer technologies for work purposes has had implications for both the employer and the employee. Employee productivity, flexibility and happiness are widely reported as benefits of IT Consumerisation (Gens et al., 2011; Harris et al., 2012; Niehaves et al., 2012). For companies, cost reduction (Stagliano et al., 2013), increased employee productivity (Gens et al., 2011) and improved business process efficiency (Choo, 2011) have been reported as realisable benefits of embracing the use of consumer technologies. The negative impacts have also been reviewed in some detail. These include, fears over data security (Gens et al., 2011), complex IT delivery (Cisek & Cosgrove, 2012) and potential risks to employee health (Niehaves et al., 2012; Ayyagari et al., 2011). Empirically based academic research is limited on this subject and the majority of the literature comes from trade magazines, white papers and online reports by software vendors, IT professionals and consultants. The literature concentrates more on the benefits for both the employer and employee and highlights the potential risks to organisations. The psychological impacts on the employee due to increased workload, availability and expectations are largely ignored.

Occupational and workplace stress are extensively documented subjects (Vagg & Spielberger, 1998; Jamadar, 2012; Aftab & Javeed, 2012). Occupational stress relating to technology usage, or "Technostress", has also been widely reviewed (Ayyagari et al., 2011; Tarafdar et al., 2011) but research relating specifically to the effects of consumer technologies on users are limited (Niehaves et al., 2012). The demands on employees and the pressures of a job role can lead to employees suffering from stress and ill health. IT Consumerisation has been reported to increase workloads, reduce employee personal time and increase work-family conflict (Singh, 2012; Yun et al., 2012). These aspects are all potential stressors for the technology user.

This study looks to expand on the body of knowledge into the negative affects that IT Consumerisation and BYOD could be having on the technology user. It looks to specifically examine a potential link between the usage of these technologies for work purposes and the perceived stress levels of employees.

1.2 Research Question

The primary research question that this dissertation will look to answer is:

1. "Is there a relationship between an individual's consumer technology usage for work purposes and their perceived stress levels?"

There are two research sub-questions that will be examined:

2. "Is there a relationship between the amount of self-directed consumer technology usage and perceived stress level?"

3. "Is there a significant difference between the consumer technology usage scores and the perceived stress levels scores between managers and non-managers?"

1.3 Research Importance

As referenced above in section 1.1 consumer technologies are becoming more prevalent in modern day enterprise. They have enabled workforces to become more mobile and have extended the workplace beyond the traditional office space. Work-related stress has also become more common with 8 out of 10 Americans reporting that they are stressed about something in their job (Interactice, 2013). The estimated annual cost of work-related stress to the Irish economy is €100m (Matters, 2013). With some reports and studies

attributing increases in work-related stress to the increase in technology usage (Ayyagari et al., 2011) there are benefits to increasing the body of academic knowledge in this area.

The target population of this research project is an I.T. service provider with a workforce situated across Ireland, the United Kingdom and the Netherlands. This company actively targeted employee stress by holding annual workshops and discussions around stress management techniques. The research findings would be of particular interest to any company looking to expand their knowledge on the affects of consumer technology usage on their workforce. The specific nature of this target population should be considered when generalising the results.

1.4 Scope and Boundaries of this Study

This research project is concerned with investigating a potential relationship between the consumer technology usage and behaviours of an IT population and their perception of their stress levels. The study targets the use of consumer technologies such as smartphones, tablet devices, privately owned laptops or desktop computers and social media applications for any work-related activity before, during and after normal working hours. The study was designed to target stressors relating to technology usage and to minimise external stressors. The opportunistic population sample was chosen from the researchers place of employment.

1.5 Timeframe of this Study

The following outlines the schedule of this research project:

- October 2012 – Research topic chosen
- November 2012 – Research proposal presented
- March 2013 – First draft of literature review submitted
- May 2013 – Ethics approval granted
- June 2013 – Online questionnaire circulated to target population
- July 2013 – Primary data collected for review

- July & August 2013 – Data Analysis

- August 2013 – Dissertation submission

1.6 Chapter Roadmap

This dissertation is structured in the following manner:

Chapter 1 – Introduction:

This chapter provides information on the context of the research project, the relevance of research into the given topic and details of the scope and timeframe of the project.

Chapter 2 – Literature Review:

The literature surrounding IT Consumerisation, consumer technologies, Bring Your Own Device (BYOD) and work related stress is reviewed in this chapter, setting the framework for the research questions. The advantages and disadvantages of using these technologies for both the organisation and the individual are explored in detail.

Chapter 3 – Research Methodology:

The chosen research philosophy and methodology is explained in this chapter. It provides details on the chosen data gathering technique, the sampled population, the questionnaire content and points of consideration. The limitations and strengths of the research project are also discussed.

Chapter 4 – Findings and Analysis:

In chapter 4 the qualitative and quantitative data gathered from the online questionnaire are analysed. The quantitative data is analysed using SPSS (Pearson r correlations and independent sample t-tests) while the qualitative data is analysed using a descriptive approach. The results from these tests form the basis on the discussion in the subsequent chapter.

Chapter 5 – Discussion:

This chapter discusses the results and analysis of the research with a view to answering the research questions. The opportunities for further research based on these findings will be considered. The chapter will also outline the strengths and weaknesses of the research project and provide a synopsis of the conclusions drawn from the results.

Appendices:

The appendices contain screenshots of the questionnaire that participants were presented with, the statistical analysis outputs and the complete set of comments that were provided by participants.

2. LITERATURE REVIEW

2.1 Introduction

2.1.1 Introduction

The global popularity of mobile devices has increased exponentially as the price of these technologies has decreased (Stagliano et al., 2013). It is projected that by the end of 2013 there will be approximately 1.4 billion smartphones in use across the globe (ABIResearch, 2013; Intelligence, 2013). ABI Research (2013) also predicts that the number for tablet device usage at that stage will be close to 268 million. With the total combined sales of smartphones and tablets to rise from 812 million in 2012 to 1.2 billion in 2013 (Gartner 2012) it would appear that mobile device usage is not just a temporary consumer trend but also a permanent shift in Information Technology consumption (Stagliano et al., 2013).

This view is supported by the recent product developments of Microsoft, traditionally the market-dominator of operating systems for the business and personal computing market. In 2012 Microsoft released their latest version of their desktop operating system, Windows 8. Windows 8 is designed specifically with the mobile device in mind with its tabular layout and touch-screen compatibility (Microsoft, 2013). In that same year Microsoft released its first tablet device, the Microsoft Surface. In 2012 and 2013 at Citrix Synergy, a yearly IT Conference hosted by Citrix Systems Inc., Mobility and Cloud Computing was the main theme running throughout the conference. Citrix Systems are one of the global leaders of desktop virtualization and server based computing (SBC), but in recent years are focusing their technological developments on the mobile market. In 2010 Citrix Systems created a partnership with one of the global leaders in network device design and manufacturing, Cisco Systems Inc. in a move to align both companies more closely with cloud computing, networking and mobility (Warrior, 2011).

2.1.2 Mobile Networks

There are other indicators of the extent to which mobile devices are gaining popularity over laptops and personal computers in the consumer market. In 2015 it is projected that tablet sales will rise above notebook sales for the first time ever (Drinkwater, 2012). The rising popularity of mobile devices is also becoming evident through analysis of global network traffic. The diagram below in *Figure 2.1* illustrates the impact of high mobile and tablet sales on the ratio of mobile traffic to Internet traffic. Cisco (2013) predicts that in 2013 the number of mobile-connected devices will exceed the population of the world.

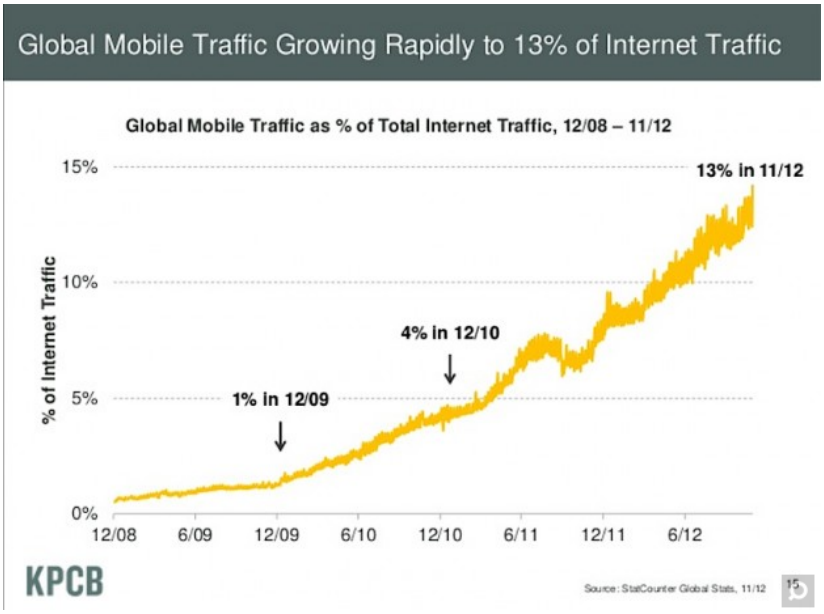

FIGURE 2.1 - Growth in Global Mobile Traffic (Source: StarCounter Global Stats)

Another aspect of technological advancement that provides an indication of the level of growth in mobile device popularity are the enhancements that have been made to mobile networks during the past 10-15 years. The 3g or "third generation" standard for mobile communications was launched in 2001, designed to cope with the large demand for data transmission, for email and Internet browsing, through mobile devices (Thomas, 2012). With 4g now in its infancy the mobile device network infrastructure is being strengthened to match the needs of data-hungry users while bolstering the IT Consumerisation movement with target data rates of 100Mbps for mobile users and 1GBps for nomadic users (Jaloun & Guennoun, 2010). In 2012 Cisco found that 4g connections accounted for 19 times more traffic on average than a non-4g connection (Cisco, 2012). In the same year the average broadband bandwidth per user in the US was recorded at 6.6 Mbps, while there was a 76 percent year-over-year growth in the number of connections exceeding 10Mbps (Young & Temple, 2012). With home broadband and mobile network bandwidth now matching, and sometimes exceeding, that of the enterprise network the remote-worker and mobile-worker capability has increased significantly.

2.2 IT Consumerisation

2.2.1 A Definition

Traditionally within the workplace the personal computer, workstation or laptop has been the employer-preferred interface for employees to access the company's data and

application set. This scenario has changed due to the arrival of an IT phenomenon that has risen on the back of smart-phone and tablet device popularity, IT Consumerisation (Gens et al., 2011). There is no common definition for "IT Consumerisation" within the related literature. Instead researchers and authors have provided their own definitions:

- *"privately-owned IT resources that are co-used for personal and business purposes"* (Niehaves et al., 2012, p.1)

- *"the arrival of consumer-originated devices into the workplace"* (Harris et al., 2012, p.99)

- *"the ubiquitous use of consumer technologies within the workplace"* (Association, 2011, p.1)

The term "IT Consumerisation" is sometimes used interchangeably with the term "Bring Your Own Device" (BYOD). However, while BYOD refers specifically to a privately-owned mobile device that is used within an enterprise, IT Consumerisation encompasses the enterprise use of publicly-accessible social media, communication and file-sharing applications such as Facebook, Twitter, Dropbox, Skype, EverNote and Google Docs as well as the use of privately-owned mobile devices (Harris et al., 2012). For the purpose of this research project and when referenced at any stage during this dissertation report IT Consumerisation will refer to the use of any consumer-originated technology that is used for work purposes.

2.3 Potential Business Impacts

2.3.1 Productivity

The majority of the literature surrounding IT Consumerisation and BYOD focuses on the potential benefits that an organisation can expect by embracing these trends. Increased employee productivity is one of the most prominently cited benefits (Harris et al., 2012; Gens et al., 2011; Gartner, 2012; Choo, 2011). Allowing employee's use privately owned devices for work purposes, and from any location, inevitably leads to those employees working longer hours as they are now able to interact with corporate systems outside of business hours (Dunnett, 2012). Business process productivity, as well as individual user productivity, is also improved as a result of increased mobility (Choo, 2011). A Sales Manager can respond to customer requests, such as a sales enquiry, in a more timely fashion when they have access to the company's mobile network while on the move.

Transforming the enterprise into a mobile enterprise can lead to increased organisational performance (Stieglitz & Brockmann, 2012). Improved employee creativity and innovation are also cited as potential outcomes of embracing consumer technologies (Stagliano et al., 2013; Harris et al., 2012). Providing employees with the freedom to select and use their own technologies breeds a freedom to design new methods through which these technologies can be used to enhance business process. Singh (2012, p1) reported that:

"organisations who embraced a BYOD policy have more happy, productive and collaborative employees"

There are some references to how consumer technologies in the workplace can also negatively affect productivity. Employees using privately owned technologies can now access personal applications and data during the working day, which may contribute to increased "downtime" as personal emails are checked or games within the personal device are accessed (Stagliano et al., 2013).

2.3.2 Potential Cost Savings

Allowing IT Consumerisation and BYOD is often viewed as a potential cost saving for a company. The company is no longer incurring the cost of replenishing hardware to supply the employee with a platform on which to work and, with that, the support of device often falls back on the end-user (Stagliano et al., 2013; Miller et al., 2012). The use of publicly available free applications, such as Facebook and Twitter, as corporate applications is also viewed as an attractive cost saving. However, there are conflicting views on whether the use of consumer technologies actually provides a cost saving. Although it is generally considered that in the long term a BYOD implementation will save costs for the enterprise there are initial start-up costs that are sometimes not considered:

"The total cost of BYOD is higher than not supporting BYOD." (Schadler, 2012, p.1)

There are some hidden costs associated with a BYOD program. Costs such as telecommunication charges (due to increased bandwidth requirements), Mobile Device Management (MDM) Costs, if MDM is employed, and security breaches or loss of intellectual property are just some that need to be considered (Stagliano et al., 2013). Murdoch et al. (2010) and Singh (2012) noted that companies with a large amount of legacy systems would find costs rising when integration with these legacy systems is required.

2.3.3 Strategies To Adopt

The literature surrounding BYOD, mobility and IT consumerisation describes numerous strategies that organisations can adopt to deal with the consumerisation trend. These include; "*laissez-faire*" or "*authoritative*" approaches (Harris et al., 2012), business engagement, investment and policy-creation (Gens et al., 2011), incorporation into a broader mobility strategy (Stagliano et al., 2013; Harris et al., 2012) and a change of management approach (Avanade, 2012). While there are a number of strategies outlined for dealing with the consumerisation, there are indications that some drive IT departments are struggling to adapt**.**

2.3.5 Affect on IT Delivery

There is a general view within the related literature that IT departments have been very slow to react to the influx of consumer technologies into the workplace and are struggling to keep up. Gens et. Al (2011) refer to a IDC global survey of 3,000 information workers and executives which showed both IT workers and iWorkers (those using consumer technologies) rated IT support for varying forms of consumerisation within their company at under 3 on a 5-point scale. Cisek & Cosgrove (2012) in a Gartner report noted that IT organizations' would need to invest in new skills and training to manage and support these new mobile technologies. Gens et. Al (2011) also found that 80% of IT departments believed that their workload would increase due to IT Consumerisation. There is also the belief that BYOD brings greater choice to the employee than could otherwise be provided by their IT departments (Henrys, 2013).

There are signs that some IT departments are starting to gain some control of the situation. Another 2012 Gartner study (MacDonald & Aron, 2012) reported that CIOs plan to spend most of their budgets on mobile technologies and mobile management in the near future (Stieglitz & Brockmann, 2012). Large-scale use of consumer technologies within the workplace has shifted the role of the IT department:

"They are no longer driving this innovation, they are coping with it" - (Dunnett, 2012)

These trends are moving organisations away from the traditional IT model and forcing them to embrace a consumer technology strategy. As far back as 2004, IT Consumerisation was listed as a "destructive technology", a common feature of new technologies that are not quite ready for the corporate market and can cause complexity issues for IT support (Moschella et al., 2004). However, the popularity of consumer

technologies within the workplace, at least with the end-user, has since been proven with its widespread adoption.

