# Antecedents of User Acceptance of Technology in the Workplace: An Extension of the Technology Acceptance Model

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**Abstract**

In a world that is highly dependent on technology, it has become increasingly important for organisations to stay up to date with the rapid technological changes. The introduction of new technology is more often than not motivated by the need to increase employee productivity and efficiency in order to achieve maximum work output; all while keeping organisational costs down.

Drawing on 96 participants from an organisation within the power, gas and infrastructure industry, the current study investigated user acceptance of technology and the antecedents to this acceptance that impact upon the acceptance and adoption of new technology.

Results supported past research in showing that perceived usefulness and perceived ease of use are strong determinants of, both direct and indirect, behavioural intention to use. Job relevance, computer anxiety and computer self-efficacy are also shown to be important antecedents of technology acceptance. Additionally, the results failed to provide support for the commonly held belief that age has a negative relationship with technology use.

Mediation analysis showed that the effect perceived ease of use has on behavioural intention to use, operates through perceived usefulness; suggesting that, despite being easy to use, new technology will not be used if it does not prove its usefulness. Mediation analysis also showed that the effect of computer anxiety on perceived ease of use was indirect through computer self-efficacy. This means that the self-efficacy an individual has will weaken the effect that their computer anxiety has on their perceived ease of use.

Overall, this study explores what impacts and influences the acceptance and adoption of new technology in the workplace. This research has successfully adapted the Technology Acceptance Model in order to suit the current needs and provides further support of the external factors that impact upon this model. The current study also challenges the notion that age has a negative impact upon technology usage in the workplace.

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I would also like to offer my thanks to the organisation I conducted this research on for agreeing to let their employees take part in this research. To the participants themselves, thank you for taking the time to fill out and complete my questionnaire. Without you, this research would not have been possible.

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## Chapter One: Introduction

Over the last century the development and use of various technologies has significantly increased not only in our everyday lives, but also in the workplace. The use of new technology has grown significantly in the last two decades (Nov & Ye, 2008; Venkatesh, Morris, Davis & Davis, 2003) and technology has managed to change the face of and impact most, if not all, industries around the world. An individual would be hard pressed to find work that does not involve the use of technology to some degree. While it may at times seem overwhelming for organisations to constantly have to stay up to date with the developments in the technology and information systems, it is becoming increasingly important for long term business success to do so. Due to this rapid expansion of technology use, there has been a growing body of research over the last almost fifty years into organisational change and all the variables that may impact it before, during and after change implementation.

Organisations are more often than not motivated to introduce new technology into the workplace due to the need to increase organisational productivity and efficiency or to lower organisational costs (Mikkelsen, Øgaard, Lindøe, & Einar Olsen, 2002). As well as this, a main goal is often to improve both organisational performance and employee performance. There are major advantages to be had for the organisation that stays up to date with and implements new technology which can include, but are not limited to, improved communication, saving time and the creation of mobility. Technology can improve organisational communication between departments or offices, as well as between an organisation and its clients due to the fact that with shared networks

and email over the internet, data and file sharing can occur almost instantaneously. Gone are the days of documents being messengered across town to other offices or clients and vice versa. As well as the immediate communication, the use of current technology in the workplace can act as a time saver due to the fact that databases that capture, store and share information do so quickly, thus facilitating quicker decision making. Automation of various tasks is almost guaranteed to increase efficiency and thus production; in many industries the quicker a job or task is completed, the more money an organisation saves through production costs and wages. The creation of mobility in many jobs is also a big advantage of introducing technology that enables employees to work from anywhere and at any time through eliminating the barriers of space and time. For example, mobile workforce management software allows field workers to access real time data and work order information when they are on the job which once again saves time by not having to drive back to offices or depots through traffic to pick up work orders.

Both the adoption and use of various computer technologies remain a core concern in the literature. Despite large advances that have been made in the information technology field over the past thirty years (Venkatesh & Davis, 2000) and despite all the advantages technology usage has, any potentially positive performance improvements are negated when new technology is not adopted and accepted by workers. Unless the new technology is actually used by employees, performance cannot increase (Davis, Bagozzi & Warshaw, 1989). An ongoing problem with technology is having the ability to identify what influences an individual's acceptance and use of the technology (King & He, 2006). Thus, user acceptance is a vital component in determining whether the introduction of new

technology is a success or a failure (Davis, 1993). Sichel (1997) identified the 'productivity paradox' which is a result of employees not utilising the systems that organisations have invested in, which leads to poor returns for the organisation (as cited in Venkatesh & Davis, 2000). Implementing new technology projects can be very costly and can only be successful if used. Therefore, non-user acceptance has acted as an impediment to technology adoption success rates and loss of revenue for many years (Davis, 1993). It is because of this that being able to understand why individuals choose to not adopt new technology and being able to create environments that encourage adoption remains a key research issue (Venkatesh and Davis, 2000).

In light of the rapid and constant technological changes that the world has seen, the need for constant retraining and adoption of new technology has become inevitable for individuals: especially those in the workforce (Cau-Bareille, Gaudart, & Delgoulet, 2012). These technological changes more often than not will involve change in some form for individuals (Nov & Ye, 2008) which can sometimes lead to employee resistance. According to Waddell, Creed, Cummings and Worley (2014) resistance to change can occur for many different reasons including, but not limited to, an individual not wanting a change in their status quo, "increased fear and anxiety about the consequences of change -real or perceived" (p.93), an individual not understanding the change itself, and the "mistrust of those leading the change" (p.93). The response to new technology does not however need to be solely negative or positive but can be a mix of both, creating feelings of ambivalence towards change (Schiavone, 2012). Understanding and managing resistance behaviour exhibited by employees is critical for the success of the change (Waddell et al., 2014) and the acceptance of

new technologies (Nov & Ye, 2008). It can be expected that individuals will react differently to the technology changes with some being more welcoming of the change, whilst others may be more resistant towards it. It is the resistance towards the new technology that most commonly derails information technology project failures (Venkatesh, Morris & Ackerman, 2000). Research that assesses the adoption of new technology and its determinants help organisations better understand how to manage and maximize the overall effectiveness and level of success of their new technology (Taylor & Todd, 1995).

**The Current Study**

The current study aims to explore user acceptance and the factors that impact upon the acceptance and adoption of new technology within an organisation. In the present setting the technology change being referred to is the 'Mobile Workforce Management System'. This is a specific category of software and related services used to manage employees working off-site; Mobile Workforce Management is a term used to reference field teams. This software can be specialised by providers for certain industries in order to allow the supervisors and managers of field crews, dispatchers, and technicians to gain access to pertinent information in the right context and time, which allows for more efficient management of employees whose work depends on their ability to be mobile.

The management of field services is not a new concept by any means, but it is a concept that has drastically changed in its requirements as field work and the management of how the work is carried out has gone, and is still going through, a period of immense transformation. Organisations have to interact with clients and customers in a customer-centric world where there is an expectation of

seamless, transparent and responsive service. This is not only true for organisations within the retail sphere whose customers are everyday people, but also for those whose customers are large firms within the utility, industrial, commercial resources and infrastructure sectors.

The organisation, on which the current study is based, is a leading provider of engineering, construction and maintenance services in New Zealand. It has a wide range of capabilities including, but not limited to: power distribution, gas network maintenance and metering, installation and maintenance of telecommunication networks, and maintenance and construction of power generation facilities incorporating both traditional and renewable energy sources. The organisation has recently implemented a brand new mobile workforce management system that has been introduced into parts of the company, which has allowed them to more efficiently communicate with and manage workers in the field with the long-term goal of improving and increasing their customer base and loyalty, as well as growing their revenue due to the improved service functions. As well as the new software implementation, field workers have also had to adapt to the additional introduction of tablet computers so that they can effectively and efficiently use the new software in the field.

Motivation for the new software came from the need of being able to access and share data within the organisation  in real time, thus allowing staff in the office to be able to dispatch information and jobs to field crews and vice versa. As well as this instant data sharing, the new software and the use of devices in the field has allowed the organisation to have a largely paperless process which, besides the positive effects on the environment, also has the added bonus of meaning no paperwork can go missing on the way to a job or on the way back to

the depot, thus utilising worker productivity. Having a system that is completely online and mobile allows the organisation to integrate their new system with the systems of their clients, allowing for optimal communication with clients.

## Theoretical Model

The theoretical model (see figure 1) was developed in order to show the relationships between the predictor variables, the mediator variables (computer self-efficacy and perceived usefulness), any correlations and the outcome variable (behavioural intention). The theoretical model for the present study was adapted from the original Technology Acceptance Model (TAM) developed by Davis, Bagozzi and Warshaw (1989) which looked at the relationships between external variables, perceived usefulness, perceived ease of use, attitude toward using, behavioural intention to use and actual system use (as seen in figure 2). Elements of the present model was also adapted from a research model employed by Powell (2013) which looked at computer anxiety and the variables that acted as antecedents, as well as correlates.

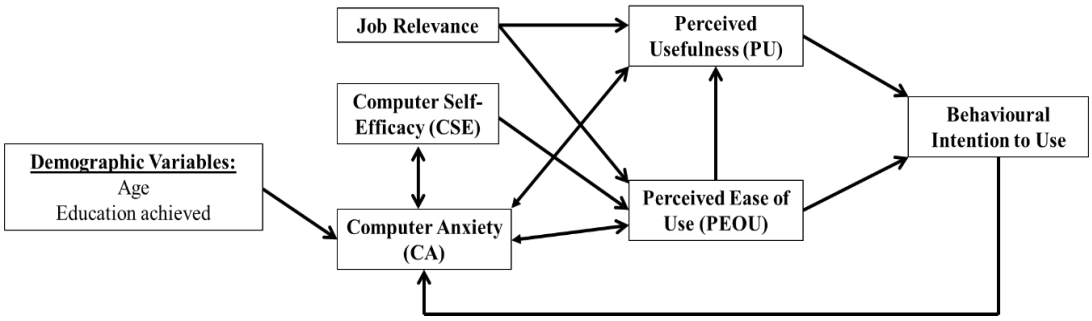


*Figure 1.* Theoretical Model for Current Study

## Technology Acceptance Model

The Technology Acceptance Model (TAM) was introduced by Davis (1989) as a method of explaining an individual's potential behavioural intention to

adopt and use newly introduced technology. It is now amongst the most well-known and widely used models within the literature on technology acceptance (Nov & Ye, 2008). When it was developed, it was tailored so that it could model user acceptance of information systems (Davis et al., 1989) due to the fact that at the time measurement scales for user acceptance were not common (Davis, 1989). TAM is an adoption of Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA) where the authors proposed that, if an individual could see that the use of computers would have positive outcomes associated, they would be more likely to use the computers (Campeau & Higgins, 1995; King & He, 2006; Yusoff, Muhammad, Zahari, Pasah & Robert, 2009). The goal of TAM is to "provide an explanation of the determinants of computer behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis et al., 1989, p. 985). Having a research model that not only predicts behaviour, but provides an explanation of why it is important, is essential, as researchers can then both identify where non-acceptance of the technology stems from and formulate corrective measures. What TAM does as a result of this, is to provide a way to expose how external factors impact and influence the internal beliefs, attitudes and intentions of a person (Davis et al., 1989; Yusoff et al., 2009).

