How Psychological Safety Affects the Success of Digital Transformation Projects

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Thesis submitted for the degree of Masters by Research

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ABSTRACT

**Purpose:** The rise of technology and its seamless integration into everyday life has become a business imperative but the performance of digital transformation projects has been inconsistent. This research addresses this literature shortcoming by examining the causal mechanisms underpinning the success of digital transformation project success by conceptualising psychological safety as the antecedent, and role conflict and trust as mediators. Although some research has been conducted in different project environments, such as the construction industry, digital transformation project environments remain relatively untouched regarding the impact of psychological safety, trust, and role conflict.

**Methodology:** Drawing on psychological safety theory, a nomological network was conceptualised and empirically tested to discover the possibility of the proposed sequence of causal mechanisms. Survey data from 256 participants who worked in digital transformation projects within their organisations in Australia were collected to seek support for hypothesised relationships between psychological safety, role conflict, trust, and digital transformation project success to test this original conceptualisation.

**Results:** This study revealed that it is possible to achieve digital transformation project success by managing role conflict, trust, and psychological safety factors in the digital transformation project environment. The statistical results demonstrated that psychological safety, role conflict, and trust have a direct and/or indirect connection with digital transformation project success, while psychological safety also affects role conflict directly and significantly. Trust has a significant impact on digital transformation project success. In contrast, role conflict and psychological safety's direct effects on digital transformation projects are insignificant. Psychological safety has a significant adverse impact on role conflict and a significant direct impact on trust. Role conflict also has a significant adverse impact on trust. Psychological safety indirectly and positively impacted digital transformation project success via trust, however, not via role conflict.

**Originality and Implications:** Empirical validation of psychological safety's direct and indirect effects on the success of digital transformation projects via role conflict and trust mediation are new discoveries in the literature which have substantial implications for both theory and practice. The connections identified within the framework demonstrated the importance of psychological factors for the success of digital transformation projects for project managers,
project sponsors and at executive level. Besides its contribution to the business world, psychological factors contributed to psychological safety theory by offering two new mediators: role conflict and trust.

**Keywords:** Psychological Safety, Role Conflict, Trust, Project Management, Digital Transformation, Project Success, Quantitative Research, Survey, Psychological Safety Theory
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CANDIDATE DECLARATION

I, Kerem Pala, declare that this thesis is my own original work and does not contain material that has been accepted for the award of any other degree or diploma [except where referenced in the text].

To the best of the candidate’s knowledge this thesis contains no material previously published or written by another person except where due reference is made in the text. [Where the work is based on joint research or publications, I have disclosed the relative contributions of the respective creators or authors using the Authorship Declaration Form.]

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CHAPTER 1 – INTRODUCTION

1.1 Background

Digital transformation has been defined as using new digital technologies, such as mobile, artificial intelligence, cloud, blockchain, and Internet of Things, to enable significant business improvements for better consumer experience, to facilitate operations, or to develop new business models (Warner & Wäger 2019). One of the primary purposes of digital transformation is to utilise digital technologies to accurately predict changes in consumer choice and to provide better product and service experience (Li 2022).

Research on digital transformation comes from diverse perspectives, such as marketing, information systems, and operational and strategic management. Scholars have pinpointed three steps in this transformation journey: a) digitisation, b) digitalisation, and c) digital transformation (Christodoulou et al. 2022). Digitisation is an introduction to modern technology but also incorporates a change in managerial approach, company culture, and how to retain existing customers meaningfully and gain new ones competitively (Ilin, Levaniuk & Dubgorn 2021). Digitisation translates information from analogous to digital sources (Christodoulou et al. 2022), while digitalisation describes the growing uptake of digital technologies and how they permeate the firm’s products and activities (Danuso, Giones & da Silva 2022). In the banking industry, digitalisation is used for a range of tasks including improving customer experience, risk assessment, customer segmentation, credit card fraud detection, and providing online customer support (Gürsoy & Varol 2021). However, digital transformation goes further and refers to the application of new digital technologies to grow, improve, or expand a company (Blanka, Krumay & Rueckel 2022). Digital transformation also identifies relationships between the use of digital technologies, disruptive phenomena, and the response of organisations to tap opportunities afforded by digital technologies (Blanka, Krumay & Rueckel 2022). Within the recent context of COVID-19 and potential future pandemics, digital transformation is a necessary and critical process for the development of businesses to preserve their entirety, competitive advantage and survival (Miethlich et al. 2022).

Despite their enormous potential impact on corporate success, digital transformation projects are prone to fail if they are mismanaged (Maximilian et al. 2016). The literature
broadly indicates that the success rates of digital transformation projects are significantly
doubtful inside organisations (Kala Kamdjoug 2023). Contemporary literature demonstrates
that failure of digital transformation projects is a major issue in this context with 84% of
companies reporting failure at digital transformation (Kozak-Holland & Procter 2019).
Furthermore, McKinsey and Co. expressed that only 16% of companies enhance their
performance via digital transformation projects, and about 70% of business transformations
fail, raising the question of how to improve digital transformation initiatives and performance
(Fabac 2022). The low success rate of digital transformation across various industries has led
researchers to analyse digital transformation success factors and the barriers, drivers,
enablers, and performance frameworks (Fabac 2022). The potential cause of failure for digital
transformation projects may be due to various dependencies and impacts. While some
reasons for failure may be initial erroneous assumptions such as improper project scope or
budget planning, the corporate world also has some problems with project management.
Deloitte indicated that the primary reason why digital transformation projects experience
disappointment is due to the human factor, especially employee resistance to change and the
managerial approach that causes 70% of digital transformation efforts to fail in practice
(Fabac 2022). When the subject is motivation or people psychology, a key factor for
consideration can be interpersonal relationships between project members and
management. Such relationships may be influenced by the psychological status of project
team members. This research is motivated by this stream of literature to suggest that
psychological factors underpin project performance.

This research examines the confluence of psychological safety, role conflict and trust on the
success of digital transformation projects by analysing the cognitive underpinnings of digital
transformation project contexts. Specifically, this research conceptualises psychological
safety as the antecedent mechanism that affects digital transformation projects in a number
of ways such as indirect effects via other psychological components such as trust and role
conflict among project team members. This nomological network suggests a sequence of
causal mechanisms undergirding digital transformation project success is empirically tested
from the survey of 256 participants in Australia who were participants in digital
transformation projects within their organisations. Structural equation modelling (SEM) is
employed to statistically test hypotheses, suggesting direct and indirect effects of
psychological safety through role conflict, and trust relating to the success of digital transformation projects. Empirical validation of psychological safety's direct influence on role conflict and its indirect impact on digital transformation projects via role conflict and trust are new findings, which have significant implications for both theory and practice. This contributes to the psychological safety literature by connecting psychological safety with role conflict and trust. For practice, this study delivers substantial guidelines to project professionals by highlighting the significance of psychological aspects to be considered for digital transformation project success. The literature has shown the impact of role conflict and trust on different project conditions. However, to my knowledge, there has not been any study that analyses and synthesises role conflict, trust, and psychological safety within an integrated framework. Therefore, the findings from this study constitute an important contribution to theory and practice.

1.2 Statement of the problem and purpose of the study

Digital transformation is a complex project that firms launch to shape their future operations and transform their businesses (Srisathan & Naruetharadhol 2022). Digital transformation is becoming a critical element of an organisation’s business strategy. Initially, digital transformation was an investment for tech-related organisations or industries. However, with the impact of globalisation, increasing customer demands and competitive industry markets encourage executives to plan their digital transformation journey to align with technological advancement in their respective industries. Most organisations face challenges, sometimes even failure, or require extra funding to complete their transformation journey. Therefore, the implementation of robust digital transformation for enterprises has attracted scholarly attention (Zhao et al. 2022). With 45% of digital transformation projects achieving less than favourable benefits as a part of transformation, there is still a lot of research that needs to be conducted regarding its successful development and implementation across organisations (Sanchez-Segura et al. 2022). Organisations have paid more attention to ensuring their costly digital transformation projects were appropriately managed to avoid potential investment failures. There can be various reasons for potential investment failures such as initial inaccurate project planning estimations and analysis.
This research focuses on psychological safety, role conflict, and trust to explore their relationships concerning the success of digital transformation projects. To establish the research purpose, an initial review of the literature was conducted. The review encompassed both academic literature and industry reports, revealing a high tendency for failure in digital transformation projects (Andriole 2020; Gouveia & São Mamede 2022; Uchihira 2022). Consequently, digital transformation projects have been selected as the contextual setting for this research.

Following this step, a thorough literature review was conducted to identify potential research gaps and theoretical frameworks examining the success of digital transformation projects. To my knowledge, there are no studies in the literature that examine how the psychology of project team members shapes the outcomes of digital transformation projects. Considering this discovery, antecedent and potential mediating mechanisms for digital transformation projects were identified, primarily from the team psychology domain. Within this literature, psychological safety has been considered the principal driving mechanism for both individual and organizational performance (Edmondson 1999). This thesis extends the theorization of psychological safety to the project management domain by suggesting psychological safety as an antecedent mechanism influencing digital transformation success both directly and indirectly.

This conceptualization proposes that since psychological safety provides team members with a shared cognitive perception—making them feel safe to articulate and initiate change—it might enable various positive outcomes, such as work engagement, task performance, and knowledge sharing (Edmondson 1999). Within this theoretical framework, this research also examined whether intervening mechanisms need to exist to link psychological safety to digital transformation project success. The potential intervening or mediating mechanisms identified were role conflict and trust, following a review of the extant literature. Thus, the conceptual framework for this study suggests that psychological safety, as an antecedent, affects digital transformation success directly and indirectly via role conflict and trust.

Theoretically, this research utilized psychological safety as an antecedent to investigate its direct and indirect effects on role conflict, trust, and ultimately, digital transformation projects. This research uncovered the effects of psychological safety levels, trust, and role
conflict among project members in digital transformation projects. The results of this study revealed the direct effect of psychological safety on digital transformation success and the indirect effect via role conflict and trust among project team members.

1.3 Research question

The research question is the driving force for most empirical studies through synthesising multiple sources to explain the unique research topic (Arnesen 2020). An established way of reaching a primary research question is by finding or forming gaps in existing theories and literature.

The proposed conceptual framework has been developed with the support of a detailed review of all relevant constructs to ensure the research model provides a new contribution to theory and practice. The relationships between psychological safety, role conflict, trust, and digital transformation success have not been previously examined. Thus, this study contributes to the literature by providing new insights on how psychological safety, role conflict, and trust combine to influence digital transformation success. The findings from this study aim to answer the following research question:

“How does psychological safety affect the success of digital transformation projects?”

1.4 Significance of the study

Digital transformation projects generally have a wide scope of digitalisation or transformation strategies. Increasing competition within industries has resulted in organisations positively moving towards digital transformation implementation for product or service offerings, thus allowing competitive advantage maintenance (Liu, Du & Li 2023). Most of the time, digital transformation projects impact multiple divisions within an organisation, including some large-scale sub-projects. In addition, digital transformation has the potential to internally transform technology processes (Zhuo & Chen 2023).

However, digital transformation project complexity or lengthy implementation periods are not the only factors for consideration. These projects are also costly investments for
businesses. Considering their complexity, and potential capital investment, proper management is critical for the organisation to avoid potential failure. Almost half of organisations highlighted that implementing digital transformation projects successfully within their organisation is one of their greatest challenges (Guinan, Parise & Langowitz 2019). Therefore, organisations ensure their investments will result in desired outcomes. However, potential dependencies to have a successful project outcome from a digital transformation journey can include improper project management, project scope that is not in alignment with organisational strategic direction, and lack of employee skillsets based on the nature of the project.

An obstacle for successful digital transformation is a lack of understanding about the concept of digitalisation, resulting in an ambiguous business strategy that does not align with desired goals and objectives (Abdellah et al. 2022). Although there are different triggers for whether project outcomes are satisfactory for the organisation, most reasons are people dependent, as the project team is the most crucial element of the digital transformation journey. When considering project teams and team members, psychological status or feelings are critical drivers. Therefore, this study discovered the potential impact of project team members' psychological safety status, trust feelings towards each other, and role conflict situations, and the impact of these factors on the success of digital transformation projects.

Digital transformation projects tend to fail due to their complex, long-term nature. As the project team is a critical component, this research highlights the potential impact of psychological status and relationship approaches of project team members with regard to the success of digital transformation projects. This study can guide government and private sector executives to consider psychological aspects and impacts on their current and future digital transformation projects. The results of this study aim to highlight to digital transformation project professionals the importance of psychological elements that require consideration when developing a digital transformation project strategy. This study introduced role conflict and trust and their mediation effects to provide a different view about the importance of psychological safety status of the project team and its impact on digital transformation success. Thus, project managers, project sponsors and executives can draw on the findings from this study of 256 project professionals' experience in different industries with different
project scopes and complexities. This study revealed it is possible to improve digital transformation project success probability to manage role conflict, trust, and psychological safety factors successfully in the digital transformation environment. The significance of findings from this study aim to counter the 70% failure rate of digital transformation projects (Sanchez-Segura et al. 2022).

Apart from the practical importance of the study, this research also contributes to the literature and psychological safety theory via role conflict, psychological safety, trust, and digital transformation success concepts. Digital transformation literature can be enriched by psychology concepts as people are the main contributing factor to the success of digital transformation projects. This research uncovers and explains the impact of psychological safety, trust, and role conflict concepts on the success of digital transformation projects by applying a quantitative research method. There is no holistic study in the literature that covers and tests these concepts within a digital transformation project environment. Therefore, this study makes a new contribution to the literature by focusing on finding the answer to the research question, "How does psychological safety affect the success of digital transformation projects?"

This research was conducted by testing five hypotheses to explore every potential aspect of the research model. Hypothesis 1 examined the direct impact of psychological safety on role conflict. This hypothesis revealed whether the psychological safety status of project team members during digital transformation projects had any direct connection with role conflict between team members.

Hypothesis 2 focused on psychological safety’s indirect effects on trust status via the mediation influence of role conflict. The results showed that role conflict impacted the connection between psychological safety and trust status of project team members.

Hypothesis 3 explored indirect effects of psychological safety on digital transformation project success via the mediation influence of role conflict. This hypothesis demonstrated whether role conflict in a digital transformation environment could affect the association between psychological safety and digital transformation success.
Hypothesis 4 analysed psychological safety’s indirect impacts on digital transformation success through trust’s mediation effect. This hypothesis indicated whether trust feelings among project members influence the connection between psychological safety and digital transformation success.

Finally, Hypothesis 5 examined the indirect effects of role conflict on digital transformation project success through trust’s mediation effect. This hypothesis disclosed whether trust affects the connection between role conflict and digital transformation project success. All five hypotheses in this study contribute new findings to the literature by highlighting psychological impacts in the digital transformation environment.

Significantly, this study contributes to psychological safety theory. As this research has been conducted based on Edmondson (1999) theory of psychological safety, the findings contribute to and expand psychological safety theory, by exploring direct and indirect effects on digital transformation project success over new concepts: role conflict and trust.

1.5 Organisation of thesis

The rest of the thesis is structured as follows:

Chapter Two frames the literature under psychological safety, role conflict, trust and digital transformation project concepts and conducts a comprehensive literature review. This chapter concludes by developing the research model with hypotheses.

Chapter Three presents the research design employs quantitative methodology for data capture, construct development and data analysis results by executing SEM which validates the excellent fit model.

Chapter Four provides significant discussion around the research model in the implications section. This chapter presents the impact of psychological safety, role conflict and trust concepts on the success of digital transformation projects. Also, this chapter introduces how this research contributes theoretically and practically to the academic and business world.
Chapter Five presents the conclusion of the study together with limitations and future directions.

1.6 Summary of Chapter 1

This chapter provides an overview of the thesis, detailing the research background and its justification. It introduces the central research problem, defines the scope and objectives of the study, and highlights the importance of understanding the dynamics among psychological safety, role conflict, trust, and the success of digital transformation projects. These dynamics are crucial for enhancing organizational practices and improving project outcomes. The research questions formulated in this chapter serve as guiding principles for the study, shaping the inquiry and structuring the investigation.
Chapter 2 reviews the literature supporting the chosen research model. The literature review presents an overview of research concepts by analysing related studies with psychological safety, digital transformation, role conflict, and trust concepts to explore existing studies in support of the identified research gap.

The primary objective of the literature review is to establish the foundation for the present study by examining the literature on psychological safety, role conflict, trust, and their relationship to digital transformation project success. This section includes comprehensive conclusions that synthesise the research findings, prior studies, and potential directions for future research. By analysing the literature review, the identified gaps were addressed, and a research model was developed accordingly. The outcomes of this literature review have significantly influenced the design and structure of this research.

**2.1 Psychological safety**

**2.1.1 Definition of psychological safety**

Edmondson (1999) developed the concept of team psychological safety at Harvard University in 1999, and this concept has been researched ever since in numerous academic studies (Cauwelier 2019). Psychological safety is defined as “a shared belief held by members of a team that the team is safe for interpersonal risk taking” (Edmondson 1999, p. 350). This definition is also described as a collective belief among individual team members that the team fosters a secure environment for taking interpersonal risks (Mellor 2022). Psychological
safety refers explicitly to a person’s view of their comfort level in expressing themselves without worrying about adverse effects on self-image, status, or job (Men et al. 2020). As such, psychological safety inspires team members to be open and honest enough to attempt new things (Swart, Bond-Barnard & Chugh 2022), encouraging expressing ideas without hesitation and discussing issues without worrying (Demirkesen, Sadikoglu & Jayamanne 2021). More importantly, it refers to an individual’s ability to be authentic and true to themselves without fear of negative repercussions or harm to their reputation within the organisation (Hu et al. 2023).

2.1.2 Establishing psychological safety in organisations

To develop high levels of psychological safety within an organisation, the initial step involves assessing the current state of the organisation (Gomez et al. 2019). This can be accomplished through various channels such as attending site orientations, daily meetings, or administering qualitative and quantitative questionnaires and interviews to gauge the level of psychological safety that exists within the organisation and its culture (Gomez et al. 2019). Using open-ended questions in the questionnaire, such as "What makes you feel safe within the workforce?" or "Do you feel confident to speak up and voice your concerns in the face of adversity?" encourages individuals to draw from their own experiences, capturing more comprehensive information (Gomez et al. 2019). Following the assessment, the results should be discussed to generate positive outcomes and determine the next steps for intervention (Gomez et al. 2019).

Establishing an organisational culture that prioritises innovation and embraces change also activates psychological safety (Ruhl & Lopez 2023). Creating an environment where errors are accepted and supportive practices are in place to learn from mistakes, such as encouraging experimentation and discussing mistakes or failures, helps counter the fear of repercussions and further promotes psychological safety (Rhaiem & Halilem 2023).

Further, leadership plays a pivotal role in fostering psychological safety. Strong leadership that promotes active participation from team members, encourages the consideration of ideas, and invokes curiosity through fostering ownership and individual responsibility towards
projects and outcomes (Gomez et al. 2019). Inclusive leadership, as advocated by Methangkool (2023), involves collective decision making, actively soliciting diverse viewpoints, and encouraging team-building exercises. Inclusive leadership has strong correlations with high psychological safety and its subsequent onflow benefits, as it fosters communication, cross-collaboration, and information sharing (Chen et al. 2023). Joo, Yoon and Galbraith (2023) also contribute to the establishment of psychological safety by stressing leadership as a core strength, and determining factor regarding an employee’s ability to, grow, learn, and collaborate within the organisation and thereby contribute to overall organisational goals and objectives. Empowered leadership is another aspect that drives psychological safety, employee engagement, productivity, and job satisfaction (Joo, Yoon & Galbraith 2023). Empowered leadership involves emphasising the significance of work, providing participation in decision making, conveying confidence in performance excellence, and removing bureaucratic constraints (Joo, Yoon & Galbraith 2023). Educated leaders with high psychological awareness are essential in promoting high psychological safety, ensuring a balance between distance and closeness, uniform treatment of subordinates while encouraging individualisation and innovation (Joo, Yoon & Galbraith 2023).

Another effective method for promoting psychological safety is the development of routines aimed at systematically increasing team strength and cohesiveness (Gomez et al. 2019). One such routine, originating at Toyota™, is called Leader Standard Work (Gomez et al. 2019). This practice includes activities that actively foster psychological safety, such as regular check-ins encouraging open discussions about what went well, areas for improvement, and tracking overall project progress (Gomez et al. 2019). These check-ins are built on a foundation of trust and respect, ensuring that individuals can raise concerns without fear of negative consequences (Gomez et al. 2019). By implementing these routines, a team environment can be created where team members feel safe and supported in expressing their thoughts, ideas, and concerns.