2.3.6 Data Security

The major concern for CIO's and IT departments with IT Consumerisation and BYOD is the security of corporate data. An Accenture global survey in 2011 showed that 23% of employees surveyed used consumer devices for work purposes on a regular basis with 36% agreeing that they do not worry about their organisations' security policies (Harris et al., 2012). A 2011 IDC study showed that 40.7% of those surveyed used a personal PC, smartphone or tablet to access business applications, while 83% agreed that security concerns were the greatest barriers to consumerisation (Gens et al., 2011). Miller et al. (2012) view the security issue as similar to those that arose when the laptop first became a corporate tool, but amplified by the smaller size of smartphones and tablet devices, making it easier for them to be removed from the workplace. A CheckPoint study in January 2012 of 768 IT professionals showed that 89% had mobile devices connecting to corporate networks (Dimensional, 2012). There are more worrying trends for IT departments, CIOs and ISOs, than those merely showing personal device usage in the workplace. A 2011 Accenture global survey showed that employees are aware that they are in breach of security policies and procedures but chose to ignore them in favour of using consumer technologies (Harris et al., 2012). This arises from the fact that employees do not believe that they are responsible for the security of consumer IT (Niehaves et al., 2012) and therefore will use it inappropriately. There is a sense that, by embracing consumer technologies or adopting a BYOD policy organisations are:

> *"trading enhanced capabilities against possible extra risk"* (Association, 2011, p.4).

On the opposite end of the data security issue from the loss of corporate data is the issue with protecting the end-user's personal data. With BYOD the employee device can now potentially contain both private and corporate data. If the enterprise employs a remote-wipe solution for managing mobile devices they then run the risk of potentially violating data privacy legislation (Absalom, 2012).

2.3.7 Legal Considerations

There are legal issues for employers to consider when taking into consideration the working trends that are emerging due to consumer technology usage. The Working Time Act was passed into law in Ireland in 1997 with legislation to govern the working hours of employees states that:

"*An employee shall be entitled to a rest period of not less than 11 consecutive hours in each period of 24 hours during which he or she works for his or her employer"* (Attorney-General, 1997, p.12)

In a global survey Gens et al. (2011) found that 40% of workers surveyed engaged in business activities using consumer technologies while commuted to work and 30% doing so from bed. These findings are also supported by McCafferty & Reisinger (2011) who reported that 49% of participants in an IDC survey for Unisys took part in work activity while on vacation. It is therefore possible to theorize that employees are unwittingly in violation of employee legislation due to their embracement of IT Consumerisation. There are additional legal considerations for companies to consider. In Ireland, for example, companies are governed by the Safety, Health and Welfare at Work Act 2005. This law states that the general duties of an employer is as follows:

"Every employer shall ensure, so far as is reasonably practicable, the safety, health and welfare at work of his or her employees." (Attorney-General, 2005, p.18)

With the above-mentioned increase in work activities taking place outside of the workplace it has become close to impossible for employers to guarantee the health and safety of a remote worker (Nieuwenhuizen, 2012). Employers are not in a position to inspect each employee's home working area to ensure it meets the requirements of the Safety, Health and Welfare at Work Act (2005).

2.4 Benefits for the Employee

As well as having a large-scale impact on corporate processes and corporate-level IT delivery, the end-user, or technology-consuming employee, has also seen their working environment and working practices affected.

2.4.1 Employee Autonomy and Happiness

There are a number of employee benefits outlined in the literature surrounding IT Consumerisation. Increased independence for the employee from the traditional fixed workplace setting is seen as an attractive aspect of consumer technology usage (Stieglitz & Brockmann, 2012). The decision on what technology to use in the corporate environment has moved from the employer to the employee. With this, the employee can now enjoy a sense of autonomy that was previously absent (Stagliano et al., 2013). 53% of employees surveyed by Accenture in 2011 agreed that if they were allowed to choose

their own technology they would be happier employees (Harris et al., 2012). Similarly, Singh (2012) and Rodham (2012) also reported that organisations that embraced their employees desire to use consumer technologies would increase employee happiness. In the 2011 Accenture survey mentioned above, 57% of employers surveyed agreed that increasing employee satisfaction was an important benefit to be realized from IT Consumerisation (Harris et al., 2012). The evidence suggests that IT Consumerisation can help to create a more attractive and happier workplace for the employee.

2.4.2 Flexibility

The use of consumer technologies within the workplace has also provided scope for increased employee flexibility. It is approximated that by 2016 43% of the American workforce, equating to 63 million workers, will occasionally work remotely (D'Arcy, 2011). Employees are no longer restricted by the physical boundaries of the office (Nieuwenhuizen, 2012). According to Singh (2012) employers that implement a BYOD policy will attract higher-performing workers due to the flexibility that BYOD provides to the employee. The increased flexibility is due mainly to the IT Consumerisation trend and the recognition from employers that there are benefits to be gained from accommodating workplace flexibility with employees.

Increased employee independence, flexibility, autonomy, and inevitably, happiness and satisfaction within the workplace are all reported as realisable benefits from embracing consumer technologies. There are some suggestions that these short-term benefits are overshadowing some longer-term health risks (Niehaves et al., 2012).

2.5 Potential Negative Impacts on the Employee

The literature, academic and otherwise, that has been reviewed and discussed in the previous sections of this chapter (Dahlstrom & diFilipo, 2013) concentrates mainly on the positive impacts of using consumer technologies for work purposes. The reported positive impacts that consumer technologies are having on both the individual employee and the organisation, through autonomy, increased mobility, increased flexibility, lower IT costs and user-productivity, are explored in full throughout the literature (Harris et al., 2012; Gens et al., 2011). The negative impact of IT Consumerisation on the organisation is also studied in some detail. Employer concerns over corporate data security and increased IT delivery complexity are those that are cited most (Song Chuang, 2012; Dahlstrom & diFilipo, 2013). However, the potential long-term negative impacts that the employee who

embraces consumer technologies may experience appears somewhat neglected by the literature.

2.5.1 Longer Working Day – Self Directed Hours

The Aerospace Industries Association (2011), as cited in (Niehaves et al., 2012) refers to how employees are now working longer hours due to out-of-hours access to enterprise systems. Mobility and consumerisation is causing the personal life of employees to extend into their working life and vice versa:

> *"Work is no longer a place you go to, and then leave, but an on-going activity"* (Singh, 2012, p.1).

Employees with ease-of-access to work systems 24 hours a day are finding themselves inadvertently accessing these systems outside of their normal working day. In a worldwide survey by Gens, Levitas and Segal (2011) of over 3,000 information workers it was shown that 50% of employees surveyed used consumer technologies while on vacation, 29% while in bed and 20% while driving. D'Arcy (2011) lists a blurring of work and home life as one of the top 5 trends resulting from IT Consumerisation. There are reports that this blurring of activity can also lead to employees being less able to switch off from work activities and feel under pressure to work longer hours (Dell-Intel, 2011).

2.5.2 Work Family Conflict

There is evidence that the increasing movement of work activity into an employee's personal time can cause some personal problems to arise for that employee. Yun et. al (2012) describe how the productivity and flexibility of the Office Home Smartphone (OHS), or a device used for home and work purposes, has led to an increase in perceived workload. In the same paper Yun et. al (2012) also references a potential impact of co-used devices and increased workload on Work-Family Conflict (WFC):

> *"WFC is the role tension that occurs as job demands interfere with the performance of family duties"* (Netemeyer et al., 2004, p.50)

Although numerous publications relate work-life flexibility to stress reduction and improved work-life balance, (Pierce & Newstrom, 1982; Kelliher & Anderson, 2008), it has also been reported that employees that enjoy flexibility in their work life are more susceptible to the affects of changes in working conditions, workplaces and locations (Sayah & Süß, 2013).

Russell (2009) found that there was a differentiation between different forms of flexible working conditions and the affect on Work-Family Conflict. They reported that working from home increased both work pressure and Work-Family Conflict (Russell et al., 2009).

Work-Family Conflict has been found to have a negative impact on employee turnover and organisational performance (Tariq et al., 2013). Ahuja et al. (2006) reported how work-life conflict can increase turnover intention. Turnover intention is "*the (subjective) probability that an individual will change his or her job within a certain time period*" (Souza-Posa & Henneberger, 2004, p.1)**.**

2.5.3 Organisational Change and Employee Stress

It has been described previously in this literature review how consumer technologies have contributed to a change in how an organisation is structured and operates, both from an I.T. delivery standpoint and a business user standpoint (Gens et al., 2011; Henrys, 2013). This can be classed as organisational change. Dahl (2010) reports that organisational change has the potential to increases the risk of negative stress. A study in 2000 exploring the affects of organizational change on employee psychological attachment found that organisational change that is fundamental to the core values of the organisation can reduce organisational commitment (Bennett & Durkin, 2000). Although this section is focused on the negative impacts of organisational change due to consumerisation, it is also important to note that certain forms of organisational change have been highlighted as a benefit of BYOD and IT Consumerisation. Singh (2012) notes that IT Consumerisation has dramatically changed the work culture and working environment by creating a more technically knowledgeable workforce.

Given these reports it is possible to hypothesise that employees who are exposed to consumer technology usage, end-users and support staff, are also vulnerable to the effects of organisational change. It is therefore possible that these employees are at risk of increased stress levels, which has been attributed to organisational change. It is also valid to argue that IT staff are exposed to a greater amount of work-related stress due to the level of organisational change experienced relative to their business counterparts i.e. pressure on IT departments to adopt to consumer technologies more quickly (Gens et al., 2011). In terms of technology management, the power-shift from IT departments to technology consuming users is another organisational change that has been reported. As noted by Harris et al. (2012) *"whatever approach is chosen to understanding and*

addressing IT Consumerisation, one thing is certain, the rules of the IT game will have to change" (Harris et al., 2012, p.107).

Even though there is evidence that IT Consumerisation is contributing to longer working hours, a merging of the work and home life and potentially increasing work-related stress, few companies have formulated policies for organisational support (Yun et al., 2012). Kasperczyk (2010) reports that work-related stress is the responsibility of the corporate governance process and is no longer viewed as the individual employee problem. There are large economic costs associated with work-place stress and resultant absenteeism (Matters, 2013; Kasperczyk, 2010). Dana (2001) has identified 8 cost factors associated with workplace stress (Dana, 2001):

1. Use of health care for illnesses and injuries that are partially psychogenic
2. Lowered job motivation
3. Lost work time
4. Wasted time
5. Reduced decision quality
6. Loss of skilled employees
7. Restructuring
8. Sabotage, theft and damage

If consumer technology usage can be related to increases in stress then it is possible to also attribute a link to these cost factors.

Workplace stress has also been associated a number of psychological stress symptoms such as stomach problems and trouble sleeping (Wichert, 2002). Identifying any stress symptoms in consumer technology users would be paramount to analysing a potential link between usage and stress levels.

2.5.4 Managerial Roles and Non-managerial Roles

The role of the individual within an organisation is a factor to consider when assessing stress levels. A number of studies have reported differences in stress levels between managers and non-managers in non-IT populations (Skakona et al., 2011; Sinha & Subramanian, 2012; Kawada & Otsuka, 2010). While there are some studies that examine stress levels in managers in IT/ICT/IS populations (Richmond & Skitmore, 2006) there is a lack of research into the differences in stress levels and stress management between

managers and non-managers. There are benefits to be realised in distinguishing between role types when examining consumer technology usage and stress levels in this research project.

2.6 Conclusion

IT Consumerisation is a relatively new area of research. Although there is a large amount of material available on this subject the majority comes from position papers, commercial surveys and magazine articles that are generally without empirical evidence to back-up the views being expressed. The general view from this literature is that the use of consumer technologies in a work setting can be beneficial to both employers and employees through increased productivity, flexibility and lower IT costs. There are some concerns around risks to data security and increased IT complexity. Although limited, there has been some research into the potential impacts of increased workloads and constant availability due to mobile devices and technologies that are easily connectable to work systems. There are indications from the reviewed material that some of the increased workload is self-directed. Increases in stress levels have been attributed to increased workloads and organisational change, both affects of the demands that consumer technologies can bring. The difference in how managers and non-managers deal with stress in workplace has been examined in non-IT populations. However, it has been largely ignored in relation to technology or consumer technology usage.

With this in mind, this research project looks to investigate a possible link between consumer technology usage and perceived stress levels. It will also examine whether a consumer technology user is contributing to their own stress levels through self-directed usage of these technologies at times when work has not been scheduled. It will look to distinguish participants by managerial and non-managerial roles in order to assess if there are differences in how managers and non-managers react to the potential stressors that consumer technology usage can bring.

The resultant research questions are described in the next chapter.

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research design that was chosen for this project. It explains the considerations that were taken when choosing the research philosophy, approach and strategy that were used to conduct the primary research. It also details the demographic of the population that were targeted and responded to the online questionnaire.

3.2 The Research Questions

There are three research questions that are addressed by this research project:

RQ1: Is there a relationship between individual consumer technology usage and the perceived stress levels of that individual?

This research question will be subdivided into two further questions:

RQ2: Is there a relationship between the amount of self-directed hours of consumer technology usage and the individual's perception of stress?

RQ3: Is there a relationship between the role of the participant in an organisation (managerial or non-managerial) and their perceived stress levels?

These research questions will be tested for significance in the next chapter.

3.3 Research Philosophy

Before considering the design of the research study there is a need to understand the over-arching research philosophy and approach. Saunders et al. (2012) state that a research philosophy:

"relates to the development of knowledge and the nature of that knowledge" (Saunders et al., 2012, p.127).

According to Holden & Lynch (2004) and Jupp (2006), ontology, epistemology, human nature and methodology are core elements to consider when discussing a research philosophy. David & Sutton (2004) describe how the importance of ontology is due to the need for the researcher to understand how their own perceptions of human nature

impacts on their research approach. It can therefore be determined that an understanding of ontology and epistemology is important before choosing a particular research design.

Saunders (2012) refer to ontology as the nature of reality. In essence it refers to the researcher's views and assumptions of how the world works. Ontology can be subdivided into Objectivism or Subjectivism. An objectivist view is one where social entities exist external to social actors. On the other hand the subjectivist view is one of social constructionism whereby the social actors create reality. With Objectivism the researcher is independent of the data gathering while Subjectivism sees the researcher being part of the observed phenomenon (Glynn & Woodside, 2009). *Figure 3.1* below provides a graphical overview of the subjective and objective positioning that a researcher can take.

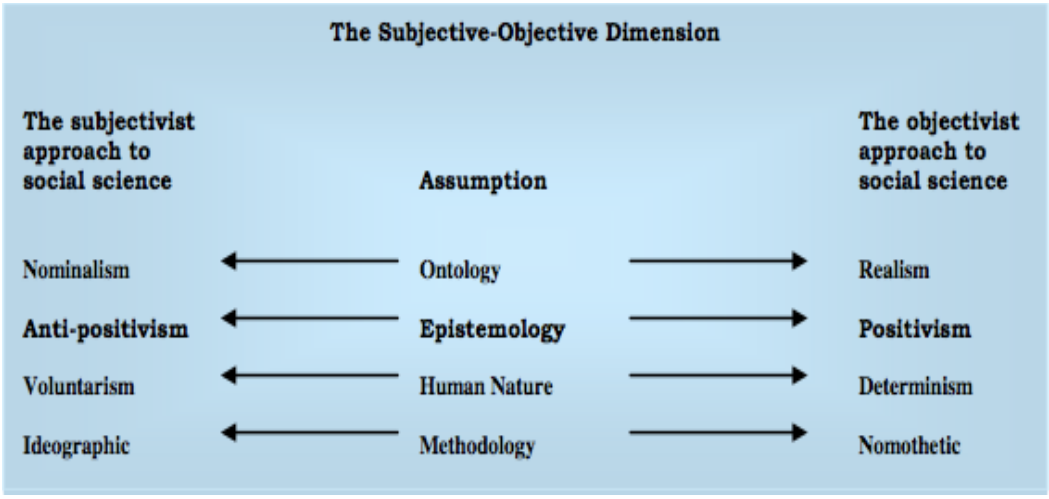

FIGURE 3.1 - A Scheme for Analysing Assumptions About the Nature of Social Science

Source - Burrell & Morgan (1979)

Epistemology is the way of understanding reality (Glynn & Woodside, 2009). Similar to ontology, epistemology can be further categorised into Positivism and Interpretivism. Positivism can be determined as a position that applies natural science methods to the study of social reality (Bryman, 2012). An Interpretivism position places emphasis on understanding differences between humans in order to interpret social roles (Saunders et al., 2012).