Two key beliefs that TAM proposes as being very relevant to computer acceptance and adoption behaviours, are perceived usefulness (PU) and perceived ease of use (PEOU) (Davis et al., 1989; Wallace & Sheetz, 2014). Considering how important these constructs are, they have been subject to a lot of research in order to determine their antecedents, which will be discussed in more detail below (Nov & Ye, 2008). Borrowing from the TRA, TAM also postulates that an

individual's technology acceptance is "determined by their voluntary intentions towards using technology" (Davis et al., 1989 as cited in Yousafzai, Foxall & Pallister, 2007, p. 252). However, a key difference being that as part of TAM, behavioural intention to use is determined by both PU and attitude towards using new technology (Davis et al., 1989; Yousafzai et al., 2007), as is seen in figure 2.

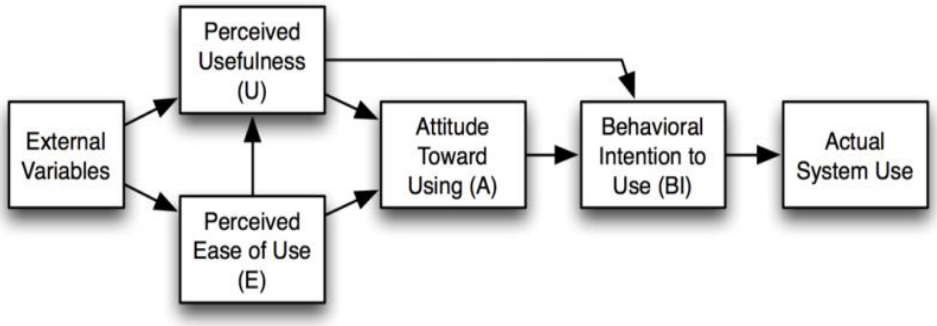


*Figure 2.* Technology Acceptance Model (Davis et al., 1989).

In the literature of technology acceptance, attitude is described as "an individual's positive or negative feelings (evaluative effect) about performing the target behaviour" (Fishbein & Ajzen, 1975, as cited in Yousafzai et al., 2007, p.264). It is argued that the attitude an individual holds towards an object impacts their intentions, which in turn impacts their usage behaviour towards said object. As a construct, attitude was included in the original version of TAM (Davis, 1986). However, further research showed that the explanatory power of TAM is just as good and "is more parsimonious without the mediating attitude construct" (Yousafzai et al., 2007, p. 265). Davis et al., (1989) showed that attitude towards using technology did not act as a strong determinant of usage intention in workplace settings when other variables, such as usefulness, could be independently taken into account as a potential determinant. Taylor and Todd

(1995) provided an explanation for the above statement, explaining that “in work-related settings, performance is key, and intentions will be formed based on performance considerations rather than simply on personal likes and dislikes with respect to performing a behaviour” (as cited in Yousafzai et al., 2007, p.265). Taking these factors into account, the following revision of TAM (see figure 3) was developed (Venkatesh & Davis, 1996) where in the construct of ‘attitude toward using’ new technology was removed from the model due in part to the fact that the direct relationship between PU and attitude was weak, whereas the direct relationship between PU and intention to use was strong (Lai, 2017).

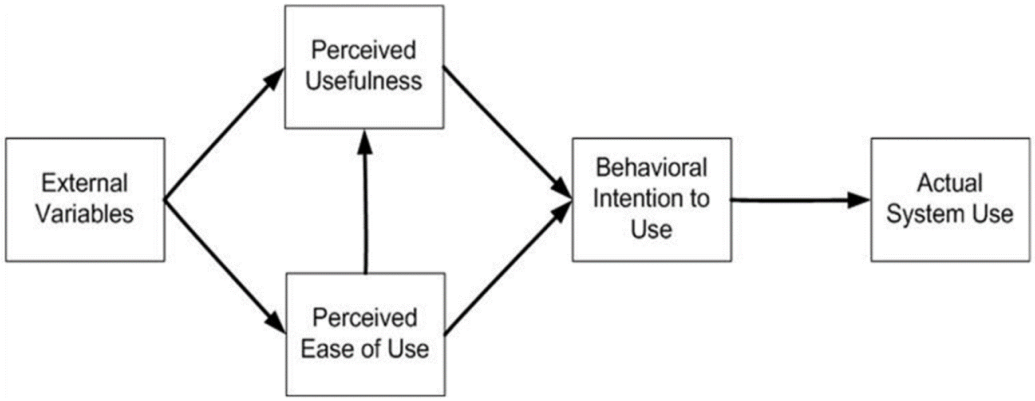


*Figure 3*. Technology Acceptance Model (Venkatesh & Davis, 1996)

Concerns have been raised about the generalizability of TAM research involving students due to the fact that, by using student populations as research participants, the age range of participants is greatly limited, the potential experience participants have with certain technologies (more advanced or job-specific software) may be limited, as well as the fact that students have different reasons and motivations for using technology (Yousafzai et al., 2007). Thus, the current study aims to add to the pool of research of user acceptance and adoption in adult workplace settings. In studies where students have acted as the

participants, technology usage was also voluntary due to their environment, whereas in the workplace the majority of technology usage is mandatory (Yousafzai et al., 2007).

**Perceived usefulness**. PU can be defined as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organisational context" (Davis et al., 1989, p. 985; Davis, 1989). Based on developments in three different areas: work motivation theory, action theory and task contingent theory, Venkatesh and Davis (2000) theorised that individuals would employ mental representations in order to assess the link between their work goals and the consequences of actually using the introduced technology as a way to form judgements on how useful they perceive the technology to be. Furthermore, it has been suggested that PU judgements are made in part by "cognitively comparing what a system is capable of doing with what they need to get done in their job" (Venkatesh & Davis, 2000, p. 190).
As a determinant of system usage, PU has been found to be 50% more influential than PEOU (Davis, 1993). This could be because primarily an individual will adopt new computer software because of the proposed benefits in its usefulness to perform a certain function with the ease or difficulty involved to get the system to perform that function being a secondary concern. Some individuals are more willing to cope with having to learn a new system or dealing with any difficulty than others as the new technology provides a critical service. Due to the fact that PU is strongly correlated to user acceptance, it should not be ignored in favour of explaining how easy a new system is to use by organisations that are implementing new technology (Davis, 1989). Davis (1989) stated that "although difficulty of use can discourage adoption of an otherwise useful system, no

amount of ease of use can compensate for a system that does not perform a useful function" (p. 333-334). PU is also a major determinant of an individuals' behavioural intention to use computers (Davis et al., 1989; King & He, 2006). Based on this research, it is hypothesised that:

> **Hypothesis 1:** Perceived usefulness will have a direct relationship with behavioural intention to use.

**Perceived ease of use.** PEOU is "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, p.320) thus meaning that, if an individual perceives that they need to exert a lot of mental or physical energy during the initial introduction of the new technology, they will have low PEOU. Through research PEOU has been identified as a key contributing factor that drives individuals to not only accept new technology, but to also use it (Nov & Ye, 2008). When technology is perceived to be easy to use, user acceptance is also more likely to be positive; whilst the majority of research shows that it is a positive relationship, some work has shown it to be mixed (Yusoff et al., 2009). It would be advantageous to gain as much understanding of PEOU, i.e. what strengthens and weakens it in order for it to ultimately enhance user acceptance (Nov & Ye, 2008). Many studies have found that PEOU has a significant relationship with PU (Davis et al., 1989; Davis, 1993; Venkatesh & Davis, 2000; Yusoff et al., 2009). If an individual finds a system to be simple to use, then they will be more likely to also find it useful. Thus it is proposed that:

> **Hypothesis 2a:** Perceived ease of use will have a positive relationship with perceived usefulness.

Previous research has found individual differences, as well as specific characteristics of the technology, to be influencing factors for PEOU (Nov & Ye, 2008). Hong, Thong, Wong and Tam (2002) have discovered that two antecedents that affect PEOU include system characteristics and individual differences. Included in individual differences is computer self-efficacy and computer anxiety (Venkatesh, 2000), which have both been found to have an influence on an individuals' PEOU. That being said, PEOU and its identified antecedents do need more work in order to further the understanding.

There is much empirical evidence to support the significant relationship between PEOU and intention to use both directly and indirectly via PU (Davis, 1989; Hong et al., 2002; Venkatesh, 1999) with some regression tests showing that PEOU may act as an antecedent to PU rather than a predictor of usage (Davis, 1989). Thus, the current study postulates that:

> **Hypothesis 2b**: Perceived ease of use will have a positive relationship with behavioural intention to use.
>
> **Hypothesis 2c**: The relationship between perceived ease of use and behavioural intention to use will be mediated by perceived usefulness.

**Job relevance**. Job relevance can be defined as "an individual's perception regarding the degree to which the target system is applicable to his or her job" (Venkatesh & Davis, 2000, p. 191) or "how well a computer system matches the tasks users need to carry out with it" (Nov & Ye, 2008, p. 848). Essentially relevance reflects on how effectively the new technology matches an individual's needs (Hong et al., 2002).

Those who view the new technology to be relevant to their job and how they perform are more likely to be able to form informed and stable perceptions of how useful the technology will be. On the opposite side, those who do not view the change to be relevant to their work performance, will be less engaged in the implementation period and thus will not have the necessary information to make informed decisions about the usefulness of the new technology, instead relying on information from other avenues on which to base their perceived judgements (Bhattacherjee & Sanford, 2006). As such, job relevance is regarded as a cognitive judgement that will be shown to have a direct effect on PU (Venkatesh & Davis, 2000), which leads to the hypothesis that:

> **Hypothesis 3a**: Job relevance will have a positive relationship with perceived usefulness.

The relationship between relevance and PEOU has also received empirical support with Hong et al., (2002) showing that there is a significant relationship between the two factors, which leads to the expectation that:

> **Hypothesis 3b:** Job relevance will have a positive relationship with perceived ease of use.