2.1.3 Influence of psychological safety on both organisations and employees

Psychological safety is considered an asset to organisations, as it serves as a critical interpersonal resource that facilitates positive outcomes, actions, and ideas among
employees (Paul Vincent et al. 2023). This plays a crucial role in the workforce by fostering a culture that encourages risk-taking, minimises judgment, and supports challenging the status quo (Gerpott et al. 2015). High level psychological safety positively impacts organisational culture, including the ability of individuals with disabilities to disclose their conditions without fear of negative reactions (McIntosh et al. 2023). High levels of psychological safety also contribute to an organisation’s competitive advantage, particularly in risk-taking, innovation, and project teams, where a culture of exploration is critical (Kostopoulos, Bozionelos & Prastacos 2009). By fostering such a culture, organisations can effectively respond to market shifts, seize new opportunities, and remain resilient in the face of uncertainty, ensuring long-term success in an ever-changing landscape (Joo, Yoon & Galbraith 2023). Psychological safety also plays a vital role in promoting knowledge sharing within organisations (Liu 2017). This fosters a positive organisational culture by encouraging knowledge sharing and inclusive leadership, promoting cross-communication, self-efficacy, and innovation (Fernando 2022).

Psychological safety plays a vital role in enabling employees to seize opportunities, adapt to changing circumstances, and think independently, ultimately enhancing their agile performance (Cai et al. 2018). In environments with high psychological safety, individuals are more willing to take risks, be creative, provide constructive feedback, and make recommendations for continuous improvement (Gerpott et al. 2015). This sense of safety fosters an environment where individuals feel comfortable experimenting, learning from failures, and embracing innovation (Kark & Carmeli 2009). When team members feel confident and safe in expressing their true identities and ideas without endangering themselves, it cultivates a sense of safety (Chaudhary 2019). This also facilitates learning behaviour, creative work, and innovation, as individuals feel comfortable expressing themselves and addressing unfavourable issues or suggesting improvements (Li et al. 2010). Employees need to feel psychologically safe when they provide suggestions about their responsibilities and share feedback about their unsatisfactory performance (Khan et al. 2020). When employees perceive a high level of psychological safety, they are more likely to take interpersonal risks and express their concerns or opinions, even in the face of anticipated resistance (Liu 2017). When team members feel comfortable expressing themselves and taking risks with others, they expect to be in a psychological state known as psychological safety, indicated by interpersonal trust and reciprocal respect (Lin et al. 2020). A high level of
psychological safety creates an environment where individuals are free to speak their minds, share opinions, and take risks, which are crucial elements for fostering creativity and innovation in the workplace (Iqbal, Nazir & Ahmad 2022).

A positive psychological safety climate fosters knowledge exchange, new ideas, and the integration of new information, ultimately changing individuals' attitudes (Gerpott et al. 2015). Creativity is directly influenced by psychological safety, as it allows employees to depart from the status quo, take unconventional approaches, and contribute novel and valuable ideas to the organisation (Liu 2017). By reducing barriers to judgment, employees feel empowered to share their knowledge, encourage cross-collaboration, and foster a creative environment (Liu 2017). This, in turn, enhances company innovation, which is instrumental in developing competitive advantage across various aspects of the business (Liu 2017).

On the other hand, a lack of psychological safety leads to individual disengagement and hinders knowledge sharing (Agarwal & Anantatmula 2022). Low levels of psychological safety are defined by actions such as utilising your voice, raising concerns, or presenting innovative ideas that pose high interpersonal risk (Li et al. 2010). As psychological safety determines individual behaviour, low psychological safety within an organisation impacts individuals as they feel intimidated, show reluctance to request assistance and raise concerns due to their fear of judgement and discrimination (Gomez et al. 2019). Low psychological safety leads individuals to view the organisational environment negatively, resulting in behaviours such as concealing information, disruptive learning, and silence (Pratt et al. 2023). A lack of psychological safety also impacts the process of learning from failure as individuals are too afraid to voice their concerns or challenge the status quo to even attempt change or progress where failure might be a learning outcome (Schöttle, Christensen & Arroyo 2019). When psychological safety does not exist within an organisation, an individual will not feel empowered to freely voice their thoughts for fear of disapproval, negative consequences and demonstrating incompetence (Schöttle, Christensen & Arroyo 2019). Low psychological safety also leads to reduced creativity, motivation, and performance, hindering an organisation’s ability to achieve its goals and objectives (Jha 2023).
2.1.4 Summary of findings from the literature review

This section offers a comprehensive overview of previous research conducted in the field of psychological safety, highlighting key findings and insights. By reviewing the literature already available, this section aims to build upon prior research and contribute to understanding psychological safety in context of this study.

Agarwal and Anantatmula (2022) discussed the importance of psychological safety on the overall impact of knowledge sharing within an organisation and demonstrate through their findings the psychological barriers that hinder this knowledge transfer from occurring. Psychological safety has a mediating role, where high psychological safety encourages knowledge sharing, growth and development while low psychological safety causes anxiety and will promote a defence response in the subordinate to avoid interpersonal risks, resulting in no knowledge sharing and other reclusive behaviour (Agarwal & Anantatmula 2022). An interesting point from their study was the impact of psychological capital, referred to as PsyCap, on an individual’s experience of abusive supervision, subject to self-efficacy, optimism, hope and resilience (Agarwal & Anantatmula 2022). A high PsyCap allows for better coping of stressful situations brought about by abusive supervision and subsequent low psychological safety (Agarwal & Anantatmula 2022). Agarwal and Anantatmula (2022) conducted a study on project-based organisations in the Indian context with 239 subordinate–supervisor pairs participating. The findings of the study concluded that abusive supervisors have a negative impact on knowledge sharing and create a reduction in psychological safety. Education about the impact of negative behaviour counters this behaviour (Agarwal & Anantatmula 2022). A limitation was that the study should not be generalised, as research was conducted in India, being a high-power distance society with future research on other variables encouraged (Agarwal & Anantatmula 2022). The study did not go into detail regarding how information was gathered from participants, whether there was a selection criterion, whether they were from various industries or just one and what questions were asked to derive the findings.

Cauwelier (2019) aimed to uncover whether action learning within an organisation can increase psychological safety. Drawing on the foundations of psychological safety from
Edmondson (1999), Cauwelier (2019) identified that the concept of psychological safety was first derived in 1999 from Harvard University, with Edmondson (1999) defining the concept as a “shared belief by members of a team that the team is safe from interpersonal risk taking” (Cauwelier 2019, p. 68). Where psychological safety is low, this encourages organisational culture to develop less risk taking, to be more reclusive and lacking any form of progressive collaboration or communication (Cauwelier 2019). Further, it is noted that team psychological safety directly impacts team learning (Cauwelier 2019). Cauwelier (2019) also provided evidence from other organisations to understand the causes for high performance teams. Cauwelier (2019) worked with four teams from four organisations in Thailand with the focus being to identify methods to increase psychological safety by distributing a survey to candidates to gather information relating to the level of psychological safety within their organisation. It was identified that action learning sessions within the team had a positive impact on psychological safety due to the action learning environment, fostering five key elements of psychological safety: team leader, trust and respect, organisational support, team habits and practice (Cauwelier 2019). This is due to the encouragement of sharing information such as lessons learnt and what went well, furthering that culture of viewing risk taking and negative outcomes as non-problematic (Cauwelier 2019). Cauwelier (2019) identified that building a high-performance team should involve a commitment to action learning initiatives that will support and foster high levels of psychological safety. Cauwelier (2019) did not specify whether the findings could be generalised; however, due to the size of the study being only four organisations from various industries, a limitation of the study is that it does not appear to be generalisable.

Liu, Keller and Bartlett (2021) examined the impact of psychological safety on knowledge sharing and team creative performance specific to research and development (R&D) teams in Taiwan. As previously discussed, citing the works of Agarwal and Anantatmula (2022) and Cauwelier (2019); Liu, Keller and Bartlett (2021) also discussed the positive impact of psychological safety towards knowledge sharing, and willingness by team members to explore new ideas and to take risks. High psychological safety encourages an environment in which employees can speak up, due to minimal perceived interpersonal risks, the importance of psychological safety and encouraging a psychologically safe culture, critical to enabling knowledge sharing behaviour patterns to develop (Liu, Keller & Bartlett 2021). Agarwal and
Anantatmula (2022) argued that high psychological safety, being a key economic driver, is due to improved productivity; Liu, Keller and Bartlett (2021) stated that knowledge sharing as a result of high psychological safety is imperative to stimulate knowledge transfer across the organisation. Similar to Cauwelier (2019), Liu, Keller and Bartlett (2021) also conducted their study in Taiwan, collecting data via surveys from 143 Taiwanese R&D teams. The survey findings found that individual psychological safety is positively related to knowledge sharing. Overall Liu, Keller and Bartlett (2021) noted there were valuable implications from their study, highlighting the importance of psychological safety for knowledge transfer which has a subsequent positive impact on the development of innovative ideas and increased creativity. Additional findings from their study state that “team initiative climate is an important antecedent of team knowledge sharing and a potential moderator of the relationship between psychological safety and individual knowledge sharing behaviour” (Liu, Keller & Bartlett 2021, p. 505). The implications for practice are that management should incorporate methods to improve and strengthen psychological safety to increase knowledge sharing and enhance team creativity. A limitation of Liu, Keller and Bartlett (2021) study is that the data was exclusively from Taiwan, and specific to R&D teams in the high-tech industry. As a result, they deem their work to not be appropriate for generalisation.

Similar to Liu, Keller and Bartlett (2021), Chandrasekaran and Linderman (2015) focused on the importance of psychological safety on knowledge sharing specific to R&D teams. While Liu, Keller and Bartlett (2021) focused on Taiwanese organisations, Chandrasekaran and Linderman (2015) study was based on American organisations. Therefore, variation in the findings, if any, would be an interesting comparison, which could be attributed to differing cultures and norms and the impact of this environment on an organisational framework within each respective country. Chandrasekaran and Linderman (2015) identified how to manage knowledge creation within high-tech R&D projects utilising a two-phase study. The first phase utilised data acquired from four high-tech business units to determine non-routine knowledge creation with information gathered via interview, observation and reference to archival material (Chandrasekaran & Linderman 2015). The findings were three key components to knowledge creation including team diversity, psychological safety and performance (Chandrasekaran & Linderman 2015). Psychological safety positively correlated with knowledge creation and transfer, as the ability to feel a sense of minimal risk naturally
encourages individuals to voice their concerns, raise issues and discuss ideas, regardless of how favourable the concepts may be (Chandrasekaran & Linderman 2015). In reference to the correlation between performance and knowledge transfer, as knowledge is power, knowledge is seen as a competitive advantage amongst individuals and therefore a driving force towards increasing productivity and performance. The second phase of Chandrasekaran and Linderman (2015) study is survey data from 110 R&D projects from 34 high technology business units from five industry segments. Their findings reported that team diversity is positively associated with objective knowledge and psychological safety is positively associated with intuitive knowledge (Chandrasekaran & Linderman 2015). The limitations of this study were minimal diversity of organisational size, as firms only came from highly competitive clock speed industries, and that results may differ for less resourceful organisations operating at a slower pace (Chandrasekaran & Linderman 2015). In comparison to the findings of Agarwal and Anantatmula (2022), whose literature aimed to identify the managerial behaviour patterns that hinder knowledge transfer and growth; Chandrasekaran and Linderman (2015) explored the importance of knowledge transfer towards a company’s competitive advantage, but their focus was on factors that create knowledge transfer and the importance of, but not limited to, psychological safety within this framework. Like Liu, Keller and Bartlett (2021) findings from their survey conducted on Taiwanese organisations, individual psychological safety was positively related to knowledge sharing, similar to much Chandrasekaran and Linderman (2015) findings, thereby resulting in minimal variance in findings on psychological safety across various geographical locations. This standpoint requires further investigation and should not be applied as matter of fact, but merely an identified observation from literature reviewed.

Departing from concepts of previous scholars, whose literature in this review predominately focused on psychological safety within the context of knowledge, knowledge sharing and its creation, Dusenberry and Robinson (2020) highlighted methods to build psychological safety through training interventions. Dusenberry and Robinson (2020) discussed the importance of team management and its onflow effect on other areas of teamwork, including problem solving, innovation, and knowledge transfer, with the importance of team work further highlighted due to the changing environment of working conditions, moving away from traditional formats to other configurations such as Agile, Kanban and virtual (Dusenberry &
Robinson 2020). The importance of managing psychological safety is critical, as an effective team environment needs to ensure individuals “feel protected from the inherent interpersonal risks associated with collaborative work, including risks that could result in members losing face – being embarrassed or humiliated in front of others” (Dusenberry & Robinson 2020, p. 207). Similar to previous scholars, Dusenberry and Robinson (2020) also mentioned the works of Edmondson (1999) and Kahn (1990) in their definitions of psychological safety, as these scholars pioneered this concept. Dusenberry and Robinson (2020) noted that high psychological safety leads to enhanced communication among team members, reducing the need to spend time managing interpersonal risks. Dusenberry and Robinson (2020) examined three outputs including psychological safety, satisfaction, and cohesion. Dusenberry and Robinson (2020) signified the importance of psychological safety being developed over time. Thus, careful consideration, time and resources are needed for its development. The data from Dusenberry and Robinson (2020) study were from 215 university participants from three different universities in America, including a video lecture followed by brief discussion, concluding with a hands-on exercise in a single 50-minute session. The training interventions were designed to provide education around the concept of psychological safety and therefore not tailored to the actual requirements of the team (Dusenberry & Robinson 2020). Thus, the training intervention did not yield any positive or negative outcomes towards psychological safety (Dusenberry & Robinson 2020). A limitation of the study was that it was conducted on students who were competing for a course grade (Dusenberry & Robinson 2020). The results cannot be generalised and applied to industry, but more a good indicator of what does not improve psychological safety from a psychological standpoint.

Although psychological safety is an important element on its own, as it has direct impacts on various aspects of an organisation’s culture, procedures, norms, and performance, it is also interesting and worthwhile to review psychological safety’s mediating role in leadership and project success, especially granted the failure rate of project success previously mentioned. Khan et al. (2020) aimed to close this gap in the literature with their study focusing on inclusive leadership towards project success, utilising psychological safety and psychological empowerment as mediating roles. Khan et al. (2020) conducted their study within the IT sector in Pakistan. The IT industry was selected due to the high volume of continuous and
disruptive innovation, which has a direct impact on daily life and would entail a high volume of projects, thereby allowing a large data source to be available (Khan et al. 2020). The data was retrieved, like previous scholars, via questionnaires with 1240 distributed and a response rate of 65% (Khan et al. 2020). The findings from the survey conclude that psychological safety and psychological empowerment are positively associated with project success (Khan et al. 2020). Khan et al. (2020) aimed to contribute to the literature of the impact of differing leadership styles on project success with their findings concluding that positive impacts correlated between psychological safety and inclusive leadership and its subsequent positive impact on project success. Therefore, it can be denoted that more organisations need to place emphasis on inclusive leadership styles throughout the lifetime of a project to maintain a higher success rate. It is important to note that the limitations of this study mentioned by the authors also advises against generalisability of the findings due to the data being sampled from one country only, with its own unique cultural norms that may impact outcomes. Further, the authors mention that other mediating roles should be applied to inclusive leadership to review its impact on project success.

Departing from an organisational standpoint, it is interesting to note the importance of psychological safety in comparison to other industries, such as the construction industry, as discussed in the works of Demirkesen, Sadikoglu and Jayamanne (2021), who reviewed lean construction projects in the United States. The construction industry is a high-risk, hazardous and accident prone industry; as a result, many construction companies are placing high priority on improving safety conditions and subsequently, improving occupational health and safety, increasing productivity, reducing costs, and implementing project policies and procedures (Demirkesen, Sadikoglu & Jayamanne 2021). While Cauwelier (2019) defined psychological safety through Edmondson (1999); Demirkesen, Sadikoglu and Jayamanne (2021) quoted Kahn (1990) to define psychological safety as “feeling able to show and employ one’s self without fear of negative consequences to self-image, status, or career” (Demirkesen, Sadikoglu & Jayamanne 2021, p. 161), and mention similarities in definition with Edmondson (1999). The literature reviews psychological safety within the construction industry using a psychological safety climate scale, reviewing four dimensions that are “management support, management priority, organisational communication, and organisational participation” (Demirkesen, Sadikoglu & Jayamanne 2021, p. 162). The gap in
The literature that Demirkesen, Sadikoglu and Jayamanne (2021) aimed to identify is that psychological safety climate is more perception, whereas psychological safety is more related to actual feelings harboured within an individual. Looking at lean construction projects, 17 interviews were conducted to review the influence of psychological safety in construction projects (Demirkesen, Sadikoglu & Jayamanne 2021). Although the sample size may seem small and a potential limitation of their study, Demirkesen, Sadikoglu and Jayamanne (2021) supported this sample size as information saturation usually occurred after the 12th interview. The sample size average age was 37 with a 65/35 male to female split in respondents of varying work titles (Demirkesen, Sadikoglu & Jayamanne 2021). The findings were that psychological safety was higher in lean construction projects as opposed to non-lean construction projects (Demirkesen, Sadikoglu & Jayamanne 2021). Further, an interesting aspect of the study was that female individuals had less psychological safety in comparison to their male counterparts (Demirkesen, Sadikoglu & Jayamanne 2021). This variance in psychological safety could be attributed to differing societal views of gender. Further, lower status individuals felt less psychologically safe in comparison to their upper-level counterparts. Another interesting finding was younger individuals felt more psychological safety and took risks to voice adverse opinions in comparison to their older counterparts, who had less psychological safety for fear of losing their jobs (Demirkesen, Sadikoglu & Jayamanne 2021). The overall findings of the study were that within the construction industry, psychological safety is problematic and a cause for deeper issue symptoms to arise within the organisational framework (Demirkesen, Sadikoglu & Jayamanne 2021). A limitation of the study was the sample size of US construction industry practitioners, and therefore is not solid in its foundation of theory to be applied to the greater industry (Demirkesen, Sadikoglu & Jayamanne 2021). However, one of the key recommendations from the study was advice to the construction industry to prioritise psychological safety, and its importance towards creating a safe working environment; and that construction companies should support internal departments that assess and build psychological safety within the organisation (Demirkesen, Sadikoglu & Jayamanne 2021).

The extensive literature on psychological safety sheds light on its significance in various organisational contexts. It reveals that psychological safety has numerous benefits that positively impact the productivity and success of an organisation. Consequently, when
developing a digital transformation project, it becomes imperative to consider the critical component of psychological safety. Studies have shown that employees are more likely to communicate openly, express innovative ideas, and take risks when they feel psychologically safe. This fosters a collaborative and inclusive work environment where individuals feel empowered to contribute their unique perspectives and skills. Psychological safety also promotes trust and mutual respect among team members, enhancing teamwork and cooperation. Moreover, research has indicated that psychological safety is vital in facilitating organisational learning and development. When employees feel safe to share their thoughts and make mistakes without fear of negative consequences, they are more likely to engage in continuous learning, experimentation, and growth. This creates a culture of continuous improvement and adaptability, which is crucial in the dynamic landscape of digital transformation. Employees need to feel secure in navigating unfamiliar territories, adapting to change, and exploring innovative solutions. By incorporating psychological safety as a key consideration, organisations can foster an environment encouraging risk-taking, learning, and collaboration. Overall, the literature strongly emphasises the importance of psychological safety in various organisational contexts. Recognising its numerous benefits towards productivity, it becomes evident that psychological safety should be a fundamental aspect to consider when embarking on a digital transformation project.

2.2 Digital transformation projects

2.2.1 Concept of digital transformation

Digital transformation is described as using digital technologies to enable or initiate meaningful business transformation (Barthel & Hess 2019). Digital technologies, referred to as SMACIT (social, mobile, analytics, cloud and the Internet of Things), are the driving force within digital transformation projects (Liu, Du & Li 2023). “Digital transformation is changing the organisation roles (offering new services and enhancing practices), processes (adopting new digital tools and streamlining processes) and business areas (new work domain and new jobs) caused by the adoption of digital technologies” (Bettayeb & Al Marri 2021, p. 1). It must be noted that the concept of digital transformation is not limited to simply changing operating technologies within organisational processes, but this concept is also the convergence of the
overall business strategy (Tran, Pernia & Nguyen-Thanh 2023), and goes beyond process automation, operational efficiency, and information processing (Serpa, Sá & Ferreira 2022) that represents a progressive and incremental form of change (Haryanti, Rakhmawati & Subriadi 2023). Digital transformation involves leveraging digital technologies, including the internet, mobile devices, big data and analytics, and artificial intelligence, to enhance operational efficiency and service delivery for organisations and governments (Nosratabadi, Atoishi & Hegedűs 2023).

Due to increased competition, organisations are welcoming digital transformation as a method to maintain competitive advantage within their respective industries (Liu, Du & Li 2023). Organisations can develop their technology adoption strategy specific to environmental conditions and then integrate digital technology into original organisational systems, thereby igniting digital innovation transition (Zhuo & Chen 2023). One organisation may adopt digital transformation to optimise processes and reduce operating costs while another may see it as an opportunity to provide new product offerings or services (Tekic & Koroteev 2019). An example of company revitalisation is Netflix™ which originally was an online digital video disk DVD-by-mail sales and rental store (Correani et al. 2020). However, improvements, reliability and affordability of the internet coupled with Netflix’s ability to critically analyse market trends and data on movie consumption allowed them to transform their business model and strategy to that of a worldwide video streaming service, which has subsequently allowed Netflix to become an original content producer (Correani et al. 2020). Microsoft™ is also known infamously across industry in reference to their exceptional execution of digital transformation strategies and their expert guidance on how best to approach digital transformation strategy and implementation tactics (Correani et al. 2020).

