Digital transformation in the workplace: the impact on frontline employees and line managers

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Declaration

This thesis is entirely my own work, and has not been previously submitted to this or any other third level institution.

Name: James Fogarty

Signed:

Date: 3rd April 2020

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Abstract

As organisations embark on digital transformation (DT) strategies to improve customer service, employee propensity to adopt technology will be critical to its success. The purpose of this paper is to explore acceptance levels in frontline employees and line managers towards DT by integrating the resistance to change scale with the technology acceptance model. A mixed method design was employed, measuring the constructs and exploring employee perceptions of DT. An employee sample (n = 72) completed the questionnaires, revealing no statistically significant relationship between the constructs. The relationship between perceived ease of use and role title was found to be statistically significant. Interview responses identified employee emotions to be a key factor in explaining this, stemming from poor communication, engagement and training. The implications and suggestions for future research will be discussed in this paper.

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Digital transformation (DT) in the workplace: The impact on frontline employees and line managers

1. Introduction

Recent research by The Expert Group on Future Skills Needs (EGFSN, 2018) suggests the acceleration of digital transformation (DT) will significantly disrupt the workplace in Ireland, with duties of some roles being changed, and others even being displaced, including frontline workers in customer service positions. Frontline workers are those who communicate directly with customers and provide a satisfactory experience (Sharma et al., 2017). For DT to be successful, organisations must adopt a structured strategy capable of addressing the challenges DT will present, including training and development, organisational change and leadership styles (Wade et al., 2017). The Organisation for Economic Cooperation and Development (OECD, 2016) suggests frontline workers will be required to undergo retraining during DT, and it will also provide an opportunity for organisations to upskill leadership regarding the competencies and behaviours required to make DT a success (Kolbjørnsrud et al., 2017). Leadership style can be a key contributor to positive DT outcomes (Sow & Aborie, 2018), with servant and transformational styles both found to benefit the process, especially when they are aligned (Divya & Suganthi, 2018).

Organisational change should be in symmetry with the DT process, and employees should be engaged with the change plan from the beginning (Kolbjørnsrud et al., 2017). Employees can sometimes resist change and create a barrier to the implementation of new technology being a success, however, the adoption of change models like Lewin's change theory can support organisations undertaking change programmes (Mullins, 2016). The resistance to change scale (RTCS) can be used to provide insight into the dispositional reasons employees resist change - an important precursor for organisations, as those employees with an inclination to resist change tend to have a negative effect on organisations who are implementing change (Oreg, 2003). The technology acceptance model (TAM) explains user behaviour when introduced to a new technology or technological process and contains two constructs: perceived ease of use (PEOU) and perceived usefulness (PU) (Davis, 1989).

1.1. **Purpose of the Research**

The objective of this research was to build on the body of knowledge within organisational psychology and examine how it can be used in conjunction with theoretical scales to support an organisation adopting a DT strategy. A gap was identified in literature surrounding the impact DT has on frontline staff and line managers, seen as those vulnerable to DT, and key to its success (OECD, 2016). Line managers are those responsible for managing and supervising members of staff (Liu, 2017). Employee resistance to change (RTC), a key barrier to successful DT (Frey & Osborne, 2013), is investigated by the paper to understand employee behaviour and decisions. In summary, the purpose of this paper was to explore how frontline employees and line managers feel about DT, and identify organisational psychology interventions that may support the DT process. Definitions of key technological terms can be found in Appendix A.

2. Literature review

2.1. The Impact of DT in the Workplace

Global 2019 business expenditure on DT reached some $1.2 trillion, an increase of 17.9% on 2018 (International Data Corporation, 2019), this despite the fact that 70% of DT programmes fail to meet their objectives (Bucy et al., 2017). A study by the EGSFN (2018) found one in three jobs in Ireland are at high risk of being disrupted by digital technologies, and job losses are predicted to hit 46,000 by 2023, with customer service roles at highest risk of being displaced by robotic process automation and chatbots. Chatbots are being used by businesses to engage with customers in a less time consuming and more efficient manner compared to human interaction, with the chatbots having the ability to respond to customer needs through software embedded natural language generation capabilities (EGFSN, 2018). Virtual assistant (VA) is another name used for chatbot technology and both use language to communicate and achieve an objective (Sousa et al., 2019). Employees can be expected to resist technologies that are being implemented which may diminish their responsibilities and impact their potential career and earnings growth (Frey & Osborne, 2013).

Beaudry et al. (2013) point out that tasks typically undertaken by low skilled employees, for example frontline customer services staff, are now being carried out by employees of a higher skill level due to the impact of digital transformation, in some cases driving low skilled employees out of the labour market. High attrition rates and work-related stress are already prominent among frontline employees (Elmadag & Ellinger, 2017). Tasks and responsibilities that require creative and social intelligence are unlikely to be reallocated to automation due to technological bottlenecks. Social intelligence is defined by Albrecht (2006) as the ability to get along with other people and have them cooperate with you. Technological bottlenecks may be good news for frontline customer services employees as judges of the Loebner Prize who compare chatbots considered to be human-like, are sceptical of chatbot social intelligence and common-sense capabilities (Frey & Osborne, 2013).

2.2. Organisational Psychology

Organisational psychology is the arm of psychology that studies human behaviour in the workplace and applies psychological principles to address common workplace issues such as training and development, recruitment, performance measurement, organisational development, workplace motivation and reward (American Psychology Association, undated). Smelser and Baltes (2001) expanded on the workplace issues organisational psychology addresses, by including leadership and workplace change. For this research, the paper will review the areas of training and development, organisational change, as well as leadership.

2.3. **Training and Development**

Recent research suggests frontline customer services employees are at high risk of facing the burden of further training and potential occupational retraining during digital transformation (OECD, 2016). Leadership can play a key part in this change process, yet leaders themselves may be sceptical of change, increasing the risk of change being unsuccessful, but this can be mitigated by organisations providing education and training to leaders that will develop their skills and support the change programme (Kolbjørnsrud et al., 2017). The accountancy firm Price Waterhouse Cooper (PWC, 2018) argue that younger employees are potentially going to benefit from digital transformation should they acquire the relevant skills and training, and mature employees will need to ensure they have the skillset to adapt to a digital workplace. Employee training in these roles is significantly lower compared to those employees in roles at medium and low risk of DT disruption, which may impact the development of young employees who have traditionally started in entry level roles and progressed to positions that utilise their cognitive and social skills (OECD 2018).

Meaningful training in new technological systems will increase the chances of frontline employees and management embracing digital transformation (Kolbjørnsrud et al., 2017). It has been suggested that companies should be incentivised by governments to prepare employees for job digital transformation, and in turn employees should be rewarded for developing their skillset through retraining, making them more employable in the digital era (EGFSN,

2018). New roles that do not currently exist will be created through digital transformation, and these jobs will be the result of the efficiencies new technologies will realise, boosting productivity and wealth in organisations (PWC, 2018). These new roles will include positions in customer service, where it is anticipated duties will become specialised compared to current roles, with some requiring academic qualifications (EGFSN, 2018). In their major study, Luthans et al. (2007) proposed that training could play a significant role in building Psychological Capital (PsyCap) in organisations going through technological change, and it has also been found to improve levels of jobs satisfaction (Sen et al., 2017).

2.4. **Organisational Change**

It is not just education and training where businesses will need to support employees during digital transformation. They will also need to help workers transition through the change, potentially revaluate income support for employees and aid those who are displaced due to automation (PWC, 2018). This is consistent with the findings of Mullins (2016), who argues that organisations can support employees going through technological change by building a culture of trust, developing collaborative team spirit and rewarding those who successfully adapt to change. Establishing employee trust can have a positive impact on Organisational Justice, and in particular interactional justice during the times when interpersonal relationships are formed (Colquitt, 2011). Kolbjørnsrud et al. (2017) propose organisations engage with employees from the start of the technological change process so learning is collective, for digital transformation to be a success. Engaging with employees can mitigate employee grumbling, as it allows employees discuss their feelings and emotions with management (Laumer et al., 2014). Even when organisations do have change programmes in place, employees can sometimes overestimate their capability to resist change, and when they do agree to adapt they can get bogged down in self-doubt (McKinsey, 2016). Mullins (2016) proposes several reasons employees resist change, including threats to job security, employee personal perceptions of the world, and forced change to employee routine and habits.