**Behavioural intention to use**. An individual's behavioural intention to use can be defined as "a person's subjective probability that he will perform some behaviour" (Fishbein & Ajzen, 1975, p. 288, as cited in Wu & Du, 2012). TAM shows that there are two key determinants of an individual's intention to use a system and they are PU and PEOU (Venkatesh & Davis, 2000). There has been much empirical research conducted on the variables that make up TAM, and in this research PU has consistently been found to be a strong determinant of

intention to use (standardised coefficient usually around 0.6) and PEOU has less consistently been shown to be a determinant of intention to use (Venkatesh & Davis, 2000). Davis et al., (1989) showed that behavioural intention is a major determinant of end user usage and that an individuals' behaviour should be able to be predicted from their intentions. It was also shown that any other variables that may influence usage behaviour only do so indirectly through behavioural intentions.

That being said, an analysis was conducted on the core variables of behavioural intention to use and actual system usage and their relationship with critical technology acceptance determinants by Wu and Du (2012). The authors showed that, within theories of social psychology, behavioural intention was found to be a direct determinant of usage behaviour. The study also highlighted the fact that there is an assumption in much of the research that the system usage construct as a dependant variable could be excluded due to the fact that if behavioural intention was predicted, then usage would be guaranteed. Findings of the meta-analysis do however show that, when behavioural intention is employed as the only dependant variable, it is more likely that results will significantly support hypotheses (Wu & Du, 2012). It is due to this finding that system usage was excluded as a dependant variable for the current study (see figure 1).

**Computer Anxiety**

As computers have become commonplace in business, home and school, a need has arisen to know more about the influence computer anxiety (CA) has on individuals. "Computer anxiety measures resistance to and avoidance of computer technology as a function of fear and apprehension, intimidation, hostility, and worries that one will be embarrassed, look stupid, or even damage the equipment

(Heinssen, Glass & Knight, 1987, as cited in Mikkelsen, 2002, p. 224). Heinssen et al., (1987) adopted the term 'computer anxiety' and stated that it was a separate issue to an individual holding a negative attitude towards computers. Instead of a negative response, those with CA display a more emotional or affective response. Despite computers being more prevalent in current society, some individuals may still experience anxiety and thus avoid and resist learning about them.

CA has been subject to hundreds of studies since the 1980's. A meta-analysis conducted by Powell (2013) demonstrates that personal characteristics (such as age and education) and the interaction between an individual and a computer are antecedents of CA. Among the literature on age and CA there is no confirmed consensus about the relationship, with there being an almost fifty-fifty split in the literature about whether there is a positive relationship (Mikkelson et al., 2002) or no relationship at all. There are only a small number of articles that have found a negative relationship (Powell, 2013). Interestingly, the meta-analysis also found that there was no significant difference between age and CA in different age groups such as college students, adults and seniors (Powell, 2013). Laguna and Babcock (1997) explain that the differing results for this relationship could be because there is not one unified mode of measurement for this relationship. There are multiple measurement scales for CA with no real agreement on which one is best, although of the four most widely used scales: the Computer Anxiety Rating (CARS), the Computer Attitude Scale (CAS), the Attitude Toward Computer Scale (ATC) and the Marcoulides CAS, CARS has been the most widely used in the 2000's (Powell, 2013).Taking the varied results into account, it is hypothesised that in the current study:

**Hypothesis 4a:** An individual's age will not have a significant relationship with computer anxiety.

The meta-analysis revealed that self-efficacy, attitude, PEOU, PU and satisfaction have all been found to be correlates of CA. The majority of research published on CA, focused on finding a relationship between computer self-efficacy (CSE) and CA, and it was shown that a negative correlation exists between the two variables (Henderson et al., 95; Thatcher & Perrewe, 2002 as cited in Powell, 2013), thus meaning that those who display high CSE will display low CA (Fagan, Neill & Wooldridge, 2004). CSE is also shown to be one of the best variables used to predict an individual's CA. Torkzadeh, Chang and Demirhan (2006) also found that those who displayed low CA were able to more significantly improve their computer self-efficacy than those who displayed high CA. This summary of research leads to the hypothesis that:

**Hypothesis 4b**: Computer self-efficacy will be negatively correlated with computer anxiety.

As described above, PEOU is "the extent to which a person believes that using a technology will be free of effort" (Venkatesh, 2000, p. 344). In the meta-analysis compiled by Powell (2013) the research on the relationship between PEOU and CA has predominantly occurred in the 2000's and the findings on the relationship have also been fairly consistent with a negative relationship being shown between the two variables (Venkatesh, 2000; Saade & Kira, 2007). Due to these consistent results it is expected that:

**Hypothesis 4c**: Perceived ease of use will be negatively correlated to computer anxiety.

PU has largely been found to be negatively related to CA in most of the literature however, about a third of the research looked at by Powell (2013) showed that there was in fact no significance between PU and computer anxiety. What was found through the meta-analysis of CA literature, is that the majority of studies done in the 2000's found there to be no significance between PU and CA versus the studies done in the 1990's, which were more likely to find a negative relationship thus aligning with the increased usage of computers and technology. Due to these findings from previous research it is expected that:

> **Hypothesis 4d:** Perceived usefulness will have a negative relationship with computer anxiety.

In terms of the relationship between CA and the outcome variable of behavioural intention to use there is some research that shows (about 40% of articles reviewed) that there is no significant relationship between intention to use and CA while the other 60% of reviewed articles show that there is a negative relationship between the two variables (Powell, 2013). Due to this, it is expected that:

> **Hypothesis 4e:** Behavioural intention to use will be negatively related to computer anxiety.

**Computer self-efficacy**

Self-efficacy has been defined by Compeau and Higgins (1995) as "the belief that one has the capability to perform a particular behaviour" (p. 189). Self-efficacy is an important idea in social psychology and has been shown to influence behaviour decision making including: what behaviour to display, effort and persistence required for behaviour and the emotional responses, such as stress

and anxiety, to the behaviour (Compeau & Higgins, 1995). Research from the 1980's and 1990's looked at the potential relationship between self-efficacy and computers, as well as computer related behaviours. This body of work showed that relationships exist between self-efficacy and enrolment into computer courses at tertiary education providers, the adoption of technology products and innovations and performance in training to use various software.

CSE stems from Social Cognitive Theory and is an important predictor of usage. CSE refers to an individual's judgement of their own capability when it comes to using a computer. Instead of being focussed on past behaviours, it instead focusses on what an individual will achieve in the future. It does not focus on simply being able to perform certain skills, such as entering data into a program, but instead places emphasis on the ability to apply those skills to broader tasks such as being able to use the data entered into the program to write a report and submit that report to superiors or clients (Compeau & Higgins, 1995). As part of the individual differences characteristic, CSE has been shown to be an antecedent of PEOU (Hong et al., 2002; Venkatesh & Davis, 1996) which means that the more an individual believes in their own technological ability, the less effort they expect they will exert; thus exhibiting a significant positive relationship (Hong et al., 2002; Yusoff et al., 2009). Due to this, the current study predicts that:

> **Hypothesis 5a:** Computer self-efficacy will have a positive relationship with perceived ease of use.

Saadé and Kira (2007) provide evidence that suggests that the poor relationship between anxiety and computer related performance is due to the fact

that self-efficacy mediates the relationship, thus making it indirect. Due to this, a study done by Saadé and Kira (2009) explored the potential for CSE to mediate the relationship between CA and PEOU. Results from this study show that CSE significantly mediated the relationship between CA and PEOU. Due to the author's findings, it is expected that in the current study:

> **Hypothesis 5b:** Computer self-efficacy will mediate the effect of computer anxiety on perceived ease of use.

**Age**

In terms of the effect age has on behavioural intention, previous research shows that there is a difference in adoption behaviour based on age (Chung, Park, Wang, Fulk & Mclaughlin, 2010). Many studies have found that there is indeed a difference in the adoption behaviours of younger adults when compared to older adults (Morris & Venkatesh, 2000). Older adults have been shown in some research to be "slower in adjusting to technological changes" (Chung et al., 2010, p. 1677) due to the fact that their way of doing things becomes more ingrained the older they get. It is because of this that the current study hypothesises that:

> **Hypothesis 6a**: Age will have a negative relationship with behavioural intention to use.

## Summary of Hypotheses

**Hypothesis 1:** Perceived usefulness will have a direct relationship with behavioural intention to use.

**Hypothesis 2a:** Perceived ease of use will have a positive relationship with perceived usefulness.

**Hypothesis 2b**: Perceived ease of use will have a positive relationship with behavioural intention to use.

**Hypothesis 3a**: Job relevance will have a positive relationship with perceived usefulness.

**Hypothesis 3b:** Job relevance will have a positive relationship with perceived ease of use.

**Hypothesis 4a:** An individual's age will not have a significant relationship with computer anxiety.

**Hypothesis 4b**: Computer self-efficacy will be negatively correlated with computer anxiety.

**Hypothesis 4c**: Perceived ease of use will be negatively correlated to computer anxiety.

**Hypothesis 4d:** Perceived usefulness will have a negative relationship with computer anxiety.

**Hypothesis 4e:** Behavioural intention to use will be negatively related to computer anxiety.

**Hypothesis 5a:** Computer self-efficacy will have a positive relationship with perceived ease of use.

**Mediation hypotheses**

**Hypothesis 2c**: The relationship between perceived ease of use and behavioural intention to use will be mediated by perceived usefulness.

**Hypothesis 5b:** Computer self-efficacy will mediate the effect of computer anxiety on perceived ease of use.

**Supplementary hypotheses**

**Hypothesis 6a**: Age will have a negative relationship with behavioural intention to use.

**Hypothesis 6b:** An individual's job level will be related to behavioural intention to use.

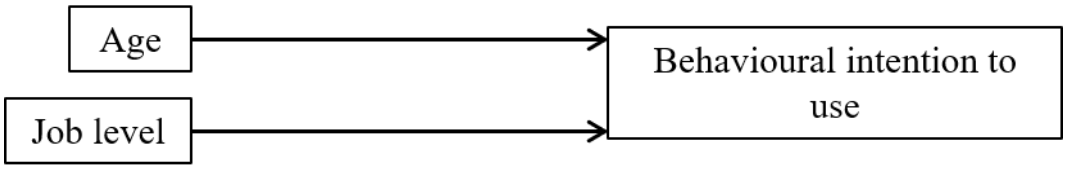


*Figure 4.* Model showing supplementary hypotheses

## Chapter Two: Method

The present study was approved by the University of Waikato Psychology Research and Ethics Committee. The research is cross-sectional and uses self-report questionnaires which were distributed via both an anonymous online link through the website Qualtrics, as well as, a physical paper copy for staff who did not have access to computers. The questionnaires were made available to staff from the Auckland (Mount Wellington, Albany and Silverdale) and Palmerston North offices of the organisation used for the study. As part of the information sheet provided at the start of the questionnaire participants were informed that, whilst their participation in the questionnaire was voluntary, they were under no obligation to complete or return the questionnaire if they did not want to. They were informed that by completing and returning the questionnaire they, as the participant, would be consenting for the information to be used as part of the research. The questionnaire is completely confidential and there are no questions that could be used to identify any one participant.