While digital transformation can impact how organisations absorb and transform technology internally and apply to their business processes (Zhuo & Chen 2023), continuous developments of digital technologies are encouraging organisations to implement digital transformation strategies to align with worldwide technological advancements (Zhou & Li 2023).

2.2.2 Challenge of digital transformation projects
Digital transformation projects apply modern technologies to transform operating methods in an organisation to enhance efficiency, decrease loss, and manage data and information sufficiently (Gertzen, van der Lingen & Steyn 2022). A vital element of digital transformation projects is executing new information technology, applying large-scale projects to accomplish these transformative outputs (Bunduchi, Tursunbayeva & Pagliari 2019). Digital transformation must not be interpreted as a silo project, but such transformation should be a comprehensive approach, encompassing every aspect of the organisation (Abdellah et al. 2022).

Digital transformation projects, when implemented successfully, create additional opportunities for efficiencies to occur, extend the customer base by allowing products or services to reach a greater audience, and expand the range of services provided while offering consumers the benefit of convenience (Kolodiziev et al. 2021). Although digital transformation provides opportunities, many organisations struggle to complete their digital transformation with the desired results (Nasiri, Saunila & Ukko 2022). With 38% of organisations indicating digital transformation is their greatest challenge, the navigation of performing this transformation is through agile methodologies (Guinan, Parise & Langowitz 2019).

Digital transformation activities and projects tend to be complex and time-consuming, presenting significant opportunities for companies while also carrying substantial risks (Ziemba & Chmielarz 2022). Digital transformation projects are complicated, prolonged and challenging to execute, often failing to meet project expectations (Bunduchi, Tursunbayeva & Pagliari 2019). Due to problems in actions, approaches, and abilities, digital transformation often fails as outcomes may differ from expectations (Correani et al. 2020). One of the greatest obstacles to digital transformation is lack of understanding digitalisation which results in an undefined business strategy for implementation (Abdellah et al. 2022), resulting in between 66% to 84% of digital transformation project failure (Correani et al. 2020). Furthermore, 35% of executives stated lack of transparent transformation strategy as a major obstacle towards achieving digital transformation (Abdellah et al. 2022). The increased level of digital investment failure reflects a low level of knowledge regarding shifting digital transformation into profitable results (Nasiri, Saunila & Ukko 2022).
The most critical component of a digital transformation project is to ensure the company has the implementation plan alongside the overall business strategy (Correani et al. 2020). Often businesses are focused more on where they want to go, but not the roads to travel to get there. The implementation strategy is often the most overlooked component of the digital transformation project of which its absence causes failure (Correani et al. 2020). An unobstructed vision, objectives and purpose for digital transformation can minimise project failure (Abdellah et al. 2022). Factors identified as reasons for partial failure of a digital transformation project include having too much dependency on external suppliers, not assessing digital transformation requirements, not understanding the purpose of the digital transformation project, and thereby not aligning digital strategies to project requirements (Hafseld, Hussein & Rauzy 2022). In terms of developing a digital transformation road map and strategic direction, an assessment of both internal and external available resources needs to be identified to mitigate the risks of failure (Buck et al. 2023). Ensuring the workforce has the right skillsets is also another obstacle facing digital transformation projects today. To ensure the skill gap in the workforce is closed, organisations must ensure skilled development programmers educate the existing workforce through training programs, which compel employees to embrace the digital transformation project (Abdellah et al. 2022).

Digital transformation projects also involve industry-specific approaches and risks. Specific to government digital transformation projects, a lack of direction, politics and a fractured hierarchy in government agencies further contributes to project failure (Hafseld, Hussein & Rauzy 2022). Regarding the healthcare industry, digital healthcare transformation projects will lead the way in transforming a modern health care system (Dendere, Janda & Sullivan 2021). However, many digital healthcare projects have also resulted in failure due to inefficient project management (Dendere, Janda & Sullivan 2021). Due to their dependency on external suppliers such as advisory companies and contractors (Dendere, Janda & Sullivan 2021), the inability to manage external third-party providers proves a challenging aspect of digital transformation projects (Hafseld, Hussein & Rauzy 2022). About 88% of businesses use a third-party supplier for a minimum of one aspect of the digital transformation project to close the digital transformation knowledge and expertise gap (Abdellah et al. 2022).
2.2.3 Summary of findings from the literature review

This subsection provides a comprehensive overview of prior research conducted in the domain of digital transformation. Analysis of previous literature will be analysed to establish a robust foundation for the present study; the focus is on highlighting key discoveries and insights.

In researching IT companies in Hungary, Ko et al. (2022) noted that digital transformation success is attributed to the support of management in driving its implementation by establishing organisational vision. In terms of digital transformation success, senior management commitment is an essential element, similar to the findings of Fachrunnisa et al. (2020) who also referred to the importance of leadership. In addition to strong managerial commitment, additional factors that support digital transformation success include agile digital operations and continuous research into the latest digital technologies (Ko et al. 2022). The success of digital transformation projects can be attributed to agile leadership where there is continuous influence on team culture by instilling organisational goals and objectives (Fachrunnisa et al. 2020).

Marino-Romero, Palos-Sanchez and Velicia-Martin (2023) discussed the success factors of digital transformation projects in relation to knowledge intensive business service (KIBS) companies. These authors highlighted that hindrance of successful digital transformation project implementation is due to limited human resources specific to their knowledge of digitalisation and skillsets with respect to digital transformation. Marino-Romero, Palos-Sanchez and Velicia-Martin (2023) also highlighted that managerial support and leadership are essential elements for digital transformation success. In addition, knowledge sharing and innovative behaviour are key components for digital transformation success and it is encouraged that leadership promote these elements.

Bandara et al. (2021) studied trigger factors that impact business process modelling, which is core to digital transformation projects, and revealed some antecedents that impact project success: Top Management Support, Project Management Capabilities, Stakeholder Input,
Modeller Expertise and Modelling Tool Usage, with two moderating variables – Importance and Complexity.

Ko et al. (2022) investigated digital transformation success factors focusing on the role of information technology and management responsibility in digitalisation with sectorial relevance affecting aspects by measuring digital transformation success with digital innovation. Their findings demonstrated that digital innovation success is powerfully determined by business management commitment and, to a lesser degree, by strategy (Ko et al. 2022).

Azzouz and Papadonikolaki (2020) focused on project management within Architecture, Engineering and Construction (AEC) industries and the emergence of digital transformation technologies that arise, which inevitably promote technological growth. Digital technologies mentioned in their study include Building Information Modelling (BIM) (Azzouz & Papadonikolaki 2020). With respect to the industries studied, digital transformation projects refer to customer-centric transformational change in the form of digitalisation that encompasses firms and projects (Azzouz & Papadonikolaki 2020). Azzouz and Papadonikolaki (2020) study focused on the role of digital agents and disconnect across their technical background, skills and managerial routines. Qualitative data was collected via interviews. More specifically, their findings discussed how digital agents engage in knowledge transfer to support digital transformation projects using BIM as digital innovation (Azzouz & Papadonikolaki 2020). Azzouz and Papadonikolaki (2020) uncovered a disconnect between skills and competencies in relation to identity and role responsibilities. This can be attributed to digitalisation enforcing the emergence of new roles and responsibilities as part of digital transformation, activating digital agents to accept new roles or take on additional responsibility beyond their expertise and discipline (Azzouz & Papadonikolaki 2020). Fluid identities that emerged within this study were a direct result of continuous change present during digital transformation (Azzouz & Papadonikolaki 2020).

Guinan, Parise and Langowitz (2019) discussed the importance of creating an innovative digital project team, as 38% of organisations in their study identified digital transformation having the greatest impact on their business strategy. The emergence of new technology or
changes and redevelopments in existing technologies allow organisations to reposition and re-engage with their market by creating new business models and strategies.

Ellström et al. (2021) focused on sensing, seizing and reconfiguring routines of varying capabilities that support successful digital transformation within organisations. They explored the definition of digital transformation and its dominant presence within today’s industries and vast opportunities that emerge as a direct result of global transition towards digitalisation (Ellström et al. 2021). Their study is based on the statement that successful digital transformation management relies on specific digital transformation capabilities that are equipped to manage the change project, as digital transformation threatens current skillsets within the workforce (Ellström et al. 2021). Ellström et al. (2021) conducted a study similar to Jason, Hung and Ida (2023), who identified that digital transformation requires a set of both soft and hard skills for successful change management, although Jason, Hung and Ida (2023) focus was quality management professionals within the digital transformation project. Ellström et al. (2021) noted the importance of digital dynamic capabilities as a direct competitive advantage allowing firms to adapt to changes in new value creation processes and organisational tasks that arise in digital transformation. Ellström et al. (2021) identified dynamic capabilities as sensing, seizing, and reconfiguring to maintain adaptability in the changing environment. In the sense category, cross industrial digital sensing and inside out digital infrastructure sensing were identified (Ellström et al. 2021). In the seize category, digital strategy development and determining enterprise boundaries were identified (Ellström et al. 2021). In the reconfigure category, decomposing digital transformation into specified projects and creating a unified digital transformation infrastructure were identified (Ellström et al. 2021). Ellström et al. (2021) identified two common digital transformation challenges: failure to capture digital transformation potential and the difficulty of implementing change management and digital transformation with the human factor. Similar to Jason, Hung and Ida (2023), Ellström et al. (2021) collected data via three methods: focus groups, interviews, and post analysis focus groups, although the area of study were firms in advisory and energy industries. Although the aim of Ellström et al. (2021) study was to be applicable across all industries for firms of all sizes; due to the limited industries in the study, a limitation was the inability to generalise the findings irrespective of industry, organisational structure, or digital maturity. An area identified by Ellström et al. (2021) as a requirement for
future study in digital transformation is data security, as this is a major risk facing organisations with respect to their digital transformation strategy.

Badewi (2022) sheds light on the importance of project management frameworks and its effect on the performance of project managers successfully delivering digital transformation projects. Of the organisations studied by the Project Management Institute, 68% of organisations in 2020 were involved in some form of digital transformation, although 35% of these projects ultimately failed for various reasons (Badewi 2022). Badewi (2022) identified that for a digital transformation project to be successful beyond its delivery within scope, budget and timeframe, organisational and personal aspects must also be in alignment to deliver the transformation successfully. Badewi (2022) discussed that the success of a digital transformation project is dependent on two separate agents, a project and benefits manager. This notion of the importance of digital agents and their influence on digital transformation success is similar to the research of Azzouz and Papadonikolaki (2020), although their study was focused on the influence of digital agents on knowledge transfer. A project manager is more focused towards technical and engineering concepts while the benefits manager is focused on soft skills such as project perceptions, behaviours, attitudes, and values (Badewi 2022). The main theoretical framework discussed by Badewi (2022) is the relative project and benefits manager frameworks empowering the project, and benefits manager digital agents that lead to successful implementation of digital transformation projects. Badewi (2022) utilised the questionnaire method to conduct research and targeted the ERP project/program and IT managers from Europe, USA, and Arab countries with 60% of 223 responses utilised for data analysis. The questionnaire measured current frameworks in existence and the relative power of the project and benefits manager within the digital transformation project (Badewi 2022). The findings of Badewi (2022) study demonstrate that the frameworks of both project managers and benefits managers give their owners power, which subsequently leads to the successful implementation of digital transformation projects. The six key findings from Badewi (2022) research concludes: 1) frameworks empower their owners; 2) power of a benefits manager decreases as power of a project manager increases; 3) benefits manager framework is more instrumental towards transformation success in contrast to project manager framework; 4) these two frameworks can enforce and direct agent behaviours; 5) although the benefits management framework is used extensively, it is of little importance to
digital transformation success; and 6) institutionalising frameworks benefit the transformation project. Badewi (2022) noted a limitation as extending the scope of framework beyond project and benefits managers towards varying knowledge and mediation roles within transformation projects. A further limitation (Badewi (2022) was that the focus of digital transformation was limited to ERP in digital transformation projects, despite digital transformation projects also including artificial intelligence or optical technologies; therefore, further study on these types of digital transformation projects and the importance of frameworks on their success can be investigated.

Ramesh and Delen (2021) explored how to actually achieve a successful digital transformation project, noting that despite digital transformation being a $1.3 trillion dollar industry, the failure rate sits at 90% with the subsequent onflow of negative impacts that arise. Ramesh and Delen (2021) opted for the Engaged Scholarship approach and interviewed experts within the industry to determine important factors for digital transformation success. Various aspects were considered as part of their study to ensure findings could be used in future studies and in theory (Ramesh & Delen 2021). To support the study and its validity, interviews were conducted with people from varying positions such as users, and project team members through top executives (Ramesh & Delen 2021). The reliability of the study was ensured by maintaining constants within the study which included vision, management, and culture; and to improve the generalisability of findings, survey respondents were from varying locations worldwide (Ramesh & Delen 2021). Common themes that arose as contributing factors toward either the success or failure of a digital transformation project were attributes, opinion leaders, diffusion approach, timing, and duration (Ramesh & Delen 2021). Of these themes, survey results indicate that the timing of a digital transformation project is a leading factor for success such that it is recommended to be in correlation with consumer demands, new technological advancements, and competitor influence (Ramesh & Delen 2021). The second important theme was the attributes of digital transformation such as user friendliness and familiarity with current technology, therefore not requiring a steep learning curve (Ramesh & Delen 2021). The last theme was opinion leaders due to their trusted nature and ability to effectively communicate with the rest of the group in a positive manner and who are often excellent at leading the transition (Ramesh & Delen 2021). Ramesh and Delen (2021) did not discuss the limitations of their study or further research.
Ghobakhloo and Iranmanesh (2021) discussed digital transformation project success during the fourth industrial revolution era, aptly titled Industry 4.0, to determine success factors and develop digital transformation guidelines for small and medium sized enterprises (SMEs) to utilise. Their findings identified the gap within the literature for digital transformation success in manufacturing SMEs due to “lacking the necessary knowledge and understanding of the strategic importance of Industry 4.0 to plan the underlying digital transformation strategically” (Ghobakhloo & Iranmanesh 2021, p. 1534). The importance of a successful digital transformation project and the wholehearted adoption and integration of Industry 4.0 are valuable competitive advantages such as reduced and more efficient operating costs, improved product quality and improved product innovation (Ghobakhloo & Iranmanesh 2021). Ghobakhloo and Iranmanesh (2021) noted that despite these competitive advantages, attributes for its low-rate adoption are due to Industry 4.0 uncertainty, in addition to general SME behaviours such as risk aversion, limited resource capability, and lack of technical competencies. From their review, 11 determinants were identified as success factors for digital transformation success (Ghobakhloo & Iranmanesh 2021). These include business partner digital maturity, cyber security, maturity, change management competency, digitalisation readiness preassessment, external support for digitalisation, information and digital technology expertise, information and digital technology readiness, management competency for digital transformation, manufacturing digitalisation strategic road mapping, operations technology readiness and resource availability (Ghobakhloo & Iranmanesh 2021). Ghobakhloo and Iranmanesh (2021) determined that the most critical success factors for digital transformation are resource availability and management competency as this allows for the development of digital transformation readiness assessment prior to commencing the project. This preassessment will determine SME readiness to consider digital transformation in addition to factoring whether the SME has the relevant competencies and resources required to undergo such extensive organisational and cultural change (Ghobakhloo & Iranmanesh 2021). Further, this preassessment is vital as attempting digital transformation prematurely can result in adverse and negative consequences for the SME in a highly competitive environment (Ghobakhloo & Iranmanesh 2021). The limitation of this study is mainly that its target was SMEs and the findings should not be generalised more broadly across the industry (Ghobakhloo & Iranmanesh 2021).
Hafseld, Hussein and Rauzy (2021) examined the complex content of digital transformation projects in government organisations. Their case study results demonstrate that project complexity is embedded in engaged connections between multiple dimensions of organisation, technologies, and innovation (Hafseld, Hussein & Rauzy 2021). Their study points out that when organisational structuring, the introduction of new technology, and efforts to innovate operate together, government digital transformation projects become increasingly challenging to govern (Hafseld, Hussein & Rauzy 2021).

Abbu et al. (2022) addressed the importance of the human component towards digital transformation success, noting that the act is more about people than about technological change. Ramesh and Delen (2021) identified that opinion leaders were considered to be a contributing factor towards digital transformation success, while Ghobakhloo and Iranmanesh (2021) identified management competency for digital transformation as a critical factor for success. The common denominator amongst these findings is the human component in relation to the success factor. Given the importance of the human component, the study conducted by Abbu et al. (2022) aims to establish a Digital Leadership Scale as a tool to assess human attributes of successful digital leaders. Like previous articles within this literature review, the method used to conduct the study was via interviews of 13 successful leaders of digitally mature organisations (Abbu et al. 2022). To ensure generalisability of the findings, interviewees were from various industries and from companies of varying size, with a deliberate intention to include female leaders to balance perspectives and experiences (Abbu et al. 2022). Fifteen human dimensions were determined, which formed the Digital Leadership Scale, all of which should be factored in by project leaders in digital transformation projects as key components towards digital transformation project success (Abbu et al. 2022). They found that trust and credibility, similar to that of opinion leaders in Ramesh and Delen (2021) study are key components of effective digital leadership (Abbu et al. 2022). The impact of trust and credibility towards a digital transformation project is attributed to the fact that these projects are often wide-scale operational change management projects that shift various aspects of an organisation from operations, procedures, management, and culture. Having a trusted and credible source to communicate effective change is essential towards those communications being accepted and integrated wholeheartedly by the organisation.
Another key component by Abbu et al. (2022) was ensuring employees were the central focus point of the digital transformation project, furthering the notion of the importance of the human component and the fact that digital transformation projects are more in alignment with people as opposed to digital technology.

### 2.3 Role conflict

#### 2.3.1 Definition of role conflict

Conflict is defined as both manifest and latent disagreement among team members and implies clashing expectations or interests (Kankanhalli, Tan & Wei 2006). Conflict can potentially inhibit goal accomplishments due to decreased performance as tension or hostility diminishes team members’ focus (Suifan, Alhyari & Sweis 2020). Previous academics have defined several types of conflict that might occur among project team members, such as task, relationship, and process conflict (Mu et al. 2021). Despite the existence of multiple conflict types documented in the literature, the primary focus of this study will be to delve into intricate nuances of role conflict. By narrowing the scope of the investigation to role conflict, this study aims to explore its unique dynamics, implications, and potential resolution strategies within the context under examination.

Role conflict is a term used to describe the situation where an individual experiences conflicting demands within their role in the workplace, leading to adverse consequences for work performance and outcomes (Kalra, Itani & Sun 2023). Role conflict can be defined as a circumstance where conflicting roles and responsibilities are performed by one individual and often require different or incompatible behaviours (Nambisan & Baron 2021). When employees encounter differing role expectations that contradict or oppose instead of harmonizing, this is identified as role conflict (Parayitam et al. 2021).

#### 2.3.2 Emergence of role conflict

Role conflict emerges where there are two different requests of a conflicting nature that require simultaneous action and where the action of one leads to neglect of the other (Atmadja & Saputra 2018). Role conflict arises when individuals encounter multiple sets of
incompatible demands and differing expectations for a particular role, and in this situation, complying with any of these role pressures hampers fulfilment of the others (Montani et al. 2020). When employees perceive incompatible or irreconcilable job expectations arising from multiple roles or even a single role, it becomes challenging for them to simultaneously meet contrasting job demands or determine the most effective approach to accomplish cognitively demanding and complex tasks and responsibilities (Montani et al. 2020). Based on the assumption of conflicting norms, an individual may experience hardship when attempting to enact one or both roles, thereby creating a situation of role conflict (Kabiri & Hughes 2018).

In digital transformation projects, role conflict arises when two roles have differing responsibilities with regards to their physical, temporal, emotional and obligatory demands (Zhang, Mo & Wang 2021). An example of role conflict is where an appointed project manager has a team of individuals of hierarch within the permanent organisation (Nuhn, Heidenreich & Wald 2018). The project manager can experience role conflict due to the level of hierarchy of the individuals conflicting with their own responsibility to address these individuals (Nuhn, Heidenreich & Wald 2018).

2.3.3 Impacts of role conflict within the project environment

Essentially the individual is required to wear two hats which can lead to confusion, stress, and an inability to manage their workload and meet required deadlines. The employee can face inconsistency and incompatibility with the varying demands of each role, thereby not fulfilling the requirements of each role satisfactorily (Dadanwala, Shrestha & Santoso 2021). The main impact associated with role conflict includes dissatisfaction with existing work, resulting in reduced work commitment, passion, interest, and eventual burnout (Nambisan & Baron 2021). The direct effects of role conflict cause individuals to become less motivated to complete required tasks and subsequently, this hinders the achievement of business strategies and objectives.