The aim of this research project was to analyse a potential relationship between consumer technology usage and an individual's perceived stress levels. In order to objectively measure either consumer technology usage or a person's stress levels would require some form of obtrusive procedure. A small software application could be placed on the

participant's device to record how often they used that device or application for work purposes. Similarly, to measure a person's stress levels objectively might require some autonomic measure like blood pressure or a salivary cortisol reading. Due to (i) time constraints, (ii) ethical boundaries and (iii) general convenience the methods listed above would not be possible. With this mind the approach and focus of this research project took a subjective direction i.e. using an interpretivism epistemology with a subjective ontology. It is important to note that a subjective approach is always open to bias as the primary data is reliant on the opinions and views of the target population.

3.4 Design

Based on the considerations listed in the previous section of this chapter, a mixed-methods, cross-sectional design was used. An online questionnaire was created containing both quantitative and qualitative type questions. The questionnaire was divided into three sections:

- Participant Demographic
- Consumer Technology Usage
- Perceived Stress Levels

An online questionnaire was the chosen method for data gathering for a number of reasons. This method provides the participant with ease-of-access to the questionnaire while participant numbers are not restricted by geographical location. It also offers complete anonymity for the participant, as there is no requirement for physical interaction with the researcher. Lumsden and Morgan (2005) list faster delivery, quick collection of responses and the dynamic nature of a web-based questionnaire, as it's advantages over a physical alternative.

3.5 Design Considerations

Questionnaire length was a consideration when designing this study. Previous research studies have shown that long questionnaires have a negative correlation on participation and response quality (Galesic & Bosnjak, 2009; Sahlqvist et al., 2011). Roszkowski and Bean (1990), in a study concerning survey length and response rates, found that shorter surveys averaged a 28% higher response rate. Guin et al. (2012) state that shorter surveys with questions that are easy to understand and a subject matter that the participant finds interesting and important can reduce respondent burden. Taking these factors into account it was decided that the distributed questionnaire should be

approximately 20-25 questions in length and should take no longer that 15 minutes to complete.

Research indicated that survey piloting is required to perfect the different elements that constitute a questionnaire or survey (Andrews et al., 2003). Considering this, a pilot group of 5 participants was selected from the target population. These participants received a first draft of the questionnaire and were asked to provide feedback. A progress bar was also included at the bottom of each questionnaire page in order to reduce attrition rates by displaying to participants how long was left until the questionnaire was completed.

The day of the week and time of day that the questionnaire was to be distributed was also a consideration. Quinn (2009) performed a meta-data research relating to optimal timing of questionnaire/survey distribution. Quinn (2009) found that Wednesday was the optimal day of the week and that 10am to 11am and 3pm to 4pm were the optimal times. With this in mind the questionnaire for this research project was distributed at 10:30am on Wednesday the 5th of June 2013.

3.6 Questionnaire Structure and Content

Participants were first presented with a research project information sheet that provided details about the researcher, the research question and what question types the participants could expect if they chose to take part. The second page of the questionnaire asked participants to provide their consent to take part in the study. If a participant did not agree to take part they were directed to a closing page that thanked them for their consideration. Those that chose to take part were first presented with some demographic questions; age, sex, nationality and whether they were employed in a managerial position or not. The decision to distinguish participants based on their role within the company was due to a number of previous studies that highlighted significant differences between stress levels in non-managers, managers and senior managers (Sinha & Subramanian, 2012; Skakon et al., 2011).

The second of three sections of questions looked at assessing the participant's use of consumer technologies for work purposes. These questions targeted consumer technology usage for work purposes in terms of:

1. Whether consumer technologies were used for work purposes or not.
2. The types of consumer technologies that were used.

3. The amount of hours during the week/weekend that these technologies were used for what purposes.
4. The locations and occasions that these technologies were used for work purposes.
5. The amount of these hours that was self-directed.

Participants were then presented with free-text fields to provide their perceptions on the advantages and disadvantages of using a consumer technology for work purposes. These two questions would later be analysed in isolation from the other quantitative-type questions.

The third section of the questionnaire assessed participant perception on the potential impact that the use of a consumer technology for work purposes may or may not be having on their stress levels. The following specific aspects were assessed:

1. Whether or not the use of consumer technologies for work purposes had increased the levels of stress in the participants' work life.
2. Whether or not the use of consumer technologies for work purposes had increased the levels of stress in the participants' personal life.
3. Whether or not the use of consumer technologies for work purposes had negatively impacted the participants' sleep patterns.
4. Whether or not the use of consumer technologies for work purposes had caused the participants to find it difficult to switch off from, or stop thinking about, work.
5. Whether overall the use of consumer technologies for work purposes had heightened the participants' stress levels.

The above questions were assessed using a Likert scale ranging from *Strongly Agree* to *Strongly Disagree*.

Participants were then asked to list any physical symptoms of stress that they have experienced (listed below) and that they believe are linked to their consumer technology usage (Smith et al., 2013):

- Distractibility
- Irritability
- Heart Palpitations
- Poor Concentration
- Muscle Tension

- Fatigue
- Racing/Overactive Thoughts

The last question of the questionnaire presented participants with the opportunity to provide any thoughts that they had on the subject of consumer technology usage for work purposes. A free-text field was provided for participants to use.

The final section of the questionnaire consisted of two exit pages. Depending on the stage at which the participant decided to exit the questionnaire they were directed to one of the two pages. If the participant decided to exit the questionnaire without providing consent they were directed to a page that thanked them for their consideration. If the participant was exposed to the consumer technology and stress related questions they were directed to a page that provided a number of links to stress prevention and stress management websites. Please see *Appendix A* for screenshots of the full questionnaire.

3.7 Method

In order to enhance the rigour of the questionnaire a pilot group of 5 participants was chosen from within the target population. The pilot group was asked to complete the questionnaire and to provide detailed feedback on questionnaire structure, content and flow. Minor aesthetic alterations were made to the questionnaire content based on the pilot group feedback.

The questionnaire was then distributed to 123 staff within the target company. Participants received an email describing the purpose of the study and a link to the online questionnaire. The email stated that the research project was not an employer initiative, was completely anonymous and any information gathered would not be accessible by the employer. This was included to encourage participants to be forthcoming with their answers. The participant had to option to opt out of the survey at any stage.

3.8 Measures and Materials

A number of industry-used stress scales were considered, and subsequently disregarded, when designing the questionnaire.

Sheldon Cohen's Perceived Stress Scale (PSS) was one of the scales that were considered. The PSS is one of the most widely used scales to measure a person's perception of stress (Cohen et al., 1988). The PSS was disregarded as a measure for this

survey as it is designed to measure a more general perception of stress and was not specific enough to the content of this survey. If the PSS were used there would be no means of determining whether the participants' measured stress scores were related to their use of consumer technologies or were influenced by external factors. The Workplace Stress Scale™, designed by The American Institute of Stress, was also examined with a view to being the measure of stress used in this survey. The Workplace Stress Scale™ consists of 8 questions relating specifically to a participants perception of stress arising from their job role. This measure was also disregarded for use in this survey due to the content of the scale not being relevant to measuring stress related to consumer technology usage. A third scale, The Social Readjustment Rating Scale, was also deemed inappropriate for this survey as it looks to measure a broad ranging and large number of life events that could potentially affect a person's stress, and is therefore too general a measure.

With the lack of a relevant, industry-used stress measure the decision was taken to design a number of bespoke questions that would be used to assess participants perceived stress levels relating specifically to their use of consumer technologies.

3.9 Participant Demographic

As this area of research is relevant to the ICT sector an convenient population sample was chosen from the researcher's place of employment, an ICT service provider for a global, fleet management organisation. The company in question has staff members in a number of European countries and therefore provided a geographical and culturally diverse population. The questionnaire was distributed to a total of 123 employees.

3.10 Ethical Considerations

Once the design of the online questionnaire was completed an ethics approval proposal was submitted to the Ethics Approval Committee at Trinity College Dublin. A separate approval submission was made to the HR director in the target company.

Due to the potential risk of highlighting sensitive personal issues for participants i.e. participant stress levels, a de-briefing section was added as the last page of the questionnaire. This page thanked participants for their time and provided some web links to information about stress and stress management.

3.11 Design Weaknesses

One of the challenges when designing the questionnaire to answer this particular research question was how to distinguish between stress that was as a result of consumer technology usage for work purposes and stress that could be attributed to some other factor(s). As already mentioned, this challenge resulted in bespoke stress measurements being used rather than choosing from the widely used, and tested, Perceived Stress Scale, Workplace Stress Scale or The Social Readjustment Rating Scale. Using a new on untested scale reduces the power of the results but was deemed necessary.

Participant Demographic			
Measure		**Number (n)**	**Percentage (%)**
Age	18-25	4	4.04%
	26-35	27	27.27%
	35-45	50	50.51%
	45+	18	18.18%
Sex	Male	76	76.77%
	Female	23	23.23%
Nationality	Irish	72	72.72%
	American	1	1.01%
	Australian	1	1.01%
	British	10	10.10%
	Chinese	1	1.01%
	Dutch	2	2.02%
	Polish	4	4.04%
	Portuguese	1	1.01%
	Scottish	1	1.01%
	Spanish	5	5.05%
	Ukrainian	1	1.01%
Position	Managerial	28	28.57%
	Non-managerial	70	71.43%

TABLE 3.1 – Participant Demographic Information

3.12 Other Points of Note

Before considering the results of the primary data gathering in the next chapter it is worth noting that the target company is, and has been for a number of years, actively raising awareness of employee welfare and health through a number of workshops held during one week of the year. With a target population that is already educated on the subject matter of the research project it could potentially have a positive bearing on the response rates of the survey. This potential affect of participant knowledge will be discussed in chapter 5.

4. FINDINGS AND ANALYSIS

4.1 Introduction

In this chapter the questionnaire responses will be examined in detail. The Survey Monkey website was used to present the questionnaire to the target population and to store the results. The final questionnaire results were gathered after 5 weeks for analysis. The results that were gathered consisted of both quantitative and qualitative data.

4.2 Response Rates and Attrition Rates

The questionnaire was distributed to 123 employees in an ICT company. 100 of these responded to the questionnaire. This provided a response rate of 81% as shown below in *Figure 4.1*.

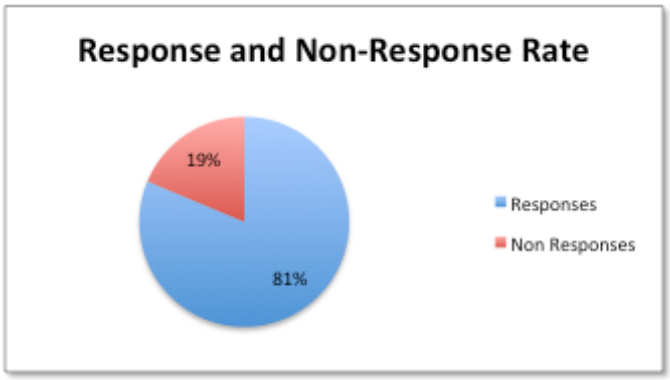

FIGURE 4.1 - Response and Non-Response Rate

Of the 100 that responded 75 of these completed all sections of the questionnaire and therefore provided measurable responses. This provides a 25% attrition rate. When analysing the questionnaire attrition rates on a per question basis it can be shown which questions of the questionnaire suffered most from participant dropout. *Figure 4.2* illustrates this point below. In the graph question 20 shows a response rate of 43%. However, this question was an optional question so is disregarded from the attrition rate calculation. An explanation as to why responses were so low on Q20 could have been due to the sensitive nature of the questions. Participants were asked to describe physical symptoms that they would attribute to stress and may have been unwilling to disclose this information.

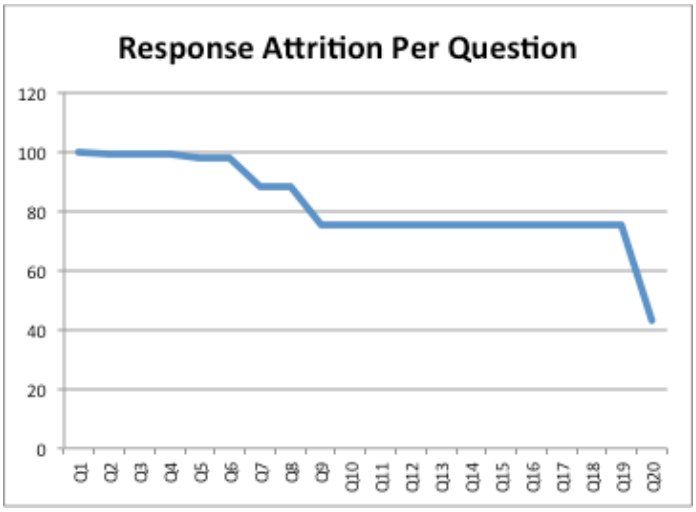

FIGURE 4.2 - Overall Questionnaire Attrition Rate

4.3 Consumer Technology Usage

Of the 100 participants that completed the questionnaire 10 answered "No" to the question *"Do you use a consumer technology for work purposes?"* A further 15 dropped out during the remainder of the questionnaire. This resulted in 75 participants being eligible to contribute to the consumer technology and stress sections of the questionnaire.

4.3.1 Participant Roles

Participants were categorised based on whether they were in a managerial position or not (Q5). This categorization would help investigate potential differences in the scores received for consumer technology usage and perceived stress levels between those responsible for the management of others and those who are not. This is illustrated in *Figure 4.3* below:

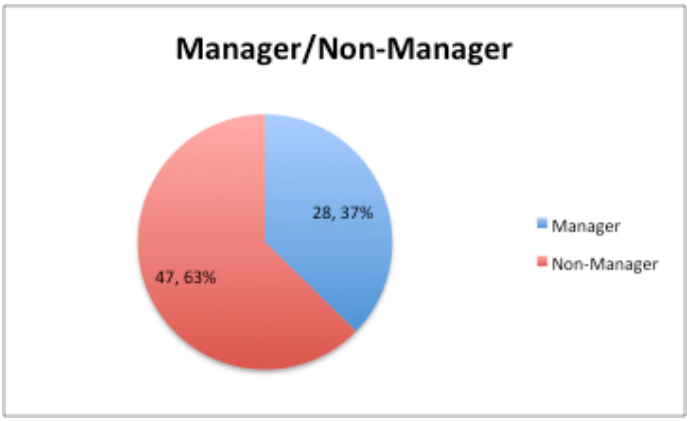

FIGURE 4.3 - Managerial and Non-managerial Roles (Q5)

4.3.2 Consumer Technologies in Use

The following graph, *Figure 4.4*, illustrates the range of consumer devices and technologies used across the targeted population:

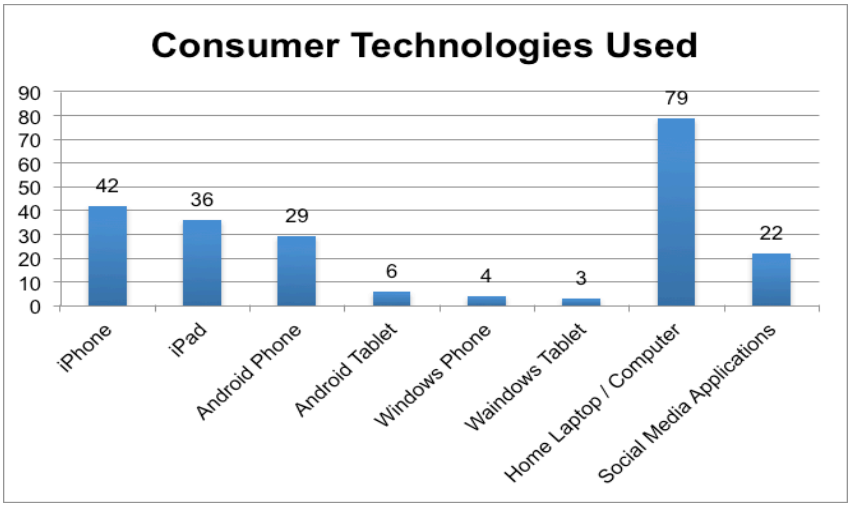

FIGURE 4.4 - Consumer Technologies Used (Q8)

It is worth noting that of the 75 participants who answered this question all used at least one of the consumer technologies listed above. An additional 12 participants, who did not complete the questionnaire in its entirety, answered this question. Only 1 of those 12 participants reported using any of these consumer technologies.