### Participants

Participants for the study were all recruited from a single organisation that has recently introduced a mobile workforce management system which was completely new software for employees to learn how to use and to implement on top of the use and adoption of devices such as tablet computers. In total 121 employees from the organisation participated in this study. However, 25 participants had to be excluded from the study due to returning incomplete questionnaires with at least 50% of the questionnaire left incomplete. Therefore, only 96 questionnaires were included in the statistical analysis. The questionnaires were made available to approximately 400 staff across the three locations included

in the study and thus there was a response rate of just fewer than 25%. Permission for the study was granted by the organisation.

**Procedure**

All personnel with an email address were informed of the study via an email that was sent to them explaining what the study was about and what they were required to do. The email also included the anonymous link to the online Qualtrics version of the study, as well as, informing them about the paper copies and drop box that were available to them in their lunch room. Most of the trade staff from both the Albany and Palmerston North branches of the organisation were informed about the study via safety and team meetings where the paper copies of the questionnaire was made available to them.

All participants were informed that all their answers would remain confidential and that they would not be identifiable through their answers. They were also reassured that their participation in the study was voluntary and they were not obliged to fill out and return the questionnaire if they did not want to. Furthermore, at the completion of the questionnaire participants were also given the opportunity to have a summary of the research results emailed to them at the conclusion of the study.

**Measures**

The questionnaire (Appendix B) was a compilation of 4 sections all examining different variables and was composed of a total of 39 items. The first section was made up of five questions asking participants for their age, education level, and details about their employment such as their job title, which job site they work at and how long they had worked for the organisation. In terms of the

job title question, based on their responses, participants were categorised into five different job levels: trade staff, supervisors, office, management, and other. For the job site question, four different locations were also identified: Mount Wellington, Albany, Palmerston North, and Silverdale.

The second section of the questionnaire focussed on the participants' acceptance of technology through examining the participants' intention to use the new technology and the perceived usefulness, perceived ease of use, and job relevance of the new technology. The third and fourth sections were concerned with examining the level of computer anxiety and computer self-efficacy participants felt they possessed. Further explanation of the specific questionnaire scales will follow below.

**Technology acceptance.** Venkatesh and Davis (2000) provided an extension of the original Technology Acceptance Model (Davis, 1989) through the creation of the TAM2 measurement scale. The extended model looked at the effects of social processes such as subjective norm, voluntariness, and image as well as cognitive instrumental processes such as job relevance, output quality, result demonstrability and perceived ease of use each of which were measured using a different subscale. However, in the present study the measurement scale was adjusted in order to only incorporate four of the subscales (intention to use, PU, PEOU and job relevance) rather than the original nine. In order to measure the strength of response to each subscale the sum of scores was calculated and a high score showed that the participants had stronger perceived feelings about each concept. For example, the maximum score possible for behavioural intention was 14 which would indicate that an individual's intention was strong. PU could be scored out of 42, PEOU could be scored out of 28 and job relevance out of 14;

high scores in each of these subscales showed that participants had more of each concept. Minor wording changes were made in order for the questions to encompass all of the new technology changes such as the new computer system as well as the introduction of smart devices or tablet computers. Thus, all items from TAM2 had the word 'system' changed to 'technology'. For example, instead of asking "*assuming I have access to the system, I intend to use it"* the question was adjusted to "*assuming I have access to the technology, I intend to use it".*

In order to measure the behavioural intention to use construct, two items were included in the questionnaire ("*assuming I have access to the technology, I intend to use it*" and "*given that I have access to the technology, I predict that I would use it*"); the original Cronbach's alpha (α) for this subscale ranging from 0.82 to 0.97. The PU subscale included four items (e.g. *"using the technology improves my performance on the job"; "I find the technology to be useful in my job*") with a Cronbach's α ranging from 0.87 to 0.98. As well as the four items that came from the TAM2 subscale, two extra items were included from Davis (1993) ("*using the technology improves the quality of my work*" and "*using the technology gives me greater control over my work*") with minor amendments to the wording made substituting 'electronic mail' to 'technology'. The Cronbach's α for these two items were not available. The PEOU subscale also consisted of four items (e.g. "*interacting with the technology does not require a lot of my mental energy*", "*I find it easy to get the technology to do what I want*") and had a Cronbach's α ranging from 0.86 to 0.98. The last subscale included in the current questionnaire measured job relevance (e.g. *"in my job, usage of the technology is important"*) with the two items having a Cronbach's α of 0.80 to 0.95. All items

that measured technology acceptance were measured on a seven-point Likert-type scale.

**Computer anxiety.** Heinssen, Glass and Knight's (1987) nineteen-item Computer Anxiety Rating Scale (CARS) was used in order to assess the participants' perceived level of computer anxiety. However, for the purpose of the present study, only ten items were included in the final questionnaire. CARS has been found to have high internal consistency (Cronbach's α 0.87) and, to be reliable ($r=0.70$, $p<0.0001$); it is still one of the most used computer anxiety rating scales (Powell, 2013). However, nine items were excluded from the measure due to the fact that they are either not relevant to the current study or are not deemed to be relevant in modern times (e.g. "*I am sure that with time and practice I will be as comfortable working with computers as I am in working with typewriters*"). Items in the CARS included seven positive statements (e.g. "*I look forward to using a computer in my job*"; "*I feel computers are necessary tools in both educational and work settings*") and three negative statements (e.g. "*I do not think that I would be able to learn new computer software*"). Some of the wording in the CARS was also altered in order for the questions to make sense in the context of the current study and the organisation being used for the study. For example, the second item stated that "*I do not think I would be able to learn new computer software*" in order to measure the anxiety around the newly introduced software system changing the words from the original question "*I do not think I would be able to learn a computer programming language*"; programming language had no relevance to the technology changes within the organisation and thus the wording was changed. Participants responded on a five-point Likert-type scale (1=strongly disagree; 5=strongly agree) thus scores ranged from ten (low level of CA) to fifty

(high level of CA). Before obtaining a final score the responses to the positive items are reversed (Heinssen et al., 1987) as will be explained in further detail in the data analysis section. In order to obtain an overall score, the sum of all scores was calculated.

**Computer self-efficacy.** Compeau and Higgins' (1995) ten-item Computer Self-Efficacy Measure (CSEM) was used in the study in order to explore how capable participants believed themselves to be when using a computer (computer self-efficacy). The measure is task focussed and as such does not reflect on simple actions such as turning on a computer or saving files. Starting with the statement "*I could complete my tasks using the new technology if...*" participants had to indicate on a ten-point confidence scale (1=not confident and 10=confident) how confident they are in their abilities completing the sentence with statements such as "*there was no one around to tell me what to do as I go*"; "*I had seen someone else using it before trying it myself*"; "*I had a lot of time to complete the tasks for which the technology was provided*" and " *I had used similar technology before this one to do the same job*". An overall score was calculated by adding up all of the responses with a maximum score of 100; a high score showed high levels of CSE and a low score showed low CSE. The wording of the beginning statement was changed in order to encompass both the new software system and the smart devices or tablet computers for field staff to use. Thus, instead of asking "*I could complete the job using the software package*" participants were asked "*I could complete my tasks using the new technology if…*". The CSEM is regarded as a reliable measure that "satisfies the major conditions for construct validity" (Compeau & Higgins, 1995, p. 207).

## Data Analysis

In order to test for all of the hypotheses, multiple data analyses were employed. The data obtained from the questionnaires, both online and in paper copy, was analysed using the IBM Statistical Package for the Social Sciences (SPSS 25). The statistical tests conducted are explained in further detail below.

**Missing values**. There are three different questions at the start of the questionnaire where participants failed to respond. The question asking for the participants' (n=96) job title had 4.0% of answers missing. For education achieved, 20.8% of responses were missing, and for tenure 42.7% of responses were missing. For the purpose of the current study, the missing responses for job title and education achieved were given a value of 0 as suggested by Field (2013) so as to not affect the statistical analysis negatively with the remaining responses used for the analyses. However, due to the high percentage of failed responses to the tenure question, none of the responses were taken into consideration for statistical analyses.

**Recoding.** The CARS measure within the study required recoding for accurate statistical analysis to occur due to a mixture of positively and negatively worded items. As recommended by Heinssen et al., (1987) the positively worded items (items 1, 3, 4, 5, 6, 7, and 10) had their scores reversed, using the transform function of SPSS. The scale was measured on a five-point Likert-type scale where 1= strongly disagree and 5= strongly agree so, in order to recode the necessary items, this was recoded so that 1= strongly agree all the way through to 5= strongly disagree.

**Descriptive statistics**. Descriptive statistics were carried out in order to calculate the mean, standard deviation, skew and kurtosis values. In order to examine the levels of skewness and kurtosis Kline (2011) shows that if the skew value is larger than +/-3 then the data is extremely skewed, similarly, if the kurtosis value it larger than +/-8 then the data indicates extreme kurtosis. When these extremes are present within the data, it is suggested that the data be transformed (Kline, 2011; Kim, 2013). However, none of the data was shown to have any extreme skewness or extreme kurtosis, which therefore means that no transformations are required to be done.

**Reliability analysis.** The internal consistency of the measurement scales was measured in order to determine the reliability. Reliability was measured by calculating the Cronbach's α for each scale and subscale where 0.7 would indicate acceptable reliability, 0.8 would indicate good reliability and 0.9 would indicate excellent reliability (Gliem & Gliem, 2003).

**Correlation analysis**. In order to examine the relationships between variables, Pearson's correlation was used. As well as examining the relationships between variables (hypotheses 1, 2a, 2b, 3a, 3b, 4a, 4b, 4c, 4d, 4e, and 5a), Pearson's correlation was also used to test the strength of the relationship between the demographic variable of age and the outcome variable of intention to use.

**ANOVA's.** One-way analyses of variance (ANOVA's) was employed to observe if there was any relationship (hypothesis 6b) between the demographic variable of job level, which consisted of multiple categories, and the outcome variable of behavioural intention to use.

**Mediation analysis.** In order to test for the potential mediating effects of PU (hypothesis 2c) and CSE (hypothesis 5b), mediation analysis was conducted in SPSS. Following the recommendation of Field (2013) the *PROCESS* approach, developed by Preacher and Hayes (2004), was employed in order to test for mediation. This approach tested the direct and indirect effects of the predictor variable on the outcome variable as shown in figure 5. The indirect effect was reported using bootstrap confidence intervals.