Role conflict also has a negative impact on organisational and employee performance as it can lead to burnout (Naoum et al. 2018). Also, role conflict affects project activities and other intentional behaviours, such as knowledge hiding (Nguyen, Malik & Budhwar 2022). Such
conflict can create a negative and harmful emotional experience for the individual, create increased tension and internal conflict, and lead to overall discontent within their role (Kabiri & Hughes 2018). “Role conflict may increase cognitive strain. In doing so, it limits the employees’ cognitive resources that are available for task engagement and reduces the workers’ capacity to utilise their intellectual potential and skills by preventing them from focusing on problems and finding new ways to solve them” (Díaz-Fúnez et al. 2021, p. 4). Therefore, role conflict within a digital transformation project has the potential to impact overall implementation strategy and success.

The level of role conflict has direct implications on the level of stress experienced by the individual. Multiple roles of equal importance are also a contributing factor towards increased stress levels. Stress was identified as a direct result of role conflict in law enforcement officers leading to employee absenteeism, high turnover rates and low productivity (Holt, Blevins & Burred 2012). Role conflict stress reduces employee motivation and their ability to adopt innovative ideas, be high performing and foster creativity (Usman & Xiao 2017). Creativity, although non-tangible, is an important characteristic to have within an employee and within greater organisational culture as creativity is what encourages employees to problem solve, think outside the box, brainstorm, and develop efficient methods of conducting operations (Usman & Xiao 2017).

Role conflict has the effect of pushing and pulling the individual in opposing directions which require incompatible behaviours and characteristics leading to limiting the amount of energy and attention the individual can give to two distinct roles (Nambisan & Baron 2021).

2.3.4 Summary of findings from the literature review

In this subsection, a thorough examination is provided of previous research carried out in the area of role conflict. Noteworthy discoveries and valuable insights are emphasised, and in-depth analysis of the literature is conducted to establish a solid basis for the present study. A comprehensive review of existing knowledge aims to extend previous research, identify research gaps, and contribute to a more profound comprehension of role conflict within the specific context addressed in this study.
Wang et al. (2022) focused on Chinese architecture, engineering, and construction (AEC) industries to determine contributing factors for employee stress, high volume workloads, hazardous working environments and conflicts of interest that arise within projects and how they can be mitigated. Wang et al. (2022), identified role conflict as a job stressor and therefore a contributing factor to employee stress levels as a negative outcome, as role conflict is often associated as a threat to AEC projects. Wang et al. (2022) issued 380 questionnaires of which a 76.1% response rate was received, with the target demographic being project management team members of varying levels. Role conflict was found to have a significant impact on autonomy and competence levels amongst individuals (Wang et al. 2022). There are some positive outcomes from role conflict worth mentioning in that overcoming work overload and role conflict may instil an intrinsic sense of achievement, subsequently generating enthusiasm and confidence (Wang et al. 2022). The limitation of this study is that the AEC industry is saturated in issues surrounding role conflict and that other industries should be reviewed and thus, generalising on the findings of this study must be avoided (Wang et al. 2022).

Pan et al. (2021) reviewed key elements of developing an environment within team projects that will enable learning to occur specific to universities and the teacher–student relationship that fosters this environment. Pan et al. (2021) noted that a critical concern in relation to a project-based learning approach is the role conflict that arises. The research methodology utilised a sole case study from a university in Singapore with the aim of data being retrieved via focus groups comprising of 26 students split amongst three groups (Pan et al. 2021). The gender ratio was almost equal (Pan et al. 2021). The cause of role conflict often arose due to role ambiguity that is present amongst individuals in the project (Pan et al. 2021). In the context of the teacher–student relationship, role conflict may occur if there are not clear boundaries for and definitions of individual roles and responsibilities established in the initial phase of project-based learning (Pan et al. 2021). As a result, role conflict can arise with subsequent impacts of “dissatisfaction with the role, decreased satisfaction, anxiety, lower commitment and lower performance” (Pan et al. 2021, p. 114).
Once again, role conflict arises due to role ambiguity, which was also evident in the role of teachers and the project-based learning approach (Pan et al. 2021). Teachers were encountered role conflict due to multiple roles and lacking clearly defined responsibilities (Pan et al. 2021). In the context of teachers within this dynamic, they were often wearing multiple hats regarding responsibilities which caused the emergence of role conflict, often playing the roles of both facilitator and assessor (Pan et al. 2021). Overall, the evidence from Pan et al. (2021) findings is that role conflict amongst teachers can allow for negative outcomes to develop such as stress, lower commitment, and reduced performance within the students. The limitation of the study was that it focused on a sole case study and therefore lacked the foundations for generalisability (Pan et al. 2021).

As role conflict can occur within any industry and organisational setting, it is an interesting tangent to review role conflict within the railway industry in Sweden, to see if any similarities exist across industries. Palmqvist, Olsson and Winslott Hiselius (2018) introduced the importance of the transport system in Sweden. The current scenario is that train punctuality is deemed too low, sitting at 90% with punctuality measured at a delay rate of a maximum of 5 minutes, when the industry requires train punctuality to be 95% by 2020. Therefore, the desire to increase train punctuality is the overall goal of their paper; however, they aim to understand areas of specific concern that arise amongst infrastructure management, train operating companies and timetable planners (Palmqvist, Olsson & Winslott Hiselius 2018). The method they used to gather information was to conduct semi-structured interviews with 20 individuals from the Swedish Transportation Administration office who worked as timetable planners (Palmqvist, Olsson & Winslott Hiselius 2018). Themes that arose from the interviews were missing tools and support, role conflict and single-loop learning which resulted in various errors they experienced in day-to-day operations (Palmqvist, Olsson & Winslott Hiselius 2018). The second theme, role conflict, arises due to liberal interpretation of the planning rules and guidelines is that train operating companies ask for shortcuts to fit more trains into the timetable, that train operating companies request short dwell times to avoid trains waiting, and that there is no clear strategy for the location and size of time supplements (Palmqvist, Olsson & Winslott Hiselius 2018, p. 10).
Timetable planners faced role conflict due to comprehensive rules and regulations to be followed as opposed to the current unsystematic process of making decisions based on feelings and/or perceptions (Palmqvist, Olsson & Winslott Hiselius 2018). Furthermore, senior timetable planners conduct different processes with train operating companies that involve time-consuming discussions aimed at consensus as opposed to imposing documented guidelines and rules, further contributing to role conflict (Palmqvist, Olsson & Winslott Hiselius 2018). Therefore, although processes are in place, they are not enforced in a consistent manner across the board, resulting in role ambiguity and role conflict (Palmqvist, Olsson & Winslott Hiselius 2018). Palmqvist, Olsson and Winslott Hiselius (2018) identified that although role conflict cannot be avoided due to technology advancement, it can be successfully mitigated by having clearly defined roles and responsibilities for each stakeholder. Although the train industry, the education industry, and many other industries all have their own specific industry concerns, the concept of role conflict has similar causes and outcomes to mitigate across industry (Palmqvist, Olsson & Winslott Hiselius 2018). Most importantly, role conflict arises due to conflicting interests or role ambiguity and can be managed through clear definition of roles, responsibilities, and expectations (Palmqvist, Olsson & Winslott Hiselius 2018).

Walrave et al. (2022) investigated varying work approaches, specific to the technology industry, through case study of a hardware and software firm working collaboratively to achieve unified desired outcomes. Hardware firms adopt a plan driven work approach while software firms adopt an agile development approach with implications for productivity and other aspects of the organisation. Walrave et al. (2022) identified the implications of working in an environment of contrasting development methods, for example, an agile software firm resorting to simply complying with plan-based operations of the hardware firm, relinquishing its agile business strategy, which allowed for role conflict to arise due to conflicting operations that caused confusion (Walrave et al. 2022). In forcing an agile software firm to adopt to its own methods, the hardware firm also faced role conflict by sabotaging its own operations due to non-alignment with its own suppliers (Walrave et al. 2022). Walrave et al. (2022) therefore identified that “hybridisation of development methods may lead to project failure in collaborative embedded systems development” (Walrave et al. 2022, p. 3). In the scenario of differing organisational constructs, role conflict arose due to incompatible demands of the
two firms, thereby pulling organisational in various directions, leading to project sabotage, project inefficiencies and delays, and overall dissatisfaction for the end consumer with a potentially undesirable product (Walrave et al. 2022). Walrave et al. (2022) puts it succinctly: the origin of role conflict between these two firms ultimately creates a mismatch of development methods. Similar to Pan et al. (2021) single case study, in their review of project-based learning amongst a group of university students, the same limitation applies to Walrave et al. (2022), as their study was based on a single case study, which does not allow for generalisability.

Nuhn, Heidenreich and Wald (2018) examined task-related antecedents such as role conflict and role ambiguity and the impact these factors have on turnover. Temporary project organisations have become increasingly popular due to their ability to generate change and innovation within an established organisation and more specifically, temporary project teams are highly specialised and engaged with problem identification and resolution, often within a predetermined timeframe and cost, making them highly desirable within organisational strategic frameworks (Nuhn, Heidenreich & Wald 2018). The data source was an online questionnaire-based survey from 253 respondents (Nuhn, Heidenreich & Wald 2018). The results from this survey, in relation to inter-role conflict, were that in a permanent organisation, inter-role conflict arose mainly from conflicts between the individual’s work and family roles, and the time, energy and resources spent on each role which led to low energy and ultimately exhaustion (Nuhn, Heidenreich & Wald 2018). In contrast, individuals working in a temporary organisation in addition to their normal permanent organisation, experienced inter-role conflict due to differing role expectations (Nuhn, Heidenreich & Wald 2018). Inter-role conflict was the strongest predictor of turnover within temporary organisations (Nuhn, Heidenreich & Wald 2018). To mitigate high turnover in temporary organisations due to inter-role conflict, a reduced workload in temporary organisations should be maintained at a reasonable and achievable level; and a clear definition of individual job priorities in both the temporary and permanent organisation to better allocate time and other resources to efficiently achieve expected outcomes need to be developed (Nuhn, Heidenreich & Wald 2018). A further interesting concept to mitigate inter-role conflict, not previously discussed in the literature, is the concept that human resource management, as a business strategy, should align role expectations of the temporary organisation with the permanent
organisation, thereby allowing for synergies to occur in addition to introducing “promotion, personal development and rewards adapted to a career in projects” (Nuhn, Heidenreich & Wald 2018, p. 2296). Overall, the findings of the study conducted by Nuhn, Heidenreich and Wald (2018) raised interesting concepts to be considered when mitigating inter-role conflicts, albeit with limitations due to the type of temporary organisation studied, and that further study on different types of temporary organisations is needed.

Departing from the technology sector, Ebbers and Wijnberg (2017a) examined the impact of role conflict, role ambiguity and role definition in the Dutch film industry, between the director, who is responsible for artistic direction of the film and the producer, who is responsible for commercial components of the film, but who together have a shared goal of creating a highly desirable cinematic piece of visual art. Dual leadership style can exist in various industries, such as education and healthcare, often the outcome of specific organisational structure; however, issues that arise with this leadership style are subsequent role and leadership conflicts (Ebbers & Wijnberg 2017b). Ebbers and Wijnberg (2017a) identified positive outcomes of role conflict and role ambiguity in project-based organisations in the film industry. Ebbers and Wijnberg (2017a) found that role conflict occurs when there are conflicting, inconsistent, and incompatible demands, whereas role ambiguity is a lack of clearly defined boundaries and responsibilities, both of which are linked to problematic outcomes such as “a distorted reality, decreased satisfaction, decreased organisational effectiveness, anxiety, lower commitment, and lower performance” (Ebbers & Wijnberg 2017a, p. 1345). Ebbers and Wijnberg (2017a) found that although role conflict and role ambiguity have negative connotations, they must also be viewed optimistically as an opportunity to bring clarity to an individual’s role and responsibilities and increase autonomy by having clearly defined and documented expectations and outcomes (Ebbers & Wijnberg 2017b). Ebbers and Wijnberg (2017a) took a qualitative data approach using semi-structured interviews to conduct their research. Considering the assistant director’s role in mediating between the director and producer, the assistant director often experiences role conflict due to ill-defined expectations (Ebbers & Wijnberg 2017b). This can include conflicting demands as the assistant director is accountable to both director and producer, thus their role is mitigating relationships on set (Ebbers & Wijnberg 2017b).
This section has provided a comprehensive overview of the extant research conducted in the area of role conflict. It delves into the literature to establish a foundation for the current study and to explore the breadth of knowledge in this area. Prior research on role conflict encompasses various disciplines, including organisational psychology, sociology, and management. Scholars have examined different dimensions of role conflict, including its antecedents, consequences, and mechanisms of manifestation. They have explored the factors that contribute to the experience of conflicting roles, such as role ambiguity and inter-role conflict. Moreover, researchers have investigated the impact of role conflict on individuals and organisations. They have examined employee job satisfaction, performance, and well-being. Additionally, the literature explores how role conflict influences team dynamics, collaboration, and organisational outcomes. The research on role conflict has also delved into the strategies and interventions aimed at mitigating or managing negative consequences. Scholars have explored clear responsibilities and communication in reducing the occurrence and effects of role conflict. They have proposed various frameworks and approaches to address role conflict and promote positive work outcomes effectively. Furthermore, the literature has explored contextual factors that influence the prevalence and significance of role conflict across different industries, occupations, and cultural settings. This highlights the importance of understanding the specific organisational and environmental contexts in which role conflict occurs.

### 2.4 Trust

#### 2.4.1 Definition of trust

Trust is conceptualised as a psychological state where individuals willingly embrace vulnerability based on positive expectations regarding the intentions of others or their dependence on partner exchange (Moloi, Quaye & Saini 2022). Trust refers to the willingness to have faith in and rely upon another party's competence, honesty, and goodwill (Ferreira, Papaoikonomou & Terceno 2022). Trust can be defined as the extent to which one party is willing to place themselves in a vulnerable position, relying on the belief that the other party will carry out specific actions that are significant to the trusting party (Niewczas-Dobrowolska 2022). Trust simply defined is “a psychological state characterized by several components, the most important of which is some sort of positive expectation regarding others’ behaviour”
(Kramer & Lewicki 2010, p. 247). This reliance remains intact, irrespective of the ability to monitor or exert control over the actions of the other party (Niewczas-Dobrowolska 2022). Further, trust is also the level of dependability within a team construct and the subsequent acceptance of vulnerability that arises within this team environment (Triplett & Loh 2018). Essentially trust is the subconscious bias that arises from the mutual relationship amongst individuals that transactions will not generate opportunist behaviour which could violate or exploit one’s vulnerabilities (Molina-Morales, Martínez-Fernández & Torlò 2011).

2.4.2 Trust in organisations

Trust is a critical component of various aspects of everyday life including facilitating cooperation, allowing seamless and efficient market exchanges to occur at a global level and allowing an organisation to demonstrate adaptability in a constantly changing environment (Molina-Morales, Martínez-Fernández & Torlò 2011). Trust within an organisation is the concept of individual intent and behavioural tendencies associated with positive expectations and feelings (Joo, Yoon & Galbraith 2023). Organisational trust can be defined as the level of confidence and “willingness to act on the basis of, the words, actions, and decisions of another” (Triplett & Loh 2018, p. 78). Organisational literature defines trust attributes as “antecedent events to risking one’s own interests through the sharing of sensitive information, emotions and attitudes with other individuals, such as teammates” (Roussin 2006, p. D4).

Trust has been researched at both macro and micro levels (Joo, Yoon & Galbraith 2023). Micro trust is associated with integrity and benevolence while macro trust is associated with overall organisational culture and the level of trust across organisational hierarchy (Joo, Yoon & Galbraith 2023). An organisational trust environment includes horizontal and vertical trust (Li & Yan 2009). Horizontal trust is in reference to the relationship between individuals and their peers while vertical trust is in reference to the relationship between individuals and managerial hierarchy (Li & Yan 2009). Ensuring trust, both vertically and horizontally, is a key component to fostering a culture of trust.
The importance of trust within an organisation and, more importantly, between employees has been well documented across all industries. Trust is an important factor of inter-organisational relationships and is often the foundation of project settings (Pinto, Slevin & English 2009). It is important to note that while trust is a critical component of an organisation’s strategy and competitive advantage due to various benefits that arise from its presence, these benefits can be conditional (Molina-Morales, Martínez-Fernández & Torlò 2011).

Mutual trust is one among five emergent states that arise within a team environment that promotes safety, along with psychological safety, collective efficacy, situation awareness and shared mental models (Salas et al. 2020). Therefore, within a team environment, trust is acknowledged as an essential element towards building and maintaining healthy relationships amongst individuals within the project (Pinto, Slevin & English 2009). It has been documented that a trusting work environment is positively associated with higher levels of safety compliance and participation (Salas et al. 2020). Regarding supplier or third-party relationship management, trust is also an essential foundation of whether that relationship will stand or fall (Xu 2019). Therefore, trust between project stakeholders can be documented as a prerequisite of project success (Olsson et al. 2010).

Trust also encourages knowledge transfer by improving project member’s motivation levels (Maurer 2010). Regarding knowledge transfer, trust plays a critical role in eliminating barriers between organisations, allowing them to “increase the depth, breadth and efficiency of their mutual exchange of knowledge, thus helping them obtain access to a wider or deeper range of information and to more valuable resources” (Molina-Morales, Martínez-Fernández & Torlò 2011, p. 120). Trust has a positive effect on knowledge sharing amongst individuals and between organisations, especially in relation to difficult to communicate information or tacit knowledge (Molina-Morales, Martínez-Fernández & Torlò 2011). This is because free flow and exchange of knowledge, learning and information is subject to the level of trust embedded in the framework of the organisation, its people, and its values (Molina-Morales, Martínez-Fernández & Torlò 2011).
Team trust has been documented to be positively associated with strong interpersonal relationships and team effectiveness (Salas et al. 2020). High team trust has positive impacts for team performance as it allows mitigation of productivity loss due to higher team monitoring, not associated with micromanagement (Salas et al. 2020). Further in a team environment, high trust and the subsequent team monitoring that arises allows for more efficient work processes to take place due to deploying adequate resources as required (Salas et al. 2020).

Establishing trust can improve knowledge sharing, creation and collaboration (Olsson et al. 2010). Improving organisational trust can be initiated at leadership level and is often intertwined with increasing or establishing (if non-existent) trust along with psychological safety and performance (Roussin 2006). Organisational trust can be utilised to maintain and strengthen inter-organisational collaborations that pose uncertainties or require cross creative collaboration (Colombo, Dell'Era & Frattini 2011). Trust has also demonstrated its ability to impact individual perceptions of one another during collaboration projects (Pinto, Slevin & English 2009). Further, the relationship between trust and innovation is positively related as an organisational setting with high levels of trust that foster collaborative working environments that allow for innovation to be encouraged as a direct result of both quantity and quality of information, knowledge and resource sharing (Molina-Morales, Martínez-Fernández & Torlò 2011).

A number of studies have pointed to the advantage of exploiting trust-based relationships; therefore, establishing and maintaining trust should take precedence within the project strategy (Pinto, Slevin & English 2009). A trusting organisational environment can also be established by developing defined and clear descriptions of roles and responsibilities, prior to any project commencing, that are shared and agreed to by all parties, thereby eliminating any potential role conflict, role ambiguity and documenting expected outcomes to avoid miscommunication (Olsson et al. 2010). Reparation of trust must commence with acknowledgement that trust has been compromised and that the cause of this distrust requires investigation (Xu 2019). An efficient method, as noted by Roussin (2006), is implementing a dyadic trust discovery process before developing team trust exercises to disseminate to the workforce and achieve grounded rationality amongst team members for
the trust exercise. This includes deploying specific methods to understand trust perceptions of individuals, not only amongst each other, but within themselves and within the leadership and managerial hierarchy they fall under (Roussin 2006). Reparation of trust requires initial acceptance of responsibility followed by intervention to determine fundamental elements of trust that have been violated (Xu 2019). Dyadic discovery methods involve private discovery and purposeful sessions between the leader and individual team member having honest, revealing and trust building conversations aimed at systematically uncovering each individual’s thoughts, ideals, perspectives, vulnerabilities and confidence in relation to their team and appointed tasks (Roussin 2006).

Another method to improve trust within a team or the greater organisation is to develop cognitive trust within individuals which stems from interaction history amongst team members (Li & Yan 2009). To ensure trust is fostered within an organisation, a mutual two-way emotional investment is required to support the relationship between individuals within the workforce, enforcing the notion of a consensus of care (Li & Yan 2009). This can include establishing commitment by creating dialogue, rules and goal setting (Olsson et al. 2010). In addition to cognitive trust, there is also affective trust of which the foundations lay within the trustee’s intention and the trustor’s belief in said intentions (Li & Yan 2009). Supporting affective trust within an organisation allows individuals to assume positive expectations from their counterparts and confidence that advantage will not be taken, thereby reducing the fear of potential losses associated with interpersonal risk taking in the workforce (Li & Yan 2009).