When organisations are successful in persuading employees to overcome RTC and develop skills to optimise capability, the employee must change psychologically to be effective, as if they are up-skilled, while still in the initial mindset of resistance they can become passive acceptors and resigned to their situation (McKinsey, 2016). According to Burke (2011), the Lewin Change Theory can support organisations overcome these psychological barriers by following its three-step model of unfreeze, change and refreeze. Lewin's model is not without its critics, with its limitations explored by Bartunek and Woodman (2016) which include it making assumptions around change linearity, the fact that organisations are never frozen due to the relentless pace of change, and that Lewin offers no insight on how relationships between change agents should be managed. On the other hand, Bakari and Hunjra (2017) have found how Lewin's model remains relevant to organisational change today as it continues to support leaders going through continuous change.

2.5. **Leadership Style**

For digital transformation to be successful, it is imperative a leadership strategy is in place that can support the technological change (Sow & Aborie, 2018). Failure to have a strategy that can account for employee resistance and suspicion towards DT can see adoption fail before the programme has begun, emphasising the importance of management style, particularly when it comes to frontline managers who were found to be least accepting of new technologies in comparison to other managers (Kolbjørnsrud, Amico, & Thomas, 2017). Larjovuori et al. (2016) found a servant leadership style can have a positive impact on employees during digital transformation. Servant leadership is characterised by Mittal and Dorfman (2012) as demonstrating egalitarianism, moral integrity, empowering and developing others, empathy, humility and creating value for the community. It can also enhance motivation and boost psychological empowerment of employees (Hakanen & van Dierendonck, 2013). Research by Divya and Suganthi (2018) proposes that servant leadership can reduce employee stress and contribute to enhance positive workplace outcomes in comparison to other leadership styles. The findings of their study would have provided a broader insight into the value of servant leadership had they adopted

other mediators beyond employee stress and burnout. Significant research validating servant leadership and workplace engagement in the field of positive organisational psychology has found servant leadership can be directly associated with DT, although it is not clear what elements of the leadership style produce successful outcomes during change (Larjovuori et al., 2016).

Combining leadership styles can have a positive impact on DT, as evidenced when aligning servant leadership with transformational leadership, resulting in positive employee outcomes (Divya & Suganthi, 2018). The key difference between transformational leadership and servant leadership is that transformational leadership is concerned with what is good for the organisation, whereas servant leadership focuses on creating value for the community (Mittal & Dorfman, 2012).

Transformational leadership is composed of the following four dimensions: a) idealised influence - the qualities employees attribute to the leader and the personal behavioural characteristic of the leader, b) inspirational motivation - having high performance expectations and articulating a powerful and positive vision, c) intellectual stimulation - promotes critical and creative thinking and encourage new ways of working, and d) individual consideration - displays genuine compassion towards employees and spends time developing their skills (Arnold, 2017). In an empirical study, Berghaus and Back (2016) found leadership styles move towards a transformational style during digital transformation, which can bring about increased trust and enthusiasm towards technological change.

2.6. **Resistance to Change**

A psychological contract is established when an employee commences work with an organisation, yet when the organisation implements changes, employees can perceive this as an infringement of the psychological contract and react negatively, which can undermine the change (Schein, 1979). Oreg (2003) demonstrated individuals who are disposed to resist change are likely to have a negative attitude towards change and will not voluntarily work with the organ-

isation to implement change. Resistance from employees can sabotage organisational change, and it is the role of leadership to reduce resistance and provide the resources that can increase the psychological factors that positively effects change (Menon & Prabhu, 2016). Even when change is in an employee's interest, certain individuals decide to resist the change, and it is the objective of the RTCS to explore the decisions behind this resistance (Oreg, 2003). The RTCS is defined as being "designed to tap an individual's tendency to resist or avoid making changes, to devalue change generally, and to find change aversive across diverse contexts and types of change" (Oreg 2003, p. 680). Oreg's research is supported by that of Judge et al. (1999),who looked at positive self-confidence and risk tolerance.

Menon and Prabhu (2016) describe RTC as a natural phenomenon that threatens the security, self-esteem, competence, social interaction and status of employees. Recent research by Oreg (2018) challenges the widespread theory that organisational change is good and resistance is bad, by demonstrating that resistance to change can provide benefits to organisations, particularly when it comes to completing routine tasks. A limitation to Oreg's study is that it did not involve active workers, consisting of job seekers. In research validating Oreg's RTCS, Stewart, May, McCarthy, and Puffer (2009) argue their study does not provide the same validity outside of America and the Western world due to political, economic and cultural factors linked to national history that can increase employee suspicion of organisational change. As the present research is taking place in a western country, the RTCS will be used as part of the study, although the limitations are noted.

2.7. **Technology Acceptance Model**

The Technology Acceptance Model (TAM) proposed by Davis (1989) plays a fundamental role in explaining user behaviour when employees are introduced to new technology and systems. The TAM is adapted from the Theory of Reasoned Action (TRA), with the main difference between the two being the removal of the attitude construct from the TRA (Venkatesh et al., 2003). Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are considered by Davis (1989) to be key factors in explaining employee behaviour.

Davis (1989, p. 320) defines PU as: “the degree to which a person believes that using a particular system would enhance his or her job performance” and PEOU as “the degree to which a person believes that using a particular system would be free of effort”. By drawing on this concept of PU and PEOU, Davis (1989) suggests the constructs can be used by business practitioners to anticipate whether a new technology or system is likely to be accepted, and if it is not, then various interventions could be identified to enhance employee acceptance, for example user testing, training and greater education.

TAM has been criticised for its lack of discovery around user behaviour and for not exploring the reasons behind decision making in technology resistance (Bagozzi, 2007). Other criticisms of TAM are its inability to use data surfaced from other systems that may provide insight to PEOU and PU, as it relies on self-reported data, and it also excludes variables such as economic and demographic factors (Ahmad, 2018). Researchers have been developing TAM since it was first published and the new models now include (a) TAM 2, which provides more information as to the reasons users find systems useful; (b) TAM 3 introduced computer anxiety and behavioural intention which aligned to PEOU and PU respectively to moderate user experience. PEOU to PU was also moderated by user experience and (c) Unified Theory of Acceptance and Use of Technology (UTAUT) uses the following four predictors of user behaviour and behavioural intention; performance expectancy, effort expectancy, social influence and facilitating conditions. Four additional variables are also present in; gender, age, experience and voluntariness of use (Lai, 2017).

Despite the criticisms and alternatives, TAM remains popular among academics and is still commonly applied in order to understand the rationale behind how users accept and use technology (Chutter, 2009). A recent study by Lim (2018) argues that TAM should be a model to support the understanding of user interaction with technologies. Lim (2018) further proposes that TAM will require integration with other frameworks that capture user behaviour factors such as social, security, personal and behaviour control.

2.8. **The Present Study**

Upon reviewing the literature for the present paper, it was assumed an employee's acceptance of a new technology or technological process would be influenced by their natural tendency to resist change. From an organisational perspective, this study intended to gain an insight into the psychological factors behind the decision to accept or resist DT by frontline employees and line managers. Thus, the research question proposed was:

RQ1: How accepting are frontline workers and line managers towards DT?

To ascertain if RTCS and TAM can provide insight into group behaviour and perceptions around DT, the following hypotheses were proposed:

H1: There will be a statistically significant relationship between a group's tendency to resist change and the perceived usefulness (PU) of VA.

H2: There will be a statistically significant relationship between a group's tendency to resist change and perceived ease of use (PEOU) of VA.

H3: There will be a statistically significant relationship between a group's PEOU and PU of VA.

3. Methodology

3.1. Design

This study employed a mixed method design, using online questionnaires and interviews to test the three variables: participant role type (IV), the TAM (DV), and the RTCS (DV). An online questionnaire was used as it, a) is an uncomplicated approach to obtain data from participants, b) is applicable and accessible to a wide range of people, and c) has the potential to offer high volume and quality data (Robson, 2002).

Interviews were chosen as, a) they are a flexible way of receiving information about the research questions b) they allow the interviewer pick up on body language, and c) they can provide valuable and insightful information (Robson, 2002). To protect the confidence and integrity of the organisation and participants, the research did not record demographic data.