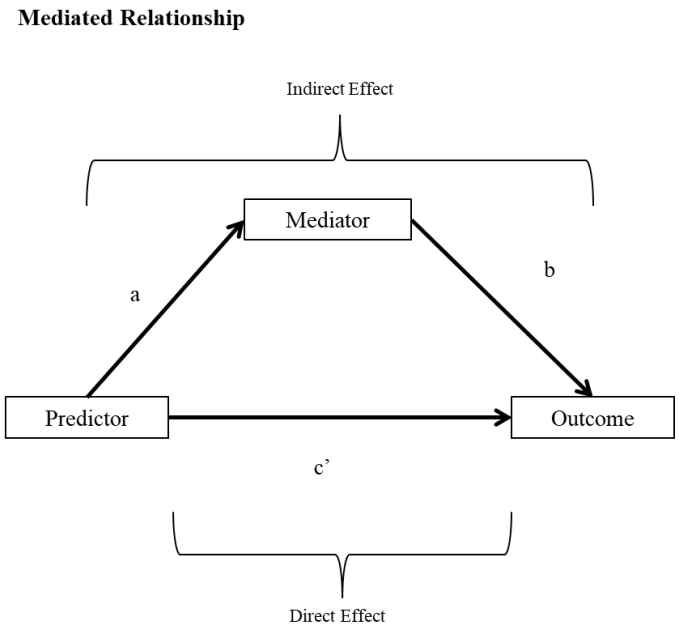


*Figure 5*. Diagram of a basic mediation model (Field, 2013)

## Chapter Three: Results

The results chapter presents findings of this study and includes descriptive statistics, reliability analyses, correlations, one-way ANOVA and mediation analyses.

### Descriptive Statistics

Descriptive statistics were calculated for age, TAM2 and its subscales (intention to use, perceived usefulness (PU), perceived ease of use (PEOU) and job relevance), CARS and CSES and include mean, standard deviation, skew and kurtosis (refer to Table 1). Responses for TAM2 ranged from one to seven (strongly disagree to strongly agree). Overall, for the TAM2 measurement scale participants scored relatively high (M=80.99), indicating higher levels of technology acceptance. When looking at the subscales, participants reported high intentions to use (M=12.64), relatively high levels of PU (M=35.81), PEOU (M=21.11) and job relevance (M=11.43). Participants showed that they had low computer anxiety (CA) (M=19.81), with responses ranging from one to five (strongly disagree to strongly agree) taking into account the recoded items as described in the Method chapter. With responses ranging on a ten-point confidence scale, participants showed moderate to high computer self-efficacy (CSE) (M=70.17).

All of the skew and kurtosis values were within the acceptable range as proposed by Kline (2011) with skew values being less than +/-3 and kurtosis values being less than +/-8.

## Reliability analysis

Reliability analysis was used to examine the internal consistency of TAM2 and its four subscales, CARS and CSES. Using Cronbach's α, each measure and subscale was tested for its reliability with the level of reliability determined by the guidelines set out by Gliem and Gliem (2003) as stated in the Method. As is shown in Table 1, TAM2 has a reliability value of 0.95, which shows that it is extremely reliable. The intention to use subscale has a reliability value of 0.90, the PU subscale has a reliability value of 0.95, the PEOU subscale has a reliability value of 0.86 and the job relevance subscale has a reliability value of 0.90, thus indicating that all four subscales of TAM2 are highly reliable. CARS has a reliability value of 0.72, showing acceptable reliability and CSES has a reliability value of 0.91, once again showing extreme reliability. The above results show that the questionnaire employed for this study has high internal consistency.

## Correlation

In order to calculate the strength of relationships between variables, Pearson's correlation analysis was conducted. Table 2 presents the results of the two-tailed correlation analysis. The sample size of 96 gives a power of 0.50 at the 0.01 level (r=0.25) thus suggesting that there is a 50% chance of finding a statistically significant relationship (Friedman, 1982).

**Hypothesis 1**. It was hypothesised that PU would have a direct relationship with behavioural intention to use. The results of the correlation analysis show that PU and behavioural intention were found to be significantly correlated, $r$=0.60, $p<0.01$. This indicates that as an individual's PU increases so does their intention to use, which fully supports hypothesis 1.

Table 1

*Descriptive Statistics and Cronbach's Alpha of Age, Measurement Scales and Sub-Scales.*

| Variables | N | Mean | Std. Deviation | Skewness | Kurtosis | Cronbach's Alpha |
|---|---|---|---|---|---|---|
| Age | 96 | 37.76 | 10.97 | 0.35 | -0.65 | NA |
| TAM2 | 96 | 80.99 | 14.08 | -1.25 | 2.40 | 0.95 |
| Intention to use | 96 | 12.64 | 2.15 | -2.26 | 6.64 | 0.90 |
| PU | 96 | 35.81 | 6.70 | -1.33 | 1.89 | 0.95 |
| PEOU | 96 | 21.11 | 4.72 | -0.57 | 0.25 | 086 |
| Job relevance | 96 | 11.43 | 2.66 | -1.2 | 0.25 | 0.90 |
| CARS | 96 | 19.81 | 4.97 | -0.07 | -0.84 | 0.72 |
| CSES | 96 | 70.17 | 16.54 | -0.05 | -0.56 | 0.91 |

**Hypothesis 2a.** It was hypothesised that PEOU would have a positive relationship with PU. The correlational analysis showed that PEOU and PU were found to have a significant positive relationship, $r$=0.58, p<0.01 supporting the hypothesis. This indicates that as an individual's feelings of PEOU increases, so do their feelings of PU.

**Hypothesis2b.** It was hypothesised that PEOU would have a positive relationship with behavioural intention to use. The results show that PEOU has a significant positive relationship with behavioural intention to use, $r$=0.38, p<0.01, which is in support of the hypothesis. This result shows that as an individual's feelings of PEOU increase, so does their intention to use.

**Hypothesis 3a**. It was hypothesised that job relevance would have a positive relationship with PU. The results of the correlation analysis showed that job relevance was positively and significantly related to PU, $r$=0.80, p<0.01. Therefore, the results show that as an individual's feelings of job relevance increase so do their feelings of PU, which fully supports hypothesis 3a.

**Hypothesis 3b**. It was hypothesised that job relevance would have a positive relationship with PEOU. The correlational analysis indicated that job relevance has a positive significant relationship with PEOU, $r$=0.64, p<0.01. This shows that as an individual's feelings of job relevance increase their feelings of PEOU also increase, thus supporting the hypothesis.

**Hypothesis 4a**. It was hypothesised that an individual's age will not have a significant relationship with CA. The results show that age did not have a significant relationship with CA, $r$=0.10, p>0.01, as hypothesised. Thus, there was no correlation between age and CA which fully supports hypothesis 4a.

Table 2

*Pearson's Correlation for Predictor, Mediator and Outcome Variables.*

| | Age | Job level | Worksite | BI | PU | PEOU | JRel | CA | CSE |
|---|---|---|---|---|---|---|---|---|---|
| Age | - | | | | | | | | |
| Job level | 0.15 | - | | | | | | | |
| Worksite | -0.08 | -0.39** | - | | | | | | |
| BI | 0.07 | 0.34** | -0.20 | - | | | | | |
| PU | -0.06 | 0.31** | -0.26** | 0.60** | - | | | | |
| PEOU | -0.06 | 0.67 | -0.27** | 0.38** | 0.58** | - | | | |
| JRel | -0.02 | 0.35** | -0.38** | 0.54** | 0.80** | 0.64** | - | | |
| CA | 0.10 | -0.17 | -0.10 | -0.43** | -0.34** | -0.51** | -0.39** | - | |
| CSE | -0.19 | 0.19 | 0.10 | 0.36** | 0.33** | 0.60** | 0.36** | -0.63** | - |

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

**Hypothesis 4b**. It was hypothesised that CSE would be negatively correlated with CA. The correlational analysis indicated that CSE had a significant negative correlation with CA, $r$=-0.63, p<0.01. This indicated that as an individual's CSE increases, their CA decreases and vice versa which is in support of the hypothesis.

**Hypothesis 4c.** It was hypothesised that PEOU would be negatively correlated to CA. The correlation analysis showed that PEOU had a significant negative correlation with CA, $r$=-0.51, p<0.01, implying that as an individual's PEOU increases, their feelings of CA decreases and vice versa. This result is in support of hypothesis 4c.

**Hypothesis 4d.** It was hypothesised that PU would have a negative relationship with CA. The results showed that a significant negative relationship existed between PU and CA, $r$=-0.34, p<0.01, indicating that as feelings of PU increase, CA decreases. Thus, hypothesis 4d is supported.

**Hypothesis 4e**. It was hypothesised that behavioural intention to use would be negatively related to CA. The correlation analysis indicates that a significant negative relationship exists between behavioural intention and CA, $r$=-0.43, $p$<0.01. Thus, hypothesis 4e is supported; as an individual's behavioural intentions to use increase, their CA decreases and vice versa.

**Hypothesis 5a**. It was hypothesised that CSE would have a positive relationship with PEOU. The correlational analysis showed that CSE had a significant positive relationship with PEOU, $r$=0.60, $p$<0.01. This shows that as an individual's CSE increases, so does their PEOU. This supports hypothesis 5a.

**Hypothesis 6a.** It was hypothesised that age would have a negative relationship with behavioural intention to use. The correlation analysis showed that age had a

positive yet non-significant relationship with behavioural intention to use, $r$=0.07, $p$>0.01thus failing to support the hypothesis.

**One-way ANOVA**

One-way ANOVA analysis was done to observe if there were any significant differences among the demographic variables that consisted of multiple categories and the outcome variable of behavioural intention to use.

The job level variable was found to be significant for behavioural intention ($F$(4,87)=3.62, p<0.01, $R^2$= 0.14). Due to this significant result, a Tukey's HSD post-hoc test was run and showed that trade staff had lower behavioural intentions ($M$=11.78, $SD$=2.83) than office staff ($M$=13.58, $SD$=1.27; $p$<0.01), but there was no other significance found between any other groups; supervisors ($M$=12.63, $SD$=2.64), management ($M$=13.50, $SD$=.79), and other ($M$=13.57, $SD$=2.11).

**Mediation Analysis**

Mediation analysis was used in order for any potential mediating factors between the predictor variables (CA and PEOU) and the outcome variables (behavioural intention to use and PEOU). The variables that were hypothesised to be mediators were CSE and PU and thus they were tested. The analysis was done by measuring both the direct and the indirect relationship that exists between the predictor and outcome variables. Mediation is said to have occurred if the indirect relationship was found to be significant. In order to generate confidence intervals around the direct effect, bootstrapping was also done based on 1000 samples at a 95% interval on the recommendation of Field (2013).