Building trust at all levels must factor in that it will take time and resources to develop. As a critical point, such trust is a component of the relationship that must be consistently maintained and all parties within the supply chain must be present (Olsson et al. 2010). Trust between project partners is a key factor towards project success (Maurer 2010). Most group level discovery sessions, aimed at identifying why there is no trust within an organisation, are often performed by external consultants due to the perception of their expertise in being able to mitigate lack of trust and potentially develop methods to increase trust (Roussin 2006).

2.4.3 Trust-related risks
It is important to note that while trust is a critical component of an organisation’s strategy and competitive advantage due to various benefits that arise from its presence, the benefits can be conditional (Molina-Morales, Martínez-Fernández & Torlò 2011). Allocation of trust must be carefully considered; if poorly managed, an organisation can place too much emphasis on and trust in the wrong relationship, which is not fruitful towards the organisation achieving its desired outcomes (Molina-Morales, Martínez-Fernández & Torlò 2011). Therefore, too much trust in the wrong relationship provides “little value for the firm, and thus misallocate precious resources and/or take unnecessary risks, with the potential for substantial negative effects on their innovation performance” (Molina-Morales, Martínez-Fernández & Torlò 2011, p. 119). There will always be the odd outlier team member who will inevitably take advantage of the trusting environment they are within by becoming too comfortable, avoiding collaboration, personal growth and development, lacking any real motivation to go beyond what is required for their team, project or work (Salas et al. 2020). An additional risk of instilling high levels of trust within organisations and the relationships between multiple organisations is the effort, time, resources and costs associated with maintaining a trusting relationship, resulting in a negative outcome (Molina-Morales, Martínez-Fernández & Torlò 2011). As a result, excessive trust without any caution provides the potential opportunity for abuse of trust (Molina-Morales, Martínez-Fernández & Torlò 2011).

On the other hand, low trust levels within an organisation can also impact the effectiveness of trust intensive group sessions, such as multi-disciplinary problem solving or planning, as team members can view these sessions as high risk or lacking incentive, thereby hindering progress, growth and development initiatives (Roussin 2006). Resistance and low motivation due to lack of trust can hinder the success of a project by displaying the exercise, task or goal as overwhelmingly difficult than actuality (Roussin 2006). Where an organisation lacks trust within the framework of its culture, it has been observed that everyone operates in their own interests and therefore selfishly, with little or no regard for the team’s unified desired outcomes for the organisation (Li & Yan 2009). Additional impacts of lack of trust can include “harm from opportunism, unintended neglect of individual interests by others and identity damage during interactions” (Li & Yan 2009, p. 31).
Trust is an intangible concept and it can operate at both intra- and inter-organisational levels (Pinto, Slevin & English 2009). In terms of inter-organisational alliances, trust is the critical indicator that will set the basis for the relationship and future direction (Panda 2016). Essentially, inter-organisational trust amongst companies is the acceptance of vulnerability of risk associated with the expectation of positive outcomes from the conduct of others (Vilana & Monroy 2010). Therefore, trust management must have some precedence within project management as it can impact the organisation from within and without in terms of relationships between third-party suppliers (Pinto, Slevin & English 2009). It should be noted that project partners who lack trust and confidence results in diminished value while high trust and confidence leads to value creation – a crucial factor for project success (Panda 2016).

Trust is an efficient tool to maintain relationships between companies working together, as trust assists to mitigate problems due to strong relationships (Vilana & Monroy 2010). Therefore, for an organisation to maintain competitive advantage, it must demonstrate a “balanced portfolio of relationships” that combine trusted suppliers with new ones to ensure a healthy dose of new ideas and that strategy is flowing through communication channels (Molina-Morales, Martínez-Fernández & Torlò 2011). Inadequate monitoring can lead to opportunistic behaviour that takes advantage of mutual trust within the relationship, which can lead to a demise of the relationship and/or organisation (Molina-Morales, Martínez-Fernández & Torlò 2011). Most group level discovery sessions aimed at identifying why there is no trust within an organisation are often performed by external consultants due to the perception that their expertise can mitigate lack of trust and potentially develop methods to increase trust (Roussin 2006).

2.4.4 Summary of findings from the literature review

This section provides a comprehensive review of previous research conducted in the trust domain. Essential findings and valuable insights are highlighted, and the literature is analysed to establish robust groundwork for the present study. Additionally, research gaps are identified, setting the stage for future investigation. By reviewing the existing knowledge, the aim is to contribute to a deeper understanding of trust within the specific context of this study.
Barrane et al. (2021) addressed the need to develop new products in the digital transformation era to maintain competitive advantage and highlighted the importance of trust amongst stakeholders. Barrane et al. (2021) main concern is how to build trust in multi-stakeholder collaborations on new product developments with the focus being on relationship maintenance. Barrane et al. (2021) conducted the study by utilising 15 semi-structured interviews with managers from one specific industry in Canada with the aim of developing strategies to develop and foster relations between trusting stakeholder collaborations. This was the wood-processing product industry (Barrane et al. 2021). Specific to trust and new product development, trust plays a critical role in “the implementation and workability of incomplete or inadequate formal management control systems” (Barrane et al. 2021, p. 209). Some of the challenges facing new product development include a lack of strategic direction, quality management techniques and design practices and therefore, maintaining high trust levels can at times be a compensating factor in the absence of direction (Barrane et al. 2021). Trust can be built by conducting training and education programs, conducting team building exercises, and fostering a creative and innovative environment for individuals to thrive and feel safe (Barrane et al. 2021). Examples of trust specific outcomes for the buyer–supplier relationship include knowledge sharing, unified decision making, and joint share of the benefits and risks associated with radical innovation (Barrane et al. 2021). Organisations that maintain high trust levels generally exhibit strong performance outcomes and competitive advantage (Barrane et al. 2021). The findings from interviews concluded various methods of increasing stakeholder trust, but this literature review will focus on key methods (Barrane et al. 2021). Stakeholder involvement in the new product development phase was critical to building the foundations of trust in the relationship (Barrane et al. 2021). This is due to incorporating stakeholders into the critical decision-making process early on in the project, demonstrating respect for stakeholders and their concerns. Barrane et al. (2021) noted “a sense of belonging is akin to taking psychological ownership of the project”. A second component of trust building is selecting appropriate stakeholders to collaborate with, subject to their relevant values, attitudes, experience, and ethics (Barrane et al. 2021). Another method to encourage trust was the focus of creating a long-term stakeholder relationship (Barrane et al. 2021), which ensured relationship maintenance was a priority. Having transparency was also found to be essential in building trust (Barrane et al. 2021). Regarding
new product development, clarifying a project vision, mission statement, and targets and role definitions are critical to ensuring trust can thrive in the stakeholder relationship (Barrane et al. 2021). Barrane et al. (2021) identified the limitation of their study as widening the data pool to a larger sample size with multiple industries for future study.

Litovtseva et al. (2022) reviewed the importance of trust in Ukraine’s public sector, specific to the digital environment as digitalisation increases convenience for citizens, equal access, and a valuable centralised point for distribution of country information and service resources. Regarding the digital environment within Ukraine’s public sector, Litovtseva et al. (2022) documented the importance of maintaining user trust in government online portals to ensure effective engagement with the public. Although the importance of trust is clearly defined, the Ukrainian people are currently at a standstill in terms of digitalisation of the public sector due to lack of trust, further highlighting how important trust is for effective digitalisation (Litovtseva et al. 2022).

The importance of trust as a leadership construct for successful digital leadership is supported by Abbu, Mugge and Gudergan (2022) in their article “Successful Digital Leadership Requires Building Trust”. Digital technologies have ushered in ground-breaking transformation across all aspects of everyday life. However, sustaining long-term success in this digital era requires effective and powerful leadership styles to guide and navigate these innovative changes. Abbu, Mugge and Gudergan (2022) acknowledge previous scholars who have emphasised the significance of effective leadership in digital transformation. However, they do not explicitly address the crucial role of trust in this transformative process. They go even further by advocating trust as the critical differentiating factor between failure and success of digital transformation. They argue that trust plays a pivotal role in driving successful outcomes during the process of digital transformation. And they identified five key elements articulating the importance of trust within digital leadership which include, employee empowerment, creating a growth mindset, management of ethical issues such as artificial intelligence, psychological safety management and building resilience. Abbu, Mugge and Gudergan (2022) further elaborated these five key elements of trust to provide additional insights. In terms of employee empowerment, the importance of trust is defined by leadership ability to communicate organisational goals, objectives, and strategies, clearly and successfully (Abbu,
Further, strong trust relations enable employees to adapt to changes in their environment at rapid speed (Abbu, Mugge & Gudergan 2022). In terms of growth mindset, trust enables the employee to reach inside themselves to realise their own potential to experience growth (Abbu, Mugge & Gudergan 2022). The benefits of such growth are then passed onto the wider organisation with an output of increased productivity and interpersonal relations (Abbu, Mugge & Gudergan 2022). Specific to digital transformation, a range of ethical issues due to cloud interfaces present, including the adoption of artificial intelligence and availability of large-scale data resources (Abbu, Mugge & Gudergan 2022). Trust is a critical component of managing ethical issues around new technologies. In addition, Abbu, Mugge and Gudergan (2022) noted the importance of trust when managing new and emerging digital trends and constant disruptions faced by industry. Finally, they touch on the importance of trust in building a resilient culture and that resilience is particularly importance in an environment of constantly changing new technologies, new developments, and associated progressive instability. To demonstrate trust in the face of resilience, leadership must demonstrate aspects of trust in the form of integrity, intent, capability, and results when making strategic business decisions (Abbu, Mugge & Gudergan 2022). Overall, Abbu, Mugge and Gudergan (2022) demonstrate the importance of trust specifically in relation to leadership in the context of digital transformation by providing guidelines and strategies to not only build but maintain trust in the long term.

One of the most important factors of digital transformation is how organisations maintain their cyber security to ensure that integrity of the data they maintain is always secure. Trust is an important aspect of the cyber asset market. Mitra and O'Regan (2020) interview with Dame Inga Beale provide good insight and knowledge in reference to the importance of trust. Dame Inga Beale is the CEO of Lloyd’s of London, which is a specialist insurance market (Mitra & O'Regan 2020). In the context of cyber security and digital asset insurance, the overall economy is dependable and reliant on digital trust (Mitra & O'Regan 2020). An interesting commentary by Dame Inga Beale regarding trust in the digital asset market discussed methods that could be implemented to mitigate the risk of cyber security attacks on data when certain government agencies were at the centre of cyber warfare (Mitra & O'Regan 2020). While the interview does not offer direct advice for managing trust, perhaps due to her high profile, the interview highlights how critical trust maintains data integrity in the
world of digitalisation and as a result, provides clear guidance for organisations to place emphasis on trust within their businesses and strategic frameworks (Mitra & O’Regan 2020).

Rijswijk et al. (2023) explored the linkage between trust and digitalisation on incumbent value chains and the subsequent outcome that each constraint poses on the other. Rijswijk et al. (2023) noted that most of the common literature surrounding trust and digitalisation reviews the relationship as only one way where the impact of trust on digitalisation is investigated. However, Rijswijk et al. (2023) aims to contribute to the literature by reviewing the relationship between trust and digitalisation as a two-way stream, focusing on how digitalisation effects trust amongst operators within the value chain. Trust is identified as an essential element for successful collaboration amongst stakeholders with the value of trust dependent on past experiences or current and historical information available (Rijswijk et al. 2023). Rijswijk et al. (2023) utilised a single case study of the Dutch flower sector to determine the importance of trust and digitalisation across the whole value chain and collected data via interviews. Although the sector chosen may seem unusual, the Dutch flower industry was worth an annual export value of 6.2 billion Euros in 2019 (Rijswijk et al. 2023). This industry has a long-standing history of value chain operators who historically worked together pre-digitalisation; therefore there was some level of existing trust amongst vendors (Rijswijk et al. 2023). The findings from this case study demonstrate that trust can be threatened during the process of digitalisation amongst operators in the value supply chain (Rijswijk et al. 2023). The reason digitalisation causes trust issues is that its disruptive nature causes new opportunities to emerge and new uncertainties and risks to arise (Rijswijk et al. 2023). Further, digitalisation creates a form of standardisation of work and therefore threatens previous informal arrangements essentially built on trust (Rijswijk et al. 2023). To mitigate the risks associated with deteriorating levels of trust, an industry governance framework needs to be developed and endorsed by the wider industry to ensure more sustainable operations can continue (Rijswijk et al. 2023). Another method to mitigate barriers to trust due to uncertainties posed by digitalisation is that “joint exploration, fore sighting and strategy building could allow actors to step out of their regular patterns of competition or co-opetition and explore new levels of collaboration for digitalisation” (Rijswijk et al. 2023, p. 9). Rijswijk et al. (2023) noted that limitations of their study were that it was based on one case study of an industry with the findings developed from interviews conducted in 2019. Therefore, the
amount of progress and digitalisation that would have occurred since these interviews could highlight differing outcomes of the relationship between trust and digitalisation (Rijswijk et al. 2023).

Candelo, Casalegno and Civera (2022) investigated enabling aspects of digital transformation in the small retailers’ context via the lens of stakeholder theory, analysing the importance of such transformations imposed by the COVID-19 pandemic. Their study found that stakeholder relationships based on trust, engagement and empowerment are enablers of digital transformation in entrepreneurial contexts based on analogic relationships and communal sharing relational models (Candelo, Casalegno & Civera 2022).

Drawing from the insights gathered in the literature review, trust can be conceptualised as accepting a certain level of vulnerability in inter- and intra-organisational relationships. By fostering trust, organisations create an environment where open communication, collaboration, and knowledge sharing thrive. In the context of digital transformation, trust becomes even more paramount. As organisations undergo significant change in their technologies, processes, and ways of operating, trust acts as a foundation upon which successful transformation is built. Trust enables individuals and teams to embrace new ideas, take risks, and adapt to the evolving digital landscape. By actively cultivating trust among stakeholders, organisations can navigate the challenges and complexities of digital transformation more effectively, increasing the likelihood of achieving successful outcomes. Thus, trust is a crucial intangible asset that plays a vital role in ensuring the success of digital transformation projects.

2.5 Hypotheses development

This research aims to investigate the dynamics of psychological safety within digital transformation project environments. The study utilises Edmondson (1999) foundational theoretical framework of psychological safety. The concept has roots in the early study of organisational change. Schein and Bennis (1965), for example, examined the need to develop psychological safety for people who feel secure and capable of change (Edmondson 1999). Edmondson (1999) suggests that since psychological safety supplies team members with a
shared cognitive perception (i.e., that they feel safe to articulate and start change), this may enable various positive results, such as work engagement, task performance, and knowledge sharing. However, even though psychological safety may play a role in improving team processes and outcomes, some complexities may be found in interpreting the effects of psychological safety, which could have negative consequences. To contribute to theory and the literature to provide more visibility on the impact of psychological safety in the digital transformation environment, this research model is presented within the theory of psychological safety (Zhang & Wan 2021). Edmondson (1999) proposed psychological safety as a team-level construct critical to team performance, mainly when tasks are complex (Letting & Menold). Within this theoretical framework, this study has investigated the potential impact of psychological safety on the success of the digital transformation project, to discover how psychological safety impacts digital transformation regarding role conflict and trust factors. Therefore, the results of this study over five hypotheses contribute to the theory by investigating undiscovered research concepts. In addition, this research also contributes to the literature by applying the theory of psychological safety in the digital transformation project environment by testing the mediation effect of trust and role conflict. Aspects of psychological safety theory and its application to the research model are detailed in Table 2.1.

Table 2.1: Psychological safety theory and its application to the research model

<table>
<thead>
<tr>
<th>Paradigm: Psychology</th>
</tr>
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<tbody>
<tr>
<td>Basic assumption: Psychological safety supplies team members with a shared cognitive perception that they feel safe to articulate and start change. It may enable various positive results, such as work engagement, task performance, and knowledge sharing.</td>
</tr>
<tr>
<td>Model application: How project team members’ feelings of psychological safety impact the success of the digital transformation project, and how trust and role conflict influence the relationship between psychological safety and success of the digital transformation project.</td>
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</table>

In order to achieve a comprehensive outcome from the research question with the aim of applying results to industry and as a guide for project professionals, a detailed investigation
was conducted by testing five hypotheses to analyse every potential aspect of the research model.

2.5.1 Direct effect of psychological safety

In this research, it is hypothesised that a higher level of perceived psychological safety among members of the digital transformation project team will lead to reduced role conflict uncertainties within the project environment. This is attributed to team members feeling at ease when expressing their thoughts and concerns about their roles, to both their colleagues and managers, without the fear of being judged or experiencing job insecurity. While some studies have discussed the psychological safety impact on team performance and project environments, its relationship with role conflict in the digital transformation project environment is still unknown. The literature demonstrates that psychological safety has a number of results for people's involvement in organisations or operations. Suppose a person has a high level of psychological safety; in that case, he or she will be confident that the interpersonal setting in which they are interacting is not threatening, and they will trust their co-workers and feel that they will not be shamed or punished for speaking up (Men et al. 2020).

According to the literature, there is evidence indicating psychological safety's relationship with various types of conflict. However, despite extensive research, no conclusive evidence has been found regarding a direct connection between psychological safety and role conflict. Kostopoulos and Bozionelos (2011) conducted a study on team-level activities, where exploratory and exploitative learning were considered as separate concepts, along with their associations with psychological safety, task conflict, and team performance. The findings revealed that task conflict plays a positive role in moderating the connection between psychological safety and exploitative learning. In the study conducted by O'Neill et al. (2017), it was discovered that teams with mid-range and dysfunctional conflict profiles had the lowest levels of psychological safety. These teams exhibited high levels of relationship conflict and process conflict, indicating interpersonal tensions and a lack of confidence in the abilities of team members. Wilkens and London (2006) also discovered that when team members felt psychologically safe and perceived themselves as disclosing information to others, they
experienced lower levels of relationship conflict and task conflict. In this sense, in psychologically safe environments, it is anticipated that team members will have the freedom to discuss any conflict points regarding their roles with their manager without fear of judgment. Consequently, this expectation implies that psychologically safe environments facilitate the resolution of such conflicts internally, leading to a reduction in overall role conflict. Aligned with psychological safety theory, the objective of this study is to make a valuable contribution to current research by presenting the following hypothesis as a complementary addition:

H1 – Psychological safety negatively impacts role conflict.

The primary hypothesis examines a direct association by investigating the direct impact of psychological safety on role conflict. By testing this hypothesis, the study aimed to determine whether the level of psychological safety among project team members in a digital transformation setting is directly related to the occurrence of role conflict within the team.

2.5.2 Mediating effect of role conflict

Role conflict refers to the simultaneous occurrence of conflicting expectations associated with different roles, particularly observed during periods of change (Brouns, Rexin & Externbrink 2021). This understanding suggests that role conflict can significantly impact transformation projects, characterised by environments that entail substantial change. In addition, van Marrewijk et al. (2016) emphasise the importance of interpersonal and organisational cooperation in large-scale projects, as these factors have the potential to give rise to conflict situations among project stakeholders. Building upon existing evidence in the literature, it is expected that role conflict will play a mediating role, influencing the relationship between psychological safety, trust, and overall success of digital transformation initiatives. Although previous studies have extensively examined the effects of role conflict in various project environments, the specific impact of role conflict on digital transformation project environments remains an unexplored area of research. The study conducted by Jia et al. (2019) demonstrated that role conflict weakens the positive association between socially responsible human resource management and organisational trust. While previous studies have shed light on the potential impact of role conflict on trust, team or individual
performance, the unique conditions of digital transformation have yet to be investigated in terms of the impact of role conflict. This study aims to address this gap by examining the mediating influence of role conflict through the following hypotheses:

**H2 – Role conflict partially mediates the relationship between psychological safety and trust.**

**H3 – Role conflict partially mediates the relationship between psychological safety and digital transformation project success.**

The second hypothesis of the research model focused on exploring the indirect impact of psychological safety on trust, mediated by role conflict. This hypothesis aimed to investigate whether the presence of role conflict among project team members in a digital transformation environment would influence the relationship between psychological safety and trust among team members. The third hypothesis investigated the indirect impact of psychological safety on the success of digital transformation projects, with role conflict as a mediating factor. Its objective was to ascertain whether the existence of role conflict among project team members in a digital transformation setting would influence the connection between psychological safety and overall achievement of the project. By uncovering the previously unexplored mediating effect of role conflict, this study makes a novel contribution to the theory of psychological safety. It sheds light on the indirect influence of psychological safety on outcomes of digital transformation project success and trust, specifically in relation to the concept of role conflict.