3.2. Participants

The research was conducted within the Customer Operations function of a large Irish multinational organisation undergoing digital transformation. The role titles were customer service agent and team leader, and participants were members of the selected organisations customer services department. In total, 122 participants were invited to take part in the research (29 line managers and 93 customer service agents). Convenience sampling was the method used to contact the participants. A total of 72 participants took part in the research, 56 frontline employees and 16 line managers. The demographic of the participants was diverse, which was helped by the selected organisation having its customer services department operating out of two locations - Ireland and Malta. All participants were fluent in the English language.

3.3. Procedure

A) Questionnaire

Data protection and IT security clearance was approved before research could begin (see Appendix B). Participants were initially contacted through the in-house Skype messaging platform. To save time, this was executed by setting up groups of twenty participants at a time to gauge interest in participating in a

study about the impact of digital transformation on frontline employees and line managers. Each participant was advised the questionnaire would take approximately ten minutes to complete. Participants who volunteered to take part were added to a password protected Microsoft One Drive file and were later contacted through their organisation's email address with a link to the questionnaire. Each participant was provided with information over Skype on the chatbot technology the TAM was measuring known as VA, and advised of the deadline for completion. Two identical information sheets (see appendix C),consent forms (see Appendix D), questionnaires (see appendix E, F & G) and debriefs (see Appendix H), were created for frontline participants and for line management. During Skype group conversations, participants were asked to complete the questionnaire at a time of their convenience and not during peak work hours. A small pilot study took place before the questionnaire went live with six colleagues, asked to examine the questionnaire for inconsistencies, grammatical errors and to test the report features. Minor grammatical errors were found as part of this process and changes were made before the final questionnaire was published. The pilot validated the ten-minute completion time, and the report data worked as expected.

B) Interviews

Semi structured interviews were held with six participants (three line managers and three customer service agents), who were conveniently selected based on availability. The Skype messaging service was used to contact participants, and Microsoft Outlook to send calendar invites. This process was used to schedule two pilot interviews to test the design, question clarity and duration. Both led to slight changes to questions and took 40 minutes on average. The interviews took place on the selected organisation's premises, and in-house video conferencing software was used to host interviews with Maltese participants. Each participant was provided with full information on the session (see Appendix I) along with an informed consent form in advance of the interview (see Appendix J). Once the forms were collected the interviews took place where participants were asked to discuss five open ended questions in the context of digital transformation; a) RTC, b) employee training, c) employee engagement, d) leadership styles, and e) fears towards DT. Upon completion, a

debrief (see Appendix K), and time for questions were allowed. The average interview duration was 45 minutes.

3.4. **Materials**

Endeavouring to answer the research question, this study undertook an empirical approach by using the TAM (see Appendix F & G) to understand employee perceptions around usefulness and ease of use towards a new technology or technological process. The RTCS (see appendix E) was used to capture the reasons why some employees decide to resist change. The questionnaire was developed using Microsoft Forms and began with information on the research project, then went through informed consent, highlighting the confidential nature and anonymity of participation. The first questionnaire was the RTCS (Oreg, 2003) scale using a six point Likert scale. It ranged from Strongly Disagree to Strongly Agree (consisting of 17 items), and the second questionnaire, TAM (Davis, 1979) using a seven point Likert scale ranging from Strongly Disagree to Strongly Agree (consisting of 28 items). The RTCS Cronbach Alpha score is 0.92 (Oreg, 2003) and the TAM Cronbach Alpha score is 0.98 for PEOU and 0.94 for PU (Davis, 1989). In the current study the Cronbach Alpha score was 0.827 for RTC, 0.946 for PU and 0.834 for PEOU (see Appendix L)

A debrief was the final part of the questionnaire, which gave an outline on the research, contact details of the researcher and a message of gratitude. All data was analysed using SPSS version 26 software that was provided by IADT. Each interviewee was emailed with a soft copy of the consent form. The voice recording application on an iPhone and an iPad were both utilised to record the focus group sessions. The objective of the focus group was to gain a deeper insight into how the participants perceived RTC, employee training, employee engagement, leadership styles and their fears towards DT.

3.5. **Analysis**

Thematic analysis was used to analyse the qualitative data. First, Otter audio transcription software was used to transcribe the recordings. The output files were then read and edited twice while listening to the recordings to ensure complete accuracy. The files were then uploaded to the MAXQDA software program

that assists with the analysis of qualitative research. The content was coded using the software and categorised. The codes and categories were read several times, and an independent coder was used to compare content to support validity. Through this process, themes were established, which were named and operationalised. This process follows the phases proposed by Braun and Clarke (2006).

3.6. **Ethics**

This assignment was approved as Ethics A (see Appendix M) by the Department of Technology and Psychology Ethics. Participation in the research was completely voluntary. Data sourced was captured on encrypted digital technology and was password protected where possible. Data shared with the supervisor was done using password protected files and all data will be destroyed after 12 months.

All participants received full information on the research carried out and were provided with informed consent, along with debrief material. Contact details of the researcher and research supervisor were also provided. Participation was completely voluntary and no participants were rewarded for taking part in the research.

The researcher was cognisant that they held workplace seniority over the participants, and this was mitigated against by advising participants in the context of the research that they are a student looking for voluntary help on a research project. The researcher maintained professional standards throughout the duration of the study. The researcher was aware of the pitfalls of ‘insider’ research such as: a) discomfort for both participant and researcher during interviews, b) errors made during the research will have to be lived with when the study concludes or c) the disclosure of confidential information could impact future working relationships (Robson, 2002).

The decision not to record participant demographic data was made when a risk emerged that could have put the confidentiality and anonymity of some

participants in jeopardy. Cultural sensitivities within the organisation were also factored into the decision.

4. Results

4.1 Quantitative

Table 1

Multiple Linear Regression Descriptive Statistics

	Mean	N	SD
Role Title	1.2222	72	.41866
RTC	3.25000000000245	72	.456793461092976
PU	4.19543650792659	72	1.25012175638512
PEOU	3.37698412699405	72	.788974598620506

Multiple linear regression (see Appendix N) was used to assess the effect of role type group (frontline staff and line management) on RTC, PU and PEOU.

Hypothesis 1 stated there would be a significant statistical relationship between groups' tendency to resist change (RTC) and perceived usefulness (PU) of Virtual Assistant (VA). Pearson product-moment correlation coefficient through SPSS software (Version 26) was used to investigate relationships between the variables. RTC and PU resulted in r = -.114, n = 72, p = .171, therefore rejecting the hypothesis.

Hypothesis 2 stated a significant statistical relationship would exist between a group's RTC and perceived ease of use (PEOU) of VA. RTC and PEOU were r = .157, n = 72, p = .094, thus rejecting the hypothesis.

Hypothesis 3 stated that there would be a significant statistical relationship between PU and PEOU. PU and PEOU results were r = .175, n = 72, p = .071, again rejecting the hypothesis.

The analysis suggested role type had a significant effect on PEOU (β = .498), with PU (β = .190) being least effected by role type. PEOU (*t* = 4.67, *p*<.001) was shown to be statistically significant between both roles. RTC (*t* = -1.85, *p* =.07) and PU (*t* = 1.8, *p* = .08) were not shown to be statistically significant between roles. An independent samples t-test was then conducted to compare PEOU between frontline staff and line management. There was a statistically significant decrease in scores between frontline staff (M = 3.20, SD = .77) and line management (M = 4.01, SD = .49), t (38.09) = -5.121, p < .001 (two tailed). The magnitude of the differences in the means (mean difference = .82, 95% CI: -1.14 to -.49) was large (eta squared = .26).

Table 2
PEOU T-test descriptive statistics

Variable	Role	N	Mean	Std. Deviation	Std. Error Mean
PEOU	Frontline	56	3.19515	0.76574	0.10233
	Line Managers	16	4.01339	0.49088	0.12272

4.2 **Qualitative**

Frontline staff

Each participant was asked the same five questions relating to DT: a) individual perceptions, b) training, c) organisational openness, d) employee support, and e) fears. The content analysis revealed a theme that seemed to be triggered by three different sub themes, which can be found in *Figure 1*.