Hypothesis 2c hypothesised that the relationship between PEOU and behavioural intention would be mediated by PU (figure 6). PEOU was significantly

related to PU, *b*=0.86, *t*=7.0, *p*<0.001 and it was shown that PEOU explains 34% of the variance in PU. PU is also shown to have a significant relationship with behavioural intention, *b*=0.18, *t*=5.70, *p*<0.001, however, when PU is included in the calculation, PEOU does not have a significant relationship with behavioural intention, *b*=0.018, *t*=0.38, *p*=0.70. The model explains 36% of variance in behavioural intention. When the mediating variable of PU is not present in the model, the total effect calculation shows that PEOU significantly predicts behavioural intention, *b*=0.17, *t*=3.94, *p*<0.001. The indirect effect of PEOU on behavioural intention was significant through PU, *b*=0.15, BCa CI [0.05, 0.30]. Thus, due to this significant indirect effect, mediation is said to occur and as such hypothesis 2c is supported.

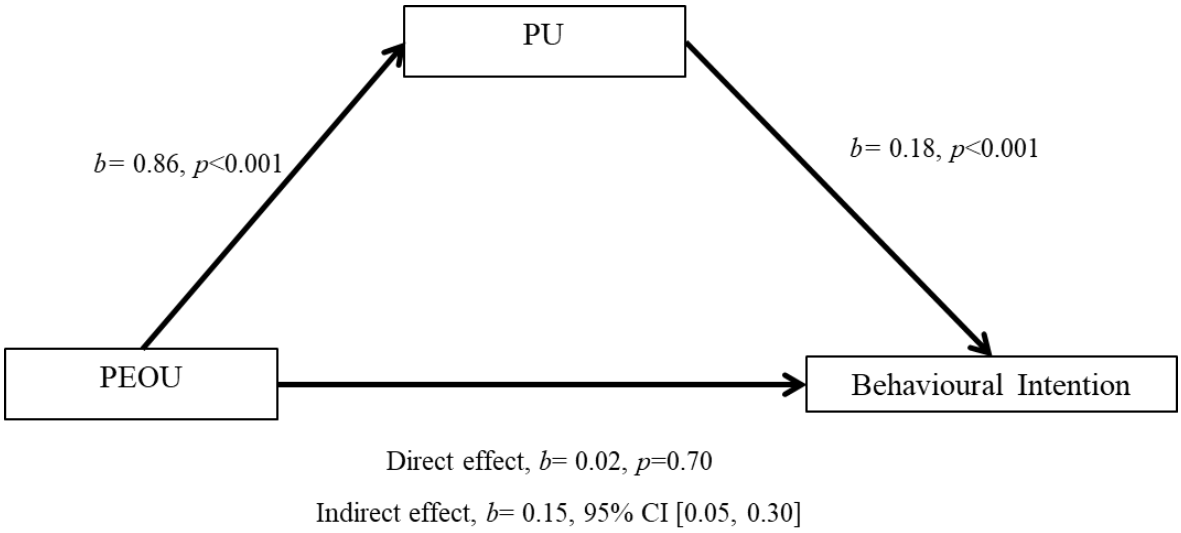


*Figure 6*. Model of PEOU as a predictor of behavioural intention, mediated by PU (hypothesis 2c).

Hypothesis 5b hypothesised that CSE would mediate the effect of CA on PEOU (figure 7). Analysis showed that CA had a significant relationship with CSE, *b*=-2.10, *t*=-7.88, *p*<0.001, and CA explained 40% of the variance in CSE. The relationship between the two variables was negative and thus as CA increases, CSE decreases. It was

also shown that CSE had a significant effect on behavioural intention, *b*=0.14, *t*=4.54, *p*<0.001. However, when CSE was included in the model, CA was found to not have a significant effect on PEOU, b=-0.20, t=-1.98, p=0.051 thus meaning that the relationship is fully mediated. The model explains 40% of variance in PEOU. The total effect calculation shows that when CSE is not included in the model, CA has a significant effect on PEOU, *b*=-0.48, *t*=-5.68, *p*<0.001. The indirect effect of CA on PEOU was significant through CSE, b=-0.28, BCa CI [-0.46, -0.14]. Therefore, due to this significant result hypothesis 5b is supported.

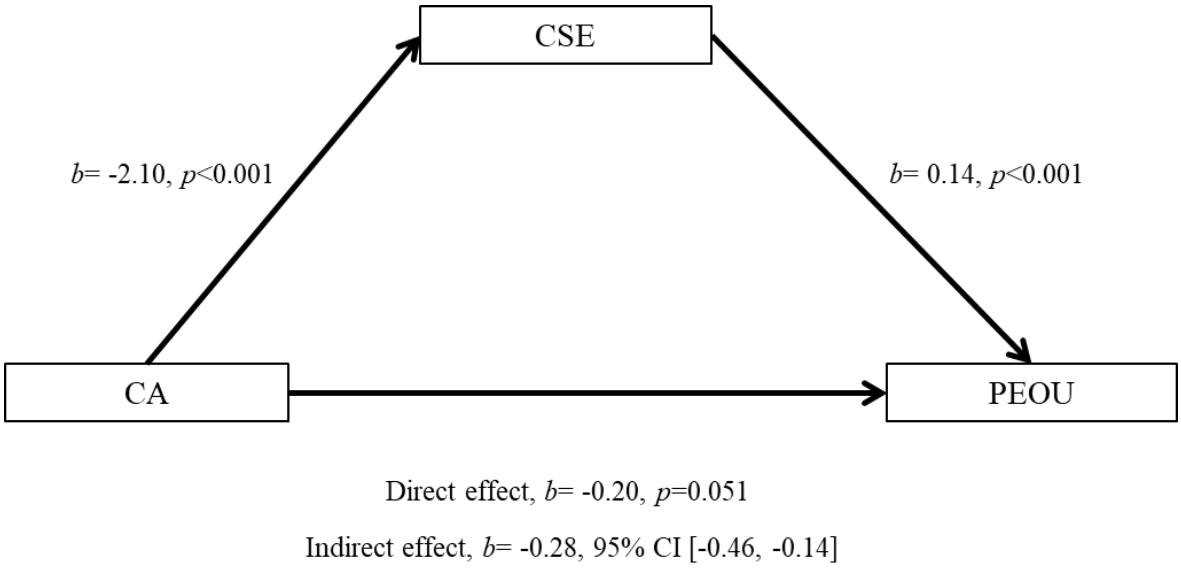


*Figure 7.* Model of CA as a predictor of PEOU, mediated by CSE (hypothesis 5b)

# Chapter Four: Discussion

The aim of the current study was to examine user acceptance of technology and to identify any of the potential factors that impact upon the acceptance and adoption of the newly introduced technology. User acceptance was looked at through employing the construct of behavioural intention to use as the outcome variable as suggested by Wu and Du (2012). Perceived usefulness, perceived ease of use, computer anxiety, computer self-efficacy and job relevance were used as predictor variables. Participants in this study were employees from the chosen organisation and completed a questionnaire that assessed their: usage intentions, perceptions of usefulness, ease of use and relevance, their computer anxiety and their perceived computer self-efficacy.

Findings from this study supported most of the proposed hypotheses and also failed to provide support of one. This chapter will discuss the main results of the study in relation to relevant previous research as well as discuss the implications this research has for organisations. Limitations of this research and suggestions for future research will also be discussed and the Discussion chapter will conclude with final remarks about the research.

## Supported Research Findings

Hypotheses 1, 2a, 2b, 2c, 3a, 3b, 4a, 4b, 4c, 4d, 4e, 5a, 5b, and 6b were all supported. The findings in relation to these hypotheses are discussed in more detail below.

### Perceived usefulness and behavioural intentions to use.

Hypothesis 1 was supported: the results of the correlational analysis showed that PU was significantly correlated to behavioural intention to use. This finding indicates that, as the perceptions of usefulness of new technology increases, so does the

behavioural intentions to use that new technology. This hypothesis was based on previous research that found PU to be a major determinant of behavioural intention (Davis et al., 1989; King & He, 2006). Previous research also shows that PU is such a strong determinant of technology acceptance due to the fact that a primary concern for users is whether or not the new technology is beneficial or useful to them whilst performing their job tasks (Davis, 1993).

It is important to have a gauge of employees' perceptions of usefulness due to the fact that some employees will be more agreeable towards having to learn how to use new technology if they perceive that technology to provide a critical service and to be crucial to their job performance (Davis, 1989).

**Perceived ease of use, perceived usefulness and behavioural intention to use.**

Hypothesis 2a was supported: PEOU was shown to have a positive relationship with PU. This finding shows that as an individual's perceptions of how easy the new technology is to use increases, so do their perceptions of its usefulness. This hypothesis was based on previous research that has shown that a significant relationship exists between the two constructs (Davis et al., 1989; Davis, 1993; Venkatesh & Davis, 2000; Yusoff et al., 2009). Nov and Ye (2008) have found that PEOU is not only a key contributor to acceptance behaviour but also to adoption behaviour which is imperative for an organisation to ensure the success of their technology introduction projects. PU is also affected by PEOU because when all other factors align, if a system is perceived to be easier to use by an individual, it will also be deemed more useful (Venkatesh & Davis, 2000).

Hypothesis 2b was supported: the results of the correlation analysis showed that PEOU was positively and significantly related to behavioural intention to use. This

indicates that an individual's intention to use new technology will increase as their perception of how easy a system is to use does.

**Job relevance, perceived usefulness and perceived ease of use.**

Hypothesis 3a was supported: the findings show that job relevance has a significant positive relationship with PU, which is in line with previous research (Venkatesh and Davis, 2000; Hong et al., 2002). Hong et al., (2002) suggest that the existence of this positive relationship shows that "the fit between the capability of the technology and the need of the users is an important antecedent of the PU of the technology" (p.117). The judgements that an individual holds about the usefulness of a system can be affected by the "cognitive matching" (Venkatesh and Davis, 2000, p. 199) of the goals that they have within their job and the consequences of using the system (the relevance).

Hypothesis 3b was also supported: the results show that a positive significant relationship exists between job relevance and PEOU. The result of finding a direct link between relevance and PEOU adds further contribution to the growing empirical data on the direct relationship between job relevance and PEOU (Hong et al., 2002). The positive relationship between job relevance, PU and PEOU shows that, as an employee's perception of the relevance of the new technology to their job increases, so does their perception of the new system's usefulness and how easy the new system is to use. This is because the construct of job relevance focuses on the content that can be found within the new system rather than other characteristics such as interface (Hong et al., 2002). Job relevance also involves the recognition of the importance and effectiveness by the end-user, as well as recognizing that the newly introduced technology will contribute to the resolution of their work needs (Hong et al., 2002). Yao (1995) also explained that the link between job relevance and PU could only exist due

to the fact that something can only be deemed useful if it is also considered to be useful by the user (as cited in Hong et al, 2002).