**2.5.3 Mediating effect of trust**

According to Ruijter et al. (2021), large-scale projects, being temporary in nature, can impact the development of trust among stakeholders involved. Wu et al. (2020) also highlighted this aspect, emphasising that the temporary nature of such projects can affect trust-building efforts. The literature highlights that effective project teams are characterised by key factors such as cooperation, knowledge sharing, and empowerment of teams through the promotion of psychological safety and trust (Ahiaga-Dagbui et al. 2020). Given this understanding, it is expected that trust will play a mediating role, affecting the influence of psychological safety
on overall success of digital transformation initiatives. This anticipation arises from the understanding that a higher level of trust fosters a collaborative and knowledge sharing environment among project team members. Likewise, the same expectation applies to the relationship between role conflict and overall achievement of digital transformation initiatives. The literature extensively investigates the impacts of trust in diverse project environments. However, the precise influence of trust on digital transformation project environments has not, to my knowledge, been thoroughly examined.

Madjar and Ortiz-Walters (2009) discovered that both trust in supervisors and trust in customers independently and jointly contributed to enhancing employee creative performance. Li and Yan (2009) examined the impact of a climate of trust on individual performance and found that a trust climate promotes individual performance by fostering psychological safety. Roussin and Webber (2012) demonstrated a positive correlation between trust, psychological safety, and initial perceptions of others' trustworthiness. Li and Tan (2013) revealed a positive correlation between trust in supervisors and psychological safety, with psychological safety mediating the relationship between trust in supervisors and job performance. Additionally, Basit (2017) established that psychological safety acts as a mediator between trust in supervisors and job engagement. Despite studies shedding some light on the potential influence of trust, the specific role it plays as a mediator between psychological safety and success of digital transformation projects, as well as between role conflict and success of digital transformation projects, has yet to be explored. This study aims to bridge this gap by investigating the mediating influence of trust, and the following hypotheses are formulated to achieve this objective:

**H4** – Trust fully mediates the relationship between psychological safety and digital transformation project success.

**H5** – Trust fully mediates the relationship between role conflict and digital transformation project success.

The fourth hypothesis focused on exploring indirect effects of psychological safety on digital transformation project success, mediated by trust. This hypothesis (H4) aimed to investigate
whether the level of trust among project team members influenced the relationship between psychological safety and overall project success in a digital transformation environment. The fifth and final hypothesis delved into the indirect impact of role conflict on digital transformation project success, mediated by trust. This hypothesis (H5) aimed to determine whether the level of trust among project team members would affect the relationship between role conflict and overall project success in a digital transformation environment.

2.6 Summary of Chapter 2

This chapter conducts a literature review that supports the chosen research model by examining key concepts such as psychological safety, digital transformation, role conflict, and trust. The main goal is to establish a foundational understanding for the current study by exploring their relationships to the success of digital transformation projects. The review synthesizes existing research findings, identifies gaps, and suggests potential directions for future research. These efforts contribute to the development of a research model that significantly shapes the design and structure of the study. The upcoming chapter will explore the research methods and outcomes, focusing on the interplay of contextual factors in the adoption and implementation of digital transformation projects in Australia.
CHAPTER 3 – RESEARCH METHODS AND RESULTS

3.1 Research design

Based on the data required for this research, the researcher could choose one of three methodology approaches: quantitative, qualitative, and/or mixed methods (Williams 2007). Quantitative research concentrates on data that can be measured, and it is functional at answering the “what” or “how” of a given case (Goertzen 2017).

Six key characteristics of quantitative research (Goertzen 2017) are:

- It deals with numbers to assess information.
- Data can be measured and quantified.
- It aims to be objective.
- Findings can be evaluated using statistical analysis.
- It represents complex problems through variables.
- Results can be summarised, compared, or generalised.

The essential principles driving data collection in quantitative research are that data are provided independently of viewer’s expectations, and the data are accurate indicators of the phenomenon (Botti & Endacott 2008). Four major objectives guide quantitative data collection (Botti & Endacott 2008):

- Empiricism: Observation and measurement that others can replicate.
- Measurement: Precise definition of scales or questionnaires to measure phenomena.
- Replicability: Ensuring that other investigators repeat the results obtained in replication studies.
- Objectivity: Aiming to eliminate prejudices in the data are gathered and analysed so that conclusions reflect truths regarding the phenomenon.

Quantitative research aims to identify predictions and establish cause–effect relationships among the variables under investigation (Chan et al. 2022). This study employed a quantitative research design, which involved the collection and analysis of numerical data to identify characteristics, establish correlations, and test formulated hypotheses (Chan et al.
When reviewing the literature, quantitative studies are generally performed via survey and experiment, while qualitative studies utilise case studies, interviews and grounded theory. In addition, some methods are more practical when handling specific types of questions and subjects, although induction and deduction should not be considered mutually exclusive (Sadeck 2013). A quantitative deductive approach uses numerical data to conduct statistical analysis as this numerical data is collected from assessments conducted by individuals directly related to the research topic (Al-Ajlouni 2021). Considering this study’s aim, this research performs a quantitative deductive approach drawing on psychological safety theory to explore the phenomena of psychological safety, role conflict, trust, and their impacts on digital transformation project success. A benefit of quantitative research is that study results may be generalisable to a larger audience (Letts 2019). Furthermore, leveraging quantitative techniques gives the capability to utilise statistical data to test hypotheses and analyse connections between variables based on numerical data. In particular, a survey taking a quantitative approach provides numerical data with variability from different angles to investigate the relationship among research concepts. The present study applied a quantitative survey-based research methodology. This research required a premise to explore overlaps and gaps in the literature on psychology, trust, role conflict and digital transformation. Therefore, as the first step, a comprehensive literature review has been conducted on psychology, trust, role conflict and digital transformation, to design the constructs and develop the research hypotheses. As the second step, the research employed a survey development technique suggested by Gehlbach and Brinkworth (2011) to attain expert panel feedback that specifies if the developed research concept matches the viewpoints of our population of interest. This research also conducted a pilot test to ensure clearness of expression in the survey instrument.

This research aims to provide data-oriented evidence of the validity of a theoretical framework to observe what possibilities might impact variables in the framework. The variable data was captured to measure numerical data for statistical procedures. The research question is developed to determine the connection between research variables. As psychological safety is the main element of psychological safety theory, this study will use psychological safety as the primary antecedent for the research model. In light of the theoretical framework, conclusive hypotheses can be established to understand the
association between variables. Variables have been identified based on the literature review and theory to analyse the relationship between digital transformation project success, psychological safety, role conflict and trust.

This research used perceptual measures for theoretical constructs. Using latent constructs is required to measure the facts and beliefs related to organisational practices and performance due to the absence of objective sources of information, or when a standard operational description cannot be generalised to multiple industry contexts (Hussain & Malik 2020). Investigating the whole population regarding time and economic aspects is impractical. Therefore, it is crucial to study a population sample to make generalisations rather than surveying everyone.

The survey was distributed using Qualtrics, an online survey platform. Qualtrics delivers an application to build and collect survey data. Researchers leverage potential survey participants to obtain their experience via survey questions based on specific and expected criteria. Therefore, Qualtrics concentrates the research survey based on the study's needs. All survey questions, control points and main survey framework were designed via the Qualtrics platform. The data collection process was outsourced to an external company with a panel of respondents who were participants in digital transformation projects within their organisations. The survey participants were informed about the researcher, project background, ethics approval and guidelines and invited to share their digital transformation experiences via the online survey platform.

3.2 Philosophical assumptions

The foundation of this study rests upon quantitative methodology that aligns with the positivist paradigm. By utilising a quantitative method within a positivist paradigm, this study investigates the causal relationship between psychological experiences of project team members and achieving project success. The researcher should be cognisant of the research paradigm adopted when collecting and analysing data (Pearse 2021). In taking a positivist approach, true knowledge is obtained through empirical means using scientific method, which involves observation and experimentation (Rehman & Ishak 2022). This approach is
based on the principles of predictability, applicability, and proportionality (Rehman & Ishak 2022). Furthermore, in order to enhance the generalisability of the research, data collection has been conducted without focusing on a specific industry. The concept of positivism was first introduced by the nineteenth-century philosopher Auguste Comte (1798--1859), who defined the term as the most advanced or highest type of knowledge (Schweber 2015). Positivism is a philosophy of science that accepts the empiricist premise: it analyses facts in its phenomenal manifestations (Joulíé 2018). Positivism can be described as the view that human interactions (between people or groups/organisations) can be investigated and demonstrated by discovering the probabilistic rules which manage them (Tatham 2017). As positivism serves as the foundation for quantitative research, which believes in a singular reality, emphasises the objectivity of researchers, employs quantitative experimental methods to establish causality, and maintains a clear distinction between facts and values (Usher 2023), this research model aligns with the positivist paradigm.

3.3 Questionnaire design

The literature examined specified the mediating roles of role conflict and trust in the relationship between psychological safety and digital transformation project success. A survey-based research design was applied to test hypothesised connections in this study. The psychological safety scale was adopted from Edmondson (1999) and also used and adapted by Lee, Swink and Pandejpong (2011). Initially, seven questions were added to the survey. Based on the literature suggesting that lower factor loading signifies a lesser contribution in measuring the observed variance of a theoretical construct (Jafari et al. 2022); to enhance Average Variance Extracted (AVE) scores, two indicator variables with low loadings were identified in the measurement model and subsequently removed from the psychological safety construct.

The scale for role conflict was adapted from Nambisan and Baron (2021), and eight questions were added to the survey. The items for trust construct were adapted from Paul et al. (2021). The one low-loading of six questions was also removed from further analysis to enhance AVE scores. As the literature has recognised its essential dimensions, project success is a multidimensional concept as projects are expected to be concluded on schedule and within
budget and scope (Zwikael & Meredith 2021). Therefore, the digital transformation project success scale was utilised as a second-order construct derived from Zwikael and Meredith (2021) project success dimension model, originally designed for general projects but modified to suit the specific context of digital transformation. Following Table 3.1 details the variables used in the research model.

**Table 3.1: Research variables and measurement scale**

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Independent &amp; Dependent</th>
<th>Measurement Scale (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Safety</td>
<td>Independent</td>
<td>1 to 7</td>
</tr>
<tr>
<td>Role Conflict</td>
<td>Dependent</td>
<td>1 to 7</td>
</tr>
<tr>
<td>Trust</td>
<td>Dependent</td>
<td>1 to 7</td>
</tr>
<tr>
<td>Digital Transformation Project Success</td>
<td>Dependent</td>
<td>1 to 7</td>
</tr>
</tbody>
</table>

In addition, an initial pilot survey test was performed with an expert panel consisting of one academic and three senior project managers with significant experience in digital transformation. The expert panel approved content relevancy and construct representativeness and proposed minor modifications to the phrasing of some questions to present a generalisable digital transformation project context. Pilot testing panel suggestions were integrated into the final version of survey questions. Theoretical constructs and their source are presented in Appendix 1.

**3.4 Ethical considerations**

As ethics is vital for research, this study maintained ethical principles and policies for protecting human subjects in research (Cintrón 2022). As this study used human subjects, it was supervised and controlled by the Research Ethics Office at Swinburne University of Technology to ensure the study would refrain from gathering any information against research ethics principles. This project has been approved by or on behalf of Swinburne University Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research.
3.5 Data collection

The research question and formulated hypotheses were examined for specific context of a digital transformation project environment. Given the distinctive attributes of digital transformation projects, they are encountered in a wide range of industries globally. Digital transformation has significant potential to make substantial contributions across various sectors in Australia including finance, insurance, healthcare, and government bodies. With the increasing focus on digitalisation, many organisations across industries have already embarked on or are considering starting the digital transformation journey. It is worth noting that while competitive pressures exist in all industries, large-scale digital transformation projects are not limited to specific sectors. The principles for successfully implementing digital transformation projects can be applied universally, aiming to enhance overall customer satisfaction and user experience. However, it is important to consider any unique factors or specific requirements that may exist within different industries. With this consideration in mind, this study adopted an industry-independent approach, avoiding limitations on the selection of participants based on their specific industries that might reduce the quality and variety of the survey data. By taking a holistic approach encompassing various industries, this study aims to provide valuable insights to professionals across sectors and contribute to the body of literature. Consequently, the data collection process encompassed participants’ experiences from different industries, regardless of industry type in which their digital transformation projects were undertaken.

The target population was digital transformation project team members who were part of a digital transformation project in their organisation. The main criterion for participant selection was that participants must have taken part in a digital transformation project within their organisation. This requirement was provided to potential survey participants in the Project Information Sheet and as a screening question at the start of online survey administered through Qualtrics. After the survey was published via the online survey platform, 538 potential participants received the Project Information Sheet. However, a total of 408 digital transformation project practitioners who have worked on a digital transformation project in their organisation agreed to complete the survey. Moreover, some quality checks have also been applied to the survey data for participants’ attention. In order
to promote careful consideration of the questions and maintain data integrity, the survey includes an attention checkpoint and a reasonable completion time checkpoint, encouraging respondents to give thoughtful responses by carefully reading the questions.

These two checkpoints allowed a robust quality of answers as it ensured the participants paid attention to survey questions and were not selecting answers at random. Similarly, the survey completion time checkpoint increased survey quality as it eliminated participants' answers to the questions that were quicker than the average expected timeframe. After filtering attention checkpoints and minimum survey completion time filters on all survey responses, 256 survey participants' answers were identified for further analysis. The final sample size of 256 participants for a 30-item survey resulted in a survey item ratio of 8:53, which meets both Kline (2015) and Hair et al. (2019) minimum sample requirement for structural equation models.

The survey also gathered some demographic information:
- Participants' IT project management experience;
- Duration of the digital transformation project;
- Industry type;
- Participants' positions; and
- Project management certification (optional).

Demographic information of survey respondents is detailed in Table 3.2. Based on demographic data, 35% of survey participants had two years or less IT project management experience, while 32% had two to five years, 20% had five to ten years, and 13% had more than ten years. These results displayed a fair variety around participants' experience in IT project management and strengthened the value of the survey response data as the participants varied in relation to level of experience.

However, the industry that dominated was technology, with 57% of survey participants. The finance industry was the second most significant industry making up 12% of the participant population. This was followed by education, utilities, healthcare, transportation, and construction industries, respectively at 5%, 5%, 2%, 2%, and 2%. Apart from these defined industries, 15% of the remaining participants came from other industries. These results prove
that the industry-independent approach provided a combination of different industry experiences in survey results.

Table 3.2: Demographic information of survey respondents

<table>
<thead>
<tr>
<th>IT Project Management Experience</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2 years</td>
<td>35%</td>
</tr>
<tr>
<td>2 to 5 years</td>
<td>32%</td>
</tr>
<tr>
<td>More than 5 to 10 years</td>
<td>20%</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>13%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration of Digital Transformation Project</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>30%</td>
</tr>
<tr>
<td>1 to 2 years</td>
<td>42%</td>
</tr>
<tr>
<td>More than 2 to 3 years</td>
<td>19%</td>
</tr>
<tr>
<td>≥ 4 years</td>
<td>9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>5%</td>
</tr>
<tr>
<td>Finance</td>
<td>12%</td>
</tr>
<tr>
<td>Healthcare</td>
<td>2%</td>
</tr>
<tr>
<td>Technology</td>
<td>57%</td>
</tr>
<tr>
<td>Transportation</td>
<td>2%</td>
</tr>
<tr>
<td>Construction</td>
<td>2%</td>
</tr>
<tr>
<td>Utilities</td>
<td>5%</td>
</tr>
<tr>
<td>Others</td>
<td>15%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Position Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Program or Portfolio Manager</td>
<td>3%</td>
</tr>
<tr>
<td>Project Manager</td>
<td>16%</td>
</tr>
<tr>
<td>Analyst (System/Business)</td>
<td>27%</td>
</tr>
<tr>
<td>Developers</td>
<td>16%</td>
</tr>
<tr>
<td>Tester</td>
<td>15%</td>
</tr>
<tr>
<td>System/DevOps Engineer</td>
<td>7%</td>
</tr>
<tr>
<td>Project Stakeholder/Business Unit</td>
<td>3%</td>
</tr>
<tr>
<td>Management</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project Management Certification (Optional)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>11%</td>
</tr>
<tr>
<td>No</td>
<td>12%</td>
</tr>
<tr>
<td>Not specified</td>
<td>77%</td>
</tr>
</tbody>
</table>

When looking at participants' positions within their organisations, it is seen that the most significant background was Analyst (System/Business) with 27% of participants. Project Managers and Developers were 16% respectively and were the second most significant backgrounds among participants. Testers made up 15% of survey participants, while
Management positions were 7% and System/DevOps Engineers had 7% involvement. This was followed by Program or Portfolio Managers with 3% and Project Stakeholder/Business Units with 3% involvement while the remaining 6% was made up of other various backgrounds. These results also further strengthened generalisability in the survey data as their diverse participant positions touched all parts of the digital transformation project, ranging from technical to managerial aspects.

Apart from participants' demographic variety, this research also collected data about digital transformation project duration within organisations. Based on survey results, 42% of digital transformation projects were completed between one to two years, while 30% were completed in less than a year. And 19% of those projects were completed between two to three years, and 9% in four years or more. These results demonstrate that 72% of all digital transformation projects were completed in two years, while 28% were greater than two years.

Lastly, this study also collected Project Management Certification status (optional). 11% of the survey participants specified they had project management certification, while 12% did not have any certification.

77% of the participants did not specify their Project Management Certification status. These overall results provide a high level of confidence in capturing differing perspectives due to diverse responses received from different industries, experiences, and positions. In addition, the differing duration of digital transformation projects also provided an opportunity to capture experiences from different projects with different timelines and scope.

As all survey questions had system control: 'previous question should be completed for next question', non-response or missing data were not subject to this survey; so all 256 responses have complete answers for all survey questions. The survey questions in the online survey platform were not tagged or connected to theoretical concepts of the research model, to maintain survey model integrity or allow participants to decode theoretical connections among survey questions, lessening the possibility of common method bias (Malik, Sarwar & Orr 2021). Besides this, voluntary survey participation and anonymity were underlined in the
survey invitation, with plain language information provided to survey participants. The survey did not gather any personal data that could identify survey participants or their organisations. There was no restriction on employees who worked at the same company, due to confidentiality of the survey.

3.6 Data analysis technique

The research used the IBM Statistical Package for the Social Sciences (SPSS) version 28 to analyse the data from the Qualtrics platform. The survey was analysed with structural equation modelling (SEM) analysis using AMOS software version 29. SEM was applied to test the hypotheses in this study because this method utilises a set of methodological approaches for statistical analysis to examine simultaneous dependency relationships (Severo, De Guimarães & Dellarmelin 2021). The first step of data analysis design is to determine data types that use statistical tests via the research data.

As survey data should be refined before starting data analysis, the next task was to ensure the data had no unanswered questions. To ensure the survey data has no incomplete data, the "prior question should be complete for the next question". Therefore, all participants had to complete survey questions to pass subsequent sections. Thus, no missing value was possible for survey participants. In addition, the completed surveys in which participants provided the same answers for all questions were also considered invalid surveys.

3.7 Data collection and adequacy tests

Utilising an ex-ante approach, the integrity of survey responses was maintained as respondents were assured anonymity. In addition, theoretical constructs were not labelled against the survey questionnaire, thereby allowing for unbiased results to be produced without respondents making a casual relation assumption and minimising common method bias (Chavez et al. 2023).

Two ex-post statistical tests were performed to determine the extent of common method bias in the collected data. First, a single factor confirmatory factor analysis (CFA) was conducted for the survey questions and the CFA model fit results were \(\text{CMIN/DF} = 1.960,\)
Tucker–Lewis Fit Index (TLI) = .907, Comparative Fit Index (CFI) = .923 and Root Mean Square Error of Approximation (RMSEA) = .061. Second, a common latent factor test was conducted by comparing measurement model fit indices with and without the common latent factor: (CMIN/DF = 1.731, Tucker–Lewis Fit Index (TLI) = .929, Comparative Fit Index (CFI) = .947 and Root Mean Square Error of Approximation (RMSEA) = .054), which showed minor differences (ΔCMIN/DF and < .25, ΔTLI and ΔCFI < .025).

3.8 Construct validity and reliability tests

As alpha coefficients are utilised to test for internal consistency of constructs (Fullerton, Kennedy & Widener 2014), the Cronbach Alpha approved survey items’ internal consistency (.756) which surpassed the advised threshold of 0.70 (Malik, Sarwar & Orr 2021). After determining the sufficiency of the data collection method, a measurement model was created in AMOS version 29 to define the validity of research constructs. The measurement model fitness measures were calculated using c2/degree of freedom ratio (CMIN/DF), Comparative Fit Index (CFI), Incremental Fit Index (IFI), and Standardized Root Mean Square Residual (SRMR). This measurement model's absolute and incremental fitness indices of c2/ degree of freedom ratio (CMIN/DF) = 1.96, Tucker–Lewis Fit Index (TLI) = 0.907, Comparative Fit Index (CFI) = 0.923, Incremental Fit Index (IFI) = 0.925 and Root Mean Square Error of Approximation (RMSEA) = 0.061 satisfied the suggested thresholds of CMIN/DF < 2.00, TLI > 0.90, CFI > 0.90, IFI > 0.90 and RMSEA < 0.08 (Hair et al. 2019).