4.3.3 Locations and Occasions of Consumer Technology Usage

For Q11 participants were asked to list the different locations and occasions that they would use a consumer technology for work purposes. *Figure 4.5* illustrates the answers received for this question:

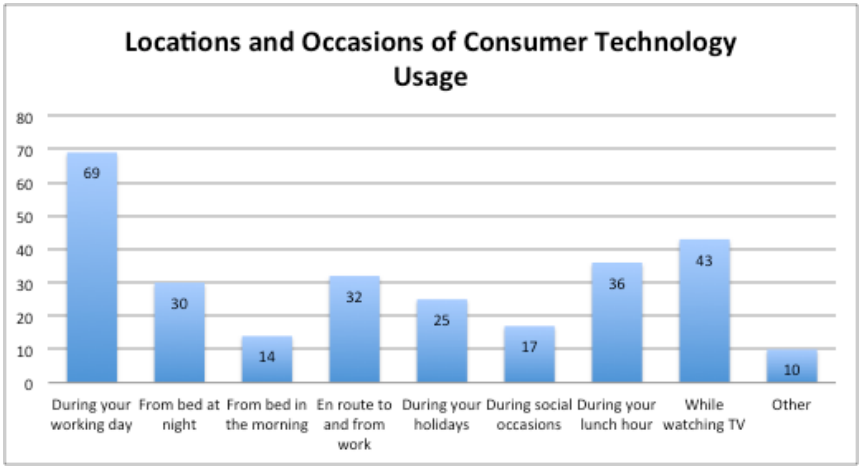

FIGURE 4.5 - Locations and Occasions of Usage (Q11)

92% of participants reported using consumer technologies during the working day, 57% while watching TV, 48% during the lunch hour, 42% on their way to work and 40% from bed at night. Exactly one third of people recorded using a consumer technology for work purposes while on vacations.

4.4 Statistical Analysis

In order to analyse the respondent data in detail IBM's SPSS version 20 was used. This study is aiming to look at the relationship between two different variables:

- Predictor Variable – The participant's use of consumer technology for work purposes.
- Outcome Variable – The participant's perception of the level of stress they are experiencing.

The respondent data was prepared by assigning a scoring mechanism to the two variables being analysed. Questions 9, 10, 11 and 12 would be scored for the predictor variable whereas questions 15, 16, 17 and 18 would be scored for the outcome variable. All additional questions would be analysed separately for potential relationships using descriptive analysis. Since both variables being analysed are scored per respondent they can both be classed as continuous variables. This is discussed in more detail below (4.6).

4.5 Statistical Tests

Using the Statistical Test Decision Tree (Field, 2009) the most suitable statistical test for this type of analysis is a Pearson *r* Correlation test:

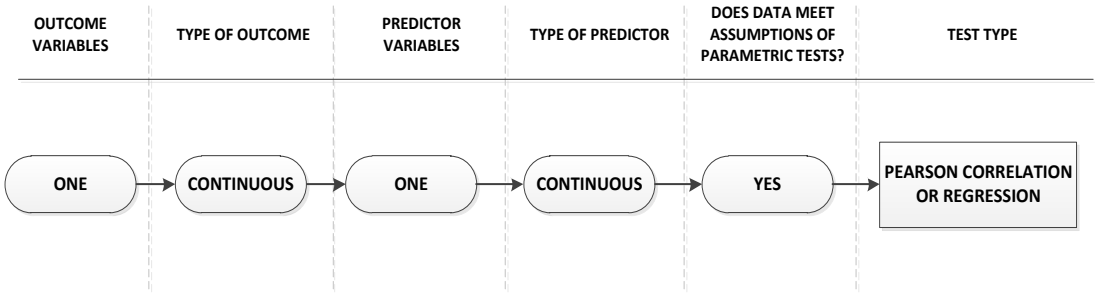

FIGURE 4.6 Statistical Test Decision Tree – Adapted from (Field, 2009)

The Pearson *r* correlation test uses covariance, cross-product deviations and standard deviation to analyse the relationship between two variables.

The Pearson *r* Correlation Test is based on the concept of covariance. Variance of a single variable represents the average amount that the data vary from the mean (Field, 2009). For covariance we are interested in finding out if changes in one variable being analysed is met with a similar change in the second variable. If one variable deviates from its mean there is an expectation that the second variable would also deviate from it's mean in a similar way (Field, 2009). The Pearson *r* correlation coefficient is a standardized covariance value and is represented by *r*. It must lie between -1 and +1.

4.6 Scoring Mechanism Used

In order to use the Pearson *r* Correlation Test each of the two variables being analysed need be presented as a single score (variable value) per participant. In order to fulfil this requirement the following questions were scored:

4.6.1 Consumer Technology Usage

Q9. How many midweek hours (outside of work) would you use a consumer technology for work purposes?

Q10. How many weekend hours would you use a consumer technology for work purposes?

Q11. When do you use a consumer technology for work purposes?

Q12. How many of these hours are self-directed? (e.g. checking your emails on your smartphone because you have convenient access)

4.6.2 Participant's Stress Perception

Q15. The use of a consumer technology for work purposes has increased stress in my work life (e.g increased workload/ demands).

Q16. The use of a consumer technology for work purposes has increased stress in my personal life (e.g. less free time; reduced well-being).

Q17. The use of a consumer technology for work purposes has negatively impacted my sleep (e.g. disruption in sleep pattern; disturbed sleep; difficulty getting to sleep).

Q18. I find it difficult to switch off from work as a result of using a consumer technology for work purposes (e.g. thinking about work tasks outside of working hours/ weekends).

Apart from Q11 all questions above had single choice answers on a 5-point scale. A participant's score per question was ranked between 1 and 5 depending on where their answer fell on that 5-point scale. For Q11, the participant was scored on how many of the different situations/occasions they used a consumer technology. If a participant used a consumer technology on one of the listed occasions they would receive a score of 1, for two of the listed occasions they would receive a score of 2 and so on. The maximum possible score for this question was 9. Once the individual question scores were tallied they were then summed together for the participant's total score per variable. The total score would then be used in the Pearson *r* Correlation Test to analyse any potential relationships.

4.7 Pearson *r* Correlation Test – Limitations

One of the limitations of interpreting the correlation coefficient is that it does not account for the direction of causality. If a correlation test finds that a change in one variable is matched by a change in the second variable it cannot be definitely stated that a change in variable one causes the change in the second variable. A relationship can be deduced but not a causing factor. There are three potential reasons why two variables may be correlated (Welkowitz et al., 2006):

1. Variable 1 causes variable 2
2. Variable 2 causes variable 1
3. Both variable 1 and variable 2 are caused by a third variable

It cannot be stated what causes the correlation or the direction of the correlation (Field, 2009). An assumption of the Pearson r test is that the relationship between the two tested variables is linear. If the relationship is, for instance curvilinear, the Pearson-r test will not detect it. This was a consideration when analysing the consumer technology and perceived stress scores.

4.8 Scatter Plot Graph

The scatter plot shown below in *Figure 4.7* demonstrates the linear relationship between the two variables. The r^2 value is 0.152 representing 15% of the variance.

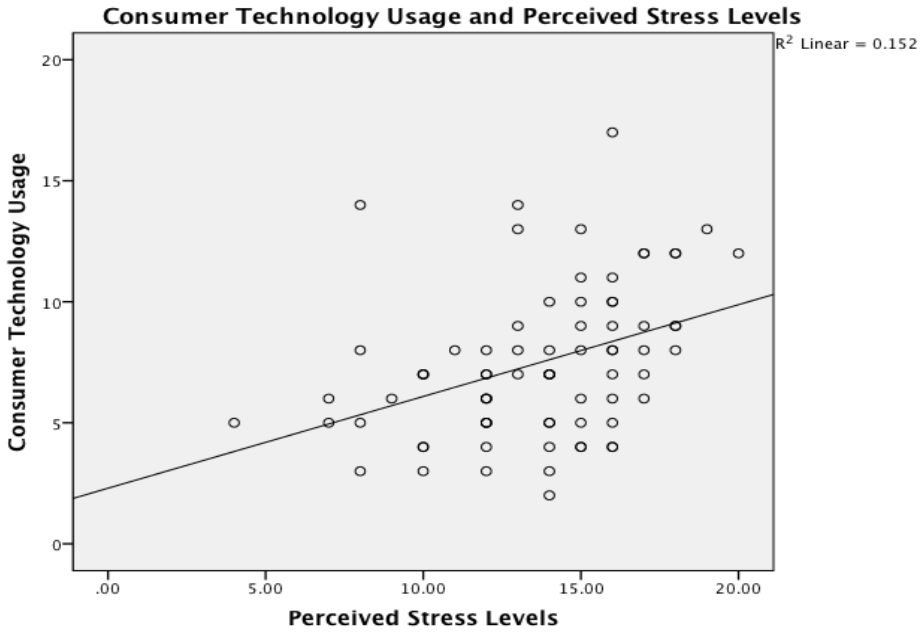

FIGURE 4.7: Scatter Plot of Consumer Technology Usage and Perceived Stress

4.9 Consumer Technology Usage and Perceived Stress Levels

The type of correlation being used is a bivariate correlation or the correlation between two variables. The Pearson *r* Correlation was run against 75 pairs of variables. The following table shows the output of the Pearson *r* Correlation Test from SPSS:

Correlations

		Consumer_Technology	Stress
Consumer_Technology	Pearson Correlation	1	.390**
	Sig. (2-tailed)		.001
	N	75	75
Stress	Pearson Correlation	.390**	1
	Sig. (2-tailed)	.001	
	N	75	75

**. Correlation is significant at the 0.01 level (2-tailed).

FIGURE 4.8: Pearson r correlation test on overall scores

This output shows that Consumer Technology Usage and Participants Perceived Stress have a .39 correlation coefficient, (r=.390, n=75, *p* =0.001). According to Field (2009) a ±0.1 represents a small effect, ±0.3 a medium effect and ±0.5 a large effect.

Summary:

This output shows that consumer technology usage is significantly and positively related to an individual's perceived stress levels. The significance of this test is represented by $p < 0.05$. This was a two-tailed analysis as the relationship could potentially be positive or negative.

4.10 Self-Directed Hours and Participant's Perceived Stress

In order to analyse the potential relationship between participant stress and their self-directed decision to use a consumer technology for work purposes, Q12 was tested against the overall stress score for each participant. This test would help highlight whether participants are unwittingly contributing to their own stress levels due to the simplified access to work systems that consumer technologies provide. Again the Pearson *r* test was used:

Correlations

		Stress	Self_Directed_Hours
Stress	Pearson Correlation	1	.013
	Sig. (2-tailed)		.915
	N	75	75
Self_Directed_Hours	Pearson Correlation	.013	1
	Sig. (2-tailed)	.915	
	N	75	75

FIGURE 4.9 - Pearson r correlation test on Q12 scores and overall stress scores

Summary

In this instance the correlation coefficient is shown as .013 (r=.013, n=75, *p*=0.915). This shows that there is close to being no relationship between these two variables.

4.11 Number of Devices Used and Participant's Perceived Stress

Another Pearson r analysis was performed on the number of devices used by the participant and that participant's perceived stress levels. This is an analysis between Q7 and the overall score for perceived stress levels. The output from SPSS is shown in *Figure 4.10* below:

Correlations

		Stress	Number_Of_Devices
Stress	Pearson Correlation	1	.038
	Sig. (2-tailed)		.744
	N	75	75
Number_Of_Devices	Pearson Correlation	.038	1
	Sig. (2-tailed)	.744	
	N	75	75

FIGURE 4.10 - Pearson r correlation test on number of devices used and perceived stress

Summary

This calculation shows that the correlation coefficient for these two variables is close to zero (r=.038, n=75, p=0.744). There is therefore no relationship between the number of devices used by the participant and their perceived stress levels.

4.12 Analysis of Managerial Roles Versus Non-Managerial Roles

4.12.1 Managerial Role and Consumer Technology Usage

An independent samples t-test was conducted to evaluate the hypothesis that people in a managerial role will have a higher level of consumer technology usage. The independent variable was the role of the participant and the dependent variable was the consumer technology score. An independent-samples t-test was chosen as all parametric assumptions were met. Levenes test for equality variance was significant (p = 0.042, p < 0.05). The means that equal variances are not assumed. The results show the mean consumer technology scores for participants in a managerial role (M = 9.89, SD = 2.986) is significantly higher (t = 5.928, *df* = 44.651, one tailed = 0) than that of participants in a non-managerial role (M = 6.04, SD = 2.206). The effect size for this test is .66, which represents a large effect. The results of the Independent Samples t-test for managerial roles and consumer technology is shown below:

Group Statistics

	Managerial Role	N	Mean	Std. Deviation	Std. Error Mean
Consumer Technology Usage	Manager	28	9.89	2.986	.564
	Non-Manager	47	6.04	2.206	.322

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Consumer Technology Usage	Equal variances assumed	4.305	.042	6.393	73	.000	3.850	.602	2.650	5.051
	Equal variances not assumed			5.928	44.651	.000	3.850	.650	2.542	5.159

FIGURE 4.11 - Independent Samples t-test – Managerial Roles and Consumer Technology Usage

Summary

On average, participants in a managerial role scored significantly higher for consumer technology usage than those in a non-managerial role, with a large effect size.

4.12.2 Managerial Role and Perceived Stress Levels

In order to evaluate the hypothesis that participants in managerial role would score higher on their perception of stress than those in a non-managerial role an independent samples t-test was again employed. The independent variable was again the role of the participant and the dependent variable was the participant's perceived stress scores. Levenes test for equality variance was not significant ($p = 0.441$, $p > 0.05$). This means that equal variances are assumed. The results show the mean perceived stress level scores for participants in a managerial role ($M = 14.64$, $SD = 2.80$) was higher, but not significantly ($t = 2.075$, $df = 73$, one tailed = 0.21), than that of participants in a non-managerial role ($M = 13.09$, $SD = 3.33$). The effect size for this statistical test was .24, which represents a small effect.

The results for the independent samples t-test for managerial roles and perceived stress levels is shown below:

Group Statistics

	Managerial Role	N	Mean	Std. Deviation	Std. Error Mean
Perceived Stress Levels	Manager	28	14.6429	2.80495	.53009
	Non-Manager	47	13.0851	3.32860	.48553

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Perceived Stress Levels	Equal variances assumed	.601	.441	2.075	73	.042	1.55775	.75082	.06137	3.05413
	Equal variances not assumed			2.167	64.613	.034	1.55775	.71884	.12197	2.99353

FIGURE 4.12 - Independent Samples t-test – Managerial Roles and Perceived Stress Levels

Summary

On average, participants in a managerial role scored higher for perceived stress levels than those in a non-managerial role, with an effect size of .24 but the affect was not significant.

4.12.3 Managerial Versus Non-Managerial Role Stress Symptoms

An additional samples t-test was carried out on the number of symptoms of stress experienced by managers versus non-managers. The output of this test is shown below in *Figure 4.13:*

Group Statistics

	Managerial Role	N	Mean	Std. Deviation	Std. Error Mean
No. of Stress Symptoms	Manager	28	2.5357	1.87542	.35442
	Non-Manager	47	1.5532	1.90889	.27844

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
No. of Stress Symptoms	Equal variances assumed	.029	.864	2.170	73	.033	.98252	.45277	.08016	1.88488
	Equal variances not assumed			2.180	57.710	.033	.98252	.45071	.08022	1.88482

FIGURE 4.13 - Independent Samples t-test – Managerial Roles and Stress Symptoms

Levenes test for equality variance was not significant (p = .864, p > .05). This means that equal variances are assumed. The results show the mean symptoms of stress scores for participants in a managerial role (M = 2.54, SD = 1.88) were higher, but not significantly (t = 2.170, *df* = 73, one tailed = 0.1), than that of participants in a non-managerial role (M = 1.55, SD = 1.91). The effect size for this test was .24, which represents a small effect.