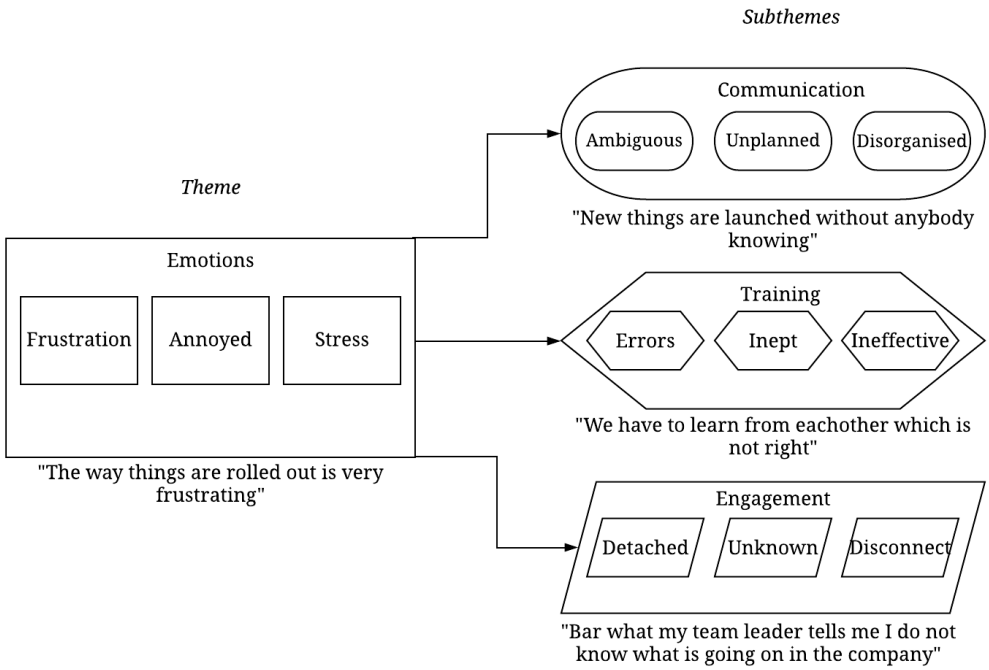

Figure 1. Frontline staff interview analysis

Theme.

***Emotions*.** Participants had strong feelings towards how DT was being implemented. "*Very frustrating*" (Participant A) was used to describe technology launches over recent months. The feeling of frustration was a common theme throughout the interviews: "*very frustrating for customers as well at times*" (Participant C) was stated when discussing the external impact of DT.

"Extremely annoying" (Participant C) was used to describe recent interactions with the Virtual Assistant, driven by the participant's perceived limitations of the technology. During new technology rollouts "*things can feel overwhelming*" (Participant B) as performance expectations remain the same for frontline staff.

Sub themes.

Communication. Participants believe communication around DT can be improved by the organisation. The belief is an over reliance on email and dropping documents on desks exists. Due to the nature of the role, the participants said it is not always possible to acknowledge this type of communication, which can

lead to a culture of "*figuring it out for yourself*" (Participant A). Communication with management is limited to when "*something is about to happen*" (Participant C) or a "*survey is taking place*" (Participant B). Some email communications were said to be "condescending" (Participant B).

***Training*.** Participants disclosed they are not always trained on new technology releases or technological processes. This has led to "*learning on the fly*" (Participant B), and not being trained on some new releases "*feels brutal*" (Participant A). "*Dropping by your desk with a handout is not real training"* (Participant A). "*We are being left to learn from each other"* (Participant C) was used to describe their perception of the organisations approach to training. Not having the required knowledge feels "stressful" (Participant A and Participant C).

***Employee Engagement*.** "*We mostly hear about what is going on from each other*" (Participant B) was detailed when speaking about how open the organisation is when it comes to DT. Explaining changes during monthly meetings would "*get people on-board*" (Participant A). It was noted most changes impact the customer in some way, and as frontline staff "*know most about customers"* (Participant C) the organisation should "*seek and respect their opinion*" (Participant C) before making changes. The way it is now, "*most agents feel taken for granted*" (Participant A).

Line managers

Participants were asked the same five questions relating to DT, a) their comfort in dealing with employee resistance, b) training, c) employee engagement, d) leadership styles, e) fears. Four specific themes were captured during the content analysis, as found in *Figure 2*.

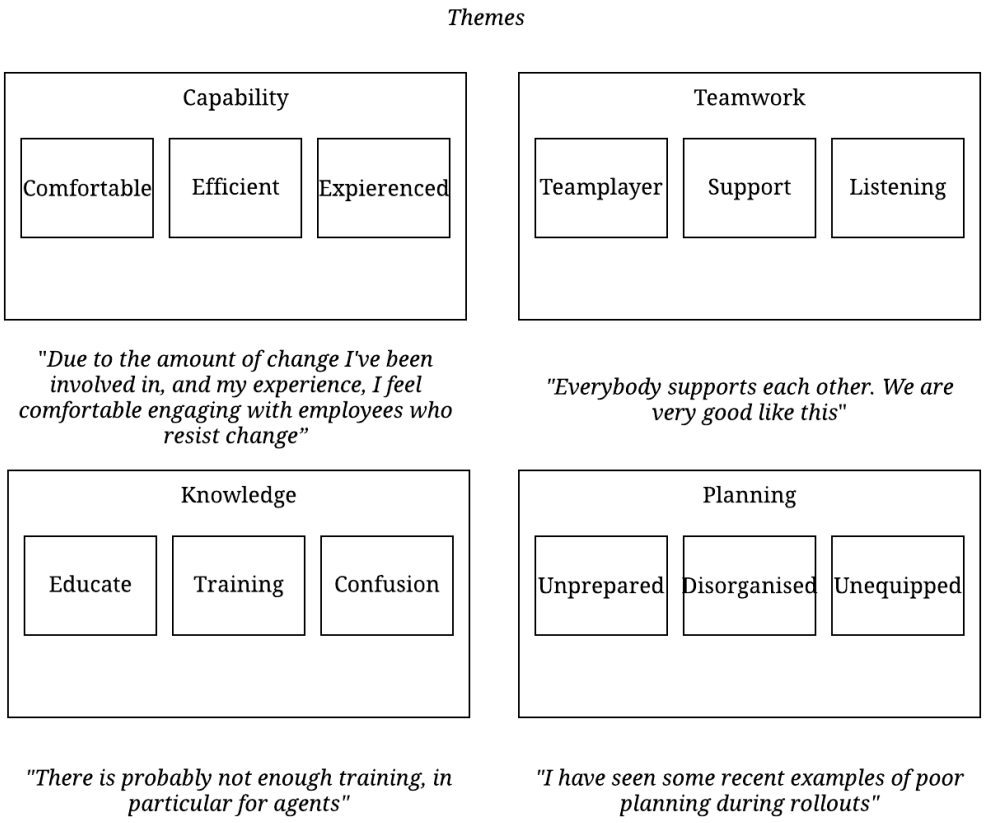

Figure 2. Line manager interview analysis

Themes.

Capability. All participants felt comfortable engaging with employees during times of digital transformation, even when employees were resisting change. *"I feel very comfortable engaging with employees during digital change, as it is an enjoyable challenge for me to engage with new ideas and approaches"* (Participant B). Participants felt competent in dealing with the challenges of working in a fast-paced environment:*"I know I have the skills to get to the bottom of things, and work with employees to overcome any hurdles"* (Participant A).

Teamwork. Participants felt they were part of a strong team that supported them during challenging times. "*Most of the support comes from within the team whereby we all support each other. We have regular huddles and create communication groups to keep each other in the loop"* (Participant B). Participants

bought into this ethos on an individual level "*I am a team player, and I believe I lead by example*" (Participant C).

Knowledge. Knowledge gaps were identified by the participants. This was at an individual level:*"I attended leadership training three years ago this year, so there probably is room for improvement, even if it is just refreshers every now and then"* (Participant C).It was also prominent when speaking about their team members:*"Training for agents never seems to be mission critical"* (Participant B). *"Sometimes training is overcooked for small things and undercooked for big things"* (Participant A).