The good fit of the measurement model permitted the calculation and comparison of AVE and inter-construct correlations with established standards. In order to enhance AVE scores, some low-loading items were excluded from further analysis, two items from psychological safety and one item from trust, which are highlighted in red in Appendix 1. The composite reliability scores evaluate internal consistency of the measure, which is usually assessed in conjunction with structural equation modelling (Wu, Wang & Chen 2017). The composite reliability scores for the two adjusted and four unchanged constructs met the condition of threshold 0.7 (Malik, Sarwar & Orr 2021). Discriminant validity evaluates the extent to which individual constructs are discrete, and the measurement of discriminant validity compares the square root of the AVE to the correlations between concepts (Fullerton, Kennedy & Widener 2014). The AVE values for the research model's concepts surpassed the threshold level of 0.5, confirming
convergent validity (Malik, Sarwar & Orr 2021). Table 3.3 demonstrates first-order concept’s composite reliability, convergent validity, and discriminate validity, while Table 3.4 details standard coefficients and t-values for all research items. Digital transformation success was measured by Zwikael and Meredith (2021) as a second-order construct that formed three first-order constructs of effect: project management success, project ownership success and project investment success.

Table 3.3: Construct reliability and validity test results

<table>
<thead>
<tr>
<th>Construct</th>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>MaxR(H)</th>
<th>PIS</th>
<th>PMS</th>
<th>Role Conflict</th>
<th>POS</th>
<th>Trust</th>
<th>PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Investment Success</td>
<td>0.882</td>
<td>0.716</td>
<td>0.677</td>
<td>0.947</td>
<td>0.846</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management Success</td>
<td>0.867</td>
<td>0.632</td>
<td>0.453</td>
<td>0.866</td>
<td>0.638</td>
<td>0.789</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role Conflict</td>
<td>0.896</td>
<td>0.526</td>
<td>0.142</td>
<td>0.913</td>
<td>-0.187</td>
<td>-0.377</td>
<td>0.725</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Ownership Success</td>
<td>0.850</td>
<td>0.739</td>
<td>0.677</td>
<td>0.854</td>
<td>0.823</td>
<td>0.673</td>
<td>-0.221</td>
<td>0.860</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.838</td>
<td>0.523</td>
<td>0.225</td>
<td>0.896</td>
<td>0.474</td>
<td>0.381</td>
<td>-0.299</td>
<td>0.438</td>
<td>0.723</td>
<td></td>
</tr>
<tr>
<td>Psychological Safety</td>
<td>0.962</td>
<td>0.837</td>
<td>0.173</td>
<td>0.979</td>
<td>0.238</td>
<td>0.116</td>
<td>-0.227</td>
<td>0.174</td>
<td>0.416</td>
<td>0.915</td>
</tr>
</tbody>
</table>

CR= Composite Reliability, AVE = Average Variance Extracted, MSV = Maximum Shared Variance, MaxR(H) = Maximal Reliability, (Maximal Square root of AVE is shown as bold in diagonal) PIS= Project Investment Success, PMS = Project Management Success, POS = Project Ownership Success, PS = Psychological Safety

Table 3.4: Theoretical constructs and indicator variables

<table>
<thead>
<tr>
<th>Theoretical Construct and Indicator Variable</th>
<th>Stand. Coefficient</th>
<th>T Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role Conflict</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 I do things that are apt to be accepted by one person and not by others.</td>
<td>.468</td>
<td>a</td>
</tr>
<tr>
<td>2 I work with two or more groups who operate quite differently</td>
<td>.539</td>
<td>6.21</td>
</tr>
<tr>
<td>3 I have to work under incompatible policies and guidelines.</td>
<td>.755</td>
<td>7.32</td>
</tr>
<tr>
<td>4 I have to do things that should be done differently under different conditions.</td>
<td>.817</td>
<td>7.54</td>
</tr>
<tr>
<td>5 I have to buck a rule or policy in order to carry out an assignment.</td>
<td>.743</td>
<td>7.19</td>
</tr>
<tr>
<td>6 I receive incompatible requests from two or more people.</td>
<td>.807</td>
<td>7.27</td>
</tr>
<tr>
<td>7 I receive an assignment without adequate resources and materials to execute it.</td>
<td>.776</td>
<td>7.50</td>
</tr>
<tr>
<td>8 I have to work under vague directives or orders</td>
<td>.810</td>
<td>7.39</td>
</tr>
<tr>
<td>Trust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 I feel that I can depend on my team members to meet task commitments.</td>
<td>.807</td>
<td>10.81</td>
</tr>
<tr>
<td>10 I feel that my team members will share information freely and openly.</td>
<td>.739</td>
<td>10.11</td>
</tr>
<tr>
<td>11 My team members’ goal is to use this project to gain real-world experience</td>
<td>.457</td>
<td>6.58</td>
</tr>
<tr>
<td>12 I feel that my team members will be concerned about my preferences/views.</td>
<td>.204</td>
<td></td>
</tr>
<tr>
<td>13 I feel that my team members will put in their best effort on the team projects.</td>
<td>.776</td>
<td>10.51</td>
</tr>
<tr>
<td>14 If required, I will be comfortable in giving my team members complete responsibility for the completion of this project</td>
<td>.673</td>
<td>a</td>
</tr>
<tr>
<td>Psychological Safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 If I made a mistake on this project, it was held against him/her^</td>
<td>.685</td>
<td>4.91</td>
</tr>
<tr>
<td>16 I was able to bring up problems and tough issues</td>
<td>4.13</td>
<td>4.54</td>
</tr>
<tr>
<td>17 People on this project sometimes rejected other members for being different^</td>
<td>.721</td>
<td>4.85</td>
</tr>
<tr>
<td>18 It was safe to take a risk on this project</td>
<td>.540</td>
<td>a</td>
</tr>
<tr>
<td>19 It was difficult to ask other team members for help</td>
<td>.744</td>
<td>5.01</td>
</tr>
<tr>
<td>20 No one on this team would deliberately act in a way that undermined others’ efforts</td>
<td>.392</td>
<td>3.77</td>
</tr>
<tr>
<td>21 I felt that my unique skills and talents were valued and utilised on this project</td>
<td>.367</td>
<td>a</td>
</tr>
</tbody>
</table>

Digital Transformation Project Success
### Project Management Success

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 22 | The digital transformation project was completed on time | .830  
| 23 | The digital transformation project was completed within budget | .845 15.43 |
| 24 | The digital transformation project was completed within the agreed scope | .838 15.27 |
| 25 | The digital transformation project was completed without undesirable benefits caused by the project manager | .621 10.38 |

### Project Ownership Success

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 26 | The digital transformation project was realised all target benefits | .840  
| 27 | The digital transformation project’s business case was realised | .878 15.71 |

### Project Investment Success

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 28 | The investment in this digital transformation project generated satisfactory results (even if the business case was not realised) | .774  
| 29 | The founder would have invested in this project again had they known everything that has happened since | .743 12.43 |
| 30 | The digital transformation project overall was a success | .934 15.70 |

### 3.9 Structural equation modelling analyses and hypothesis testing

The research data was analysed using a SEM (Hauseman 2016) method via AMOS version 29 as the next step in confirming concept validity and reliability. Psychological safety, role conflict and trust were performed as the first-order construct, and digital transformation project success was the second-order construct in the research model.

The measurement model fitness measures were calculated using c2/degree of freedom ratio (CMIN/DF), Comparative Fit Index (CFI), the Incremental Fit Index (IFI) and Standardized Root Mean Square Residual (SRMR). This measurement model's absolute and incremental fitness indices of c2/degree of freedom ratio (CMIN/DF) = 1.96, Tucker–Lewis Fit Index (TLI) = 0.907, Comparative Fit Index (CFI) = 0.923, Incremental Fit Index (IFI) = 0.925 and Root Mean Square Error of Approximation (RMSEA) = 0.061 satisfied the suggested thresholds of CMIN/DF (2.00, TLI 0.90, CFI > 0.90, IFI > 0.90 and RMSEA < 0.08 (Hair et al. 2019).

After confirming concept validity, a structural equation model was constructed to analyse path coefficients for testing the research hypotheses. The fitness of the structural equation model was also assessed, demonstrating a good model fit. Table 3.4 shows standard coefficients and t-values for all variables, while Table 3.5 shows hypotheses test results for the structural model path diagram. Figure 3.1 below demonstrates the conceptual framework of this research.
Table 3.5: Hypotheses results

<table>
<thead>
<tr>
<th>Relationships</th>
<th>Direct effect</th>
<th>Specific Indirect effect</th>
<th>Mediation Type</th>
<th>Hypothesis test</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 Psychological Safety → Role Conflict</td>
<td>-.562 ***</td>
<td>---</td>
<td>---</td>
<td>Accepted</td>
</tr>
<tr>
<td>Direct Relationship X → Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2 Psychological Safety → Role Conflict → Trust</td>
<td>.920 ***</td>
<td>.166 ***</td>
<td>Partial</td>
<td>Accepted</td>
</tr>
<tr>
<td>X → Mediator → Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3 Psychological Safety → Role Conflict → Dig. Trans. Project Success</td>
<td>-.456 ns</td>
<td>.088 ns</td>
<td>No Relationship</td>
<td>Rejected</td>
</tr>
<tr>
<td>X → Mediator → Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4 Psychological Safety → Trust → Dig. Trans. Project Success</td>
<td>-.456 ns</td>
<td>.703 ***</td>
<td>Full</td>
<td>Accepted</td>
</tr>
<tr>
<td>X → Mediator → Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H5 Role Conflict → Trust → Dig. Trans. Project Success</td>
<td>-.157 ns</td>
<td>-.225 ***</td>
<td>Full</td>
<td>Accepted</td>
</tr>
<tr>
<td>X → Mediator → Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** = p < 0.05 significance level, *** = p < 0.005 significance level, ns = not significant

Table 3.6: Indirect Effects

<table>
<thead>
<tr>
<th>Parameter – Indirect Effects</th>
<th>Estimate</th>
<th>Lower</th>
<th>Upper</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Safety → Role Conflict</td>
<td>-.562</td>
<td>-1.470</td>
<td>-.222</td>
<td>***</td>
</tr>
<tr>
<td>Psychological Safety → Role Conflict → Trust</td>
<td>.166</td>
<td>.046</td>
<td>.608</td>
<td>***</td>
</tr>
<tr>
<td>Psychological Safety → Role Conflict → Dig. Trans. Project Success</td>
<td>.088</td>
<td>-.042</td>
<td>.414</td>
<td>ns</td>
</tr>
<tr>
<td>Psychological Safety → Trust → Dig. Trans. Project Success</td>
<td>.703</td>
<td>.390</td>
<td>1.661</td>
<td>***</td>
</tr>
<tr>
<td>Role Conflict → Trust → Dig. Trans. Project Success</td>
<td>-.225</td>
<td>-.460</td>
<td>-.070</td>
<td>***</td>
</tr>
</tbody>
</table>

P = Probability Value
This research modelled a total of five hypotheses, and four were accepted, while Hypothesis 3 was not supported.

Hypothesis 1 (H1) tested psychological safety as an antecedent of role conflict to highlight its direct impact on role conflict in the digital transformation project environment. The psychological safety scale was adopted from Edmondson (1999) and also used and adapted by Lee, Swink and Pandejpong (2011), while the scale for role conflict was adapted from Nambisan and Baron (2021). The results demonstrated a significant direct relationship between these concepts (p=***, estimate=-.562, C.R.= -3.418). As a result, H1 was accepted with a significant direct adverse effect of psychological safety on role conflict in digital transformation projects.

Hypothesis 2 (H2) questioned role conflict’s mediation effect between psychological safety and trust in the digital transformation project environment. The items for the trust concept were adapted from Paul et al. (2021). The results showed that psychological safety has a significant linear direct effect on trust (p=***, estimate=.920, C.R.= 3.890). When role conflict’s mediation effect is added between these two concepts, psychological safety’s
impact on trust remains linear and significant (p=***, estimate=.166). In conclusion, H2 was partially accepted with a significant mediation effect of role conflict between psychological safety and trust.

Hypothesis 3 (H3) examined role conflict’s mediation effect between psychological safety and digital transformation project success. The digital transformation project success scale was adopted from Zwikael and Meredith (2021) project success dimension model. The results indicated that psychological safety has no significant direct effect on digital transformation project success (p=ns, estimate=-.456, C.R.= -1.911). When role conflict's mediation influence is counted between these two concepts, psychological safety still has no impact on digital transformation project success (p=ns, estimate= .088). Therefore, H3 was rejected under the not significant mediation effect of role conflict between psychological safety and digital transformation project success.

Hypothesis 4 (H4) investigated trust's mediation effect between psychological safety and digital transformation project success. As it is mentioned in hypothesis 3’s results, psychological safety has no significant direct effect on digital transformation project success (p=ns, estimate= -.456, C.R.= -1.911). However, when trust’s mediation effect is involved between these two concepts, psychological safety has a significant linear impact on digital transformation project success (p=***, estimate= .703). Therefore, H4 was fully accepted with a significant mediation effect of trust between psychological safety and digital transformation project success.

Hypothesis 5 (H5) analysed trust’s mediation effect between role conflict and digital transformation project success. Role conflict has a non-significant direct effect on digital transformation project success (p=ns, estimate= -.157, C.R.= -1.313). However, when trust’s mediation effect is added between these two concepts, role conflict’s non-significant impact on digital transformation project success becomes significant and adverse (p=***, estimate= -.225). Thus, H5 was fully accepted with a significant mediation effect of trust between role conflict and digital transformation project success.
3.10 Summary of Chapter 3

This chapter has delineated the research methodology and the underlying paradigm. It provided an outline of the research design and the context in which data collection occurred. A detailed discussion of the units of analysis followed, along with explanations of the construct validity and reliability tests, and the results of the hypotheses tests. The next chapter will delve into a detailed discussion of both theoretical and practical implications arising from these findings.
CHAPTER 4 – DISCUSSION

4.1 Theoretical implications

This study contributes towards digital transformation theory by identifying the implications of psychological safety and role conflict on the success of digital transformation projects. By empirically testing the relationship between psychological safety, role conflict, trust, and digital transformation project success, this study provides a framework for considering future digital transformation projects. Digital transformation is described as "a change in how a firm employs digital technologies to develop a new digital business model that helps to create and appropriate more value for the firm" (Christodoulou et al. 2022, p. 614). Digital transformation projects facilitate service delivery via process redesign and automation (Alshallaqi 2022). However, managers have reported that over 70% of digital transformation projects fail (Danuso, Giones & da Silva 2022). Therefore, factors that impact digital transformation project success are critical for both theory and practice.

The focus of this study is the psychological impact that digital transformation projects have towards project team members. This research contributes to digital transformation concepts by investigating findings on the causal relationship of psychological safety, role conflict, and trust concepts that impact project success. Although there is various literature surrounding digital transformation and psychology, the focus for this study and its empirical validation makes a new contribution to the literature which validates the relationship between psychological safety, role conflict and trust concepts within digital transformation project success.

This study identifies the relationship between psychological safety and role conflict in digital transformation project environments. The study’s first hypothesis (H1) has revealed a significant adverse relationship between psychological safety and role conflict in digital transformation project environments. This result signifies that when project team members psychologically feel safe, the possibility of role conflict decreases significantly during the digital transformation project period. Extant literature on psychological safety can be found in works by Liu, Keller and Bartlett (2021), Agarwal and Anantatmula (2022) and Cauwelier
(2019). Liu, Keller and Bartlett (2021) examined the impact of psychological safety on knowledge sharing and team creative performance specific to R&D teams in Taiwan. Agarwal and Anantatmula (2022) discussed the importance of psychological safety on the overall impact of knowledge sharing that occurs within an organisation and demonstrate through their findings the psychological barriers that hinder this knowledge transfer. Cauwelier (2019) strived to identify the impact of action learning towards psychological safety. All three studies discuss the importance and positive impact of psychological safety on knowledge sharing, and team member willingness to take risks and explore new ideas. However, the association between psychological safety and role conflict is yet to be discovered, further signifying the importance of identifying this association between the two concepts and its implications for both theory and practice. This empirical result demonstrates that providing a safe environment for project members, in which they feel safe without fear, would be a beneficial and proactive approach to avoid role conflict. The relationship between psychological safety and role conflict in the digital transformation project environment contributes to the team psychology, project management, role conflict and digital transformation literature by introducing new connections between these two variables, which had previously not been studied. Therefore, this finding suggests that project professionals should always pay attention to building a safe atmosphere for team members in which they can safely express their thoughts without isolating themselves from others, do not feel afraid of making mistakes, and can help other team members without question. This environment will reduce the possibility of role conflict among them. This significant relationship is a new finding in the literature and points to a potential research direction that combines psychology, role conflict and digital transformation literature. Also, this hypothesis also contributes to psychological safety theory by introducing new potential consequences of psychological safety in large-scale digital transformation project environments with significant impact.

Another significant contribution of this study discovered the mediating effect of role conflict between psychological safety and trust in the digital transformation project environment. Psychological safety has a significant direct effect on trust among project team members in the digital transformation project environment. This linear relationship between these two concepts shows that improved psychological safety feeling among team members during digital transformation projects can increase project staff’s trust level in each other during the
project’s lifespan. Barrane et al. (2021) briefly touched on the correlation between building trust within an organisation and its subsequent impact on fostering a creative and innovative environment for employees to feel safe. Psychological safety has obtained much attention in the literature as a psychologically safe climate is considered to have positive impacts on team interactions due to the supportive atmosphere it fosters (Eisenberg & DiTomaso 2021). Therefore, this environment would provide a safe place for project team members to trust each other without questioning others’ intentions. The literature highlights critical antecedents of highly effective project teams’ association and willingness to transfer knowledge, and empowerment of the team by developing psychological safety and trust (Ahiaga-Dagbui et al. 2020). Besides this, when the mediation effect of role conflict is added between these concepts, the linear connection between psychological safety and trust remains significant. This result indicates two main findings. Firstly, linear trust grows among digital transformation team members when psychological safety feelings increase. That means when digital transformation project team members feel psychologically secure, they tend to trust each other better during the project journey. In addition, even if role conflict is experienced between project team members who feel psychologically safe, their trust level will remain significant. This result implies that psychological safety also has an indirect and significant impact on the trust level of project team members besides its significant direct impact. If project environments are good enough for project members to grow their psychologically secure feelings, trust level also increases in parallel. Project team members were more likely to trust in terms of task commitment, task assignment and sharing information and goals with others, freely and openly. The recent literature has suggested that where psychological safety exists, individuals concentrate better on collaborative objectives and problem solving rather than self-protection and recreating blame games (Ahiaga-Dagbui et al. 2020). Psychological safety has been investigated in some studies in the literature, such as psychological safety’s moderator effects on the type of team structure on individual perceptions of team communication and the emergent state of trust in other team members investigated by Eisenberg and DiTomaso (2021). Its mediating effect between affect-based trust in the leader and team performance has been analysed by Holtzhausen and de Klerk (2018). Lean implementation effects on psychological safety through respect for people, trust, communication, lean leadership, problem-solving, continuous improvement, no blame culture, value creation, and waste elimination in construction projects has been investigated
by Demirkesen, Sadikoglu and Jayamanne (2021). And its mediating effect on the relationship between a climate of trust and individual performance was studied by Li and Yan (2009). However, despite all those studies, this research concept is a new finding in the literature. The results of this hypothesis contribute to trust, psychology, role conflict and project management literature with new significant findings. These results also contribute to research theory by exhibiting that psychological safety empowers trust positively in digital transformation project environments, directly and indirectly, over the mediation effect of role conflict.

The third contribution of this research is the mediation effect of role conflict between psychological safety and digital transformation project success. The results demonstrate that psychological safety does not influence digital transformation project success. Examples attributed to this result include some project team members viewing transformation as invisible change, as transformation might be a grey space for future organisational involvement. When testing this mediating effect between the impact of psychological safety and digital transformation project success, it is observed that role conflict has no significant mediation effect between these two constructs. These results imply two central values. Surprisingly, it was found that psychological safety has no impact on the success of digital transformation. Chandrasekaran and Mishra (2012) investigated the impact of psychological safety on project performance through the mediation of team turnover, and their study indicated that the effect of psychological safety on project performance was indirect and mediated via team turnover. Harms (2015) discovered the connection between team learning and performance growth when psychological safety is heightened, respectively descending when psychological safety is low. Ostermeier, Davis and Pavur (2020) also found that psychological safety affects team potency and, eventually, performance. However, the empirical results of this study did not find any significant relationship between psychological safety and digital transformation project success, directly or indirectly, via role conflict. That means when the level of psychological safety is increasing or decreasing, it will not directly impact digital transformation project success. Secondly, when role conflict appears among the project team members who feel psychologically safe, there is also no significant mediation effect on digital transformation project success. Some studies in the literature also investigated the potential effect of psychological safety on project or team performance.
Khan et al. (2020) investigated the connection between inclusive leadership and project success by including the mediating effects of psychological empowerment and psychological safety. Kostopoulos and Bozionelos (2011) studied team-level activities and their relationships with psychological safety, task conflict, and team performance. Although these studies in the literature have discussed relationships between psychological safety and project or team performance, psychological safety's impact on the digital transformation project environment was still undiscovered, and nor was the mediation effect of role conflict on these two concepts. Therefore, this hypothesis result is also a new contribution to the literature. In terms of psychological safety theory, the results of this hypothesis also contribute to theory by enriching psychological safety's impact and potential role conflict mediation effects.