Summary

On average managers experienced more stress symptoms than non-managers. However the difference was not significant and the effect size was small.

4.13 Overall Results for Participant Symptoms of Stress

Q20 asked participants to identify any relevant symptoms of stress that they have experienced and could attribute to consumer technology usage. Of the 75 participants that completed the study, 43, or 57% of the total population, recorded experiencing some symptoms of stress:

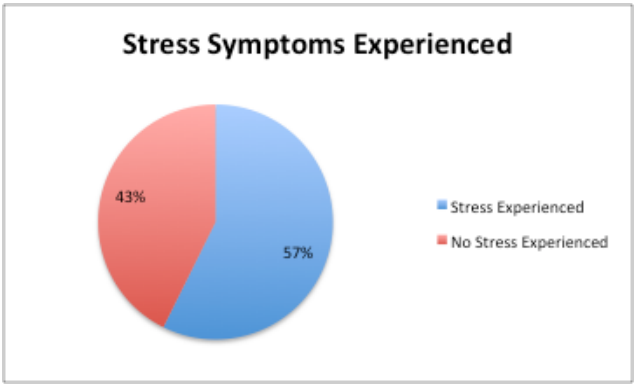

FIGURE 4.14: Stress Symptoms Experienced % (Q20)

The following table outlines the different symptoms that participants reported:

Symptoms Experienced	N
Irritability	31
Fatigue	30
Racing/Overactive Thoughts	30
Distractibility	23
Poor Concentration	15
Muscle Tension	12
Heart Palpitation	3
Sleeping Problems	1
Depression	1
Worry	1

TABLE 4.1: Outline of Stress Symptoms Experienced (Q20)

For Q19 participants were asked, in a Yes or No format, whether they believed that consumer technology had heightened their stress levels. Of the 75 that completed the questionnaire 44 (58%) answered yes:

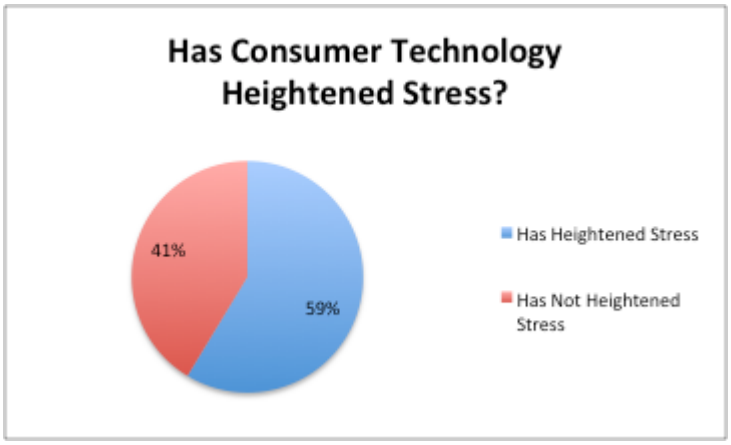

FIGURE 4.15: Overall has the use of consumer technology heightened stress? (Q19)

4.14 Qualitative Analysis

There were 3 questions in the questionnaire that allowed participants to share their thoughts on the research topic. With Q13 and Q14 participants were asked to share their views on the advantages and disadvantages that using consumer technologies for work purposes had brought to their personal and work lives respectively. For the last question, Q21, participants were asked to provide any additional thoughts that they had on the subject matter.

For Q13, *What advantages has the use of a consumer technology for work purposes brought to your (i) personal life and (ii) work life?* 69 participants provided an answer for

the personal life advantages and 71 provided an answer for the work life advantages. The common themes running through these answers are summarised in the following two tables:

Q13a Personal Life Advantages	
Advantage	**Number of References**
Ease of Communication / Access	19
Increased Flexibility	15
No Advantages	15
More Convenient	8
Increased Efficiency	5
Improves Work / Life Balance	2
Keeping In Touch With Friends / Colleagues	2
Less Cost Incurred for the Individual	1
Entertainment Value	1
Increases Free Time	1
Staying Connected to Work at all Times	1
No Dependency on Work Devices	1
Reduces Working Hours	1
Reduces Stress	1

TABLE 4.2 - Advantages Consumer Technology brings to Personal Life (Q13a)

Q13b Work Life Advantages	
Advantage	**Number of References**
Better Preparation for Work	22
Increased Productivity / Efficiency	21
Ease of Access to Work Systems	13
Increased Flexibility in Work Role	12
Increased Availability	3
Improved Knowledge Sharing	2
Increased Convenience	1
Reduces the Fear of Next Day at Work	1

TABLE 4.3 - Advantages Consumer Technology brings to Work Life (Q13b)

For Q14, *What disadvantages has the use of a consumer technology for work purposes brought to your (i) personal life and (ii) work life?* 70 answered the personal life disadvantages and 67 answered the work life disadvantages sections. Once more the common themes are summarised in the following tables:

Q14a Personal Life Disadvantages	
Disadvantage	**Number of References**
Reduces Personal / Family Time	33
Always Reachable	11
Difficult to Switch Off	9
Increases Stress	6
No Down Time	5
None	4
Distractibility	2
Reduces Sleep / Restless Sleep	2
Increased Working Hours	1
Reduces Memory Span	1
Working for Free	1
Working from Home When Sick	1
Reduces Concentration	1

TABLE 4.4 - Disadvantages Consumer Devices bring to Personal Life (Q14a)

Q14b Work Life Disadvantages	
Disadvantage	**Number of References**
No Disadvantages	17
Always Available	15
Negatively Impacts Working Activities	5
Unreasonable Expectations	4
Increased Workload	3
Work / Life Balance	3
Increase in Number of Technologies Supported	3
Employer Takes Employee for Granted	2
Missed Lunches	1

Performing Unpaid Work	1
Reduced Comfort	1
Procrastination Due to Different Devices Used	1
Respond to Work Too Quickly	1
Removes Traditional Working Times	1

TABLE 4.5 - Disadvantages Consumer Devices bring to Work Life (Q14b)

Q21 asked participants to provide any additional thoughts that they had on the subject matter addressed in this questionnaire. 14 participants answered this question and excerpts of their comments are listed below.

- *Technology now means that people are contactable 24x7 that makes it difficult to switch off.*

- *From a business perspective this has many advantages, as Managers are available all hours, however in most cases personal lives suffer and can lead to conflict with spouse and family as they compete for time 24X7.*

- *I work for 9 hours a day but I am thinking about work for 16 hours a day.*

- *Increased access to work information does not necessarily contribute to higher stress levels - as long as you effectively manage time.*

- *I do not think Technology is good 24X7. We as humans need to switch off.*

- *My view is that Consumer technology is a massive advantage for companies.*

- *"Stress" is still taboo in my view and almost perceived as a weakness if admitted. Companies need to keep up or fall behind but should think about introducing "Freeze Zones" where notifications are not pushed to devices unless urgent.*

- *There are pluses and minuses to the advancement in mobile technology. In the main it is a positive thing.*

- *To expand on the symptom of poor concentration, I find it increasingly difficult to concentrate on one specific item such as reading a book as I am now used to constant interruptions from smartphones.*

- *Consumer products have resulted in a 'double edged' effect on my work, they do allow me to address service related issues in a more timely fashion however it has also resulted in an increased perception that I am available (for work) all the time.*

- *When I use my personal device now for non-work purposes it still reminds of work even though I am not using it for work purposes. Just using the device reminds me of work tasks that need to be done. This causes distraction, irritability and can create a sense of guilt for not doing it, which can also lead to stress.*

- *The stress factors I feel are the need to be touch with work and the almost constant need to check email and ensure I can react quickly if required.*

- *I love my role and the challenge of what I do, I also see stress as a positive motivator at times and prefer stressful roles so this is not necessarily a negative.*

As is the case with the results of Q13 and Q14 there are a number of common themes running through the answers from Q21. Although some participants view the use of consumer technologies for work purposes as having a positive impact on their work and personal lives, the majority view is that it has contributed to a reduction in personal time, an inability to switch-off from work activities and, in some cases, increased the individual's stress levels. Some participants have experienced a rise in the expectations of their role responsibilities as consumer technologies enable them to be available and contactable 24 hours a day and 7 days a week.

5. DISCUSSION

5.1 Introduction

The objective of this research was to investigate the relationship between the use of consumer technologies for work purposes and perceived stress levels experienced by the individual. As discussed in Chapter 2, there is a significant body of evidence that suggests the presence of an unwanted by-product arising from the use of devices and technologies for business and personal purposes, namely, the merging of work and personal time. As reported by many authors, this blurring of work and personal activity can lead to less down time (Gens et al., 2011), longer working hours (Association, 2011) and an inability for the individual to switch-off from work activities (Niehaves et al., 2012). With this in mind, the present study's questionnaire was explicitly designed to investigate a relationship between consumer technology usage and perceived stress levels.

This chapter summarises the findings of the research, looks at whether the findings can be generalised outside of the target population used, discusses the limitations of the research and the direction that future research in this area may take.

5.2 Research Questions

There were three main research questions: (i) *Is there a relationship between individual consumer technology usage and the perceived stress levels of that individual?* (ii) *Is there a relationship between the amount of self-directed hours of consumer technology usage and the individual's perception of stress?* and (iii) *Is there a relationship between the role of the participant in an organisation (managerial or non-managerial) and their perceived stress levels?*

5.3 Discussion of Research Findings

In order to address these three research questions, participants were presented with a questionnaire that assessed consumer technology behaviours and perceptions of stress. The questions explored what consumer devices were in use, the times, locations and occasions that they were used from. Participants were also assessed on their perceptions that the use of these technologies had, or had not, contributed to their stress levels. Additional questions asked for participants to list any physical symptoms that they were experiencing and believed were linked to the use of these technologies.

5.3.1 Consumer Technology Usage and Perceived Stress Levels

In order to assess a relationship between consumer technology usage and perceived stress levels a Pearson *r* correlation was carried out on the scores for each variable (Consumer Technology and Perceived Stress Levels) per user. A significant positive relationship was found between consumer technology usage and perceived stress levels of participants.

This finding is consistent with the findings of Yun et al. (2012) and Ayyagari et al. (2012), which support the idea that increased consumer technology usage, is associated with increased stress levels. Interestingly, 33 participants reported that they believed consumer technologies were extending their work life into their personal time and as a result were causing personal conflicts outside of working hours. As one participant highlighted:

"Spending more time working which impacts my personal family time. This can also increase stress as I spend time focusing on work rather than family time."

In line with Russell et al. (2009), another theme that emerged was that using these technologies to work from increases perceived work pressures. A number of participants indicated that the convenience and accessibility of consumer technologies meant that they were always available for work activities. While it could be suggested that this factor would have a positive impact over employee productivity, 20 participants outlined feeling significant pressure as a result of perceived unrealistic expectations being placed on them due to having the ability to access work at all times and from any location. As two participants wrote:

"It's harder to say no to additional or out of hours work when it is so easy to get access to work resources."

"Impact on personal time, the expectation that you'll "be available" or "will take the call""

These findings support the results of Ayyagari et al. (2011) who found that technological usability can lead to stressors such as work overload, invasion of privacy and work home conflict. All factors which have been associated with stress (Moen, 2003; Jaramillo et al., 2011).

Stress Symptoms

57% (n=43) of participants reported experiencing at least one of the listed symptoms of stress resulting from consumer technology usage. 30% (n=23) reported psychological and emotional symptoms of short attention span, 29% (n=22) overactive thoughts and 20% (n=15) irritability. Some also noted finding difficulty switching off and connected this experience to the perception that technologies provided "*constant distractions"*. Participants also noted a number of physical symptoms commonly associated with stress (Smith et al. 2013) such as fatigue (49%, n=30) and difficulty sleeping (3%, n=2). Occupational stress has been linked to absenteeism and increased employee turnover intention (Kasperczyk, 2010; Sayah & Süß, 2013; Moore, 2000). With absenteeism costing Irish businesses €1.5bn per year (IBEC, 2011) it is possible to theorise that certain types of consumer technology usage can contribute to absenteeism and, in turn, result in employers incurring costs.

Some participants referred to the need of self-discipline to ensure that their work life does not dominate the personal life while others had the perception that they were working for free due to having ease-of-access to work systems. 9.4% (n=7) of participants did report that self-directed hours were a major disadvantage. This raises the issue that each individual may have a different responses to stress (Claessens et al., 2011) and it would be important for any organisation to recognise that a subset of their workforce is potentially reacting differently to the demands of their role than others. In practical terms this may mean that employers could promote the overall health and productivity of their workforce by identifying individual needs and responding to this by introducing stress intervention programs (Kasperczyk, 2010).

It is important to consider that many participants appeared to maintain the view that the advantages of mobile device usage are perhaps realised more by companies than by individual employees. Arguably, this provides a source of stress for employees resulting from the perception of being undervalued. The question arises as to whether this ultimately is more advantageous for companies on a long term basis given that the links between employee stress levels and cost to the employer and economy have been well publicised (Matters, 2013). One practical application relevant to any organisation invested in the health and well being of employees may be to put in place official policies and procedures around the usage of devices outside normal working hours. A potential stress-management intervention strategy may be most effective in targeting the common symptoms highlighted by the IT population in this study.

Stress Reduction

While comments concerning the disadvantages of consumer technologies outnumbered comments concerning the advantages, many participants highlighted that the use of consumer technologies increased work flexibility. A factor some participants associated with an improved work-life balance. As participants commented;

"I can leave work early for personal engagements and catch up later"

"Also, the ability to work from home means I can spend more time with my family".

In direct contrast to the above mentioned findings, some participants outlined that increased flexibility as a consequence of increased consumer technology usage enabled them to better plan their work activities so as not to encroach on their personal time. In other words, convenient access to work systems served to reduce perceived stress levels. These participants appear to be using consumer technologies to offset the demands of increased workloads. One potential weakness of the present study may be that participants were initially provided with an invitational e-mail informing them that the questionnaire would address consumer technology and perceived stress levels. All participants were made aware that this study was interested in examining a potential negative aspect of these technologies. Arguably, this may have had the affect of priming participants to consider negative feelings about consumer technologies before they had started the questionnaire. Arguably, participants may have reported more advantages about the usage of consumer technology usage had this not been the case. Nonetheless, even considering this point, a significant number of participants reported both physical and emotional symptoms of stress that they could directly attribute to consumer technology usage for work purposes. An explanation as to why there have been directly opposing views expressed by participants on this subject is that participants are aware that there are advantages and disadvantages to using these technologies and are willing to incur the negative aspects in order to reap the benefits. As one participant noted;

"Consumer products have resulted in a 'double edged' effect on my work, they do allow me to address service related issues in a more timely fashion. However it has also resulted in an increased perception that I am available for work all the time."

These results suggest that the benefits of consumer technologies are realisable but the negative effects need to be managed to reduce the impact on the employee.

5.3.2 Managerial Roles and Non-Managerial Roles

The independent samples t-test to determine differences in the mean scores of managers and non-mangers found that on average, participants in a managerial role scored significantly higher on consumer technology usage than those in a non-managerial role. An additional t-test which examined the differences in mean scores between managers and non-managers in terms of perceived stress scores, found that managers scored only marginally higher than non-managers and the difference was not significant. While managers were on average more active in their usage of consumer technologies than their non-manager counterparts a third t-test indicated that there was no significant difference between groups on stress symptoms experienced. One explanation as to why managers did not score higher on perceived stress levels than their non-manager counterparts is that managers have greater control over their own workload and may have greater possibilities for development (Skakon et al., 2011). Alternatively, the difference could be due to managers being less likely to report on negative aspects of their role.