Planning. Participants often felt unprepared and not ready for technology releases due to a perceived lack of planning:*"There have been recent examples of poor planning which has impacted the team"* (Participant C);*"...do more around preparation and education of employees on the run up to rollout of changes"* (Participant B); "We tend to be late to the party and then our role becomes that of a foot soldier delivering the message to agents and customers without any insight or input to a plan" (Participant A).

5. Discussion

The purpose of the present study was to explore how accepting line managers and frontline employees are towards DT. Based on the findings, line managers are more accepting of DT than frontline employees. While this can be attributed to the stress linked to the role of frontline employees (Elmadag & Ellinger, 2017), the themes identified during the research suggest there are multiple factors involved. The results of the interviews did support the questionnaire findings, suggesting organisations going through DT may be able to use RTC and TAM as support levers.

Previous research by Laumer et al. (2015) also examined RTC and TAM variables, suggesting individuals with a tendency to resist change will demonstrate lower PU and PEOU. The findings of the current study are consistent with the findings of Laumer et al. (2015). A central aim of the current study was to explore whether a significant statistical relationship exists between RTC and TAM. This was not supported when it came to Hypothesis 1 or Hypothesis 2. Interestingly, Laumer et al. (2015) do highlight the importance of training, change management, communication and engagement when it comes to technology adoption in the workplace. Like the current study, there are limitations to the research, in that it took place in one organisation using one technology, in one point of time (Laumer et al. 2015).

Hypothesis 3, which stated a statistically significant relationship would exist between PU and PEOU, was not supported. This contradicts the findings of previous research undertaken by Hallikainen and Laukkanen (2016), that found a highly significant connection between PEOU and PU. This could potentially be explained by the participants being customers, as opposed to employees in the current study. On the back of their findings, Hallikainen and Laukkanen (2016) recommend organisations should put more effort into making technology systems that are low effort and easy to use. This research is limited, as it took place within one organisation in a single country, and the participants were all experienced users of the technology, meaning new users were not included (Hallikainen & Laukkanen, 2016).

5.1 **Theoretical Implications**

Frontline employees demonstrated outspoken emotional responses to DT, and outlined what can be improved to make them more accepting of future technology releases. This response is consistent with research by Laumer et al. (2014), who found employee negativity to be a key element of early technological change driven by usability. Laumer et al. (2014) identify two practical steps organisations can implement to guard against employee negativity: a) introduce systems that allow employees share feelings and emotions about the new system, and b) implement forums where employees and management can have constructive conversations about the value of new systems. Limitations of the study include the absence of research between gender and employee negativity, and research focused on one organisation and one technology only (Laumer et al., 2014).

Organisations can support employees suffering emotional strain by embedding Psychological Capital (PsyCap) practices to its culture, which in turn can cultivate positive workplace attitudes and support the wellbeing of employees (Muse et al., 2008). PsyCap can play a key role when organisations are going through technological change, as its four components foster positivity throughout the process: a) self-efficacy - increases trust and reduces fear of change, b) optimism - brings a positive attitude towards change, c) hope - helps workers handle change, and d) resilience - in an evolving climate, employees will face challenges head-on (Menon & Prabhu, 2016). A study by Sen et al. (2017) found an increase in PsyCap during technological change had a positive impact on employee stress levels and job satisfaction. The study is limited as it was predominantly made up of married males (Sen et al., 2017).

Employee perceived fairness during organisational change can have a significant effect on burnout, job satisfaction, stress, commitment to the role and attrition (Parker et al., 2011). In the present study, frontline employees were vocal in addressing the areas of communication, engagement and training need to improve. Yean and Yusof (2016) propose that Organisational Justice can benefit organisations by enhancing employee trust, increasing employee performance, and improving employee attrition. Organisational Justice consists of three dimensions - distributive, procedural and interactional (Colquitt, 2001).

Interactional justice can help support employee engagement and communication by building relationships using a) interpersonal justice - that describes the level of respect perceived by employees, and b) informational justice - which is employee perception around communication and engagement. The research does contain limitations related to potential bias during construct development, and self-report variables utilised the same source, which again raises questions of bias.

5.2 **Practical Implications**

In research exploring new technology using TAM, Ebardo (2018) argues user training enhances PU and PEOU, and the quality of training can also positively influence PU and PEOU. Adequate training was found to be critical to the success of new technology being adopted by users. Limitations of the research include its application just one institution and its mainly student demographic (Ebardo, 2018). The findings of Ebardo (2018) are consistent with those of Huang et al. (2012) who researched emerging technology usage using TAM, and found employees who received adequate training before technology implementation will increase PEOU and decrease employee resistance. The research also found organisations who share knowledge, resources and opportunities to employees will also increase PEOU and decrease employee resistance. Limitations to the research did exist in that it only focused on one technology, and the research took place during one point in time (Huang et al., 2012).

Boston Consulting Group (2018) point out that for DT to be a success the organisations employees must be engaged, with leadership from executive level to frontline leaders playing a key role. A suggestion by Guinan et al. (2019) is to promote the idea of creating psychological safe zones as a platform to share information, feedback, ideas and training with employees. The customer knowledge that frontline employees possess should be nurtured by organisations as part of technology and product development, as it can lead to higher employee engagement and build customer relationships, potentially increasing sales (Schwaferts & Baldi, 2018). Employees engaged in DT are more likely to invest their time in creating new ideas within the workplace, even outside of

work time (Schwaferts & Baldi, 2018). A weakness of the research carried out by Schwaferts and Baldi (2018) is it was specific to organisations in a single country.

Hicks (2019) warns organisations that embark on DT without having employees on board will fail to meet their objectives. It has been found that communication at the early stage of DT can not only have a major positive effect on employee acceptance of technology, but also on society's acceptance of DT (Klewes, 2017). Organisations can drive communication by investing in a centralised communication platform where organisational news, strategic updates, training documents and general information can be shared (Hicks, 2019). Research by Wolf et al. (2018) identifies transparent employee communication as a key driver in successful DT, as it enables employees to understand the organisation's objectives and allows time for the employee to process the changes.

In the present study, line managers highlighted their personal strength around capability, and their team's togetherness. Organisations rolling out DT processes should retain and employ those who possess the competencies and capabilities to successfully manage the change processes, while also investing in training programmes that will build the competencies required for DT (Butschan et al., 2018). Giving managers a voice when it comes to the training strategy can provide a sense of ownership, adding value to the DT process. Capability for teamwork is another key factor in DT, as it helps foster reliable team workflows that add value to the organisation during the digital change, with teamwork seen as an employee's ability to efficiently collaborate with peers to solve complex issues (Butschan et al., 2018). A limitation of the study is that it focused on one industry in one country (Butschan et al., 2018).

5.3 **Limitations**

This study has a number of limitations, which provide useful starting points for future research. Foremost of them is the fact the participants were confined to a single organisation, and generalisability is limited. Participants were questioned on just one technology during one period of time, which coincided with a

large technology release as part of the organisation's DT strategy. It is possible that some of the participants were suffering from change fatigue (Camilleri et al., 2018).

Participant demographic data was not recorded as part of this research, which is a limitation. The convenience sampling method used has been linked with unspecified biases (Robson, 2002). The research solely focused on post launch data, and did not explore pre-launch information, which is a limitation of the study. The study uses TAM to investigate technology acceptance, and updated variations of the model do exist which may have impacted the findings of the study.

5.4 **Strengths and Future Research**

The research objective was to ascertain how accepting frontline workers and line managers are towards DT, with the technology focus being on a chatbot tool. This research has filled an identified gap in literature, and furthermore, the study design enables it to be replicated for non-chatbot research, as other emerging technologies are rolled out commercially. Additional roles beyond frontline staff and line managers can also be explored using the study design.

The study was undertaken by an insider researcher who had access to the technology being researched and the participant sample base. The organisation is at the forefront of emerging technology adoption, which was valuable for communicating with participants through several tools and channels. The researcher was also under no restrictions from the organisation when it came to contacting potential participants.

Future research should expand on this study, using a larger, multi organisational and randomised sample to gain a broader representation of how accepting frontline staff and line managers are towards DT. A consideration for such a study would be the phase of DT each organisation is in, as it could impact the results. Greater qualitative research could deliver new insights around technology acceptance and resistance to change.