The fourth contribution of this research is trust's mediating effect between psychological safety and digital transformation project success. As mentioned above, this study did not observe any significant direct impact of psychological safety on digital transformation project success. Conversely, the results demonstrate that trust significantly and positively impacts digital transformation project success. As trust has been discussed as one of the critical success factors for cooperation in some project management studies, researchers have investigated how to build trust in projects and administrative activities that have antecedents' impact on trust (Xu, Smyth & Zerjav 2021). Wang and Chen (2006) characterise trust as a psychological mechanism that emerges within a social structure, which is developed and strengthened through the process of learning, and trust continuously generates and perpetuates positive expectations over time as with other psychological mechanisms. The literature also demonstrates that trust has positive impacts directly and/or indirectly. Castro et al. (2022) noted that project managers' emotional intelligence and team members' trust levels significantly influence project success. Madjar and Ortiz-Walters (2009) also studied the impact of trust on employees' creative performance via the mediating influence of psychological safety. They demonstrated that trust among supervisors and customers significantly contributed to employees' creative performance (Madjar & Ortiz-Walters 2009). Hypothesis 4 in this study tests the mediating effect of trust between psychological safety and digital transformation project success, to discover whether the direct effect of psychological safety on digital transformation project success changes. The empirical results support that
trust significantly mediates psychological safety's impact on digital transformation project success. This indicates that trust can change psychological safety's non-significant effect into a significant linear impact on digital transformation project success. This implies that when project team members feel psychologically safe and trust each other, the possibility of digital transformation success also significantly increases with a linear relationship. The mediation effect of trust is significant in this model, which also changes psychological safety's non-significant effect to a significant linear influence for digital transformation project success. Consequently, digital transformation project teams must face a positive trend in digital transformation when they feel psychologically safe and trust each other. There are some studies in the literature on psychological safety and trust types. Ahiaga-Dagbui et al. (2020), for example, showed that psychological safety is one of the outcomes of creating micro-level trust among team members, which includes and exceeds interpersonal trust. Rao-Nicholson, Khan and Stokes (2016) studied trust's impact on leadership and psychological safety. However, its mediating effect between psychological safety and digital transformation project success had not been studied before. Therefore, the result of Hypothesis 4 also contributes to trust, psychology, project management and digital transformation literature with a new finding of a new conceptual model. In terms of theory, these results also contribute by discovering trust's mediating effect on psychological safety impact over the digital transformation project success.

The fifth contribution to the literature is discovering trust's mediation effect between role conflict and digital transformation project success. Based on survey results, role conflict between project team members does not significantly affect digital transformation project success. That means when role conflict arises around project team members, the possibility of digital transformation project success might not change significantly, positively or negatively. However, when adding trust's mediating effect to this model, role conflict has a significant inverse impact on digital transformation project success. This result again shows trust concept's importance among project team members. Trust is a crucial element for a group of individuals to have the chance to become a team (Rogers 2019). This outcome indicates that if there is role conflict among project team members during a large-scale digital transformation project, its success is not significantly impacted. However, if there is role conflict among project team members who also trust each other in that environment, digital
transformation success is impacted significantly and adversely. Even though Bedford, Speklé and Widener (2022) studied the moderator effect of trust on budget tightness change and role conflict, and Jia et al. (2019) found that role conflict weakens the relationship between socially responsible human resource management and organisational trust, the mediation effect of trust between role conflict and digital transformation success is a new finding, contributing to trust, role conflict, project management and digital transformation literature.

Besides these contributions, this research also has a control variable – IT Project Management Experience – to see if it impacts trust, role conflict, and/or digital transformation project success. The results demonstrated that IT Project Management Experience has no significant impact on trust, role conflict and/or digital transformation project success.

4.2 Implications for practice

This study presents key factors for consideration by management when developing and implementing digital transformation projects within their organisation. Such projects need to be appropriately managed from planning to closure stages, as they have high-level failure potential. Digital transformation projects are a complex technical journey for many organisations. They are also significant investments, even for large organisations, when considering financial and time costs of large-scale transformation projects. Therefore, proper administration is vital for a better outcome for costly digital transformation project investments. Proper administration significantly affects the project's success and investment return. When discussing project management discipline, it covers end-to-end project lifespan to experience a satisfactory project outcome, including planning, budgeting, costs, quality management and risk management, which manage potential internal and external factors that may impact project success negatively or positively. More importantly, project management discipline is strongly linked with people management, as project teams are the main factor in projects.

This research illustrates that psychological safety has a positive influence to avoid potential role conflict among project team members (H1). That means if professionals improved psychological safety feelings among project members, they would keep their project
environment safe from potential role conflict. Therefore, this study recommends that project professionals closely monitor their team members' psychological safety feelings to avoid potential role conflict during large-scale transformation projects.

This study also provided another insight into psychological safety and trust factors among project team members (H2). Project managers and project sponsors also observe that if psychological safety is higher among project team members, the trust level may significantly improve. Therefore, project professionals are again advised to maintain their project team members' psychological safety to improve the trust level for the life of the project. In addition, psychological safety has also indirectly and significantly impacted trust level via role conflict (H2). That means if the psychological safety level is high among project team members, even if role conflict is observed, their trust level will still be impacted positively. This finding shows how important psychological safety is for project-based teams to build trust.

Although psychological safety significantly influences trust and role conflict, this research also pointed to a critical point for project professionals by demonstrating that psychological safety might not directly impact digital transformation project success (H3). Additionally, even if role conflict arises in an environment where team members are psychologically safe, project professionals are still unlikely to observe a significant impact of mediation influence of role conflict, either positively or negatively, over the success of the digital transformation project (H3).

On the other hand, trust feelings among project team members significantly and positively impact digital transformation project success (H4). That means if project professionals can provide an environment where project team members trust each other, the possibility of success and digital project transformation would significantly grow. Therefore, this direct and significant impact should be a critical consideration for project professionals during project development and culture building. As mentioned above, psychological safety’s significant impact on digital transformation was not previously observed. However, the result dramatically and significantly changes when analysing psychological safety’s indirect impact on digital transformation projects via trust. When the trust factor is evident among those who feel psychologically safe, the likelihood of digital transformation project success will
significantly improve (H4). Therefore, if project leaders can maintain trust feelings in their project environment, they will have better potential for a success. This result again demonstrates the importance of trust among professionals to improve the possibility of digital transformation project success. Therefore, this study highly recommends that project leaders provide a trustworthy project environment so project team members can trust each other and, inherently, increase their project success potential.

Another point of this study for the business world is that it has not seen any significant direct impact of role conflict on digital transformation projects (H5). Even though some studies have discussed positive and/or negative impacts of role conflict on project environments, it has not observed any significant impact of role conflict on transformation success. However, when trust exists between project team members, role conflict would significantly indirectly and negatively impact digital transformation project success (H5). That means if there is role conflict in the project and team members trust each other, they will likely notice a significant adverse impact on digital transformation project success.

Overall, this study revealed that it is possible to improve digital transformation project success by managing role conflict, trust, and psychological safety factors properly in the digital environment. This research focused on project team members, their psychological status, and their connection with the digital transformation project. With the results from this study, organisations and project executives would have potential project success factors they need to monitor carefully during the project lifespan to have a better digitalisation project journey. This study offers guidance on factors for consideration for successful digital transformation projects to ensure more positive and successful digital transformation outcomes. Despite the fact that there may be many factors which affect large-scale digital transformation projects, this study sheds light on why professionals need to be more considerate of trust, role conflict and psychological safety during their digital transformation journey in terms of their significant direct and indirect impacts on digital transformation project success. These results significantly impact project professionals and enterprises, as businesses are experiencing high-level turbulence in their digital transformation journeys. Therefore, project professionals and executives must pay attention to psychological situations and conflicts in the project environment to achieve desired digital transformation outcomes.
4.3 Summary of Chapter 4

This chapter presents a comprehensive analysis of the findings of this thesis, discussing all results within the broader context of their significance in the adoption of Digital Transformation Projects. It explores the theoretical, practical, and methodological contributions of the thesis, providing a detailed examination of the impact and implications of these findings. The subsequent chapter will provide an overview of the conclusions, highlight the limitations of the study, and suggest directions for future research.
CHAPTER 5 – CONCLUSIONS, LIMITATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

This study sheds light on digital transformation projects from a psychological perspective, by highlighting crucial roles played by concepts of psychological safety, role conflict, and trust. Specifically, this study supports psychological safety theory within digital transformation projects by concentrating on participants’ experiences who were involved in digital transformation projects in their organisations.

This study discovered a significant adverse relationship between psychological safety and role conflict in digital transformation project environments. This finding indicated that when project team members psychologically felt safe, the role conflict possibility between project team members reduced significantly during the life of the project. This result reinforces the importance of psychological safety within project environments. When project team members felt psychologically safe, the possibility of role conflict significantly decreased.

The relationship between psychological safety and trust via the mediation effect of role conflict on the digital transformation project resulted in two primary outcomes. Firstly, that psychological safety had a strong linear relationship with trust as trust increased significantly between digital transformation project team members when psychologically safe feelings increased. The second outcome was the mediation effect of role conflict between psychological safety and trust. The result demonstrates that even if role conflict occurred among project team members who felt psychologically safe, their trust level remained significant.

This study demonstrated that psychological safety did not significantly impact digital transformation project success, and surprisingly it, did not change significantly. Role conflict and trust mediators have also been tested for their effects on these two primary constructs. When role conflict’s mediation effect between psychological safety and digital transformation project success was tested, no significant impact was observed. However, when trust mediated between psychological safety and digital transformation project success, a significant linear relationship existed. This critical finding highlights the power of
psychological safety and trust, directly and indirectly. This result suggested that if trust was high among project team members who also felt psychologically safe, the success of a digital transformation project significantly improved the likelihood of project success. Trust can change psychological safety’s non-significant impact to a significant linear influence. The survey findings also suggest that role conflict was not significantly related to digital transformation project success. When trust was added as a mediator between role conflict and the digital transformation project, the impact of role conflict changed adversely. This finding indicated that when digital transformation project team members experienced role conflict but also trusted each other, digital transformation project success was affected significantly in a negative way. That means if project team members experienced role conflict with their trustworthy project teammates, the outcome was negative regarding digital transformation project success. Therefore, project professionals must maintain a trustworthy project environment for team members. However, they also needed to ensure the team avoided any negative conflict as the impact would be greater on those who trusted each other.

In comparing these findings with other scholars, the concepts of psychological safety, role conflict and trust have previously been investigated as individual concepts in different settings ranging from their impact in R&D teams, the film industry, the construction industry, and the educational sector, to list a few. However, there has been no study conducted on the impact of psychological safety as an antecedent, and role conflict and trust as mediators on the success factor of digital transformation projects. Apart from these contributions, the findings from this study are unique, as they also contribute to and expand psychological safety theory by investigating psychological safety’s impact on new concepts: role conflict, trust, and digital transformation project success.

Despite these contributions to the literature, there were some limitations to this study that could provide potential directions for future research in the field of digital transformation. A limitation of this study was that survey participants were from Australia and from various industries; therefore, the study did not focus on industry specific digital transformation. Thus, the findings from this study provided a general overview regardless of sector-based dependency. Some participants’ experiences vary based on their industry dynamics, which
was not the focus of this study. Future direction could involve limiting this research to a particular industry to see if the findings differ. Another limitation of this study is the participants’ definitions of the concepts: role conflict, trust, psychological safety, and digital transformation project success. These definitions are not consistent. Specifically, the definition of digital transformation project success may not be clear to everyone within the organisation. Future study may include a benchmark for digital transformation project success to support participants to determine whether digital transformation was successful. Another limitation of this study was that because all survey responses were anonymous, more than one participant from the same organisation could have been part of the survey. This possibility would weight their organisations higher than other responses. Another limitation was the decision not to concentrate on a specific type of digital transformation project. Different types of digital transformation projects exist, such as artificial intelligence, machine learning, and system transformation. However, this study did not determine any specific digital transformation type, to allow a more inclusive perspective. Future research may tailor this study to a specific form of digital transformation. Another limitation was the scope of the study, as it was limited to analysis of the constructs of psychological safety, role conflict and trust over digital transformation project success even though other potential factors may impact digital transformation project success. Future studies could consider other factors that determine or impact digital transformation project success.

This study focused on how psychological safety, role conflict and trust impact digital transformation project success. As data were not collected to uncover the impact of digital transformation projects on the psychological welfare of employees, this focus is encouraged for future study, to understand the full psychological impact of digital transformation projects pre, during and post implementation.
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## APPENDICES

### Appendix 1: Survey questions

<table>
<thead>
<tr>
<th>Theoretical Construct and Indicator Variable</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Role Conflict</strong></td>
<td>The scale for role conflict was adapted from Nambisan and Baron (2021). Originally developed by Rizzo, House and Lirtzman (1970) and later modified by House, Schuler and Levanoni (1983)</td>
</tr>
<tr>
<td>(1= Strongly disagree, 2= Disagree, 3= Somewhat disagree, 4= Neither agree nor disagree, 5= Somewhat agree, 6= Agree, 7= Strongly agree)</td>
<td></td>
</tr>
<tr>
<td>1. I do things that are apt to be accepted by one person and not by others.</td>
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<tr>
<td>2. I work with two or more groups who operate quite differently</td>
<td></td>
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<tr>
<td>3. I have to work under incompatible policies and guidelines.</td>
<td></td>
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<tr>
<td>4. I have to do things that should be done differently under different conditions.</td>
<td></td>
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<tr>
<td>5. I have to buck a rule or policy in order to carry out an assignment.</td>
<td></td>
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<tr>
<td>6. I receive incompatible requests from two or more people.</td>
<td></td>
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<tr>
<td>7. I receive an assignment without adequate resources and materials to execute it.</td>
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<tr>
<td>8. I have to work under vague directives or orders</td>
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<tr>
<td><strong>Trust</strong></td>
<td>The items for the trust construct were adapted from Paul et al. (2021). Originally developed by Jarvenpaa and Leidner (1998) and Sarker, Valacich and Sarker (2003)</td>
</tr>
<tr>
<td>(1= Strongly disagree, 2= Disagree, 3= Somewhat disagree, 4= Neither agree nor disagree, 5= Somewhat agree, 6= Agree, 7= Strongly agree)</td>
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<tr>
<td>9. I feel that I can depend on my team members to meet task commitments.</td>
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<tr>
<td>10. I feel that my team members will share information freely and openly.</td>
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<tr>
<td>11. My team members’ goal is to use this project to gain real-world experience</td>
<td></td>
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<tr>
<td>12. I feel that my team members will be concerned about my preferences/views.</td>
<td></td>
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<tr>
<td>13. I feel that my team members will put in their best effort on the team projects.</td>
<td></td>
</tr>
<tr>
<td>14. If required, I will be comfortable in giving my team members complete responsibility for the completion of this project</td>
<td></td>
</tr>
<tr>
<td><strong>Psychological Safety</strong></td>
<td>The psychological safety scale was adopted from Edmondson (1999) and also used and adapted by Lee, Swink and Pandejpong (2011)</td>
</tr>
<tr>
<td>(1= Strongly disagree, 2= Disagree, 3= Somewhat disagree, 4= Neither agree nor disagree, 5= Somewhat agree, 6= Agree, 7= Strongly agree)</td>
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<tr>
<td>15. If I made a mistake on this project, it was held against him/her</td>
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<tr>
<td>16. I was able to bring up problems and tough issues</td>
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<tr>
<td>17. People on this project sometimes rejected other members for being different</td>
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<tr>
<td>18. It was safe to take a risk on this project</td>
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<tr>
<td>19. It was difficult to ask other team members for help</td>
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<tr>
<td>20. No one on this team would deliberately act in a way that undermined others’ efforts</td>
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<tr>
<td>21. I felt that my unique skills and talents were valued and utilised on this project</td>
<td></td>
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<tr>
<td><strong>Digital Transformation Project Success</strong></td>
<td>The digital transformation project success scale was adopted as a second order from Zwikael and Meredith (2021) project success dimension model.</td>
</tr>
<tr>
<td>(1= Strongly disagree, 2= Disagree, 3= Somewhat disagree, 4= Neither agree nor disagree, 5= Somewhat agree, 6= Agree, 7= Strongly agree)</td>
<td></td>
</tr>
<tr>
<td>22. The digital transformation project was completed on time</td>
<td></td>
</tr>
<tr>
<td>23. The digital transformation project was completed within budget</td>
<td></td>
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<tr>
<td>24. The digital transformation project was completed within the agreed scope</td>
<td></td>
</tr>
<tr>
<td>25. The digital transformation project was completed without undesirable benefits caused by the project manager</td>
<td></td>
</tr>
<tr>
<td><strong>Project Management Success</strong></td>
<td></td>
</tr>
<tr>
<td>26. The digital transformation project was realised all target benefits</td>
<td></td>
</tr>
<tr>
<td>27. The digital transformation project’s business case was realised</td>
<td></td>
</tr>
<tr>
<td><strong>Project Ownership Success</strong></td>
<td></td>
</tr>
<tr>
<td>28. The investment in this digital transformation project generated satisfactory results (even if the business case was not realised)</td>
<td></td>
</tr>
<tr>
<td>29. The founder would have invested in this project again had they known everything that has happened since</td>
<td></td>
</tr>
<tr>
<td><strong>Project Investment Success</strong></td>
<td></td>
</tr>
<tr>
<td>30. The digital transformation project overall was a success</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix 2: Demographic questions

1. **How many years of IT project management experience do you have?**
   - a) < 2 years
   - b) 2 to 5 years
   - c) More than 5 to 10 years
   - d) > 10 years

2. **What was/is the time duration of your digital transformation project?**
   - a) < 1 year
   - b) 1 to 2 years
   - c) More than 2 to 3 years
   - d) ≥ 4 years

3. **Which industry do you work for?**
   - a) Education
   - b) Finance
   - c) Healthcare
   - d) Technology
   - e) Transportation
   - f) Construction
   - g) Utilities
   - h) Others

4. **What was/is your position in the digital transformation project?**
   - a) Program or Portfolio Manager
   - b) Project Manager
   - c) Analyst (System/Business)
   - d) Developer
   - e) Tester
   - f) System/DevOps Engineer
   - g) Project Stakeholder/Business Unit
   - h) Management
   - i) Other

5. **Do you have any Project Management certification? If yes, please type below the certification title?**
   - a) Yes, certification title
   - b) No, I don’t have any
Appendix 3: Ethics approval

Swinburne University of Technology Human Research Ethics Committee

Approval certificate

05/07/2022

The ethics application for your project Role Conflict and its Impact on the Success of Digital Transformation Projects has been approved.

Chief Investigator: Mohsin Malik

Ref: 20226470-10230

Approved Duration: 05/07/2022 to 05/07/2023

I refer to the ethical review of the above project protocol by Swinburne's Human Research Ethics Committee (SUHREC) or its sub-committees.

I am pleased to advise that, as submitted to date, the project may proceed in line with standard on-going ethics clearance conditions outlined below.

- The approved duration is as shown above unless an extension request is subsequently approved.
- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research (2018) and with respect to secure data use, retention and disposal.
- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project, ensuring that they are aware of ethics clearance conditions, including research and consent processes or instruments approved. Any change in Chief Investigator/Supervisor, and addition or removal of other personnel/students from the project, requires timely notification and SUHREC endorsement.
- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical approval/endorsement from SUHREC for approval. SUHREC must be notified in writing of (a) any serious or unexpected adverse effects on participants and any redress measures, (b) any serious breach of participant confidentiality, and (c) unforeseen events which might affect continued ethical acceptability of the project.
- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.
- Please forward this approval certificate to relevant members of the project team.

This research project was approved during COVID-19 restrictions. The conduct of the research during this period should reflect any changes in relation to university and government COVID-19 mandates in the relevant jurisdictions. To ensure you have accommodated these mandates please refer to the Swinburne Ethics COVID-19 website here.

The following investigators have been approved to work on the project:

Chief Investigator
Mohsin Malik

Associate Investigators
Amir Andargoli

Student Investigators
Kerem Pala

Please contact the Swinburne Research Ethics Office if you have any queries.

Regards,

Dr Astrid Nordmann

on behalf of

Research Ethics Office
Swinburne University of Technology

P: +61 3 9214 3845 | E: resethics@swin.edu.au