As an aside to consumer technology and perceived stress measures, it also found that managers displayed greater follow through in this survey. Of the 28 managers who responded to the survey, all 28 completed all compulsory questions and 26 out of the 28 responded to the non-compulsory questions. This is in comparison to only 47 out of 70 non-managers completing the survey. This finding could provide the basis for future research into the characteristics of participants in relation to reducing survey attrition and response rates. Additionally, the fact that managers were found to use consumer technology more frequently but scored lower on perceived stress levels highlights a potential avenue for further investigation in future research.

5*.3.4 Additional Findings*

Participants were asked if overall they believed consumer technologies had heightened their perceived stress levels. 59% (n=44) reported that it had. This result re-enforces the findings of research question 1 (RQ1), that there is a relationship between consumer technologies and perceived stress.

5.4 Generalisability of Results

Given that an opportunistic sample was chosen from an IT company who already employed stress management strategies the results are generalisable to a similar population. Notably the participants used in this study worked in an organisation that utilised various strategies to reduce employee stress levels and promote a positive

working environment. e.g. (a yearly “Health is your Wealth” week with various workshops designed to raise awareness of workplace and work-related stress). Despite these interventions, it is interesting to note that a significant number of participants reported feelings of stress. The use of stress interventions in this population is a point of consideration when generalising these results to other populations.

Another consideration when generalising these results is to note the potential bias that exists with this research project. Participants were asked for their subjective views on the research topics but the pre-existence of stress, or stress as a result of external factors, could not be measured.

5.5 Limitations of this Study

5.5.1 Measures Used

As discussed in Chapter 3, the strength of the design of this survey was reduced due to the lack of an industry tested stress scale with relevance to technology usage. Given this limitation, it was necessary to create and use a bespoke set of questions. A bespoke scoring mechanism was also used to provide one score for each variable per participant.

5.5.2 Subjective Design

Due to the subjective nature of the research design, whereby participants were asked for the views on the research topic rather than being objectively measured, the results were susceptible to bias. For instance, the affects of external stressors, unrelated to consumer technologies, could not be accounted for. Due to limited resources, time constraints and the requirement of objective measures to be more intrusive to the participant, the subjective design was chosen.

5.5.3 Chosen Population

The target population was comprised mainly of participants that used consumer technologies; such were the company policies in place and the nature of the business that this company was in. This had the affect of limiting the use of comparisons between the stress scores for consumer technology users and those that did not use any of these technologies. This highlights a potential direction for future research.

5.6 Strengths of this Study

5.6.1 Online Data Gathering Format

A methodological strength of this survey is the use of an Internet based data-gathering database. There are some disadvantages to using this form of data collection i.e. a reliance on the participant to be interested enough in the subject matter so as to complete the questionnaire in its entirety, which could potentially lead to higher rates of attrition. However, the advantages outweigh the disadvantages i.e. a low cost solution, offers anonymity to the participant, allows data to be gathered into a format that can be easily analysed and allows the participant to complete the questionnaire at any time of day. The online format also provided access to a greater population than an offline or paper-based alternative and was not restricted by geographical boundaries between the researcher and participant. Anonymity and privacy were factors of significance in the study design. Given that the same company employed the researcher and participants, and that some of the questions touched on sensitive subjects, it potentially allowed participant's to be more forthcoming with their answers safe in the knowledge that the results of the study would not be disclosed to the employer.

5.6.2 Cross-Sectional Design

The cross-sectional design and questionnaire length were also strengths of this study. Participants were only approached once during the life of the project and at that point only needed to take a maximum of 15 minutes out of their day to complete the questionnaire. Questionnaire length and design was communicated to participants prior to commencing the questionnaire. This had the potential to reduce attrition rates.

5.7 Opportunities for Future Research

5.7.1 Development of a Technology Stress Scale

Both consumer technologies and employee stress are relevant topics at present and there are a number of directions that future research into this area can take. It would be beneficial to see the development of a stress scale focusing specifically on technology usage. This would allow research projects similar to this one to test such a scale in a real-life research setting. The absence of a stress scale of this nature, tried and tested against real populations, reduced the strength of this project.

5.7.2 An Objective Approach

There is also an opportunity for research projects with greater time-scales and funding to follow a more objective route of analysis when assessing the affects of technology usage on user stress. Measuring stress by cortisol levels, or some other biometric measure, while also measuring technology usage through monitoring programs on the technology devices would remove some of the external bias that this project was subjected to.

5.7.3 Longitudinal Study

The cross-sectional design of this research project provided a concise insight into the subject matter at a precise moment in time. However, this area of research would also benefit from a longitudinal study building on the factors highlighted in this study, such as irritability, fatigue and overactive thoughts as the most prominent physical affects of consumer technology usage. This could be in the form of an intervention study where these factors are measured both before and after a stress reduction intervention takes place. This would allow researchers to gauge the effectiveness of the intervention.

5.7.4 Additional Populations

As this research project focused on an IT population there is scope for additional research into other non-IT populations. Due to the nature of their work, IT companies perform a lot of their activity outside of normal business hours, as this is the time that systems that are critical to the core business are least active, therefore minimising impact. This type of work could potentially increase stress. This makes the results of this research less generalisable to non-IT populations. Another unique aspect of the current population was that their company actively employed an employee health and well-being initiative. There would be benefits in a comparative study between a population where such initiatives were in place and one that did not. This would help to highlight the effectiveness of such initiatives in tackling the issue of employee stress.

5.8 Summary

This research project aimed to investigate if there was a relationship between the consumer technology usage of participants and their perceived stress levels. Through the use of a cross-sectional study incorporating an online questionnaire, 75 employees of an ICT service provider were assessed on their usage of consumer technologies such as smartphones, tablets, personal laptops and social media applications and their perception of their stress levels in relation to the usage of these technologies. Using Pearson r

correlations and independent sample t tests the resultant data was examined against three research questions:

(i) *Is there a relationship between individual consumer technology usage and the perceived stress levels of that individual?*

(ii) *Is there a relationship between the amount of self-directed hours of consumer technology usage and the individual's perception of stress?*

(iii) *Is there a relationship between the role of the participant in an organisation (managerial or non-managerial) and their perceived stress levels?*

It was found that there was a medium level relationship of significance between consumer technology usage and perceived stress scores. There was no correlation between self-directed hours and perceived stress levels but 9.4% (n=7) of participants reported that self-directed hours and their own lack of self-discipline was a problem. In the comparison of managers against non-managers it was found that managers scored significantly higher on consumer technology scores but not on perceived stress levels. On average managers reported a higher number of stress symptoms than non-managers but the result was not significant. 57% (n=42) of participants reported experiencing some symptoms of stress.

Participants reported a clear awareness of the advantages and disadvantages of using consumer technologies for work purposes. They were aware that consumer technologies can bring them more flexibility in their work and personal lives and can lead to increased productivity but can also impact their personal time and relationships if not managed correctly.

The evidence points towards the need to raise awareness of the impacts on employees from using devices and technologies that enable unlimited access to work systems. Given that a significant relationship between consumer technology usage and perceived stress was found in a company that was actively targeting stress in the workplace and raising awareness of potential stressors, there are suggestions that stress management measures that specifically target these technologies are required.

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APPENDIX A – Online Questionnaire

Page 1 – Participant Information Sheet

[SURVEY PREVIEW MODE] The Impact of Consumer Technologies used for Work Purposes on Employee Stress Survey

The Impact of Consumer Technologies used for Work Purposes on Employee Stress

Participant Information Sheet

TRINITY COLLEGE DUBLIN

PROJECT TITLE:

"The Impact of Consumer Technologies used for Work Purposes on Employee Stress".

SOME USEFUL TERMS:

What is a consumer technology? - A consumer technology is any device or application created for the individual. Examples include smartphones, tablets, home PC's/laptops and social media applications.

What is IT Consumerisation? - The use of consumer technologies, company-owned or privately-owned, for work purposes.

INVITATION:

You are invited to take part in a research study. Before you decide it is important that you understand why the research is being done and what it will involve. If you agree to take part in this study I will ask you to indicate consent. If there is anything that you are not clear about I will be happy to explain it to you. Please take as much time as you need to read this information. You should only consent to participate in this research study when you feel you understand what is being asked of you, and you have had enough time to think about your decision. Thank you for reading this.

WHAT IS THE PURPOSE OF THIS STUDY?

The use of consumer technologies for work purposes is a relatively new phenomenon and little research has been done in this area. This study aims to assess consumer technology usage for work purposes and employee stress in an IT population.

WHAT DOES IT INVOLVE?:

Firstly you will be asked to give consent to participate. Then you will be given a questionnaire about your consumer technology usage and your perception of stress. Questions should take no longer than 15 minutes to complete. All responses are anonymous and will remain confidential.

DO I HAVE TO TAKE PART?:

The questionnaire is completely voluntary and you have the right to withdraw at any time.

WHAT ARE THE BENEFITS OF TAKING PART?:

Limited research has been done in this area. Your participation in this study will contribute to and help further knowledge in this area.

WHAT ARE THE POTENTIAL DISADVANTAGES OF TAKING PART?:

There is a section of the questionnaire that asks questions about your perceived stress levels. You may feel uncomfortable answering these questions. However your answers will be completely anonymous and confidential.

PARTICIPANT DEBRIEFING:

On completion of this survey you will be provided with links for further useful information.

POTENTIAL ILLICT ACTIVITIES:

In the extremely unlikely event that illicit activity is reported I will be obliged to report it to appropriate authorities.

CONFLICTS OF INTEREST:

This research project is part of a work colleague's dissertation that is to be submitted to the University of Dublin in partial fulfilment of the requirements for the degree of MSc in Management of Information Systems. The information provided here is strictly confidential and will not be disclosed to your employer. All responses will be used solely for the purpose of this study.

****YOUR EMPLOYER HAS PROVIDED THE RESEARCHER WITH PERMISSION TO DISTRIBUTE THIS QUESTIONNAIRE****

10%

Next

Page 2 – Informed Consent Form

The Impact of Consumer Technologies used for Work Purposes on Employee Stress

Informed Consent Form

TRINITY COLLEGE DUBLIN

LEAD RESEARCHER: John Whitty

PROJECT TITLE:"The Impact of Consumer Technologies used for Work Purposes on Employee Stress"

BACKGROUND OF RESEARCH:

This questionnaire is part of a research project that has been designed to analyse the potential relationship between an employee's use of consumer technologies for work purposes, outside of normal business hours, and the level of stress that the employee may be experiencing.

PROCEDURES OF THIS STUDY:

This questionnaire should take no longer than 15 minutes to complete. It will assess the participant's consumer technology usage for work purposes and perceived stress levels.

PUBLICATION:

While it could be up to 2 years before the final results are published I would be pleased to include you on an address list to receive publications arising from this study. This list will be used for no other purpose and transmitted to no third party. Only general findings will be reported, without reference to identifiable individual results.

Individual results will be aggregated anonymously and research reported on aggregate results.

DECLARATION:

- I am 18 years or older and am competent to provide consent.
- I have read, or had read to me, a document providing information about this research and this consent form.
- I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and understand the description of the research that is being provided to me.
- I agree that my data is used for scientific purposes and I have no objection that my data is published in scientific publications in a way that does not reveal my identity.
- I understand that if I make illicit activities known, these will be reported to appropriate authorities.
- I understand that I may stop electronic recordings at any time, and that I may at any time, even subsequent to my participation have such recordings destroyed (except in situations such as above).
- I understand that, subject to the constraints above, no recordings will be replayed in any public forum or made available to any audience other than the current researchers/research team.
- I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights.
- I understand that I may refuse to answer any question and that I may withdraw at any time without penalty.
- I understand that my participation is fully anonymous and that no personal details about me will be recorded.
- I understand that if I or anyone in my family has a history of epilepsy then I am proceeding at my own risk.
- I have received a copy of this agreement.

RESEARCHERS CONTACT DETAILS:

Name: John Whitty
Email: whittyjo@tcd.ie

SUPERVISOR CONTACT DETAILS:

Name: Denise Leahy
Email: denise.leahy@cs.tcd.ie

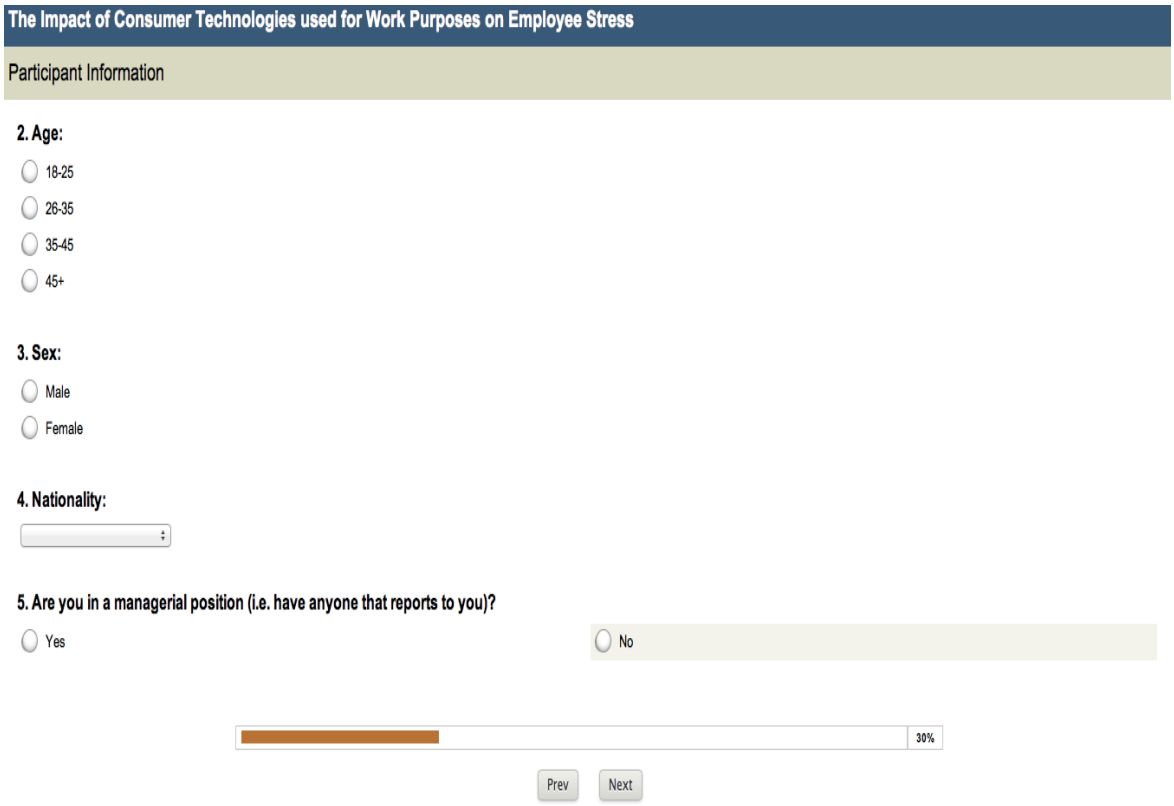
1. Do you agree to take part in this study?

○ Yes ○ No

20%

Prev Next

Page 3 – Participant Demographic



The Impact of Consumer Technologies used for Work Purposes on Employee Stress

Participant Information

2. Age:

- 18-25
- 26-35
- 35-45
- 45+

3. Sex:

- Male
- Female

4. Nationality:

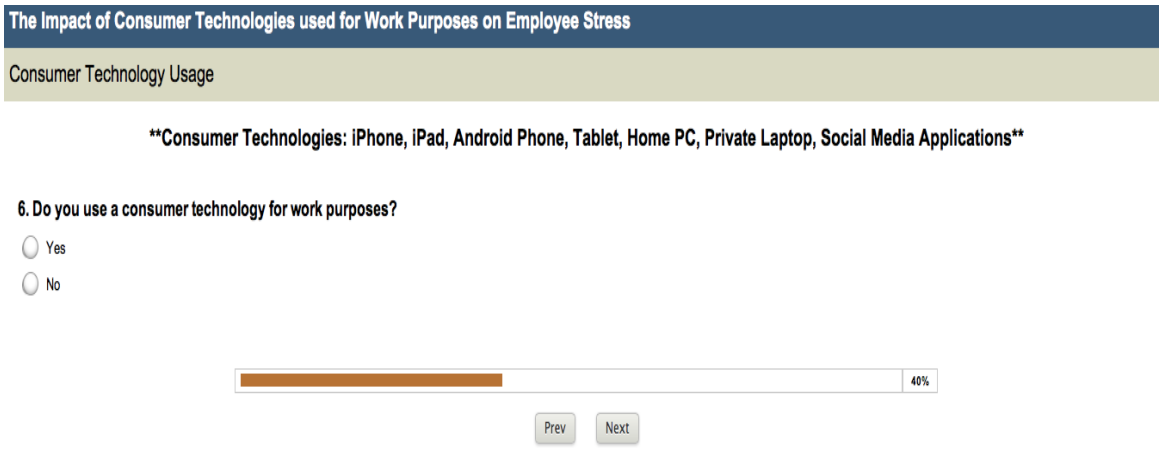
5. Are you in a managerial position (i.e. have anyone that reports to you)?