Another suggestion for future research is to capture demographic data from participants, which may lead to richer findings. The inclusion of pre-implementation questionnaires from participants to add greater weight to findings could be a consideration for future research. The inclusion of this information could shed greater light on the statistically significant data found in this research. As the field of data analytics evolves at pace, a much larger data set could yield more comprehensive results.

This research utilised a mixed method design as it helps corroboration between the quantitative and qualitative data, thus increasing validity of the research topics (Kelle, 2006). Without a mixed method design, it is unlikely the link between PEOU and the theme of frontline employee emotions would have been discovered. This is a noteworthy strength of the research.

6. Conclusion

This study is a significant step in the direction of investigating the impact DT has on frontline employees and line managers. It was hypothesized that a significant statistical relationship would exist between the independent variable of role type, and the dependent variables of RTC and TAM. Although no evidence was found to accept the hypotheses, the findings do contribute to knowledge. A significant statistical effect was found when role type and PEOU were measured. The scores for frontline employees' perceived ease of use of VA were significantly lower than that of the line managers. Participant interviews shed light on the factors contributing to the difference in scores, with frontline employees displaying intense emotions driven by a perceived lack of training, communication and engagement when new technologies are released. Researchers and organisations will find this information insightful, as it can support the development of interventions backed by organisational psychology to enhance the usability, training and communication of future technology releases.

During the line manager interviews, each participant did mention their concerns around the effect DT was having on frontline employees, however from an individual perspective they were positive towards DT, although planning and communication were areas identified for improvement. Each participant articulated comfort when discussing their personal capability of managing change during DT, and each commented very positively about their respective team mates when it comes to support. From the questionnaire data captured, PEOU was the only construct with a significant statistical difference between line managers and frontline employees. The present research outlines how TAM and RTC can be leveraged by organisations to measure technology acceptance and employee resistance. Based on the findings, employee resistance and technology acceptance can be influenced by role type. This finding could be of vital importance to organisations, enabling them to prioritise and target specific roles when intervention planning. This could lead to faster rates of acceptance and return on investment.

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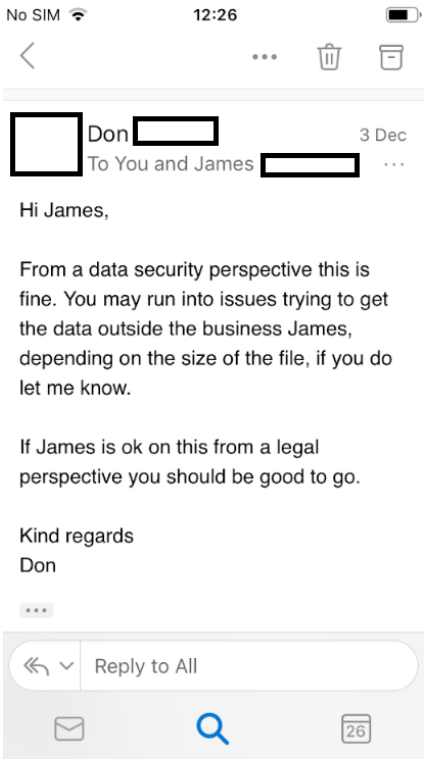
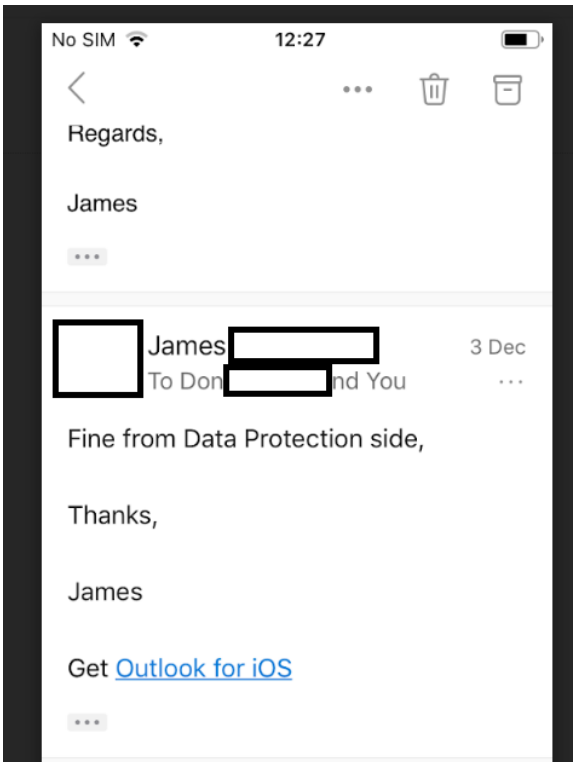
Appendices

Appendix A: Technological terms and definitions

Term	Author	Definition
Digital Transformation (DT).	Westerman, Calméjane, Bonnet, Ferraris, & McAfee (2011).	The use of technology to radically improve the performance or reach of enterprises — is becoming a hot topic for companies across the globe. Executives in all industries are using digital advances such as analytics, mobility, social media, and smart embedded devices — and improving their use of traditional technologies such as ERP (enterprise resource planning) — to change customer relationships, internal processes, and value propositions.
Artificial Intelligence (AI).	Kok, Boers, Kosters, Van der Putten, & Poel. (2002).	Computer systems that think like humans, act like humans, which think rationally, and act rationally.
Chatbot.	McKinsey Global Institute (2017).	An artificial intelligence (AI) system that can communicate with human users, particularly when they are integrated with messaging apps.
Robotic Process Automation (RPA).	McKinsey Global Institute (2017).	A class of robotics embedded in software that can replicate human actions which require interaction with other software systems.

Appendix B: Data security and data protection approval





Appendix C: Information sheet for frontline employees and line managers

Please read carefully.

Invitation
You are invited to consider taking part in this research study. This project is being undertaken by James Fogarty. Before you decide whether you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information sheet carefully and discuss it with friends and relatives if you wish. Please ask if anything is unclear, or if you would like more information. If you have any question regarding the study, please use the following email address: N00182578@student.iadt.ie . This research has been approved by the IADT Institute Research Ethics Committee.

Purpose of the Research
The aim of the current research is to investigate the effects of digital transformation on frontline employees and line managers in the workplace.

Do I have to take part?
You are free to decide whether you wish to take part or not. There is no obligation to participate, and whether or not you choose to do so will have no bearing on future opportunities within the organisation. If you do decide to take part, you will be asked to indicate your consent through completion of a short form. You are free to withdraw from this study at any time and without giving reasons. You can also choose to skip any questions you do not wish to answer.

If I take part, what do I have to do?
You will be asked to complete two questionnaires. The first is titled the Resistance to Change Scale, and the second is titled the Technology Acceptance Model. It will take approximately 10 minutes to answer all questions. The answers and information you give will be anonymous and will not be retained. .

How will the information about me be used and who will have access to it?
The results of this study will be used in a thesis submission for the MSc in Cyberpsychology in the Dun Laoghaire Institute of Art, Design, & Technology. The data collected will be stored securely on a password protected file. The data will be destroyed 1 year after submission of the thesis (unless it is published, in which case it will be 5 years after the submission of the thesis).

Who has reviewed the study?
This study has been approved by the Department of Technology and Psychology Ethics Committee (DTPEC).

What if there is a problem?
If you have a concern about any aspect of this study, you can contact the researcher who will do everything to answer any questions at N00182578@student.iadt.ie . Alternatively you can contact the research supervisor at Cliona.Flood@iadt.ie .

Thank you for taking the time to read this information sheet.

Appendix D: Consent Form

Consent Form

Please read carefully and select the boxes if you would like to participate in the study.

1. I confirm that I have read and understand the information sheet for the above study. *

- Yes
- No

2. I understand that my participation is voluntary and that I am free to withdraw at any time. *

- Yes
- No

3. I can confirm that I am over 18. *

- Yes
- No

4. I agree to take part in this study *

- Yes
- No

Appendix E: RTCS Questionnaire part 1

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. I generally consider changes to be a negative thing	○	○	○	○	○	○
2. I'll take a routine day over a day full of unexpected events any time	○	○	○	○	○	○
3. I like to do the same old things rather than try new and different ones	○	○	○	○	○	○
4. Whenever my life forms a stable routine, I look for ways to change it	○	○	○	○	○	○
5. I'd rather be bored than surprised	○	○	○	○	○	○
6. If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed	○	○	○	○	○	○
7. When I am informed of a change of plans, I tense up a bit	○	○	○	○	○	○
8. When things don't go according to plans, it stresses me out	○	○	○	○	○	○

RTCS Questionnaire part 2

9. If my boss changed the criteria for evaluating employees, it would probably make me feel uncomfortable even if I thought I'd do just as well without having to do any extra work	○	○	○	○	○	○
10. Changing plans seems like a real hassle to me	○	○	○	○	○	○
11. Often, I feel a bit uncomfortable even about changes that may potentially improve my life	○	○	○	○	○	○
12. When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me	○	○	○	○	○	○
13. I sometimes find myself avoiding changes that I know will be good for me	○	○	○	○	○	○
14. I often change my mind	○	○	○	○	○	○
15. Once I've come to a conclusion, I'm not likely to change my mind	○	○	○	○	○	○
16. I don't change my mind easily	○	○	○	○	○	○
17. My views are very consistent over time	○	○	○	○	○	○

Appendix F: TAM – PU

	Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
1. My job would be difficult to perform without Virtual Assistant	○	○	○	○	○	○	○
2. Using the Virtual Assistant gives me greater control over my work	○	○	○	○	○	○	○
3. Using the Virtual Assistant improves my job performance	○	○	○	○	○	○	○
4. The Virtual Assistant addresses my job-related needs	○	○	○	○	○	○	○
5. Using the Virtual Assistant saves me time	○	○	○	○	○	○	○
6. Virtual Assistant enables me to accomplish tasks more quickly	○	○	○	○	○	○	○
7. Virtual Assistant supports critical aspects of my job	○	○	○	○	○	○	○
8. Virtual Assistant allows me to accomplish more work than would otherwise be possible	○	○	○	○	○	○	○
9. Using the Virtual Assistant reduces the time I spend on unproductive activities	○	○	○	○	○	○	○
10. Using the Virtual Assistant changes my effectiveness on the job	○	○	○	○	○	○	○
11. Using the Virtual Assistant improves the quality of the work I do	○	○	○	○	○	○	○
12. Using the Virtual Assistant increases my productivity	○	○	○	○	○	○	○
13. Using the Virtual Assistant makes it easier to do my job	○	○	○	○	○	○	○
14. Overall, I find the Virtual Assistant useful in my job	○	○	○	○	○	○	○

Appendix G: TAM - PEOU

	Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
1. I often become confused when I use Virtual Assistant	○	○	○	○	○	○	○
2. I make errors frequently when using Virtual Assistant	○	○	○	○	○	○	○
3. Interacting with Virtual Assistant is often frustrating	○	○	○	○	○	○	○
4. I need to consult user support often when using Virtual Assistant	○	○	○	○	○	○	○
5. Interacting with Virtual Assistant requires a lot of my mental effort	○	○	○	○	○	○	○
6. I find it easy to recover from errors encountered while using Virtual Assistant	○	○	○	○	○	○	○
7. The Virtual Assistant is rigid and inflexible to interact with	○	○	○	○	○	○	○
8. I find it easy to get the Virtual Assistant to do what I want it to do	○	○	○	○	○	○	○
9. The Virtual Assistant often behaves in unexpected ways	○	○	○	○	○	○	○
10. I find it cumbersome to use the Virtual Assistant	○	○	○	○	○	○	○
11. My interaction with the Virtual Assistant is easy for me to understand	○	○	○	○	○	○	○
12. It is easy for me to remember how to perform tasks using the Virtual Assistant	○	○	○	○	○	○	○
13. The Virtual Assistants provides helpful guidance in performing tasks	○	○	○	○	○	○	○
14. Overall, I find the Virtual Assistant easy to use	○	○	○	○	○	○	○

Appendix H: Questionnaire debrief

Debrief

Thank you very much for taking part in this research study

The study in which you just participated was designed to investigate the impact of digital transformation on frontline employees and line managers.

If you have questions about this study or you wish to have your data removed from the study before the 14th February, please contact the researcher at the following e-mail address: N00182578@student.iadt.ie . Alternatively, you may contact the research supervisor, Cliona Flood at Cliona.Flood@iadt.ie .

Thank you sincerely for contributing, and please be assured your data is confidential and anonymous. If published, the data will not be in any way identifiable as yours.

If you have been affected by the content of this study in any way, the organisations below may be of assistance:

www.aware.ie or contact Aware on 1800 80 48 48 (Ireland)
www.samaritans.org or contact Samaritans on 116 123 (Ireland)
www.richmond.org.mt or contact Richmond on 1770 (Malta)

Appendix I: Interview information sheet

Please read carefully.

Invitation
You are invited to consider taking part in this research study. This project is being undertaken by James Fogarty. Before you decide whether you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information sheet carefully and discuss it with friends and relatives if you wish. Please ask if anything is unclear, or if you would like more information. If you have any question regarding the study, please use the following email address: N00182578@student.iadt.ie . This research has been approved by the IADT Institute Research Ethics Committee.

Purpose of the Research
The aim of the current research is to investigate the effects of digital transformation on frontline employees and line managers in the workplace.

Do I have to take part?
You are free to decide whether you wish to take part or not. There is no obligation to participate, and whether or not you choose to do so will have no bearing on future opportunities within the organisation. If you do decide to take part, you will be asked to indicate your consent through completion of a short form. You are free to withdraw from this study at any time and without giving reasons. You can also choose to skip any questions asked by the interviewer.

If I take part, what do I have to do?
You will be asked questions about leadership style, training, engagement and change in the workplace . The answers and information you give will be anonymous and completely confidential. The interview will be recorded using a voice recorder and will be transcribed.

How will the information about me be used and who will have access to it?
The results of this study will be used in a thesis submission for the MSc in Cyberpsychology in the Dun Laoghaire Institute of Art, Design, & Technology. The data collected will be stored securely on a password protected file. The data will be destroyed 1 year after submission of the thesis (unless it is published, in which case it will be 5 years after the submission of the thesis).

Who has reviewed the study?
This study has been approved by the Department of Technology and Psychology Ethics Committee (DTPEC).

What if there is a problem?
If you have a concern about any aspect of this study, you can contact the researcher who will do everything to answer any questions at N00182578@student.iadt.ie . Alternatively you can contact the research supervisor at Cliona.Flood@iadt.ie .

Thank you for taking the time to read this information sheet.

Appendix J: Interview informed consent

Consent Form

Please read carefully and select the boxes if you would like to participate in the study.

1. I confirm that I have read and understand the information sheet for the above study. *

- Yes
- No

2. I understand that my participation is voluntary and that I am free to withdraw at any time. *

- Yes
- No

3. I can confirm that I am over 18. *

- Yes
- No

4. I agree to take part in this study *

- Yes
- No

Appendix K: Interview debrief

Debrief

Thank you very much for taking part in this research study

The study in which you just participated was designed to investigate the impact of digital transformation on frontline employees and line managers.

If you have questions about this study or you wish to have your data removed from the study before the 14th February, please contact the researcher at the following e-mail address: N00182578@student.iadt.ie . Alternatively, you may contact the research supervisor, Cliona Flood at Cliona.Flood@iadt.ie .

Thank you sincerely for contributing, and please be assured your data is confidential and anonymous. If published, the data will not be in any way identifiable as yours.

If you have been affected by the content of this study in any way, the organisations below may be of assistance:

www.aware.ie or contact Aware on 1800 80 48 48 (Ireland)
www.samaritans.org or contact Samaritans on 116 123 (Ireland)
www.richmond.org.mt or contact Richmond on 1770 (Malta)

Appendix L: RTC, PU and PEOU Cronbach Alpha scores

RTC

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.827	.829	17

PU

PU Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.946	.945	14

PEOU

PEOU Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.834	.842	14

Appendix M: DTPEC Approval

Tue 28/05/2019 09:53

Sinead Meade <Sinead.Meade@iadt.ie>

Re: [External Email] Ethics A Form & Letter

To James Fogarty; Robert Griffin

We removed extra line breaks from this message.