**Age and computer anxiety.**

Hypothesis 4a was supported: the results show that age had a non-significant (although positive) relationship with CA. The non-significant result adds further empirical evidence to the suggestion of Fernández-Ardèvol and Ivan (2015) that age is not a good indicator of CA and thus should not be used as a "main exploratory variable" (p. 215). Their research instead shows that other variables have more impact upon CA, such as an individual's occupational status (employed, unemployed, pensioner) or their household income. The results of their research showed that being a pensioner increased CA and having a high income household decreased it. It was proposed that ICT experience was an important factor when examining the age and CA relationship and that this relationship was also better explained through having mediating variables. Overall, it was concluded that, when it comes to explaining an individual's CA, age was just not that important (Fernández-Ardèvol & Ivan, 2015). Although the relationship was found to be non-significant, the fact that it is positive, is in line with the discovery that in the 2000's, finding a positive relationship between the two variables was more likely, rather than finding no relationship at all (Powell, 2013). This is due to the fact that since 2000, people have increasingly been exposed to technology at younger ages and thus tend to exhibit lower CA than older workers who did not have that early exposure.

**Computer self-efficacy and computer anxiety.**

Hypothesis 4b was supported: analysis showed that CSE had a significant negative relationship with CA. This finding is in accordance with the majority of research in this relationship where CSE is shown to be "the best predictor of CA"

(Henderson, Deane & Ward, 1995, as cited in Powell, 2013, p. 2374) due to the consistent finding of a significant negative relationship between the two variables. This finding also adds to the small body of research, where this relationship is researched with an adult population rather than a university or college student population.

Torkzadeh et al., (2006) describes CSE as being an important construct in order to better understand user computer behaviours. CSE aids in being able to determine perceptions and thus acceptance and use of newly introduced technology and computer systems. Due to the constant change and improvement technology goes through, many organisations now expect their employees to stay up to date with and continually adapt along with the technology. In order to learn new computer skills and to use these new skills efficiently, important factors that must be present are low CA and high self-efficacy (Achim & Kassim, 2015). Alongside these two variables it was also found that user attitude is an important variable to look at due to the fact that the interaction between attitude and CA can impact the level of improvement in CSE (Torkzadeh et al., 2006).

**Perceived ease of use, perceived usefulness and computer anxiety.**

Hypothesis 4c was supported: the results show that PEOU had a significant negative relationship with CA. This finding is consistent with previous research on the relationship (Saadé & Kira, 2006; Saadé & Kira, 2009; Venkatesh, 2000). Powell (2013) found that the majority of research that looked at the relationship between these two variables found a significant negative relationship, showing that the easier an individual perceives the new technology or computer system to be to use, the less anxiety they will feel around this technology. This has implications for the training of employees and their previous knowledge and experiences with similar technology due to the fact that, if through their previous experiences or training they perceive the

system to be easy to use, their feelings of intimidation, or worry about potential social embarrassment (Fernández-Ardèvol & Ivan, 2015) are more likely to be lower, thus resulting in lower levels of anxiety. Venkatesh (2000) states that as an emotional response, CA, along with other factors such as CSE "serve as anchors that users employ in forming perceived ease of use about a new system" (p. 355).

Hypothesis 4d was also supported: PU was shown to have a significant negative relationship with CA. Thus, as an individual's perception of usefulness of the new technology increases or improves, their feelings of anxiety decrease. This result is important as it adds support to negative relationship findings in the 2000's, as Powell (2013) found that a negative relationship was more likely to be found in the 1990's (with no relationship between the two variables being found in the 2000's). This is crucial since it shows that, even if an individual presents signs of CA, it is more likely that in the technology heavy world we live and work in, they are more likely to recognize and accept the usefulness of the technology and its influence on both work and everyday life (Powell, 2013).

**Behavioural intention to use and computer anxiety.**

Hypothesis 4e was supported: behavioural intention had a significant negative relationship with CA. Thus, if an individual's CA is low they will have increased usage intentions. Being an inverse relationship, this also shows that an individual's behavioural intention will weaken if they experience heightened levels of CA. This is an important finding when it comes to the practical uses of research due to the fact that by finding ways to assess and measure employee's CA levels, managers may have the ability to more proactively intervene before negative usage behaviours take hold. This will be explained in more detail below in the Contributions chapter.

**Computer self-efficacy and perceived ease of use.**

Hypothesis 5a was supported: the statistical analysis showed that there is a significant positive relationship between the two variables. Thus, if an individual is shown to have high CSE they will also be more likely to find the technology easier to use than those who exhibit low CSE. This finding is consistent with previous research (Hong et al., 2002; Venkatesh & Davis, 1996) in finding that CSE is a strong determinant of PEOU, thus, extending the generalizability of the result and validating "the importance of computer self-efficacy in understanding user acceptance of various computer technologies" (Hong et al., 2002, p.116). Venkatesh and Davis (1996) took looking at the relationship between the two variables a step further by measuring participants' CSE before and after they were exposed to the technology and had hands-on experience. The authors found that, before gaining hands-on experience, those that used the new technology would base their perceptions of the ease of use of the technology on their levels of CSE. This was "irrespective of the extent of procedural information given to the subjects" (Venkatesh & Davis, 1996, p. 472). Previous research suggests that a good way to increase the CSE of an individual is to offer more training, so that users are able to familiarise themselves with all aspects of the new technology. By being familiar with the technology and potentially more comfortable around it, users may feel increased confidence with it, thus increasing their CSE, which in turn can improve their perception of the ease of use (Hong et al., 2002).

It is important to look at the antecedents such as CSE since a limitation of the original TAM is that, while it allows us to better predict user acceptance based on the perceptions of those using the technology, it does not always allow us to fully understand or to explain any acceptance (Venkatesh & Davis, 1996). However, by

researching and discovering the antecedents to the original TAM constructs, researchers can more fully describe and explain user acceptance of technology.

### Job level and behavioural intention to use.

Hypothesis 6b was supported: ANOVA testing showed that there was a significant relationship between job level and behavioural intention. With further post hoc testing showing that there was a significant difference specifically between trade and office staff with trade staff exhibiting lower behavioural usage intentions than the office staff. This is an important finding because it shows that organisations cannot manage the change and training for the different departments in the same manner. When one group of staff have differing usage intentions to another group, it shows that the organisation must assess why their intentions to use the new technology are lower compared to other employees. By knowing what motivates usage intentions between different groups of employees, organisations will be able to manage the continued use of the new technology better over a sustained period of time.

## Unsupported Research Finding

### Age and behavioural intention to use.

Hypothesis 6a was not supported: age was not negatively related to behavioural intention to use. This result differs from previous research (Chung et al., 2010; Morris & Venkatesh, 2000) that found a negative relationship. This finding shows that, as a worker gets older their behavioural intentions to use the new technology in their workplace do not decrease.

This is an important finding to look at and dissect more since organisations are going to have to develop ways to cope with an increasingly aging workforce (Kunze, Boehm & Bruch, 2013). There is a growing belief, not only in the workplace but also in

everyday life, that the older a worker is, the more resistant to change they are and the less likely they will be able to learn how to use and incorporate new technology into their lives and work. However, there is still very little empirical evidence of these beliefs (Kunze et al., 2013), thus indicating that they are just stereotypes. Previous research also shows that no negative relationship exists between age and job performance (Kanfer & Ackerman, 2004, as cited in Kunze et al., 2013) and it is also worth noting that there is no significant relationship between organisational costs and older workers (Broadbridge, 2011, as cited in Kunze et al., 2013). Cau-Bareille et al., (2012) shows that when they are given fair and favourable conditions for learning, older workers are just as capable as younger workers of learning how to use and incorporate new technology into their work. Therefore, the current study aids in challenging the age stereotype, but does not disprove it.

**Mediator hypotheses**

Hypothesis 2c was supported: PU mediated the effect of PEOU on behavioural intention to use. This finding is consistent with previous research (Davis, 1989; Hong et al., 2002; Venkatesh, 1999) that found that the effect PEOU had on behavioural intention became indirect and thus operated through PU instead. This is explained by Yousafzai et al., (2007) "that no amount of ease of use will compensate for low usefulness" (p. 266). Hong et al., (2002) explained this relationship by stating that a new computer system may be abandoned if it does not prove its functionality over time; no matter how easy the system is to use.

Hypothesis 5b was also supported: CSE fully mediated the effect of CA on PEOU. This result is consistent with that of Saadé and Kira (2009) who proposed and found that anxiety had an indirect effect on PEOU through self-efficacy. This finding provides further understanding of this mediation relationship suggesting that CSE is

able to mediate CA by decreasing the effect that it has on PEOU. This is further explained by stating that "reduced anxiety and increased experience only facilitate performance upon tasks indirectly by increasing levels of self-efficacy, which in turn, leads to improved performance" (Saadé & Kira, 2009, p. 181).

**Practical Contributions**

The current study enables organisations to gain insight into what might impact upon the acceptance and adoption of potentially very expensive technology. Therefore, it is important to investigate the acceptance of technology in the workplace due to the fact that non-adoption or resistance to change can prove to be major factors in lowered productivity, efficiency, and also loss in revenue. By knowing what to look for and how to assess during the planning phase, they will be able to control and manage any potentially negative effects of introducing new technology, such as being able to identify and work with those who exhibit computer anxiety. Davis (1989) believes that within the workplace "people are generally reinforced for good performance by raises, promotions, bonuses and other rewards" (p.320). Therefore, it is imperative that organisations who are facing resistance or challenges with technology implementation find out what motivates employee performance in order to promote the adoption of the new technology.

Through offering a questionnaire and asking about constructs such as how relevant the new technology is to their job, organisations will be able to identify and concentrate on the areas of contention where successful adoption and acceptance is involved. Being able to identify the main factors that impact upon technology acceptance is important because knowing what influences acceptance can enable organisations to better target those areas during the design, implementation and training phases of introducing new technology. Any potential barriers to learning need to be

taken down in the workplace so that employees feel supported throughout the learning and development process and so that they can still be in control of their own work, despite the dependency on the technology (Holden & Karsh, 2010).

Computer anxiety, as has been described through this paper, comes from a place of apprehension, fear or embarrassment about one's skills and as such is one of these barriers that needs to be removed for optimal learning to occur. Organisations need to identify where the anxiety towards technology use stems from in different employees and work with these employees in order to mitigate these negative feelings. Managers and supervisors need to find the best ways to facilitate learning and development, such as holding extra training sessions or having weekly or monthly check-in sessions with those identified as holding more anxiety towards technology use.