- Yes
- No

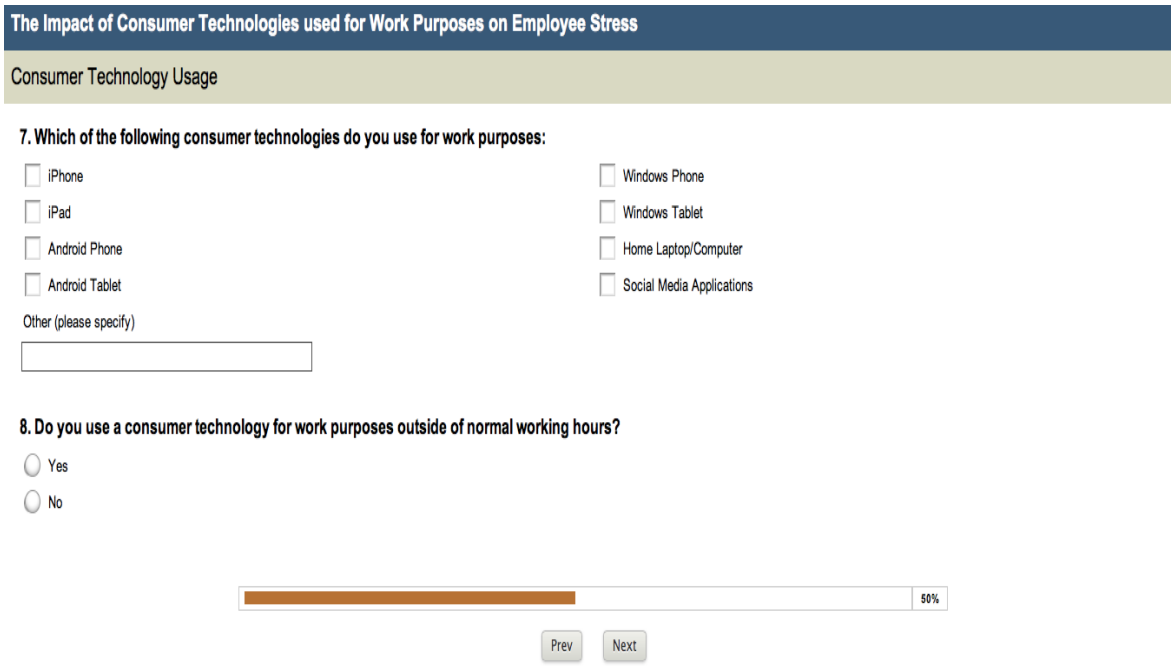
30%

Prev Next

Page 4 – Consumer Technology Usage



Page 5 – Consumer Technology Usage



Page 6 – Consumer Technology Usage

The Impact of Consumer Technologies used for Work Purposes on Employee Stress

Consumer Technology Usage

9. How many midweek hours (outside of work) would you use a consumer technology for work purposes?

- ○ 0-5 hours
- ○ 5-10 hours
- ○ 10-15 hours
- ○ 15-20 hours
- ○ 20+ hours

10. How many weekend hours would you use a consumer technology for work purposes?

- ○ 0-5 hours
- ○ 5-10 hours
- ○ 10-15 hours
- ○ 15-20 hours
- ○ 20+ hours

11. When do you use a consumer technology for work purposes?

- ☐ During your working day
- ☐ From bed at night
- ☐ From bed in the morning
- ☐ En route to and from work
- ☐ During your holidays
- ☐ During social occasions
- ☐ During your lunch hour
- ☐ While watching TV

Other (please specify)

12. How many of these hours are self-directed? (e.g. checking your emails on your smartphone because you have convenient access)

- ○ None
- ○ 0-5 hours
- ○ 5-10 hours
- ○ 10-15 hours
- ○ 15-20 hours
- ○ 20+ hours

13. What advantages has the use of a consumer technology for work purposes brought to your:

1. Personal LIfe
2. Work Life

14. What disadvantages has the use of a consumer technology for work purposes brought to your:

1. Personal Life
2. Work Life

60%

Prev Next

Page 7 – Stress Perception

The Impact of Consumer Technologies used for Work Purposes on Employee Stress

Your Perception of Stress

*You will now be shown 4 statements about whether your use of consumer technologies has caused you stress.

*Please rate your agreement to these statements using the associated scale:

15. The use of a consumer technology for work purposes has increased stress in my work life (e.g increased workload/ demands).

○ Strongly Disagree ○ Disagree ○ Neither Agree nor Disagree ○ Agree ○ Strongly Agree

16. The use of a consumer technology for work purposes has increased stress in my personal life (e.g less free time; reduced well-being).

○ Strongly Disagree ○ Disagree ○ Neither Agree nor Disagree ○ Agree ○ Strongly Agree

17. The use of a consumer technology for work purposes has negatively impacted my sleep (e.g disruption in sleep pattern; disturbed sleep; difficulty getting to sleep).

○ Strongly Disagree ○ Disagree ○ Neither Agree nor Disagree ○ Agree ○ Strongly Agree

18. I find it difficult to switch off from work as a result of using a consumer technology for work purposes (e.g thinking about work tasks outside of working hours/ weekends).

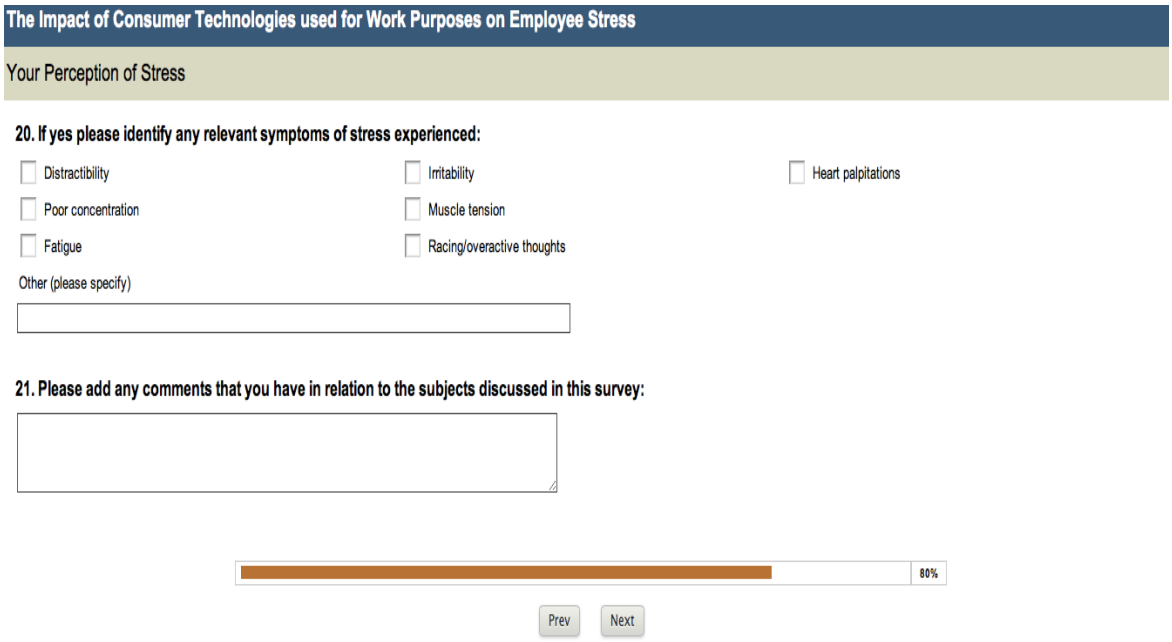
○ Strongly Disagree ○ Disagree ○ Neither Agree nor Disagree ○ Agree ○ Strongly Agree

19. Overall has the use of consumer technology for work purposes heightened your stress levels (please select):

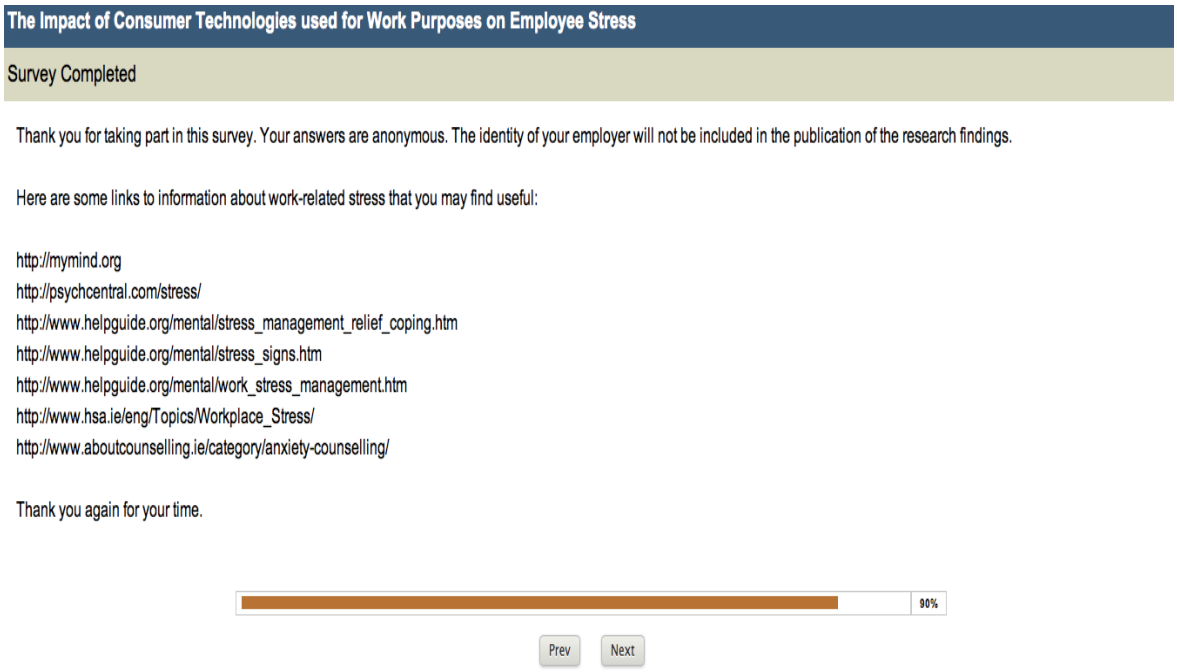
○ Yes ○ No

Prev Next

Page 8 – Stress Perception



Page 9 – Exit Page 1 – Stress Management Links



The Impact of Consumer Technologies used for Work Purposes on Employee Stress

Survey Completed

Thank you for taking part in this survey. Your answers are anonymous. The identity of your employer will not be included in the publication of the research findings.

Here are some links to information about work-related stress that you may find useful:

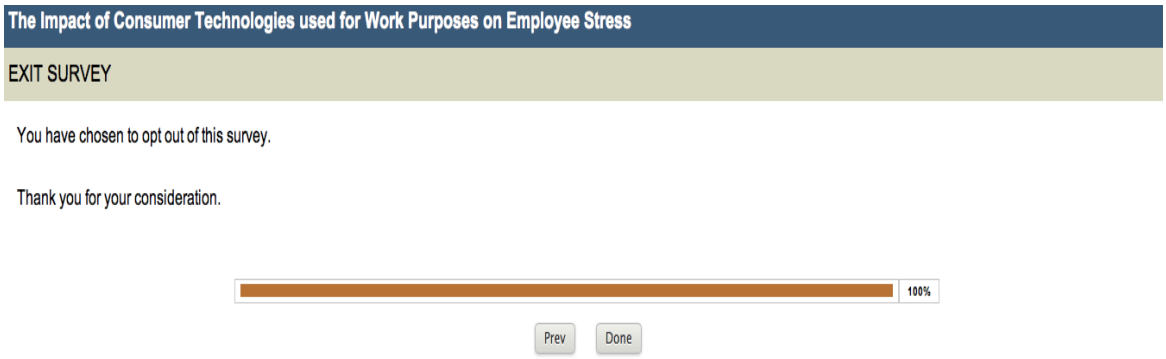
http://mymind.org
http://psychcentral.com/stress/
http://www.helpguide.org/mental/stress_management_relief_coping.htm
http://www.helpguide.org/mental/stress_signs.htm
http://www.helpguide.org/mental/work_stress_management.htm
http://www.hsa.ie/eng/Topics/Workplace_Stress/
http://www.aboutcounselling.ie/category/anxiety-counselling/

Thank you again for your time.

90%

Prev Next

Page 10 – Exit Page 2 – Thank You



Appendix B – SPSS Output Tables

Output 1

Pearson r correlation: Consumer Technology Usage and Perceived Stress Levels

Correlations

		Consumer_Technology	Stress
Consumer_Technology	Pearson Correlation	1	.390**
	Sig. (2-tailed)		.001
	N	75	75
Stress	Pearson Correlation	.390**	1
	Sig. (2-tailed)	.001	
	N	75	75

**. Correlation is significant at the 0.01 level (2-tailed).

Output 2

Pearson r correlation: Self-Directed Consumer Technology Hours and Perceived Stress Levels

Correlations

		Stress	Self_Directed_Hours
Stress	Pearson Correlation	1	.013
	Sig. (2-tailed)		.915
	N	75	75
Self_Directed_Hours	Pearson Correlation	.013	1
	Sig. (2-tailed)	.915	
	N	75	75

Output 3

Pearson r correlation: Number of Consumer Technology Devices and Perceived Stress Levels

Correlations

		Stress	Number_Of_Devices
Stress	Pearson Correlation	1	.038
	Sig. (2-tailed)		.744
	N	75	75
Number_Of_Devices	Pearson Correlation	.038	1
	Sig. (2-tailed)	.744	
	N	75	75

Output 4

Independent T Test: Managers versus Non-Managers and Consumer Technology Usage

Group Statistics

	Managerial Role	N	Mean	Std. Deviation	Std. Error Mean
Consumer Technology Usage	Manager	28	9.89	2.986	.564
	Non-Manager	47	6.04	2.206	.322

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Consumer Technology Usage	Equal variances assumed	4.305	.042	6.393	73	.000	3.850	.602	2.650	5.051
	Equal variances not assumed			5.928	44.651	.000	3.850	.650	2.542	5.159

Output 5

Independent T Test: Managers versus Non-Managers and Perceived Stress Levels

Group Statistics

	Managerial Role	N	Mean	Std. Deviation	Std. Error Mean
Perceived Stress Levels	Manager	28	14.6429	2.80495	.53009
	Non-Manager	47	13.0851	3.32860	.48553

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Perceived Stress Levels	Equal variances assumed	.601	.441	2.075	73	.042	1.55775	.75082	.06137	3.05413
	Equal variances not assumed			2.167	64.613	.034	1.55775	.71884	.12197	2.99353

Appendix C Participant Comments

Advantages consumer technologies have brought to your personal life

- *Easy communication, keeping up to date, keeping informed, contact worldwide regardless of time zone*
- *Flexible working, leave work early for personal engagements/family commitment, catch up later on*
- *Seamless integration, work and play on the same device, work and play apps, one device in my pocket, the device can do a lot more than email, diary and phone.*
- *Interconnects personal and work world for convenient access to both on a dynamic basis*
- *Ability to be more flexible with working hours*
- *Flexibility - can leave office earlier because I can work later. That often suits me. Work provide the iPAD - the family use it at weekends*
- *It allows you to keep in contact with people all over the world very easily and quickly*
- *Do not have to drive to the office for on call, so less time in the office or on commute*
- *Ease of access to Internet and associated applications*
- *Access to information*
- *Not being dependant on work devices*
- *Quick access to work documents*
- *Allows me to easily schedule and plan personal events and activities*
- *Entertainment value*
- *More free time, using laptop has taken over from watching TV*
- *Do not have to take extra time to log onto a laptop, then log in remotely to work systems*

- *Able to work from home*
- *I can work remotely*
- *Allows me to have all connectivity for personal purposes paid as a business expense*
- *Knowledge and Information pertaining to my immediate social engagements*
- *They let me get a head start on the following days workload allowing me to get out of work at a reasonable time.*
- *I am reachable when not directly in the office and I can perform a significant amount of my work away from the office.*
- *Ability to go home on time while retaining (see next answer)*
- *Minimised stress level*
- *Allows the facility to work remotely*
- *Flexibility & home working can prevent work from impinging on social plans*
- *It has allowed me to leave the office earlier than I otherwise could, also it has allowed me to work from home on the weekends when needed rather than travelling to the office. Being able to check urgent mails before Monday morning can also prepare you for any potential issues.*
- *Keeping in touch with friends*
- *Prevents pile up of work and the stretch / rush to catch up after breaks, seminars, weekends, holidays, can do things when I want not crammed into office hours*
- *Don't have to log on to PC/Laptop. Convenience of checking iPhone*
- *Flexibility*
- *Ease of access*
- *Access to information 24 hours a day*
- *Catch up with ex colleagues*
- *Real time access to events using Meetup.com for arranging social events*

- *Ability to work from home means I can spend more time with family (no travel required)*
- *A reduction of the hours you are required to spend in the office, and there is no longer a need to carry the work laptop to and from the office*
- *Flexibility*
- *Knowing the schedule of the week helps to plan my start-finish of the day*
- *Allows me greater flexibility in work / life balance*
- *Can work from home when I need to. Especially helpful for out of hours work that needs to be done.*
- *Reduces the possibility of last minute issues arising, thus reducing the risk of me working excessively long hours*
- *Access, allowing more freedom / flexibility*
- *Fun to use and ease of contact with friends and colleagues alike*
- *Additional work (overtime) undertaken at home rather than staying late in the office.*
- *It is easier to leave the office on time knowing I can access my work from anywhere*
- *Allows me to work from Home if needed*
- *Social outlet*
- *Allows me to check emails while away from the office, makes it easier, so I am not coming back to lots of emails after a few days off for example*
- *Allows me to dictate when and how I work extra meaning I can manage my downtime better*
- *Feel more relaxed on the go when I can check in to see if everything is alright*
- *Little, it benefits work but impacts home and personal life. It's also habit forming.*
- *The ability to better mix work and personal time without impacting either*

Advantages consumer technologies have brought to your work life

- *Allows me to keep updated with work*
- *Prepared for potential issues before arriving at work*
- *Seamless integration, work and play on the same device, work and play apps, one device in my pocket, the device can do a lot more than email, diary and phone*
- *Improved access to email, documents and other collaboration applications*
- *It lets me clear down my emails as well as answer anything that could be a potential problem the next day.*
- *Ability to respond more quickly to queries/requests*
- *Flexibility again - being in touch and on top of things, no surprises. Much more productive*
- *Allows me to work from anywhere*
- *Faster turnaround of support calls. Reduced cost for my employer*
- *Ease of access to company applications and work information*
- *Access to information*
- *Efficiency and commitment*
- *I am able to keep on top of workload and address items I am otherwise unable to during office hours*
- *Easy access to different applications*
- *Allows me to stay up to date and respond to user and customer needs*
- *Benefit to be able to work from home, sometimes 5 minutes of work from home at night can prevent a lot more work the following day.*
- *Better connected, and issues are highlighted quicker*
- *Kept up-to-date, manage serious issues much quicker - better response time.*
- *More flexibility and less travel onsite to office*
- *Can respond to customers quicker*
- *Check systems at night to prevent issues the following day.*

- *Get outstanding stuff done, flexibility*
- *Being kept up to date with work related issues.*
- *I can check my email messages on my smartphone at any time and from any location*
- *Helping to keep up with the work level demand and responding within deadlines*
- *Gives me up to date info and alerting*
- *Allows me to be prepared when I return to work as i can monitor developments*
- *Knowledge from shared resources to resolve issues and to up-skill*
- *They let me get a head start on the following days workload*
- *Flexibility*
- *Significant advantages - ability to work while travelling, at home etc. I can provide speedier updates to customers etc.*
- *Ability to make changes at times convenient to the customer safely; ability to keep working while slightly ill (infectious!)*
- *Increased availability*
- *Massive improvements in productivity. Use of Apps such as Evernote has really helped.*
- *Allow to work remotely, outside office hours*
- *Keep on top of things*
- *Can negate the need to visit site to work on issues.*
- *Get more work done.*
- *It has made my day more flexible. When on projects the option of working from home and away from distractions can be very useful*
- *Troubleshooting*
- *I have been able to respond to customer issues and queries faster than I would have using traditional technology*
- *Can work around my personal schedule, not around traffic reports, office hours*

- *Keep up to date on work happening outside of normal working hours. Can intervene if needed.*
- *Ability to check status of items prior to arriving in the office*
- *Improved access and the ability to complete tasks outside of work hours*
- *Keep up to date with work issues. Management of e-mails*
- *Information at fingertips*
- *Easy access to information and resources needed to complete daily responsibilities*
- *Updates on latest trends. Also compare what other companies are doing / offering*
- *Don't have to be in the office*
- *Being able to access work files at home and concentrate on report writing and research in a quiet environment.*
- *I am more connected / contactable,*
- *Convenience*
- *Flexibility*
- *Easier access*
- *Allows me to check the status of specific scheduled job without having to remain in the office*
- *I can get work done in the evenings when needed.*
- *Keep up to date on emails. Finish work outside of hours*
- *Stay 'on top of' workloads and getting alerted to service issues*
- *Getting a head start, allowing for planning or review and ensure deadlines are met.*
- *Catch up on what's going on before getting to the office*
- *Greater flexibility to provide out of hours support*
- *Availability and ease of use to assist colleagues*
- *Helps keep me on top of things.*
- *Flexibility to work from home when required during normal working day.*

- *Ease of access*
- *Makes it easier to keep on top of things and meet deadlines*
- *Allows me to work away from the office and connect to resources if need with ease*
- *Greater understanding of new technologies*
- *Keeps me more informed*
- *Do not have that fear when logging into your computer at work after a day off etc.*
- *More effective and easy to prepare for the day and be aware of any emerging issues or priorities demanding immediate attention*
- *Do not have to be in the workplace to contribute effectively*

Disadvantages consumer technologies have brought to your personal life

- *Difficult to switch off, 24 X 7 availability, intrusion on family life, reduces downtime*
- *Bringing work issues into personal time*
- *A blurring of the home vs. work rules. "They know where I am at all times".*
- *Don't fully disconnect from work unless you shut off the work channels on the device*
- *Obviously it can cause some stress to my personal life, however I'd imagine the stress would be there the next morning anyway.*
- *No down time*
- *Disruption to personal life by work - need discipline to ensure doesn't dominate it*
- *More time spent working*
- *More time spent performing work activities*
- *If personal equipment breaks down no ability to connect; can be intrusive in family affairs.*
- *Spending more time working, which impacts my personal family time. This can also increase stress as I spend time as I am focussing on work rather than family time*
- *Consumes personal leisure time*
- *Intrudes on your personal life space and time*
- *Cost*
- *Impact on family life, can cause conflict / stress.*
- *Contactable at all times*
- *It is a constant distraction and reduces quality time with family, can never 'switch off'*
- *Can invade home life making work and home the same location.*
- *Very little*

- *Time impact on family and family events. Distraction during 'out of work' hours.*
- *I can work remotely*
- *Increased stress level as it is convenient to check things from home but there is an added underlying stress that is there*
- *Wife hates me using it*
- *Adds hours to the working week*
- *Lack of long term memory, short attention span, lack of concentration*
- *I rarely get to bed early or have a good nights sleep*
- *Impact on personal time, the expectation that you'll "be available" or "will take the call"*
- *Still working while at home - not ideal*
- *In previous employment it has become excessive and written off all personal life.*
- *Lack of distinction between your free time and work time*
- *Always being switched on thereby not focusing on family 100%. Assumption that you are always reachable. I have had a holidays ruined due to remote accessibility*
- *Always checking work email*
- *I am occasionally contactable when I don't want to be.*
- *I work more at home, outside of my normal working hours, which leads to a reduced 'work-life balance'.*
- *Being aware of issues for a Monday morning can make for restless nights. Ease of access to the office environment can be tempting to get more work done and skew work/like balance*
- *I find that I am reading and responding to mails at times when I would not have been working previously*
- *Self control needed to not take a look*
- *Not sure when/if switch from personal to work happens*
- *Blurring of boundaries between home /work*

- *Disruption to home life, inability to attend to family happenings, home schedule dictated by work*
- *Encroaches on out of office time*
- *More things to check. Harder to switch off even on holiday.*
- *I don't tend to let my work life and personal life clash, so none*
- *Interruption of home life on occasion*
- *Information overload and SPAM*
- *Likely to 'work for free' by checking in with the office from home.*
- *It infringes on personal time / down time has been drastically reduced, alerts and e-mail are no respecter of people sleeping*
- *More availability*
- *Some (self-imposed) pressure to be available during 'non-working' hours*
- *Constantly getting prompts of emails even when on holidays*
- *Can appear intrusive to receive mails or notifications during non-working hours*
- *End up working from home in the evenings when perhaps you would not have it you had no home access to work.*
- *Stress*
- *Impacts on my work / life balance and gives the perception that I am always contactable*
- *Less downtime - more time thinking about work*
- *Impacting social life.*
- *Fun to use and ease of contact with friends and colleagues alike*
- *I'm always reachable, wherever I am.*
- *Working from home when sick*
- *Stress, more difficult to "switch off" and separate personal life from work life*
- *It can feel you are online 24x7*
- *Time taken away from regular social activities*

- *Feel I have to keep checking it while on holidays, never truly 'switch off'*
- *Becomes more difficult to switch off from work*
- *Never fully get away from work. Always contactable.*
- *It's disruptive and creates conflict at times with mainly members*
- *It could impact by imparting in the family life and not having the quality conversation in the home*

Disadvantages consumer technologies have brought to your work life

- *Secretly eats into personal time*
- *Difficult to switch off, increased expectation as people are aware that contact has been made even out of hours*
- *Broken down traditional working times*
- *I do unpaid work at home, evenings and weekends*
- *Sometimes responses are made too quickly (without thought)*
- *None - so far*
- *Work life balance*
- *Employer taking for granted availability of personal device; excessive dependence.*
- *I feel like I am never away from the office and always contactable*
- *Procrastination with different devices*
- *Rarely away from work / business*
- *Better connected, and issues are highlighted quicker*
- *Too easy to be contacted.*
- *Contactable at all times*
- *Now unreasonable expectations that employees are available 7 days a week, outside core work hours*
- *Missed lunches*
- *No real work disadvantage, as I am always available to take calls etc.*
- *I can check my email messages on my smartphone at any time and from any location*
- *Very contactable so can cause interruptions while doing other work tasks*
- *Takes up so much time responding to emails and the amount of information being sent*
- *Allows for a more flexible working week.*

- *Over access to more work, more distractions again shortens my attention toward verbose detail*
- *People know they can get me at anytime and are starting to change their work practices accordingly.*
- *Hour of operation extend beyond the normal hours in an on demand way - sometimes difficult to find time to wind down.*
- *In previous employment - fatigued & stressed (clinically)*
- *Assumption of unreasonable reaction time to mails etc.*
- *Less comfort related to laptop usage, without desk, large monitor(s), mouse, etc.*
- *Always checking work email*
- *It's harder to say no to additional or out of hours work when it is so easy to get access to work resources.*
- *None that I can think of*
- *Work life tends to spill over into personal life where you end up working weekends and evenings to get things done.*
- *More different platforms to learn*
- *Removing myself from my work environment is more difficult due to information being available instantly*
- *The expectation that I work out of hours*
- *24 hour availability assumed by management*
- *Expectation of an instant answer*
- *Stressed outside of work as well as inside work*
- *Always available to be contacted*
- *None, employers must love this new technology.*
- *More availability*
- *Requirement to support those services that are used almost 7x24 by people that have a completely mixed up work/life balance.*

- *Having to react to work related issues*
- *The perceived need to 'keep up' with emails / technology / trends etc.*
- *Too easy to get dragged into work emails is there is something urgent out of hours*
- *Availability and ease of use to assist colleagues*
- *I'm always reachable, wherever I am.*
- *Generally expected to be available*
- *Too much work*
- *Take on more work than can be managed in a regular working week*
- *Lines between work and home life are blurred*
- *An expectation is that you are always online thus able to complete more work than your contractual hours allow for*
- *Information tends to be scanned and prioritised rather than fully assimilated so decision making can be impaired as a result*
- *Give a false impression to work colleagues and managers that you always available*

Additional Comments on the Topic

- *Technology now means that people are contactable 24x7, which makes it difficult to switch off. Email, SMS record the contact and lead to unrealistic expectations from customers and clients. Working in the IT industry delivering online services demonstrates that people expect 100 % availability when and where they want to use the service and this in turn places demands on the people delivering. From a business perspective this has many advantages, as Managers are available all hours, however in most cases personal lives suffer and can lead to conflict with spouse and family as they compete for time 24X7.*

- *I work for 9 hours a day but I am thinking about work for 16 hours a day*

- *I view these devices as a necessary evil for my job and I don't believe I'll be doing the same for the rest of my life. The need only applies to certain roles.*

- *Increased access to work information does not necessarily contribute to higher stress levels - as long as you effectively manage time. I find checking emails, etc. during personal time, often prepares me for issues that I have to address when I arrive into the office. The stress symptoms you indicate in the survey can fluctuate between mild and severe but most often, this is not as a result of having access to the information but rather what the information is telling you.*

- *I do not think Technology is good 24X7. We as humans need to switch off. Just back from a week off and did not look at mail once or work phone calls. Very relaxing time.*

- *My view is that Consumer technology is a massive advantage for companies. "Stress" is still taboo in my view and almost perceived as a weakness if admitted. Companies need to keep up or fall behind but should think about introducing "freeze Zones" where notifications are not pushed to devices unless urgent. Either this or accept that employees work hours begin and end through the doors. While companies continue to get "free" work from employees, albeit at increased risk to their employees, I don't see them introducing any policies on this. A case of hear no evil, see no evil*

- *There are pluses and minuses to the advancement in mobile technology. In the main is a positive thing.*

- *I think this is a good topic and relevant*

- *To expand on the symptom of poor concentration, I find it increasingly difficult to concentrate on one specific item such as reading a book as I am now used to constant interruptions from smartphones.*

- *As someone who is a member of a technical team I am aware of the benefits of the BYOD policies, but this has increased the workload in the office as you are forced to provide solutions to users, and at the same time I refuse to subscribe to some useful services as these have a knock on affect of leaving you permanently connected, and for those who are permanently connected there is no downtime*

- *Consumer products have resulted in a 'double edged' effect on my work, they do allow me to address service related issues in a more timely fashion, however it has also resulted in an increased perception that I am available (for work) all the time*

- *Previously my personal device was used primarily from checking personal emails, social networks etc., now it is mostly work related. When I use my personal device now for non-work purposes it still reminds of work even though I am not using it for work purposes. Just using the device reminds me of work tasks that need to be done. This causes distraction, irritability and can create a sense of guilt for not doing it, which can also lead to stress.*

- *While the use of consumer technologies is designed to make life easier and improve the work life balance, the effect is that it increases the time I spend working. The stress factors I feel are the need to be touch with work and the almost constant need to check email and ensure I can react quickly if required. This is a factor in an operational role. When out of the office for a few days on leave, the thought of returning to the office and a number of developing issues or crisis is a concern. Access to email enables this concern to be reduced but it does impact on the quality of personal life as a result. I love my role and the challenge of what I do, I also see stress as a positive motivator at times and prefer stressful roles so this is not necessarily a negative.*