Your application for ethical approval for your MSc Cyberpsychology research project has been approved by the Department of Technology and Psychology Ethics Committee.

We wish you the very best with your project.

Best wishes,
Sinéad Meade

Assistant Lecturer,
Department of Technology & Psychology,
Dun Laoghaire Institute of Art, Design and Technology (IADT), Kill Avenue, Dun Laoghaire, Co. Dublin.????????

From: James Fogarty <jamesfogarty@gmail.com>
Sent: 16 April 2019 16:38
To: Sinead Meade; Robert Griffin
Subject: [External Email] Ethics A Form & Letter

[EXTERNAL EMAIL]
Please report any suspicious attachments, links, or requests for sensitive information.

Hi Sinead and Robert,

Please find attached my ethics A form and employer letter.

Should I need to include anything else please let me know.

Regards,

James

Appendix N: SPSS Multiple regression output

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.517[a]	.267	.235	.36621

a. Predictors: (Constant), PEOU, RTC, PU

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.325	3	1.108	8.264	.000[b]
	Residual	9.120	68	.134		
	Total	12.444	71			

a. Independent Variable: Role Title

b. Predictors: (Constant), PEOU, RTC, PU

Descriptive Statistics

	Mean	Std. Deviation	N
Role Title	1.2222	.41866	72
RTC	3.25000000	.456793461	72
PU	4.19543651	1.25012176	72
PEOU	3.37698413	.788974599	72

Appendix N (continued)

SPSS Multiple regression output

Correlations

		Role Type	RTC	PU	PEOU
Pearson Correlation	Role Type	1.000	-.139	.125	.434
	RTC	-.139	1.000	-.114	.157
	PU	.125	-.114	1.000	-.175
	PEOU	.434	.157	-.175	1.000
Sig. (1-tailed)	Role Type	.	.123	.147	.000
	RTC	.123	.	.171	.094
	PU	.147	.171	.	.071
	PEOU	.001	.094	.071	.
N	Role Type	72	72	72	72
	RTC	72	72	72	72
	PU	72	72	72	72
	PEOU	72	72	72	72

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.644	.400		1.611	.112	-.154	1.441					
	RTC	-.179	.097	-.195	-1.850	.069	-.372	.014	-.139	-.219	-.192	.968	1.033
	PU	.064	.035	.190	1.797	.077	-.007	.134	.125	.213	.187	.962	1.040
	PEOU	.264	.057	.498	4.677	.000	.152	.377	.434	.493	.486	.950	1.052

a. Dependent Variable: Role Type

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	RTC	PU	PEOU
1	1	3.881	1.000	.00	.00	.00	.00
	2	.082	6.898	.00	.01	.64	.17
	3	.030	11.455	.03	.24	.18	.75
	4	.008	22.203	.96	.75	.18	.08

a. Dependent Variable: Role Type

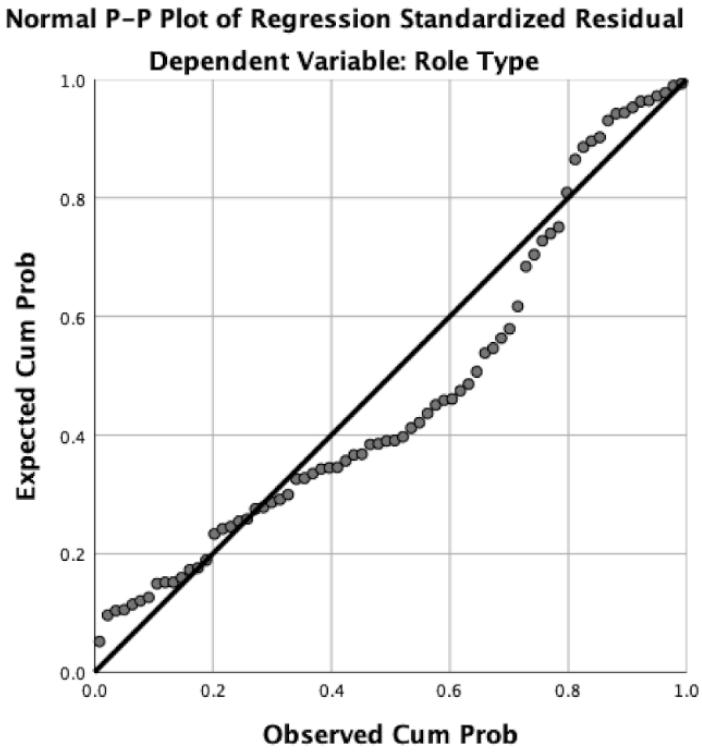
Appendix N (continued)

SPSS Multiple regression output

Residuals Statistics[a]

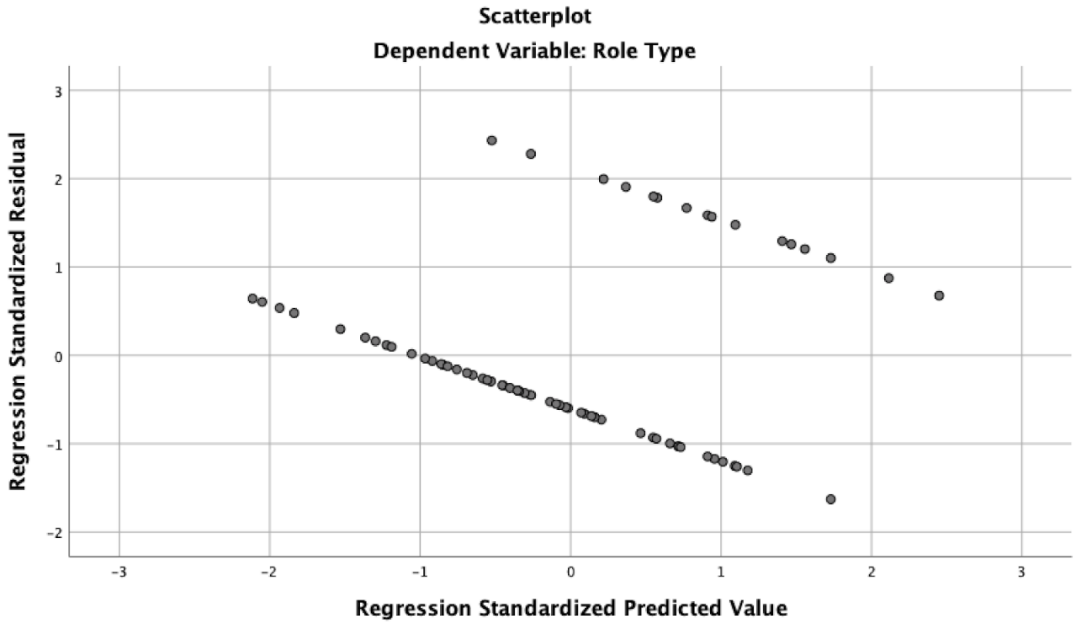
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.7647	1.7523	1.2222	.21640	72
Std. Predicted Value	-2.114	2.450	.000	1.000	72
Standard Error of Predicted Value	.048	.170	.083	.025	72
Adjusted Predicted Value	.6998	1.7222	1.2212	.21711	72
Residual	-.59644	.89111	.00000	.35839	72
Std. Residual	-1.629	2.433	.000	.979	72
Stud. Residual	-1.683	2.458	.001	1.000	72
Deleted Residual	-.63691	.90910	.00104	.37426	72
Stud. Deleted Residual	-1.707	2.556	.007	1.013	72
Mahal. Distance	.258	14.373	2.958	2.604	72
Cook's Distance	.000	.055	.011	.013	72
Centered Leverage Value	.004	.202	.042	.037	72

a. Dependent Variable: Role Type



Appendix N (continued)

SPSS Multiple regression output



Appendix O: SPSS PEOU Independent t-test output

Group Statistics

	Role	N	Mean	Std. Deviation	Std. Error Mean
PEOU	1.00	56	3.19515306	.765742764	.102326681
	2.00	16	4.01339286	.490881998	.122720500

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
PEOU	Equal variances assumed	9.193	.003	-4.033	70	.000	-.81823980	.202906016	-1.2229231	-.41355651
	Equal variances not assumed			-5.121	38.087	.000	-.81823980	.159784451	-1.1416822	-.49479742