The current research alongside much of the previous literature on this topic also shows that employees are more likely to accept and use technology that is free from hassle and excess effort, and thus it is important for organisations to ensure that whatever technology is introduced, is user-friendly and has an interface that is non-threatening and engages the user to learn and use it (Dorodolu, 2016). Making new technology easy to use is not, however, the only important factor.

For the long-term adoption of technology, organisations need to ensure that they provide their employees with support. Different groups within an organisation hold different attitudes about technology (as is shown by the significant relationship found between job level and behavioural intention) and have different levels of confidence or maturity in their skill sets. Therefore, organisations must ensure that they are in a position to provide the support that the different groups of employees need. Gebauer (2008) suggests that organisations need to take the effort it takes to set up and maintain

technology usage into account because “technology maturity can become a moving target that dynamically ‘adjusts’ as the sophistication of the technology progresses” (p.116). Thus, just because employees were trained when the technology was first introduced, does not mean that more training will not be needed. Group information sessions with different departments for example, are a great way to open the lines of communication with staff and hear what they have to say about the changes that are happening within the organisation. The views of employees should not only be heard but should also be addressed in order for them truly feel that they are being supported.

On a more practical note, it is also important that organisations realise that usability and functionality do not only apply to the new software itself, but also to the devices that field staff are using it on. Organisations must ensure that devices are durable and are not too heavy or too big to use in the field. Part of the ease of use of this technology and the usefulness comes from the portability of the devices and functionality in terms of how long it holds its charge and how long it takes to charge them.

**Theoretical contributions**

The current study expands the knowledge currently available on user acceptance and all the potential factors that affect it, not only based on the original TAM by Davis (1989), but also including individual differences (CA and CSE) and cognitive judgements (job relevance). Hypotheses that were formulated based on the adaption of TAM and on the work compiled by Powell (2013) on CA, contribute towards a body of research that is growing, not only in size, but also in importance.

The traditional constructs of PU and PEOU behaved as was expected, with the mediation analysis showcasing the indirect effect PEOU has on behavioural intention to

use through PU. This finding adds to the previous research on the existence of this mediation relationship and aids to cement the belief that no matter how easy a system is to use, if it is not useful, employees will not use it.

The finding of no significant relationship between age and behavioural intention to use, contributes towards the previous literature that has no 'agreed upon' consensus about whether age has an impact upon behavioural intention to use technology.

The current study also adds to the body of user acceptance research that is conducted on adults in the workplace instead of university students. Venkatesh (1999) suggests that by basing the study on adults in the workplace, it adds to the external validity of the findings. Further generalizability of TAM is also achieved through this study showing that the original model is able to be adapted and applied to different industries and technologies.

**Limitations and Future Research**

A limitation of the current study is that it was cross-sectional in nature and thus results must be treated with caution. It is suggested that in future more longitudinal research is conducted in order to see the effects of the antecedents of technology acceptance over a period of time, such as before, during and after technology implementation. Previous studies have found that the effect of certain variables decreased or gained strength over time. For example, it was found that during the initial stages of learning and behaviour towards new technology, the direct relationship between PEOU and intention was stronger than during the latter stages, where users have had more time and experience with the technology; the relationship was found to become indirect, with PU acting as a mediator for the relationship (Yousafzai et al., 2007).

The study was also questionnaire based and thus all answers were self-reported and subjective in nature; a consequence of self-report measurement is that it can lead to common method bias.

Torkzadeh et al., (2006) proposed that the CSE of an individual may be affected by the environment that the individual is in (i.e. mandatory versus voluntary technology use). Thus, further research should be done in both of these situations in order to determine if there is a difference to not only CSE, but also other antecedents of technology acceptance and adoption based on environment.

Whilst it is the most used model when researching user acceptance of technology, there have been complaints by some researchers saying that TAM is too generalizable and, as such, it does not offer "tangible guidelines" (Hackberth, Grover & Yi, 2003, p.8) to those who need to ensure that the adoption and acceptance of the new technology is successful. Thus, it is very important that not only the current antecedents of technology acceptance continue to be researched to gain better understanding (Hackberth et al., 2003; Venkatesh & Davis, 1996), but that more constructs such as experience, training, enjoyment, and satisfaction are researched to identify the effect that they will have on acceptance behaviour.

**Concluding Statements**

In conclusion, the current study investigated user acceptance and the variables that impact upon the acceptance and adoption of new technology. The research demonstrates that TAM is a robust model that is still reliable and relevant almost thirty years after its conception. The findings of the current study show that, perceived usefulness and perceive ease of use are strong determinants, directly and indirectly, of

behavioural intention to use, and that job relevance, computer self-efficacy and computer anxiety are all related to and fit into the original TAM.

Overall, the current study shows that when employees perceive the newly introduced technology to be useful, easy to use, and relevant to their job, they exhibit low CA and higher CSE. Then they are more likely to have high usage intentions which results in actual system use. When the conditions are met for usage intention, the likelihood that users will accept and adopt the new technology is high.

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**Appendix A**

Letter to Participants

## *Research Information Sheet*

THE UNIVERSITY OF WAIKATO
*Te Whare Wānanga o Waikato*

***Measuring Resistance to Technological Change in the Workplace***

**Research Information Sheet - Questionnaire**

Dear Participant,

My name is Danielle Botha and I am conducting research on resistance to technology in the workplace as part of my thesis that will go towards completing my Masters in Applied Psychology at the University of Waikato. The aim of this research project is to examine if any resistance to the recent technological changes within your organisation exists and to examine what the influencing factors and variables are to any resistance that may be present. This questionnaire seeks to collect data on how you as an employee feel about the technology you use as part of your job. Your contribution to the research through completion of the questionnaire would be greatly appreciated. However, you are under no obligation to participate if you do not wish to participate you don't have to return the questionnaire. If there are any questions you do not want to answer then simply skip them. If you do participate, and if you do supply your name or email (which you need not do), it will NOT be revealed to anyone except my research supervisors. By completing and returning the questionnaire, you the participant are giving your consent for the information within the questionnaire to be used in the

research. The identity of participants will remain strictly confidential in the writing up and presentation of the research. If you wish to contact me to learn more about the research, please use the email address. Please return completed questionnaires to the locked drop box.

**Declaration by participant:**

I agree to participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Psychology Research and Ethics Committee (Dr Rebecca Sargisson, phone 07 837 9580, email: rebecca.sargisson@waikato.ac.nz).

Y☐ N☐

Whether or not you decide to participate in the research, I would like to thank you very much for taking the time to read this message.

Thank you very much for your time and help in making this study possible.

Danielle Botha

Db85@students.waikato.ac.nz

My supervisors for this research:

Dr Anna Sutton

Dr Maree Roche

**Appendix B**

Questionnaire

# Questionnaire

Below is the questionnaire for you to please complete if you wish. Thank you for taking the time to fill out and complete this survey, it is greatly appreciated. If you wish to be notified of the research findings at the completion of my research please supply your email address at the end of this questionnaire (all personal details provided will remain confidential).

*Please provide your:*

Age:

Job Title (e.g. Supervisor, Fault man, Office):

Education achieved (e.g. NCEA/School C, tertiary level, post-graduate):

Work Site (e.g. Mt Wellington, Albany, Palmerston North):

Tenure with Electrix:

*Please tick the box that best applies to you:*

| | | **Strongly Disagree** | **Moderately Disagree** | **Somewhat Disagree** | **Neutral** | **Somewhat Agree** | **Moderately Agree** | **Strongly** |
|---|---|---|---|---|---|---|---|---|

| | **Question** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|---|---|---|---|---|---|---|---|---|
| **1** | Assuming I have access to the technology, I intend to use it | | | | | | | |
| **2** | Given that I have access to the technology, I predict that I would use it | | | | | | | |
| **3** | Using the technology improves my performance in my job | | | | | | | |
| **4** | Using the technology improves the quality of my work | | | | | | | |
| **5** | Using the technology gives me greater control over my work | | | | | | | |
| **6** | Using the technology in my job increases my productivity | | | | | | | |
| **7** | Using the technology enhances my effectiveness in my job | | | | | | | |
| **8** | I find the technology to be useful in my job | | | | | | | |
| **9** | My interaction with the technology is clear and understandable | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **10** | Interacting with the technology does not require a lot of my mental effort | | | | | | | |
| **11** | I find the technology to be easy to use | | | | | | | |
| **12** | I find it easy to get the technology to do what I want it to do | | | | | | | |
| **13** | In my job, usage of the technology is important | | | | | | | |
| **14** | In my job, usage of the technology in relevant | | | | | | | |

| | | **Strongly Disagree** | **Disagree** | **Undecided** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|
| | **Questions** | **1** | **2** | **3** | **4** | **5** |
| **1** | I look forward to using a computer on my job | | | | | |
| **2** | I do not think I would be able to learn new computer software | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **3** | The challenge of learning about computers is exciting | | | | | |
| **4** | I am confident that I can learn computer skills | | | | | |
| **5** | Anyone can learn to use a computer if they are motivated | | | | | |
| **6** | Learning to operate computers is like learning any new skill- the more you practice, the better you become | | | | | |
| **7** | I feel that I will be able to keep up with the advances happening in the computer field | | | | | |
| **8** | I feel apprehensive about using computers as part of my job | | | | | |
| **9** | I find it difficult to understand the technical aspects of computers | | | | | |
| **10** | I feel computers are necessary tools in both | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | educational and work settings | | | | | |

| | ***Please tick the box that most applies:*** | **Not Confident** | | | | | **Moderately Confident** | | | | **Totally Confident** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Questions** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| | **I could complete my tasks using the new technology if…** | | | | | | | | | | |
| **1** | There was no one around to tell me what to do as I go | | | | | | | | | | |
| **2** | I had never used technology like it before | | | | | | | | | | |
| **3** | I had only the help manuals for reference | | | | | | | | | | |
| **4** | I had seen someone else using it before trying it myself | | | | | | | | | | |
| **5** | I could call someone for help if I got stuck | | | | | | | | | | |
| **6** | Someone helped me get started | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **7** | I had a lot of time to complete the tasks for which the technology was provided | | | | | | | | | | |
| **8** | I had just the built-in help facility for assistance | | | | | | | | | | |
| **9** | Someone showed me how to do it first | | | | | | | | | | |
| **10** | I had used similar technology before this one to do the same job | | | | | | | | | | |

Thank you for completing this questionnaire, it is greatly appreciated. Please return it to the locked drop box that is placed in the common areas in your office.

Thank you

Danielle Botha

Do you wish to receive a summary of the research findings? Please provide your email address below and they will be sent to you:

Email: